

# 2718 - Special Flood Hazard Area Permit Records Digitization and Retention

## Application Details

Funding Opportunity:	2335-Virginia Community Flood Preparedness Fund - Capacity Building/Planning Grants - CY24 Round 5
Funding Opportunity Due Date:	Mar 28, 2025 11:59 PM
Program Area:	Virginia Community Flood Preparedness Fund
Status:	Under Review
Stage:	Final Application
Initial Submit Date:	Jan 24, 2025 9:58 AM
Initially Submitted By:	Tom Brockenbrough
Last Submit Date:	
Last Submitted By:	

## Contact Information

### Primary Contact Information

Active User*:	Yes
Type:	External User
Name*:	Mr. Tom Middle Name Brockenbrough Salutation First Name Last Name
Title:	GIS Coordinator/Floodplain Administrator
Email*:	tbrockenbrough@co.accomack.va.us
Address*:	PO Box 93

Accomac Virginia 23301  
City State/Province Postal Code/Zip

Phone*:	(757) 787-5797 Ext.
	Phone
	###-###-####
Fax:	###-###-####

Comments:

### Organization Information

Status*:	Approved
Name*:	County of Accomack
Organization Type*:	County Government
Tax ID*:	54-6001099
Unique Entity Identifier (UEI)*:	000000000000
Organization Website:	

**Address\*:**

23296 Courthouse Avenue

Accomac Virginia 23301-  
City State/Province Postal Code/Zip

**Phone\*:**

757-787-5726 Ext.  
#### #### ####

**Fax:**

#### #### ####

**Benefactor:**

**Vendor ID:**

**Comments:**

## VCFPF Applicant Information

### *Project Description*

**Name of Local Government\*:** Accomack County

Your locality's CID number can be found at the following link: [Community Status Book Report](#)

**NFIP/DCR Community Identification Number (CID)\*:** 510001

If a state or federally recognized Indian tribe,

**Name of Tribe:**

**Authorized Individual\*:** Mike Mason  
First Name Last Name

**Mailing Address\*:** PO Box 388  
Address Line 1  
Address Line 2

Accomac Virginia 23301  
City State Zip Code

**Telephone Number\*:** 757-787-5700

**Cell Phone Number\*:** 757-710-3242

**Email\*:** mmason@co.accomack.va.us

Is the contact person different than the authorized individual?

**Contact Person\*:** Yes

**Contact:** Tom Brockenbrough  
First Name Last Name  
P.O. Box 93  
Address Line 1  
Address Line 2

Accomac Virginia 23301  
City State Zip Code

**Telephone Number:** 757-787-5797

**Cell Phone Number:** 757-787-5797

**Email Address:** tbrockenbrough@co.accomack.va.us

Enter a description of the project for which you are applying to this funding opportunity

**Project Description\*:**

Conversion of historical permits in flood zones from 1980's - 2005 to an organized digital storage. Historical files are in paper format and not filed in an easy to locate manner. Files are deteriorating in storage and include zoning, wetlands, land disturbance, building permits and associated

paperwork, etc. in flood zones, including historical elevation certificate information for Accomack County as well as multiple incorporated towns. Low-income geographic area means any locality, or community within a locality, that has a median household income that is not greater than 80 percent of the local median household income, or any area in the Commonwealth designated as a qualified opportunity zone by the U.S. Secretary of the Treasury via his delegation of authority to the Internal Revenue Service. A project of any size within a low-income geographic area will be considered.

Is the proposal in this application intended to benefit a low-income geographic area as defined above?

**Benefit a low-income geographic area\***: Yes

Information regarding your census block(s) can be found at [census.gov](http://census.gov)

**Census Block(s) Where Project will Occur\***: 510010904022019

**Is Project Located in an NFIP Participating Community?\***: Yes

**Is Project Located in a Special Flood Hazard Area?\***: No

**Flood Zone(s) (if applicable):**

**Flood Insurance Rate Map Number(s) (if applicable):**

## Eligibility - Round 4

### **Eligibility**

Is the applicant a local government (including counties, cities, towns, municipal corporations, authorities, districts, commissions, or political subdivisions created by the General Assembly or pursuant to the Constitution or laws of the Commonwealth, or any combination of these)?

**Local Government\***: Yes  
Yes - Eligible for consideration  
No - Not eligible for consideration

If the applicant is not a town, city, or county, are letters of support from all affected local governments included in this application?

**Letters of Support\***: N/A  
Yes - Eligible for consideration  
No - Not eligible for consideration

Has this or any portion of this project been included in any application or program previously funded by the Department?

**Previously Funded\***: No  
Yes - Not eligible for consideration  
No - Eligible for consideration

Has the applicant provided evidence of an ability to provide the required matching funds?

**Evidence of Match Funds\***: N/A  
Yes - Eligible for consideration  
No - Not eligible for consideration  
N/A- Match not required

## Scoring Criteria for Capacity Building & Planning - Round 4

### **Scoring**

Eligible Capacity Building and Planning Activities (Select all that apply) ? Maximum 100 points. To make multiple selections, Hold CTRL and click the desired items.

**Capacity Building and Planning\***: Floodplain Staff Capacity

Is the project area socially vulnerable? (based on [ADAPT Virginia's Social Vulnerability Index Score](#))

**Social Vulnerability Scoring:**

Very High Social Vulnerability (More than 1.5)

High Social Vulnerability (1.0 to 1.5)

Moderate Social Vulnerability (0.0 to 1.0)

Low Social Vulnerability (-1.0 to 0.0)

Very Low Social Vulnerability (Less than -1.0)

**Socially Vulnerable\***: Moderate Social Vulnerability (0.0 to 1.0)

Is the proposed project part of an effort to join or remedy the community's probation or suspension from the NFIP?

**NFIP\*:**

No

**Is the proposed project in a low-income geographic area as defined below?**

"Low-income geographic area" means any locality, or community within a locality, that has a median household income that is not greater than 80 percent of the local median household income, or any area in the Commonwealth designated as a qualified opportunity zone by the U.S. Secretary of the Treasury via his delegation of authority to the Internal Revenue Service. A project of any size within a low-income geographic area will be considered.

**Low-Income Geographic Area\*:** Yes

**Does this project provide ?community scale? benefits?**

**Community Scale Benefits\*:** More than one census block

**Comments:**

The project by increasing the capacity of Accomack County to maintain and more easily locate historical flood permit data provides benefits community wide throughout the Special Flood Hazard Area, including unincorporated and incorporated areas.

## Scope of Work and Budget Narrative - Capacity Building and Planning - Round 4

### **Scope of Work - General Information**

**Upload your Scope of Work**

Please refer to Part IV, Section B. of the grant manual for guidance on how to create your scope of work

**Scope of Work Attachment\*:**

[Accomack County Application for Virginia Community Flood Preparedness Fund Round 5 Scope of Work Narrative.pdf](#)

**Comments:**

### **Budget Narrative**

**Budget Narrative Attachment\*:**

[Accomack County Application for Virginia Community Flood Preparedness Fund Round 5 Budget Narrative.pdf](#)

**Comments:**

Attachment reflects County's wish that the grant request is for \$50,000 with all funds coming from CFPF and the local match waived.

Accomack County is a Low to Moderate Income Area, and has federally designated opportunity zones.

## Scope of Work Supporting Information - Capacity Building and Planning

### **Scope of Work Supporting Information**

**Describe identified resource needs including financial, human, technical assistance, and training needs**

**Resource need identification\*:**

Without financial assistance existing paper documentation will continue to deteriorate and it risks becoming not of use as a resource as long term employees who know how to research and locate the information in the paper files retire or otherwise leave County employment. It is a vast archive of information that should be used by the County, but is not because of the difficulty in using the paper files and the research that has to first be undertaken just to know what to look for in the files.

**Describe the plan for developing, increasing, or strengthening knowledge, skills and abilities of existing or new staff. This may include training of existing staff, hiring personnel, contracting consultants or advisors**

**Development of Existing or New Staff\*:**

Currently very few employees know how to research and locate the paper files. Staff does already know how to research and locate the digital files. The changes from paper to digital will fit seamlessly with existing staff training on documentation in order to better manage the information as it's use. It will change from a manual and time intensive process to a digital format much like how documents since 2005 are stored and located.

**Where capacity is limited by funding, what strategies will be developed to increase resources in the local government? (This may include work with non-governmental organization, or applying for grants, loans, or other funding sources)**

**Resource Development Strategies\*:**

Certainly this grant leverages the resources of the information in the files which is becoming less valuable day by day as documents deteriorate or staff do not know how to locate them. We also do not have the dedicated manpower, equipment, or staff space to do this work in house.

**Describe policy management and/or development plans**

**Policy management and/or development\*:**

Documentation will be managed by the IT Department on the server with information backed up. Does not require any new policy management or

development.

Describe plans for stakeholder identification, outreach, and education strategies

#### **Stakeholder identification, outreach, and education strategies\*:**

Current stakeholders are the staff within the Department of Building, Planning, and Economic Development as well as the Department of Environmental Programs. Once the information is received digitally it will be incorporated along with other digital information on the County Server which will then make it more useful to staff. Staff will be educated with respect to the availability of the data and it will be trained on this information as they are other permit information on the County Server.

## Budget

### **Budget Summary**

#### **Grant Matching Requirement\*:**

LOW INCOME - Planning and Capacity Building - Fund 90%/Match 10%

\*Match requirements for Planning and Capacity Building in low-income geographic areas will not require match for applications requesting less than \$3,000.

Is a match waiver being requested?

**Match Waiver Request** Yes

Note: only low-income communities are eligible for a match waiver.

\*:

**I certify that my project is in a low-income geographic area:** Yes

**Total Project Amount (Request + Match)\*:** \$50,000.00

\*\*This amount should equal the sum of your request and match figures

**REQUIRED Match Percentage Amount:** \$5,000.00

## BUDGET TOTALS

Before submitting your application be sure that you meet the match requirements for your project type.

**Match Percentage:** 10.07%

Verify that your match percentage matches your required match percentage amount above.

**Total Requested Fund Amount:** \$50,000.00

**Total Match Amount:** \$5,600.00

**TOTAL:** \$55,600.00

### **Personnel**

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

### **Fringe Benefits**

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

### **Travel**

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

### **Equipment**

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

### Supplies

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

### Construction

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

### Contracts

Description	Requested Fund Amount	Match Amount	Match Source
Records Scanning	\$50,000.00	\$5,600.00	Local keyed in as place holder, Requesting Match Be Waived
	\$50,000.00	\$5,600.00	

### Pre-Award and Startup Costs

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

### Other Direct Costs

Description	Requested Fun Amount	Match Amount	Match Source
No Data for Table			

## Supporting Documentation - General

### Supporting Documentation

Named Attachment	Required	Description	File Name	Type	Size	Upload Date
Detailed map of the project area(s) (Projects/Studies)						
FIRMap of the project area(s) (Projects/Studies)						
Historic flood damage data and/or images (Projects/Studies)						
Alink to or a copy of the current floodplain ordinance		Accomack County Flood Ordinance	Flood Hazard Overlay District Provisions to the Accomack County Zoning Ordinance.pdf	pdf	10 MB	01/23/2025 10:26 AM
Maintenance and management plan for project						
Alink to or a copy of the current hazard mitigation plan		Accomack County Portion of the Eastern Shore Hazard Mitigation Plan	Eastern Shore of Virginia Hazard Mitigation Plan.pdf	pdf	21 MB	01/23/2025 10:35 AM

Alink to or a copy of the current comprehensive plan	Current version of the Accomack County Comprehensive Plan. The County expects to have an RFP available to services to update the plan during the first quarter of 2025.	<a href="#">ACCOMACK COMP PLAN AS AMENDED 20181017.pdf</a>	pdf 17 01/23/2025 MB 10:39 AM
Social vulnerability index score(s) for the project area			
Authorization to request funding from the Fund from governing body or chief executive of the local government	Signed AppendixA	<a href="#">Accomack County Application for Virginia Community Flood Preparedness Fund Round 5 Appendix A.pdf</a>	pdf 293 01/23/2025 KB 04:41 PM
Signed pledge agreement from each contributing organization			
Maintenance Plan			
Benefit-cost analysis must be submitted with project applications over \$2,000,000. in lieu of using the FEMA benefit-cost analysis tool, applicants may submit a narrative to describe in detail the cost benefits and value. The narrative must explicitly indicate the risk reduction benefits of a flood mitigation project and compares those benefits to its cost-effectiveness.			
Benefit Cost Analysis			
Other Relevant Attachments			

#### **Letters of Support**

Description	File Name	Type	Size	Upload Date
No files attached.				

## **Accomack County Application for Virginia Community Flood Preparedness Fund Round 5**

### **Scope of Work Narrative**

#### **Need:**

Accomack County is seeking assistance from the Virginia Community Flood Preparedness Fund to have permit records preserved by converting from paper format to digital format.

Accomack County handles permits in Special Flood Hazard Areas for the unincorporated portion of Accomack County as well as 6 incorporated towns (Belle Haven, Chincoteague, Onancock, Saxis, Tangier, and Wachapreague). The types of permits vary by the town, each town handles their own zoning permits and in addition Chincoteague handles its own building permits. All other development permits in the Special Flood Hazard Area are conducted by Accomack County through implementation of the building code, as well as land disturbance permits and wetlands permits. Accomack County also maintains its zoning permits within the Special Flood Hazard Area.

Since 2005, the County has utilized software, first Permit Manager, currently EnerGov, to maintain digital copies of permit records. There is large volume of records from the mid 1980's to 2005 that are being stored in paper format offsite. The records are not stored in an easy to locate method, being stored first by type of permit, then by the year either the permit or the Certificate of Occupancy was issued (they were not consistent), and finally by the name of the property owner at the time the permit was issued. It makes locating records difficult. As an example to find a permit from 1995 you have to first research property transfers going back 20 years to determine who owned the property at that time before you can get to the offsite storage facility to attempt to locate the record. It is especially difficult to locate information if a parcel has had multiple permits going back over many years. Many times the record cannot be located due to being misfiled.

In addition, with age, the records not being stored in a climate controlled environment, mice, and termites, the records are deteriorating. As there is a need for the County to permanently store records with respect to development in Special Flood Hazard Areas there is a need to have the records preserved in a digital format, which is indexed in a manner that it is easier to locate records (by parcel number), as well as have them more readily available than having to go to an offsite facility. The County has almost 300 linear feet of such records, stored either in file cabinets or in boxes.

Currently, only a very limited number of staff know where and how the records are stored as well as the information needed prior to going to the remote site for records. Currently, all staff are familiar with the process for locating digital records. Moving the records to a similar remote storage means all staff will have access to records and that the County will continue to have access to them as the few remaining employees familiar with the paper process retire or move to other employment.

Having the records preserved, easier to locate, and in digital format will allow Accomack to better maintain the records we are required to maintain for our own permits, as well as those of the incorporated towns in the Special Flood Hazard Area. It will make it easier for the staff to locate information, as well as being more responsive to the public for information requests. Without the records being digitized, they will continue to deteriorate and difficult to locate. If the County is unable to locate some of the information, such as an elevation certificate, it can cause delays in permitting current projects as information that cannot be located but then be obtained and paid for by the person seeking a permit.

The records cover the entire County, across a range of incomes. Having the information more readily available allows the County to better identify what areas may be at risk of flooding. For example, staff has scanned elevation certificates when found in the files and recorded information such as lowest adjacent grade and top of floor into a database which will allow the County to target responses in the event of a flooding event for damage assessment.

## **Goals and Objectives**

### **Goal 1 – Records Maintenance and Preservation.**

Objective 1 – Have documents converted from paper to digital format to prevent further degradation.

Objective 2 – Have digital copies stored on County Server which is also backed up so files will not be lost permanently.

### **Goal 2 – Store Records More Efficiently for Ease of Use.**

Objective 1 – Rather than stored manually by type, year, and ownership, records will be stored by parcel number so all permits on a parcel can be quickly located.

All goals are achievable during the grant period.

## **Work Plan:**

Major activities and tasks are as follows:

1. Select a vendor to perform the work. The County has already spoken with multiple vendors to estimate costs and what is needed to complete the project.
2. Execute contract with vendor. This will be done in conjunction with the County's Purchasing Agent.
3. Package records, ship to scanning facility, prepare records for scanning (remove staples, paperclips, binder clips, etc.) scan and index records. All of this is to be completed by the contractor.
4. Quality Control. Performed by the Vendor and the County.
5. Receive deliverable of digital records to be stored digitally by the County and made available for use by County staff

Other than the maintenance performed by the IT department with respect to backup and storage of County files. As this grant only covers a records from a period when no records were stored digitally, there is no need to sustain the project as there will be no new records being added. This will be a static dataset.

**Evaluation:**

Indicators of success will be the ability to locate files without having first research property ownership, not having to travel to remote file storage site to retrieve information and fewer "missing files" by not being filed in the proper location, and ease of locating all files on a parcel.

With respect to cost effectiveness, it is measured against staff efficiency with respect to the amount of staff time now required to research files prior to even attempting to locate them at the remote storage facility, the fact that more staff will now know how to research and locate documents rather than

Without the assistance provided by the Virginia Community Flood Preparedness Fund the County would be unable to undertake this project. Records would continue to deteriorate. As those few employees who are familiar with the process to research and locate paper records leave County employment, those records would eventually become worthless. Converting them to digital would make them more useable and increase their value to the County.

**Accomack County Application for Virginia Community Flood Preparedness Fund Round 5**

**Budget Narrative**

The estimated cost to complete the project is \$50,000.00, which would be fully contracted out to a third party to package and ship documents, prepare the documents for scanning, scan and index the documents, and return digital copies to Accomack County.

The County has received several estimates for the work, which is almost 300 feet of files currently stored remotely in boxes and file cabinets. Accomack has approached several estimates from companies. While an exact figure cannot be determined due to the fact that it is based on the number of scans and separate files, which is unknown, the estimates range from about \$40,000. to \$53,000. All but one of the estimates came in below \$50,000. We've applied an estimate of 10% over the estimates to allow for price changes as well as potentially having more scans than estimated. Based on the estimates we do feel all work can be done for \$50,000.00 and within the timeframe of the grant.

As a low income area, the County is requesting the full cost up to \$50,000 to come from the grant funds, with no match from Accomack County.

## Appendix B: Budget Narrative Template

<p>Applicant Accomack County          Name: Community Flood          Preparedness Fund &amp;          Resilient Virginia          Revolving Loan Fund          Detailed Budget Narrative          Period of Performance: <u>4/1/2025</u> through <u>10/1/2026</u>          Submission Date: <u>1/23/2025</u></p>																																																																																
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #4f81bd; color: white; padding: 5px;">Grand Total State Funding Request</td> <td style="padding: 5px;">\$ 50,000</td> </tr> <tr> <td style="background-color: #4f81bd; color: white; padding: 5px;">Grand Total Local Share of Project</td> <td style="padding: 5px;">\$ 0</td> </tr> <tr> <td style="background-color: #4f81bd; color: white; padding: 5px;">Federal Funding (if applicable)</td> <td style="padding: 5px;">\$ 0</td> </tr> <tr> <td style="background-color: #4f81bd; color: white; padding: 5px;">Project Grand Total</td> <td style="padding: 5px;">\$ 50,000</td> </tr> <tr> <td style="background-color: #4f81bd; color: white; padding: 5px;">Locality Cost Match</td> <td style="padding: 5px;">% 0</td> </tr> </table>	Grand Total State Funding Request	\$ 50,000	Grand Total Local Share of Project	\$ 0	Federal Funding (if applicable)	\$ 0	Project Grand Total	\$ 50,000	Locality Cost Match	% 0																																																																						
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## ARTICLE XV. - FLOOD HAZARD OVERLAY DISTRICT

### *Footnotes:*

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***Editor's note***— An ordinance adopted March 18, 2015, repealed art. XV in its entirety, and enacted new provisions to read as herein set out. Former art. XV, §§ 106-351—106-358 pertained to similar subject matter, and derived from an ordinance adopted Nov. 17, 1982; and an amendment adopted Feb. 18, 2009.

### Sec. 106-351. - Statutory authorization and purpose.

This article is adopted pursuant to the authority granted to localities by Code of Virginia, § 15.2-2280 for the purposes of preventing the loss of life and property, the creation of health and safety hazards, the disruption of commerce and governmental services, the extraordinary and unnecessary expenditure of public funds for flood protection and relief, and the impairment of the tax base by:

- (1) Regulating uses, activities, and development which, alone or in combination with other existing or future uses, activities, and development, will cause unacceptable increases in flood heights, velocities, and frequencies;
- (2) Restricting or prohibiting certain uses, activities, and development from locating within districts subject to flooding;
- (3) Requiring all those uses, activities, and developments that do occur in floodprone districts to be protected and/or floodproofed against flooding and flood damage; and
- (4) Protecting individuals from buying land and structures which are unsuited for intended purposes because of flood hazards.

The floodplain districts described in subsection 106-364(a) shall be overlays to the existing underlying districts as shown on the official zoning ordinance map, and as such, the provisions for the floodplain districts shall serve as a supplement to the underlying district provisions.

If there is any conflict between the provisions or requirements of the floodplain districts and those of any underlying district, the more restrictive provisions and/or those pertaining to the floodplain districts shall apply.

In the event any provision concerning a floodplain district is declared inapplicable as a result of any legislative or administrative actions or judicial decision, the basic underlying provisions shall remain applicable.

(Ord. of 3-18-2015)

### Sec. 106-352. - Definitions.

[The following words, terms and phrases, when used in this article, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

*Base flood* means the flood having a one-percent chance of being equaled or exceeded in any given year.

*Base flood elevation* means the Federal Emergency Management Agency designated one-percent annual chance water surface elevation and the elevation determined per Section 4.6. The water surface elevation of the base flood in relation to the datum specified on the community's flood insurance rate map. For the purposes of this article, the base flood is 100-year flood or one-percent annual chance flood.

*Basement* means any area of the building having its floor sub-grade (below ground level) on all sides.

*Coastal A zone* means flood hazard areas that have been delineated as subject to wave heights between 1.5 feet and three feet.

*Coastal barrier resources system areas (CBRS areas, COBRA areas)* means an undeveloped portion of coastal barriers designated by the Coastal Barrier Resources Act and shown on the flood insurance rate map. In these areas federal government is removed from financial involvement associated with building and development. NFIP flood insurance is unavailable in these areas for properties built or substantially improved after the area received COBRA designation.

*Development* means any manmade change to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.

*Elevated building* means non-basement building built to have the lowest floor elevated above the ground level by means of solid foundation perimeter walls, pilings, or columns (posts and piers).

*Existing construction* means structures for which the "start of construction" commenced before the effective date of the FIRM or before January 1, 1975 for FIRMs effective before that date. "Existing construction" may also be referred to as "existing structures."

*Flood or flooding* means:

- (1) A general or temporary condition of partial or complete inundation of normally dry land areas from:
  - a. The overflow of inland or tidal waters; or,
  - b. The unusual and rapid accumulation or runoff of surface waters from any source.
- (2) The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in paragraph (1)a. of this definition.

*Flood insurance rate map (FIRM)* means an official map of a community, on which the Federal Emergency Management Agency has delineated both the special hazard areas and the risk premium zones applicable to the community. A FIRM that has been made available digitally is called a digital flood insurance rate map (DFIRM).

*Flood insurance study (FIS)* means a report by FEMA that examines, evaluates and determines flood hazards

and, if appropriate, corresponding water surface elevations, or an examination, evaluation and determination of mudflow and/or flood-related erosion hazards.

*Floodplain* means any land area subject to a one-percent or greater chance of being flooded in any given year as determined in subsection 106-364(b) of this article.

*Floodproofing* means any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

*Floodway* means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

*Freeboard* means a factor of safety usually expressed in feet above a flood level for purposes of floodplain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization in the watershed. When a freeboard is included in the height of a structure, the flood insurance premiums may be less expensive.

*Highest adjacent grade* means the highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

*Historic structure* means any structure that is:

- (1) Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
- (2) Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;
- (3) Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or
- (4) Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:
  - a. By an approved state program as determined by the Secretary of the Interior; or,
  - b. Directly by the Secretary of the Interior in states without approved programs.

*Letters of map change (LOMC)* means an official FEMA determination, by letter, that amends or revises an effective flood insurance rate map or flood insurance study. Letters of map change include:

*Letter of map amendment (LOMA)*: An amendment based on technical data showing that a property was incorrectly included in a designated special flood hazard area. A LOMA amends the current effective flood insurance rate map and establishes that a land as defined by meets and bounds or

structure is not located in a special flood hazard area.

*Letter of map revision (LOMR):* A revision based on technical data that may show changes to flood zones, flood elevations, floodplain and floodway delineations, and planimetric features. A letter of map revision based on fill (LOMR-F), is a determination that a structure or parcel of land has been elevated by fill above the base flood elevation and is, therefore, no longer exposed to flooding associated with the base flood. In order to qualify for this determination, the fill must have been permitted and placed in accordance with the community's floodplain management regulations.

*Conditional letter of map revision (CLOMR):* A formal review and comment as to whether a proposed flood protection project or other project complies with the minimum NFIP requirements for such projects with respect to delineation of special flood hazard areas. A CLOMR does not revise the effective flood insurance rate map or flood insurance study.

*Limit of Moderate Wave Action (LiMWA)* means a line on the FIRM showing the inland limit of the area expected to receive one and one-half foot or greater breaking waves during the one-percent annual chance flood event. The LiMWA line marks the inland limit of the Coastal A zone part of the coastal SFHA referenced by building codes and standards where wave heights can be between one and one-half and three feet during the one-percent annual chance event.

*Lowest adjacent grade* means the lowest natural elevation of the ground surface next to the walls of a structure.

*Lowest floor* means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of Federal Code of Regulations 44 CFR § 60.3.

*Manufactured home* means a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes the term "manufactured home" also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than 180 consecutive days, but does not include a recreational vehicle.

*Manufactured home park or subdivision* means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

*New construction* means, for the purposes of determining insurance rates, structures for which the "start of construction" commenced after June 1, 1984, and includes any subsequent improvements to such structures. For floodplain management purposes, new construction means structures for which the start of construction commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvements to such structures.

*Otherwise protected areas (OPAs)* means areas established under federal, state or local law or held by a qualified organization, primarily for wildlife refuge, sanctuary, recreational or natural resource conservation purposes. Such areas are indicated on the flood insurance rate map and have a federal spending prohibition on federal flood insurance.

*Post-FIRM structures* means a structure for which construction or substantial improvement occurred after June 1, 1984.

*Pre-FIRM structures* means a structure for which construction or substantial improvement occurred on or before June 1, 1984.

*Primary frontal dune* means a continuous or nearly continuous mound or ridge of sand with relatively steep seaward and landward slopes immediately landward and adjacent to the beach and subject to erosion and overtopping from high tides and waves during major coastal storms. The inland limit of the primary frontal dune occurs at the point where there is a distinct change from a relatively steep slope to a relatively mild slope.

*Recreational vehicle* means vehicle which is:

- (1) Built on a single chassis;
- (2) Four hundred square feet or less when measured at the largest horizontal projection;
- (3) Designed to be self-propelled or permanently towable by a light duty truck; and
- (4) Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational camping, travel, or seasonal use.

*Repetitive loss structure* means a building covered by a contract for flood insurance that has incurred flood-related damages on two occasions during a ten-year period ending on the date of the event for which a second claim is made, in which the cost of repairing the flood damage, on the average, equaled or exceeded 25 percent of the market value of the building at the time of each flood event.

*Severe repetitive loss structure* means a structure that:

- (1) Is covered under a contract for flood insurance made available under the NFIP; and
- (2) Has incurred flood related damage.
  - a. For which four or more separate claims payments have been made under flood insurance coverage with the amount of each claim exceeding \$5,000.00, and with the cumulative amount of such claims payments exceeding \$20,000.00; or
  - b. For which at least two separate claims payment have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the insured structure.

*Shallow flooding area* means a special flood hazard area with base flood depths from one to three feet where a clearly defined channel does not exist, where the path of flooding is unpredictable and indeterminate, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

*Special flood hazard area* means land in the floodplain subject to a one-percent or greater chance of being

flooded in any given year as determined in subsection 106-364(b) of this article.

*Start of construction* means for other than new construction and substantial improvement, under the Coastal Barriers Resource Act (P.L. - 97-348), means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, substantial improvement or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of the construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

*Structure* means for floodplain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home.

*Substantial damage* means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

*Substantial improvement* means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the start of construction of the improvement. This term includes structures which have incurred substantial damage regardless of the actual repair work performed. The term does not, however, include either:

- (1) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions, or
- (2) Any alteration of a historic structure, provided that the alteration will not preclude the structure's continued designation as a historic structure.
- (3) Historic structures undergoing repair or rehabilitation that would constitute a substantial improvement as defined above, must comply with all ordinance requirements that do not preclude the structure's continued designation as a historic structure. Documentation that a specific ordinance requirement will cause removal of the structure from the National Register of Historic Places or the State Inventory of Historic Places must be obtained from the Secretary of the Interior or the State Historic Preservation Officer. Any exemption from ordinance requirements will be the minimum necessary to preserve the historic character and design of the structure.

*Violation* means the failure of a structure or other development to be fully compliant with the community's floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in Section 3.7 B11, Section 4.3 B, Section 4.4 A, Section 4.5, and section 4.8 is presumed to be in violation until such time as that documentation is provided.

*Watercourse* means a lake, river, creek, stream, wash, channel or other topographic feature on or over which waters flow at least periodically. Watercourse includes specifically designated areas in which substantial flood damage may occur.

(Ord. of 3-18-2015; Ord. of 08-18-2021(1))

#### Sec. 106-353. - Applicability.

These provisions shall apply to all privately and publicly owned lands within the unincorporated area of Accomack County and identified as areas of special flood hazard according to the flood insurance rate map (FIRM) that is provided to Accomack County by FEMA.

(Ord. of 3-18-2015)

#### Sec. 106-354. - Compliance and liability.

- (a) No land shall hereafter be developed and no structure shall be located, relocated, constructed, reconstructed, enlarged, or structurally altered except in full compliance with the terms and provisions of this article and any other applicable ordinances and regulations which apply to uses within the jurisdiction of this article.
- (b) The degree of flood protection sought by the provisions of this article is considered reasonable for regulatory purposes and is based on acceptable engineering methods of study, but does not imply total flood protection. Larger floods may occur on rare occasions. Flood heights may be increased by man-made or natural causes, such as ice jams and bridge openings restricted by debris. This article does not imply that districts outside the floodplain district or land uses permitted within such district will be free from flooding or flood damages.
- (c) This article shall not create liability on the part of the county or any officer or employee thereof for any flood damages that result from reliance on this article or any administrative decision lawfully made thereunder.
- (d) Records of actions associated with administering this article shall be kept on file and maintained by the floodplain administrator.

(Ord. of 3-18-2015)

#### Sec. 106-355. - Abrogation and greater restrictions.

This article supersedes any ordinance currently in effect in floodprone districts. Any ordinance, however, shall remain in full force and effect to the extent that its provisions are more restrictive.

(Ord. of 3-18-2015)

Sec. 106-356. - Severability.

If any section, subsection, paragraph, sentence, clause, or phrase of this article shall be declared invalid for any reason whatever, such decision shall not affect the remaining portions of this article. The remaining portions shall remain in full force and effect; and for this purpose, the provisions of this article are hereby declared to be severable.

(Ord. of 3-18-2015)

Sec. 106-357. - Penalty for violations.

Any person who fails to comply with any of the requirements or provisions of this article or directions of the zoning administrator or any authorized employee of Accomack County shall be guilty of a class 3 misdemeanor as specified under section 106-277 and subject to the penalties therefore.

The VA USBC addresses building code violations and the associated penalties in Section 104 and Section 115. Violations and associated penalties of the Zoning Ordinance of Accomack County are addressed in section 106-277.

The imposition of a fine or penalty for any violation of, or noncompliance with, this article shall not excuse the violation or noncompliance or permit it to continue; and all such persons shall be required to correct or remedy such violations within a reasonable time. Any structure constructed, reconstructed, enlarged, altered or relocated in noncompliance with this article may be declared by Accomack County to be a public nuisance and abatable as such. Flood insurance may be withheld from structures constructed in violation of this article.

(Ord. of 3-18-2015)

Sec. 106-358. - Designation of the floodplain administrator.

The zoning administrator, or their designee, is hereby appointed to administer and implement these regulations and is referred to herein as the floodplain administrator.

(Ord. of 3-18-2015)

Sec. 106-359. - Duties and responsibilities of the floodplain administrator.

The duties and responsibilities of the floodplain administrator shall include but are not limited to:

- (1) Review applications for permits to determine whether proposed activities will be located in the special flood hazard area (SFHA).
- (2) Interpret floodplain boundaries and provide available base flood elevation and flood hazard information.

- (3) Review applications to determine whether proposed activities will be reasonably safe from flooding and require new construction and substantial improvements to meet the requirements of these regulations.
- (4) Review applications to determine whether all necessary permits have been obtained from the federal, state or local agencies from which prior or concurrent approval is required.
- (5) Verify that applicants proposing an alteration of a watercourse have notified adjacent communities, the Department of Conservation and Recreation (Division of Dam Safety and Floodplain Management), and other appropriate agencies (VADEQ, USACE) and have submitted copies of such notifications to FEMA.
- (6) Advise applicants for new construction or substantial improvement of structures that are located within an area of the coastal barrier resources system established by the Coastal Barrier Resources Act that federal flood insurance is not available on such structures; areas subject to this limitation are shown on flood insurance rate maps as coastal barrier resource system areas (CBRS) or otherwise protected areas (OPA).
- (7) Approve applications and issue permits to develop in flood hazard areas if the provisions of these regulations have been met, or disapprove applications if the provisions of these regulations have not been met.
- (8) Inspect or cause to be inspected, buildings, structures, and other development for which permits have been issued to determine compliance with these regulations or to determine if non-compliance has occurred or violations have been committed.
- (9) Review elevation certificates and require incomplete or deficient certificates to be corrected.
- (10) Submit to FEMA, or require applicants to submit to FEMA, data and information necessary to maintain FIRMs, including hydrologic and hydraulic engineering analyses prepared by or for the county within six months after such data and information becomes available if the analyses indicate changes in base flood elevations.
- (11) Maintain and permanently keep records that are necessary for the administration of these regulations, including:
  - a. Flood insurance studies, flood insurance rate maps (including historic studies and maps and current effective studies and maps) and letters of map change; and
  - b. Documentation supporting issuance and denial of permits, elevation certificates, documentation of the elevation (in relation to the datum on the FIRM) to which structures have been floodproofed, other required design certifications, variances, and records of enforcement actions taken to correct violations of these regulations.
- (12) Enforce the provisions of these regulations, investigate violations, issue notices of violations or stop work orders, and require permit holders to take corrective action.
- (13) Advise the board of zoning appeals regarding the intent of these regulations and, for each application for a variance, prepare a staff report and recommendation.

- (14) Administer the requirements related to proposed work on existing buildings:
  - a. Make determinations as to whether buildings and structures that are located in flood hazard areas and that are damaged by any cause have been substantially damaged.
  - b. Make reasonable efforts to notify owners of substantially damaged structures of the need to obtain a permit to repair, rehabilitate, or reconstruct, and prohibit the non-compliant repair of substantially damaged buildings except for temporary emergency protective measures necessary to secure a property or stabilize a building or structure to prevent additional damage.
- (15) Undertake, as determined appropriate by the floodplain administrator due to the circumstances, other actions which may include but are not limited to: issuing press releases, public service announcements, and other public information materials related to permit requests and repair of damaged structures; coordinating with other federal, state, and local agencies to assist with substantial damage determinations; providing owners of damaged structures information related to the proper repair of damaged structures in special flood hazard areas; and assisting property owners with documentation necessary to file claims for increased cost of compliance coverage under NFIP flood insurance policies.
- (16) Notify the Federal Emergency Management Agency when the corporate boundaries of the county have been modified and:
  - a. Provide a map that clearly delineates the new corporate boundaries or the new area for which the authority to regulate pursuant to these regulations has either been assumed or relinquished through annexation; and
  - b. If the FIRM for any annexed area includes special flood hazard areas that have flood zones that have regulatory requirements that are not set forth in these regulations, prepare amendments to these regulations to adopt the FIRM and appropriate requirements, and submit the amendments to the governing body for adoption; such adoption shall take place at the same time as or prior to the date of annexation and a copy of the amended regulations shall be provided to Department of Conservation and Recreation (Division of Dam Safety and Floodplain Management) and FEMA.
- (17) Upon the request of FEMA, complete and submit a report concerning participation in the NFIP which may request information regarding the number of buildings in the SFHA, number of permits issued for development in the SFHA, and number of variances issued for development in the SFHA.
- (18) It is the duty of the community floodplain administrator to take into account flood, mudslide and flood-related erosion hazards, to the extent that they are known, in all official actions relating to land management and use throughout the entire jurisdictional area of the community, whether or not those hazards have been specifically delineated geographically (e.g. via mapping or surveying).

(Ord. of 3-18-2015)

Sec. 106-360. - Boundary changes.

(a) *Jurisdictional boundary changes.* The county floodplain ordinance in effect on the date of annexation shall remain in effect and shall be enforced by the municipality for all annexed areas until the municipality adopts and enforces an ordinance which meets the requirements for participation in the National Flood Insurance Program. Municipalities with existing floodplain ordinances shall pass a resolution acknowledging and accepting responsibility for enforcing floodplain ordinance standards prior to annexation of any area containing identified flood hazards. If the FIRM for any annexed area includes special flood hazard areas that have flood zones that have regulatory requirements that are not set forth in these regulations, prepare amendments to these regulations to adopt the FIRM and appropriate requirements, and submit the amendments to the governing body for adoption; such adoption shall take place at the same time as or prior to the date of annexation and a copy of the amended regulations shall be provided to Department of Conservation and Recreation (Division of Dam Safety and Floodplain Management) and FEMA.

In accordance with the Code of Federal Regulations, Title 44 Subpart (B) Section 59.22(a)(9)(v) all NFIP participating communities must notify the Federal Insurance Administration and optionally the state coordinating office in writing whenever the boundaries of the community have been modified by annexation or the community has otherwise assumed or no longer has authority to adopt and enforce floodplain management regulations for a particular area.

In order that all flood insurance rate maps accurately represent the community's boundaries, a copy of a map of the community suitable for reproduction, clearly delineating the new corporate limits or new area for which the community has assumed or relinquished floodplain management regulatory authority must be included with the notification.

(b) *District boundary changes.* The delineation of any of the floodplain districts may be revised by the county where natural or manmade changes have occurred and/or where more detailed studies have been conducted or undertaken by the U.S. Army Corps of Engineers or other qualified agency, or an individual documents the need for such change. However, prior to any such change, approval must be obtained from the Federal Emergency Management Agency.

(Ord. of 3-18-2015)

Sec. 106-361. - Interpretation of district boundaries.

Initial interpretations of the boundaries of the floodplain districts shall be made by the zoning administrator or their designee. Should a dispute arise concerning the boundaries of any of the districts, the board of zoning appeals shall make the necessary determination. The person questioning or contesting the location of the district boundary shall be given a reasonable opportunity to present his case to the board and to submit his own technical evidence if he so desires.

(Ord. of 3-18-2015)

#### Sec. 106-362. - Submitting technical data.

A community's base flood elevations may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six months after the date such information becomes available, a community shall notify the Federal Emergency Management Agency of the changes by submitting technical or scientific data. Such a submission is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premium rates and floodplain management requirements will be based upon current data.

(Ord. of 3-18-2015)

#### Sec. 106-363. - Letters of map revision.

When development in the floodplain will cause or causes a change in the base flood elevation, the applicant, including state agencies, must notify FEMA by applying for a conditional letter of map revision and then a letter of map revision.

Example cases:

- Any development that causes a rise in the base flood elevations within the floodway.
- Any development occurring in zones A1-30 and AE without a designated floodway, which will cause a rise of more than one foot in the base flood elevation.
- Alteration or relocation of a stream (including but not limited to installing culverts and bridges) 44 Code of Federal Regulations § 65.3 and § 65.6(a)(12).

(Ord. of 3-18-2015)

#### Sec. 106-364. - Description of special flood hazard districts and official floodplain map.

- (a) *Basis of districts.* The various special flood hazard districts shall include the SFHAs subject to a one-percent or greater chance of being flooded in any given year. The basis for the delineation of these districts shall be the FIS and the FIRM for Accomack County prepared by the Federal Emergency Management Agency, Federal Insurance Administration, to become effective May 18, 2015, and any subsequent revisions or amendments thereto.

The boundaries of the SFHA districts are established as shown on the FIRM which is declared to be a part of this article and which shall be kept on file at the county offices.

- (1) The floodway zone is in an AE zone and is delineated, for purposes of this article, using the criterion that certain areas within the floodplain must be capable of carrying the waters of the one-percent annual chance flood without increasing the water surface elevation of that flood more than one foot at any point. According to the May 18, 2015 FIRM, the county does not contain a floodway.
- (2) The AE, or AH zones on the FIRM accompanying the FIS shall be those areas for which one-percent annual chance flood elevations have been provided and the floodway has not been delineated. According to the May 18, 2015 FIRM, the county does not contain any areas designated as AH. For purposes of this ordinance those portions of the AE zone on the FIRM that are subject to wave action greater than one and one-half feet during the one-percent annual chance event, as shown by the Limits of Moderate Wave Action (LiMWA) line are designated as a Coastal A zone. The following provisions shall apply within an AE or AH zone [44 CFR 60.3(c)]:

Until a regulatory floodway is designated, no new construction, substantial improvements, or other development (including fill) shall be permitted within the areas of special flood hazard, designated as zones A1-30 and AE or AH on the FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the county.

Development activities in zones A1-30 and AE or AH, on the county's FIRM which increase the water surface elevation of the base flood by more than one foot may be allowed, provided that the applicant first applies—with the county's endorsement—for a conditional letter of map revision, and receives the approval of the Federal Emergency Management Agency.

\*The requirement in 63.3(c)(10) only applies along rivers, streams, and other watercourses where FEMA has provided base flood elevations. The requirement does not apply along lakes, bays and estuaries, and the ocean coast.

The following provisions shall apply within an AE or AH zone:

The floodplain administrator reserves the right to require a hydrologic and hydraulic analysis for any development. When such base flood elevation data is utilized, the lowest floor shall be elevated to two feet above the base flood level.

During the permitting process, the floodplain administrator shall obtain:

1. The elevation of the lowest floor (including the basement) of all new and substantially improved structures; and
2. If the structure has been floodproofed in accordance with the requirements of this article,

the elevation (in relation to mean sea level) to which the structure has been floodproofed.

Base flood elevation data shall be obtained from other sources or developed using detailed methodologies comparable to those contained in a FIS for subdivision proposals and other proposed development proposals (including manufactured home parks and subdivisions) that exceed 50 lots or five acres, whichever is the lesser.

- (3) The A zone on the FIRM accompanying the FIS shall be those areas for which no detailed flood profiles or elevations are provided, but the one-percent annual chance floodplain boundary has been approximated. Within A zone areas, the following provisions shall apply [44 CFR 60.3(b)]:

The approximated floodplain district shall be that floodplain area for which no detailed flood profiles or elevations are provided, but where a 100-year floodplain boundary has been approximated. Such areas are shown as zone A on the maps accompanying the FIS. According to the May 18, 2015 FIRM, the county does not contain any areas designated as A zone. For these areas, the base flood elevations and floodway information from federal, state, and other acceptable sources shall be used, when available. Where the specific one-percent annual chance flood elevation cannot be determined for this area using other sources of data, such as the U.S. Army Corps of Engineers Floodplain Information Reports, U.S. Geological Survey Flood-Prone Quadrangles, etc., then the applicant for the proposed use, development and/or activity shall determine this base flood elevation. For development proposed in the approximate floodplain the applicant must use technical methods that correctly reflect currently accepted non-detailed technical concepts, such as point on boundary, high water marks, or detailed methodologies hydrologic and hydraulic analyses. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a thorough review by the floodplain administrator.

The floodplain administrator reserves the right to require a hydrologic and hydraulic analysis for any development. When such base flood elevation data is utilized, the lowest floor shall be elevated two feet above the base flood level.

During the permitting process, the floodplain administrator shall obtain:

1. The elevation of the lowest floor (including the basement) of all new and substantially improved structures; and
2. If the structure has been floodproofed in accordance with the requirements of this article, the elevation (in relation to mean sea level) to which the structure has been floodproofed.

Base flood elevation data shall be obtained from other sources or developed using detailed methodologies comparable to those contained in a FIS for subdivision proposals and other proposed development proposals (including manufactured home parks and subdivisions) that exceed 50 lots or five acres, whichever is the lesser.

- (4) The AO zone on the FIRM accompanying the FIS shall be those areas of shallow flooding identified as AO on the FIRM. According to the May 18, 2015 FIRM, the county does not contain any areas

designated as AO. For AO areas, the following provisions shall apply [44 CFR 60.3(c)]:

- a. All new construction and substantial improvements of residential structures shall have the lowest floor, including basement, elevated to or above the flood depth specified on the FIRM, above the highest adjacent grade at least as high as the depth number specified in feet on the FIRM. If no flood depth number is specified, the lowest floor, including basement, shall be elevated no less than two feet above the highest adjacent grade.
  - b. All new construction and substantial improvements of non-residential structures shall:
    1. Have the lowest floor, including basement, elevated to or above the flood depth specified on the FIRM, above the highest adjacent grade at least as high as the depth number specified in feet on the FIRM. If no flood depth number is specified, the lowest floor, including basement, shall be elevated at least two feet above the highest adjacent grade; or,
    2. Together with attendant utility and sanitary facilities be completely floodproofed to the specified flood level so that any space below that level is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.
  - c. Adequate drainage paths around structures on slopes shall be provided to guide floodwaters around and away from proposed structures.
- (5) The coastal A zone shall be those areas, as defined by the VA USBC, that are subject to wave heights between one and one-half feet and three feet, and identified on the FIRM by the Limit of Moderate Wave Action (LiMWA) line.
- (6) The VE zones on FIRMs accompanying the FIS shall be those areas that are known as coastal high hazard zones, extending from offshore to the inland limit of a primary frontal dune along an open coast. For Coastal A and VE Zones, the following provisions shall apply [44 CFR 60.3(e)]:
- a. All new construction and substantial improvements in Coastal A and VE zones shall be elevated on pilings or columns so that:
    1. The bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to two feet above the base flood level if the lowest horizontal structural member is parallel to the direction of wave approach or elevated at least two feet above the base flood level if the lowest horizontal structural member is perpendicular to the direction of wave approach; and,
    2. The pile or column foundation and structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of wind and water loads acting simultaneously on all building components. Wind and water loading values shall each have a one-percent chance of being equaled or exceeded in any given year (one-percent annual chance).
  - b. A registered professional engineer or architect shall develop or review the structural design,

specifications and plans for the construction, and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the provisions of subsection 106-364(a)(5)a.

- c. The floodplain administrator shall obtain the elevation (in relation to mean sea level) of the bottom of the lowest horizontal structural member of the lowest floor (excluding pilings and columns) of all new and substantially improved structures in Coastal A and VE zones. The floodplain management administrator shall maintain a record of all such information.
  - d. All new construction shall be located landward of the reach of mean high tide.
  - e. All new construction and substantial improvements shall have the space below the lowest floor either free of obstruction or constructed with non-supporting breakaway walls, open wood-lattice work, or insect screening intended to collapse under wind and water loads without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting foundation system. For the purpose of this section, a breakaway wall shall have a design safe loading resistance of not less than ten and no more than 20 pounds per square foot. Use of breakaway walls which exceed a design safe loading resistance of 20 pounds per square foot (either by design or when so required by local codes) may be permitted only if a registered professional engineer or architect certifies that the designs proposed meet the following conditions:
    1. Breakaway wall collapse shall result from water load less than that which would occur during the base flood; and
    2. The elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement, or other structural damage due to the effects of wind and water loads acting simultaneously on all building components (structural and nonstructural). Maximum wind and water loading values to be used in this determination shall each have a one-percent chance of being equaled or exceeded in any given year.
  - f. The enclosed space below the lowest floor shall be used solely for parking of vehicles, building access, or storage. Such space shall not be partitioned into multiple rooms, temperature-controlled, or used for human habitation.
  - g. The use of fill for structural support of buildings is prohibited. When non-structural fill is proposed in a coastal high hazard area, appropriate engineering analyses shall be conducted to evaluate the impacts of the fill prior to issuance of a development permit.
  - h. The manmade alteration of sand dunes, which would increase potential flood damage, is prohibited.
- (b) *Official floodplain map.* The boundaries of the special flood hazard area and flood hazard overlay districts are established as shown on the flood insurance rate map which is declared to be a part of this article which shall be kept on file at county offices.

(Ord. of 3-18-2015; Ord. of 08-18-2021(1))

## Sec. 106-365. - Permit and application requirements.

- (a) *Permit requirement.* All uses, activities, and development occurring within any floodplain district, including placement of manufactured homes, shall be undertaken only upon the issuance of a zoning permit. Such development shall be undertaken only in strict compliance with the provisions of this article and with all other applicable codes and ordinances, as amended, such as the Virginia Uniform Statewide Building Code (VA USBC) and the Accomack County Subdivision Regulations. Prior to the issuance of any such permit, the floodplain administrator shall require all applications to include compliance with all applicable state and federal laws and shall review all sites to assure they are reasonably safe from flooding. Under no circumstances shall any use, activity, and/or development adversely affect the capacity of the channels or floodways of any watercourse, drainage ditch, or any other drainage facility or system.
- (b) *Site plans and permit applications.* All applications for development within any floodplain district and all building permits issued for the floodplain shall incorporate the following information:
  - (1) The elevation of the base flood at the site.
  - (2) The elevation of the lowest floor (including basement) or, in V zones, the lowest horizontal structural member.
  - (3) For structures to be floodproofed (non-residential only), the elevation to which the structure will be floodproofed.
  - (4) Topographic information showing existing and proposed ground elevations.

(Ord. of 3-18-2015)

## Sec. 106-366. - General standards.

The following provisions shall apply to all permits:

- (1) New construction and substantial improvements shall be according to the VA USBC and this article, and anchored to prevent flotation, collapse or lateral movement of the structure.
- (2) Manufactured homes shall be anchored to prevent flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This standard shall be in addition to and consistent with applicable state anchoring requirements for resisting wind forces.
- (3) New construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
- (4) New construction or substantial improvements shall be constructed by methods and practices that minimize flood damage.
- (5)

Electrical, heating, ventilation, plumbing, air conditioning equipment and other service facilities, including duct work, shall be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

- (6) New and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system.
- (7) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharges from the systems into floodwaters.
- (8) On-site waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during flooding.
- (9) All new, replaced, or existing oil, and propane tanks must be anchored against flotation, collapse and lateral movement under flood conditions by means of an approved anchorage system or shall be installed a minimum of three feet above base flood elevation and shall be set upon a firm foundation and supports to prevent these occurrences during flood conditions.

In addition to provisions (1)—(9) above, in all special flood hazard areas, the additional provisions shall apply:

- (10) Prior to any proposed alteration or relocation of any channels or of any watercourse, stream, etc., within this jurisdiction a permit shall be obtained from the U.S. Corps of Engineers, the Virginia Department of Environmental Quality, and the Virginia Marine Resources Commission (a joint permit application is available from any of these organizations). Furthermore, in riverine areas, notification of the proposal shall be given by the applicant to all affected adjacent jurisdictions, the Department of Conservation and Recreation (Division of Dam Safety and Floodplain Management), other required agencies, and the Federal Emergency Management Agency.
- (11) The flood carrying capacity within an altered or relocated portion of any watercourse shall be maintained.
- (12) Electrical, heating, ventilation, plumbing and air conditioning and other service equipment shall be elevated to a minimum of two feet above the base flood elevation.

(Ord. of 3-18-2015; Ord. of 08-18-2021(1))

#### Sec. 106-367. - Elevation and construction standards.

In all identified flood hazard areas where base flood elevations have been provided in the FIS or generated by a certified professional, the following provisions shall apply:

- (1) *Residential construction.* New construction or substantial improvement of any residential structure (including manufactured homes) in AE zones with detailed base flood elevations shall have the lowest floor, including basement, elevated to two feet above the base flood level.
- (2) *Non-residential construction.* New construction or substantial improvement of any commercial, industrial, or non-residential building (or manufactured home) shall have the lowest floor,

including basement, elevated to a minimum of two feet above the base flood level. Buildings located in all AE zones may be floodproofed in lieu of being elevated provided that all areas of the building components below the elevation corresponding to the BFE plus one foot are watertight with walls substantially impermeable to the passage of water, and use structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy. A registered professional engineer or architect shall certify that the standards of this subsection are satisfied. Such certification, including the specific elevation (in relation to mean sea level) to which such structures are floodproofed, shall be maintained by (title of community administrator).

- (3) *Space below the lowest floor.* In AE zones, fully enclosed areas of new construction or substantially improved structures which are below the regulatory flood protection elevation shall:
  - a. Not be designed or used for human habitation, but shall only be used for parking of vehicles, building access, or limited storage of maintenance equipment used in connection with the premises. Access to the enclosed area shall be the minimum necessary to allow for parking of vehicles (garage door) or limited storage of maintenance equipment (standard exterior door), or entry to the living area (stairway or elevator);
  - b. Be constructed entirely of flood resistant materials below the regulatory flood protection elevation;
  - c. Include measures to automatically equalize hydrostatic flood forces on walls by allowing for the entry and exit of floodwaters. To meet this requirement, the openings must either be certified by a professional engineer or architect or meet the following minimum design criteria:
    1. Provide a minimum of two openings on different sides of each enclosed area subject to flooding.
    2. The total net area of all openings must be at least one square inch for each square foot of enclosed area subject to flooding.
    3. If a building has more than one enclosed area, each area must have openings to allow floodwaters to automatically enter and exit.
    4. The bottom of all required openings shall be no higher than one foot above the adjacent grade.
    5. Openings may be equipped with screens, louvers, or other opening coverings or devices, provided they permit the automatic flow of floodwaters in both directions.
    6. Foundation enclosures made of flexible skirting are not considered enclosures for regulatory purposes, and, therefore, do not require openings. Masonry or wood underpinning, regardless of structural status, is considered an enclosure and requires openings as outlined above.
- (4) *Standards for manufactured homes and recreational vehicles.*
  - a. All manufactured homes placed, or substantially improved, on individual lots or parcels, must

meet all the requirements for new construction, including the elevation and anchoring requirements in sections 106-364(a)(6), 106-366 and 106-367.

b. All recreational vehicles placed on sites must either:

1. Be on the site for fewer than 180 consecutive days, be fully licensed and ready for highway use (a recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices and has no permanently attached additions); or
2. Meet all the requirements for manufactured homes in subsection (4)a.

(Ord. of 3-18-2015)

#### Sec. 106-368. - Standards for subdivision proposals.

- (a) All subdivision proposals shall be consistent with the need to minimize flood damage;
- (b) All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage;
- (c) All subdivision proposals shall have adequate drainage provided to reduce exposure to flood hazards; and
- (d) Base flood elevation data shall be obtained from other sources or developed using detailed methodologies, hydraulic and hydrologic analysis, comparable to those contained in a flood insurance study for subdivision proposals and other proposed development proposals (including manufactured home parks and subdivisions) that exceed 50 lots or five acres, whichever is the lesser.

(Ord. of 3-18-2015)

#### Sec. 106-369. - Existing structures in floodplain areas.

A structure or use of a structure or premises which lawfully existed before the enactment of these provisions, but which is not in conformity with these provisions, may be continued subject to the following conditions:

- (1) Any modification, alteration, repair, reconstruction, or improvement of any kind to a structure and/or use located in any floodplain areas to an extent or amount of less than 50 percent of its market value shall conform to the VA USBC and this article.
- (2) The modification, alteration, repair, reconstruction, or improvement of any kind to a structure and/or use, regardless of its location in a floodplain area to an extent or amount of 50 percent or more of its market value shall be undertaken only in full compliance with this article and shall require the entire structure to conform to the VA USBC and this article.

(Ord. of 3-18-2015)

#### Sec. 106-370. - Variances: Factors to be considered.

Variances shall be issued only upon (i) a showing of good and sufficient cause, (ii) after the board of zoning appeals has determined that failure to grant the variance would result in exceptional hardship to the applicant, and (iii) after the board of zoning appeals has determined that the granting of such variance will not result in (a) additional threats to public safety, (b) extraordinary public expense; and will not (c) create nuisances, (d) cause fraud or victimization of the public, or (e) conflict with local laws or ordinances.

Variances may be issued for new construction and substantial improvements and for other development necessary for the conduct of a functionally dependent use provided that the criteria of this section are met, and the structure or other development is protected by methods that minimize flood damages during the base flood and create no additional threats to public safety.

In passing upon applications for variances, the board of zoning appeals shall satisfy all relevant factors and procedures specified in other sections of the zoning ordinance and consider the following additional factors:

- (1) The danger to life and property due to increased flood heights or velocities caused by encroachments. No variance shall be granted for any proposed use, development, or activity within any floodway district that will cause any increase in the one-percent chance flood elevation.
- (2) The danger that materials may be swept on to other lands or downstream to the injury of others.
- (3) The proposed water supply and sanitation systems and the ability of these systems to prevent disease, contamination, and unsanitary conditions.
- (4) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners.
- (5) The importance of the services provided by the proposed facility to the community.
- (6) The requirements of the facility for a waterfront location.
- (7) The availability of alternative locations not subject to flooding for the proposed use.
- (8) The compatibility of the proposed use with existing development and development anticipated in the foreseeable future.
- (9) The relationship of the proposed use to the comprehensive plan and floodplain management program for the area.
- (10) The safety of access by ordinary and emergency vehicles to the property in time of flood.
- (11) The expected heights, velocity, duration, rate of rise, and sediment transport of the flood waters expected at the site.
- (12) The historic nature of a structure. Variances for repair or rehabilitation of historic structures may be granted upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.
- (13) Such other factors which are relevant to the purposes of this article.

The board of zoning appeals may refer any application and accompanying documentation pertaining to any

request for a variance to any engineer or other qualified person or agency for technical assistance in evaluating the proposed project in relation to flood heights and velocities, and the adequacy of the plans for flood protection and other related matters.

Variances shall be issued only after the board of zoning appeals has determined that the granting of such will not result in, (a) additional threats to public safety, (b) extraordinary public expense; and will not (c) create nuisances, (d) cause fraud or victimization of the public, or (e) conflict with local laws or ordinances.

Variances shall be issued only after the board of zoning appeals has determined that the variance will be the minimum required to provide relief.

The board of zoning appeals shall notify the applicant for a variance, in writing that the issuance of a variance to construct a structure below the 100-year flood elevation (a) increases the risks to life and property and (b) will result in increased premium rates for flood insurance.

(Ord. of 3-18-2015)

Secs. 106-371—106-375. - Reserved.

# INTRODUCTION

This section provides a general introduction to the Eastern Shore of Virginia Hazard Mitigation Plan. This section consists of the following subsections:

- Background
- Purpose
- Organization

## BACKGROUND

Since the 1960's, Congress and the President have been under increasing pressure to organize resources for the nation during large disasters. The government has increasingly turned its attention to the federal response for these types of disasters. It was during the 1960's that the National Flood Insurance Program (NFIP) was created in order to shift costs of disasters to those who choose to live in an area at risk. In the 70's, the Federal Emergency Management Agency (FEMA) was created to centralize a great deal of the assistance the federal government offers to states in emergency situations. The Stafford Act was passed in the 80's with the intent to standardize federal response and institute programs to decrease disaster vulnerability for the United States. In the early 1990's, the National Flood Insurance Program was reformed to increase the participation of those most at risk to flooding. Still, disaster assistance costs mounted and the late 80's-early 90's saw some of the largest disasters the country had ever experienced. This included multiple billion-dollar events, such as Hurricane Hugo, the Loma Prieta Earthquake, the Northridge Earthquake, Oakland Wildfires, the Midwest Floods of 1993, Hurricane Andrew, and Hurricane Iniki.

In October of 2000, the United State Congress passed an amendment to the Stafford Act called the Disaster Mitigation Act of 2000. This act seeks to protect lives and property and to reduce disaster assistance costs by mitigation – sustained actions to reduce long-term risk. FEMA has since written regulations based on this Act.

Local governments are required to complete a Hazard Mitigation Plan to continue to receive certain types of disaster assistance.

In Spring of 2003, the Virginia Department of Emergency Management asked the counties on the Eastern Shore of Virginia and the Accomack-Northampton Planning District Commission (A-NPDC) to undertake this work directed the A-NPDC to apply for a Pre-Disaster Mitigation Grant to finance the planning process. The Eastern Shore's plan was originally completed and adopted in 2006 according to 44 CFR Part 78, flood mitigation assistance, and the Disaster Mitigation Act of 2000. The current update to the plan occurred in 2021, with the adoption occurring in 2022.

As these plans continue to evolve across the county, the understanding of different hazards and hazard planning has expanded to include a broad range of potential disasters and a concept of community resiliency. The counties and towns of the Eastern Shore of Virginia have worked diligently to complete the following revised Hazard Mitigation Plan, which is presented to address the requirements of the Disaster Mitigation Act of 2000.

## PURPOSE

The purpose of the Eastern Shore of Virginia Hazard Mitigation Plan is to:

- Ensure the protection of life, safety, and property by reducing the potential for future damaged and economic losses that result from hazards;
- Make local communities safer places to live, work, and play;
- Assist localities in meeting the criteria for grant funding prior to and following disasters;
- Expedite the recovery and redevelopment process following disasters;
- Exhibit a commitment from localities for hazard mitigation in the region; and
- Comply with federal and state legislative requirements for hazard mitigation plans.

## PLAN ORGANIZATION

The chapters comprising this document follow the process spelled out in the Disaster Mitigation Act of 2000 and are organized to be both functional and reader-friendly as possible. The organization and intended flow of this document is described in the following sections.

### Chapter 1: Hazards on the Shore

Provides an overview of the hazards that have historically impacted the region and provides insight into the geographic and geologic setting of the region. A chronology of hazard events documents both pre-historic and historic hazard events that have impacted the Eastern Shore of Virginia.

### Chapter 2: Planning Process

Narrates a complete description of the process used to prepared the Plan, including how the public and other stakeholders were involved and who participated on the Hazard Mitigation Plan Steering Committee.

### Chapter 3: Risk Assessment

Identifies and analyzes hazards, assesses the risks associated with each hazard threatening the region, and gauges the capability of available and cost-effective mitigation options for each hazard. This process builds on available historical data, defines detailed profiles for each hazard, and ranks each hazard for associated risk based on occurrence frequency, affected structures, primary and secondary impacts, and mitigation options. The outcome of this process is a priority ranking of hazards that impact the region.

### Chapters 4 – 8: Hazards

Profile the five hazards that were given the highest priority ranking: High Wind, Coastal Erosion, Coastal Flooding, Storm Water Flooding, and Pandemic. Each chapter provides background information, historical accounts, explanations of potential damages, and vulnerability overviews regarding each of the four high-priority hazards.

### Chapter 9: The Region

Provides insight to the potential impacts of hazards on the regional level. As rural, low-populated, and isolated counties in Virginia, many entities must operate at a regional level to be successful and efficient with resources. This was a new chapter added at the adoption of the 2016 Plan and provides a significant level of detailed information.

## **Chapters 10 – 23: Accomack County and its Localities**

Profile Accomack County and participating incorporated towns within the County. Communities are ordered alphabetically and provide a general description including geographic, physical, demographic, and economic characteristics. In addition, land-use patterns, general historical disaster data, and building characteristics are discussed. These profiles assist County officials and residents by providing baseline information on concerning environmental and economical characteristics that play a role in determining hazard vulnerability.

## **Chapters 24 – 29: Northampton County and its Localities**

Profile Northampton County and incorporated towns within the County. Communities are ordered alphabetically and provide a general description including geographic, physical, demographic, and economic characteristics. In addition, land-use patterns, general historical disaster data, and building characteristics are discussed. These profiles assist County officials and residents by providing baseline information on concerning environmental and economical characteristics that play a role in determining hazard vulnerability.

## **Chapters 30 – 34: Regional Visions & Goal Statements**

Guides the identification and prioritization of specific mitigation projects for the region and for each local government jurisdiction participating in the planning process and funding options for implementation. Descriptions for how the plan is to be maintained by government officials are included in the mitigation strategy chapters for Accomack County, Northampton County, and the Town of Chincoteague (Chapters 31, 32, and 33 respectively). Each specific project is assigned a start timeline and a responsible department/person to ensure action is taken to make localities less vulnerable to the damaging forces of hazards, while improving the economic, social, and environmental health of the community. Chapter 34 describes federal mitigation funding options available to localities prior to and following natural disasters. Together, these chapters are designed to make the Plan both strategic through identification of long-term goals and functions through the identification of short-term and immediate actions that will guide daily decision making and project implementation.

## LIST OF ACRONYMS USED THROUGHOUT THE PLAN

ACS – American Community Survey  
ANEC – A & N Electric Cooperative  
A-NPDC – Accomack-Northampton Planning District Commission  
ANRHA – Accomack Northampton Regional Housing Authority  
ANTDC – Accomack Northampton Transportation District Commission  
BFE – Base Flood Elevation  
CBBT – Chesapeake Bay Bridge Tunnel  
CBPA – Chesapeake Bay Preservation Area  
CDBG – Community Development Block Grant  
CRS – Community Rating System  
ESCC – Eastern Shore Community College  
ESHD – Eastern Shore Health District  
ESVA – Eastern Shore of Virginia  
ESVBA – Eastern Shore of Virginia Broadband Authority  
FEMA – Federal Emergency Management Agency  
FIRM – Flood Insurance Rate Map  
FIS – Flood Insurance Study  
GIS – Geographical Information System  
HAZMAT – Hazardous Materials  
HIRA – Hazard Identification and Risk Assessment  
HMGP – Hazard Mitigation Grant Program  
HMP – Hazard Mitigation Plan  
MSC – Marine Science Consortium  
NASA – National Aeronautics and Space Administration  
NFIP – National Flood Insurance Program  
NHC – National Hurricane Center  
NOAA – National Oceanic Atmospheric Administration  
NOAA CSC – National Oceanic Atmospheric Administration Coastal Services Center  
NWS – National Weather Service  
RL – Repetitive Loss  
RMA – Resource Management Area  
RPA – Resource Protection Area  
SFHA – Special Flood Hazard Area  
SLR – Sea Level Rise  
SRL – Severe Repetitive Loss  
USACE – United States Army Corps of Engineers  
USGS – United States Geological Survey  
UVA LTER – University of Virginia Long Term Ecological Research  
VCZM – Virginia Coastal Zone Management  
VDEM – Virginia Department of Emergency Management  
VDEQ – Virginia Department of Environmental Quality  
VDOF – Virginia Department of Forestry  
VDOT – Virginia Department of Transportation  
VIMS – Virginia Institute of Marine Science  
WFF – Wallops Flight Facility  
WWTP – Waste Water Treatment Plant

## MITIGATION TERMS – DEFINITIONS

### **Acquisition of Hazard Prone Structures**

Local governments can acquire lands in high-hazard areas through conservation easements, purchase of development rights, or outright purchase of property.

### **Adaptation**

The process of developing traits or habits suitable for sustainment of a given activity.

### **Base Flood Elevation (BFE)**

The elevation of the base flood in relation to a specified datum, such as the National Geodetic Vertical Datum of 1929. The BFE is used as a standard for the Nation Flood Insurance Program.

### **Capability Assessment**

An assessment that provides a description and analysis of a community or state's capability to address the threats associated with hazards. The capability assessment attempts to identify and evaluate existing policies, regulations, programs, and practices that positively or negatively affect the community or state's vulnerability to hazards.

### **Community Rating System (CRS)**

CRS is a program that provides incentives for National Flood Insurance Program communities to complete activities that reduce flood hazard risk. When communities complete specified activities, the insurance premiums of policyholders in the community are reduced.

### **Critical Facilities**

Facilities vital to the health, safety, and welfare of the population that are especially important following disasters. These include, but are not limited to, emergency shelters, police stations, fire departments, hospitals, etc.

### **Debris**

The scattered remains of assets broken or destroyed in a hazard event. Debris transported by a wind or flood hazard event can cause additional damage to other assets.

### **Disability**

ACS: Covers six different disability types including hearing, vision, cognitive, ambulatory (serious difficulty walking or climbing stairs), self-care (difficulty bathing or dressing), and/or independent living.

### **Disaster Mitigation Act of 2000**

The latest legislation to improve the planning process. Signed into federal law on October 30, 2000. This legislation reinforces the importance of mitigation planning and emphasizes planning for disasters prior to their occurrence.

### **Displacement Time**

The average time which the building's occupants typically must operate from a temporary location while repairs are made to the original building due to damages resulting from a hazard event.

### **Elevation of Structures**

Raising structures above the BFE to protect structures located in areas prone to flooding.

### **Erosion**

Wearing away of the land surface by detachment and movement of sediments during a flood or storm through the action of wind, water, or other geological processes.

## Introduction

### **Federal Emergency Management Agency (FEMA)**

Federal agency created in 1979 to provide a single point of accountability for all federal activities related to disaster mitigation and emergency preparedness, response, and recovery. FEMA is currently part of the U.S. Department of Homeland Security.

### **Flood**

A general and temporary condition of partial or complete inundation of normally dry areas from (1) the overflow or inland or tidal waters, (2) the unusual and rapid accumulation of runoff or surface waters from any source, or (3) mudflows or the sudden collapse of shoreline land.

### **Flood Depth**

Height of the flood water surface above ground surface.

### **Flood Elevation**

Elevation of the water surface above an established datum, e.g., National Geodetic Vertical Datum of 1929, North American Vertical Datum of 1988, or Mean Seal Level.

### **Flood Insurance Rate Map (FIRM)**

Map of a community prepared by FEMA that shows both the SFHAs and the risk premium zones applicable to the community.

### **Flood Insurance Study (FIS)**

A study that provides an examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations in a community or communities.

## LAND USE CATEGORY DESCRIPTIONS

The following table describes land use categories mentioned throughout the plan and their descriptions.

**Table 1: Land Use Category Descriptions**

Land Use Category	Description
<b>Developed</b>	Areas characterized by a high percentage (30% or greater) of constructed materials. e.g., asphalt, concrete, buildings, etc.
<b>High</b>	Includes infrastructure (e.g., roads, railroads, etc.) and all highly developed areas.
<b>Medium</b>	Includes highly developed areas where people reside in high numbers. e.g., apartment complexes, row houses, etc. Vegetation accounts for less than 20% of the cover. Constructed materials account for 80-100% of the cover.
<b>Low</b>	Includes areas with a mixture of constructed materials and vegetation. Constructed materials account for 30-80% of the cover. Vegetation may account for 20-70% of the cover. These areas most commonly include single-family housing units. Population densities will be lower than in high-intensity residential areas.
<b>Open</b>	Includes areas that have approximately 100% vegetative cover. These areas could be large grass yards, recreational fields, golf courses, etc.
<b>Planted/Cultivated</b>	Areas characterized by herbaceous vegetation that has been planted or is intensively managed for the production of food, feed, or fiber, or is maintained in developed settings for specific purposes. Herbaceous vegetation accounts for 75-100% of the cover.
<b>Cultivated Crops</b>	Areas used for the production of crops such as corn, soybeans, vegetables, rice, etc.
<b>Hay/Pasture</b>	Areas of grasses, legumes, pr grass-legume mixtures planted for livestock grazing or the production of seed of hay crops.
<b>Natural</b>	Areas where the vegetative cover is in balance
<b>Forest Uplands</b>	Areas characterized by tree cover (natural or semi-natural woody vegetation, generally greater than 6 meters tall); tree canopy accounts for 25-100% of the cover.
<b>Deciduous Forest</b>	Areas dominated by trees where 75% or more of the tree species shed foliage simultaneously in response to seasonal change.
<b>Evergreen Forest</b>	Areas dominated by trees where 75% or more of the tree species maintain their leaves all year. Canopy is never without green foliage.
<b>Mixed Forest</b>	Areas dominated by trees where neither deciduous nor evergreen species represent more than 75% of the cover present.
<b>Low Vegetation</b>	
<b>Herbaceous</b>	Areas dominated by upland grasses and forbs. In rare cases, herbaceous cover is less than 25%, but exceeds the combined cover of the woody species present. These areas are not subject to intensive management, but they are often utilized for grazing.
<b>Shrub/Scrub</b>	Areas dominated by shrub; shrub canopy accounts for 25-100% of the cover. Shrub cover is generally greater than 25% when tree cover is less than 25%. Shrub cover may be less than 25% in cases when the cover of other life forms (e.g., herbaceous or tree) is less than 25% and shrubs cover exceeds the cover of the other life forms.
<b>Wetlands</b>	Areas where the soil or substrate is periodically saturated with or covered with water, or may be present at or near the surface all year, seasonally, or varying periods.
<b>Woody Wetlands</b>	Areas where forest or shrubland vegetation accounts for 25-100% of the cover and the soil or substrate is periodically saturated with or covered with water.
<b>Emergent Herbaceous Wetlands</b>	Areas where perennial herbaceous vegetations accounts for 75-100% of the cover and the soil or substrate is periodically saturated with or covered with water.

# CHAPTER 1: HAZARDS ON THE SHORE

## INTRODUCTION

It is believed that the worst disaster the Shore ever experienced in recorded history was the Great September Gust of 1821. This hurricane caused an ocean recession in the vicinity of the Chincoteague Island. Although not completely understood, it is believed that the hurricane may have triggered a landslide on the continental slope causing a tsunami in tandem with the force of the hurricane. Its destruction was so complete that it is unlikely that any of the homes standing today predate this event. In fact, two of the oldest homes on the island were probably erected to replace destroyed houses (*Once Upon an Island*, Kirk Mariner). Flooding caused by hurricanes, nor'easter, and tropical storms has proven to be the greatest natural hazard to people and property on the Eastern Shore of Virginia.

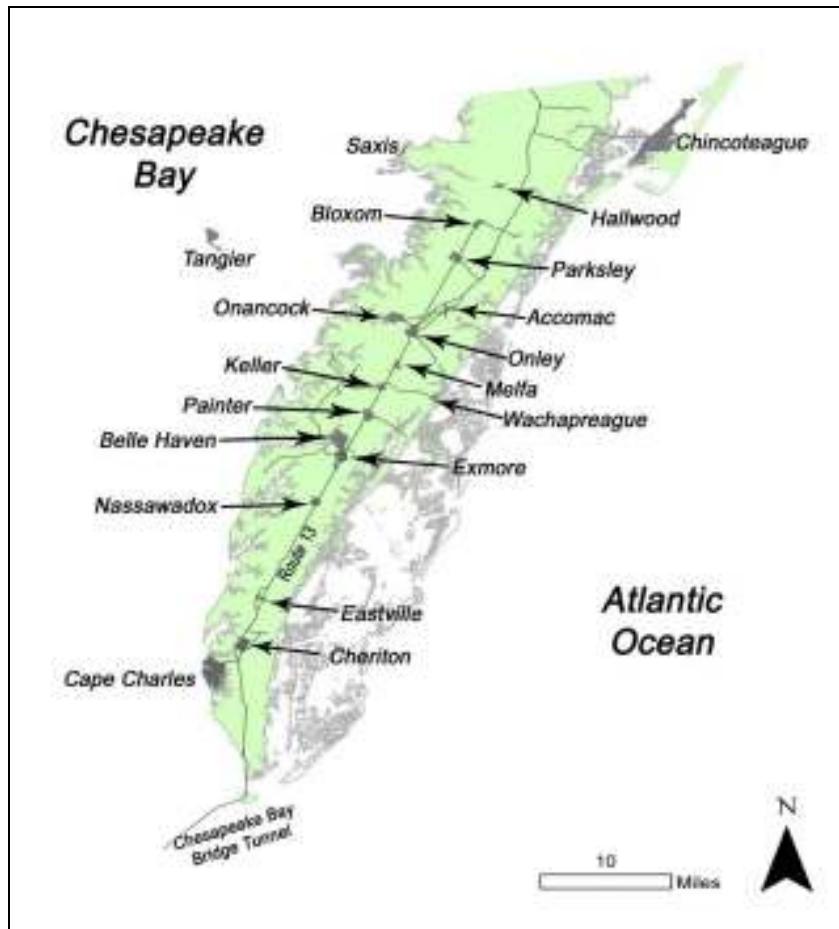
**Coastal erosion, high coastal winds, and storm water flooding**, in addition to several other secondary risks, have caused substantial damage to the communities and environments on the Shore. These events have destroyed property, caused extended isolation of communities where provisions such as fuel and food have grown thin, and at several times whole industries have been wiped out or dealt such a heavy blow that months or years were necessary to recover. In modern times, investments in real estate, infrastructure, and industry have increased the potential for significant damage and the need for advance planning.

## DESCRIPTION OF CONDITIONS

### GEOGRAPHIC AND GEOLOGIC SETTING

The Eastern Shore is a low-lying peninsula separating two great bodies of water, the Chesapeake Bay, and the Atlantic Ocean, as seen in Figure 1. The highest elevation on the Shore is near the Town of Melfa in Accomack County at 60 feet above mean sea level. The Eastern Shore of Virginia formed as a southward prograding peninsula that consists of unconsolidated sediments deposited predominantly in marine conditions during approximately the last 200,000 years. Sea level fluctuations during this time have created the landforms seen on the Eastern Shore today.

In addition to the peninsula, uninhabited barrier islands protect the Atlantic coastline. Many of these are part of the Nature Conservancy's Virginia Coastal Reserve. Some islands also exist in the Chesapeake Bay. Many of these islands once held communities, but in recent years many have been abandoned in the face of hazards from the sea. Nine of the islands still have development in some manner: Assateague, Chincoteague, Wallops, Cedar, Hog, Smith, and Fisherman's Islands in the Atlantic and Tangier and Saxis Islands in the Chesapeake Bay.



**Figure 1: Vicinity Map of the Eastern Shore of Virginia**

## CHRONOLOGY OF HAZARD EVENTS ON THE SHORE

It is no surprise that four risks consistently rise to the top during the risk assessment process for the Eastern Shore: high winds, coastal flooding, coastal erosion, and storm water flooding. All four of these risks are typically embodied in the fierce, frequent, and familiar coastal storms known to area residents: hurricanes, tropical storms, tropical depressions, and nor'easters.

### THE 20<sup>TH</sup> CENTURY

Major storms continued to pose hazards to life and property throughout the 20th century. The century started with three relatively quiet decades after the tremendous damages that occurred during the 1890s. The 1930s would change that trend.

Table 1 outlines the major storms of the 20<sup>th</sup> century, and their lasting impacts on the Eastern Shore.

## Hazards on the Shore

**Table 1: Major 20th Century Storms affecting the Eastern Shore of Virginia**

20 <sup>th</sup> Century Storms						
County	Date	System Name	*Property Damage (\$)	*Crop Damage (\$)	Description	Source
Accomack/Northampton	8/23/1933	Chesapeake-Potomac Hurricane	-	-	The deadly Chesapeake-Potomac Hurricane of 1933, also called the August Storm, was a Category 1 storm that claimed the lives of six Eastern Shore residents. On Chincoteague, Main Street was flooded, and 25' waves broke over Assateague Island. The Towns of Cape Charles, Chincoteague, and Wachapreague, and the Villages of Willis Wharf and Kiptopeake all experienced flooding. Much of Tangier Island was inundated, and children jumped from second floor windows to swim. When the water receded, parts of the island were done.	<i>The Great Hurricane of 1933, Assateague Naturalist, <a href="http://www.assateague.com">www.assateague.com</a>; God's Island: The History of Tangier, Kirk Mariner.</i>
Accomack/Northampton	9/18/1936	-	-	-	This seaside hurricane was transitioning from Category 2 to Category 1 when it crossed from North Carolina to Virginia, causing heavy damage to agriculture and aquaculture. Late crops were destroyed and some 60,000 broiler chickens were killed. Eel grass, which is a critical habitat for clams, oysters, and bay scallops in the coastal bays along the seaside of the Eastern Shore, had already been decimated by widespread disease, and the succession of storms in the 1930s was likely the main factor in wiping out the remaining eel grass population and crippling the industries associated with hard-shellfish varieties.	<i>God's Island: The History of Tangier, Kirk Mariner; NOAA Historical Hurricane Tracks, <a href="https://coast.noaa.gov/hurricanes">https://coast.noaa.gov/hurricanes</a></i>
Accomack/Northampton	8/14/1953	-	-	-	Category 1 hurricane that produced record rain on Tangier Island, 10.62" in Onley, and 10.43" in Accomack County.	NOAA Historical Hurricane Tracks, <a href="https://coast.noaa.gov/hurricanes">https://coast.noaa.gov/hurricanes</a>

Eastern Shore of Virginia Hazard Mitigation Plan 2021

20 <sup>th</sup> Century Storms						
County	Date	System Name	*Property Damage (\$)	*Crop Damage (\$)	Description	Source
Accomack/Northampton	10/15/1954	Hazel			Hurricane Hazel's eye tracked through the center of Virginia bringing damaging winds and a storm surge of 3 to 7.5 feet that caused extensive erosion. Electric lines were damaged and many were without power.	<i>Flood Reports of the 1962 Ash Wednesday Storm, USACE NOAA Historical Hurricane Tracks, <a href="https://coast.noaa.gov/hurricanes">https://coast.noaa.gov/hurricanes</a></i>
Accomack/Northampton	10/1/1957	-	-	-	The nor'easter caused tides in the Town of Wachapreague four feet above normal and sank many boats. The storm also caused gusts of 70 mph and brought a great deal of rain.	<i>Flood Reports of the 1962 Ash Wednesday Storm, USACE</i>
Accomack/Northampton	9/12/1960	Donna	-	-	Donna was a Category 2 with 105 mph gusts as it swept past the Eastern Shore, but much of the damage was concentrated on the bay side. Flooding occurred in Cape Charles, Bayford, Onancock, and other areas on the Chesapeake Bay. Donna was considered the most destructive storm since accurate weather records began in 1840.	<i>Flood Reports of the 1962 Ash Wednesday Storm, USACE</i>
Accomack Co.	3/6/1962	Ash Wednesday Storm	\$9,438,765	-	The islands of Chincoteague and Assateague were completely submerged. Hundreds of thousands of chickens died, along with Chincoteague's poultry industry. Dead chickens posed an extreme health hazard causing the health department to ask all women, children, and elderly to evacuate. A million dollars in damage was done to NASA's Wallops Island Launch facility. One hundred Assateague ponies were killed, five homes destroyed, and 1,000 inundated by stormwater. Ninety percent of Chincoteague's automobiles were flooded.	<i>Flood Reports of the 1962 Ash Wednesday Storm, USACE,</i>

## Hazards on the Shore

20 <sup>th</sup> Century Storms						
County	Date	System Name	*Property Damage (\$)	*Crop Damage (\$)	Description	Source
Accomack Co.	3/28/1984	-	-	-	Nor'easter of March 1984 took a track over the lower Chesapeake Bay. The storm hit Accomack County especially hard, with the worst tidal flooding since the Ash Wednesday Storm of 1962. Saxis and Onancock were flooded up to 5' of water while Tangier had water over 75% of the island. East Point, Chesconnessex, Mears, and Sanford were all flooded.	Accomack Community Rating System Application
Accomack Co.	9/27/1985	Gloria	-	-	Hurricane Gloria brushed past the Eastern Shore causing \$2 million in damage to Accomack Co. The storm was a Category 2 that caused wind gusts and rain, but did not directly strike the area.	Accomack Community Rating System Application
Accomack / Northhampton	10/31/1991	Halloween Nor'easter	-	-	Halloween Nor'easter hit unexpectedly, stranding residents, damaging barrier islands, and destroying piers and a motel.	Accomack Community Rating System Application
Northhampton Co.	8/28/1992	Andrew	-	-	Winds associated with Hurricane Andrew remnants blew down trees. No wind speed estimate available.	NOAA, National Climatic Data Center
Accomack / Northhampton	9/6/1996	Fran	-	-	Hurricane Fran was downgraded to tropical storm status as it arrived in Virginia, but still brought damaging winds.	Accomack Community Rating System Application
Accomack / Northhampton	1/27/1998	Twin Nor'easter #1	-	-	Nor'easter Jan. 27-28. Slow storm movement combined with high astronomical tides created moderate coastal flooding. Two-4" of rain caused widespread flooding on streets and in poorly drained areas in both counties.	NOAA, National Climatic Data Center

Eastern Shore of Virginia Hazard Mitigation Plan 2021

20 <sup>th</sup> Century Storms						
County	Date	System Name	*Property Damage (\$)	*Crop Damage (\$)	Description	Source
Accomack / Northampton	2/3/1998	Twin Nor'easter #2	-	-	Nor'easter Feb. 3-5. Slow movement with extended period of gale-force winds resulted in moderate to severe coastal flooding. Rainfall totals of 5-7" also brought widespread storm water flooding and 46 mph winds.	NOAA, National Climatic Data Center
Accomack / Northampton	9/1/1999	Dennis	\$10,218	-	Hurricane and Tropical Storm Dennis, Aug. 30-Sep. 5. One of the most prolonged periods of tropical cyclone conditions across eastern Virginia on record. Moderate coastal flooding and 46 mph winds.	NOAA, National Climatic Data Center
Accomack Co.	9/5/1999	Floyd	\$5,194,081	\$19,808,110	Hurricane Floyd was a Category 1 Hurricane when it impacted the Eastern Shore. Ten to 20" of rain brought flash floods along with 7' storm surge, which damaged 300 buildings in both counties.	Accomack Community Rating System Application
Accomack / Northampton	10/17/1999	Irene	\$1,522,088	\$3,657,775	Hurricane Irene brushed by the Eastern Shore bringing gusty winds, locally heavy rainfall, and widespread flooding and road closures. Highest sustained wind of 45 mph, with a peak gust of 66 mph, was recorded at Wachapreague; sustained wind of 49 mph, with gusts to 63 mph, recorded at Kiptopeke. Rainfall totals ranged from 5-9.5". Storm tides generally 4-5' above astronomical tides in Accomack; 3-4' in Northampton. The tide level at Wachapreague reached 9.30'; 6.46' in Kiptopeke. Irene spawned a tornado near Chincoteague.	NOAA, National Climatic Data Center

## Hazards on the Shore



**Figure 2: Flooding during the Ash Wednesday Storm of 1962. Photo printed in the Army Corp of Engineers Flood Plain Report for Wachapreague**

### THE 21<sup>ST</sup> CENTURY

Despite advancements in modern technology and understanding of coastal storms, the residents of the Eastern Shore still face the same hazards in the 21<sup>st</sup> Century that have plagued residents throughout history.

Table 2 summarizes the major storms affecting the Eastern Shore of Virginia since year 2000. The eight storms detailed in the table resulted in over \$87 million\* in damages from Eastern Shore residents, businesses, and farmers.

Eastern Shore of Virginia Hazard Mitigation Plan 2021

**Table 2: Major 21<sup>st</sup> Century Storms Affecting the Eastern Shore of Virginia**

21 <sup>st</sup> Century Storms						
County	Date	System Name	*Property Damage (\$)	*Crop Damage (\$)	Description	Source
Accomack/Northampton	4/10/2003	-	\$30,839	-	A spring nor'easter produced strong gusts up to 55 mph. The winds also downed some trees and utility poles, as well as produced minor structural damage.	NOAA, National Climatic Data Center
Accomack/Northampton	9/18/2003	Isabel	-	\$15,419,348	Hurricane Isabel made landfall over Ocracoke, NC, and continued overland toward Richmond. ESVA communities of Wachapreague, Oyster, Tangier, and Saxis all had significant coastal flooding. Farmers reported crop loss due to salt spray. Storm surge inundated communities on seaside and bayside. Wachapreague, Tangier, and Saxis all experienced significant coastal flooding. Wachapreague's tide monitor was swept away. Salt spray coated power lines causing outages until precipitation washed lines clean. Rainfall totaled 1-2". Winds reached 74 mph.	NOAA, National Climatic Data Center, local oral accounts of the storm, NOAA Isabella Post-Storm Summary
Northampton Co.	8/14/2004	Charley	-	-	Tropical Storm Charley involved sustained winds of 45 mph at CBBT, 51 mph estimated gusts. Rain measured 3.17" at Wallops	NOAA National Hurricane Center

## Hazards on the Shore

21 <sup>st</sup> Century Storms						
County	Date	System Name	*Property Damage (\$)	*Crop Damage (\$)	Description	Source
Accomack/Northampton	9/1/2006	Ernesto	\$45,034,284	\$0	Tropical Depression Ernesto interacted with a strong weather front to produce a tight pressure gradient resulting in high winds that caused numerous downed trees and power outages, along with significant structural damage. Tides were 4-5' above normal, and 6-8' waves caused significant damage to homes, piers, bulkheads, boats, and marinas. Sustained winds of 34 mph and gusts to 51 mph at Kiptopeke; 44 mph at Wallops. Delmarva Power reported 49,000 residents without power in MD and the Eastern Shore of VA.	NOAA, National Climatic Data Center; Tropical Storm Ernesto Post-Storm Report, NWS, 2006
Accomack/Northampton	9/6/2008	Hanna	\$672,055	\$0	Tropical Storm Hanna produced heavy rain and gusty winds across much of the county. Few trees were downed. Rainfall amount of 1.16 inches was recorded near Onancock.	NOAA, National Climatic Data Center
Accomack Co.	11/12/2009	Nor'Ida	\$5,303,146	\$0	An intense nor'easter formed from the remnants of Hurricane Ida and produced heavy rain across much of central and eastern Virginia. Rainfall amounts ranged from three to as much as thirteen inches over the area, with the highest totals between seven and thirteen inches occurring over southeast Virginia.	NOAA, National Climatic Data Center

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

21 <sup>st</sup> Century Storms						
County	Date	System Name	*Property Damage (\$)	*Crop Damage (\$)	Description	Source
Accomack / Northampton	8/27/2011	Irene	\$1,702,757	\$3,657,775	Hurricane Irene moving northward over the outer banks of North Carolina and just off the Virginia and Maryland coasts produced heavy rains which caused widespread flooding across most of central and eastern Virginia Saturday afternoon, August 27th into early Sunday morning, August 28th. Storm total rainfall generally ranged from three to as much as eleven inches. Widespread low-land flooding was reported across the area, including roadways which were washed out or closed. Tornado spawned from Irene downed trees and caused minor roof damage.	NOAA, National Climatic Data Center

## Hazards on the Shore

21 <sup>st</sup> Century Storms						
County	Date	System Name	*Property Damage (\$)	*Crop Damage (\$)	Description	Source
Accomack / Northampton	10/28/2012	Sandy	\$15,962,366	\$0	<p>Hurricane/Superstorm Sandy caused widespread coastal flooding and erosion, storm water flooding, and brought very strong winds that downed numerous trees and power lines and produced minor structural damage. Water levels reached 3.0 feet to 5.0 feet above normal adjacent to the Chesapeake Bay and Atlantic Ocean resulting in moderate to severe coastal flooding.</p> <p>Wachapreague reached a tide height of 8.40 feet MLLW. The towns of Chincoteague, Saxis, and Sanford received the most significant damage, with estimated losses near two million dollars in Chincoteague alone.</p>	NOAA, National Climatic Data Center

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

21 <sup>st</sup> Century Storms						
County	Date	System Name	*Property Damage (\$)	*Crop Damage (\$)	Description	Source
Accomack / Northampton	9/2/2016	Hermine	\$5,985	-	<p>Tropical Storm Hermine moving northeast along the Southeast Coast then off the Mid Atlantic Coast produced tropical storm force winds, minor to moderate coastal flooding, and locally heavy rainfall across portions of Hampton Roads, the Middle Peninsula, and the Virginia Eastern Shore from Friday afternoon, September 2nd into Saturday night, September 3rd. Rain bands associated with Tropical Storm Hermine produced generally 0.5 inch to 1.75 inches of rainfall across the county. Cape Charles (5 ENE) reported 1.35 inches of rain. Cape Charles (5.8 NNE) reported 0.83 inch of rain. Wind gust of 38 knots was measured at Kiptopeke State Park. Tropical storm wind gusts caused minor tree and structural damage. Coastal storm tides of 2 to 3 feet above astronomical tide levels were common, with only minor beach erosion reported. The maximum storm tide reached 5.46 feet MLLW at Kiptopeke, which resulted in moderate coastal flooding Saturday morning into Saturday afternoon.</p>	NOAA, Storm Events Database

## Hazards on the Shore

21 <sup>st</sup> Century Storms						
County	Date	System Name	*Property Damage (\$)	*Crop Damage (\$)	Description	Source
Accomack / Northampton	10/8/2016	Matthew	\$598,514	-	The combination of a cold front moving through the Mid-Atlantic and Post Tropical Cyclone Matthew tracking northeast just off the North Carolina and Virginia coasts, produced heavy rain which caused flooding across portions of the Virginia Eastern Shore from Saturday night, October 8th into early Tuesday evening, October 11th. Heavy rain caused an extended period of significant flooding across portions of the counties. Several roads were impassable or closed for a couple of days, and some homes and businesses were impacted.	NOAA, Storm Events Database
Accomack / Northampton	10/20/2019	Nestor	-	-	Remnant low pressure of Tropical Storm Nestor tracked northeast across eastern North Carolina and off the southeast Virginia coast. This storm produced heavy rain which caused some minor flooding across portions of central and eastern Virginia. Rainfall totals ranged from 1.5 inches to near 4.5 inches.	NOAA, Storm Events Database
Accomack / Northampton	9/17/2020	Sally	-	-	Post Tropical Cyclone Sally tracking northeast across the Southeast United States and off the Mid Atlantic Coast produced heavy rain across portions of Central and Eastern Virginia. Rainfall totals were between 1 and 4 inches.	NOAA, Storm Events Database

Eastern Shore of Virginia Hazard Mitigation Plan 2021

21 <sup>st</sup> Century Storms						
County	Date	System Name	*Property Damage (\$)	*Crop Damage (\$)	Description	Source
Accomack / Northampton	10/11/2020	Delta	-	-	Post Tropical Cyclone Delta tracking east northeast across the Middle Atlantic region produced heavy rain across portions of central and eastern Virginia. Rainfall totals generally ranged between two inches and four inches across the county.	NOAA, Storm Events Database

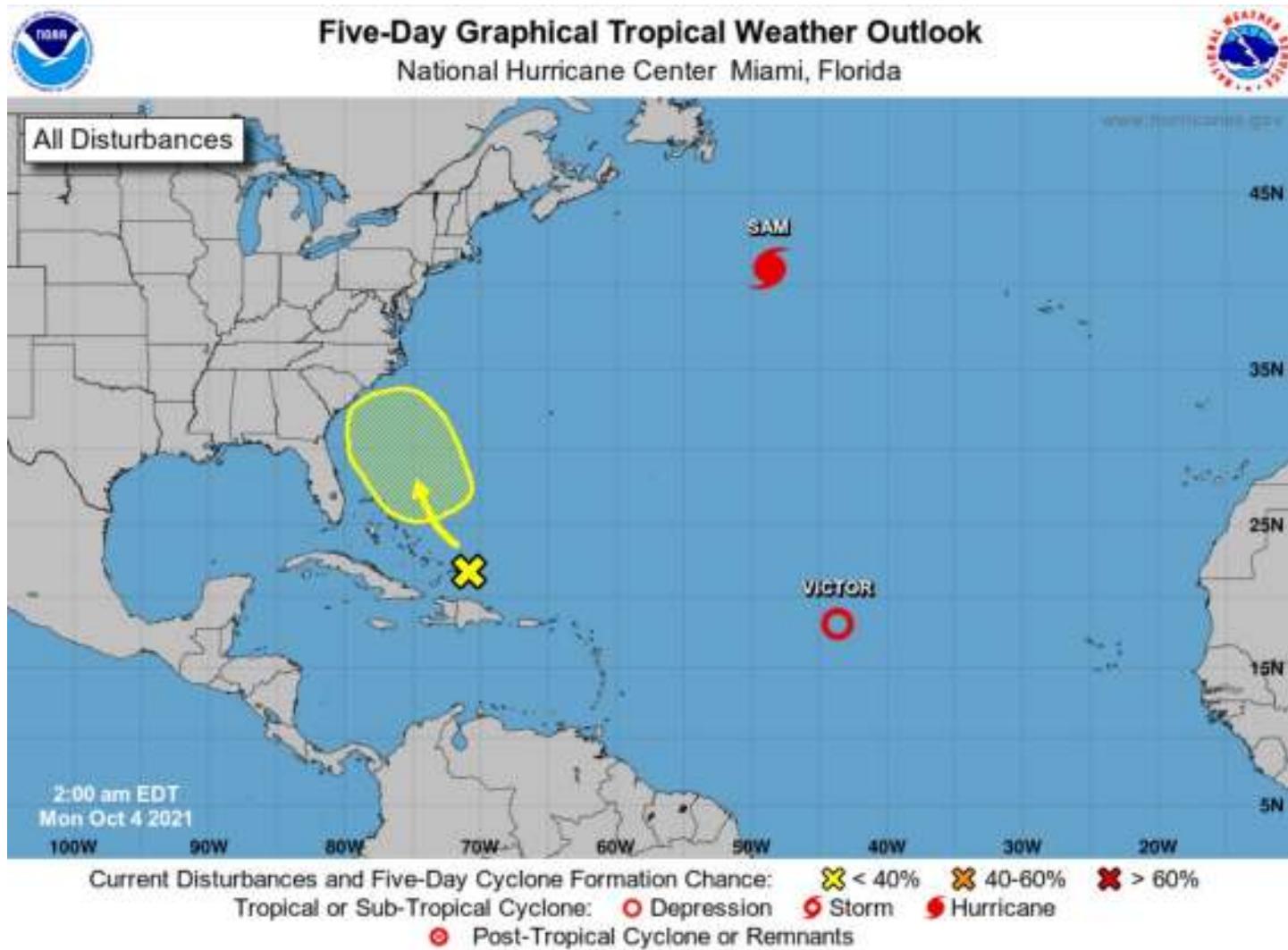
\*All figures have been adjusted for inflation to 2022 dollars

## MODERN STORM TRACKING

Advances in modern technology have allowed for improved weather forecasting and storm tracking. Residents of the Eastern Shore are provided more information on approaching weather events from multiple media outlets including television, radio, internet, and mobile phone alerts (including CodeRED alert system) with the end result being increased hazard preparedness.

In addition, the Wallops Flight Facility in northern Accomack County is home to the NOAA Wallops Command and Data Acquisition Station, which is one of only two facilities of this type in the world (the other is in Alaska) (Figure 3). This facility provides accurate weather data to the entire nation and also has a global reach, monitoring natural phenomena around the world such as sea surface temperatures, forest fires, icebergs in shipping lanes, hurricanes, tsunamis, and earthquakes, among others.

**Figure 3: An example of modern storm tracking data issued by the National Hurricane Center (NHC)**  
Courtesy of NOAA



# CHAPTER 2: PLANNING PROCESS

## PLAN DEVELOPMENT PROCESS OVERVIEW

The Eastern Shore's first Hazard Mitigation Plan was completed in 2006, a hallmark in Shore-wide planning for the protection of citizens, businesses, and visitors alike. The 2011 update built off that initial success, bringing in additional towns and new technology. Technological improvements between 2011 and 2016 spurred a complete rewrite of the plan.

The update to the 2021 plan began during the COVID-19 pandemic. Though traditional hazard planning is still an integral piece of the update process, the pandemic brought new challenges and a greater focus for developing plans to address pandemics. This focus can be seen by the inclusion of a new chapter in this plan, focused entirely on pandemics. The COVID-19 pandemic moved in-person meetings onto a virtual format, with the committee joining meetings via web link or through phone call. The Berkley Group, a consulting firm, worked with A-NPDC to manage meetings and to update the plan's contents.

## 2021 HAZARD MITIGATION PLAN PARTICIPATION

A-NPDC endeavored to engage all 19 towns, along with both counties, on the Eastern Shore. All but one community joined the planning process, with the towns of Accomac and Painter joining for the first time. A total of 18 jurisdictions participated in the planning process, plus Accomack and Northampton Counties.

Participating towns and counties were invited to join the plan's Steering Committee and to designate their own representatives. Additional stakeholders were identified and invited to join the Steering Committee as well. The 2020-21 plan update did not include a distinction between the Steering Committee and the Planning Council, as the 2016 plan did. All members of the Steering Committee were invited to participate in all meetings and to receive all agendas and other meeting materials.

More than 30 agencies and organizations were invited to join the Steering Committee, from local historical and cultural nonprofits, social services, and neighboring county governments across the state line in Maryland. All received the same agenda and packet materials and were invited to attend all meetings, but not all were regular participants. Some that were not regular participants were called upon by A-NPDC staff when their expertise was needed, whether for a particular meeting, or while drafting materials to take before the committees.

Monthly meetings were held via the online video conference tool, Zoom. Committee members received a link to the meeting and a phone number to dial in, if needed. These meetings, which were open to the public, were held on the third Tuesday of each month. Email blasts and website posts encouraged participation from the public; however, social distancing guidelines and the attempt to reduce the spread of COVID-19 led the Committee to hold all meetings virtually. The COVID-19 pandemic provided for limited public outreach opportunities, compared to the 2016 Plan. The kickoff meeting with the committee was held on December 1, 2020. Email invitations were distributed to the Steering Committee and meeting dates and log-in information was posted on the A-NPDC web site.

An iterative process was used, with A-NPDC staff assembling information and presenting the information to the combined committees at regular meetings. Additionally, A-NPDC staff met with each local government to discuss their individual chapters of the plan.

## Planning Process

During the 2016 planning process, a chairperson, James Eichelberger, and vice chairperson, Peter Stith, had been elected by the committee. Due in part to the pandemic, the 2020-21 Steering Committee chose to move ahead with the planning process without electing a chair and vice-chair.

### 2021 HAZARD MITIGATION PLAN – PARTICIPATING JURISDICTIONS

Jurisdiction	<u>2006</u>	<u>2011</u>	<u>2016</u>	<u>2021</u>
A-NPDC	X	X	X	X
Accomack County	X	X	X	X
Chincoteague	X	X	X	X
Saxis	X	X	X	X
Hallwood	-	X	X	X
Bloxom	-	X	X	X
Parksley	-	X	X	X
Tangier	X	X	X	X
Accomac	-	-	-	X
Onley	-	X	X	X
Onancock	X	X	X	X
Melfa	-	-	X	X
Wachapreague	X	X	X	X
Keller	-	X	X	X
Painter	-	-	-	X
Belle Haven	-	-	-	-
Northampton County	X	X	X	X
Exmore	-	X	X	X
Nassawadox	-	-	X	X
Eastville	-	X	X	X
Cheriton	-	-	X	X
Cape Charles	X	X	X	X

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

### 2021 HAZARD MITIGATION PLAN – STEERING COMMITTEE MEMBERS

<u>First</u>	<u>Last Name</u>	<u>Jurisdiction</u>	<u>Position</u>
Kerri	Atkinson	Painter	Town Clerk
Thomas	Beasley	Bloxom	Mayor
Mark	Bowden	Chincoteague	Building and Zoning Administrator
Jeb	Brady	Cape Charles	Code Official
Tom	Brockenbrough	Accomack County	Floodplain Administrator/GIS Coordinator
Connie	Campbell	Painter	Mayor
Laurie	Chamberlain	Onley	Town Administrator
Donna	Croushore	Saxis	Town Council Member
Jackie	Davis	Cheriton	Mayor
Sarah	Dickey*	Accomack County	Deputy Coordinator of Emergency Management
Denise	Drewer	Saxis	Mayor
Robert	Duer	Exmore	Town Manager
Taylor	Dukes	Wachapreague	Director of Utilities and Zoning
Jeanette	Eby*	Bloxom	Town Clerk
David	Eder	Eastville	Chief of Police
Kim	Fitzpatrick	Nassawadox	Town Council Member
Andrea	Fox	Nassawadox	Town Council Member
Keith	Greer	Parksley	Chief of Police
Chris	Guvernator*	Accomack County	Director of Environmental Programs
Teresa	Guy	Keller	Vice Mayor
Greg	Hardesty	Cheriton	Town Council Member
Sharon	Hart	Keller	Mayor
Arthur	Leonard	Chincoteague	Mayor
Lauren	Lewis	Parksley	Town Clerk
Susan	McGhee	Northampton County	Director of Planning
Billie J.	Miles*	Accomack County	Department of Public Works
Jackie	Poulson	Hallwood	Mayor
Charles	Pruitt	Accomack County	Director of Public Safety
Bryan	Rush	Chincoteague	Director of Emergency Services
Jayme	Salazar	Onley	Town Manager
Danny	Shrieves	Hallwood	Town Clerk
Danny	Siegert	Parksley	Zoning & Floodplain Administrator
Pat	Smith	Accomac	Mayor
John	Spivery	Onley	Chief of Police
Matt	Spuck	Onancock	Town Manager
Patsy	Stith	Nassawadox	Mayor
Jim	Sturgis	Eastville	Mayor
Laurie	Thomas	Tangier	Town Manager
Michael	Tolbert	Chincoteague	Town Manager
Charles	Wilbur	Melfa	Mayor
Robert	Williams	Wachapreague	Floodplain Admin./CRS Coordinator

\*Hazard Mitigation Steering Committee Alternate

## Planning Process

### 2021 HAZARD MITIGATION PLAN – OTHER PARTICIPANTS

<u>First</u>	<u>Last Name</u>	<u>Jurisdiction</u>	<u>Position</u>
Shannon	Alexander	A-NPDC	Director of Planning
Ashley	Mills	A-NPDC	Regional Planner
Thomas	Hicks	The Berkley Group	Planning Director
Jonathan	McCoy	The Berkley Group	Planner
Aaron	Berryhill	The Berkley Group	Planner
Harrison	Bresee	VDEM	All Hazards Planner
Bruce	Sterling	VDEM	Region V Coordinator

**Figure 1: Steering Committee Members Participating in a Virtual Meeting**



## PUBLIC PLANNING PROCESS AND OUTREACH EFFORTS

A combination of strategies was used to generate interest and participation both in the plan and issues addressed in the plan. The 30+ organizations and agencies represented in the stakeholder's group were selected both for their expertise and the individuals and interests they represent, so that our reach would be broad and deep.

The following section documents the efforts made to generate interest, opinion, and comments about the Eastern Shore Hazard Identification and Risk Assessment and Hazard Mitigation Plan.

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### THE PUBLIC

The public were invited to attend all meetings of the Hazard Mitigation Steering Committee, which were publicly posted and held via Zoom and by dial-in. The A-NPDC used the A-NPDC website and Facebook page and sent email blasts to encourage public attendance. Following the FEMA review and prior to HMP adoption the A-NPDC used the same process to advertise to the public. Several attempts at public participation were made; however, there was a lack of public attendance at the Steering Committee meetings. The A-NPDC had some members of the public reach out regarding information about the plan, concerns of hazards in their community, and grant program information.

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### BUSINESS

The Eastern Shore of Virginia Chamber of Commerce, the Northampton County Chamber of Commerce, and the Chincoteague Chamber of Commerce were invited to appoint a representative to the Planning Committee. Evelyn Shotwell of the Chincoteague Chamber of Commerce participated in some virtual meetings throughout the planning process, including hazard identification and prioritization.

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### ACADEMIA

Wie Yusuf, Professor in the Strome College of Business at Old Dominion University and Program Lead of the ODU/Virginia Sea Grant Climate Adaptation and Resilience Program, attended the April meeting. Professor Yusuf delivered a presentation on the Resilience Adaptation Feasibility Tool (RAFT). This tool was developed to help Virginia's coastal localities improve resilience to flooding and other coastal storm hazards while remaining economically and socially viable (RAFT Mission & Goals, n.d.).

Scott Hall, Workforce and Business Solutions Officer, attended several meetings on behalf of Eastern Shore Community College.

Schools in both counties were invited to participate, although no participants joined the meetings.

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### GOVERNMENT AGENCIES

At the state level, Amy Howard, Hazard Mitigation Coordinator for Virginia Department of Emergency Management (VDEM), provided guidance throughout the process and participated in some meetings. Harrison Bresee, All Hazards Planner with VDEM, attended several meetings and worked closely with A-NPDC and Berkley Group staff in the update to the plan.

The Virginia Departments of Historic Resources, Forestry, and Conservation and Recreation were invited to participate in meetings. The Department of Social Services in both counties, the Virginia Department of Game and Inland Fisheries, and the Eastern Shore Soil and Water Conservation District (ESSWCD) were unable to attend meetings but were sent all meeting packets.

## Planning Process

In addition to the Hazard Mitigation committees, the A-NPDC briefed the Eastern Shore Disaster Preparedness Coalition (ESDPC). This regional body is made up of federal, state, regional, and local government officials with any type of role in preparing for, or responding to, disasters, so there is some overlap between the two groups. The coalition also includes representatives of businesses, physical and mental health services, communication providers, education, and private environmental providers. As a result of Covid-19 the A-NPDC staff did not participate in the coalition during the HMP plan development.

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### NON-PROFIT INTERESTS

Non-profit organizations were invited to participate in the update to the 2020-21 plan. These organizations include:

- Barrier Islands Center,
- Chincoteague Museum,
- Eastern Shore Amateur Radio Club.
- Eastern Shore Area Agency on Aging,
- Eastern Shore Center for Independent Living,
- Eastern Shore Coalition Against Domestic Violence,
- Eastern Shore Community Services Board,
- Eastern Shore Historical Society,
- Food Bank of Southeast Virginia, Eastern Shore,
- NAACP,
- Riverside Shore Memorial Hospital,
- Saxis Island Museum,
- The Nature Conservancy (TNC),
- Watermen's Museum, and
- Wetlands Watch

TNC provided support in several ways. In addition to participating in several meetings, TNC provided technical support to A-NPDC staff and the committees in the area of storm surge modeling and sea level rise, through its [Coastal Resilience tool](#).

Seventeen hypothetical storms were modeled in building the Coastal Resilience tool, along with Nor'Ida, a nor'easter that formed from the remnants of Hurricane Ida in 2009. The model was calibrated using measured water depths from that storm. The depth grids, paths, and data from these hypothetical storms (before sea level rise factors were applied) were shared with A-NPDC staff for use in the storm surge analysis.

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### NEIGHBORING JURISDICTIONS

Somerset County, Maryland and Worcester County, Maryland are the only two Maryland Counties that border Accomack County. Both were added to the Steering Committee so that they would receive all development material and could participate in any discussions. Neither chose to participate in the plan development phase, however.

## CONTINUED PLAN MAINTENANCE

Since the development of the 2016 plan, the participating towns and both counties have used the plan to develop other local plans. Accordingly, each town will keep a copy of their respective Chapter in their town hall and each county a copy of the entire plan in their respective planning offices for convenient reference. With these copies, there will also be a comment area provided for written comments and the contact information for A-NPDC staff in order to provide comment by email or phone.

In addition, the plan will be referenced in the event of funding availability and/or a disaster event. Mitigation actions will be revisited at least annually in an effort to track completions and add newly discovered potential mitigation actions.

All the mitigation actions for each jurisdiction were compiled into a master spreadsheet. This allows mitigation actions to be easily compared and tracked. The format also allows for easy updating and reference within the 5-year cycle.

The entire plan will remain indefinitely available on the A-NPDC website and in the A-NPDC office located in the Town of Accomac for stakeholder reference and use and for public comment.

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## PLAN EVALUATION

In addition to the Emergency Management Coordinator (EMC) evaluating the Plan annually according to Local Capability Readiness Assessment (LCAR) criteria, the A-NPDC staff will work together with the EMC to address the following concerns to evaluate if:

- The Plan offers mitigation actions that protect property, promote public awareness, aid emergency services, suggest preventative land use, structural controls, and protect natural mitigation features.
- Goals and objectives address current and expected conditions.
- The magnitude or nature of the risks have changed.
- Current resources are appropriate for implementing the Plan.
- Additional or different resources are now available.
- Implemented actions were cost effective.
- There were any implementation challenges.
- Changes in county/town resources impacted Plan implementation.
- Changes in programming or government structure have created a need to change the Plan.
- New agencies/departments/staff/organizations should be included.

### DOCUMENTS AND RESOURCES

The Committee and A-NPDC staff drew on many written resources throughout all phases of plan development, referenced in Appendix A. Among the resources are local historical books and articles, U.S. Army Corps of Engineer Flood Reports of storms that struck the Eastern Shore, FEMA's 2011 Coastal Construction Manual, NOAA and USGS data, historical information, and technical information available through various government websites such as the Chincoteague National Wildlife Refuge on Assateague Island and VDEM, and local town and county plans. Staff also listened to local accounts of various hazard events.

Historic severe weather events data were extracted from the NOAA's National Climatic Data Center Severe Weather Events database and compiled as the basis for weather-related hazard information. Data from January 2000 through May 2021 are reflected in the Plan.

The Berkley Group used FEMA's multi-hazard Hazus® model to estimate flood losses for the one percent annual chance flood and hurricane wind losses. Complete documentation of the Hazus® modeling process can be found in Appendix C.

The Nature Conservancy's Coastal Resilience tool allows users to view storm surge under various sea level rise scenarios. The storm modeling that underlies that tool was used to model storm surge for the coastal flood risk assessment.

# CHAPTER 3: RISK ASSESSMENT

## RISK ASSESSMENT PROCESS

The process of risk assessment began with a collaborative discussion on January 19, 2021, via a zoom call. The Eastern Shore had a diverse group of attendees participate in the risk assessment representing local and state government, non-profits, and education interests. Together, they learned about historic hazards that have affected the Shore, the expected effect of sea-level rise on the frequency and intensity of tropical storms, and the role of hazard mitigation planning in protecting lives and property.

Participants also received information which identified risks in the last two hazard mitigation plans, and then participated in an Esri Survey123 to prioritize those hazards based on their own experiences, as well as new knowledge they had acquired from presentations. Participants also added to the hazard list if they judged there were any missing items.

A comprehensive list of hazards that were evaluated included:

***Table 1: Types of Potential Hazards in the Eastern Shore of Virginia***

Hazard Category	Hazard Type
Agriculture & Food Emergency	Invasive Environmental Species and Diseases
	Plant Disease or Infestation
	Food Contamination
	Farm Animal Disease
	Fish Kill
Environmental	Hurricane
	Coastal Flooding
	High Wind
	Storm Surge
	Coastal Erosion
	Non-Coastal Flooding
	Tornado
	Extreme Heat
	Thunderstorm
	Drought or Low Water
	Winter Weather
	Erosion- Not Coastal
	Land Subsidence
	Lightning
	Wildland Fire
	Extreme Cold
	Fog
	Earthquake
Extraterrestrial	Space Weather
	Space Object/Debris Crash
Hazardous Materials	Chemical
	Oil or Natural Gas
	Radiological

## Risk Assessment

	Nuclear
	Pandemic
	Water Quality
	Infectious Disease
	Substance Use and Overdose
Health	Active Threat
	Cyber Attack
	Civil Disorder
Public Safety	Chemical, Biological, Radiological, Nuclear, and high yield Explosives
	Crowd Disaster
	Geopolitical Pressures
	Sabotage
	Electromagnetic Pulse
Structural	Fire/Explosion
	Building or Structural Failure
	Mine or Underground Structure Emergency
Supply & Distribution	Communications Failure
	Electrical Energy Failure
	Water or Wastewater Disruption
	Food Shortage
	Medical Drug, Blood Product or Supplies Shortage
	Petroleum Product Shortage
Transportation	Road and Highway
	Marine
	Public Transportation
	Aviation
	Rail

Participants were asked to rank and score each of the hazards based on the following:

- *Probability*
- *Affected Communities*
- *Primary / Secondary Impacts*

The scores were compiled and averaged by A-NPDC staff and shared with the Steering Committee members. Hazards were reviewed and then divided into three priorities: high, medium, and low.

The resulting prioritization was presented at the next meeting on February 16, 2021. At that meeting, the prioritization of hazards was slightly revised, and similar categories from previous HMP documents were combined. The high priority hazards – coastal flooding, wind, coastal erosion, and storm water flooding – did not change, and remained consistent with the previous hazard mitigation plans (Table 2). Although hazards such as ice/snow, drought, and wildfire were ranked as low or medium in previous plans, Steering Committee members elected to not rank these hazards for the current update in order to focus on hazards that impact the region more frequently. These hazards are still included and described in some locality chapters, however, as each locality has special circumstances surrounding their infrastructure, emergency response capabilities, and ability to recover following a hazard. Scoring results were clearly indicative of these five hazards being the most probable, most frequent, and affects the most communities in the region – by far. Each of these five identified priority hazards and their impacts are described in each respective locality chapter, as well as identified secondary, local hazards for each jurisdiction. Hazards identified in these chapters are to be reassessed annually and amended in the plan as needed.

**Table 2: Eastern Shore of Virginia Hazard Prioritization**

Hazard	2006	2011	2016	2021
<b>High Wind</b>	High	High	High	High
<b>Coastal Erosion</b>	High	High	High	High
<b>Coastal Flooding</b>	High	High	High	High
<b>Storm Water</b>	High	High	High	High
<b>Pandemic</b>	-	-	-	High*
<b>Well Contamination (Water Quality)</b>	Medium	Unranked	Medium	Medium
<b>Ice-Snow</b>	Medium	Medium	Medium	Unranked
<b>Biological Hazards (Infectious Disease)</b>	Medium	Unranked	Medium	Medium
<b>Drought</b>	Medium	Medium	Medium	Unranked
<b>Sewage Spills</b>	Medium	Medium	Medium	Unranked
<b>Storm Surge</b>	-	-	-	Medium*
<b>Non-Coastal Flooding</b>	-	-	-	Medium*
<b>Road and Highway</b>	-	-	-	Medium*
<b>Wildland</b>	Low	Medium	Low	Unranked
<b>Hazardous Materials Incidents</b>	Low	Low	Low	Unranked
<b>Heat Wave</b>	Low	Low	Low	Unranked
<b>Fish Kills</b>	Low	Unranked	Low	Unranked
<b>Invasive Environmental Disease</b>	Low	Unranked	Low	Unranked
<b>Earthquake</b>	Low	Unranked	Low	Unranked
<b>Substance Use and Overdose</b>	-	-	-	Low*
<b>Communications Failure</b>	-	-	-	Low*
<b>Active Threat</b>	-	-	-	Low*
<b>Electrical Energy Failure</b>	-	-	-	Low*
<b>Tornado</b>	-	-	-	Low*

\*New Priority Identified in the 2021 Plan

With the hazards identified, the group began the risk analysis for the five priority hazards: coastal flooding, wind, coastal erosion, storm water flooding and pandemic. The first step was to thoroughly document their histories, to understand the causes, and to look at the human systems that have been put in place to attempt to mitigate their effects. This work can be found in Chapter 4: High Wind; Chapter 5: Coastal Erosion; Chapter 6: Coastal Flooding; Chapter 7: Storm Water; and Chapter 8 Pandemic

The extent and vulnerability of each of the four high priority environmental hazards, are documented in each of the locality chapters, beginning with Chapter 9: The Region. Structures insured by the National Flood Insurance Program (NFIP) that have been repetitively damaged by floods are addressed in the appropriate local chapters.

# CHAPTER 4: HIGH WIND

## INTRODUCTION

The Eastern Shore's location between two coastal bodies, the Chesapeake Bay and the Atlantic Ocean, makes it vulnerable towards high wind events. Hurricanes, coastal spouts, tornadoes, tropical storms, and nor'easters are some of the high wind events that cause the shore to be designated as within the 110 to 120 mph zone. This means that structures built should be able to withstand 110 mph per building code standards. This is consistent with a strong Category 1 hurricane whose 3 second gusts could be anywhere from 93 to 119 mph. High wind events on the Eastern Shore are identified in Table 1. These events were sourced from the NOAA Storm Events Database and do not reflect all high wind events on the Eastern Shore.

## NATURAL FORCES AND CONDITIONS

### CAUSES OF HIGH WIND

#### HURRICANES, TROPICAL STORMS, AND TROPICAL DEPRESSIONS

Tropical cyclone storms are reviewed in detail in Chapter 6 – Coastal Flooding, but that discussion centers on coastal flooding, not wind speed, which is the key measure of hurricane intensity as shown in the Saffir-Simpson Wind Scale. However, wind speed is also used to differentiate tropical depressions, tropical storms, and post-tropical depressions.

#### NOR'EASTERS

Nor'easters, or Northeasters, usually occur in the mid-latitudes over the winter months from September to April. These storms are generally very large and slow moving and can cause severe and widespread damage at the same level as their stronger summer counterpart, the hurricane (USGS, St. Petersburg Coastal and Marine Science Center).

#### TORNADOES

"We got an emergency message on a cellphone and within 30 seconds, the thing hit and it blew down 40, 50 trees in the park." That's how one man described the early morning EF1 tornado that struck Cherrystone Campground on July 24, 2014, killing three and injuring 36. The popular summertime destination on the Chesapeake Bay near Cheriton, Virginia was packed with 1,328 adults and children and 40 staff members at the time. A New Jersey couple was killed instantly when a tree fell on their tent. Their son, who was in a neighboring tent, died days later from a head injury, also from a fallen tree.

The tragedy brought into sharp focus the dangers posed by tornadoes. The July 24 twister was one of Virginia's deadliest, and although the National Weather Service Office issued a tornado warning 20 minutes before it hit, campers were caught off guard, forcing early risers to scramble for cover and catching others completely unaware.

The catastrophe made national news, and since then the Eastern Shore Disaster Preparedness Coalition has been working cooperatively with campgrounds on preparing materials to be provided to campers at check-in about where to seek shelter during storms and other camper safety information.

Tornadoes have traditionally occurred on the Eastern Shore during the spring and summer months with the largest one reaching F3 status in 1967. This tornado caused 5 injuries and about \$25,000 in damage.

Eastern Shore of Virginia Hazard Mitigation Plan 2021

**Table 1: High Wind Events Recorded in NOAA Storm Events Database, 2011-2021  
(Excluding Tropical Cyclones and Nor'easters)**

County	Date	Event Category	Property Damage (\$, not adjusted for inflation)	Crop Damage (\$, not adjusted for)	Source	Narrative
Accomack Co.	2/25/11	High Wind	2000	0	ASOS	Wind gust of 61 mph was measured at Wallops Flight Facility Airport (WAL). Very strong gradient winds produced wind gusts to around 60 mph over portions of eastern Virginia.
Accomack Co.	8/27/11	Tornado	25000	0	Emergency Manager	Weak tornado (EF0) downed trees and caused minor roof damage. Hurricane Irene moving northward over the outer banks of North Carolina and just off the Virginia coast produced two tornadoes across portions of eastern and southeast Virginia during Saturday, August 27th.
Northampton Co.	6/1/12	Tornado	3000	0	NWS Storm Survey	The tornado was spawned from the same supercell which produced a tornado just east of the Monitor Merrimac Bridge Tunnel and moved across the city of Hampton before moving over the Chesapeake Bay. The tornado produced damage consistent with an EF-0, tossing around kayaks and shearing off the tops of several trees. The tornado occurred at the Savage Neck Dunes Natural Area Preserve.
Accomack Co.	7/14/12	Tornado	15000	0	NWS Storm Survey	A slow-moving tornado made a short narrow path through rural portions of Accomack County just east of Onley. The tornado first touched down in a small residential development just southwest of the intersection of Custis Neck Road and Drummondtown Road. Numerous trees were damaged or brought down by the tornado with one tree falling on an unoccupied vehicle. The tornado then continued slowly southwest through a wooded area with the last visible tree damage seen just southwest of Accawmacke Elementary School.

## High Wind

County	Date	Event Category	Property Damage (\$, not adjusted for inflation)	Crop Damage (\$, not adjusted for	Source	Narrative
Accomack Co.	10/29/12	High Wind	10000	0	911 Call Center	The very strong winds downed trees, produced minor structural damage, and caused scattered power outages. Wind gust of 59 knots (68 mph) was measured at WAL. Wind gust of 55 knots (63 mph) was measured at Accomack County Airport (MFV). Intense low pressure moving from off the northern Mid Atlantic Coast northwest into extreme southern New Jersey produced very strong west to northwest winds across eastern Virginia. The very strong winds downed numerous trees, produced minor structural damage, and caused scattered power outages.
Northampton Co.	10/29/12	High Wind	10000	0	911 Call Center	The very strong winds downed trees, produced minor structural damage, and caused scattered power outages. Intense low pressure moving from off the northern Mid Atlantic Coast northwest into extreme southern New Jersey produced very strong west to northwest winds across eastern Virginia. The very strong winds downed numerous trees, produced minor structural damage, and caused scattered power outages.
Accomack Co.	3/6/13	High Wind	3000	0	ASOS	Wind gust of 55 knots (63 mph) was measured at WAL. Intense low pressure moving off the Mid Atlantic Coast produced very strong northeast winds across southeast Virginia. The very strong winds downed trees, produced minor structural damage, and caused scattered power outages.
Accomack Co.	6/18/13	Funnel Cloud	0	0	Public	A funnel cloud was reported over Tasley. A cold front produced scattered showers and thunderstorms across central Virginia. Isolated severe weather produced strong winds, heavy rainfall, and a funnel cloud.
Northampton Co.	7/24/14	Tornado	200000	0	NWS Storm Survey	The tornado began in the Chesapeake Bay, a few miles west of Cherrystone Campground. The tornado then tracked eastward affecting the northern portions of Cherrystone Campground. The tornado then continued eastward across Old Cherrystone Road and Route 13 before lifting near Seaside Road close to the Northampton Landfill. Many trees were downed or snapped off. Numerous camping trailers were damaged, and several were destroyed. Several trees were downed on cabins.

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

County	Date	Event Category	Property Damage (\$, not adjusted for inflation)	Crop Damage (\$, not adjusted for inflation)	Source	Narrative
Accomack Co.	8/4/15	Tornado	2000	0	Public	A weak tornado was reported by several people near and east southeast of Saxis. Large limbs were downed in the road. Other debris was blown around. Scattered severe thunderstorms in advance of a cold front produced damaging winds, large hail, and one weak tornado across portions of the Virginia Eastern Shore.
Accomack Co.	1/23/16	High Wind	75000	0	ASOS	Wind gust of 61 knots (70 mph) was measured at WAL. Wind gust of 50 knots (58 mph) was measured at MFV. Numerous trees were downed on Chincoteague Island, with a few trees falling on homes. Strong Low Pressure moving from the Southeast United States northeast and off the Mid Atlantic Coast produced very strong wind gusts across portions of Eastern Virginia.
Northampton Co.	10/8/16	High Wind	75000	0	Emergency Manager	Post Tropical Cyclone Matthew tracking northeast just off the North Carolina and Virginia coasts, produced very strong northeast or north winds across portions of southeast Virginia from Saturday, October 8th into Sunday, October 9th. The very strong winds downed numerous trees, some onto homes, and caused some power outages.
Northampton Co.	8/7/17	Funnel Cloud	0	0	911 Call Center	Funnel cloud was reported near Birdsnest.
Accomack Co.	3/2/18	High Wind	25000	0	Emergency Manager	Wind gusts of 61 knots (70 mph) were measured at Chincoteague (1 WSW). Wind gust of 56 knots (64 mph) was measured at WAL. Intense low pressure spinning off the southern New England coast produced very strong northerly winds across portions of central and eastern Virginia. The very strong winds downed numerous trees, produced structural damage, and caused power outages.
Northampton Co.	3/2/18	High Wind	25000	0	Emergency Manager	Wind gust of 57 knots (66 mph) was measured at Kiptopeke State Park. Intense low pressure spinning off the southern New England coast produced very strong northerly winds across portions of central and eastern Virginia. The very strong winds downed numerous trees, produced structural damage, and caused power outages.

## High Wind

County	Date	Event Category	Property Damage (\$, not adjusted for inflation)	Crop Damage (\$, not adjusted for	Source	Narrative
Northampton Co.	10/11/18	High Wind	15000	0	Emergency Manager	Tropical Cyclone Michael tracked from South Carolina northeast and off the Mid Atlantic Coast from Thursday morning, October 11 into early Friday morning, October 12. Very strong northwest winds on the back side of the storm produced damaging wind gusts across portions of south central, eastern, and southeast Virginia. Numerous trees were downed and there was minor structural damage. Several campers were overturned or damaged at Cherrystone campground.
Accomack Co.	10/11/18	High Wind	5000	0	Law Enforcement	Tropical Cyclone Michael tracked from South Carolina northeast and off the Mid Atlantic Coast from Thursday morning, October 11 into early Friday morning, October 12. Very strong northwest winds on the back side of the storm produced damaging wind gusts across portions of south central, eastern, and southeast Virginia. Numerous trees were downed and there was minor structural damage.
Northampton Co.	5/29/19	Thunderstorm Wind	5000		Emergency Manager	Isolated severe thunderstorm in advance of a trough of low pressure produced damaging winds across portions of the Virginia Eastern Shore. Several trees were downed and there was some light damage to weak structures in Eastville.
Accomack Co.	12/25/20	Thunderstorm Wind	2000	0	Utility Company	Scattered severe thunderstorms in advance of a strong cold front produced damaging winds and two tornadoes across portions of eastern and southeast Virginia. Trees were downed at Indian Trail Road and Scarboroughs Neck Road.

## TYPE, LOCATION, AND EXTENT

### DAMAGES

High wind events cause progressive failure of structures. Once a building's envelope has been breached, wind will start to enter the building and either pull or push at other parts of the structure. Partially enclosed buildings experience a 30% higher wind pressure than enclosed buildings. Once a building becomes partially enclosed due to wind damage, higher wind pressures cause further damage (*FEMA Coastal Construction Manual*, 2011).

A building fails in high winds because the wind speed exceeds the capacity of the structure to hold up. This can happen in two ways: wind speed exceeds the design or construction standards used or windborne debris damages the structure, and as a result of increased wind pressure, the design or construction standards are surpassed. Wind damage commonly assumes a couple of forms. Roofs can fail, lightweight structures can overturn at the foundation, siding and shingles can be pulled off the building, and openings can be blown in. Once a structure's envelope has been penetrated by wind, wind-driven rain and debris causes additional damages (*FEMA Coastal Construction Manual*, 2011).

Storms that occur when the trees are in full leaf, like Hurricane Isabel, also cause tremendous tree damage. Thousands of trees were blown over due to the winds from Isabel and saturated soils. Many of these trees damaged houses, auxiliary structures, power lines, and vehicles.

### EXPOSURE AND POTENTIAL LOSS

The building code requires all structures to withstand 110 mph winds, the equivalent of a Category 2 hurricane. However, a community shelter on the Eastern Shore must be built to withstand 160 mph winds, due to the Shore's categorization as a Zone II wind zone (ASCE 7-98). With these standards, a community shelter should withstand a F2 tornado and a Category 4 hurricane.

This wind speed is based on the 100-year return frequency. That means that over 70 years a structure would have a 50% chance that the 110-mph wind speed would be met or exceeded. However, wind speed design builds in a 1.5 safety factor so a structure should withstand a higher wind speed (*FEMA Coastal Construction Manual*, 2011).

Siting decisions affect the types of wind speed seen at a building. Ocean promontories generally receive high wind speed due to the topography of the area. A more exposed condition because of lack of vegetation around the structure will open the building up to greater wind speeds. Those structures near open water are exposed to higher winds than structures located more landward. In addition, the height of a structure above the ground can be a factor in wind damage. The higher a house is located above ground the higher the wind speed will be around the structure. This can be an issue in flood zones since elevation of the building is the primary means of mitigating flood damage (*FEMA Coastal Construction Manual*, 2011).

In addition, a structure is only as wind resistant as its smallest component. If a window, door, roof covering, siding or chimney fails, the rest of the structure will be subjected to wind pressures that can cause other components to fail even though they perform to their design guidelines (*FEMA Coastal Construction Manual*, 2011).

## SECONDARY HAZARDS

Auxiliary hazards of high wind are salt spray and soil erosion. High winds can gather salt from the ocean and spread it over the Eastern Shore, causing crops to be destroyed and power lines to fail. Hurricane Isabel caused both types of damage. Additionally, strong winds from the northwest are common during the winter months on the Eastern Shore. According to local oral accounts, these winds can cause significant soil erosion to fields in the winter, stripping critical nutrients from fields and depositing them in local waterways.

## HUMAN SYSTEMS

There are various ways that property damage and personal injury can be minimized. Preparation is one of the most important of these. Resilient construction is key to this, as discussed previously in the Exposure and Potential Loss section above. Early warnings are also vital to ensuring that people can move to shelter prior to the onset of a high wind event.

## WARNING ANNOUNCEMENTS

The National Weather Service provides warnings for high winds through their Land-based Wind Hazard Announcements and Water-based Wind Hazard Announcements. These warnings are available to the residents of the Eastern Shore via several delivery methods: television, radio, internet, and mobile phone alerts (including CodeRED alert system).

## CONSTRUCTION STANDARDS

The 2011 FEMA Coastal Construction Manual lays out very specific design standards for wind, flooding, fire, and more. Design for wind loads is essentially the same whether the winds are due to hurricanes, thunderstorms, or tornadoes, and both Counties (and subsequently their respective incorporated Towns), go by these standards for building and zoning codes.

## PERSONAL RESPONSIBILITY

Even if structures are built to the proper standard, regular maintenance to ensure their stability and resilience are important. FEMA has produced a guide to protecting property from high winds, available online in PDF format. Some of the recommendations include documenting the contents of the home for insurance purposes, building a safe room for sheltering during storm events, using storm shutters for windows and glass doors, reinforcing garage doors and double-entry doors, fortifying the roofs, securing objects outside the home, and more.

# CHAPTER 5: COASTAL EROSION

## INTRODUCTION

Standing on the pristine beach of Cobb Island in Northampton County, one would never know that the now-tranquil barrier island was a bustling recreational center in its prime where a harpist once entertained guests in the island's grand resort hotel (Figure 1: Advertisement for Cobb's Island Hotel).



**Figure 1: Advertisement for Cobb Island Hotel**

It can happen so incrementally that it goes almost unnoticed in the short-term and is best measured in years, or so dramatically that what was there one day is gone the next. Erosion becomes problematic when it threatens lives or property. With sea-level rise, that threat has become more prevalent.

On a peninsula, water and waves come to mind as primary drivers of erosion, but wind is also a powerful sculptor of land. The rate of erosion is also greatly influenced by underlying geology, and sometimes by man-made interventions in those natural processes - like the seawall and jetty proposed for Tangier. Those interventions can also have negative effects, like accelerating erosion in other locations, or destruction of natural bottom in front of the structure from reflected wave energy.

The Cobb's Island Hotel might have been lost in a single storm, but the setup came over the course of a couple of decades as the hotel went from being 500 yards from the surf to within 50 feet, according to authors of "A Short History of the Virginia Barrier Islands" (Barnes and Truitt, 1997). Erosion from a series of late century storms had made the hotel easy pickings for a nor'easter-hurricane double-punch in 1897.

Over the course of the subsequent 100 years, Tangier Island would see more than half of its land mass recede into the Chesapeake Bay, but officials are working to make sure that Cobb Island's history is not Tangier Island's future. The Town received a commitment from the Commonwealth and the Corps of Engineers in 2012 to build a seawall and jetty to protect the Town harbor. A contract to build the seawall and jetty was awarded to a Virginia-based firm in May 2020.

There are other factors that differentiate Cobb and Tangier Islands. For example, the conditions and energy to which they are subjected are vastly different. Cobb Island is part of a long chain of barrier islands subjected to a constant barrage of plunging ocean waves breaking onto the beach, while Tangier Island is within the Chesapeake Bay where wave energy is less intense and erosion is augmented primarily by sea-level rise and subsidence.

Erosion itself can be simply described as energy moving sediment.

## Coastal Erosion

FEMA's 2011 Coastal Construction Manual describes the following ways that erosion can threaten coastal buildings:

- Destroying dunes or other natural protective features,
- Destroying erosion control devices,
- Lowering ground elevations,
- Undermining shallow foundations and reducing penetration depth of pile foundations,
- Transporting beach and dune sediments landward, where they can bury roads, buildings, and marshes,
- Breaching low-lying coastal barrier islands exposing structures on the mainland to increased flood and wave effects, and
- Eroding coastal bluffs that provide support to buildings outside the floodplain itself.

This chapter succinctly reviews the forces at work that cause erosion, how erosion changes the coastline and adjacent landforms over time, and erosion control measures that have attempted to redirect—at least temporarily—water's capacity to reshape land.

The focus of this chapter is to review changes to portions of the Eastern Shore landscape over time. Risk assessment is not found in this chapter but may be found in each locality chapter beginning with Chapter 8.

## NATURAL FORCES AND CONDITIONS

### CAUSES OF EROSION

Large tropical and extratropical storms are associated with three of the major causes of erosion: Water, wind, and waves. A list of major storms affecting the region can be found in Chapter 1: Hazards on the Shore.

#### WATER

Water picks up and transports sediments as it moves over land. Surface erosion by water will depend on the volume of water, the speed at which it is moving, the surface characteristics (vegetative cover, permeability, sediment grain size), and its slope. Coastal floods (discussed more thoroughly in Chapter 6 – Coastal Flooding) can be sources of coastal erosion as they pick up and move large quantities of water-borne sediment to be deposited elsewhere. Erosion from water can degrade coastal bluffs and tidal marshes, causing them to slump into adjacent water bodies.

Localized scour—the removal of sediment from around a fixed structure—can result from water moving at high velocity. Scour can undermine slabs or other at-grade foundations, causing them to fail, or expose other structural elements (FEMA Coastal Construction Manual, 2011).

Regardless of the source, sediment transported by water is left somewhere, and even experienced boaters have been caught on shoals that were not there the previous fall. Shoaling in some stretches of the Virginia Inside Passage, once a continuous seaside water passage buffered from the sea by the mainland to the west and the barrier islands to the east, has now rendered sections impassable, and others passable only at high tide.

#### WIND

Exposed soil is susceptible to wind erosion, and in coastal areas, sandy areas are prevalent. This same wind can remove sand around coastal buildings. This exposes buildings in velocity zones to higher-than-anticipated forces,

putting them at risk to these velocity flow hazards. Like water, wind can also scour sand from around structural supports (FEMA Coastal Construction Manual, 2011).

Wind contributes to wave height—another erosional force—through the interaction of three factors: wind speed, duration, and fetch - the distance over water that wind blows in a single direction. Slow wind speed will produce small waves, regardless of duration and fetch. Strong winds lasting only a few minutes will not produce large waves, and strong winds over a long period, but over a short stretch, will not result in large waves. All three factors must be present to produce significant wave height (NOAA, n.d.).

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## WAVES

Away from shore, waves do not have much forward motion. As they approach the shore, friction with the ocean bottom gives the top of the waves forward momentum, causing the waves to break. The mass of forward-moving water breaking into the shore gives waves their erosive power (Hyndman and Hyndman, 2011).

With perpendicular or near-perpendicular waves, sand is pushed onto the beach by breaking waves, and pulled back as the wave washes back into the ocean. Longshore drift is a phenomenon created by waves striking the shore at an angle and water being pulled back into the ocean perpendicular to the shore. This drift generally moves sand southward along the Atlantic coast of the Eastern Shore (Hyndman and Hyndman, 2011). This pattern moves sediment grain-by-grain to build long stretches of beach, a pattern that is repeated within zones along the entire Atlantic coastline. The general pattern of transport in the Eastern Shore area is southward along the Atlantic Coastline into the Chesapeake, and southward within the bay to the lower Chesapeake where it is deposited either in the bay or tributaries of lower bay rivers, as shown in Figure 2 (USACE, 2015).

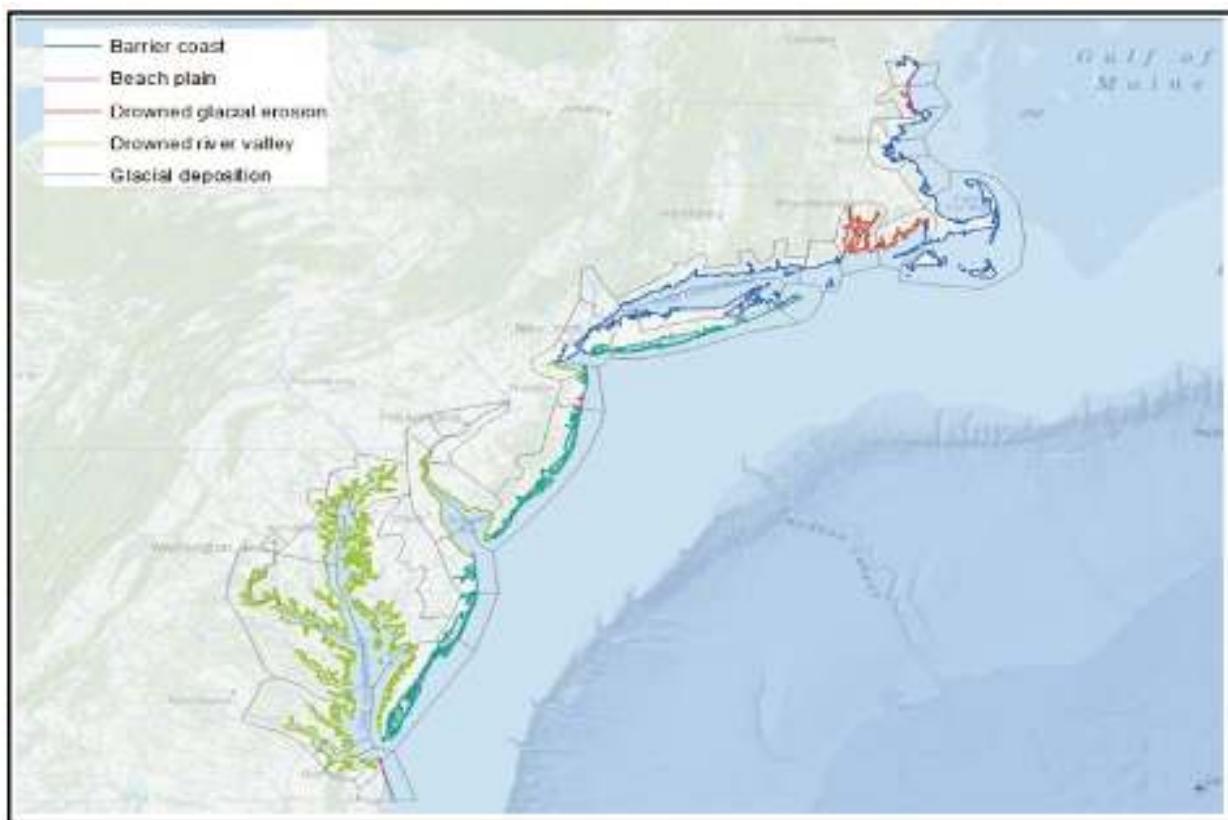


**Figure 2: Net sediment transport pathways for Chesapeake Bay and Atlantic area off the Virginia Cost. Source: "North Atlantic Coast Comprehensive Study Report (USACE, 2015).**

### EROSION AND UNDERLYING GEOLOGY

The rate of erosion of a given area is largely dependent on its underlying geology. Figure 3 depicts the mid- and northern Atlantic's coastal geology, with the Chesapeake Bay side of the Eastern Shore characterized as "drowned river valley" and the ocean side as "barrier coast."

Drowned river valley coastlines are commonly characterized by low banks, marshes, and beaches fronting the mainland. Bayside dunes are extant in both counties, with 4.9 miles of dune shoreline in Accomack County and 10.2 miles of dune shoreline in Northampton County, including those reaching 20-50 feet at Savage Neck Dunes Natural Area Preserve. In addition to the dunes, natural resiliency features include submerged aquatic vegetation beds, oyster reefs, tidal marsh beds, and tidal creeks. Primary drivers of erosion are wave action, wave height, and wind strength and direction, which can direct water into normally dry shore areas.



**Figure 3: Atlantic Coastal Geology. Source: "North Atlantic Coast Comprehensive Study Report" (USACE, 2015).**

Atlantic barrier coastlines consist of long and narrow barrier islands, with beach on the seaward side and one or more bays on the land-facing side that support complex tidal marsh systems. Natural resiliency features include beaches, wash over fans, extensive tidal marshes with tidal flats and tidal creeks, mollusk reefs, and submerged aquatic vegetation beds.

The Eastern Shore's seaside includes the longest expanse of coastal wilderness remaining on the Atlantic seaboard and is comprised of thousands of acres of pristine tidal marshes, vast tidal mudflats, shallow lagoons, and navigable

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

tidal channels that support thriving seafood and recreational tourism industries. This unique environment carries the designation of World Biosphere Reserve from United Nations Educational, Scientific and Cultural Organization.

Biodiversity of the barrier island ecosystem may be globally recognized, but it is only one benefit the island chain affords. Barrier islands take the brunt of ocean energy, protecting the habitats and structures behind them. This makes barrier islands important in times of hurricanes, tropical storms, and destructive nor'easters. The low wave energy environments allow for thousands of acres of tidal marshes to thrive in the coastal bays behind the islands, increasing their flood mitigation benefits.

Sediment in this environment is moved by both longshore drift, which requires an adequate supply of sediment and "rollover," where high tides erode sand from the ocean side of the island and carry it toward the center or back side of the island as seen in Figures 4 and 5. Another factor of barrier island erosion is the interruption of the supply of sand by up-stream interventions such as jetties or groins. Storms are unable to remobilize this trapped sediment, and downstream islands erode as a result (USACE, 2015).

Sections of the barrier islands are changing rapidly, with segments of islands disappearing and moving into the back barrier channels and marshes. This is especially true for areas adjacent to active inlets and as shown in Figure 4. The home that is the subject of the photos no longer exists.

Tidal marshes are also subject to erosion. Some of the worst erosion occurs when winds pick up during mid-tide or from wake generated by motorized vessels. During low tide, the water is not high enough for waves to lap against the land edge, and during high tide, it is buried. However, at mid-tide the water is pushed against the marsh edge and wears away at the edge.

### SEA-LEVEL RISE AND EROSION

Sea-level rise threatens both seaside and bayside marshes, which afford the mainland with protection from both floods and erosion. As sea-level rises, barrier islands will respond by migrating landward, disintegrating if sediment supply is insufficient, or drowning in place (Moore, List, et al., 2011).

Changes to vegetation can also occur, as seen on Assateague Island, where "ghost forests" - stands of dead and dying loblolly pines - are succumbing to saltwater intrusion caused by a combination of sea-level rise and barrier island processes and have been impacted by the Southern Pine Beetle. Vegetation serves as a stabilizing force for shorelines and loss of vegetation increases a shoreline's vulnerability to erosion.

Changes in inundation levels can cause shifts in habitat types. For example, irregularly flooded marshes may become regularly flooded marshes, eventually turning from mud flats to open water. This change in habitat type is not only detrimental to the wildlife that resides there, but also increases coastal exposure to wind and wave action, most often leading to increases in erosion rates.

## Coastal Erosion



**Figure 4: Changes to the southern end of Cedar Island, 2006-2014. Source: Gordon Campbell, At Altitude Photograph. Copyright protected, used with permission.**

Because the Eastern Shore barrier islands are largely in their natural states and without erosion control mechanisms, the process of rollover is readily observed. In Figure 5, images of a section of Assateague Island, taken before and after Hurricane Sandy, illustrate how waves washing over the island carried sand toward the mainland. This phenomenon provides critical width for islands and establishes a back-barrier platform which the island can continue to roll onto, thereby increasing the long-term viability of the island.



**Figure 5: Aerial photographs of a section of Assateague Island before and after Hurricane Sandy. Photo Credit: USGS**

## HUMAN SYSTEMS

When natural processes threaten lives and investments, it is commonplace to look for ways to redirect nature's course or lessen its impacts. To slow coastal erosion and stabilize shorelines, structural interventions such as groins, jetties, and seawalls, are often employed. Other options include soft interventions, such as living shorelines or beach nourishment. These erosion control responses must be considered and selected based on conditions of the particular location and surrounding environs. Measures that are employed on the Eastern Shore are described in the following

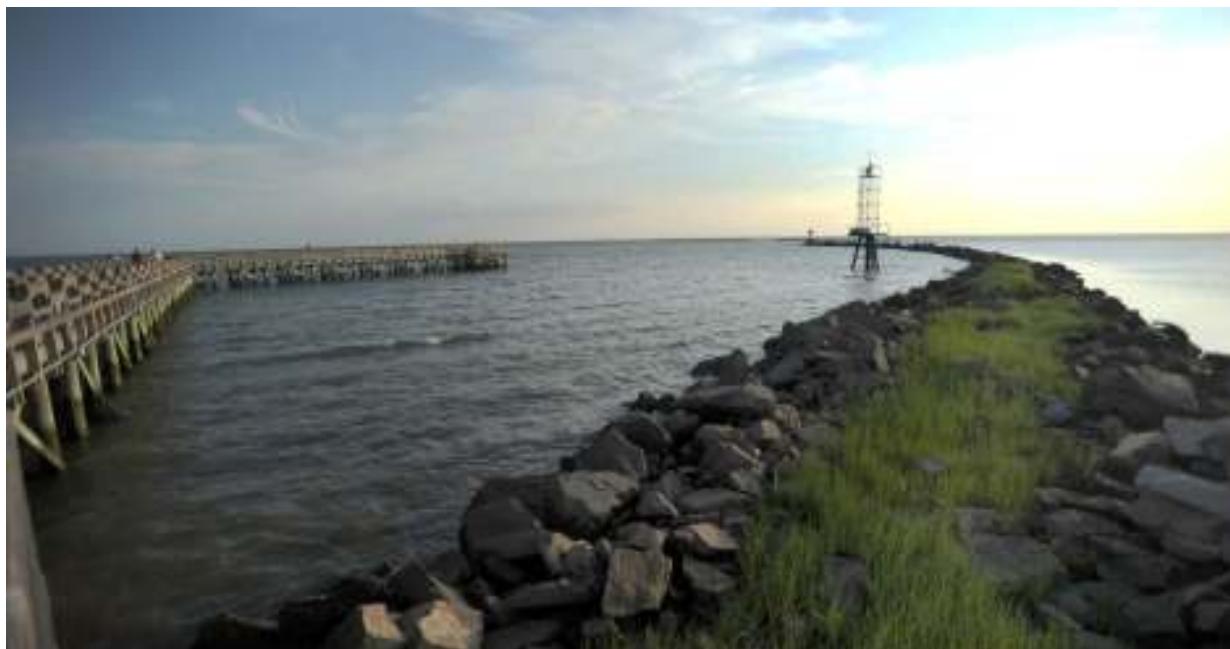
sections. A complete listing, along with benefits, impacts, and costs, can be found in Appendix C of the 2015 USACE North Atlantic Coast Comprehensive Study.

## HUMAN INTERVENTIONS

### GROINS AND JETTIES

Groins and jetties are engineered structures placed perpendicular to the shoreline to interrupt longshore drift. Both kinds of structures extend out into the water, but jetties are generally used to protect inlets and harbor entrances (Figure 6), while groins can be used to protect any stretch of shoreline.

Groins and jetties interrupt the natural drift of sand, causing sediment to build, or accrete, on the up-drift side of the structures. These structures accelerate erosion on the immediate down-drift side because the area is robbed of the natural sediment it would have received from longshore drift (Barnard, T., VIMS Self-Taught Education Unit, Coastal Shoreline Defense Structures). The VIMS Self-Taught unit on Coastal Shoreline Defense Structures contains additional information on groins and jetties.



**Figure 6: Jetty at Cape Charles Harbor. Photo Credit: Jay Diem, Eastern Shore News. Used with permission.**

### PARALLEL STRUCTURES – SEAWALLS, BULKHEADS, AND REVETMENTS

Seawalls are built parallel to shorelines to inhibit erosion by intercepting waves. They are designed with sufficient height and heft to prevent being overrun by storm surge or undermined by powerful waves.

Seawalls are not perfect solutions. New sea wall prices can run into the tens of millions of dollars and they can also be undermined by scour, causing wall failure (Reuters, "Water's Edge: The Crisis of Rising Sea Levels," September 4, 2014). Seawalls can also obstruct scenic views and negatively impact wildlife (USACE, 2015).

Bulkheads, also built parallel to shorelines, are meant to keep land from eroding into the sea. They can be anchored or cantilevered sheet piles, or gravity structures; but they, too, can be undermined by scour.

## Coastal Erosion

Both seawalls and bulkheads can have detrimental effects on neighboring shorelines and nearshore environments. When these structures work as designed, they protect the property where they are installed, but the deflected wave energy has to go somewhere. Neighboring properties and the near-shore environment in front of parallel shoreline protection structure usually receive the brunt of that energy, which creates not only scour conditions for the structure, but scours the ocean bottom of marine life (Barnard, T., VIMS Self-Taught Education Unit, Coastal Shoreline Defense Structures).

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### REVETMENTS

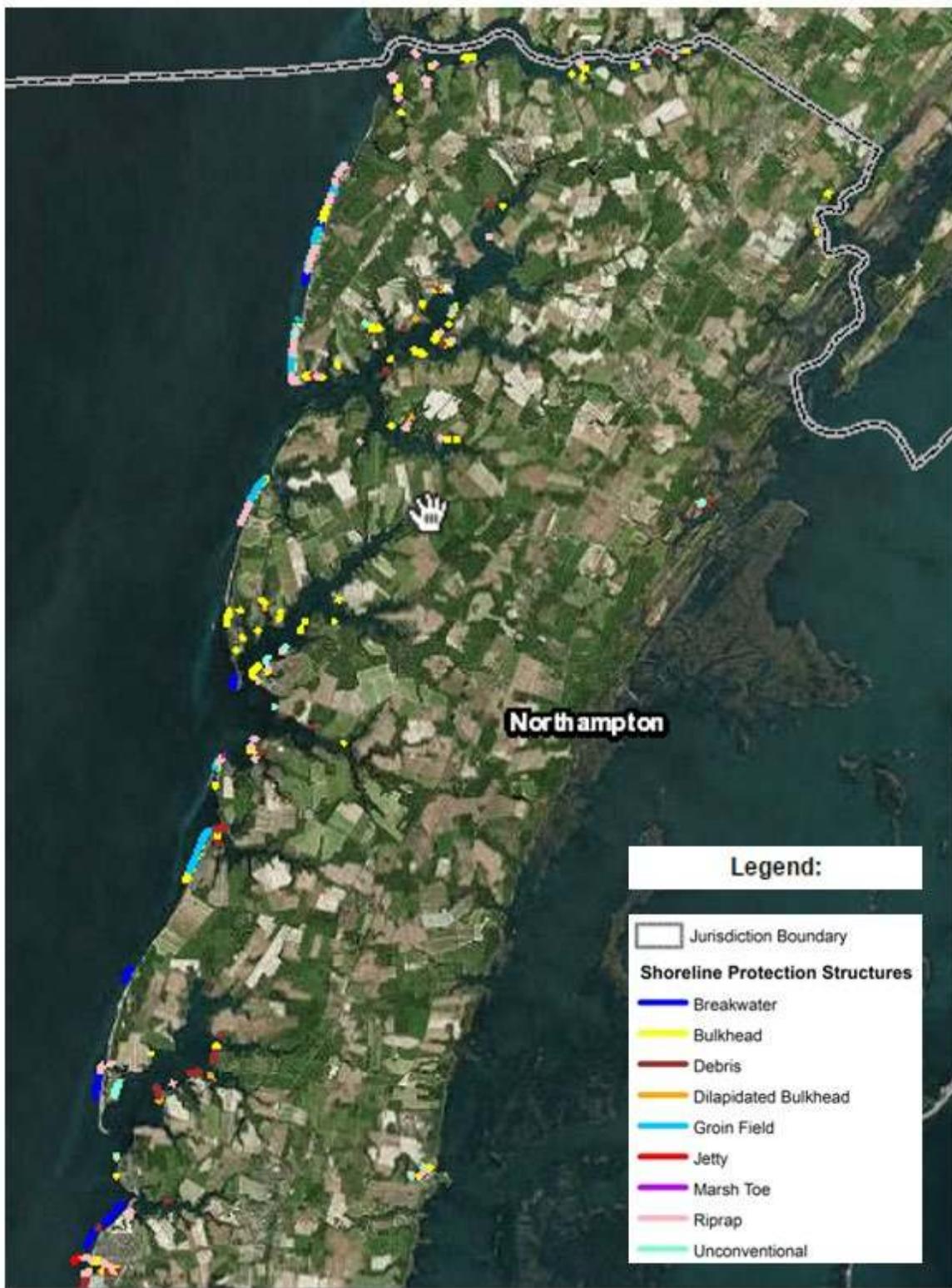
Revetments are hardening or reinforcement of a surface exposed to waves or strong currents to prevent erosion. Typical construction consists of a filter layer overlain with stone or concrete (Figure 7). Revetments can be used alone or in combination with other structures. For example, a seawall can be capped with a revetment.

Revetments tend to reflect less wave energy because they are more sloped but are still subject to the same erosion impacts as other parallel structures. Accessibility to the shoreline can be a drawback of using revetments (USACE, 2015).



**Figure 7: Revetment at the beach of Wallops Flight Facility. Photo Credit: NASA**

Figure 8 below shows the locations of all type of shoreline erosion control structures for the northern two-thirds of Northampton County, including bulkheads. As increasing numbers of property owners install these structures, and with lifespans of 20-25 years, long-term financial commitments will be needed to maintain them (Barnard, Thomas, VIMS Self-Taught Education Unit, Coastal Shoreline Defense Structures).



**Figure 8: Northampton County Shoreline Protection Structures. Source: VIMS Center for Coastal Resource Management**

### BEACH NOURISHMENT

The placement of sand on an eroded beach is known as beach nourishment. It can be used alone as a beach restoration tool or in combination with other tactics, such as breakwaters. Beach nourishment does not change the rate at which erosion is occurring, and in fact, can accelerate erosion under certain conditions (USACE, 2015).

Beach nourishment is not a long-term fix. It requires periodic renourishment, typically every four to five years on average, and following major storms. NASA found it had good news and bad news to report about its completed beach protection project at the Wallops Flight Facility in the aftermath of Hurricane Sandy in 2012. The \$43 million investment in a revetment and beach nourishment – completed three months before the storm – had worked to protect \$1.2 billion in state and federal space program-related assets and launch infrastructure. The bad news was that another \$11 million would be needed to replace 650,000 cubic yards of sand taken from the beach by the storm (Figure 10).

In February 2020, the U.S. Army Corps of Engineers awarded a \$23.7 million contract to a Florida-based company to conduct beach renourishment at Wallops Island, including “construction of breakwaters and placing 1.3 million cubic yards of sand along a four-mile stretch of the facility’s waterfront.” (US Army Corps of Engineers, Norfolk District Website, 2020).



**Figure 9: Beach Erosion at Wallops Flight Facility. Left: The completed beach nourishment project at WFF in August 2012. Right: The same stretch of beach is extensively eroded less than three months later, following Hurricane Sandy. Photo Credit: NASA**

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### INTERVENTIONS ON BARRIER ISLANDS

In their natural states, conventional wisdom holds that barrier islands are best left to manage themselves. Such conventional wisdom may offer little consolation to communities like Wachapreague and Chincoteague, which are closely watching the year-by-year changes to Cedar Island and Assateague Island – barrier islands that have long afforded storm protection to their communities.

The USACE North Atlantic Coast Comprehensive Study acknowledges that some barrier islands may require management and intervention if the islands are to continue to provide such protections, and in fact, the USACE did intervene at the Assateague Island National Seashore.



**Figure 10: Locations of Manually-Constructed Oyster Reefs in Waters off Virginia's Eastern Shore. Source: VCZMP**



**Figure 11: Oyster Reef under Construction**  
**Photo Credit: © Bowdoin Lusk/ The Nature Conservancy. Used with permission.**

## BREAKWATERS

Offshore structures placed parallel to the shoreline to soften the impact of waves are called breakwaters. Because wave energy is slowed by the structures, sand and sediment may settle in the area behind the breakwater, which can form an inviting environment for the growth of marsh grasses, an added protection against future erosion. Breakwaters can also disrupt supply of sand to down-drift beaches (USACE, 2015).

Oyster reefs can serve as natural breakwaters and once established, continue to grow vertically over time with sea-level rise, improving their ability to resist storms and mitigate erosion. Figure 11 shows the locations of oyster reefs that have been installed for long-term water quality and coastal resilience benefits, and Figure 12 is a photograph of an oyster reef under construction. Since oyster reefs are limited in elevation by the depth of the water column at a normal high tide, they provide excellent protection from relatively smaller waves and storm surge events; however, they can only provide minimal protection from wave action riding atop that is above average high tides or storm surge.

## LIVING SHORELINES

One approach that is being employed in low wave-energy areas on the Eastern Shore is the construction of living shorelines. These shorelines re-establish the natural vegetative, nutrient, and slope characteristics of healthy shorelines so that they naturally dissipate wave energy.

Large-scale living shorelines have been established in Oyster and at Camp Occohannock. In both locations, large granite rocks were brought in and piled parallel to the shore. Sand was added between the rock barriers and the shoreline to create salt marshes sloping upward to meet the previous shore edges. Marsh grasses were planted to stabilize the newly created areas between the open waters and the uplands.

### EROSION PREVENTION LAWS AND PROGRAMS

#### COASTAL ZONE MANAGEMENT ACT

The federal Coastal Zone Management Act (CZMA) of 1972 put into statute the recognition of the “national interest in the effective management, beneficial use, protection, and development of the coastal zone.”

The CZMA established three national programs, the National Coastal Zone Management Program, the National Estuarine Research Reserve System, and the Coastal and Estuarine Land Conservation Program (CELCP). The National Coastal Zone Management Program aims to balance competing land and water issues through state and territorial coastal management programs, the Reserves serve as field laboratories that provide a greater understanding of estuaries and how humans impact them, and the CELCP provides matching funds to state and local governments to purchase threatened coastal and estuarine lands or obtain conservation easements.

The CZMA connects with coastal erosion prevention through its many programs, including Coastal Zone Enhancement Grants, technical assistance grants, and research.

#### VIRGINIA COASTAL ZONE MANAGEMENT PROGRAM

The Coastal Zone Management Program, established through Executive Order, administers enforceable laws, regulations, and policies that protect coastal resources and foster sustainable development. Relevant laws, regulations, and policies on the Coastal Zone Management Program are described below.

##### WETLANDS MANAGEMENT

The tidal wetlands program is administered by the Marine Resources Commission under Code of Virginia § 28.2-1301 thru § 28.2-1320. It is intended to preserve and protect tidal wetlands and accommodate economic development in a manner consistent with wetlands preservation. Oversight is provided by the Virginia Marine Resources Commission and local wetlands boards.

The Virginia Water Protection Permit Program is administered by the Department of Environmental Quality (DEQ) and includes protection of tidal and non-tidal wetlands. This program is authorized by the Code of Virginia § 62.1-44.15:20 and the Water Quality Certification requirements of Section 401 of the Clean Water Act of 1972.

##### DUNES AND BEACHES MANAGEMENT

Dune protection is carried out pursuant to the Coastal Primary Sand Dune Protection Act and is intended to prevent destruction or alteration of primary dunes. This program is administered by the Marine Resources Commission (Code of Virginia § 28.2-1301 thru 28.2-1320).

##### COASTAL LANDS MANAGEMENT

Coastal Lands Management is a state-local cooperative program administered by DEQ's Water Division and 84 localities that regulates activities in Chesapeake Bay Resource Management Areas and Resource Protection Areas in Tidewater, Virginia established pursuant to the Chesapeake Bay Preservation Act (Virginia Code §§ 62.1-44.15:67 through 62.1-44.15:79) and Chesapeake Bay Preservation Area Designation and Management Regulations (Virginia Administrative Code 9 VAC 25-830-10 et seq.).

#### **EROSION AND SEDIMENT CONTROL**

Three state laws apply to land disturbance activities in Virginia: The Stormwater Management Act, Erosion and Sediment Control Law, and the Chesapeake Bay Preservation Act. For more information on these three laws, see “Storm Water Flooding Prevention Laws and Programs” in Chapter 7 – Storm Water.

# CHAPTER 6: COASTAL FLOODING

## INTRODUCTION

Hurricanes and Tropical Storms are often the most well documented causes of coastal flooding along the Eastern Shore of Virginia. Hurricane Sandy, in October 2012, grazed the Eastern Shore of Virginia causing significant damage and flooding although the storm had not yet reached its full strength and remained nearly 100 miles offshore. Sandy went on to be one of the largest Atlantic storms on record, and Eastern Shore residents were fortunate that Sandy did not follow a course up the Chesapeake Bay or stall off the coast as originally forecasted, which would have led to widespread damage and flooding across the Eastern Shore. If Sandy had tracked closer to the Eastern Shore, the results for the Chesapeake Bay, the local economy, and area residents could have been tragically different ("Ecological impacts of Hurricane Sandy on Chesapeake & Delmarva Coastal Bays," 2012). If the nine-foot storm surge caused by Sandy in the Northeast had occurred on the Eastern Shore, it would have been destructive to both the land and the Chesapeake Bay, since the flow of sediment from the land into the Chesapeake Bay would have impacted aquaculture and other water-based economic sectors (*ibid*).

Flooding poses a major risk to communities across the country and collectively accounts for more than 70 percent of federally declared disasters (FEMA, 2021). In the Eastern Shore of Virginia, coastal flooding is the most hazardous form of flooding. However, hurricanes and tropical storms are not the only source of coastal flooding. Different types of storms and storms paths, in addition to tide cycles and low-lying elevations, can all affect the extent of coastal flooding. Also, global and relative sea level rise combined with traditional causes of coastal flooding further complicates the risk of coastal flooding.

Chapter 1 provided a review of major storms in the Eastern Shore's history including all tropical cyclones and nor'easters, many of which have caused significant coastal flooding. However, other storms and events can cause coastal flooding, and the causes are not always as easily identifiable. Strong onshore winds, offshore low-pressure systems, changes to ocean currents, and high astronomical tides, or any combination of these, can also cause coastal floods that disrupt schools, local businesses, and transportation routes. For example, in October 2015 when Hurricane Joaquin's center was still near the Bahamas, a "cut-off low aloft" developed over the southern U.S. fed by a steady stream of moisture from Joaquin. Gales blowing in from New England, and the already occurring perigean spring tide (a period of extra-high tide) helped to contribute to local flooding (seen in Figure 1) as swell from Joaquin moved northward to the Eastern Shore. (Hurricane Joaquin, 28 September – 7 October, 2015) Recorded storm surge on Oct. 2 at Wachapreague was 3.9 feet; Kiptopeke recorded a storm surge of 3.2 feet.

This chapter examines in detail the natural forces and conditions that cause flooding, and the human systems used to gauge their impacts and protect against harm to lives and property. The quantitative assessment of risks posed by flooding will be found in the local chapters, beginning with Chapter 10.

Table 1 provides a recent history of coastal flooding events that were not included in the Chapter 1 list. The events were taken from the NOAA National Climatic Data Center storm events database. This data reinforces that while hurricanes and other tropical cyclones (tropical storms and depressions) are the predominant storm types causing coastal flooding, other conditions, such as coastal low-pressure systems, tide cycles, and rapidly moving cold fronts also can cause coastal flooding.



**Figure 1: Flooding on Atlantic Ave. (above) and Drummondtown Rd. (right), Oct. 2, 2015. Photo Credit: A-NPDC staff**



## Coastal Flooding

**Table 1: Coastal Flooding Events Recorded in NOAA Storm Events Database, 2000-2021)**

County	Date	Event Category	Property Damage (\$, not adjusted for inflation)	Crop Damage	Source	Narrative
Accomack Co.	12/21/12	Coastal Flood	150000	0	911 Call Center	A rapidly deepening low-pressure system drove a strong southeast wind with frequent gale force gusts over the Chesapeake Bay, which allowed water to flow up the Bay. Due to the very strong winds, moderate to severe coastal flooding was observed across portions of Accomack County.
Accomack Co.	3/6/13	Coastal Flood	10000	0	Park/Forest Service	A low-pressure system produced coastal flooding. Rising water levels resulted in moderate coastal flooding along the coastal side of Accomack County. The Chincoteague Causeway (Highway 175) was impassable due to two feet of water over the roadway.
Accomack Co./Northhampton Co.	10/2/15	Coastal Flood	0	0	River/Stream Gage	A combination of Hurricane Joaquin near the Bahamas and strong high pressure over New England produced strong onshore winds over the Mid-Atlantic. The strength and duration of the onshore winds produced a tidal departure of 3 to 4 feet resulting in moderate flooding.
Accomack Co./Northhampton Co.	1/23/16	Coastal Flood	0	0	C-MAN Station	A combination of low pressure moving from the southeast United States northeast and just off the Atlantic Coast, and high pressure over southeast Canada produced very strong onshore winds across the Mid-Atlantic. The strength and duration of the onshore winds produced moderate to major coastal flooding along the Atlantic Coast and Chesapeake Bay.
Accomack Co./Northhampton Co.	2/9/16	Coastal Flood	0	0	C-MAN Station & River/Stream Gauge	Strong winds behind a cold front caused minor to moderate coastal flooding along central and southern portions of the Chesapeake Bay region. Minor to low end moderate flooding occurred in bay side sections of the Eastern Shore.

Eastern Shore of Virginia Hazard Mitigation Plan 2021

County	Date	Event Category	Property Damage (\$, not adjusted for inflation)	Crop Damage	Source	Narrative
Northampton Co.	10/8/16	Coastal Flood	10000	0	Emergency Manager	Post Tropical Cyclone Matthew, tracking northeast just off the North Carolina and Virginia coasts, produced very strong northeast or north winds over and the Virginia Eastern Shore. These winds helped to cause moderate coastal flooding over portions of the area. Coastal storm tides of 2 to 3.5 feet above astronomical tide levels were common, with only minor beach erosion reported.
Northampton Co.	9/6/19	Coastal Flood	0	0	C-MAN Station & River/Stream Gauge	Hurricane Dorian tracking northeast along the North Carolina coast and just off the Virginia coast produced very strong northeast to north winds which caused moderate to major coastal flooding across portions of the southern Chesapeake Bay. It produced tidal anomalies between 2.5 and 3.0 feet causing major coastal flooding over portions of southern Northampton County.
Northampton Co.	10/10/19	Coastal Flood	0	0	Emergency Manager	The combination of low pressure sitting off the New Jersey coast and strong high pressure over southeast Canada resulted in persistent north or northeast winds over the Chesapeake Bay. These persistent north or northeast winds, along with high waves, allowed water levels to rise throughout the bay, producing tidal anomalies between 2.0 and 3.0 feet.
Northampton Co.	11/17/19	Coastal Flood	0	0	C-MAN Station	The combination of high pressure over northern New England and low pressure just off the Middle Atlantic Coast resulted in very strong northeast to north winds over the southern Chesapeake Bay, which caused minor to moderate coastal flooding.
Accomack Co.	8/4/20	Coastal Flood	0	0	River/Stream Gage	The center of Tropical Storm Isaias tracked north just inland off the Middle Atlantic Coast. Winds associated with the tropical storm caused moderate (tidal) coastal flooding across portions of the Virginia Eastern Shore adjacent to the Chesapeake Bay.

## NATURAL FORCES AND CONDITIONS

### TROPICAL CYCLONES: HURRICANES, TROPICAL STORMS, AND TROPICAL DEPRESSIONS

Hurricanes and tropical storms occupy a memorable place in the memories of those whose lives and ancestry are tied to the Eastern Shore of Virginia. Accounts of the tempests date back to the mid-1600s, recording sinking ships, scattered cargo, demolished settlements, and re-carved landscapes. Shipwrecks themselves testify to some of these “dreadful” and “tremendous” storms, as they were colorfully named.

Hurricanes are simply one type of tropical cyclones, which are organized, rotating systems of clouds and thunderstorms originating in tropical or subtropical waters. They typically form during the months of June through November and feed off of the warm tropical waters present in the ocean during this period.

Categories of tropical cyclones are distinguished by wind speed.

- **Tropical depressions** have a maximum wind speed of 38 mph.
- **Tropical storms** have a wind speed between 39 – 74 mph.
- **Hurricanes** have a wind speed 75 mph or higher.

Hurricanes are further rated by the Saffir-Simpson Wind Scale from 1 to 5 based on the hurricane’s sustained wind speed (Table 2). This tool helps to estimate potential property damage and threat to human life from winds.

**Table 2: Saffir-Simpson Hurricane Wind Scale**

Category	Sustained Winds	Types of Damage Due to Winds
1	74-95 mph 64-82 kt 119-153 km/hr	<b>Very dangerous winds will produce some damage:</b> Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap, and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96-110 mph 83-95 kt 154-177 km/hr	<b>Extremely dangerous winds will cause extensive damage:</b> Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3 (major)	111-129 mph 96-112 kt 178-208 km/hr	<b>Devastating damage will occur:</b> Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.

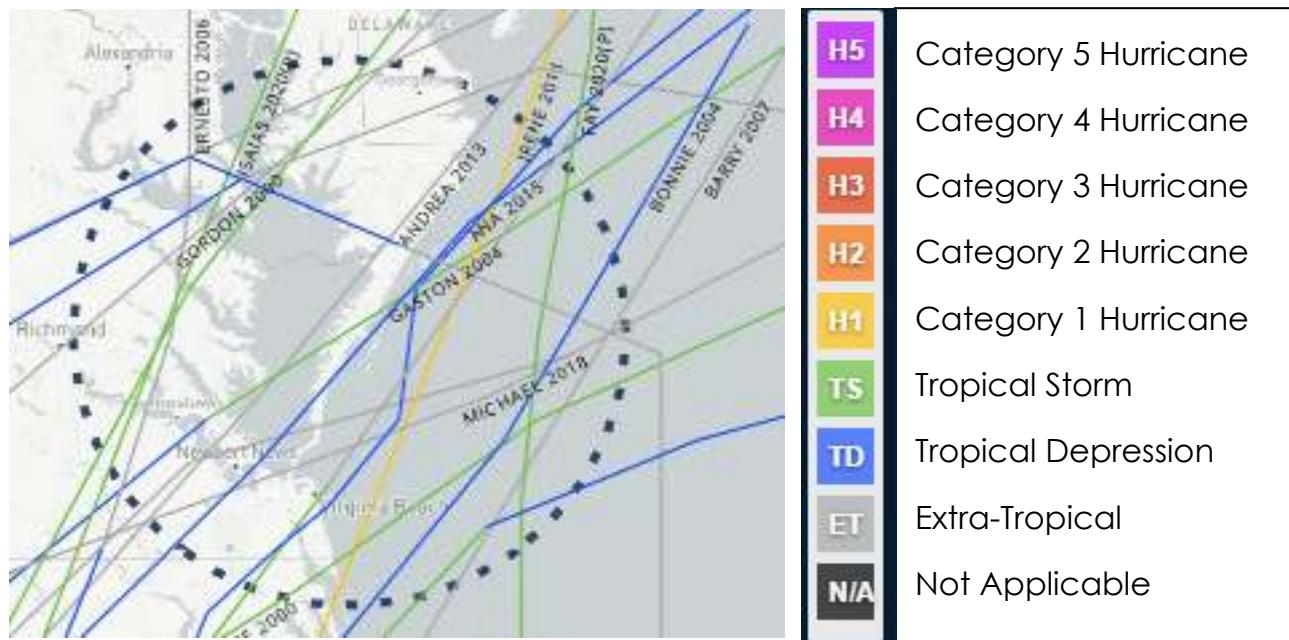
## Eastern Shore of Virginia Hazard Mitigation Plan 2021

Category	Sustained Winds	Types of Damage Due to Winds
<b>4 (major)</b>	130-156 mph 113-136 kt 209-251 km/hr	<b>Catastrophic damage will occur:</b> Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted, and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
<b>5 (major)</b>	157 mph or higher 137 kt or higher 252 km/hr or higher	<b>Catastrophic damage will occur:</b> A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

*Source: National Hurricane Center*

The scale, however, is not an indicator of the extent of flood damage that can be expected, but winds do affect flooding in two ways. First, they drive wave action and push waters onshore. Secondly, with larger tropical storms, the storm's low pressure elevates the water and then pushes it ahead creating an elevated storm surge at the leading edge of the storm.

Figure 2 is a compilation of the tropical cyclones that have tracked within 75 miles of Painter, Virginia (generally the center point of the Eastern Shore) from 2000-2021 as catalogued by NOAA and identified by category.



**Figure 2: Paths of tropical and extra-tropical systems with 75 statute miles of Painter, Virginia, 2000-2021. Source: NOAA Digital Coast, Historical Hurricane Tracks**

## Coastal Flooding

The proximity of storm centers to the Eastern Shore does not always demonstrate the storm threats from tropical cyclones with massive scales located farther offshore. One notable absence from Figure 2 is Hurricane Sandy; its storm-force winds extended over 1,000 miles in diameter, yet it did not register in Figure 2, as it only depicts tropical cyclones that passed within 75 miles of Painter. At its nearest point, the eye of Sandy was more than 100 miles away—and that was near Chincoteague after Sandy had begun to turn west and was no longer a hurricane.

Yet Sandy managed to cause more than \$6 million in damage across the Eastern Shore, including significant damage in Cape Charles, Saxis, Sanford, Tangier, and other bayside locations, in addition to losses on Chincoteague. Although sustained winds did not reach a tropical storm strength on the Eastern Shore, the flow of the existing wind and impact on tides, similar to a severe nor'easter, is responsible for the damage from Sandy.

*Likelihood of Recurrence:* The timeframe of Figure 2 does not provide an accurate sense of the frequency of tropical cyclones over the short term. In its study of recurrent flooding in Tidewater Virginia, the Virginia Institute for Marine Science (VIMS), citing a NOAA report, asserts that a tropical storm, or its remnants can be expected to affect Virginia every year, with hurricanes every 2.3 years.

## NOR'EASTERS

Nor'easters are cyclonic storms that form along the Atlantic Coast of North America when the polar jet stream reaches the Atlantic and meets warmer air pushed up from the Gulf of Mexico and southern Atlantic. They typically develop within 100 miles of the coastline between Georgia and New Jersey and are strongest and most frequent between September and April (NOAA).

Some of the most damaging floods the Eastern Shore has experienced have been from nor'easters, which tend to move more slowly than hurricanes, lasting through multiple tide cycles. Additionally, these storms can further exacerbate flooding since they can sometimes occur in pairs, with one flood not fully receding before the next nor'easter flooding begins.

Some Eastern Shore residents remember nor'easters as much as or more so than hurricanes. Such storms like the devastating Ash Wednesday storm of 1962 and the nor'easters of November and December 2009. With the exception of "The Perfect Storm," nor'easters do not tend to receive the same public attention as hurricanes, but they can pack the same winds, catastrophic flooding, and severe coastal erosion. Other notorious nor'easters, including the so-called "Nor-Ida" nor'easter of November 2009, which formed from the remnants of Hurricane Ida, and during which tides exceeded levels experienced during Hurricane Isabel.

*Likelihood of Recurrence:* Nor'easters occur with sufficient frequency to provide a high level of confidence they will continue to be a significant coastal flooding threat.

## ASTRONOMICAL TIDES

*Note: Information in this section sourced from NOAA Ocean Service*

Independently, astronomical tides rarely cause more than nuisance flooding, but high astronomical tides combined with storms can worsen coastal flooding. Astronomical tides result from the gravitational pull of the sun and the moon on the earth's oceans, causing the oceans to bulge. Because the moon is closer to the earth than the sun, its effect on tides is greater. As the moon makes its monthly orbit around the earth, and the earth makes its yearly orbit

around the sun, the oceans are pulled back and forth as the bodies' positions relative to one another change, causing tides go in and out.

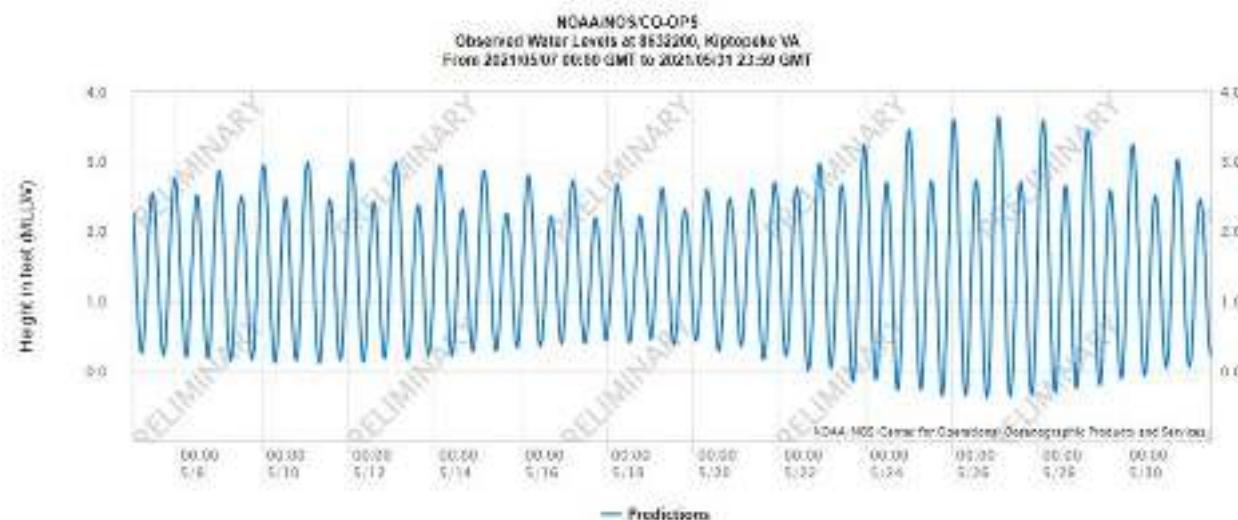
**Table 3: Tidal Ranges at Eastern Shore Tidal Stations**

	Mean Tidal Range (feet)	Great Diurnal Change (feet)*
<b><u>Seaside</u></b>		
Wachapreague	3.99	4.47
<b><u>Bayside</u></b>		
Chesapeake Bay Bridge Tunnel	2.66	3.02
Kiptopeke	2.6	2.94

\*Difference between highest and lowest tides of the day  
\*\*Tidal gauges deployed by USGS in 2015

Source: NOAA Tides and Currents

In the normal course of a day, the NOAA official tide stations record tidal differences between high and low tide of about three feet on the bayside and four and a half feet on the seaside (Table 3). During new and full moons, the earth, moon, and sun are nearly in full alignment, and the gravitational pull of the moon and sun are working together to cause the oceans to bulge more than usual. New and full moons cause high tides to be slightly higher and low tides to be slightly lower than average. These are known as spring tides.



**Figure 3: Perigean Spring Tide at Kiptopeke Tide Gauge. Source: NOAA Tides and Currents**

Every 28 days, the moon reaches its closest point to the earth, known as a perigee, which also causes a larger tide. When perigee coincides with a spring tide, three or four times each year, it is referred to as a perigean spring tide and the effect is to expand the tidal range, as illustrated in Figure 3. Notice how the length of line representing the

## Coastal Flooding

difference between low tide and high tide at the Kiptopeke tidal gauge is elongated approaching the perigean spring tide on February 18.

The converse of the perigee is the apogee – the point in the earth’s elliptical orbit where the earth is farthest from the sun and the sun’s gravitational pull on the earth is the weakest. Table 4 demonstrates some of these effects with the moon and tide phases on the landfall approach for some of the Eastern Shore’s historic storms.

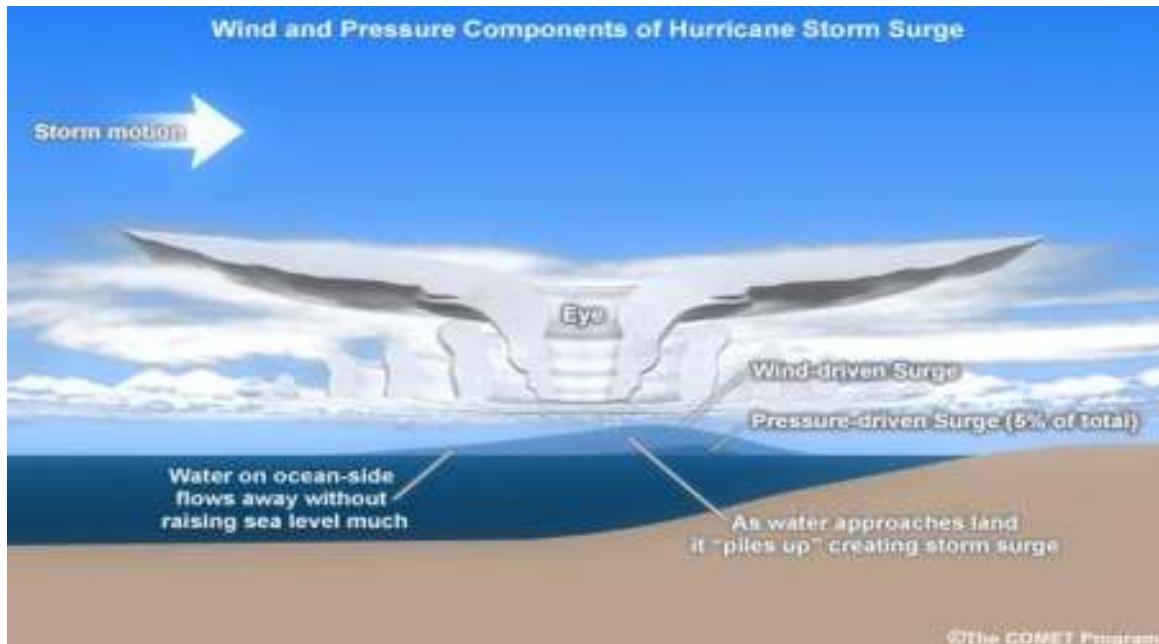
**Table 4: Moon/Tide Phases Coinciding with Historic Eastern Shore Storms**

Storm	Phase of the Moon	Perigee/Apogee
<b>September 3, 1821 (The Great September Gust)</b>	First Quarter (Neap Tide)	Apogee
<b>August 23rd, 1933 (The Chesapeake-Potomac Hurricane)</b>	Waxing Crescent – 3 Days from the New Moon (Spring Tide)	In between
<b>October 15, 1954 (Hurricane Hazel)</b>	Waning Gibbous – 3 Days from the Full Moon (Spring Tide)	2 Days after the Perigee
<b>March 6th-8th, 1962 (The Ash Wednesday Storm)</b>	New Moon (Spring Tide)	Perigee
<b>September 15th-16th, 1999 (Hurricane Floyd)</b>	Waxing Crescent – 6 Days from the New Moon and 2 Days to the First Quarter (Neap Tide)	Apogee
<b>September 18th, 2003 (Hurricane Isabel)</b>	Waning Gibbous – 8 Days from the Full Moon and 1 Day to the Third Quarter (Neap Tide)	Apogee
<b>NOTE: The Ash Wednesday storm occurred during a perigean spring tide. Both the new moon and the perigee occurred on March 6th, 1962, the first day of the storm</b>		

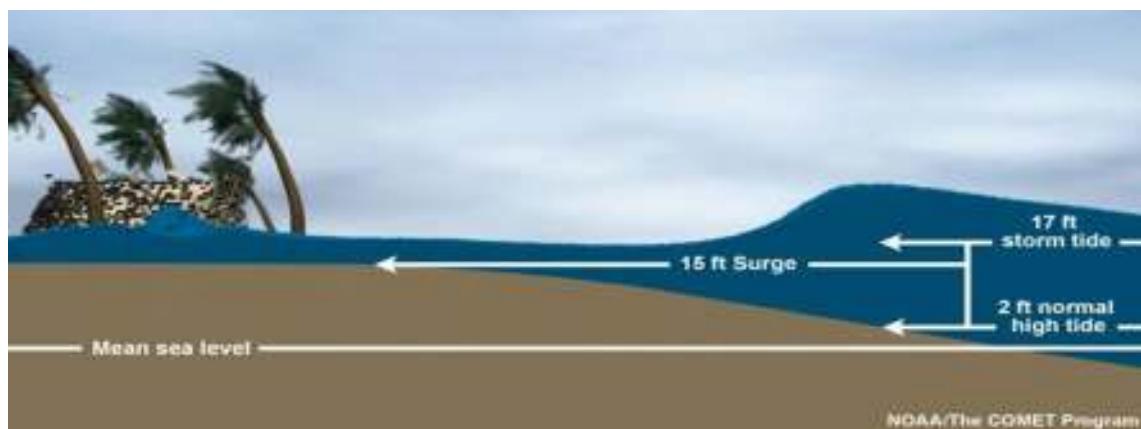
## STORM SURGE

*Note: information in this section is sourced from the National Hurricane Center.*

The high tide generated by a storm that is above the predicted astronomical tide is known as storm surge. The surge is produced by the force of the cyclone winds pushing the water ahead, along with the lesser force of the low pressure. Figure 4 illustrates this effect.



**Figure 4: Wind and Pressure Components of Hurricane Storm Surge.** Source: The Comet Program. ©1997-2021 University Corporation for Atmospheric Research. All Rights Reserved.



**Figure 5: Storm Surge vs. Storm Tide.** Source: NOAA/The COMET Program. ©1997-2015 University Corporation for Atmospheric Research. All Rights Reserved.

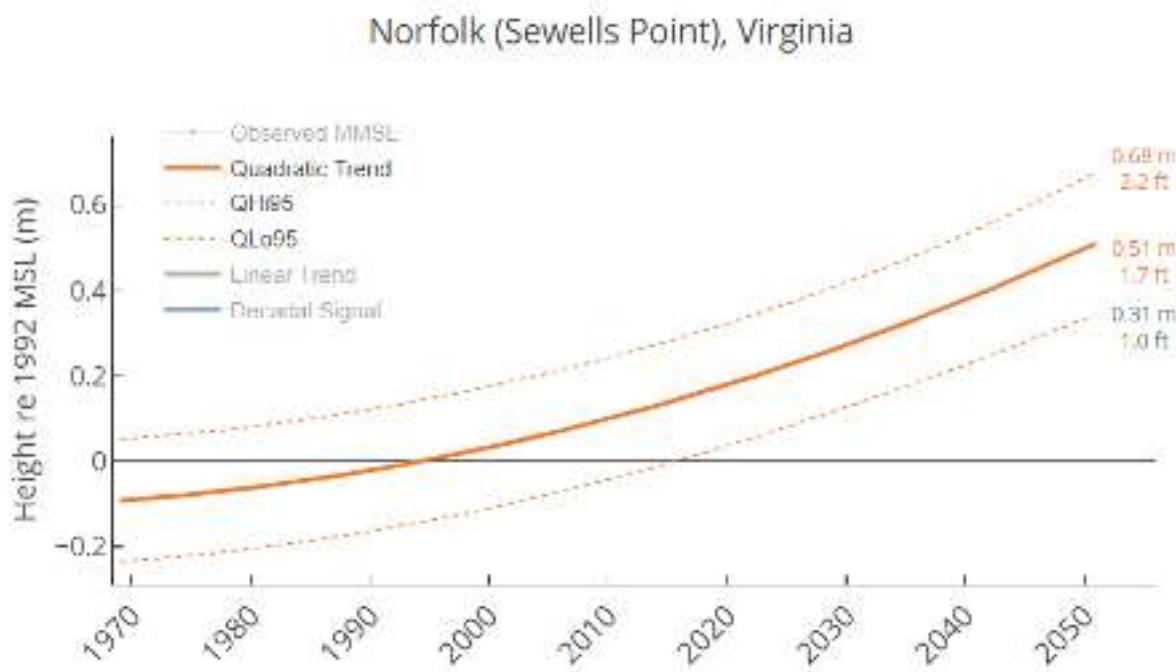
## Coastal Flooding

The bathymetry of the ocean and bay floors also greatly influence storm surge. Shallower gradients, such as those along the bayside and seaside of the Eastern Shore, allow for greater storm surge. For example, a Category 1 hurricane may cause four to five feet of surge. The shape of the Chesapeake Bay “pinches” the water and thereby makes the surge grow in height on the bayside. Storm surge is not the same as storm tide, however. Storm tide refers to the water level rise attributable to the astronomical tide plus the effects of the storm surge, as illustrated in Figure 5.

### SEA LEVEL RISE AND COASTAL FLOODING

The Virginia Institute of Marine Science (VIMS) tracks sea level data and produces “report cards” highlighting sea level change at local levels. Using annual tide-gauge data, VIMS can also project sea-level height to the year 2050 (VIMS “U.S. Sea Level Report Cards. N.d.). Figure 6 below provides the sea-level report card for Norfolk, the nearest point to the Eastern Shore that VIMS tracks. This figure displays the Mean Sea Level (MSL) beginning in 1970 and projected through the year 2050. The quadratic trend line indicates the average projected rise in MSL, while “QHi95” and “QLo95” represent the 95% confidence interval. The “QHi95” indicates that MSL could be as high as 2.2 ft above current levels.

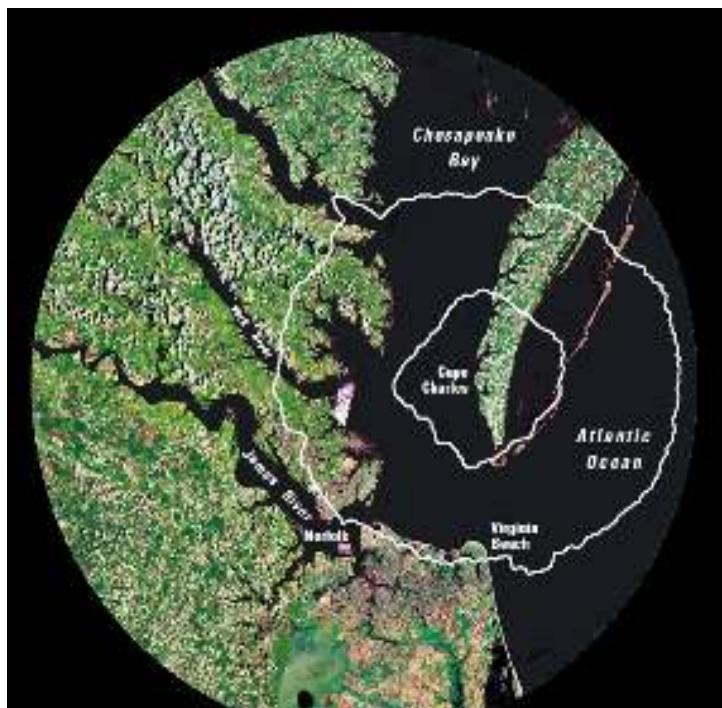
There is ample scientific evidence that sea level rise is occurring and is projected to continue quadratically into the future.



**Figure 6: Sea Level Rise Scenarios. Source: VIMS Sea-Level Report Cards**

## RELATIVE SEA LEVEL RISE

Relative sea level is the perceived water level as it relates to the level of land. The discussion of relative sea level rise in the lower Chesapeake region begins approximately 35.5 million years ago when a bolide, or object from space, two to three miles in diameter, struck near the area that is now Cape Charles, creating an impact crater roughly twice the size of Rhode Island (Figure 7). The crater, now underlying all of Northampton County and portions of southern Accomack County, and the sediments that have buried it, have continuously settled over time, creating increased subsidence of landforms in the region (USGS Fact Sheet 049-98).



**Figure 7: A Bolide Bull's-Eye. Source: USGS**

global cause of sea level rise. As water trapped in glaciers and ice sheets melts into the earth's oceans, and water already in the ocean expands as the temperature increases, the volume of water in the ocean increases, causing sea level to rise (VIMS).

Scientists posit that another contributor to sea level rise could be changes to the Gulf Stream brought on by warmer polar regions. A smaller difference in temperature between the Atlantic coast and the polar region slows the cycle in which waters sink and move south as they are cooled, which in turn slows the rate at which they are replaced by warmer waters drawn north (VIMS). The result of the sluggish cycle is higher tides in the mid-Atlantic, as illustrated in Figure 8.

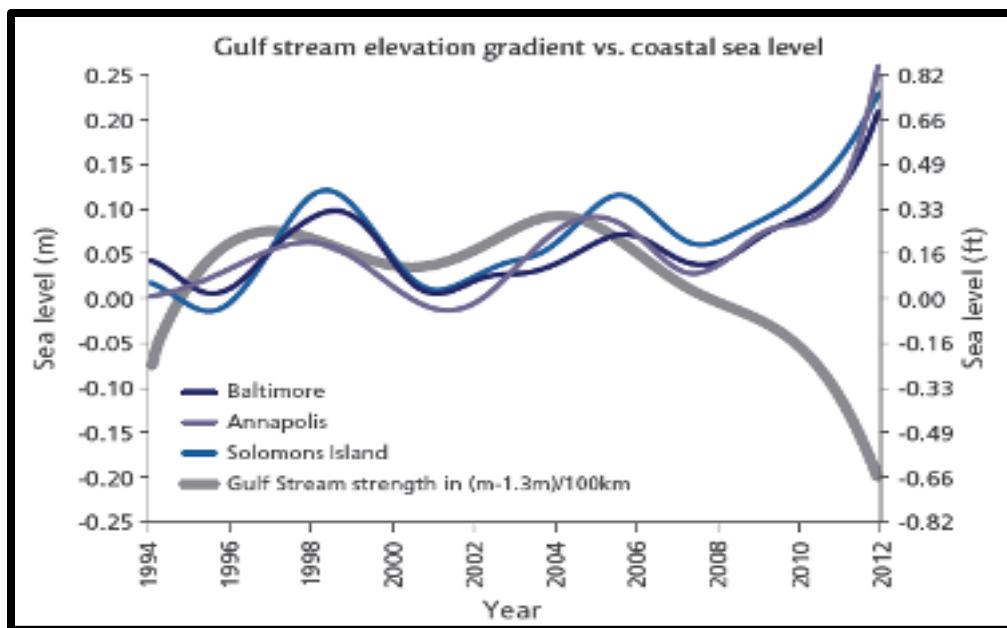
A second cause of subsidence is rebound of the earth's crust from glaciers. Even though the Laurentide ice sheet did not reach the lower Delmarva Peninsula, the weight of the ice as it pressed down caused the earth's crust to bulge in adjacent areas. As the ice retreated, and the pressure it exerted was relieved, the earth's crust began to rebound, the bulging areas began gradually sinking, and in fact are still trying to achieve a state of equilibrium (USGS Circular 1392).

Two other factors that affect relative sea level rise to a lesser degree on the Eastern Shore are groundwater withdrawal and tectonic changes. Subsidence from all sources range from 1.2 millimeters of subsidence per year at Kiptopeke to 2 millimeters per year at southern Assateague (Holdahl and Morrison, 1974).

## GLOBAL SEA LEVEL RISE

The increasing volume of water in the ocean is a

## Coastal Flooding



**Figure 8: Sea level at elevation vs. Gulf Stream strength. Source: Ezer et al., 2013**

The result of sea level rise ultimately raises the base flood elevation. The same VIMS study estimates 208 square miles of land in Accomack County is vulnerable to sea level rise over the next century, and another 186 square miles is vulnerable in Northampton County, along with increased threats from erosion and infrastructure flooding. A study conducted by the A-NPDC during 2015 examined the implications of future sea level rise upon roads within the region and the communities they serve. The study found that just one foot of inundation – a threshold that could be reached in the next 10 years – could put the majority of Tangier's roads completely under water, disrupt access to eight more communities, and limit access to two more. More about the study results can be found in local chapters, beginning with Chapter 10.

### Vulnerability of Virginia's Eastern Shore to Sea Level Rise

"Several communities in Accomack are considered vulnerable to sea level rise. The natural resource-based agriculture and seafood industries of the region are being impacted as farmlands are experiencing increased inundation and salt contamination and local seafood industries are experiencing problems created by stormwater runoff and changing coastal dynamics. Accomack has three developed islands, Tangier, Saxis, and Chincoteague. In Tangier, approximately 90% of structures are in the 100-year flood plain, the entire island is below the 5-ft contour, and severe shoreline erosion threatens the island. Saxis Island also has severe erosion problems, and the northern portion of the island is very low-lying land. The evacuation route, a causeway through the marsh, is at risk from both potential compaction of the roadbed and erosion of the surrounding marshes as well as recurrent flooding and sea level rise. Chincoteague is somewhat less vulnerable to erosion, because it is located in the wave attenuated Chincoteague Bay but is vulnerable to recurrent flooding and sea level rise."

"Overall, the risk to communities in Northampton County is lower than those in Accomack County. This is due in a large part to topography; even the lowest lying town (Town of Cape Charles) is mostly above the 5-ft elevation. However, it is still vulnerable to storm surges and stormwater flooding as drainage ditches become tidal, reducing their capacity to handle stormwater. The lowest lying lands (the barrier islands) are largely undeveloped. The primary impact from sea level rise is expected to be increased shoreline erosion."

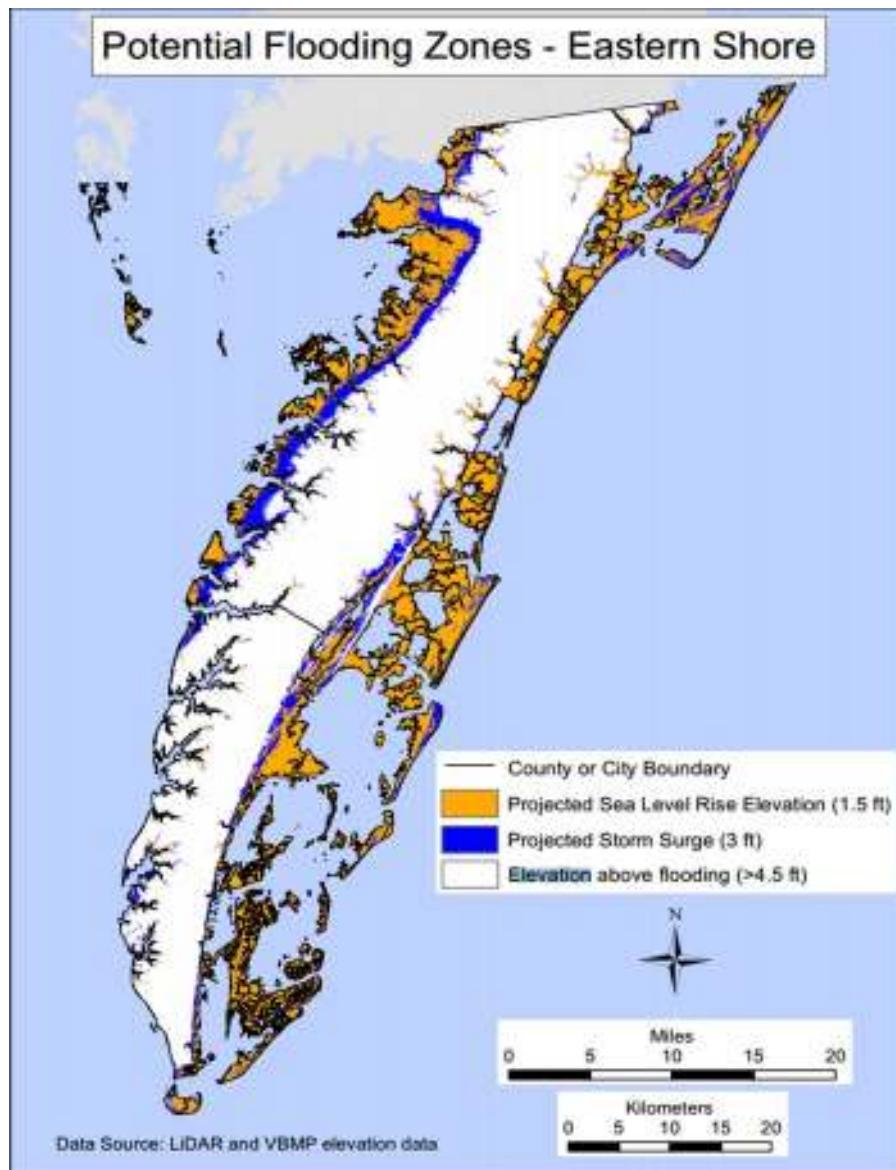
*"Recurrent Flooding Study for Tidewater Virginia," Virginia Institute of Marine Science, 2013.*

## ELEVATION

The elevation of land in relation to water levels must also be considered as a contributing factor in flooding. Northampton and Accomack Counties are low-lying areas with the highest elevation in the town of Melfa at 60 feet above mean sea level.

In 2011, LiDAR (Light Detection and Ranging) elevation data was acquired for all of the Eastern Shore. LiDAR data is collected by flying aircraft using light pulses to measure distance to earth. The data is the most accurate comprehensive elevation data collected for the Eastern Shore of Virginia, accurate to within about six inches. In 2015, a second set of LiDAR elevation data was collected and further enhanced the region's planning capacity.

The 2013 VIMS study considered anything under 4.5 feet to be potential recurrent flood zones (Figure 9).



**Figure 9: Potential Recurrent Flood Zones**

## TYPE, LOCATION, AND EXTENT

### FLOOD ZONES

A flood is a general and temporary condition where two or more acres of normally dry land or two or more properties are inundated by water or mudflow. To identify a community's risk, FEMA conducts a flood insurance study, which is then used as the basis for maps that identify flood risk areas, called Special Flood Hazard Areas (SFHA). The maps are known as Flood Insurance Rate Maps or FIRMs.

It should be pointed out that FIRMs and flood zones are regulatory tools used to set construction standards and flood insurance rates and are based on a flood that has a one percent chance of occurring in any given year. Although storm surge is a factor in determining the extent of the flood zones depicted on FIRMs, a storm surge map issued for a given storm is not the same, and a FIRM should not be counted on to determine potential storm surge from a storm event.

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### V ZONES

V zones are the portion of the Special Flood Hazard Area (SFHA) that extends from offshore to the inland limit of a primary frontal dune along an open coast, and any other area subject to high-velocity wave action. Within these zones, damage from coastal flooding is from hydrodynamic force called velocity flow. This type of flow is known to scour around buildings and to destroy structures in its path. In addition, velocity flow picks up debris and smashes that debris into anything in its way. FEMA has identified areas where velocity flow from the 100-year flood event would occur as V zones. These flows commonly damage or destroy any wall that is struck by this moving water.

Current floodplain management ordinances require that in V zones any new structure be built with its lowest horizontal structural element to be elevated above the Base Flood Elevation. Further, no living space is to be put below the Base Flood Elevation and any enclosures must have breakaway walls.

The debris carried by velocity flow can destroy a structure that is built to flood regulations. This debris commonly includes parts of houses, decks, vehicles, propane or oil tanks, and any other objects that the floodwater picks up. During Hurricane Isabel in 2003, six-ton riprap was swept-up from beaches and came to rest in front of houses. Smaller riprap actually was swept through broken walls and came to rest inside of structures. If flood-borne debris strikes or gets caught against the foundation of a post-FIRM structure, that structure could sustain severe damage or destruction despite it being built to floodplain regulations.

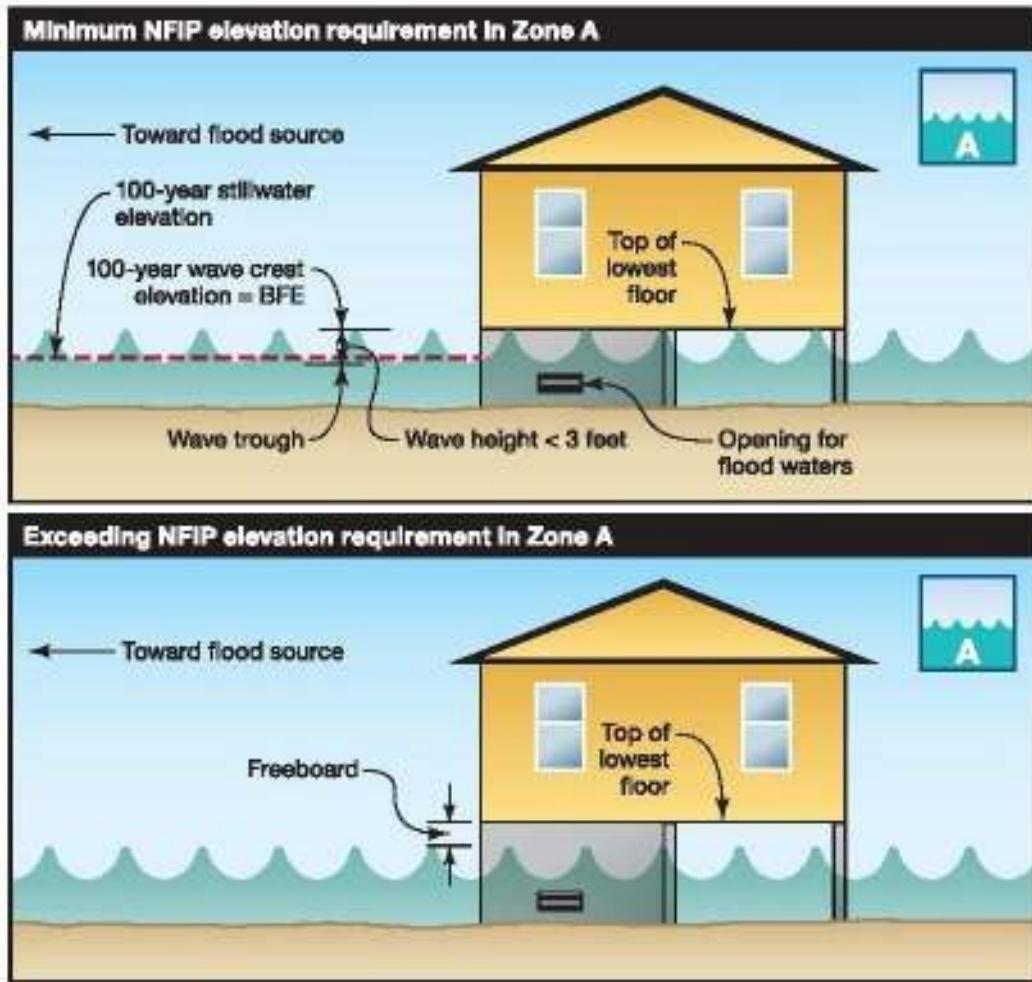
Waves are another source of damage to structures in velocity flow areas. When waves break against a structure the tremendous force can damage the walls. Waves commonly destroy decks as waves advance up a vertical wall further than they would on a sloped surface.

(Source for this section: FEMA Coastal Construction Manual, 2011; local oral accounts from Hurricane Isabel)

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### A ZONES

A zones are areas where the one-percent-annual-chance flood would inundate, but waves would not exceed three feet. A-zone construction must have the lowest floor positioned at or above the base flood elevation, and foundation walls must be equipped with openings that allow floodwaters to enter and exit to equalize hydrostatic pressure (Figure 10).



**Figure 10: Recommended Elevation for Buildings in Zone A Compared to Minimum Requirements**  
Source: FEMA Coastal Construction Manual, 2011

FEMA post-storm inspections have shown that coastal A zones are areas of increased damages. The A zone regulation does not take into account the hazards of waves, hydrodynamic flow, and erosion. Yet coastal A zones can be subject to all of these hazards during a 100-year flood event.

Some of the coastal A zones may not experience these types of hazards but will suffer from damage from standing water. Common types of direct damage include waterlogged and corroded building elements, waterlogged furniture, damaged electronic appliances and equipment, damaged tanks from buoyancy forces, and contaminated exteriors and interiors from black water. In addition, building materials may wick up floodwater to higher areas not directly inundated (FEMA Coastal Construction Manual, 2011). All new construction must address these issues and meet the Virginia Uniform Statewide Building Code.

Damages from flooding increase rapidly with water depth. The National Flood Insurance Program provides an online interactive flood damage estimation tool at [floodsmart.gov](http://floodsmart.gov). Based on estimates from this tool, just 1 inch of water in a 1,000-square-foot home built on a slab with average furnishings would cause an estimated \$10,600 of damage – most of it in finished floors and carpet. At 6 inches of water, the damage estimates roughly doubles.

## Coastal Flooding

Former flood zone maps used still water to establish base flood elevations, not taking into account wave height associated with storm surge. FIRM maps effective in early 2015 incorporated this information, along with the line of moderate wave action (LIMWA) – a line that delineates the approximate edge of 1.5-foot wave height, which although not in a velocity zone, can still pose a significant hazard to properties constructed to A-zone standards (Accomack County Flood Insurance Study, 2015).

### SECONDARY FLOOD HAZARDS

Secondary hazards associated with coastal flooding include water that contaminates wells. Floodwater commonly becomes contaminated with pollutants. When this water level is above the elevation of a well's air vent, the contaminated water can flow into the well and render it unusable until the water is treated and in agreement with state and federal health standards. Wells for public use are required to be tested regularly per state and federal health regulations, but private wells are not held to the same standards. Therefore, private well owners are responsible for tracking the water quality of their wells. In economically-disadvantaged communities, private well owners may not be able to afford the sampling needed to ensure adequate water quality.

On the Eastern Shore, several types of older wells are in use. The rarest type is the hand dug well. This well is usually 10 to 12 feet deep and would have initially been used with a bucket. There are also shallow wells, less than 100 feet deep, that have a static water level near the top of the well and a non-submersible pump that pulls water into a tank.

Deeper wells, greater than 100 feet, that were drilled prior to the 1970s, were designed in much the same way but instead of just a pump located in the top of the well there is a second pipe running down to the static water level capped by a packer with a venturi. The packers were most useful with metal pipes but in the 1970s most well pipes were replaced with PVC and the packers could not easily maintain a seal against this material. These wells also have low pumping rates and are hard to prime if power is lost (Written communication, Jon Richardson, Eastern Shore Health District, May 10, 2016).

In most cases, since the 1970s, submersible pumps have been used. The well with this setup needs an air vent. During a flood, water can enter the well through the air vent. Elevating this air vent above the Base Flood Elevation is one of the best ways to avoid contaminated floodwater entering the well. (Written communication, Jon Richardson, Accomack and Northampton Health Department, May 10, 2016). An NFIP flood policy will not cover wells damaged by floods (NFIP Standard Flood Policy).

Septic tanks and septic systems are also not covered under an NFIP flood policy. When a flood is in the area of a septic tank, the water will backflow from the drain field into the tank causing the cushion of air at the top of the tank to disappear. This means the tank can no longer handle flow from the structure and drainage will fail inside. After the floodwater recedes, a small cushion of air will redevelop, and it is during this time that sewage can escape the septic tank through the drain field. This small cushion of air will allow the tank to accept wastewater from the structure, but at the level of drainage inside the tank the water is poorer than it usually is. This poor-quality water containing sewage can escape into the drain field (Written communication, Jon Richardson, Eastern Shore Health District, May 10, 2016).

Alternative sewage systems are much more susceptible to flood waters than conventional septic tank and drain field (STE) systems because they, in most instances, rely on an above grade mound to dispose of wastewater. All of the mound, or portions, could erode away during a flood event. Alternative systems also produce a higher quality (cleaner) effluent than STE systems. In addition, they include electrical components to operate pumps and pre-treatment tanks which can malfunction if exposed to flood waters. A pump malfunction would render the system

incapable of receiving wastewater from the home once that tank filled with wastewater. A failure of the pre-treatment tank operation would result in wastewater of lesser quality to be dispersed to the mound which would foul the distribution piping in the mound and could lead to premature mound failure. Pre-treatment tanks are also susceptible to flooding (Written communication, Jon Richardson, Eastern Shore Health District, May 10, 2016).

## HUMAN SYSTEMS

### NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

While NFIP flood insurance covers some losses associated with flood events, several types of property have no available coverage under this program.

Although NFIP flood insurance has many exclusions and types of property not covered, some of the more important ones to remember are wells, septic systems, land, seawalls, bulkheads, piers, wharves, containers, decks, driveways, and walks. In addition to these, FEMA's 38 General Property Form, Standard Flood Policy lists several other types of property that will not be covered. Finally, NFIP flood insurance only covers flood damage, not coastal erosion, rain damage, wind damage, or water spray. Past disasters have shown that many policyholders, while carrying flood insurance for the structure, do not purchase flood contents insurance. In Hurricane Floyd, several homes were not structurally damaged to a great degree, yet the contents were completely destroyed (local oral accounts).

The federal government requires that all improved property in a SFHA with a federally backed mortgage be covered with flood insurance. Content coverage is not required unless it is part of the security of the mortgage. Many buyers who are confronted with this requirement will obtain flood insurance for the structure but will opt not to buy contents insurance to reduce the cost of closing on the property. After an event occurs, these policyholders learn the costly consequences of this decision.

Although the 100-year base flood is a 1% chance in each year that it will occur, over 30 years (the standard mortgage) a structure in an A or V zone will have a 26% chance of experiencing a 100-year flood. If that same house lasts 70 years, the useful life of most buildings, it has a 51% chance of experiencing a 100-year base flood. The 50-year flood event has a 45% probability of occurring within its floodplain over the course of a 30-year mortgage and a 76% chance of occurring in 70 years. It is important to understand that a smaller flood such as the 50-year event could damage a structure, especially those built below the Base Flood Elevation. The 50-year still water elevation for V zones ranges from 7.5 – 8.5' on the seaside and 3.8 – 7.4' on the bayside. In addition, the 50-year still water depth in Chincoteague Bay ranges from 4.8 – 6.0'.

Over time, buildings become more susceptible to hazards, so it is important to maintain coastal structures. The predominant hazards in coastal areas are corrosion from salty air and wind driven salt spray, termites, moisture, and sun-caused weathering. Regular maintenance lowers the risk of flood damage during a storm event. The 2011 FEMA Coastal Construction Manual recommends an annual inspection of foundation, exterior walls, porches, walls, floors, windows and doors, roof, and attic using a checklist provided in the manual.

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### COMMUNITY RATING SYSTEM

Localities volunteering to participate in the NFIP Community Rating System (CRS) have chosen to recognize and encourage floodplain management activities that exceed the minimum NFIP requirements. The CRS is a voluntary incentive program that rewards residents with reduced flood insurance premium rates as a result of the participating community's actions pertaining to the three goals of the CRS: reducing flood losses, facilitating accurate insurance

## Coastal Flooding

rating, and promoting the awareness of flood insurance. Flood insurance premium rates are discounted in increments of 5% for the ten different class ratings.

Accomack County, plus the towns of Cape Charles, Chincoteague, and Wachapreague participate in the Community Ratings System. Information about savings through their participation in the program can be found in Table 5.

Communities participating in CRS are rated A, B, or C based on the number of repetitive losses. Each category carries specific steps that must be taken, with C requiring a plan or repetitive loss analysis. Accomack County is the only community currently participating in CRS that must take this step. As a Category A, Cape Charles is required only to submit information as needed to update the repetitive loss list. Chincoteague and Wachapreague are both Category B communities, and must take steps to identify the repetitive loss areas and properties, but not in the level of detail required for Category C communities. Several other localities in the region have expressed interest in joining the program but have not done so to date due to staff limitations.

**Table 5: Regional Participation in the Community Rating System**

CRS Jurisdiction	CRS Class	Number of Policies	Total NFIP Premium	CRS Discount SFHA	CRS Discount Non-SFHA
Accomack County	6	1,230	\$872,839	20%	10%
Town of Cape Charles	8	170	\$92,992	10%	5%
Town of Chincoteague	8	1,710	\$1,299,222	10%	5%
Town of Wachapreague	8	72	\$56,723	10%	5%

Source: FEMA Community Status Book Report, 2021

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## REPETITIVE LOSS PROPERTIES

An insured property with two or more NFIP losses (occurring more than 10 days apart) of at least \$1,000 each during any 10-year period since 1978 is known as a repetitive loss property. A 2004 report of the U.S. Government Accountability Office found 38 percent of NFIP claim costs were the result of repetitive loss properties. Between the two counties, 103 repetitive loss properties have seen 304 losses with payments from the NFIP totaling nearly \$5.5 million for both structures and contents (FEMA NFIP Data Report, 2022). More information on RL/SRL properties can be found in Chapter 9: The Region.

# CHAPTER 7: STORMWATER

## INTRODUCTION

While the section does look at changes to portions of the Eastern Shore landscape over time, risk assessment is not found in this chapter, but can be found in Chapter 3: Risk Assessment.

Stormwater flooding on the Eastern Shore is often a very sudden and unpredictable occurrence. For example, on September 3, 2003, a massive thunderstorm produced heavy rains, dropping 6 to 8 inches of rain in a very short period across northern Accomack County (NOAA Climate Data Center Severe Weather Events Database). In Bloxom, floodwaters reached a depth of at least 2 feet; in some areas the flooding was greater. Railroad tracks blocked drainage in some directions in town, contributing to extensive stormwater flooding that impacted several homes. An afternoon rainstorm had saturated the soils earlier in the day, a common contributor to stormwater flooding on the Shore. The drainage ditches were inundated from high tides that accompanied the storm, and deferred maintenance leading up to the storm event meant the ditches could not accommodate the large amounts of water the storm produced. Compounding the problem in Bloxom was that many acres of tomato fields in the area were covered in plastic, greatly increasing the number of impervious surfaces and increasing stormwater runoff. This practice is still in use across the Eastern Shore, which can exacerbate runoff in areas where it is used.

Although there were no estimates of the probability of this storm event, the entire 12-hour period including the initial storms in the afternoon would put this at the 100-year storm event level, which on the Eastern Shore is 7 to 8 inches in 12 hours. Residents who remember the Bloxom storm recall that the larger storm's rainfall occurred over approximately 2 hours, making this storm above the 100-year storm event. The 2-hour 100-year storm on the Eastern Shore is between 4.5 and 5 inches of rain. Recurrence intervals of rainfall intensity are presented in Table 1 below.

**Table 1: Recurrence Intervals of 24-hour Rainfall Totals**

Recurrence Interval	Rainfall (inches)
1-year 24 hour	3.0 - 3.5*
2-year 24 hour	3.5 - 4.0
5-year 24 hour	4.5 - 5.0**
10-year 24 hour	5.0 - 6.0
25-year 24 hour	6.0 - 7.0
50-year 24 hour	7.0 - 8.0
100-year 24 hour	8.0 - 9.0

\* All of the Eastern Shore has this recurrence interval except for around the Town of Saxis. Recurrence Interval: 2.5 – 3.0

\*\* All of the Eastern Shore has this recurrence interval except for the Southeast corner of Northampton County. Recurrence Interval: 5.0 – 5.5

Source: The National Weather Service established that the worst-case scenario for the Eastern Shore would be 8 to 30 inches of rainfall during a 6-hour precipitation event for a 10 square mile area.

## NATURAL FORCES AND CONDITIONS

### STORMWATER AND UNDERLYING GEOLOGY

Surface features characteristic of the Coastal Plain of the Eastern Shore include terraces, stream channels, drowned valleys, Carolina bays, swamps and marshes, remnant dunes, and bar-like features formed during the Pleistocene time. The central portion of the Eastern Shore peninsula forms a broad, low ridge which trends northeast-southwest and stands at an elevation ranging from about +25 to +50 feet mean sea level. This central highland area is the principal fresh ground water recharge area for the peninsula and is referred to as the "recharge spine" of the Eastern Shore. The terrace has maintained the same strand line for almost the entire length of the Atlantic Coastal Plain and is divided into a lower and upper terrace which directs the drainage of the Eastern Shore.



The lower terrace, generally located west of Route 13, consists of broad flats broken by large meandering tidal creeks, and bordered by tidal marshes. The topography of the upper terrace, typically thought of as more complex than the lower terrace, is characterized by shallow sand-rimmed depressions known as Carolina bays. These bays, predominantly oval in shape, exert an influence on the infiltration, retardation of runoff, and movement of surface and ground water, often due to the associated Nimmo series soil types. Between the mainland and the barrier islands are extensive tidal marshes flooded regularly by saltwater and drained by an extensive system of creeks (Hulme, 1955). These systems accept ground and surface water discharge.

Numerous drainage basins exist on the Shore ranging in size from approximately four to six square miles. These basins consist of several small creeks and interconnected ditches. Primary drainage basins of the Eastern Shore of Virginia are Gargathy Creek, Folly Creek, Finney Creek, Occohannock Creek, and Pungoteague Creek basins in Accomack County; and Mattawoman Creek and Nassawadox Creek basins in Northampton County. The Pocomoke River basin borders Worcester County, Maryland and Accomack County, Virginia and serves as a major drainage divide for this area.

**Figure 1: Created with LiDAR data, this "bayShore" overlay reveals the hundreds of ellipsoidal Carolina Bays. Prior to the advent of LiDAR, using aerial imagery only about 100 bays were identified, but now there are 700.**

Source: Michael Davias, [www.cintos.org](http://www.cintos.org)

## STORMWATER AND SOIL COMPOSITION

The Eastern Shore exists entirely within the Atlantic Coastal Plain Physiographic Province, which consists of unconsolidated sediments deposited by marine and fluvial processes. The three most abundant soil types on the mainland of Accomack and Northampton Counties are the Bojac, Munden, and Nimmo series (Table 2, Figures 2 and 3). These soil types have distinct characteristics that affect the way that they either contribute towards or help alleviate stormwater impacts (ESVA Land Use & Ground Water Resources Report, 2010).

**Table 2: Predominant Soil Types, Eastern Shore of Virginia**

Soil Series	Description	Drainage	Suitability for Septic	Water Table
Bojac	Primarily loamy sands found on undulating surfaces and rims of Carolina bays	Moderately to excessively well drained	Considered most suited for septic drainage	Water table more than 4' below surface
Munden	Sandy loam found in nearly level surfaces of coastal plain uplands and stream terraces	Not well drained	Not as well suited for septic drainage	Water table 18"-30" below surface
Nimmo	Sandy loam found in flats, depressions, and drainageways of coastal plain uplands and stream terraces	Poorly drained	Not suited for septic drainage	Water table 0-12" below surface

Source: USDA Natural Resource Conservation Service Soil Survey, 1994

## Stormwater



**Figure 2: Accomack County Soils Map showing the distribution of the three predominant soil types**



**Figure 3: Northampton County Soils Map showing the distribution of the three predominant soil types**

## CAUSES OF STORMWATER

Stormwater flooding is unlike coastal flooding in that it is caused by intense downbursts of rain or from rainwater accumulation in low-lying or poorly drained areas, or where debris blocks drainage paths. Once rainwater falls on the land surface, it drains into the soil and enters the ground water system, re-enters the atmosphere through evaporation, is taken up by vegetation via transpiration, or enters streams or creeks as surface runoff and eventually enters the tidal waters draining towards the Atlantic Ocean or Chesapeake Bay.

The greatest amount of flow in the creeks and streams lags after the peak rainfall. This is due to the various factors that cause the rain to slow down as it flows over the land including land cover, slope, extent of soil saturation, and capability of drainage in ditches and culverts.

## STORM POTENTIAL

Extratropical storms including hurricanes and nor'easters represent the greatest threat of catastrophic stormwater flooding that can occur on the Eastern Shore. The 2009 storm known as Nor'Ida is one such example. It was a major nor'easter, producing moderate to severe coastal flooding. Peak tide at Kiptopeke was 7.04 feet above MLLW, which was a higher reading than during Hurricane Isabel, which was a storm of record for much of the larger Chesapeake Bay region. Chincoteague recorded 13" of rain, and rainfall across the rest of the Eastern Shore averaged 4"-8". The National Weather Service recorded stormwater flooding in both counties on roadways and in poorly drained areas.



**Figure 4: Common scene of flooded roadways following intense rainfall on the Eastern Shore. Photo by Jay Diem, Eastern Shore News.**

The chapter of this report on Coastal Flooding details tropical storms and nor'easters, most of which were also stormwater events for the region. Downbursts of rain from thunderstorms also have the potential to create stormwater flooding. The worst downburst in Virginia's history was in Guinea, across the Bay from Northampton County. On August 24, 1906, 9.25 inches fell in 40 minutes.

Table 3 below lists storm events that have caused stormwater flooding on the Eastern Shore, not including tropical cyclones and nor'easters, which were covered in Chapter 1.

## Stormwater

**Table 3: Storms that have generated intense rainfall on the Eastern Shore, 2000 – 2021**

County	Date	Event Category	Property Damage (\$, not adjusted for inflation)	Crop Damage (\$, not adjusted for inflation)	Source	Narrative
Accomack Co.	8/4/2000	Flash Flood	0	0	Law Enforcement	Heavy rain caused flooding on Route 13 near Mappsville and Nelsonia.
Northampton Co.	7/30/2003	Flash Flood	0	0	Emergency Manager	Extensive flooding to secondary roads, as well as portions of Route 13.
Accomack Co.	9/3/2003	Flash Flood	0	0	Law Enforcement	Several inches of water on Route 13 in the areas of Nelsonia and Mappsville. Some parts impassable. Many roads closed, under 6 to 8 inches of water.
Accomack Co.	7/28/2004	Flash Flood	0	0	NWS Employee	One foot of water across Route 175 in town of Chincoteague. Six inches of water to 1.5 feet of water across northbound and southbound lanes of Route 13. Southbound lanes of Route 13 were closed for a time. Standing water of 1.5 feet alongside northbound Route 13 was threatening houses along the road.
Accomack Co./Northampton Co.	10/24/2007	Heavy Rain	0	0	ASOS	The combination of low pressure over the Southeast United States and a nearly stationary frontal boundary across the Middle Atlantic Region helped to produce heavy rain. The storm system brought an average of three to four inches of rainfall to the area. Locally heavier amounts over six inches were reported with some in excess of 7 inches.
Accomack Co./Northampton Co.	12/10/2008	Heavy Rain	0	0	ASOS	The combination of a frontal boundary laying across the area and low pressure moving through the region, produced rainfall amounts between two and five inches over much of eastern Virginia.
Accomack Co.	7/27/2009	Flash Flood	0	0	Trained Spotter	Scattered thunderstorms in advance of a cold front produced heavy rain which caused flash flooding across portions of the Virginia Eastern Shore. Four and a half inches of rain was reported in some locations.
Accomack Co.	3/13/2010	Heavy Rain	0	0	Trained Spotter	Low pressure over the area produced heavy rain across portions of the Virginia Eastern Shore. Rainfall amount in the area was estimated to be 1.20 inches.
Accomack Co./Northampton Co.	3/28/2010	Heavy Rain	0	0	COOP Observer	Showers and thunderstorms associated with low pressure and a cold front produced one to three inches of rain across eastern Virginia.

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

County	Date	Event Category	Property Damage (\$, not adjusted for inflation)	Crop Damage (\$, not adjusted for inflation)	Source	Narrative
County	Date	Event Category	Property Damage (\$, not adjusted for inflation)	Crop Damage (\$, not adjusted for inflation)	Source	Narrative
Accomack Co.	6/19/2011	Flash Flood	0	0	Law Enforcement	Isolated thunderstorms associated with low pressure produced heavy rains which caused flash flooding across portions of the Virginia Eastern Shore. High water was covering Routes 316 and 182.
Accomack Co.	7/14/2012	Flash Flood	0	0	911 Call Center	Isolated thunderstorm along a frontal boundary caused heavy rain which produced flash flooding across portions of the Virginia Eastern Shore.
Accomack Co.	8/25/2012	Heavy Rain	0	0	State Official	Low pressure along the Mid Atlantic Coast produced scattered thunderstorms with heavy rain across portions of central and eastern Virginia. Rainfall amounts were reported between 2 and 6 inches.
Accomack Co.	6/7/2013	Flash Flood	0	0	911 Call Center	The combination of the remnants from Tropical Storm Andrea and a frontal boundary draped over the region caused heavy rain which produced flash flooding across portions of central and eastern Virginia. Several roads were impassable due to high water.
Northampton Co.	8/12/2014	Flash Flood	0	0	Emergency Manager	Slow moving thunderstorms in advance of a cold front produced 3 to 5 inches of rain in a small area around Cape Charles, VA. Flooding was reported on many streets in Cape Charles. Several cars were flooded by 2 to 3 feet of water.
Northampton Co.	9/8/2014	Heavy Rain	0	0	COOP Observer	Showers and scattered thunderstorms associated with low pressure along the North Carolina Coast produced locally heavy rainfall across portions of southeast and south-central Virginia. Storm total rainfall amounts generally ranged from three inches to as much as twelve inches.
Accomack Co./Northampton Co.	11/9/2015	Heavy Rain	0	0	COOP Observer	Low pressure moving up along the East Coast produced rainfall amounts between 1.5 inches and 3.5 inches across much of eastern and southeast Virginia.

## Stormwater

County	Date	Event Category	Property Damage (\$, not adjusted for inflation)	Crop Damage (\$, not adjusted for inflation)	Source	Narrative
Accomack Co.	7/1/2016	Heavy Rain	0	0	Mesonet	Scattered showers and thunderstorms in advance of a cold front produced heavy rain and caused flash flooding across portions of eastern and southeast Virginia. Rainfall totals ranged from five to as much as eleven inches in areas where flash flooding occurred.
Accomack Co.	7/18/2016	Heavy Rain	0	0	911 Call Center	Scattered thunderstorms in advance of a cold front produced heavy rain and minor flooding across portions of the Virginia Eastern Shore.
County	Date	Event Category	Property Damage (\$, not adjusted for inflation)	Crop Damage (\$, not adjusted for inflation)	Source	Narrative
Accomack Co./Northhampton Co.	9/19/2016	Heavy Rain	0	0	Mesonet	The combination of a stalled frontal boundary and the remnant low pressure area that was Tropical Storm Julia, produced heavy rain across much of eastern and central Virginia ranging from 2 to 8 inches.
Accomack Co.	9/28/2016	Heavy Rain	0	0	CoCoRaHS	Waves of low pressure moving along a stalled frontal boundary over the Mid-Atlantic region produced periodic showers and thunderstorms with heavy rain across much of the Virginia Eastern Shore. Totals ranged from 1 to 8 inches.
Accomack Co./Northhampton Co.	10/8/2016	Heavy Rain	0	0	ASOS	The combination of a cold front moving through the Mid-Atlantic and Post Tropical Cyclone Matthew tracking northeast just off the North Carolina and Virginia coasts, produced heavy rain across the Virginia Eastern Shore. Rainfall totals generally ranged from 4 to 13 inches.
Northhampton Co.	6/5/2017	Heavy Rain	0	0	Mesonet	Scattered thunderstorms well in advance of a cold front produced heavy rain and minor street flooding across portions of southeast Virginia. Rainfall totals around 4 inches.
Accomack Co.	7/29/2017	Heavy Rain	0	0	CoCoRaHS	Scattered thunderstorms in advance of and along a frontal boundary produced heavy rain and flash flooding across portions of central and eastern Virginia. Rainfall totals around 2-3 inches.
Accomack Co./Northhampton Co.	8/8/2017	Heavy Rain	0	0	CoCoRaHS	Scattered severe thunderstorms associated with low pressure and a cold front produced damaging winds, one tornado, and heavy rain across portions of eastern Virginia. Rainfall totals between 3-5 inches.

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

County	Date	Event Category	Property Damage (\$, not adjusted for inflation)	Crop Damage (\$, not adjusted for inflation)	Source	Narrative
Accomack Co./Northampton Co.	8/29/2017	Heavy Rain	0	0	Trained Spotter	Low pressure moving northeast off the Mid Atlantic Coast produced heavy rain which caused minor flooding across portions of central and eastern Virginia. Rainfall totals between 3 and 7 inches.
Northampton Co.	9/9/2018	Flash Flood	0	0	911 Call Center	Scattered showers and thunderstorms along a stationary boundary produced heavy rain which caused flash flooding across portions of the Virginia Eastern Shore. Numerous homes were flooded, and water rescues were reported in Exmore. Radar estimates indicated that up to three to four inches of rain had fallen in the area.
County	Date	Event Category	Property Damage (\$, not adjusted for inflation)	Crop Damage (\$, not adjusted for inflation)	Source	Narrative
Accomack Co./Northampton Co.	10/20/2019	Heavy Rain	0	0	ASOS	Remnant low pressure of Tropical Storm Nestor tracked northeast across eastern North Carolina and off the southeast Virginia coast. This storm produced heavy rain which caused some minor flooding across portions of central and eastern Virginia. Rainfall totals ranged from 1.5 inches to near 4.5 inches.
Accomack Co./Northampton Co.	9/17/2020	Heavy Rain	0	0	CoCoRaHS	Post Tropical Cyclone Sally tracking northeast across the Southeast United States and off the Mid Atlantic Coast produced heavy rain across portions of Central and Eastern Virginia. Rainfall totals were between 1 and 4 inches.
Accomack Co./Northampton Co.	10/11/2020	Heavy Rain	0	0	CoCoRaHS	Post Tropical Cyclone Delta tracking east northeast across the Middle Atlantic region produced heavy rain across portions of central and eastern Virginia. Rainfall totals generally ranged between two inches and four inches across the counties.

Source: NOAA, National Climatic Data Center, Storm Events Database: <http://www.ncdc.noaa.gov/stormevents/>

## SEA-LEVEL RISE AND STORMWATER

Since 1933, the relative sea-level rise measured at Sewell's Point has risen by 14.5 inches, and the rate of rise is shown to be steadily increasing. Because of the Chesapeake Bay impact crater, the Eastern Shore is also subsiding. The combination of the sinking and the sea-level rise is considered the relative sea-level rise and is an even greater threat.

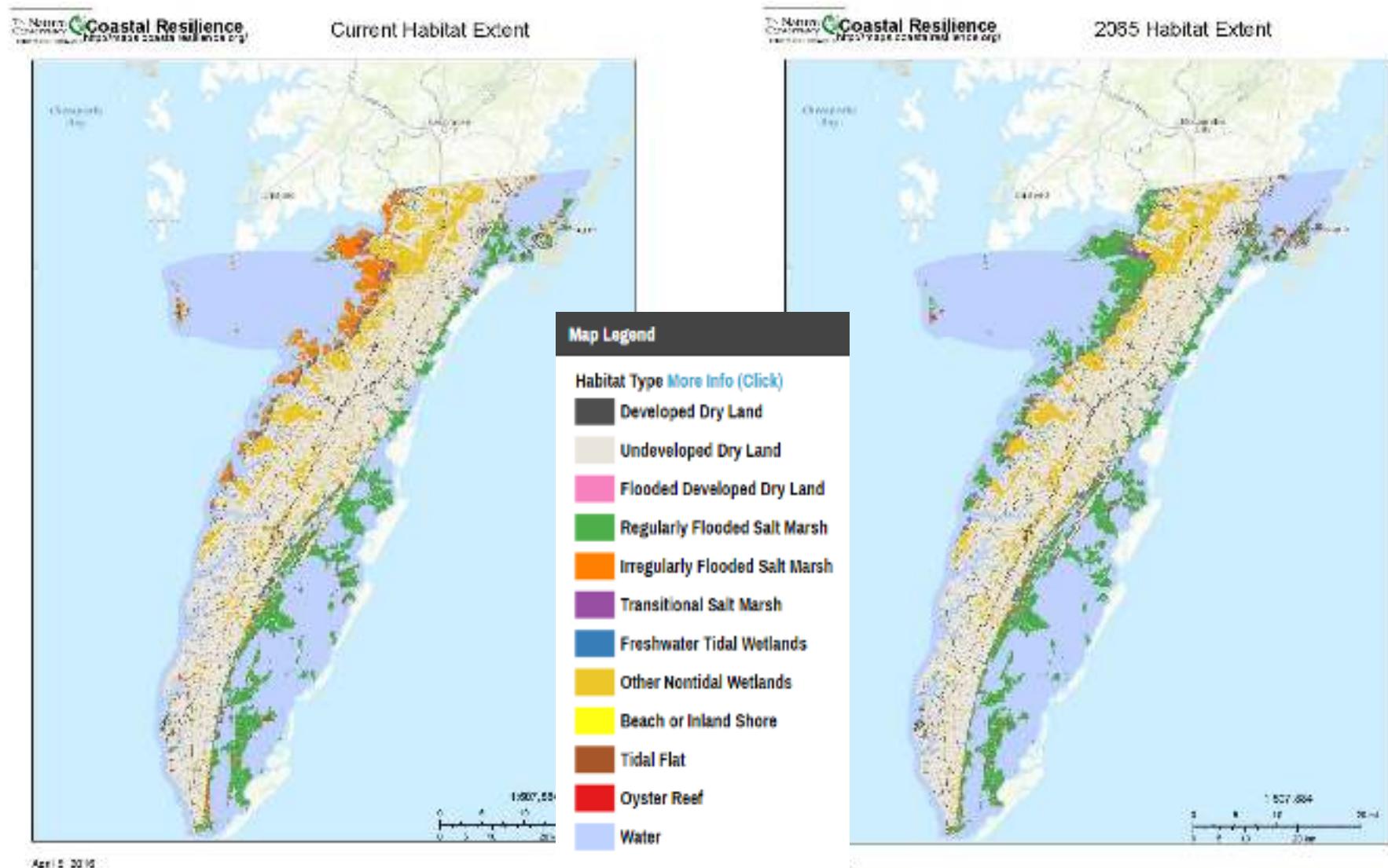
With issues associated with climate change, recurrent flooding, and/or increased storm frequency, the frequency of heavy precipitation events (or proportion of total rainfall from heavy storms) is expected to increase in the Eastern United States. Although the average total annual precipitation isn't predicted to change significantly in our region, the timing and intensity of storm events is expected to change (ICPP, 2007), with increased precipitation extremes leading to increases in stormwater flooding.

Changes to vegetation can also occur and depending on the ecosystems' ability to migrate and their ability to retain flood waters, the impacts on stormwater flooding will vary greatly. An example of natural flood mitigation through vegetation can be seen in Figure 5. Overall, it is predicted that there will be a decrease in dry land (developed and undeveloped), irregularly flooded salt marsh, and other nontidal wetlands, but an increase in the expanse of regularly flooded and transitional salt marshes. Figure 6 reveals these changes, as shown by the Future Habitat application of the Coastal Resilience mapping tool. Vegetation serves as a stabilizing force for shorelines and a water retention resource on the shoreline and inland, and thus a loss of vegetation increases inland areas' susceptibility to flooding.



**Figure 5: One of the ecosystem services of freshwater wetlands is flood mitigation. Shifting habitats can alter the ability of an area to help absorb flood waters. Photo By: Shannon Alexander**

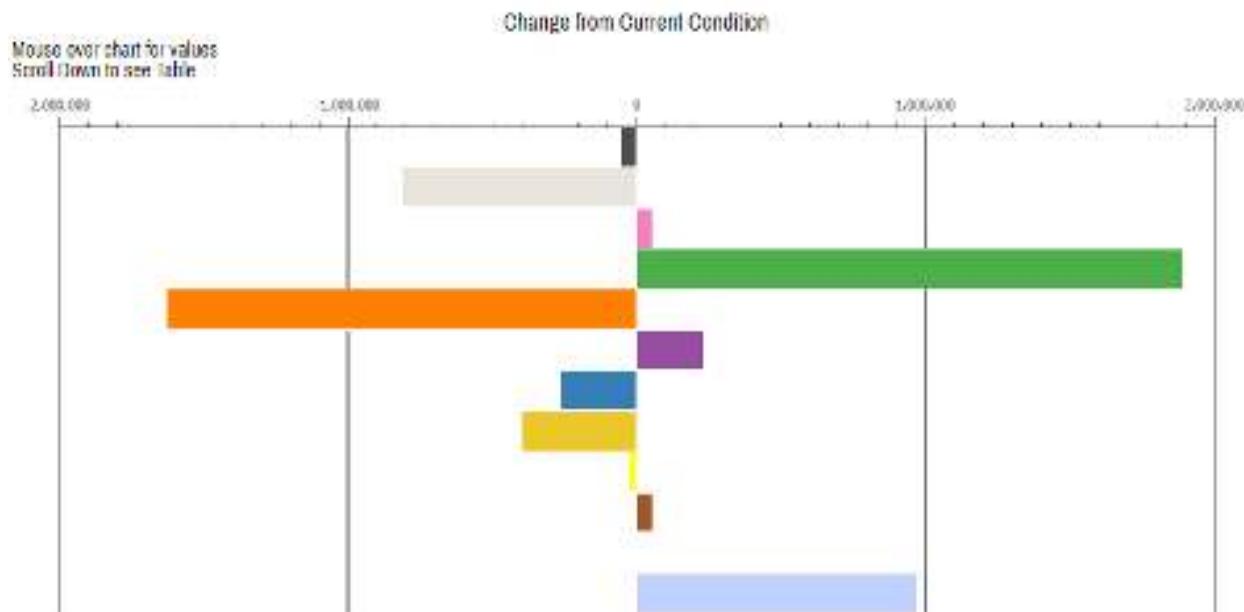
## Eastern Shore of Virginia Hazard Mitigation Plan 2021



**Figure 6: Coastal Resilience Mapping Tool; Future Habitat Application Source: The Nature Conservancy**

## Stormwater

**Figure 7: Habitat Change from Current Condition (Acres)**



## TYPE, LOCATION, AND EXTENT

### DAMAGES

Flash flooding from stormwater can be quite hazardous to humans. Since conditions develop rapidly, people can become trapped before even realizing they are in danger. In September 2018, heavy rains related to Hurricane Florence washed away a portion of Hillsborough Drive in Belle Haven and closed several other roads in Accomack and Northampton Counties. Flooding like this creates safety hazards and takes time, money, and resources to repair.

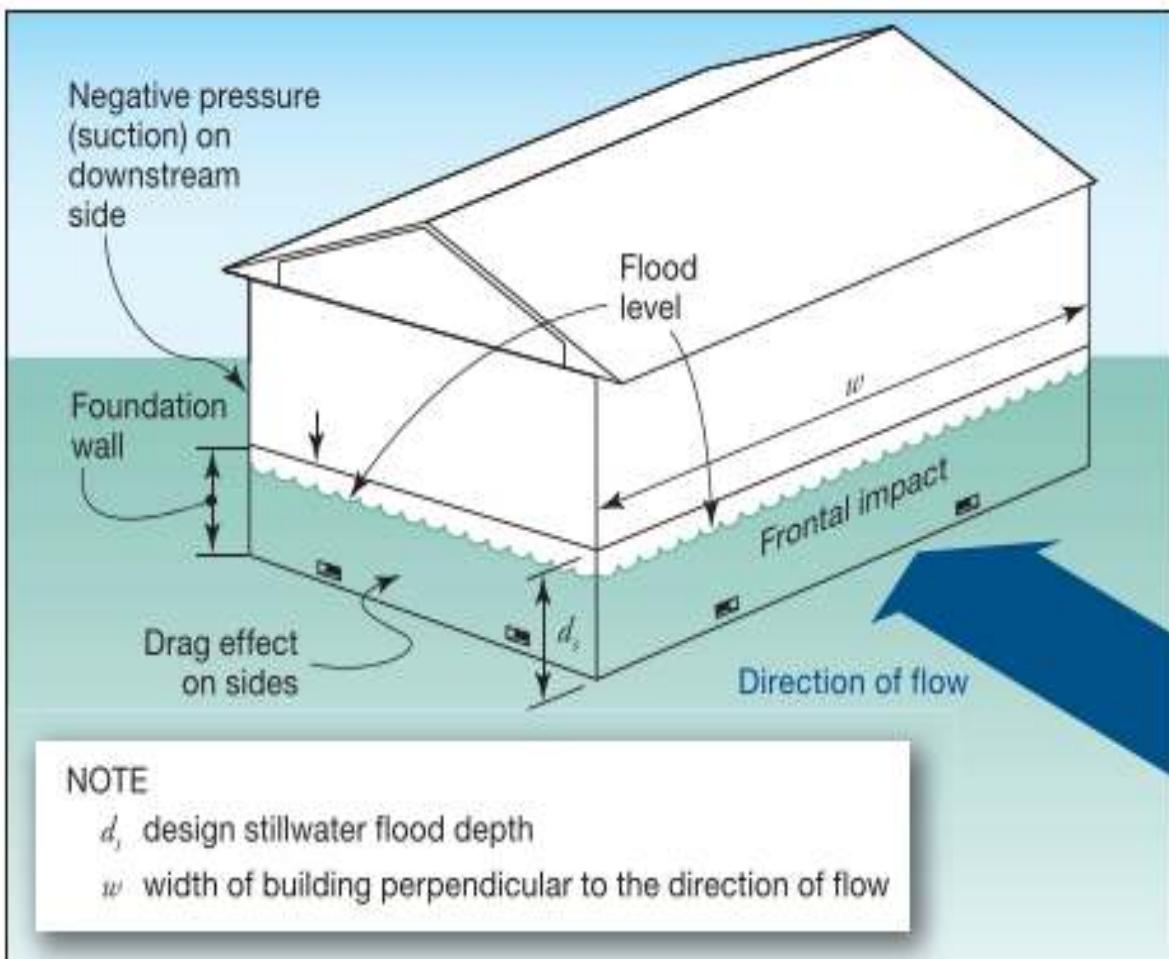


**Figure 8: Hillsborough neighborhood in Belle Haven Monday Morning September 10, 2018. Photo Credit: Phillip Spohn**

Buildings are in danger from hydrostatic loads, which occur when flood waters come into contact with a building, its foundation, or a building element. The hydrostatic load can be lateral or vertical. In order for lateral forces to cause displacement of a building or element, there must be a substantial difference in water elevation on opposite sides of the wall. The purpose of flood vents is to allow water to flow freely through a crawl space area to equalize hydrostatic pressure on either side of the foundation wall (*FEMA Coastal Construction Manual*, 2011).

Inadequately elevated buildings on shallow foundations are most in danger from vertical hydrostatic forces (buoyancy or flotation). Such buildings are vulnerable to uplift from flood and wind forces because the weight of a foundation or building element is much less when submerged than when not submerged. (*FEMA Coastal Construction Manual*, 2011).

Stormwater floods that move faster than 10 feet per second are generating hydrodynamic loads in addition to the hydrostatic loads (Figure 7). Hydrodynamic loads are a function of flow velocity and structural geometry, including frontal impact on the upstream face, drag along the sides, and suction on the downstream side. These loads can destroy walls, push structures off foundations, and carry sediment and debris (*FEMA Coastal Construction Manual*, 2011).

**Figure 9: Hydrodynamic Building Loads**

Source: FEMA Coastal Construction Manual, 2011

**Table 4: Locations Identified as Flooded Following Rain Events**

County	Town	Intersection / Road	Intensity/Effect
Accomack	Bloxom	Between Bull St & Bayside Dr	No homes, recreational area for the Town
Northampton	Cape Charles	Historic district; Intersection of Plum St & Madison Ave	Residential and commercial; primarily road flooding, hindering travel
Northampton	Cheriton	Mill St, Cherrystone Rd; Drainage an issue Town-wide	Residential, saturated soils, higher risk of wind damage to trees
Northampton	Eastville	Courthouse Rd, Willow Oak Rd east of Rt 13, northwestern side of the Rt 13 & Willow Oak Rd intersection. Willow Oak Rd receives water from the Holland Court area.	Residential, commercial, and access to County seat buildings and jail
County	Town	Intersection / Road	Intensity/Effect
Northampton	Exmore	Town-wide except along the railroad tracks and New Road's housing area (west of Rt 13 & south of Occohannock Neck Rd)	Damage to buildings and other personal property, affects mobility of non-automobile travelers, erosion cutting away parking lots, can impact public water/sewer
Accomack	Hallwood	Town-wide; particularly adjacent to the railroad past Bethel Church Rd, Main St	Hinders travel, saturated soils, damage to personal property
Accomack	Keller	Central & northern part of Town, intersection of Center Ave w/ West St & Lee St, northern end of West St	Town Office & PO susceptible
Accomack	Melfa	Woodland Ave – entire street (culvert pipe needed)	Residential and Shore Engineering
Northampton	Nassawadox	Woodstock residential area, Hospital Ave (even next to Rayfield's Pharmacy)	Hinders travel, residential, commercial, medical
Accomack	Onancock	Lilliston Ave, North St area including the Police Station/Town Office	Residential, Town facilities
Accomack	Onley	Town-wide, particularly east of Rt 13 (hydric soils)	Primarily commercial
Accomack	Parksley	Intersection of Dunn Ave & Adelaide St, in front of Jaxon's, perennial ditch on south side	Some residential, but primarily the downtown business district

Source: See local Chapter personal communication reference

Bloxom and Melfa have had some success mitigating stormwater flooding through aggressive ditch maintenance programs.

## EXPOSURE AND POTENTIAL LOSS

In some interior areas of the Shore, the Base Flood Elevation (BFE) is 4 feet. However, the AE Zones identified are associated with creeks, the ocean, or a bay. For example, there is no identified Special Flood Hazard Area in Bloxom. Flood Insurance Rate Maps (FIRMs) were updated in 2015, but some still miss many areas with recurring stormwater flooding.

## Stormwater

There are two main hazards to residential construction associated with falling rain itself. One is the penetration of the building envelope during high-wind events and the other is the vertical weight load due to rainfall ponding on a roof (*FEMA Coastal Construction Manual*, 2011).

To look at potential losses it is necessary to observe what a flood would do to a structure. The average 2,000 ft<sup>2</sup> home, built on a slab, and with typical household items would suffer from \$52,220 in total losses with a one-foot flood and \$74,580 in total losses under a four-foot flood (NFIP The Cost of Flooding App).

Since so many areas of stormwater flooding are unstudied and unmapped, probabilities of the occurrence of certain flood elevations are not really known. High resolution LiDAR elevation data has been produced for the entire Eastern Shore making the region one of the few regions in the state to have access to such excellent data. There are current efforts to recapture the LiDAR data to create an even more accurate data set. This will provide the resolution needed to map and analyze stormwater flooding issues on the Eastern Shore. The data has already been used in the Eastern Shore of Virginia Transportation Infrastructure Inundation Vulnerability Assessment and subsequently in the Coastal Resilience 2016 mapping portal for the Eastern Shore.

Just because a rain event is within a certain probability also does not necessarily correspond to the same flood probability. Since floods are dependent on both rain and other conditions, such as soil moisture, a small isolated low probability rain event might not cause a low probability flood.

In 2011, there were 246 and 173 non-Special Flood Hazard Area (SFHA) NFIP flood insurance policies in the unincorporated portions of Accomack County and Northampton County, respectively. These numbers represent the percent of all policies in Accomack County and 11.9 percent in Northampton County. There was an increase in the total number of policies, both SFHA and non-SFHA policies, and in the percentage of non-SFHA policies in both Counties from 2003 to 2011, but then a decline from 2011 to 2016, although the number of policies remains higher than in 2003 (FEMA NFIP Insurance Reports, July 2003, May 2011, and January 2016). Table 5 summarizes these trends. This is an indication that there are areas in both Counties where property owners feel the need to buy flood insurance although their structure is not in an identified flood zone, but that perhaps the new FEMA flood zone maps has prompted some homeowners to discontinue their policies.

**Table 5: Summary of flood insurance policies for the unincorporated areas of Accomack and Northampton Counties.**

Flood Insurance Policy Summary – Unincorporated Areas of Accomack and Northampton Counties				
	Year	SFHA Policies (% of Total)	Non-SFHA Policies (% of Total)	Total Policies
Accomack County	2016	2060 (88.1%)	246 (11.9%)	2306
	2011	2724 (93.7%)	184 (6.3%)	2908
	2003	2457 (95.8%)	107 (4.2%)	2564
Northampton County	2016	161 (48.2%)	173 (51.8%)	334
	2011	252 (59.9%)	169 (40.1%)	421
	2003	213 (73.2%)	78 (26.8%)	291

\*Source: FEMA NFIP Insurance Reports, May 2011, July 2003, and January 2016

## SECONDARY HAZARDS

There are secondary hazards from stormwater flow as well. Generally, intense rainfalls will not only affect the immediate area but will affect other places downstream. On the Eastern Shore, this is less of a problem than other areas in Virginia that have much larger watersheds. Unlike most places in Virginia and the nation, Accomack and Northampton are not impacted by stormwater coming from other jurisdictions.

Intense rainfalls increase the number of contaminants in the water. When the water flows over agricultural land, residential yards, roads, and commercial parking lots, contaminants are picked up and carried into the streams. Larger overland flows also erode streams and if this erosion is severe, property damage can ensue. The excess nutrients that are introduced into our coastal creeks and bays following heavy rain events can cause algal blooms followed by eutrophication, depleting the dissolved oxygen levels to a level that kills aquatic animals. Additional steps need to be made to ensure that areas storing materials with high levels of nutrients are not built in the flood plain or very close to tidal tributaries.

Often the saturated soils and standing water cause septic system and drain field failures. In some flooding instances, alternative system tanks have become dislodged and subsequently floated out of the ground. When this occurs, additional contaminants that pose immediate risk to human health are introduced into the flood waters. Without proper education about these dangers, residents often wade through, and children often play in the remaining waters once the storm system has passed.

## HUMAN SYSTEMS

### FRESH WATER IMPOUNDMENTS

An important source of water for agricultural and other irrigation needs is from farm ponds or impounded creeks and streams. Most of the impounded creeks and streams are historical, many created before 1980, and the majority of the ponds post-date 1980. These impoundments often act as a holding area for water for irrigation, however, the source of water is a combination of both stormwater and groundwater recharge from the Columbia aquifer (Eastern Shore Ground Water Management Plan, 2013).

### STORMWATER FLOODING PREVENTION LAWS AND PROGRAMS

When managed well, stormwater can recharge groundwater and protect land and streams from erosion, flooding, and pollutants.

An EPA study released in December of 2015 supports long-term benefits of green infrastructure and low impact development. This modeling study used the FEMA Hazus ® model and national-scale datasets to estimate the flood loss avoidance benefits from application of small storm retention practices for new development and redevelopment nationwide. According to the study, the use of green stormwater infrastructure can save hundreds of millions of dollars in flood losses when applied to new development and redevelopment, and if retrofitting were to occur, the avoided losses would be even more significant (Atkins, 2015).

The lead agency for developing and implementing statewide Stormwater management and nonpoint source pollution control programs in the Commonwealth is the Virginia Department of Environmental Quality (DEQ). The Clean Water Act (CWA), properly titled the Federal Water Pollution Act, was essentially established in 1972, and is Stormwater managed by the U.S. Environmental Protection Agency (EPA). This is the origin of Virginia's Total

## Stormwater

Maximum Daily Loads (TMDLs). These are important values developed by DEQ to assess state waters and causes of impairment. The development process of the TMDL and the Implementation Plan (IP), often result in a need to reduce the amount of runoff. On the Eastern Shore this is frequently due to nutrients associated with the runoff, and the resulting eutrophication, elevated bacteria levels, and reduced dissolved oxygen (DO).

At this point in time, there are three Commonwealth of Virginia laws that apply to land disturbance activity in Virginia, however, the Stormwater Stakeholder Advisory Group (SAG) is currently brainstorming ways to streamline these programs. These laws include the Stormwater Management Act (§ 62.1-44.15:24 et seq.), Erosion and Sediment Control Law (§ 62.1-44.15:51 et seq.), and Chesapeake Bay Preservation Act (§ 62.1-44.15:67 et seq.), all three of which were incorporated into the State Water Control Law (§62.1-44.2 ET SEQ.) in 2013. For counties and towns, these laws are important in the creation of zoning and subdivision ordinances, in setting out the way in which these laws are followed. From the restricting of where new development can occur, to the frequency of septic pump-outs, these regulations affect the local municipalities and residents, with the intent to improve water quality.

In rural areas, the volume of water that is discharged following a storm event has an increased flow rate due to the combined effects of subdivisions, roads, and buildings. Historically the aim of stormwater management was to quickly drain water away to the seaside and bayside creeks and bays. Not only can this lead to erosion and nutrient loading, but it is also eliminating the opportunity for that rainwater to recharge aquifers or be retained for irrigation and agricultural use.

Virginia's Erosion and Sediment Control Law requires soil-disturbing projects to be designed to reduce soil erosion and to decrease inputs of chemical nutrients and sediments to the Chesapeake Bay, its tributaries, and other rivers and waters of the Commonwealth. This program is administered by DEQ (Virginia Code §62.1-44.15:51 et seq.).

Coastal Lands Management is a state-local cooperative program administered by the DEQ Water Division and 84 localities that regulates activities in the Chesapeake Bay Resource Management Areas and Resource Protection Areas in Tidewater, Virginia. It was established pursuant to the Chesapeake Bay Preservation Act (Virginia Code §§62.1-44.15:67 through 62.1-44.15:79) and the Chesapeake Bay Preservation Area Designation and Management Regulations (Virginia Code 9 VAC 25-830-10 et seq.).

The Department of Conservation and Recreation (DCR) has 47 Soil and Water Conservation Districts (SWCDs), who work closely with districts, landowners, and other land managers to control and decrease harmful runoff. The Eastern Shore Soil and Water Conservation District offers technical assistance in shoreline erosion control, soil surveys, and animal waste management. More information can be found on their web site at <http://esswcd.org/>.

The United States Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) also provides technical and financial assistance to farmers, private landowners, conservation districts, tribes, and other types of organizations through the Farm Bill.



# CHAPTER 8: PANDEMIC

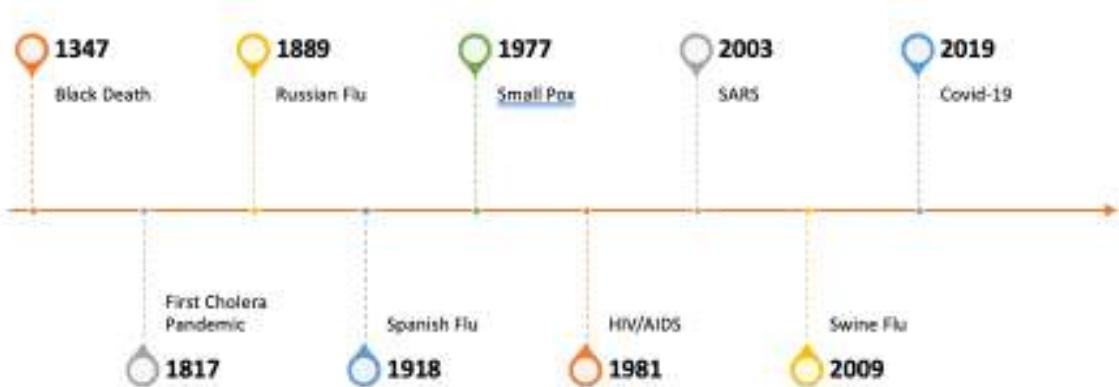
## INTRODUCTION

An epidemic is a disease that spreads rapidly throughout a region's or country's population. Pandemic refers to an epidemic that has spread throughout a larger geographic area impacting multiple countries or continents.

Throughout history no other event has killed more human beings than infectious diseases. A review of the major pandemics illustrates the frequency, and now with the COVID-19 pandemic, nearly 3 million deaths have occurred worldwide at time this document is published. Figure 1 below gives a basic timeline of some of the deadliest pandemics recorded in human history.

**Figure 1: Timeline of Worst Pandemics**

### Worst Pandemics



The challenge with the transmission of disease is the variety of ways a person can become infected. A look at just a few major pandemics illustrates the different paths to infections and their sources:

**Table 1: Pandemics and Infection Paths**

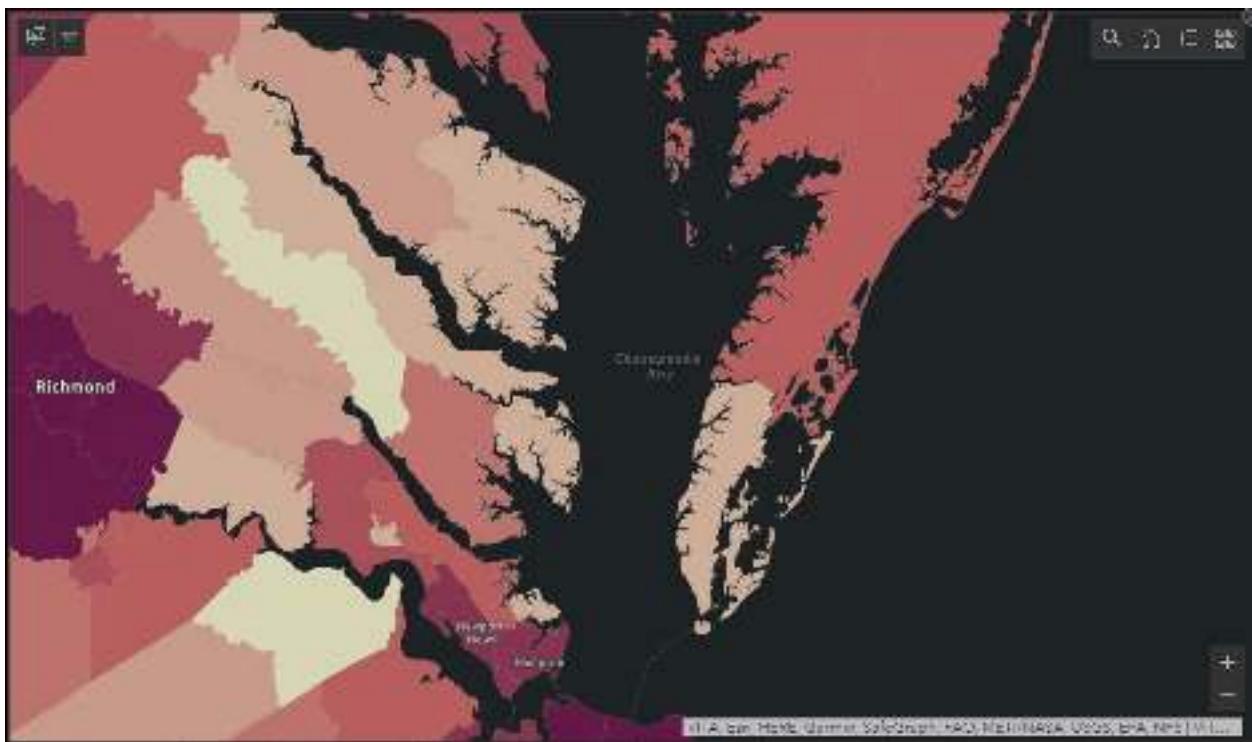
Pandemic	Path of Infection
1918 & 2009 Influenza (H1N1)	Respiratory droplets, infected surfaces Zoonotic influenza virus from swine
Avian Influenza A (H5N1 & H7N9)	Spread occurs by contact with infected living or dead poultry and birds Zoonotic influenza virus from birds and poultry
Bubonic Plague	Flea bites Zoonotic bacteria found in fleas and small mammals
Ebola	Contact with infected blood or body fluids Zoonotic Ebola virus from bats
COVID-19, MERS-CoV, SARS-CoV	Respiratory droplets Zoonotic coronavirus, possibly from bats

## Pandemic

History has shown that the best-known types of pandemics are Influenza pandemics. Currently the world is being impacted by COVID-19 which is a new strain of coronavirus. COVID-19 causes an outbreak of respiratory illness that was first detected in Wuhan, Hubei province, China. Coronaviruses are a large family of viruses that are known to cause illness ranging from the common cold to more severe diseases such as severe acute respiratory syndrome (SARS) and Middle East Respiratory Syndrome (MERS).

COVID-19 has resulted in the estimated death of 3 million people worldwide at the time of writing this chapter. The true number is likely higher, but unknown. The United States has recorded the greatest number of deaths of any country, at just over 600,000 fatalities. Vaccine efforts are ongoing, with multiple options available to the public. These vaccines carry some side effects but have largely been proven to be safe and effective against the Coronavirus. The image below is a map produced by Johns Hopkins University displaying the number of confirmed cases of COVID-19 for Accomack County and Northampton County. The darker colors indicate a higher confirmed case count. As of August 3, 2021, Accomack County has 2,928 confirmed cases and Northampton County has 811.

**Figure 2: Cases of COVID-19 by County. Source: Johns Hopkins University**  
<https://coronavirus.jhu.edu/us-map>



During the COVID outbreak on The Eastern Shore, officials came together to support testing and vaccinations. Locally, the Virginia Department of Health's Eastern Shore Health District (ESHD) partnered with Eastern Shore Rural Health System, Inc. (ESRHS) and Riverside Medical Group (Riverside). Virginia's emergency declaration on March 12, 2020, also allowed the Virginia National Guard to be deployed across the state. In the town of Melfa, the Virginia National Guard assisted ESHD with running a testing site at the Eastern Shore Community College. As seen in Figure 3, below.

There are several factors which contribute to an outbreak, and the result is often demonstrated by more cases than would be normally expected, often suddenly, of an infectious disease in a community or facility. These factors include:

- Time of the year
- Weather
- Environment
- Origin

In addition to the factors which influence an outbreak of a pandemic, epidemiologists are concerned with both the frequency and pattern of health events that might impact a population. Frequency is the number of health events and its relationship to the size of a population. One simple example is comparison of the impact of diabetes across different populations. Patterns refer to how often an event happens as it relates to time, place, and person. Because of patterns, geospatial data has been critical in capturing the impact of COVID-19. Geospatial data now informs patterns to help draw correlations between:

- Time: annual, seasonal, weekly, daily, hourly, weekday versus weekend
- Place: urban/rural differences, and location of work sites or schools
- Demographic: age, sex, marital status, and socioeconomic status

These data sets can demonstrate how serious a disease is to the individual and using the example of the annual flu, which usually impacts 5-15 percent of the population; the Eastern Shore may have between 2,200 to 6,600 people become sick.

## IMPACTS

### HEALTH AND SAFETY OF PERSONS IN THE AFFECTED AREA AT THE TIME OF THE INCIDENT

Healthcare and safety workers are affected by the spread of a pandemic. Transmission can be anticipated in the workplace not only from patients to workers, but also among co-workers and between members of the public and workers in other types of workplaces. The employer needs to proactively engage in clear communications and training, provide the appropriate personal protective equipment, and implement effective control measures. The following table indicates the estimated level of risk for various types of employment.

**Table 2: Risk Type by Employment**

Very High & High Exposure Risk	Medium Exposure Risk	Lower Exposure Risk (Caution)
Healthcare workers, particularly those working with known or suspected pandemic patients.	Workers with high-frequency interaction with the public (e.g., those working in schools, restaurants and retail establishments, travel and mass transit, or other crowded environments).	Workers who have minimal contact with the public and other coworkers (e.g., office workers).

## CONTINUITY OF OPERATIONS AND DELIVERY OF SERVICES

According to FEMA, “Continuity of operations (COOP) during a pandemic requires using existing plans in more adaptive ways to address unique requirements, to include employee health, social distancing, and widespread absenteeism.” (COVID-19 Best Practice Information: Continuity of Operations, n.d.).

FEMA recommends the following best practices for jurisdictions and communities:

- Review and/or assess your organization’s essential functions and personnel
- Establish and practice your telework ability in advance. Employers should regularly check in with staff to see what is and is not working during teleworking to assess where new processes and procedures are needed to communicate with and support staff
- As organizations implement expanded telework to maintain business operations, companies should examine IT practices and procedures, and security risks that may arise from a remote workplace
- Identify essential workers needed to maintain the critical infrastructure services and functions that the community depend on daily
- Key critical infrastructure sectors should consider procuring supplies to include cots, sleeping bags, and food if essential workers need to shelter-in-place at work to ensure continued reliable service while avoiding exposure to the virus
- Local governments should aim to conduct business remotely while continuing to make time-sensitive decisions
- Use technology to expand virtual options to engage citizens in public meetings to maintain momentum on critical planning efforts

## INFRASTRUCTURE AND ECONOMIC

Impacts to infrastructure are often limited except for increased demand on public health facility and care. Other areas of concern in a prolonged pandemic relate to the lack of maintenance or arability of resources because the supply chain is interrupted. One simple example is the loss of heat in the winter months in a school and resources are not available to place the systems back online.

## ECONOMIC AND FINANCIAL CONDITION

The need to alter or prevent the normal social contacts, called “social distancing,” or a lockdown will lead to a temporary decrease in the financial condition of the community. Recovery is often measured in the amount of time the economy is impacted by the pandemic.

# CHAPTER 9: THE REGION

## INTRODUCTION

The Eastern Shore of Virginia is a two-county peninsula situated between the Chesapeake Bay and the Atlantic Ocean (Figure 1). Along the Eastern Shore's approximately 70-mile length lie 19 incorporated towns and the longest expanse of coastal wilderness remaining on the Atlantic seaboard. The region is unique compared to neighboring regions in the Commonwealth in that three of its incorporated communities and several key economic drivers are located on islands in the Chesapeake Bay and Atlantic Ocean.



**Figure 1: Eastern Shore of Virginia Location Map**

### REGION PROFILE

On the seaside of the Eastern Shore are thousands of acres of pristine salt marshes, tidal mudflats, shallow lagoons, and navigable tidal channels that support thriving seafood and recreational tourism industries. These environments are bound on the east by a barrier island chain that is largely undeveloped and on the west by the mainland. The bayside, though more developed, also has near-shore islands (that are not the same as barrier islands), with its own salt marshes and brackish marshes.

Together, the area is an important stopover and wintering ground for migratory waterfowl. Coastal marshes provide food and nesting for birds, mammals, reptiles, and amphibians. Some of the very qualities that make the Eastern Shore more attractive for other animal species have long drawn humans to live and work, and later to recreate, on the peninsula's shores and in between.

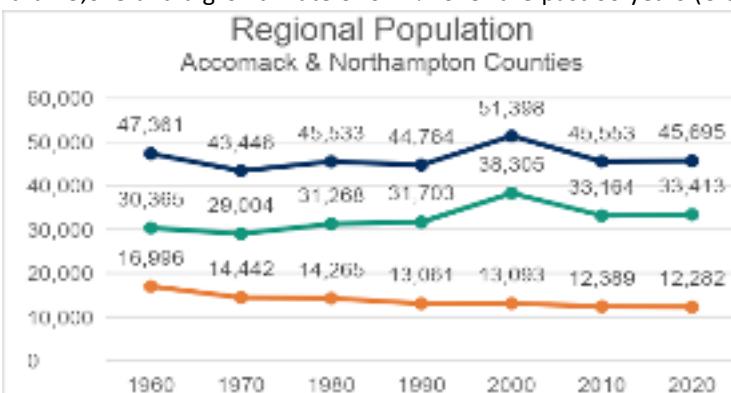
First American populations tended to be mobile and in concert with nature's inconsistencies; however, with European systems of extracting wealth from natural resources and patterns of permanent settlement tending to be near water, naturally occurring phenomena became a threat to life and property and a risk to be managed and mitigated. Primary hazards are coastal flooding, coastal erosion, storm water flooding, and wind. Secondary hazards are groundwater/well contamination, snow and ice, drought, and sewage spills.

### SOCIO-ECONOMIC

Part of assessing hazards in relation to their risk is understanding the people affected. Not all people are affected equally. Some are affected by the factors relating to their ability to understand risks posed by hazards, and some by their ability to remove themselves from harm's way. Those factors include age, mobility, income, and the languages individuals speak and the languages in which individuals are able to access information.

### DEMOGRAPHICS

Population for the two-county region has seen a net decrease of about 1,600 since 1960; however, this does not paint a fair picture of how the population on the Eastern Shore has changed. As Figure 2 shows, population has shifted from Northampton to Accomack County, with Northampton seeing a net loss of approximately 4,714 residents in the 60-year period from 1960 to 2020, with another slight decline of 102 residents within the last decade. Accomack County, however, after experiencing a small initial decline in population between 1960 and 1970, saw its population grow to a high of 38,305 by 2000. The population fell again by 2010, but still netting an increase of more than 3,048 and a growth rate of 0.17% over the past 60 years (U.S. Census 2020). Population projections for 2030 and beyond have not been made available yet by the Cooper Center for Public Service as of December 2021.



**Figure 2: Regional Population**

The 2020 U.S. Census shows both Counties have White/Caucasian alone as the largest race/ethnicity, which has grown by 0.8% since 2010. The Black/African American population has decreased throughout the region from 30.2% in 2010 to 27.2% in 2020, and the Hispanic/Latino population has increased from 8.2% to 9.8%, respectively.

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

Not only is the overall population not growing, it is aging in place. As reflected in Table 1 below, the median age for Accomack County residents has increased from 39.4 years old in 2000 to 45.9 in 2020, an increase of about 6 years. Similarly, Northampton County has also experienced an aging population, with the median age increasing from 42.4 in 2000 to 49 in 2020. In 2019, 89% of the region spoke only English at home, with 11.9% of the region's population speaking another language. Spanish was the most common second-language for both counties.

**Table 1: Regional Demographic Data**

	2020			2010			2000		
	Accomack	Northhampton	Region	Accomack	Northhampton	Region	Accomack	Northhampton	Region
<b>Population</b>	33,413	12,282	45,695	33,164	12,369	45,533	38,305	13,093	51,398
<b>Median Age</b>	45.9	49	n/a	44.7	47.8	n/a	39.4	42.4	n/a
<b>Median Household Income</b>	\$46,073	\$47,227	n/a	\$41,372	\$35,760	n/a	\$30,250	\$28,276	n/a
<b>Poverty</b>	6,141	2,079	8,220	5,258	2,311	7,569	6,788	2,633	9,421
<b>% In Poverty</b>	18.4%	17.3%	18.9%	15.9%	18.7%	17.0%	18.0%	20.1%	18.5%
<b>Disability</b>	4545	1811	6356	4408	n/a	n/a	n/a	n/a	n/a
<b>% Disabled</b>	14.0%	15.6%	14.0%	13.3%	n/a	n/a	n/a	n/a	n/a

Sources: U.S. Census 2020, 2010, 2000; American Community Survey Five-Year Estimates 2019

Approximately 14% of residents in both counties identified having some sort of disability in 2020. That compares to about 12% nationally, and 12% for Virginia as a whole. There are a range of disabilities reflected in this statistic, and those disabilities can affect everything from a person's ability to receive and process information about hazards and actions to take to protect themselves and their property in the event of a hazard, to their physical ability to carry out such actions. The disability demographic does not include individuals living in group settings, such as nursing homes.

Poverty can be another factor that limits an individual's ability to receive or respond to information about hazards. For example, many hurricane preparedness campaigns presuppose availability of \$50-\$100 required to assemble the basic items recommended for an emergency kit for a family of two to four. Moreover, families struggling with food security are not likely to stash three days' worth of food when day-to-day meals are uncertain. The rate of poverty throughout the region has remained relatively the same since 2000, with 18.9% of residents in the region under the poverty threshold in 2020. Northampton County has seen a slight decrease of those under the poverty threshold by approximately 3%. Compared to the United States poverty average of 13.4% and Virginia at 10.6%, both counties and the region overall have higher rates of poverty.

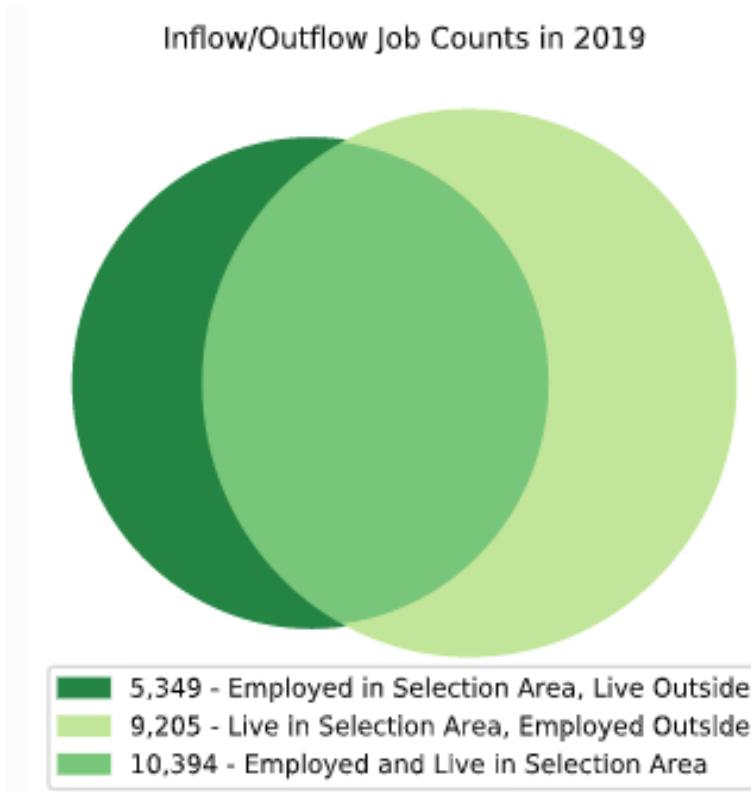
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## WORK FORCE

Employment patterns are important to examine for two reasons. They can help to identify concentrations of people for hazard information dissemination or hazard rescue and evacuation. They can also identify where disruptions in employment and income might occur in the aftermath of a disaster.

The size of the workforce in the two-county region has declined by approximately 0.4% from 2010 to 2019 according to estimates from the U.S. Census Bureau's American Community Survey. Two primary contributors to the dwindling workforce include the shrinking population and the population as a whole aging out of the workforce. On the whole, there is a net outflow of jobs, meaning the workforce is larger than the number of jobs available (Figure 3).

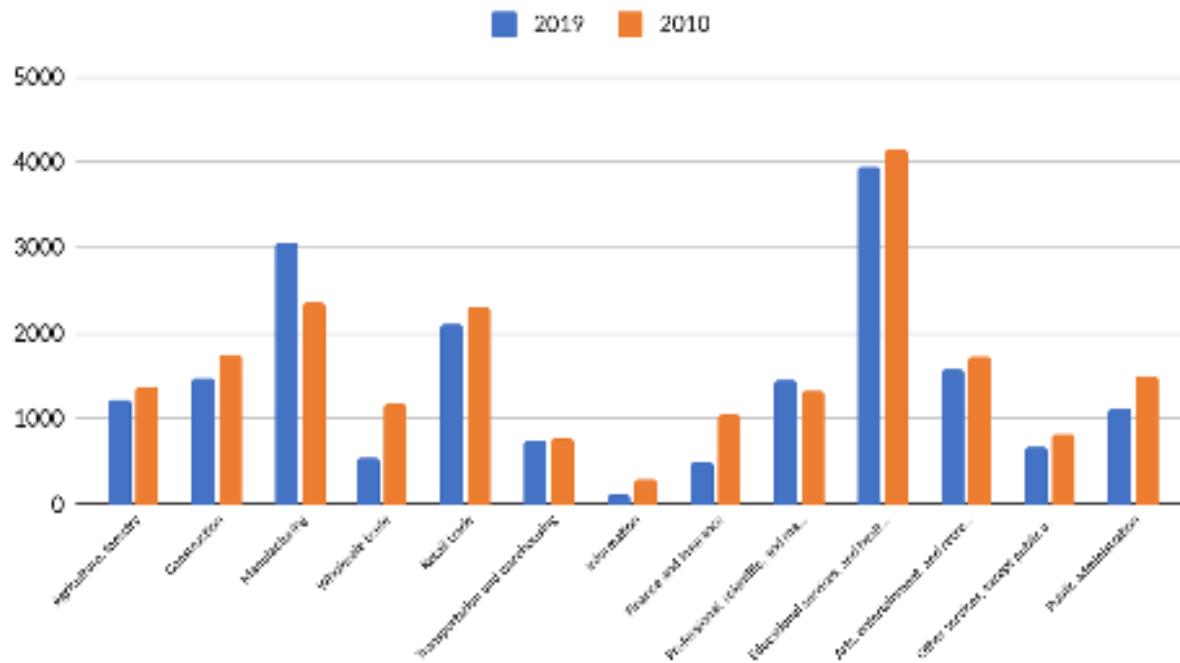
**Figure 3: Inflow/Outflow Job Counts in 2019**



Source: U.S. Census Bureau. 2019. OnTheMap Application. Longitudinal-Employer Household Dynamics Program.  
[http://onthemap.ces.census.gov/.](http://onthemap.ces.census.gov/)

**Figure 4: Civilian Employed Population 2010-2019 (US Census 2010, ACS 2019)**

### Eastern Shore Civilian Employed Population 2010-2019, by Industry



The category of educational and health care services dominates the work in which regional employees are engaged, followed by manufacturing, retail trade, and the employment grouping of arts, entertainment, recreation, and food services (Figure 4).

**Table 2: Regional Local Workforce Industry**

Industry	Civilian Employed Population				Regional Change
	2019	Percent	2010*	Percent	
Agriculture, forestry, fishing/hunting, or mining	1,215	6.5%	1,367	6.4%	-1.2%
Construction	1,476	8.0%	1,756	9.0%	-1.8%
Manufacturing	3,062	16.5%	2,366	11.5%	3.3%
Wholesale trade	558	3.0%	1,172	6.1%	-5.8%
Retail trade	2,119	11.4%	2,302	11.2%	-0.9%
Transportation and warehousing, and utilities	748	4.2%	770	3.7%	-0.3%
Information	124	0.7%	300	1.5%	-6.5%
Finance, insurance, real estate, and rentals	502	2.7%	1,047	5.1%	-5.8%
Professional, scientific, waste management	1,446	7.9%	1,323	6.4%	1.0%
Educational, health care, social services	3,960	20.1%	4,149	20.2%	-0.5%
Arts, entertainment, recreation, food	1,571	3.6%	1,720	8.4%	-1.0%
Public Administration	1,117	6.0%	1,494	7.3%	-2.8%
Other	674	3.6%	819	4.0%	-2.0%
TOTAL CIVILIAN EMPLOYED POPULATION	18,572	-	20,585	-	-1.1%

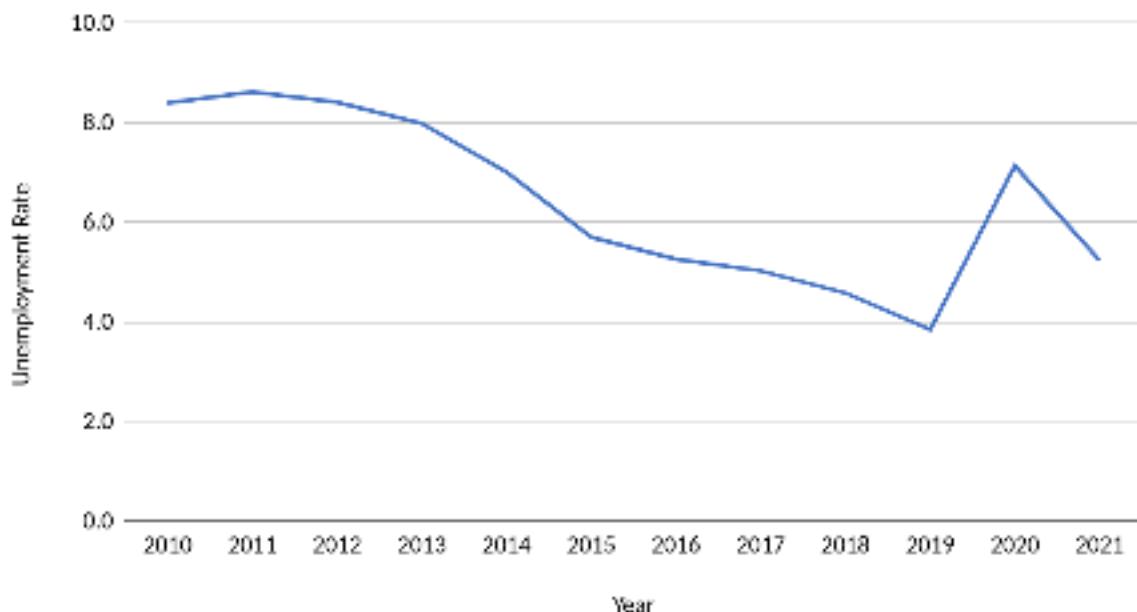
Source: ACS, 2019, \*U.S. Census 2010

## The Region

Because many of the major employment categories are tied to seasons, such as agriculture and tourism, there are observable seasonal employment patterns which are easily observed unemployment rates, as shown in Figure 5 below.

**Figure 5: Regional Average Unemployment Rate, Not Seasonally Adjusted, 2010-2021  
(BLS Unemployment Statistics)**

### Regional Unemployment Rate 2010-2021



There is also a migrant labor workforce that appears seasonally for agricultural work, typically under H-2A work visas. That workforce was once estimated to be near 13,000 (*Virginia Pilot*, 2006), but is now believed to hover closer to 1,000 or more (*New York Times*, 2020).

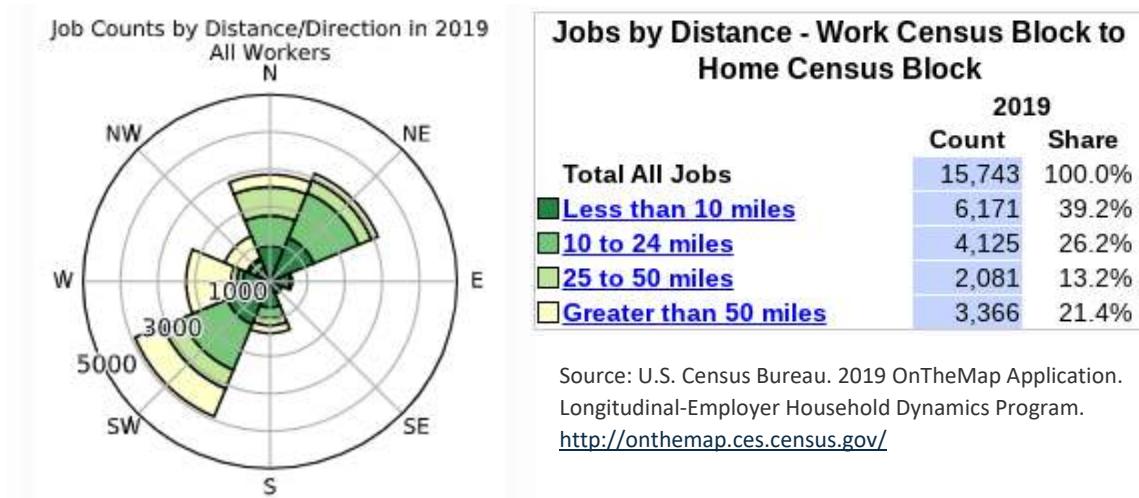
In addition to knowing the type of work in which people are engaged, it is helpful to examine commuting patterns at a regional level to ascertain the scales of hazards that may create large-scale unemployment based on where people work. Figure 6 shows the most common work locations of Eastern Shore residents. Outside of the two-county region, the City of Virginia Beach and Fairfax County are the top two places outside of the region where residents work. Only about half of the approximate 16,000 workers in the region are employed in one of the two counties. Approximately 5,000 of the region's workers commute at least 25 miles or more to work in the southwest direction (Figure 7). While there is no way to know how many telecommute, or how frequently, it is safe to assume that many cross the Chesapeake Bay Bridge Tunnel (CBBT). A hazard that disrupts travel on the CBBT could be economically challenging for the region.

**Figure 6: Job Counts by County: Where Eastern Shore Residents are Employed**

Jobs Counts by Counties Where Workers are Employed - All Jobs		
2019		
	Count	Share
All Counties	19,599	100.0%
Accomack County, VA	7,641	39.0%
Northampton County, VA	2,753	14.0%
Virginia Beach city, VA	619	3.2%
Fairfax County, VA	547	2.8%
Worcester County, MD	495	2.5%
Wicomico County, MD	464	2.4%
Norfolk city, VA	462	2.4%
Chesapeake city, VA	423	2.2%
Newport News city, VA	368	1.9%
Henrico County, VA	342	1.7%
All Other Locations	5,485	28.0%

Source: U.S. Census Bureau. 2019. OnTheMap Application. Longitudinal-Employer Household Dynamics Program.  
<http://onthemap.ces.census.gov/>

**Figure 7: Distance and Direction for Eastern Shore Residents' Commute to Work**



### BUSINESSES

Business data provides basic information used in projecting potential capital, rent, and income losses for businesses, as well as lost wages for employees. An inventory of businesses can also serve as an indicator of community recovery resources. Finally, business data can help to prioritize restoration of utility and infrastructure functions following a high-intensity hazard.

The uniqueness of the Eastern Shore is not limited to its geography. Its business profile is anchored in traditional land and sea-based pursuits of commercial seafood and agriculture, but boosts high technology as well, with the NASA Wallops Complex, including the Virginia Space and Mid-Atlantic Regional Spaceport at Wallops Island, and related industries and employers supplying another component of the area's economy. Tourism is also a driving component of the economy on the Eastern Shore. Chincoteague Island, with its proximity to the Chincoteague National Wildlife Refuge and Assateague Island National Seashore, combined with the herd of wild ponies auctioned every July following the annual Pony Swim, has the largest share of the tourism market. Other towns in the region, such as Tangier, Cape Charles, Onancock, and Wachapreague, have found their followings as well.

Even the more traditional sectors have incorporated high technology, with aquaculture becoming an increasingly important and reliable means of seafood production, GPS systems that ensure straight lines in crop fields, and complete computerization of the poultry industry with everything from metered watering and feeding of chicks, to the separation of chicken parts on the processing line. All of these improvements, while improving production, also boost the potential capital losses from disasters.

According to County Business Patterns, the number of business establishments in the region has declined by 127 from 2009 to 2019 (Table 3). The number of people employed in those establishments has decreased during that time period as well, by 564 individuals. In 2019, 20.9% of all the establishments in the region belonged to the Retail Trade industry, which was the most prominent industry in both 2009 and 2019. Retail Trade was followed by Accommodation and Food Services at 13.3% and Construction at 9.8%. Other Services (except Public Administration) accounted for 12.7% of the region's industry in 2019.

**Table 3: Region Business Types**

Industry Code Description	Total Establishments			
	2019		2009	
	Count	Percent	Count	Percent
Agriculture, Forestry, Fishing, and Hunting	13	1.3%	9	0.8%
Utilities	5	0.5%	-	-
Construction	101	9.8%	138	11.9%
Manufacturing	30	2.9%	25	2.2%
Wholesale Trade	36	3.5%	46	4.0%
Retail Trade	215	20.9%	246	21.3%
Transportation and Warehousing	16	1.6%	27	2.3%
Finance and Insurance	49	4.8%	52	4.5%
Information	18	1.8%	18	1.6%
Real Estate and Rental and Leasing	59	5.7%	50	4.3%
Professional, Scientific, and Technical Services	67	6.5%	92	8.0%
Administrative, Support, and Waste Management	36	3.5%	35	3.0%
Education Services	6	0.6%	-	-
Health Care and Social Assistance	85	8.3%	109	9.4%
Arts, Entertainment, and Recreation	21	2.0%	25	2.2%
Accommodation and Food Services	137	13.3%	140	12.1%
Other Services (Except Public Administration)	131	12.7%	144	12.5%
<b>Total, All Establishments</b>	<b>1,029</b>		<b>1,156</b>	
<b>Total Employees</b>	<b>12,070</b>	<b>26.4%</b>	<b>12,635</b>	<b>27.7%*</b>

Source: American Community Survey 5-Year Estimates 2009, 2019

\*Calculated using the 2010 U.S. Census Population and ACS 2009 Industry Data

## CULTURAL RESOURCES

Long before the first European colonists arrived on the land now known as the Eastern Shore of Virginia, the Accawmacke, part of the larger Powhatan confederacy, lived there subsisting on diets based around food availability in five culturally defined seasons. European colonists arriving on the Eastern Shore were some of the earliest in North America. The courthouse records in Northampton County, the oldest continuous courthouse records in the Country dating back to 1632, document not only court proceedings, but many aspects of life throughout the time of recorded history of the Shore. The courthouse records in Accomack County date to 1663. In Northampton County, records are stored in a climate-controlled room to protect them from deterioration. Accomack County does not have this protection for their records.

The Virginia Department of Cultural Resources catalogs known historic sites. Some of that information is shared widely through public designations such as historic road markers, historic districts, and properties on the national register of historic places. Other sites are examined as a part of environmental clearance processes, and because they may be private properties, the sharing of information about those sites is more sensitive.

Working closely with the Virginia Coastal Zone Management Program (VCZMP), the Accomack-Northampton Planning District Commission was able to interview residents of the Eastern Shore and document their accounts of coastal changes over the last several decades and more recent years. These can be accessed on the VCZMP Coastal Gems website ([www.coastalgems.org](http://www.coastalgems.org)) in the “Coastal Land” data category.

## BUILT INFRASTRUCTURE

Housing units, community facilities, and transportation are all important factors when considering hazard resiliency. They provide the social services necessary during hazardous scenarios, safe cover for those wanting to stay, and a way to leave for those seeking safer conditions.

### HOUSING UNITS

Knowledge of a community's housing base contributes to hazard and vulnerability analysis by quantifying the exposure. According to the U.S. Census Bureau, the Region's housing stock has grown by 2,979 units from 2000 to 2020, with almost all of that occurring between 2000 and 2010 (Table 4).

**Table 4: Housing in the Region**

	2020		2020		2010		2000	
	Region	Accomack	Northampton	Region	Accomack	Northampton	Region	Accomack
<b>Total Housing Units</b>	29,076	21,703	7,373	28,303			26,097	
Occupied	19,759	14,302	5,457	19,121			20,620	
%	68%	66%	74%	67.6%			79%	
Vacant	9,317	7,401	1,916	9,182			5,377	
%	32%	34%	26%	32.4%			21%	
	2019**		2019**		2010	2000		
	Region	Accomack	Region	Accomack	Northampton	Region	Accomack	Northampton
<b>Owner-Occupied</b>	12,333	8,977	3,356	13,516			14,131	
%	62.4%*	62.8%*	61.5%*	70.7%*			68.5%*	
<b>Renter-Occupied</b>	6,253	4,461	1,792	5,605			5,489	
%	31.6%*	31.2%*	32.8%*	29.3%*			26.6%*	
	2019**		2010		2000			
	Accomack	Northampton	Accomack	Northampton	Accomack	Northampton	Accomack	Northampton
<b>Median Housing Value</b>	\$171,800	\$176,800	\$149,800	\$199,600	\$79,300	\$78,700		

Source: U.S. Census 2000, 2010, 2020; \*\*American Community Survey 2019

\*Percentage calculated using ACS 2019 owner/renter-occupied data and U.S. Census 2020 total occupied units

The region has been experiencing an increase of renter-occupied units and a decrease of owner-occupied units over the past two decades. The amount of occupied housing units has decreased by 11% since 2000, paralleling the 11% increase of vacant units. This is likely due to an influx of individuals purchasing second homes near popular tourist destinations on the Eastern Shore, such as Cape Charles in Northampton County and Chincoteague in Accomack County. The unit is considered vacant if it is not the owner's primary residence. Vacant structures often lack year-round maintenance, therefore increasing the potential for loose, hazardous debris during high-wind events. According to American Community Survey five-year estimates, the median housing value in 2019 was relatively similar in both counties and has increased roughly \$100k since 2000. This amount is likely to increase even more due to a recent surge in the housing market. According to the Eastern Shore Association of REALTORS® Home Sales Report, the median sales price in the region was \$243,000 in the first quarter of 2021, up 35% from the previous year. Northampton County saw a 54% increase in median sales prices, while Accomack County observed a 29% spike ([ESAR 2021-Q1 Housing Market Report](#)).

## TRANSPORTATION

Transportation availability before a disaster is a major determinant of the ability of individuals to remove themselves from harm's way and to get aid and support into an area following a hazardous event.

### AUTOMOBILE

The primary form of transportation for most Eastern Shore residents is a personal automobile. Approximately 90% of households have at least one automobile available for use (Table 5). Rates of automobile availability have stayed relatively stable from 2000-2019, with three or more automobiles available growing the most in the 19-year period.

**Table 5: Vehicles Available per Household in the Region**

Vehicles Available	2019**			2010	2000
	Region	Accomack	Northampton	Region	Region
None	1,771	1,222	549	1,850	2,119
%	9%*	8.5%*	10.1%*	9.7%	10.3%
One	5,870	4,142	1,728	6,283	7,558
%	29.7%*	29%*	31.7%*	32.9%	36.7%
Two	6,678	4,916	1,762	7,357	7,584
%	33.8%*	34.4%*	32.3%*	38.5%	36.8%
Three or more	4,267	3,158	1,109	3,683	3,359
%	21.6%*	22.1%*	20.3%*	19.3%	16.3%

Source: U.S. Census 2000, 2010, 2020; \*\*American Community Survey 2019

\*Percentage calculated using ACS 2019 vehicles available data and U.S. Census 2020 total occupied units

The roadway system consists of 464 miles of public highways. U.S. Route 13 is a four-lane divided highway that runs down the peninsula's spine and is the primary north-south route. It serves as the region's designated hurricane evacuation route. This evacuation route is northbound only due to the fact that the 17.6-mile-long Chesapeake Bay Bridge Tunnel (CBBT), which connects the Eastern Shore peninsula to the Hampton Roads area, is not acceptable for use in the event of a hurricane or other hazard evacuation and is frequently forced to restrict travel due to high winds as well as other hazardous conditions. Further attesting to its importance in the highway system, Route 13 is also part of the Department of Defense Strategic Highway Network (STRAHNET), the Federal Highway Administration (FHWA) National Highway System, and is designated by the Virginia Department of Transportation (VDOT) as a Corridor of Regional Significance.

Tourists and residents alike rely on two major bridges and two causeways, including the CBBT, the Chincoteague Causeway and Draw Bridge, and, to a lesser extent in regional context, the Saxis Causeway. The CBBT opened to traffic in 1965 as a two-lane facility, which was later expanded into two lanes in each direction in 1999 – except where traffic merges into a single lane in both directions while passing through the two tunnels. Capacity plays a factor in the CBBT not being a designated evacuation route; however, as previously mentioned, wind restrictions stand as the primary cause. These restrictions operate on six different levels: ([CBBT: Travel and Weather](#)).

- Level 1: Wind speeds of 40 mph – Restricts campers, trailers, anything being towed, exterior cargo, etc.
- Level 2: Wind speeds of 47 mph – Restricts motorcycles, empty tractor trailers, moving vans, school buses, etc.
- Level 3: Wind speeds of 55 mph – The only vehicles allowed to cross are cars and pick-up trucks without exterior cargo, mini vans, SUVs, tractor trailers without trailers, empty flatbed trailers, commercial buses, and heavily-laden tractor trailers and tankers.

## The Region

- Level 4: Wind speeds of 60 mph – Only cars, pick-up trucks, SUVs, and mini vans are allowed to cross at a maximum speed of 45 mph.
- Level 5: Wind speeds of 65 mph – Only cars without exterior cargo at 45 mph can cross.
- Level 6: Unforeseen weather conditions or other safety concerns – Closed to all traffic.

Furthermore, the CBBT faces the risk of closure as a result of other hazardous conditions, such as vessels and large trucks striking the facility. In the late 1960's and early 70's, three ship accidents forced extensive closures. In December of 1967, a coal barge struck the bridge's roadbed, prompting a two-week closure. Just over two years later, the CBBT shut down for 42 days after the Yancey, a Navy attack cargo ship, rammed into the bridge while dragging anchor in a gale. Two more years later, the facility faced another two-week closure when a runaway barge shattered a section of the bridge ([Washington Post, 1984](#)). In more recent years, the bridge-tunnel was shut down on more than one occasion after a tractor trailer drove off the side of the bridge and plunged into the Chesapeake Bay. In 2018, an oversized work truck struck the ceiling of a tunnel, leading to a 17-hour closure and traffic nightmare. Lastly, a three-vehicle head-on crash inside one tunnel caused northbound and southbound lanes to close for just over one hour in the summer of 2021.

The Chincoteague Causeway and Draw Bridge, part of Virginia State Route 175, is the only route to and from Chincoteague Island. It has been subject to closure from several different storms and has been forced to close on multiple occasions, primarily due to flooding and extreme high tides; however, car crashes have also forced lengthy closures. In May of 2021, the Causeway was forced to close for nearly 7 hours as a result of a fatal head-on collision. What is likely a result of COVID-19, a recent increase in tourism and travel to more remote destinations, such as Chincoteague, has again sparked conversations regarding the safety of the Causeway leading to the resort island. The small bridge allowing vehicular traffic across the Assateague channel connects Chincoteague to Assateague Island, home of the famous wild ponies as well as the Chincoteague National Wildlife Refuge and Assateague Island National Seashore; thus, it is vital to the economy for the Town of Chincoteague in addition to Accomack County and the region as a whole. The Saxis Causeway is also the only route to and from the Town of Saxis. Although it is less exposed to open water than the Chincoteague Causeway, it has closed at least twice since 2000 as a result of flooding from storms. Another major causeway and bridge that is not as well known, though also extremely important to the region's economy, is the Wallops Island Causeway leading to NASA's only owned and operated launch range, the Wallops Flight Facility (WFF), as well as the Mid-Atlantic Spaceport and Navy Combat Systems Center. The WFF is at the core of an industry that supports over 5,800 jobs and impacts the U.S. economy by an estimated \$829.3 million ([NASA Wallops Flight Facility](#)).

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### PASSENGER TRANSIT

STAR Transit provides public transit service for approximately 86,000 ([Accomack Northampton Transportation District Commission \(ANTDC\) Minutes](#)) passengers annually; however, an evident decrease in ridership was prompted by the COVID-19 pandemic in early 2020. Operations typically span from roughly 6:00 AM to 6:00 PM Monday through Friday and extend from the Town of Cape Charles in Northampton County up to the Town of Chincoteague in Accomack County with a transfer point connecting northern and southern routes in the Town of Onley. Passengers are responsible for a \$0.50 ride fare and an additional charge for on-demand services and deviations from routes. STAR Transit would generally be available to assist in the event of an evacuation prior to an approaching hazard, though services would cease upon the arrival of dangerous conditions. Shore Ride, the Eastern Shore's only currently available ride sharing service, is also available for residents and visitors; nonetheless, this private service lacks the capacity needed for evacuations or high-demand service.

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### RAIL

Prior to 2018, Bay Coast Railroad operated 68 miles of track running along the elevated central spine of the Eastern Shore, paralleling U.S. Route 13 for approximately 41 miles. In 2018, however, 49.1 miles of the line, extending from

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

the Town of Hallwood south to the Town of Cape Charles, was abandoned under the approval of the Surface Transportation Board (STB). Subsequently, this portion of the corridor has been preserved via railbanking, a method approved by the National Trails Act. Operated by Delmarva Central Railroad as of 2018, the line north of Hallwood remains active, often serving NASA and the Wallops Flight Facility in Northern Accomack County. The remaining 49.1-mile stretch of rail has been sold and is currently being removed from the corridor in preparation for construction and development of the prospective Eastern Shore of Virginia Rail Trail. Provided funds are awarded or allocated for construction and other costs, the Eastern Shore Rail Trail would supply opportunities for economic development throughout the region in addition to providing safe access to outdoor recreation and exercise, towns up and down the Eastern Shore, local services, businesses, schools, churches, and more. The overall improvement of health for residents on the Eastern Shore is anticipated subsequent of trail development. Additionally, long-term maintenance of the trail is likely to encourage continuous maintenance of nearby drainage ditches, which could, in-turn, potentially alleviate impacts that often result from storm water flooding along portions of U.S. Route 13.

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### AVIATION

Although the closest scheduled air passenger services are located in Salisbury, MD to the north of the region and Norfolk, VA to the south, a number of other airports are located on the Eastern Shore. Most of these are small, private general aviation airports with turf runways. Airports open to the public with paved runways include the Accomack County Airport and the Tangier Island Airport. Additionally, the privately owned Campbell Field's two turf runways are located in Northampton County and open to the public.

The Accomack County Airport is located 0.7 mile east of the Town of Melfa and is accessible by vehicle from U.S. Route 13 through the Accomack County Industrial Park. According to the [Accomack County Website](#), the public airport is home to 25 based aircraft and two businesses that lease space from the Airport in addition to the 5,000 x 100-foot asphalt runway, automated weather observation, open lobby, pilot lounge, conference room, weather and flight briefing room, and a terminal area with a modern terminal building, self-serve and 100LL fuel service, Jet-A Fuel services, 18 T-hangars and T-hangar taxiway, a partial parallel taxiway, wireless internet access, an aircraft parking apron, and an automobile parking lot. Navigational aids include runway lights, rotating beacon, lighted windsock, an automated weather observation system (AWOS), localizer approach, and GPS. Current planned and ongoing projects for the Accomack County Airport include runway rehabilitation, apron expansion, and obstruction removal.

The public Tangier Island Airport has a 2,426 x 75-foot asphalt runway with AWOS and no lights for navigation aid. Tie-downs are available, but there are no hangars or fuel sales. Although there is no terminal building, there are restrooms available for use in an on-site trailer (Personal communications, Renee Tyler, Town Manager (former), April 1, 2016; confirmed January 19, 2022, [AIR NAV](#)).

Wallops Flight Facility (WFF) is a secure facility owned and operated by NASA. Landings there are for businesses with the federal government at NASA or related facilities and by permission only. A control tower operates 10 hours daily, Monday through Friday. Wallops boasts two crosswind runways, both exceeding 8,000 x 150 feet. Both have precision approach path indicators (PAPI), high intensity runway edge lights, runway end identifier lights (REILS), rotating beacon, AWOS, and GPS approaches. A third 4,808 x 150-foot concrete/asphalt runway intersects the other two runways and has the same navigational features as well as Jet A fuel availability ([www.aopa.org](http://www.aopa.org)). While Wallops is not open to the general public, its governmental ownership, large runways, and hangar space make it an ideal location for receiving cargo planes and supplies in the aftermath of a disaster. Airport officials have made space available in the past to Coast Guard officials for storing boats and other assets when hurricanes have threatened the Coast Guard Station on Chincoteague (Personal communications, Ed Sudendorf, WFF Airport Manager, April 8, 2016).

### COMMERCIAL AREAS

Commercial areas can be assets in times of disasters, but can also be areas of high economic vulnerability due to the higher investment, relative to residential areas. This is especially true in waterfront areas on the Eastern Shore. Large commercial parking areas can be useful for emergency response – some designated as points of distribution following disasters. Additional parking areas could be designated points of distribution as well, should the usual points be unavailable or unusable.

Many of the commercial areas are clustered in the region's nineteen incorporated towns, ten of which are along the Route 13 corridor and six waterfront communities. Other non-incorporated places dot the landscape, where churches, post offices, and remaining commercial enterprises hint at their once-bustling pasts. These unincorporated areas are well-known to the region's residents and include Atlantic, New Church, Willis Wharf, Quinby, Oyster, Pungoteague, Mappsville, and Tasley, to name a few.

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### REGIONAL SERVICES AND FACILITIES

Regional facilities are required to support the services and functions on a regional level, whether by government alone or in cooperation with other public and private entities. These facilities enhance the overall quality of life for the area and its citizens. It is important to note the facilities that are available in the event of a hazard, and to make an inventory of facilities that could be affected by a hazard. Regional facilities include such assets as public safety offices, public water and sewer systems, regional parks, and recreational facilities.

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#### PUBLIC SAFETY

Accomack County, Northampton County, the Town of Chincoteague, and Wallops Island all have departments of public safety with lead responsibility for coordination of public safety and emergency planning and response in conjunction with the numerous public safety entities across the two-county region. They also may open emergency operations centers that are activated at different levels contingent upon the seriousness of the situation and in accord with the Emergency Operations Plan (EOP) of each entity. Available EOP's can be accessed through the following links:

- [Accomack County](#)
- [Northampton County](#)
- [Town of Chincoteague](#)
- [Wallops Island](#)

#### LAW ENFORCEMENT

According to the [FBI's Crime Data Explorer](#), there are an estimated 163 police officers for the region employed by Accomack County Sheriff's Department, Northampton County Sheriff's Department, Cape Charles, Chincoteague, Eastville, Exmore, Onancock, Onley, and Parksley Police Departments; however, this number is not entirely inclusive of the region. Though the number of police officers not included is low, the following agencies and departments were not reported to the Uniform Crime Reporting (UCR) Program or included in FBI crime data: U.S. Fish and Wildlife, National Park Service, U.S. Navy, U.S. Coast Guard, NASA, State Police, Virginia Marine Resource Officers (VMRC), Game Wardens, Chesapeake Bay Bridge-Tunnel Police, and Eastern Shore Community College Police. In addition, the Bloxom and Hallwood Police Departments each have one full-time police officer not included in the previously stated figure.

Saxis and Tangier Police Departments are currently without any officers. The incorporated towns of Accomac, Belle Haven, Cheriton, Keller, Melfa, Nassawadox, Painter, and Wachapreague do not have their own police force and instead rely on the local Sheriff's Departments and Virginia State Police (VSP) for police protection. Many of these

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

towns, like Keller and Nassawadox, contract an officer from VSP or their respective County for additional traffic enforcement. The Town of Tangier currently relies on a VMRC officer that lives on the Island. Bloxom, Cape Charles, Chincoteague, Eastville, Exmore, Hallwood, Onancock, Onley, and Parksley all maintain a police force, though the size of the force varies from one to ten or more officers.

The Chincoteague Police Department is the only agency in the region with State Accreditation through the Virginia Law Enforcement Professional Standards Commission (VLEPSC), and the only town agency with a dispatch center. In 2017, Chincoteague's communication officers responded to approximately 6,000 calls, while ten sworn officers made nearly 200 arrests and issued over 1,000 uniform summonses ([Chincoteague Police Department](#)). Between July 2020 and September 2021, officers conducted 953 stops ([Virginia Data Open Portal](#)).

Accomack County Sheriff's Department in the Town of Accomac and Northampton County Sheriff's Department in Eastville provide general law enforcement services for the two counties. With an estimated total of 75 personnel, Accomack responded to more than 9,600 calls and conducted 1,104 stops/arrests in 2020 (Personal communications, Accomack County Sheriff's Department, July 27, 2021). The department's communication officers monitor exterior security for the Accomack County Jail, a maximum-security jail with an average daily population of 95 inmates, in addition to receiving and dispatching calls. Northampton's Department consists of an estimated 85 employees, 53 of which are employed at the Eastern Shore Regional Jail, a 248-bed facility housing both male and female minimum and maximum offenders. Virginia State Police (VSP) provide traffic enforcement, crash response, drug task force initiatives, drug education, and crime prevention activities from Post 31 in the Town of Melfa. Additionally, they provide disaster response resources following extreme hazards, such as the deadly 2014 tornado that hit Cherrystone Campground. The Eastern Shore of Virginia 9-1-1 Communications Center serves both Accomack and Northampton Counties and receives all 9-1-1 calls. Police calls are transferred to Accomack County Sheriff's Department, Northampton County Sheriff's Department, Chincoteague Police Department, or Virginia State Police. Fire and EMS calls are dispatched directly to the appropriate fire and EMS agency.

No police facilities are located within a Special Flood Hazard Zone (SFHA).

## The Region

### FIRE, RESCUE, AND EMS

When the alarms are sounded, career employees and hundreds of volunteers at 23 different stations are available to answer the call, from New Church in Northern Accomack County to Cape Charles in Southern Northampton County. Some stations provide a full-range of response – Fire, Rescue, and Emergency Medical Services (EMS) – while others are not fully arrayed. Mutual aid, a system of reciprocal assistance with neighboring departments, is imperative and allows all stations to provide the best coverage and life-saving services. Table 6 below provides a summary the capabilities of all Fire, Rescue, and EMS services on the Shore.

**Table 6: Regional Fire Company Capabilities**

Station Number	Agency Name	Fire	Rescue	EMS
1	New Church Volunteer Fire & Rescue	X	X	
2	Greenbackville Volunteer Fire Co.	X	X	X
3	Chincoteague Volunteer Fire Co.	X	X	X
4	Atlantic Volunteer Fire & Rescue Co.	X	X	
5	Saxis Volunteer Fire Co.	X	X	X
6	Bloxom Volunteer Fire Co.	X	X	X
7	Parksley Volunteer Fire Co.	X	X	X
8	Tasley Volunteer Fire Co.	X	X	
9	Onancock Volunteer Fire Department	X	X	X
10	Melfa Volunteer Fire & Rescue Co.	X	X	X
11	Wachapreague Volunteer Fire Co.	X	X	
12	Painter Volunteer Fire Co.	X	X	X
13	(Exmore) Community Fire Co.	X	X	X
14	Cheriton Volunteer Fire Co.	X	X	
15	Cape Charles Volunteer Fire Co.	X	X	
16	Northampton Volunteer Fire & Rescue	X	X	
17	Eastville Volunteer Fire Co.	X	X	
19	Cape Charles Rescue Service			X
20	Oak Hall Rescue			X
21	Tangier Volunteer Fire Co.	X	X	X
25	NASA WFF Fire (Main Base)	X	X	X
26	NASA WFF Fire (Wallop Island)	X	X	X
31	Northampton County EMS			X

Source: Eastern Shore of Virginia 911 Communications Center

When requested, the Virginia Department of Forestry responds to assist in fighting wildfires, bringing its bulldozers equipped with specially designed plows to make a fire line and two pick-up trucks equipped for firefighting.

Through the Eastern Shore Regional Fire Training Facility in Melfa, firefighters can receive training locally. A plan to upgrade and expand the facility to EMT accreditation standards is under review. This would allow EMT trainees to complete the entire process locally.

The majority of the Shore's Fire and EMS stations are located outside of special flood hazard areas (SFHA), with the exceptions of the Tangier, Chincoteague, Saxis, Wachapreague, and NASA WFF (Island) stations. None of the stations in a SFHA are mutual aid to each other. Although Tangier may seem more vulnerable due to its isolated location preventing mutual aid, Chincoteague and Saxis share its vulnerability during major storms. As flooding frequently causes both causeways to become impassable, Chincoteague and Saxis are left isolated without mutual aid as well.

Street flood patterns must be considered for all Fire and EMS stations. For example, using The Nature Conservancy's [Coastal Resilience Mapping Tool](#) to look at hypothetical storm scenarios shows that although the Greenbackville Fire Station remains elevated out of the flood zone during a moderate hurricane, the streets surrounding the station

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

could be covered under 4 to 8 feet of water. In such an instance, pre-storm evacuation of equipment would be needed in order to assist in post-storm recovery operations. A similar concern exists for Wachapreague, where the model shows that every route in and out of town would be inundated, even with a low-intensity hurricane. Chincoteague has plans with Wallops Island to evacuate equipment to the mainland in the face of a major storm.

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### WATER SUPPLY

The one thing all residents and businesses of the Eastern Shore have in common is that they rely on ground water for their drinking water – and much of their other water needs. In order to protect the water so many rely upon, both counties have adopted water supply plans and jointly manage a Regional Ground Water Resource Protection and Preservation Plan.

There are four major aquifers present in both counties. In order of the increasing depth below ground surface, the four major aquifers present in both counties are the Columbia (unconfined), and the Upper, Middle, and Lower Yorktown-Eastover (confined) aquifers. Aquifers deeper than the lower Yorktown-Eastover contain brackish and salt water, effectively limiting their use without additional treatment, and are not currently used as a source of drinking water. The entire two-county region, and therefore its aquifers, is located within the Eastern Shore Groundwater Management Area (ESGWMA) as defined by the Virginia Ground Water Management Act of 1992, which requires a permit from the Department of Environmental Quality (DEQ) for any person or entity wishing to withdraw in excess of 300,000 gallons per month from a declared Groundwater Management Area.

The majority of drinking water needs in the region are met through withdrawals from wells screened in the confined Yorktown-Eastover aquifers, while the rest is met through withdrawals from wells screen in the surficial Columbia aquifer. Ground water availability in the Columbia aquifer is characterized by relatively large recharge rates, lower aquifer storage, and a higher susceptibility to contamination; conversely, ground water availability in the Yorktown-Eastover aquifer is characterized by relatively low recharge rates, higher aquifer storage, and a lower susceptibility to contamination.

The Virginia Department of Health (VDH) records 135 public water systems on the Eastern Shore that use groundwater as their source of potable water. These systems include 68 transient non-community water systems (TNCWS), 46 non-transient non-community water systems (NTNCWS), and 21 community water systems (CWS). The TNCWS are principally small commercial systems such as gas stations, restaurants, fast-food services, campgrounds, and small agricultural systems. The NTNCWS are larger and include commercial office buildings, shopping malls, and industrial sites (Personal communications, Britt McMillan, Hydrogeologist Consultant, Eastern Shore Ground Water Committee, January 25, 2022). These systems may also serve vulnerable populations, such as schools, nursing homes, hospitals, and other health care facilities.

CWS provide water to permanent residents and include mobile home parks, subdivisions, and towns. Of the 21 CWS, 7 are municipal water systems serving a total population of 8,716 (U.S. Census 2020) in the towns of Cape Charles, Eastville, and Exmore in Northampton County and Chincoteague, Onancock, Parksley, and Tangier in Accomack County. Other community systems are privately operated and may serve areas such as Captain's Cove in Northern Accomack County with a population of 1,544 (U.S. Census 2020).

Despite the number of public wells, most residential dwellings in both counties are not connected to those public supplies and rely on private, individual wells for well water – many of which are within the SFHA and subject to periodic flooding. Wells permitted for public use are required to be tested regularly and after hazardous events to determine if the water is safe for public use. Thousands of private wells, however, are the responsibility of the owner; therefore, they may not be aware of the need to test or unable to afford the necessary sampling.

## The Region

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### SOLID WASTE DISPOSAL

Solid waste pick-up is determined by each individual town. For a fee, some private providers will provide service to areas outside of towns where the population is sufficiently concentrated to make it economically feasible. In other areas, it is the responsibility of the resident to take their household refuse and recycling to a convenience center for collection. There are 13 convenience centers in the region as well as a transfer station in each county.

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### PARKS AND RECREATION

There are several public parks and recreation areas located in the region. In addition to the information provided below, more details can be found in each locality's section, Chapters 10-29.

### BOAT LAUNCHES

Access to both the Chesapeake Bay and the Atlantic Ocean is one of the greatest assets of life on the Eastern Shore. With 36 public launch sites, many with multiple slips, there are endless recreational opportunities afforded by the waters around the peninsula and its creeks.

Unfortunately, these launch sites and other working waterfront infrastructure frequently experience flooding of grounds and dryland facilities, wave damage to docks or difficulty using docks due to recurrent flooding, flood impacts to buildings and equipment, and shoreline erosion with scouring and backwashing of bulkheads as a result of hazardous storms, particularly hurricanes and nor'easters. Snow and ice storms have also caused damage to working waterfront infrastructure, though it is not a significant concern for most facilities.

### NATURE PRESERVES

The Eastern Shore has many ecologically sensitive locations that have been set aside in public and private nature preserves and easements. Many are located along the seaside and bayside coastlines and benefit hazard mitigation through their ability to buffer the effects of coastal flooding and erosion.

The Department of Conservation and Recreation (DCR) manages five Eastern Shore natural preserves totaling almost 2,000 acres. Magoth Bay, 516 acres, and Mutton Hunk, 286 acres, are located on the seaside, while Cape Charles, Savage Neck Dunes, and Parkers Marsh are located on the bayside and encompass 29 acres, 298 acres, and 759 acres, respectively. In addition, The Nature Conservancy (TNC) owns 12 barrier islands and portions of two others that comprise its Virginia Coast reserve and form the longest expanse of coastal wilderness remaining on the eastern seaboard. Through this initiative, TNC protects some 40,000 acres of barrier islands, marshlands, and uplands ([The Nature Conservancy](#)).

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### DRAINAGE DITCHES

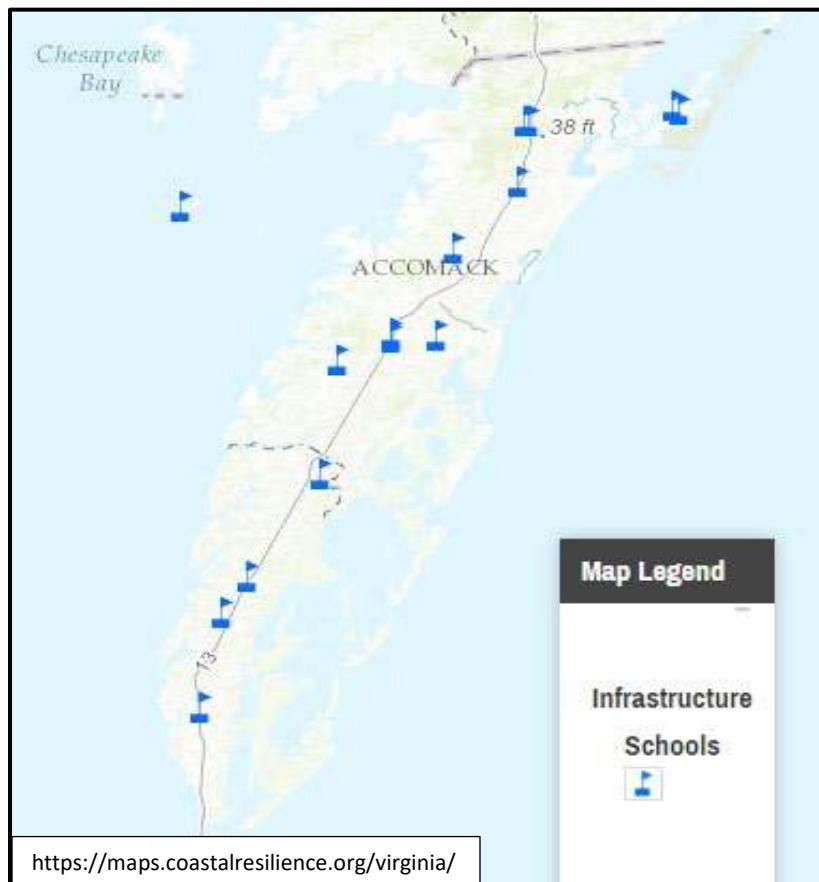
Drainage ditches are a component of infrastructure that often goes unnoticed by the public when functioning properly. There is no single regional body to manage storm water drainage; as a result, maintenance of drainage ditches and storm drains is a shared responsibility among VDOT, Accomack and Northampton Counties, and the incorporated towns.

In Accomack County, there are county funds for drainage projects with prioritization sometimes described as "complaint driven". Once problems are identified, easements must be obtained from property owners. If one property owner is not inclined to cooperate, it can be to the detriment of multiple other residents in the area. Northampton County does not have a county drainage system. Unless there is a connection with some other policy objective, such as the Chesapeake Bay Act, relief is rare.

### SCHOOLS

Northampton and Accomack County together house 15 public schools, as shown in Figure 8. A total of seven elementary schools are located in the region and include Chincoteague, Kegotank, Metompkin, Accawmacke, Pungoteague, Occohannock, and Kiptopeke. There are two middle schools, two high schools, and three combined schools: Arcadia Middle, Arcadia High, Nandua Middle, Nandua High, Northampton Combined (6-12), Chincoteague Combined (6-12), and Tangier Combined (K-12). The entirety of Tangier Combined School is located in the SFHA as well as a portion of Chincoteague Combined School. There are several private schools in the region including Cape Charles Christian School, Shore Christian Academy in Exmore, Central Baptist Academy in Onley, Broadwater Academy in Exmore, and the Montessori Children's House in Franktown. Additionally, both counties operate Head Start programs. Pre-schools and day care programs in the region have dwindled in recent years, causing issues for many parents. Unsurprisingly, this has only gotten worse with the onset of COVID-19 and the protective measures that followed.

**Figure 8: Public Schools in the Region**



High school graduates who wish to continue their education have the option to enroll at the Eastern Shore Community College (ESCC) in the Town of Melfa. Many students pick a focus of study in the fields of Applied Science, Technology, and Nursing, while others may enter dual enrollment programs, transfer programs, or career programs. Other nearby colleges include Norfolk State and Old Dominion University, located across the Chesapeake Bay Bridge Tunnel (CBBT), and University of Maryland Eastern Shore in Princess Anne and Salisbury University – both out-of-state universities located on the Eastern Shore of Maryland.

## The Region

If students choose to commute, most would likely head north into Maryland to attend classes; however, those that choose to commute south may face delays in the event of wind restrictions and/or closures to the CBBT. As previously mentioned under “Transportation”, the CBBT is at risk from additional hazards as well.

The University of Virginia and William and Mary operate coastal research facilities in the region. Each has approximately a dozen member universities and has been educating students of all ages for nearly 50 years. The University of Virginia’s Anheuser-Busch Coastal Research Center in Oyster supports research activities in coastal bays, salt marshes, and barrier islands. Furthermore, the center carries a permanent field staff, laboratories, classrooms, and a dormitory capable of housing up to 30 individuals. William and Mary’s Virginia Institute of Marine Science (VIMS) Eastern Shore Laboratory is located in the Town of Wachapreague and supports field research in coastal ecology and aquaculture. This facility has a permanent field staff, dry and saltwater labs, classrooms, and dormitory space capable of housing 42 individuals. Due to the saltwater lab’s location in a VE (velocity) flood zone, special flood proofing standards were applied. The building was constructed with an elevated foundation that brings the flood to 9 feet above mean sea level and a waterproof envelop that provides flood protection up to 14 feet above mean sea level.

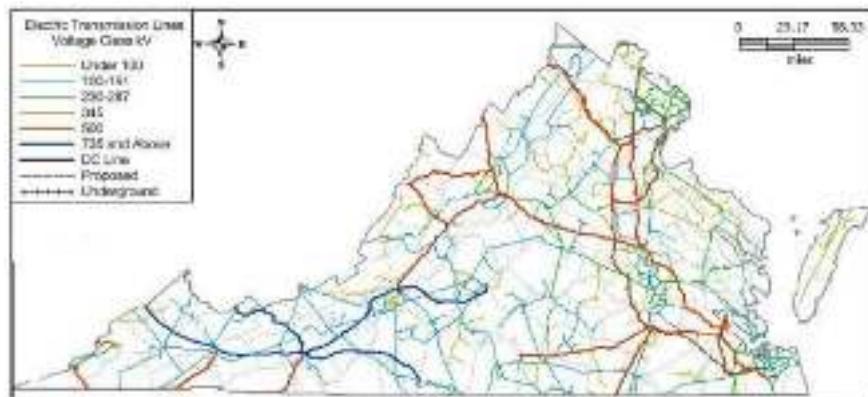
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### ELECTRICAL DISTRIBUTION

Electricity is provided by A&N Electrical Cooperative (ANEC), a member-owned cooperative that serves the entire Eastern Shore. As shown in Figure 9, all Eastern Shore transmission lines are less than 100 kilovolts, except a small stretch extending from the “peaker plant” in the northern part of Accomack County.

The peaker plant is a diesel-powered plant with 350-megawatt capacity that kicks in during periods of peak demand. It is the largest electrical producer on the Shore, but several smaller generators are placed throughout both counties. Old Dominion Electric Cooperative (ODEC) owns six sites in Accomack County, each with two 4-megawatt generators that run on ultra-low sulfur diesel fuel stored on-site. According to the [ODEC Website](#), these generators are utilized in the event of electrical transmission problems. Other locations with generating capacity include Tasley, Bayview, Tangier, and Accomack County.

**Figure 9: Electrical Transmission Lines in Virginia**



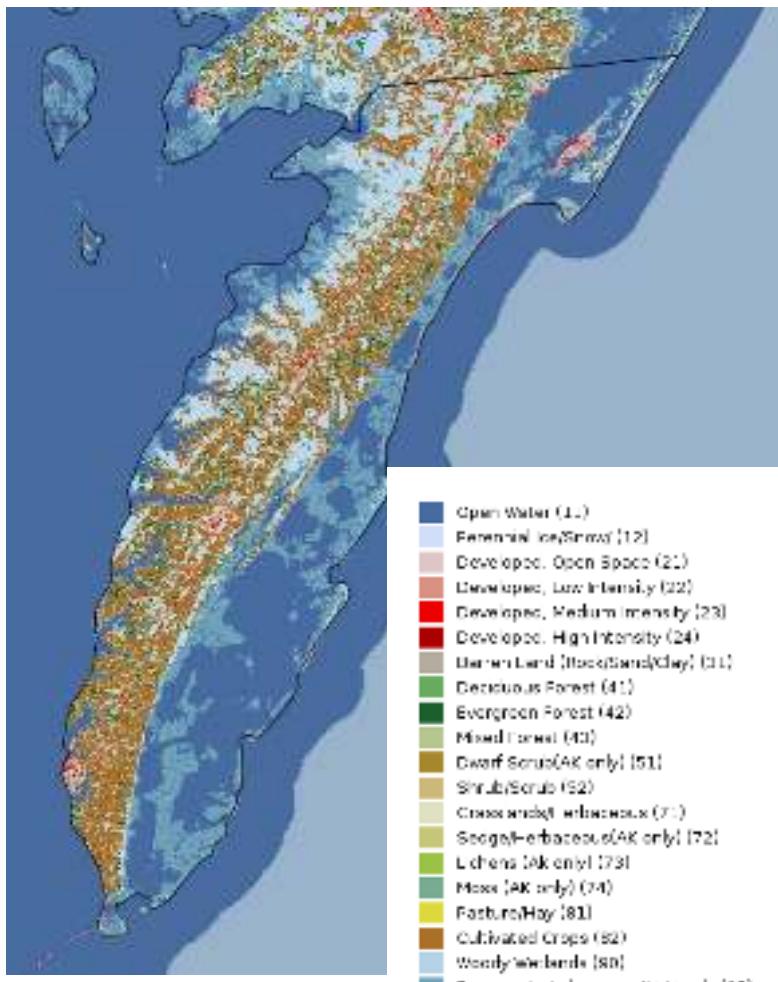
Source: Virginia Department of Mines, Minerals, and Energy. “Energy Assurance Plan”, 2012

## NATURAL ENVIRONMENT

Below is a description of the region's natural environment. A detailed discussion and break down of geology and soils on the Eastern Shore of Virginia can be found in Chapter 7: Storm Water.

### LAND COVER

As shown in the Figure 10 land cover map with associated acreage, the two categories of wetlands account for nearly half of the region's land cover. The animal and aquatic habitat, recreational, and economic resources in the region's largely unspoiled wetlands are of the highest order and central to the lives and livelihoods of the Eastern Shore's residents and businesses. Additionally, wetlands provide great coastal resilience benefits and help to blunt the effects of storm surge by absorbing wave energy, storing storm water, and slowing erosion. All developed land uses account for 8.1% of the total land cover on the Eastern Shore.



Land Cover	Acres	Percent
Barren Land	41,812	1.89%
Cultivated Crops	472,787	21.38%
Deciduous Forest	42,486	1.92%
Developed, High Intensity	2,793	0.13%
Developed, Medium Intensity	11,301	0.51%
Developed, Low Intensity	34,275	1.55%
Developed, Open Space	130,562	5.91%
Emergent Herbaceous Wetland	587,339	26.56%
Evergreen Forest	109,082	4.93%
Hay/Pasture	189,483	8.57%
Herbaceous	9,049	0.41%
Mixed Forest	44,361	2.01%
Shrub/Scrub	50,010	2.26%
Woody Wetland	485,687	21.97%
Totals	2,211,027	100.00%

**Figure 10: Land Use Land Cover Map with Associated Acreage\***

Source: National Land Cover Data Set, 2019.

\*Associated Acreage 2011 data

## GROUNDWATER

The Eastern Shore of Virginia depends entirely on ground water for potable water supplies as well as most non-potable water supplies, such as irrigation water. Because the peninsula is surrounded by large bodies of saltwater, ground water becomes brackish at relatively shallow depths, generally less than 350 feet, in most areas, and the total available ground water supply is more limited than on the mainland. The Eastern Shore of Virginia is one of six EPA-designated sole source aquifers in the Mid-Atlantic region.

Threats to ground water in the region may be placed into three general categories:

- Saltwater Intrusion
- Hydraulic Head Depression
- Contamination

Intrusion of saltwater into fresh ground water aquifers can be caused by wells that are screened too close to the fresh water/saltwater interface, are too close to the shoreline, and/or pump at an excessive rate. Depression of the hydraulic head occurs around every pumping well, but if pumping rates are too high or if wells are too close to one another, water levels in wells can drop so low that well yields are reduced. In extreme cases the head may fall so low that the aquifer is partially dewatered, potentially resulting in consolidation and a permanent loss of transmissivity – which will also reduce well yield (Eastern Shore of Virginia Ground Water Resource Protection and Preservation Plan, 2013).

The State Water Control Board included the Eastern Shore of Virginia in the consolidated Eastern Virginia Ground Water Management Area after observing declining levels of ground water and interference between wells in two areas of Accomack County as well as contamination in the confined water table aquifer and the possibility of over-withdrawal if not monitored closely. This designation allows the Virginia Department of Environmental Quality (VDEQ) to regulate ground water withdrawals that equal or exceed 300,000 gallons per month.

Recognizing the importance of protecting the vital resource, the Accomack County Board of Supervisors and the Northampton County Board of Supervisors formed the Ground Water Committee in 1990. The Committee includes elected officials, citizens, and local government to help promote understanding, awareness, and responsible management practices and prepare all necessary ground water studies and plans. Ground water withdrawal applications submitted to VDEQ are also reviewed by the Ground Water Committee.

## HAZARD PREPAREDNESS & COMMUNITY CAPABILITIES

### PREVIOUS HAZARD MITIGATION PLANS

The Eastern Shore of Virginia has participated in the hazard mitigation process since 2006. The region's primary risks identified by the Hazard Mitigation Steering Committee include coastal flooding, coastal erosion, high-wind, and storm water flooding. A list of additional risks identified by the Steering Committee can be found in Chapter 3: Risk Assessment. The locality sections of the Plan, Chapters 10-29, also provide details on how specific secondary hazards have, or could potentially, affect their local community and the region as a whole.

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

**Table 7: Regional Hazard Mitigation Resources**

<b>Resource</b>	<b>Participating Agencies &amp; Members</b>	<b>Mission</b>	<b>Updated</b>
Eastern Shore of Virginia Hazard Mitigation Plan	A-NPDC, FEMA, VDEM; Accomack & Northampton Counties, 18 incorporated towns; federal, state, & local representatives of emergency management, health, & disaster preparedness	Provides details on hazard mitigation analysis and preparedness	2021
Virginia Hurricane Evacuation Guide	VDEM	Provides education & guidance on hurricane preparation and evacuation zones & routes; Provides recovery resources & emergency information	2019
All Hazards Emergency Preparedness Z-Card	Northampton County	Provides information & resources on preparing for disasters	2016
All Hazards Preparedness Guide Brochure	Eastern Shore Disaster Preparedness Coalition (ESDPC)	Focuses on All Hazards; Provides information & resources on emergency planning, emergency supply kits, shelters, evacuation routes, & returning safely	2017
Transportation Infrastructure Inundation Vulnerability Assessment	A-NPDC, VDOT	Identifies various scenarios of inundated roadways from storm surge, tides, and SLR	2015
Emergency Operations Plan	Accomack County; Northampton County; Town of Chincoteague; Wallops Flight Facility	Provides a comprehensive review of actions for large scale emergencies; Details lines of responsibility, procedures, & response time	AC - 2018 NC - 2012 CH - 2021
Mutual Aid Agreements & Documents	Accomack County; Northampton County; Town of Chincoteague; Wallops Flight Facility; Accomack-Northampton Firemen's Association; Worcester County, MD	Ensures that resources are available when another EMS company's resources are insufficient for an incident or rendered unable to respond	Varies
Eastern Shore Oil and HazMat Response Plan	Departments of Public Safety, Eastern Shore Hazardous Materials Response Team, responding fire departments	Details steps for hazmat emergencies	2014; Reviewed annually
Eastern Shore of Virginia Hazardous Material Commodity Flow	Accomack County Department of Public Safety	Identifies the types of hazardous materials to ensure the proper response to hazmat incidents	2014
Eastern Shore Health District Pandemic Influenza Plan	VDH, Eastern Shore Health District	Ensures the continuation of public health services while providing for emergency needs during a pandemic	2009
FEMA Coastal Construction Manual	FEMA	Provides a comprehensive approach to planning, siting, designing, constructing, and maintaining homes located in a coastal environment	2011
Virginia Coastal Resilience Master Plan	Department of Conservation and Recreation; Local government, state agencies, federal partners, regional PDC's, Secure & Resilient Commonwealth Panel, VIMS, partner universities in Virginia Sea Grant Program, Commonwealth Center for Recurrent Flooding	Builds on 2020 Framework; Addresses concerns of flood exposure, vulnerability, & associated risks tied to socioeconomic, historical, & physical context; A call to action for the Commonwealth	Phase 1 Completed Dec. 2021

## The Region

**Table 8: Regional Hazard Mitigation Resource Committees & Programs**

Committees & Programs	Participating Agencies & Members	Mission	Established
Eastern Shore Disaster Preparedness Coalition	Accomack & Northampton Counties; VDEM, FEMA, VDH – Ranges from emergency services organizations, health departments, and schools to church-based disaster relief groups, mayors, and volunteer amateur radio operators	To form local & regional partnerships; Promote regional planning & coordination	2003
Climate Adaptation Working Group	Lead agency: A-NPDC Local, state, and federal representatives of government, aquaculture, agriculture, and community organizations	To better plan & mitigate risks associated with climate change & SLR; Provide educational outreach & develop planning tools	2012
Eastern Shore Ground Water Committee	Accomack & Northampton County Board of Supervisors, A-NPDC	To assist local governments and residents in understanding, protecting, and managing ground water resources; Maintain plans & studies; Serve as an educational resource	1990
Eastern Shore Navigable Waterways Committee	Accomack & Northampton County Board of Supervisors, A-NPDC, USACE	To study & advise respective Boards on condition & status of navigable waterways; List & prioritize navigation needs; Provide possible solutions	2015
Eastern Shore Health District (ESHD)	Accomack County Health Department, Northampton County Health Department	To prevent illness & disease, protect the environment, & promote optimal health and emergency preparedness	-
Eastern Shore Health District Emergency Preparedness & Response Program	State, regional, and local emergency response partners, local health care providers, volunteer groups; CDC, NACCHO	To effectively respond to any emergency impacting public health through preparation, collaboration, education, and rapid intervention	-
Eastern Shore Community Emergency Response Team (CERT) Program	Regional and local volunteers; Currently 250 members	To educate the public and distribute emergency preparedness public education materials to citizens and visitors, participate in training exercises, and to assist ESHD and LE to quickly distribute prophylactic medication to the entire region during a public health emergency	2004
Eastern Shore Medical Reserve Corps (MRC)	Volunteer medical and non-medical health care professionals, trained staff	To respond and assist local emergency responders and public health professionals	2004

## NATIONAL FLOOD INSURANCE PROGRAM & HAZARD MITIGATION GRANT PROGRAM

### NFIP

Table 9 below displays each jurisdiction's participation in the hazard mitigation planning process, the National Flood Insurance Program (NFIP), and the Community Rating System (CRS). Within the region, 18 jurisdictions including both counties have joined the NFIP, with the Town of Cheriton the most recent to join in 2020. Accomack County and the Towns of Chincoteague, Wachapreague, and Cape Charles are the only four jurisdictions in the CRS.

**Table 9: Program Participation by Jurisdiction**

Jurisdiction	HMP Participation	NFIP Participation	CRS Participation
Accomack County	2006	06/01/1984	10/01/1992
Town of Accomac	2021	08/23/2017	NO
Town of Belle Haven	NO	02/08/2001	NO
Town of Bloxom	2011	10/16/2012	NO
Town of Chincoteague	2006	03/01/1977	10/01/2000
Town of Hallwood	2011	05/01/2000	NO
Town of Keller	2011	NO	NO
Town of Melfa	2016	NO	NO
Town of Onancock	2006	12/15/1981	NO
Town of Onley	2011	02/01/2012	NO
Town of Painter	2021	NO	NO
Town of Parkesley	2011	12/22/2008	NO
Town of Saxis	2006	11/17/1982	NO
Town of Tangier	2006	10/15/1982	NO
Town of Wachapreague	2006	09/02/1982	10/01/1996
Northampton County	2006	08/11/1976	NO
Town of Cape Charles	2006	02/02/1983	05/01/2010
Town of Cheriton	2016	07/08/2020	NO
Town of Eastville	2011	05/08/2007	NO
Town of Exmore	2011	09/04/2008	NO
Town of Nassawadox	2016	05/08/2007	NO

Source: FEMA Community Status Book Report, 2021

The Town of Belle Haven is the only jurisdiction that has not yet participated in the hazard mitigation plan; however, they did join the NFIP in 2001 and currently have two active policies in place. Table 10 summarizes each participating locality's active NFIP policies, total losses/claims, total premiums, and the total amount paid as of February 2022. Even though both counties have joined the NFIP, citizens residing in incorporating towns are not eligible to purchase flood insurance under the program unless the town in which they reside has joined. The Towns of Keller, Melfa, and Painter in Accomack County have not joined the NFIP.

## The Region

**Table 10: Summary of the Region's NFIP Participation**

Jurisdiction	NFIP Participant	Active Policies	Total Losses	Total Premium	Total Paid	RL	SRL	Level of NFIP Regulations Required*
Accomack County	Y	1,230	778	\$923,105	\$9,168,322.97	-	1	60.3(e)
Town of Accomac	Y	2	0	\$1,038	\$0	-	0	60.3(a)
Town of Belle Haven	Y	2	0	\$908	\$0	-	0	60.3(c)
Town of Bloxom	Y	0	1	\$0	\$0	-	0	60.3(a)
Town of Chincoteague	Y	1,710	141	\$1,299,222	\$959,295.19	-	2	60.3(e)
Town of Hallwood	Y	0	1	\$0	\$4,922.75	-	0	60.3(a)
Town of Keller	NO	-	-	-	-	-	0	60.3(a)
Town of Melfa	NO	-	-	-	-	-	0	60.3(a)
Town of Onancock	Y	30	3	\$18,645	\$16,423.82	-	4	60.3(c)
Town of Onley	Y	1	0	\$415	\$0	-	0	60.3(a)
Town of Painter	NO	-	-	-	-	-	0	60.3(a)
Town of Parksley	Y	2	0	\$1,004	\$0	-	3	60.3(a)
Town of Saxis	Y	38	37	\$39,231	\$572,258.50	-	0	60.3(e)
Town of Tangier	Y	49	107	\$50,468	\$1,218,918.29	-	2	60.3(e)
Town of Wachapreague	Y	72	29	\$56,723	\$430,385.37	-	2	60.3(e)
<b>ACCOMACK TOTAL</b>	-	<b>3,136</b>	<b>1,097</b>	<b>\$2,390,759</b>	<b>\$12,370,526.89</b>	<b>92</b>	<b>14</b>	-
Northampton County	Y	222	78	\$177,672	\$949,284.61	-	0	60.3(e)
Town of Cape Charles	Y	170	14	\$92,992	\$95,059.05	-	0	60.3(e)
Town of Cheriton	Y	-	-	-	-	-	0	60.3(c)
Town of Eastville	Y	-	-	-	-	-	1	60.3(a)
Town of Exmore	Y	6	6	\$2,836	\$82,677.52	-	0	60.3(a)
Town of Nassawadox	Y	2	1	\$905	\$4,214.26	-	0	60.3(a)
<b>NORTHAMPTON TOTAL</b>	-	<b>400</b>	<b>99</b>	<b>\$274,405</b>	<b>\$1,131,235.44</b>	<b>11</b>	<b>1</b>	-
<b>REGION TOTAL</b>	-	<b>3,536</b>	<b>1,196</b>	<b>\$2,665,164</b>	<b>\$13,501,762.33</b>	<b>103</b>	<b>15</b>	-

Source: FEMA NFIP Data Report, 2022

\*60.3(a)-FEMA has not defined SFHAs within community; 60.3(c)-FEMA has provided FIRM with BFEs;

60.3(e)-FEMA has provided FIRM showing coastal high-hazard areas

The NFIP tracks a category of high-risk structures called repetitive loss (RL) properties. These properties are defined as any insurable building for which two or more claims of more than \$1,000 were paid by the NFIP more than ten days apart, within any rolling 10-year period since 1978<sup>1</sup>. Repetitive loss structures account for approximately 1% of NFIP policies, but 25-35% of flood insurance claims. Throughout the region, 103 repetitive loss properties have seen 304 losses with payments from the NFIP totaling over \$5.5 million for both structures and contents (FEMA NFIP Data Report, February 2022). A further classification is for severe repetitive loss (SRL) properties. These properties have incurred four or more separate flood-related claim payments exceeding \$5,000 for buildings and contents under flood insurance coverage or cumulative amounts exceeding \$20,000, OR for which the total of at least two separate building loss claim payments exceed the market value of the insured property. As of 2022, there are 15 total SRL properties in the region, with all but one located in Accomack County.

<sup>1</sup> Note that FEMA's Flood Mitigation Assistance Program defines repetitive loss differently: A structure that has incurred flood-related damage on two occasions, in which the cost of the repair, on the average, equaled or exceeded 25 percent of the market value of the time of each flood event, and at the time of the second incidence the contract has increased cost of compliance coverage. See FEMA Flood Insurance Manual for details. <http://www.fema.gov/media-library/assets/documents/115549>

#### **HMGP**

The region's participation in the Hazard Mitigation Grant Program (HMGP) dates back to 1999 and the major disaster declaration following Hurricane Floyd. Accomack County received funds for a project to elevate 29 homes, while Northampton County received funds for utility proofing in addition to the elevation of 3 homes.

To date, a total of 24 homes in Northampton County and nearly 100 in Accomack County have been elevated out of the floodplain. No houses have been razed or relocated under the programs. The Accomack-Northampton Planning District Commission (A-NPDC) manages the HMGP for the Eastern Shore and intends to submit an application for another round of funding to elevate a number of additional homes, particularly on Tangier Island.

## HAZARDS PROFILE

The top four hazards identified by the Hazard Mitigation Steering Committee were high wind, coastal erosion, coastal flooding, and storm water flooding. Additionally, the Committee included pandemic as a new hazard for the 2021 Plan, which was also ranked as a high-priority hazard. Medium-priority hazards include well contamination and biological hazards, as well as the three newly identified hazards, storm surge, non-coastal flooding, and road and highway. Substance use and overdose, communications failure, active threat, electrical energy failure, and tornado were all new hazards and ranked as low-priority. Further details can be found in Chapter 3: Risk Assessment.

It is important to note that these are region-wide rankings. Rankings decided upon by each individual locality vary according to the risk assessments performed for that locality. Information on these hazards can be found in each locality's respective chapter.

### HIGH WIND

High-winds on the Eastern Shore of Virginia primarily stem from hurricanes and tropical storms, off-shore low pressure systems like nor'easters, rotating cells in thunderstorms that produce tornadoes and waterspouts, and straight-line winds associated with fast-moving thunderstorms.

Large storms, such as hurricanes and nor'easters, typically affect the entire region; however, localized events often carry regional impacts as well. Damage or destruction to one localized area could impact the economy of the entire Eastern Shore as well as hinder available emergency response resources. When a deadly tornado struck Cherrystone Campground in 2014, units from across the region were called on to respond and were not available to the rest of the region for several hours.

Additional details on historic wind events in the region, the causes of high-winds, regional exposure, and attempts to manage loss, see Chapter 4: High Wind.

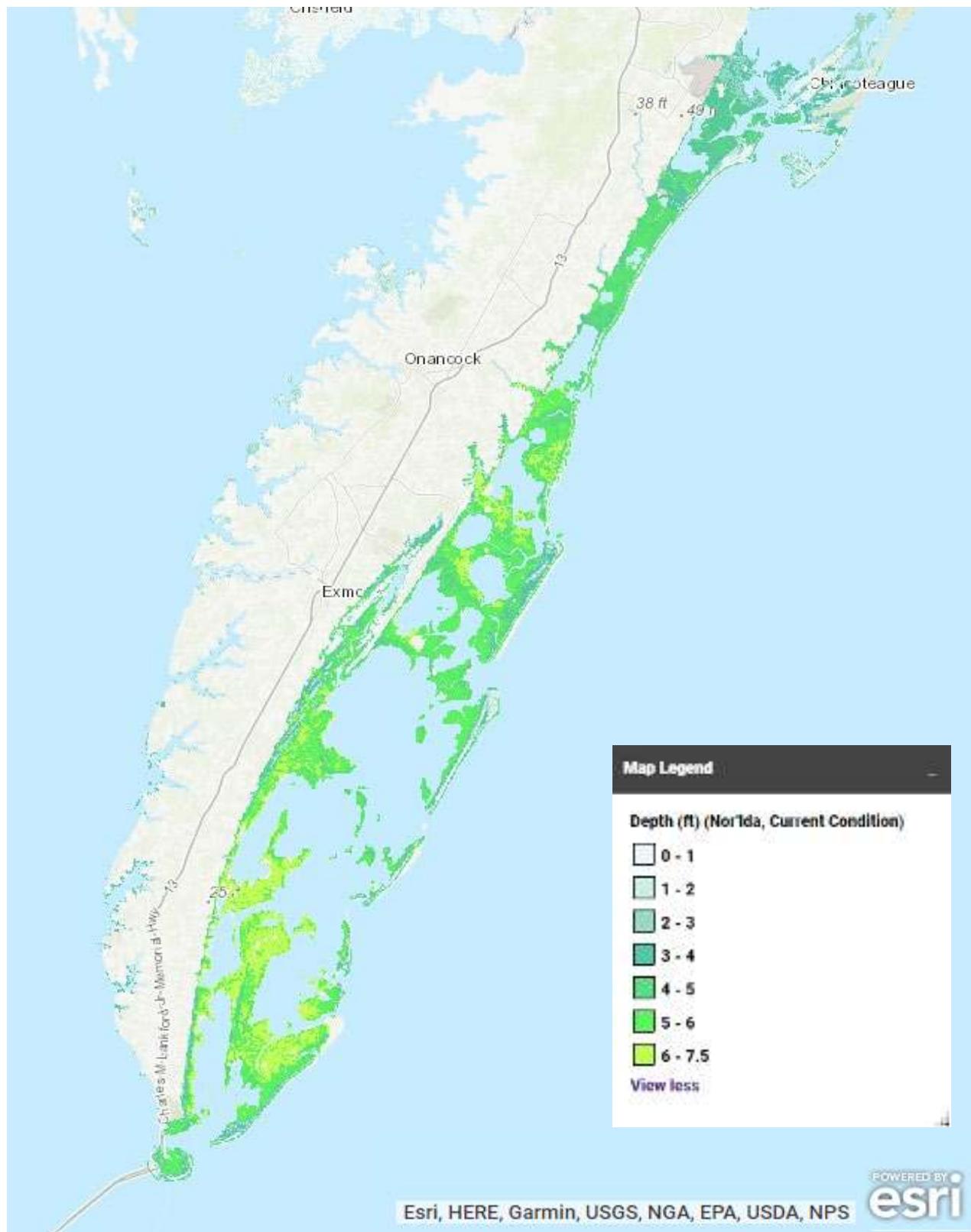
### COASTAL EROSION

All areas of the Eastern Shore are susceptible to coastal erosion, whether from water, wind, or waves. The barrier island ecosystem on the seaside, with its expanses of tidal marshes, mudflats, and lagoons, buffer the mainland from the worst of storm impacts, dissipating wave energy and mitigating floods. Natural low banks and marshes on the bayside are subject to direct wave action erosion from wind, storms, and motorized watercraft. Mitigating erosion of the barrier islands and marshlands surrounding the Eastern Shore is critical to the region's well-being as we know it.

Figures 11, 12, and 13 were created using The Nature Conservancy's (TNC) Coastal Resilience Mapping Tool. Figure 11 demonstrates the storm surge that occurred from Nor'Ida in November of 2009, while Figure 12 shows the potential storm surge from a high-intensity storm, which would be completely devastating for the region as the shoreline continues to experience a great deal of erosion, therefore increasing the region's vulnerability to coastal storms. In fact, as shown in Figure 13, 82% of the Eastern Shore's coastline is currently eroding (TNC Coastal Resilience Mapping Tool, 2021).

For a more detailed look into the causes of erosion for the bayside and seaside, see Chapter 5: Coastal Erosion.

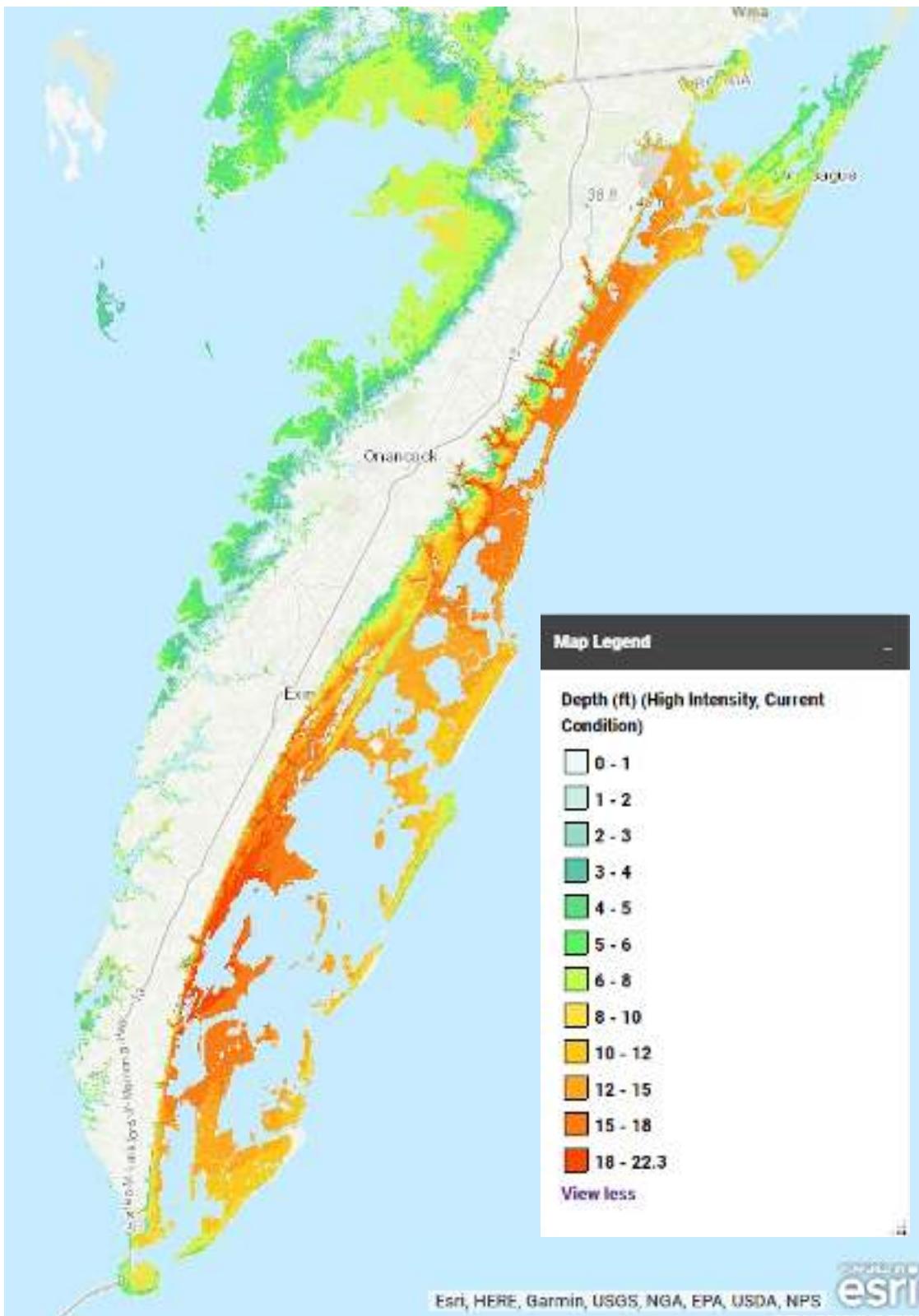
**Figure 11: Nor’Ida Storm Surge on the Eastern Shore of Virginia**



Source: Coastal Resilience Mapping Tool by The Nature Conservancy, 2021

## The Region

**Figure 12: High-Intensity Storm Surge**



**Figure 13: Eastern Shore of Virginia Coastline Change Rate**

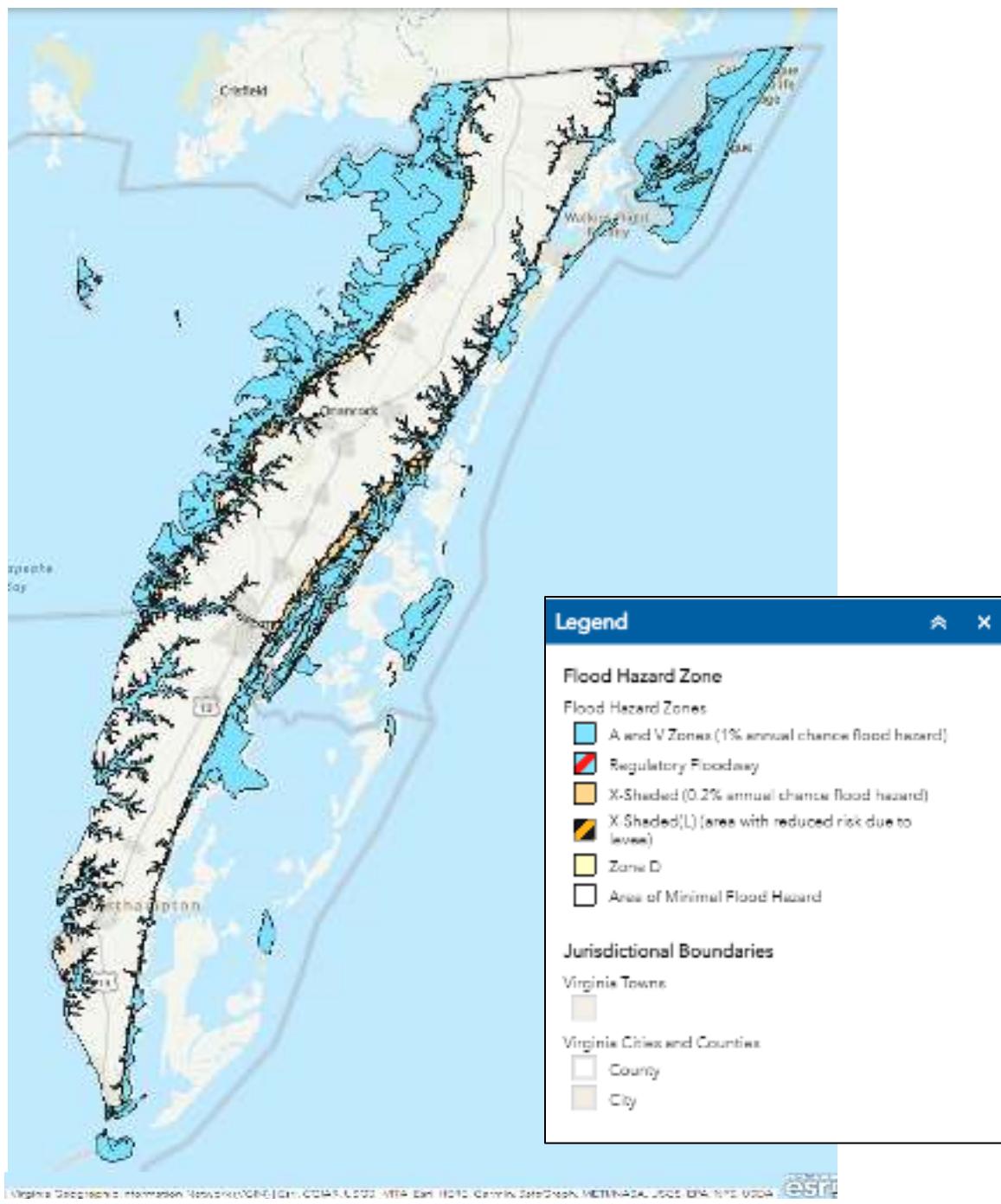


Source: Coastal Resilience Mapping Tool by The Nature Conservancy, 2021

## COASTAL FLOODING

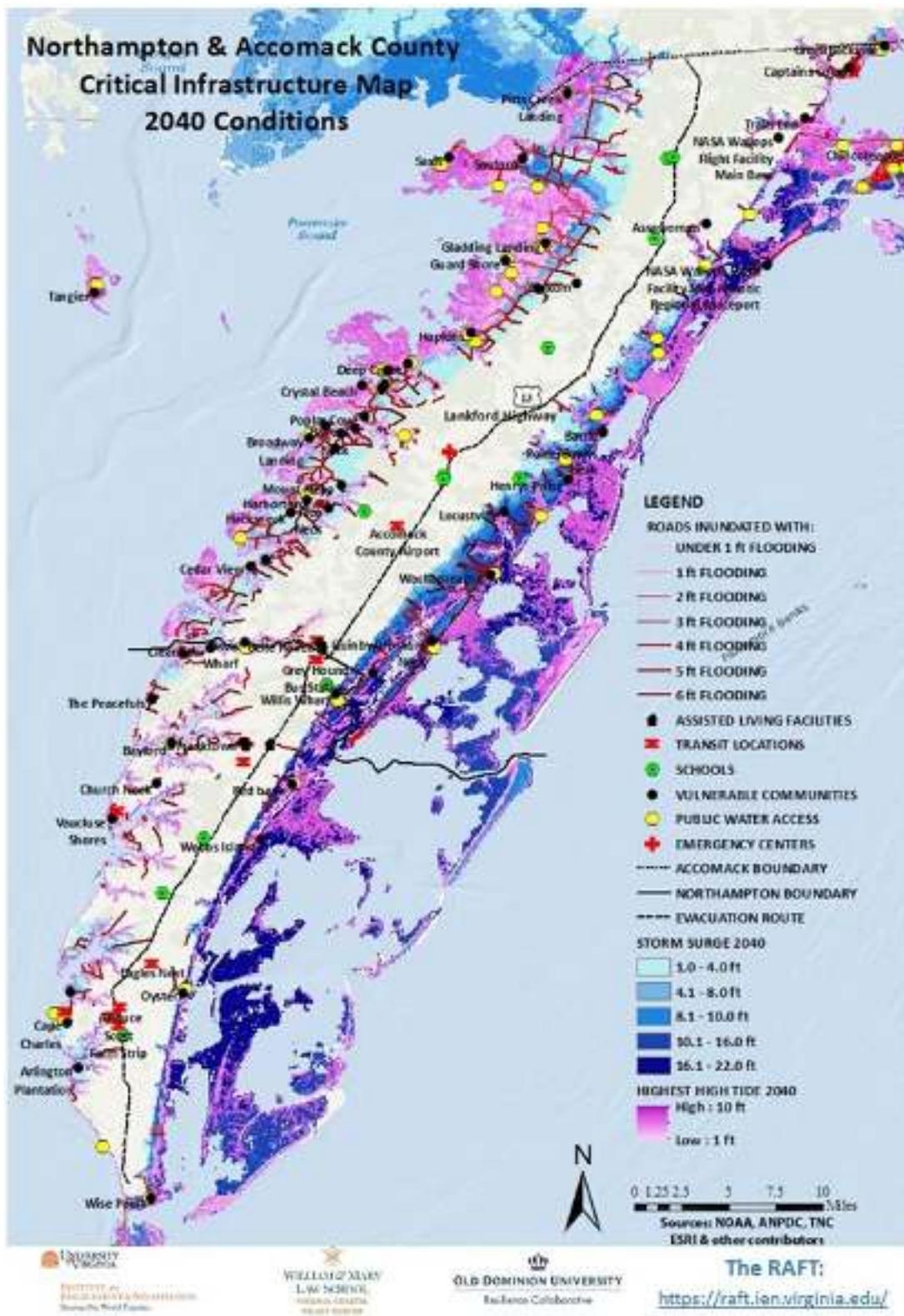
As detailed in Chapter 6: Coastal Flooding, hurricanes and nor'easters have dominated the Eastern Shore severe weather headlines for centuries, bringing with them floods from torrential rainfall, wind-driven high tides, and storm surge. Further information on these storm events can be found in Chapter 1: Hazards on the Shore.

**Figure 14: Eastern Shore of Virginia Flood Hazard Zones**



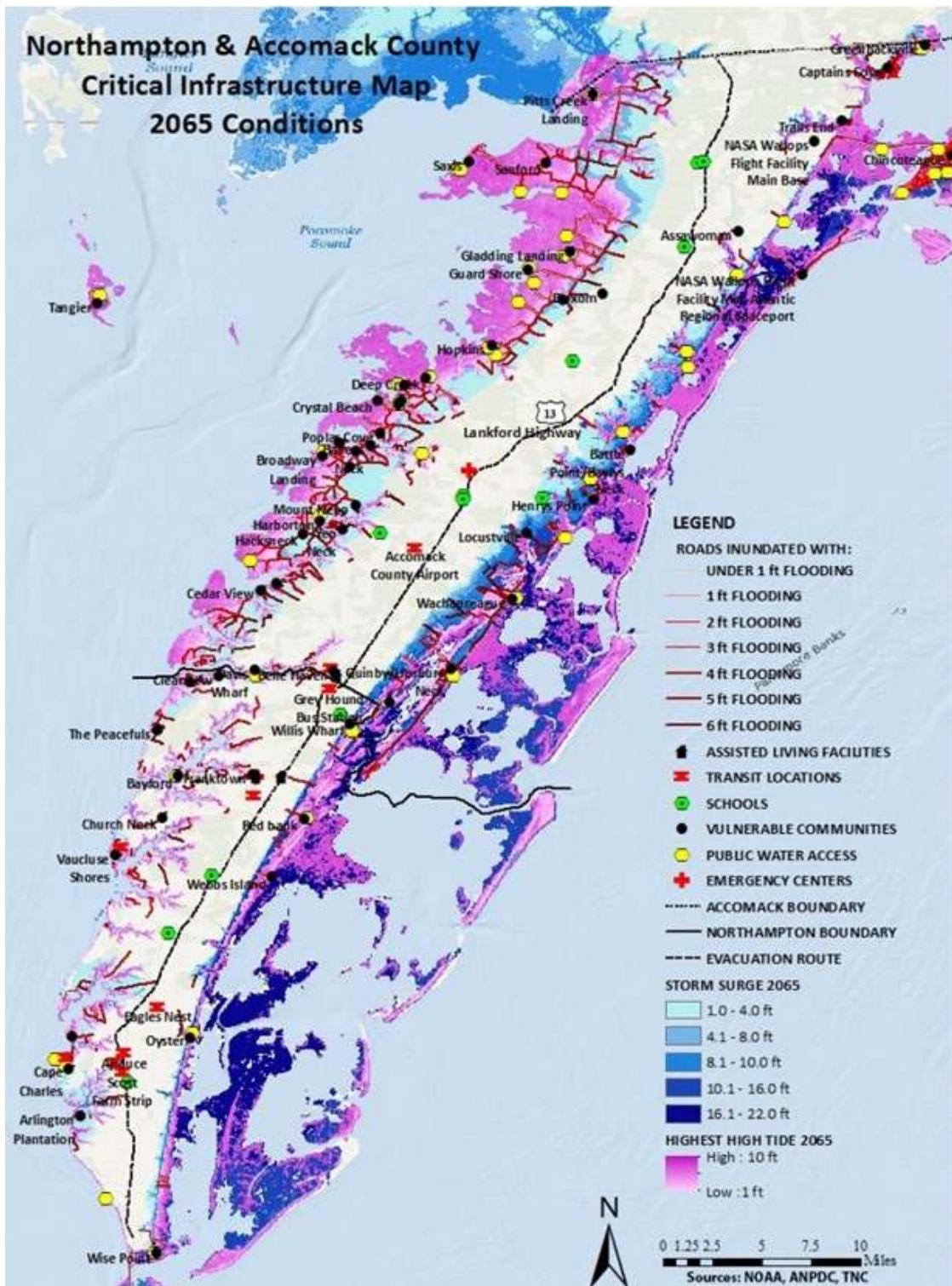
Source: Virginia Flood Risk Information System (VFRIS), 2021

**Figure 15: Accomack & Northampton County, 2040 Conditions**



## The Region

**Figure 16: Accomack & Northampton County, 2065 Conditions**



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## STORM WATER FLOODING

Storm water flooding has frequent impacts on the region and can affect the entire region at once, as with a tropical cyclone or nor'easter. This type of flooding can be very localized and intense as well, as with thunderstorms that frequently occur on the Shore, particularly during the warmer months.

Several inland towns reported persistent storm water flooding problems that threaten not only motorist safety, but personal property as well. Many towns have frequent drainage issues that are mostly contributed to the lack of proper maintenance of drainage ditches by the responsible party. This responsibility generally falls on Virginia Department of Transportation, one of the two counties, or the town in which the drainage ditch is located. Drains clogged with debris and the Eastern Shore's flat topography combined with poorly drained soils also play a large contributor to storm water flooding issues.

More information regarding storm water flooding events as well as the cause, exposure, recurring flood locations, and attempts to manage loss can be found in Chapter 7: Storm Water.

## HAZARDS OF LOCAL SIGNIFICANCE

Other hazards identified by the Hazard Mitigation Steering Committee, but ranked below high priority, are included in Table 11 below. More information on identified hazards can be found in Chapter 3: Risk Assessment and each localities respective chapter.

**Table 11: Regionally Identified Hazards**

Hazard	2006	2011	2016	2021
Well Contamination	Medium	Unranked	Medium	Medium
Ice and Snow	Medium	Medium	Medium	Unranked
Biological Hazards	Medium	Unranked	Medium	Medium
Drought	Medium	Medium	Medium	Unranked
Sewage Spills	Medium	Medium	Medium	Unranked
Storm Surge*	-	-	-	Medium
Non-Coastal Flooding*	-	-	-	Medium
Road and Highway*	-	-	-	Medium
Wildfire	Low	Medium	Low	Unranked
Hazardous Material Incidents	Low	Low	Low	Unranked
Heatwaves	Low	Low	Low	Unranked
Fish Kills	Low	Unranked	Low	Unranked
Invasive Environmental Disease	Low	Unranked	Low	Unranked
Earthquakes	Low	Unranked	Low	Unranked
Substance Use and Overdose*	-	-	-	Low
Communications Failure*	-	-	-	Low
Active Threat*	-	-	-	Low
Electrical Energy Failure*	-	-	-	Low
Tornadoes*	-	-	-	Low

\*New priority identified for 2021

## CRITICAL FACILITIES

The following table lists the critical facilities and their relative importance to the region.

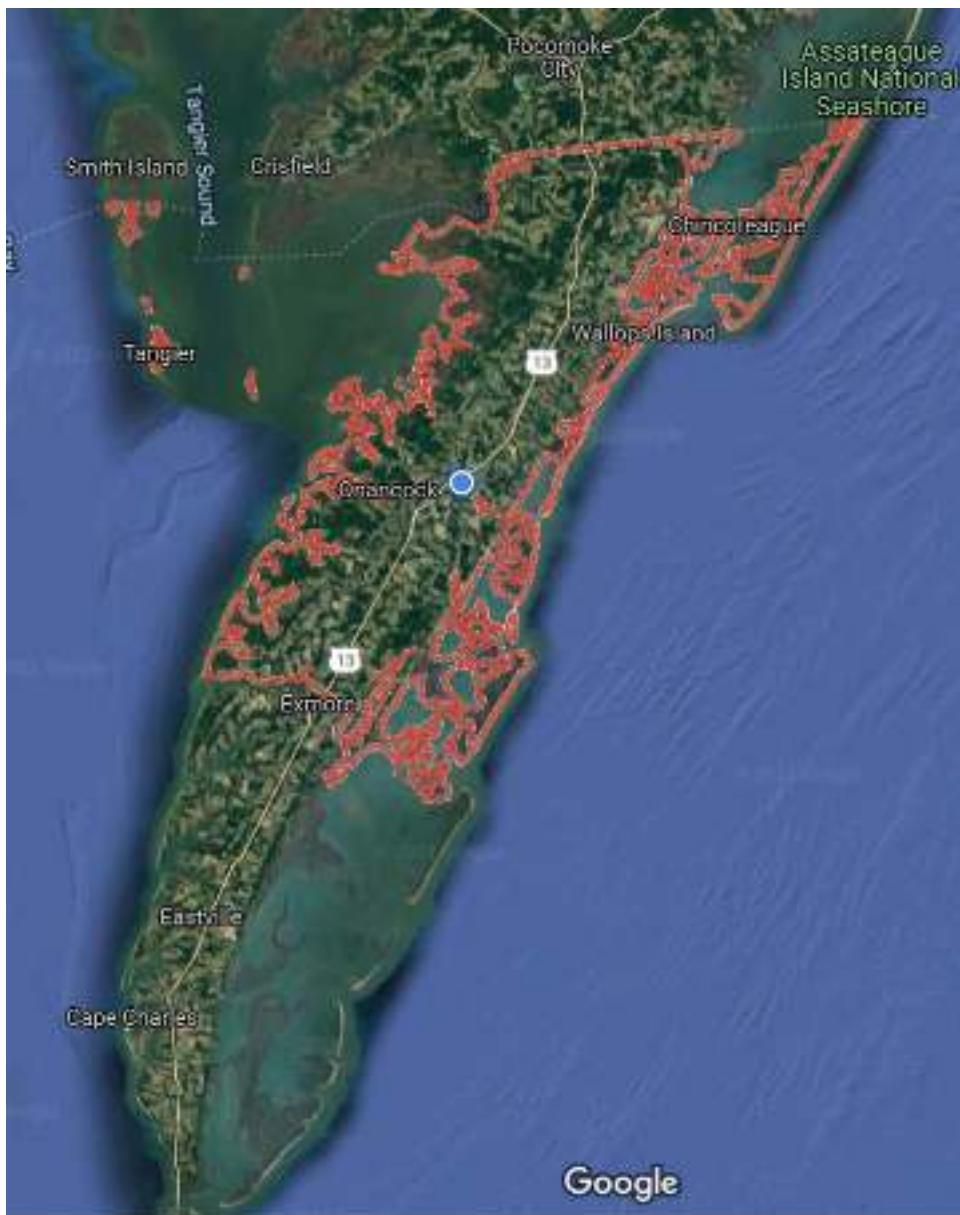
**Table 12: Regional Critical Facilities**

Facility	HMP 2006*	HMP 2011*	HMP 2016	HMP 2021	Hazards	People Affected	Loss Potential	Relocation Potential	Retrofit Potential
U.S. Route 13	-	-	X	X	Wind, Erosion, Storm Water Flooding, Ice/Snow, HazMat	20,000+ per day	Devastating	No	No
Chesapeake Bay Bridge Tunnel	-	-	X	X	Wind, Erosion, Coastal Flooding, Storm Water Flooding, Ice/Snow, HazMat	9,000+ per day	Devastating	No	No
Chincoteague Causeway	-	-	X	X	Wind, Erosion, Coastal Flooding, Storm Water Flooding, Ice/Snow, HazMat	7,000+ per day	Devastating	No	Yes
Saxis Causeway	-	-	X	X	Wind, Erosion, Coastal Flooding, Storm Water Flooding, Ice/Snow	900+ per day	Major Disruption	No	Yes
Wallops Island Causeway/Bridge	-	-	X	X	Wind, Erosion, Coastal Flooding, Ice/Snow, HazMat	45,000+	Devastating	No	Yes
Emergency Shelters	-	-	X	X	Wind, Ice/Snow, Pandemic, Infectious Disease, Biological Hazards	45,000+	Major Disruption	Yes	Yes
Emergency Communications	-	-	X	X	Wind, Ice/Snow, Fire	45,000+	Devastating	No	Yes
U.S. Coast Guard Stations	-	-	X	X	Wind, Erosion, Coastal Flooding, Fire, Infectious Diseases	45,000+	Devastating	Yes	Yes
911 Communications Center	-	-	X	X	Wind, Ice/Snow, Fire	45,000+	Devastating	Yes	Yes
ANEC Power Stations	-	-	X	X	Wind, Ice/Snow, Fire	45,000+	Devastating	Yes	Yes
Riverside Shore Memorial Hospital	-	-	X	X	Wind, Pandemic, Ice/Snow, Infectious Diseases, Biological Hazards	45,000+	Devastating	Yes	Yes
Health Centers	-	-	X	X	Wind, Storm Water Flooding, Pandemic, Ice/Snow, Infectious Diseases, Biological Hazards	45,000+	Major Disruption	Yes	Yes
Fire and EMS Companies	-	-	X	X	Wind, Storm Water Flooding, Pandemic, Infectious Diseases, Biological Hazards	45,000+	Devastating	Yes	Yes
Public Schools	-	-	X	X	Wind, Coastal Flooding, Storm Water Flooding, Pandemic, Infectious Diseases	45,000+	Major Disruption	Yes	Yes
Eastern Shore Community College	-	-	X	X	Wind, Pandemic, Ice/Snow, Infectious Diseases,	45,000+	Major Disruption	Yes	Yes
Regional Fire Training Facility	-	-	X	X	Wind, Pandemic, Snow/Ice, Fire	45,000+	Minor Disruption	Yes	Yes

# CHAPTER 10: ACCOMACK COUNTY

## COUNTY PROFILE

There are 14 incorporated towns in the County: Accomac, Belle Haven (portion located in Northampton County also), Bloxom, Chincoteague (most populated town), Hallwood, Keller, Melfa, Onancock, Onley, Painter, Parksley, Saxis, Tangier, and Wachapreague. The following information is for the unincorporated areas of Accomack and the incorporated Town of Belle Haven. Information for the other incorporated towns in Accomack is located in their respective chapters. These Towns include Accomac, Bloxom, Chincoteague, Hallwood, Keller, Melfa, Onancock, Onley, Painter, Parksley, Saxis, Tangier, and Wachapreague.



**Figure 1: Accomack County Context and Google Map**

## SOCIO-ECONOMIC

Part of assessing hazards in relation to their risk is understanding the people affected. Not all people are affected equally. Some are affected by factors relating to their ability to understand risks posed by hazards, and some by their ability to remove themselves from harm's way. Those factors include age, mobility, income and the languages individuals speak and the languages in which individuals are able to access information.

### DEMOGRAPHICS

The 2019 American Community Survey estimate indicated the County had a population of 32,673, which would indicate that the population is remaining more or less steady and has not declined much since 2000. The median age for residents in Accomack County in 2019 was indicated to be 45.9, which is about 7 years higher than that of both the state and nation, and is an increase from 2000. Often, individuals in a higher age bracket require additional assistance, particularly in the case of an emergency.

**Table 1: Accomack County Demographic Information**

	2020	2014**	2010***	2000****
<b>Population</b>	33,413	33,165	33,164**	34,488*****
<b>Median Age (Years)</b>	45.9*	44.9	44.7**	39.4
<b>Disability</b>	14.1%*	12.1%	3.2%	19.9%
<b>Income</b>				
Median Household Income	\$46,073*	\$38,389	\$41,372*	\$30,130
Poverty Level	19.0%*	20.5%	34.7%*	18.0%
<b>Language</b>				
Only English	88.5%*	89.6%	91.3%*	93.3%
Other	11.5%*	10.4%	8.7%*	6.7%
Spanish	8.1%*	8.3%	6.9%*	5.7%
Ind-Euro	2.7%*	1.9%	1.4%*	0.7%
Asian	0.6%*	0.2%	0.3%*	0.2%
Other	0.1%*	-	-	-

Source: U.S. Census 2020, \*ACS 2014-2019, \*\*ACS 2009-2014, \*\*\*U.S. Census 2010, \*\*\*\*U.S. Census 2000,

\*\*\*\*\*Accomack County Comprehensive Plan

As illustrated in Table 1, poverty levels returned to only slightly higher than those indicated in the 2000 Census. Values from Table 1 also indicate that the non-English speaking population is increasing. County representatives also indicated that there has been an increase in non-English speaking residents, particularly, an increase in residents speaking Creole and Spanish. Populations living in poverty and populations that do not speak English are often at a disadvantage in their ability to receive imperative information for preparing for and recovering from hazards.

### WORKFORCE

Employment patterns are important to examine for two reasons. They can help to identify concentrations of people for hazard information dissemination or hazard rescue and evacuation. Additionally, they can identify where disruptions in employment and income might occur in the aftermath of a disaster.

The County's two largest industries are manufacturing and educational and health care services. The vast majority of individuals in the manufacturing industry are most likely employed at either Tyson Foods or Perdue Farms. These companies often have policies in place to mitigate the economic impact of a hazard for both the company and the employees; however, long-term closures would have strong negative impacts on the County. There would be a 'domino effect' from such a closure, as employees in that industry wouldn't have spending dollars for rent, local

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

shops, nor family necessities. Other dependent agricultural businesses would be at a loss as well, particularly noting the increasing trend of individuals in the agricultural industry within the County. Although it may take some time for the industry to recover following a hazard, the United States Department of Agriculture (USDA) Farm Service Agency provides assistance for natural disaster losses, which enables farmers to rebound more easily following severe weather events. Other large employers in the County include the County of Accomack, Accomack County School Board, NASA, Eastern Shore Community Services, and Riverside Shore Memorial Hospital, to name a few.

Although a respectively smaller group of the employed population work in fishing and aquaculture, it is a culturally invaluable trade. In the year 2000, there were 599 commercial licenses and zero aquaculture permits issued by the Virginia Marine Resources Commission (VMRC). In 2010 VMRC issued 475 commercial licenses, but also 153 oyster aquaculture permits and 116 clam aquaculture permits, revealing an increase in the number of individuals who make their living working on the waterways of the Eastern Shore. There is an observation that many of the individuals who were previously employed as migrant workers are staying on the Eastern Shore year-round and working in the aquaculture industry. Because clam and oyster aquaculture are long-term investments, with oysters typically taking about three years to reach suitable size for market, and because the equipment can be costly, this important industry could take years to rebound following a damaging storm event.

**Table 2: Accomack County Local Workforce Industry**

Industry	Civilian Employed Population							
	2019*		2014**		2010***		2000****	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Agriculture, forestry, fishing/hunting, or mining	961	7.0%	669	4.6%	740	4.9%	1,050	5.8%
Construction	1,092	7.9%	873	6.0%	1,283	8.6%	1,357	7.5%
Manufacturing	2,686	19.6%	2,276	15.8%	1,960	13.1%	2,945	16.4%
Wholesale trade	331	2.4%	785	5.4%	860	5.7%	697	3.9%
Retail trade	1,472	10.7%	1,619	11.2%	1,770	11.8%	2,963	16.5%
Transportation and warehousing, and utilities	585	4.3%	310	2.1%	470	3.1%	581	3.2%
Information	75	0.5%	137	0.9%	259	1.7%	19	0.1%
Finance, insurance, real estate, and rentals	356	2.6%	299	2.1%	729	4.9%	702	3.9%
Professional, scientific, waste management	1,188	8.7%	1,339	9.3%	1,067	7.1%	940	5.2%
Educational and health care services	2,641	19.3%	2,922	20.2%	2,879	19.2%	2,696	15.0%
Arts, entertainment, recreation, food	1,013	7.4%	1,575	10.9%	1,183	7.9%	1,567	8.7%
Public Admin	834	6.1%	1,105	7.7%	1,257	8.4%	1,181	6.6%
Other	447	3.3%	524	3.6%	512	3.4%	740	4.1%
TOTAL CIVILIAN EMPLOYED POPULATION	13,681	-	14,433	-	14,972	-	17,983	-

Source: \*ACS 2015-2019, \*\*ACS 2010-2014; \*\*\*US Census 2010, \*\*\*\*U.S. Census 2000

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## BUSINESSES

Business data provides basic information used in projecting potential economic losses from business and employment disruption, along with wage losses to employees. It can also serve as an indicator of community recovery resources. Finally, it can help to prioritize restoration of utility and infrastructure functions following a high-intensity hazard. According to Table 3, the County has seen a steadily declining business presence over the last ten years, and the total civilian employed population has also declined, respectively. Retail Trade and Accommodation and Food

## Accomack County

Services are the two industries with the most establishments in the County, which is reflective of the tourism-based economy in many of the Eastern Shore towns.

**Table 3: Accomack County Business Establishment Types**

Industry Code Description	Total Establishments			
	2018	2014	2012	2010
Agriculture, Forestry, Fishing, and Hunting	5	4	4	3
Utilities	5	4	4	2
Construction	78	78	81	96
Manufacturing	21	19	17	21
Wholesale Trade	21	24	28	31
Retail Trade	147	168	173	168
Transportation and warehousing	16	17	23	22
Finance and insurance	32	31	15	16
Information	14	13	32	35
Real Estate and Rental and Leasing	42	37	38	39
Professional, Scientific, and Technical Services	46	59	64	71
Management of Companies and Enterprises	-	3	3	3
Administrative, Support, Waste Management	27	26	25	27
Education Services	3	3	2	2
Health Care and Social Assistance	50	55	57	61
Arts, Entertainment, and Recreation	17	17	15	20
Accommodation and Food Services	96	97	101	106
Other Services (except Public Administration)	92	86	92	103
Industries not Classified	-	1	-	-
<b>Total, All Establishments</b>	<b>714</b>	<b>742</b>	<b>774</b>	<b>826</b>

Source: Census Zip Code Business Patterns, 2019, 2014, 2012, 2010

## BUILT INFRASTRUCTURE

§201.6(d)(3) Housing units, community facilities, and transportation are all important factors when considering hazard resiliency. They provide the social services necessary during hazardous scenarios, safe cover for those wanting to stay, and a way to leave towards safety.

### HOUSING UNITS

Knowledge of a community's housing base contributes to hazard and vulnerability analysis by identifying how many homes are at risk. Vehicles available to households is one indicator of a household's ability to evacuate when necessary.

As Table 4 reveals, there has been little change in the number of housing units in the County with a slow but steady increase since 2000. The table also indicates that over a quarter of the total housing units are vacant. As of December 2020, approximately a third of the parcels identified as potentially having a residential use were owned by entities outside of Accomack County. While it is possible some of these units are rented to individuals residing in them, the number of these units that are second homes, used seasonally, as well as hotels, seasonal campgrounds, and migrant housing, indicates the local population tends to increase during the summer months (Personal communications, Tom Brockenbrough, Floodplain Administrator, March 2, 2021). The high influx of seasonal residents account for a large portion of what the US Census classifies as vacant housing units; however, there are still several vacant

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

dilapidated units in the unincorporated areas of Accomack County that are not accounted for in each incorporated Town's chapter and a large number of manufactured homes in the County as well. Dilapidated structures pose a threat and can cause additional debris hazards during high-wind events due to lack of maintenance. Manufactured homes are typically more susceptible to storm damages incurred from winds and flooding.

**Table 4: Accomack County Housing**

	<b>2019*</b>	<b>2014**</b>	<b>2010***</b>	<b>2000****</b>
<b>Total Housing Units</b>	21,319	21,054	21,002	19,550
Occupied	13,438	14,289	13,798	15,299
Vacant	7,881	6,765	7,204	4,251
<b>Owner-Occupied</b>	8,977	10,053	9,963	11,482
<b>Renter-Occupied</b>	4,461	4,236	3,835	3,817
<b>Median Housing Value</b>	\$171,800	\$152,500	NA	NA

Source: \*ACS 2014-2019, \*\*ACS 2010-2014, \*\*\*US Census 2010, \*\*\*\*US Census 2000

## TRANSPORTATION

The measure of vehicles available to households is one indicator of a household's ability to evacuate when necessary. As of 2019, it is estimated that about 9% of the County's occupied residences are without even a single vehicle. This is a slight decrease from previous years. This can be assumed to be due to the fact that the owners of the new residences since 2000 most likely have at least one vehicle.

**Table 5: Accomack County Vehicles Available per Household**

<b>Vehicles Available</b>	<b>2019*</b>	<b>2014**</b>	<b>2010***</b>	<b>2000****</b>
None	1,222	1,470	1,287	1,447
One	4,142	4,664	4,372	5,570
Two	4,916	5,263	5,647	5,686
Three or more	3,158	2,892	2,779	2,596

Source: \*ACS 2014-2019, \*\*ACS 2010-2014, \*\*\*ACS 2006-2010, \*\*\*\*US Census 2000

Star Transit provides substantial, daily services up and down the Eastern Shore. The Greyhound bus line typically offers travel from the Eastern Shore across the Chesapeake Bay Bridge Tunnel; however, it does not have a stop in Accomack County, but rather right at the County line with Northampton in the Town of Belle Haven. The cost is not very high (about \$20 each way to either Norfolk or Salisbury); however, this service would probably not run during an emergency and does not have the capacity to evacuate all residents without a vehicle. Star Transit is available to assist in the event of an evacuation, although this service would cease upon the arrival of hazardous conditions. Additionally, Shore Ride, a private ride-sharing company, serves the region and offers long-distance transportation.

Prior to the construction of the railroad in 1884, water-based transportation dominated the region. Water-transportation is still vital in Accomack County. Used both commercially and recreationally for enjoyment and fishing activities, the waterways are essential to the economy of the County. The Island of Tangier relies upon personal vessels and the ferries to gain access to the mainland and its essential commodities. Dredging of these channels is vital not only for safe transportation, but also for the local economy. The Regional Dredging Needs Assessment was completed in Fall of 2016 and provides details about the condition of navigable waterways in the region.

## Accomack County

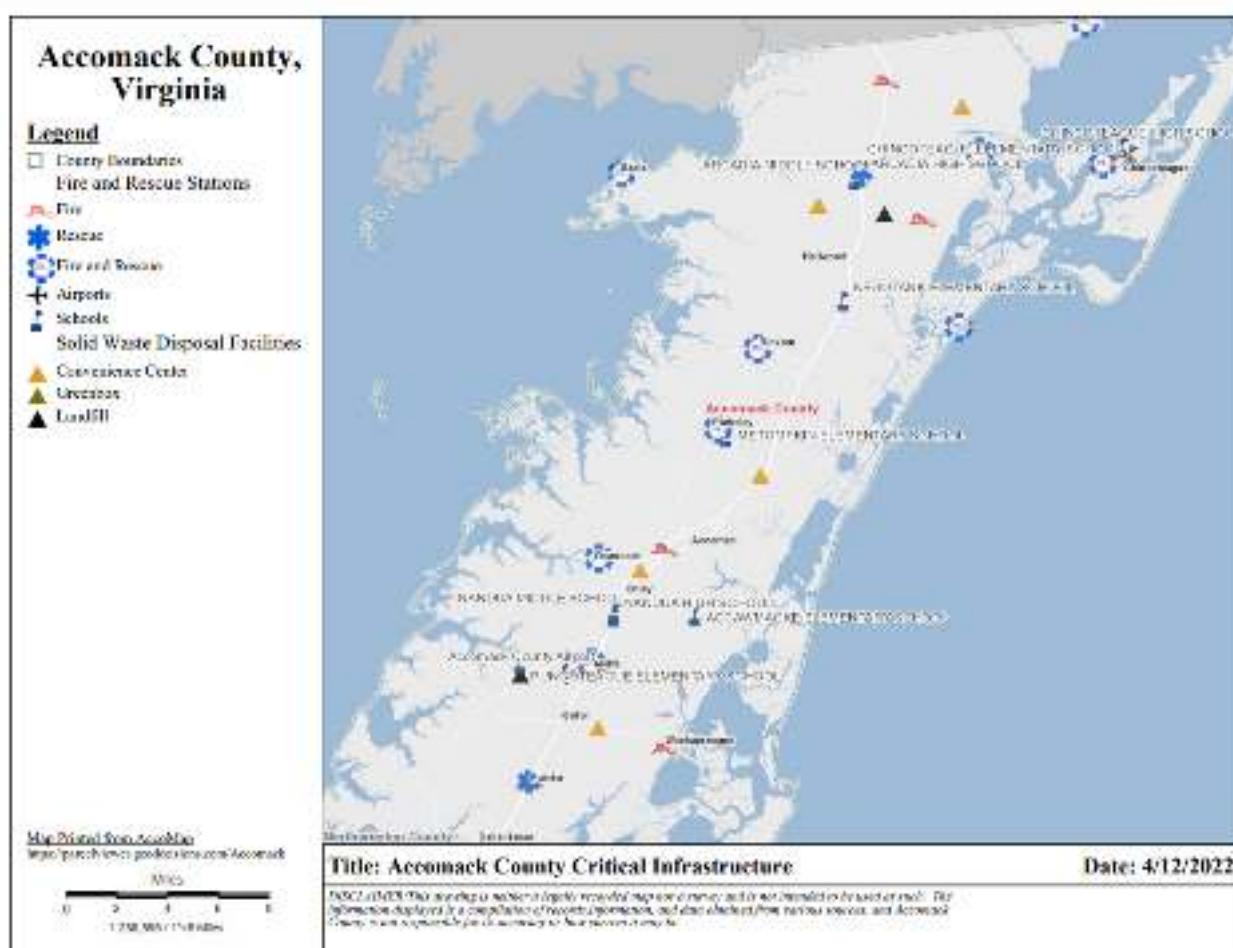
The Accomack County Airport (MFV) sits on 410 acres and is the only public airport on the Eastern Shore of Virginia. The runway is lit and is 100' wide and 5,000' long. The airport also has 18 hangars and jet fueling services. This is also the location of the Automated Weather Observation System AWOS III.

Train service south of Hallwood in the County was discontinued in 2018; however, there are ongoing plans to turn the abandoned railroad corridor into a multi-use bike and pedestrian path.

## COMMUNITY SERVICES AND FACILITIES

Community facilities support the services and functions provided by the County government or in coordination with other public and private entities. These facilities enhance the overall quality of life for the County and its citizens. It is important to note what facilities are available in the case of a hazard and to make an inventory of facilities that could be affected by a hazard.

**Figure 2: Accomack County Critical Infrastructure**



## Eastern Shore of Virginia Hazard Mitigation Plan 2021

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### PUBLIC SAFETY

Emergency Services in Accomack County are provided by 60 career personnel and over 600 volunteer members (Personal communications, Tom Brockenbrough, Floodplain Administrator, March 2, 2021). Services are delivered from 13 independent volunteer fire and/or rescue companies. Crews respond to an estimated 7,000 calls annually. In addition to emergency response, the Department of Public Safety personnel provide a free smoke detector program, disaster preparedness presentations, Emergency Response Training (CERT), community CPR training, and staff serve on regional committees to advance emergency services within the County and Region ([Accomack County Public Safety](#)).

Several of the volunteer fire departments in the County are struggling to obtain an adequate amount of funding and number of volunteers. A lack of fire and EMS volunteers create additional demand on County resources. Since 2016, EMS services transitioned from the Wachapreague Station to the Painter Station, which strengthened the effectiveness and decreased the EMS response time in the southern reaches of the County. In 2017, the Onley Volunteer Fire and Rescue Company was dissolved (Personal communications, Tom Brockenbrough, Floodplain Administrator, March 2, 2021).

With 30 deputies, the Accomack County Sheriff's Department responded to more than 9,600 calls and 1,104 arrests in 2020 (Personal communications, Accomack County Sheriff's Department, July 27, 2021). The Sheriff's Department is not located within the Special Flood Hazard Zone Area (SFHA).

During a 1-percent-annual-chance flood event, Hazus® estimates that out of the 13 total fire stations in the County, one would be completely lost and two would be at least moderately damaged. According to Hazus®, all of the police and fire stations are to be unaffected by a 1-percent-annual-chance wind event, although this statement is not supported by local representatives (County Staff, personal communications, July 14, 2016, 2021).

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### MEDICAL SERVICES

Riverside Shore Memorial Hospital relocated from Nassawadox to between Onley and Onancock. The County has just hired 12 EMS personnel, as many of the fire companies also provide EMS services (Personal communications, Tom Brockenbrough, Floodplain Administrator, March 2, 2021). There are five Eastern Shore Rural Health (ESRH) Community Health Centers (CHC) located in Accomack County that provide medical and dental services; however, Onley and Chincoteague CHC's are solely medical, while Pungoteague Elementary and Metompkin Elementary are dental. The Atlantic CHC provides both medical and dental services and is located in the unincorporated area of New Church.

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### PARKS AND RECREATION

The Accomack County Department of Parks and Recreation maintains three parks and a gold driving range at Pungoteague Elementary School (35 acres). Arcadia Park (25 acres) and Nandua Middle Park are used extensively for picnics, reunions, family gatherings, and excursions. Accomack County's new Sawmill Park located at the former Jones Lumber property adjacent to the Town of Accomac opened in 2018 (Personal communications, Tom Brockenbrough, Floodplain Administrator, March 2, 2021). The 35-acre site includes a baseball/softball field and a soccer field as well as concessions, a playground, a walking trail, a pavilion, and picnic tables. A football field and dog park are planned for this location in the future (Personal communications, Tom Brockenbrough, Floodplain Administrator, March 2, 2021).

The County maintains twenty-seven water access sites of varying infrastructure, only two of which (Greenbackville and Quinby Harbors) incur any fee for use. As of July 1, 2021, a boating facilities parking permit is required at 15 of these sites. The permit is available free-of-charge to Accomack County tax payers and is offered to all others for a fee (Personal communications, Tom Brockenbrough, Floodplain Administrator, March 2, 2021). A list of these access

## Accomack County

points with their location and facility types can easily be found on the [Accomack County website](#). There is extremely limited access to beaches in Accomack County. The beach on Assateague Island at the Chincoteague National Wildlife Refuge and Assateague Island National Seashore is accessible for a fee of \$10/day. Longer permits are also available for purchase. There are two other water access sites, Guard Shore and Burton's Shore, which have a limited amount of sand and even more limited parking. Mutton Hunk is the only Natural Area Preserve in the County with public access, and although there are two walking trails and seaside bay views, there is no water access. Saxis and Greenbackville beaches are also quite small with limited sand and parking; however, those with pets visit these beaches quite frequently.

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### WATER SUPPLY AND WASTEWATER

Most residents rely on private wells and septic systems for their water supply and wastewater disposal. The only public Waste Water Treatment Plants (WWTP) in the County for residential sewage treatment are located in the Town of Tangier and just outside Onancock Town limits (Personal communications, Tom Brockenbrough, Floodplain Administrator, March 2, 2021). There are several private sewage treatment plants, including NASA Wallops Flight Facility (WFF), that serves Chincoteague and is designed for 800,000 GPD, and Captain's Cove in Greenbackville, which currently serves over 1,500 residents and has the capability to serve over 200 homes. The Captain's Cove facility has two lagoons for onsite effluent treatment and in 2016 updated their VDEQ permit to allow for infiltration polishing basins. In the past, poor soils limited development on some vacant parcels of land in the County, but above-ground septic technologies have made some previously undevelopable parcels available for development; however, these systems are much more expensive to build and to maintain than traditional systems.

There are ongoing plans for Hampton Roads Sanitation District (HRSD) to provide services up and down the Eastern Shore. Phase 1 of the project would connect Nassawadox in Northampton County to the Town of Onancock's WWTP in Accomack County, while allowing several towns to connect along the way. Future phases would provide several other localities in both Accomack and Northampton County the option to connect to the sewer system, which would allow for a significant increase in development on the Eastern Shore and would assist in the mitigation of groundwater contamination.

The largest industries which discharge waste directly into surface waters are Perdue Farms, Tyson Foods, NASA Wallops Flight Facility, the Town of Onancock's WWTP, and several seafood facilities. Although surface water in the County is not used for human consumption, it is important for recreation and shellfish harvesting, thus water quality must be protected in accordance with the State Water Control Law. According to the 2014 VDEQ Water Quality Assessment Integrated Report, almost all of the creeks in the County are considered impaired due to various causes such as pH, Enterococcus, Fecal Coliform, benthic-macroinvertebrate bioassessment, E. Coli, dissolved oxygen, etc. There are many causes for the various impairments, including wildlife; however, it is worth noting that there are an estimated 200 to 400 homes Shore-wide lacking any plumbing. This is a source of contamination that could be avoided, while at the same time directly improving the quality of life of individuals living in these conditions.

Due to the sole source aquifer designation of the Eastern Shore's water supply, Accomack County has revised its zoning ordinance to require that groundwater protection be considered in all major site plan reviews. The primary concern is not quantity of water in the York-Eastover aquifer, but rather, quality, as saltwater intrusion has already been documented in some coastal areas.

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### SOLID WASTE

The County operates seven Convenience Centers, all of which are closed one day each week (staggered) and offer recycling, tire, and used oil disposal. Some offer disposal of scrap metal including appliances, but none accept commercial waste. There is one landfill and one landfill transfer station which meet the disposal needs for commercial operations, construction companies, and households.

### POWER AND COMMUNICATIONS INFRASTRUCTURE

Old Dominion Electric Cooperative (ODEC) in cooperation with Accomack and Northampton Electric Cooperative (ANEC) replaced the main transmission line between Tasley and Exmore. This project extended the redundant line from the state line to Tasley that was installed several years ago (Janelle Dawkins, ANEC, personal communication, July 28, 2016). There are plans to add more redundant lines, which will help ensure that long-term power outages are not a wide-spread concern on the Eastern Shore. Maintaining and advancing our infrastructure is key to increasing our resiliency in the occasion of a hazard. In 2016, the Amazon Solar Farm Virginia, an 80-megawatt project, came online in the Withams area. This was a new land use, that required rezoning and additional permits as well as decreases in acreage available for agriculture, as currently, there are no designated joint land uses for these operations (Personal communications, Tom Brockenbrough, Floodplain Administrator, March 2, 2021).

In 2019, an Information Technology (IT) Disaster Recovery Plan was prepared by Accomack County to develop, implement, and maintain the ability to recover its information technology systems. This Plan complies with the County Security Standards, meeting the requirements of CJIS, HIPAA, and PCI DSS. The Plan has been distributed internally within the County and with external organizations that might be affected by its implementation. Training exercises for all IT staff are completed on an annual basis (Personal communications, Tom Brockenbrough, Floodplain Administrator, March 2, 2021).

It is important to note that the IT DR Plan is a supporting component of Accomack County's Continuity Plan, which has also been in the process of development since late summer of 2020. The Continuity Plan provides direction and documentation as it relates to the response, recovery, resumption, restoration, and return to normal operations after a severe business disruption, which can also include an IT disaster; therefore, these plans must be developed and maintained together to ensure consistency in the County's response to incidents. Finalization of the Continuity Plan and subsequent training exercises for all County leadership were scheduled for completion by the end of March 2021 (Personal communications, Tom Brockenbrough, Floodplain Administrator, March 2, 2021).

The Eastern Shore of Virginia Broadband Authority (ESVBA) network of fiber cable stretches from Virginia Beach to the Maryland border and serves as the electronics 'backbone', providing high-speed internet to both Counties. The majority of service is provided along Route 13 as well as every incorporated Town in Accomack and Northampton Counties; however, there are still a high number of underserved households in Accomack County that are not located along Route 13 or an incorporated Town. Wide-spread high-speed internet provides residents with the capability to take advantage of educational opportunities, work from home, etc.

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### DRAINAGE DITCHES

The County relies on VDOT for the maintenance of ditches along state-maintained roadways but is responsible for maintenance of all ditches along County roads and between properties that drain state ditches. There are approximately 1,516 miles of primary and secondary roads in Accomack and Northampton Counties (Virginia Base Mapping Program Road Centerline Data, 2014).

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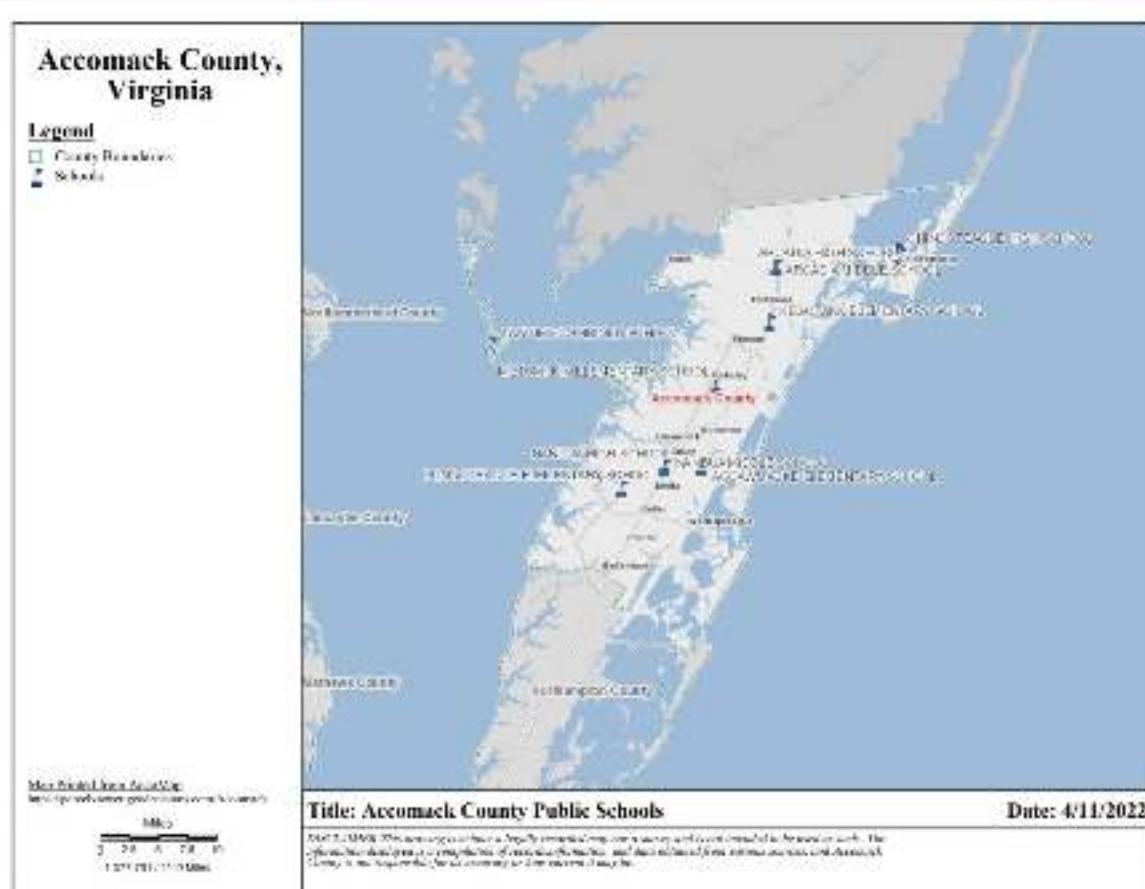
### SCHOOLS

Schools are important to consider for disaster readiness and during an actual emergency. Schools offer an opportunity to teach children and adults how to effectively and efficiently respond to many emergency situations. They are also areas of concentrated high-risk individuals, particularly primary schools with young students. The Accomack County Public School Division is responsible for such planning. Each school has a Crisis Response Team, an emergency radio to receive updates on weather situations, two-way radios, a Crisis Management Plan for all bus drivers, and a pre-recorded warning message system.

## Accomack County

There are five elementary schools, five secondary schools, and one K-12 combined school in the Accomack County school system, with locations of these schools displayed in Figure 2. Central Baptist Academy in the Town of Onley is the only private school in Accomack County (Personal communications, Tom Brockenbrough, Floodplain Administrator, March 2, 2021). According to FEMA estimates using Hazus®, of the 11 total schools, damage would be incurred by both Chincoteague Elementary School and Tangier Combined School during a 1-percent-annual-chance flood event. The remaining nine schools are not expected to incur damages from this event.

**Figure 3: Accomack County Public School Locations**



According to the Virginia Department of Social Services (DSS), there are 7 licensed and 7 unlicensed daycare facilities in the County, with locations in Accomac, Atlantic, Hallwood, Horntown, Keller, Onancock, Onley, Painter, and Parksley ([Virginia DSS](#)). Arcadia Middle School and Nandua Middle School are the emergency shelters for the County. The County has previously expressed willingness to open their shelters and, if necessary, additional schools to Northampton County residents, considering they are currently without a shelter. Six of the County's schools are designated emergency shelters and can easily be found on [Accomack County's Website](#). Additionally, the Eastern Shore Community College in Melfa has been used as a base of operations during times of declared emergencies.

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### CULTURAL RESOURCES

Although the County has several building museums, Kerr Place, Locustville Academy, the Debtors Prison, the Railway Museum, Tangier Island Museum, etc., there is no interpretive center or readily available materials that comprehensively teach the history of the Eastern Shore culture. The Historical Society of the Eastern Shore is based in Onancock, maintains three properties there, and offers a range of educational programs.

Only 25 buildings in Accomack County are registered with the Virginia Department of Historic Resources (VDHR) as official Historic Places. In 2001, the VDHR completed the archaeological survey of the Chesapeake Bay shorelines and in 2003, the Atlantic coast shorelines associated with both Eastern Shore Counties. The latter was updated in April of 2016.

### NATURAL ENVIRONMENT

Accomack County, entirely within the Atlantic Coastal Plain, is relatively flat with elevation ranging from sea level to about 50-feet above mean sea level. The majority of slopes are under 1%, but in a few sections, the slope reaches up to 15%. The average depth of the water table is about 18 inches. Flat areas are typically more prone to flooding problems, particularly where the water table is high and hydric soils dominate.

There are approximately eighteen major tidal creeks on the seaside and twelve on the bayside, according to FEMA reports. The [Regional Dredging Needs Assessment](#) inventoried 34 seaside creeks and 24 bayside creeks in Accomack County.

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### LAND USE LAND COVER

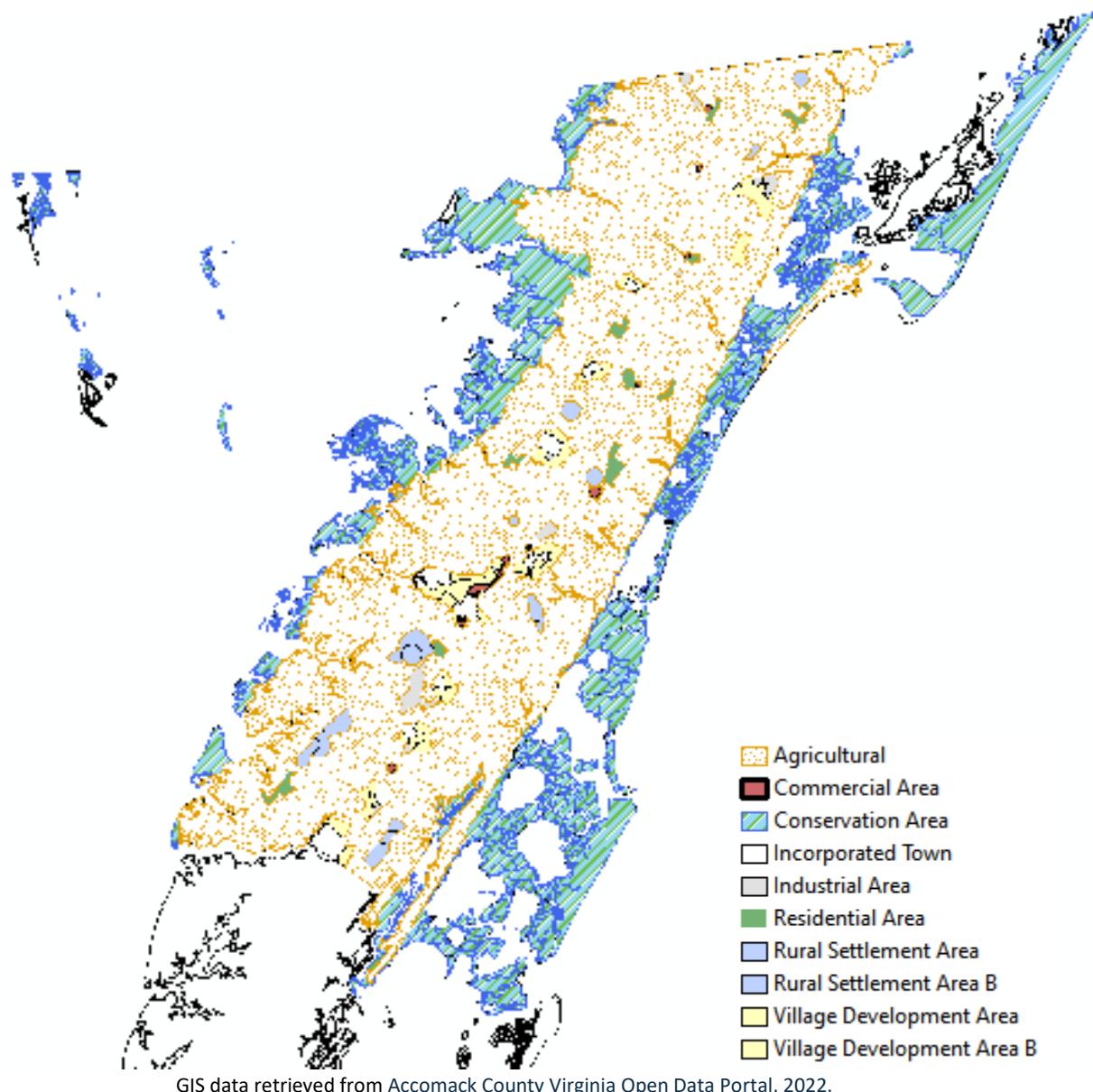
The total land and water area of Accomack County is approximately 602 square-miles, 476 of which is comprised of uplands and the adjacent wetland areas. The majority of land use consists of farms, forests, and marshlands, dotted with towns, villages, and hamlets.

According to the Census of Agriculture, there were 239 farms in 2017. Despite an increase of 13 farms since 2012, the total acreage and average size of farms has decreased. There has been a downward trend in the number of farms, the total acreage of farms, and the acreage of land in the agricultural and forest districts dating back to at least 1992. Although there was a boom in subdivision activity which peaked between 2004 and 2006, many of those areas were never developed after the downturn in the economy. The larger decrease in farm acreage cannot be largely attributed to these subdivisions, but rather the result of various causes. A 2009 publication indicated that 47 acres of wetlands are created annually from the inundation of low-lying farms (Titus, 2009), which could be part of the cause in the continuing decrease of farmlands. Around the time of the 2012 Census, one of the major vegetable growers was going through bankruptcy. They owned and leased a large quantity of land. In 2013, another company bought the majority of their operations at auction and now most of the land is back in production. It was expected that the 2017 Census would show a rebound in the number of farms; however, this was dependent on the expansion rate of solar energy production areas and other operations. It is possible this could affect numbers in the 2022 Census.

Water and wetlands originally made up approximately 65% collectively of land use, and the terrestrial, upland land cover is more relevant for management purposes. According to the NOAA C-CAP Land Cover Atlas, between 1996 and 2010 there was a net increase of 4.75% and 8.27% in developed areas and in impervious surfaces respectively. Still, Accomack County only has a total of 4% of its upland areas classified as developed and the percent of the County that is wetland has remained fairly constant for the past two decades (C-CAP NOAA, 2016).

## Accomack County

**Figure 4: Accomack County Future Land Use**



GIS data retrieved from [Accomack County Virginia Open Data Portal, 2022](#).

## HAZARD PREPAREDNESS & COMMUNITY CAPABILITIES

### PREVIOUS HAZARD MITIGATION PLANS

§201.6(b)(3), §201.6(d)(3) Accomack County has participated in the hazard mitigation planning process since 2006. The County's primary risk is associated with coastal and storm water flooding. Although the County's Comprehensive Plan was updated in 2018, much of the content refers to dated data from the early 2000's. The comprehensive plan further emphasizes the need to protect groundwater, open space, historic resources, agricultural lands, National Aeronautics and Space Administration (NASA) Wallops Flight Facility (WFF), and to strengthen existing towns and communities.

**Table 6: Accomack County Hazard Mitigation Resources**

Authority	Ordinances, Plans, & Publications										Resources, Committees							
	* Building Code	* Chesapeake Bay Act	* SVMP	* Hazard Mitigation Plan	* Comprehensive Plan	* Zoning Ordinance	* Storm Water Regulations	* Transportation Infrastructure Inundation Vulnerability Report	All Hazards Preparedness Brochure	* Emergency Operations Plans	* Mutual Aid Agreements/Documents	* Neighborhood Emergency Help Plan	* Virginia Hurricane Evacuation Guide	* Oil & HazMat Response Plan; HazMat Commodity Flow	* Ground Water Committee	* Navigable Waterways Committee	* Climate Adaptation Working Group	* ES Disaster Preparedness Coalition
County	* Building Code	* Chesapeake Bay Act	* SVMP	* Hazard Mitigation Plan	* Comprehensive Plan	* Zoning Ordinance	* Storm Water Regulations	* Transportation Infrastructure Inundation Vulnerability Report	All Hazards Preparedness Brochure	* Emergency Operations Plans	* Mutual Aid Agreements/Documents	* Neighborhood Emergency Help Plan	* Virginia Hurricane Evacuation Guide	* Oil & HazMat Response Plan; HazMat Commodity Flow	* Ground Water Committee	* Navigable Waterways Committee	* Climate Adaptation Working Group	* ES Disaster Preparedness Coalition
Regional																		
State																		
Federal																		

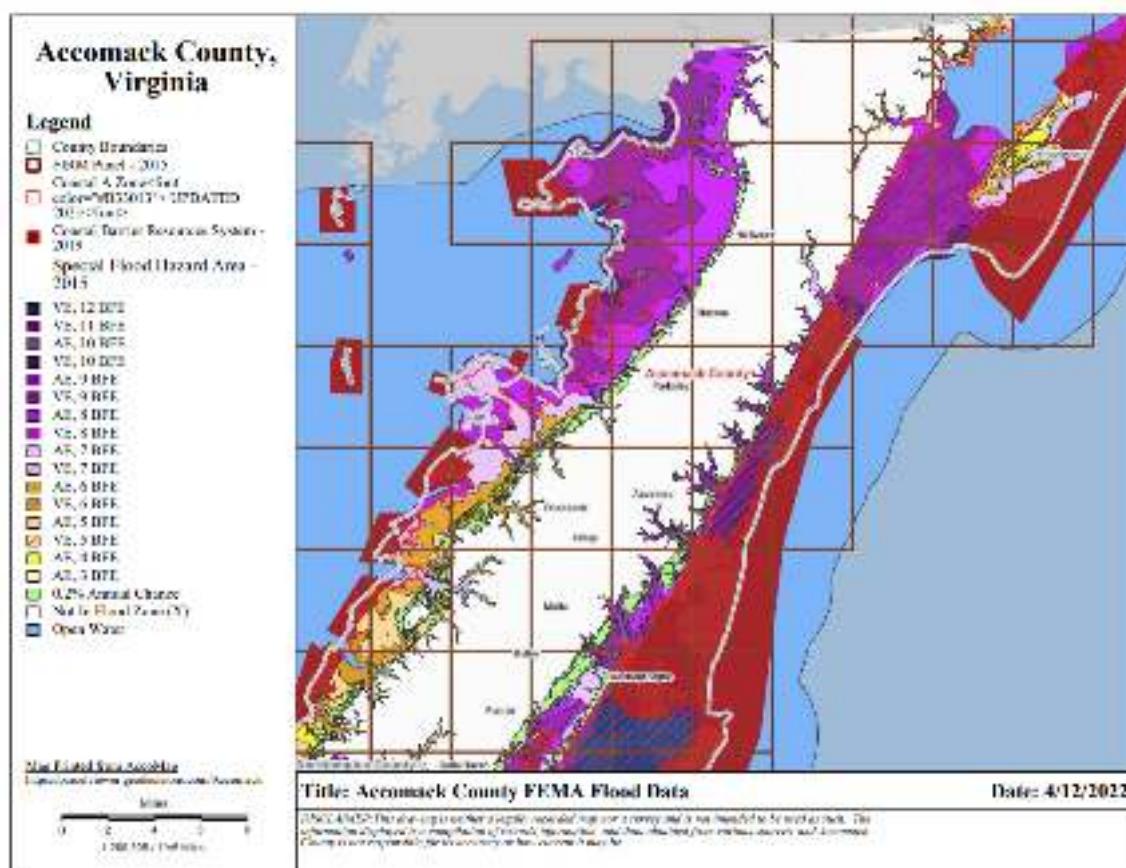
## NATIONAL FLOOD INSURANCE PROGRAM & HAZARD MITIGATION GRANT PROGRAM

### NFIP

§201.6(d)(3) Since 1953, there have been 14 Federal Disaster Declarations for hurricanes, flooding, and severe storms in the County, three of which occurred in the past five years ([FEMA Disaster Declarations, 2022](#)). There are 14 severe repetitive loss (SRL) properties and 92 NFIP-recognized repetitive loss (RL) properties in the County (FEMA NFIP Data Report, 2022), which has increased substantially since 2015. According to the FEMA Flood Risk Report in 2015, there were only 3 SRL and 37 RL properties, which was 12 more than there were in 2003 (FEMA Flood Risk Report 2015, FEMA NFIP Report December 2003). There has been a steady decrease in the total number of active insurance policies for the County, as more homeowners learn of the changes to the Flood Insurance Rate Map (FIRM).

With the 2015 updates to the FIRM, there were changes to the associated Special Flood Hazard Area (SFHA) for the County. The total area of the SFHA increased by 12 square miles and decreased by 16.6 square miles for a net decrease of 4.6 square miles including 1,111 buildings. The area within the V zone increased by 3.6 square miles and decreased by 44.8 square miles for a net decrease of 41.2 square miles including 300 buildings. This is extremely important as 1,411 structures that previously were required to have flood insurance under a mortgage are no longer required to have even basic flood insurance coverage. Flood insurance is cost prohibitive for many residents in the County. Without insurance, should there be flooding, the recovery time for residents, businesses, and the overall community will be much longer.

The County participates in the Community Rating System (CRS) program in order to provide a policy discount to residents and businesses in the unincorporated areas of the County. Since 2016, Accomack County's CRS rating has dropped from 8 to 6, now providing residents a 20% discount for insurance (Personal communications, Tom Brockenbrough, Floodplain Administrator, March 2, 2021). More information on repetitive loss properties, NFIP policies and claims, and the CRS program can be found in Chapter 6: Coastal Flooding and Chapter 9: The Region.

**Figure 5: Accomack County FIRM Base Flood Elevation (BFE)**

## HMGP

The County of Accomack has historically participated in the Hazard Mitigation Grant Program. After Hurricane Floyd in 1999, the County received a 28-home elevation project for homes located in the unincorporated portions of the County and in the Town of Tangier. See Table 7 for more details. As of 2016, a total of almost 100 homes in Accomack County have been elevated out of the floodplain and no houses have been relocated or razed under the program. These grants are regularly utilized in the County, particularly in coastal Towns such as Tangier and Saxis.

## HAZARD PROFILE

### PANDEMIC RESPONSE AND READINESS

Accomack County responded to the COVID-19 pandemic in several ways. The County offices were forced to shut down from mid-March of 2020 to June 8, 2021 (Personal communications, Tom Brockenbrough, Floodplain Administrator, July 23, 2021). The majority of meetings were held virtually and some held with limited parties in the meeting room. The public was required to make an appointment to go into the Administrative Building with the exceptions of going to the Commissioner of Revenue Office or the Treasurer's Office.

Staff only attended meetings that were held outside or were socially distanced and alternated between working in the office and working remotely. Masks were required at all times unless working in an office that was not shared with any other staff and high-touch surfaces were cleaned and sanitized frequently. Upon returning to work, some staff were relocated to different offices in an attempt to maintain social distancing of crowded work areas and many offices were reconfigured with plexiglass shields. Additional hand sanitizer dispensers, social distancing floor schedules, flexible work schedules, and arrangements to work remotely to ensure social distancing and to assist those with who had children going to school virtually at home were put in place. The County also assisted employees who were interested in receiving one of the COVID-19 vaccinations (Personal communications, Tom Brockenbrough, Floodplain Administrator, July 23, 2021).

The County used CARES Act and other COVID-19 related funds to purchase any needed PPE and technology to hold virtual meetings. The County used funds for Broadband proliferation and collaborated with Accomack County Schools and the Eastern Shore of Virginia Broadband Authority to create public access hotspots in areas with concentrations of students without internet services. Funds were also used for safety-related facility improvements, hazard pay, grants for small businesses, watermen, and charter/passenger boats, mortgage and rental assistance programs, and more (Personal communications, Tom Brockenbrough, Floodplain Administrator, July 23, 2021). Every incorporated town in the County was also allocated funds according to the town's population; however, a few of the towns left their allotment with the County.

## HIGH WIND

The peak wind gusts predicted by Hazus® during a 1-percent-annual-chance wind event are evidenced in Figure 3. The building-related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with the inability to operate a business due to damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those individuals displaced from their homes as a result of hurricane damages.

The total property damage losses were \$72 million, with 5% of the estimated losses related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, making up over 95% of the total loss.

Hazus® estimates that approximately 230 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 16 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus® Hurricane technical manual.

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

The model also estimates that a total of 265,278 tons of debris will be generated. Of the total amount, 234,643 tons (88%) is Other Tree Debris. Of the remaining 30,635 tons, Brick/Wood comprises 14%, Concrete/Steel comprises 0%, and the remainder is Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 173 truckloads at 25 tons/truck to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 26,317 tons are collected and processed. The volume of tree debris generally ranges from approximately 4 cubic yards per ton for chipped or compacted tree debris, to approximately 10 cubic yards per ton for bulkier, uncompacted debris.

The County's Building Code is currently based on the 2012 Virginia Uniform Statewide Building Code (USBC). The USBC is periodically updated and the County updates their code respectively. Our region lies within the 110-mph wind zone; thus, the County requires structures be built to withstand winds of at least this strength (Personal communications, Bruce Herbert, (Former) Building Inspector, August 1, 2016; confirmed Bruce Herbert, A-NPDC Community Development Coordinator, July 19, 2021). These standards affect many aspects of the construction, from the quality of the shear walls to the number of nails used to secure shingles.

Hazus® estimates the number of households that are expected to be displaced from their homes due to a 1-percent-annual-chance wind event as well as the number of displaced individuals that will require accommodations in temporary public shelters. For Accomack County, the model estimates 21 households to be displaced. Of these, 14 individuals, out of a total population of 33,164, will seek out temporary public shelters.

Additional wind hazards, which are described in Chapter 4, are straight line winds, tornados, and nor'easters. Manufactured homes are the most susceptible to wind damages.

## COASTAL EROSION

Accomack County is experiencing erosion along the bayside shoreline and the barrier island shorelines on the seaside. The inland seaside shoreline is relatively protected from erosion by the barrier islands, marshes, and bays to the east. That said, the shifting and erosion of the barrier islands and loss of marshes to habitat migration and rising seas, may leave the inland seaside shoreline in a more exposed position in the future.

The erosion rates on the barrier islands range from 7- to 17-feet per year on average; however, a single high intensity nor'easter or hurricane could erode more than that in just a few days. The Accomack County Comprehensive Plan emphasizes the importance of consulting with the VIMS Shoreline Situation Report to prevent building in high erosion areas or those areas indicated to have a loss of greater than one foot per year. The Coastal Resilience Tool finalized an application that shows historic positions of the seaside barrier islands. This tool is now available to the public.

Table 8 reveals the areas in the County identified by the 2002 VIMS *Shoreline Situation Report* and updated information from local County representatives. According to the VIMS Center for Coastal Resources Management 2016 Accomack County Shoreline Inventory, 46 of the 708 miles of shoreline surveyed are defended in some way, the majority of which (26.6 miles) are bulkheads.

Assateague Island, an area vital to the economy in Accomack County, has experienced severe erosion. Decisions are still currently being made for the long-range plan for the Chincoteague National Wildlife Refuge and Assateague Island National Seashore on Assateague Island, with regards to new locations for parking, beach access, interpretive structures, facility buildings, etc.

Just to the south of Assateague is Wallops Island, which is owned by the federal government and home to the NASA WFF, a major economic driver for the County. In June of 2016, the United States Army Corps of Engineers (USACE) completed the Wallops Island beach nourishment, which cost almost \$36 million (about \$10 /yd<sup>3</sup> of sediment).

The restrictions within the Resource Protection Areas identified in the Chesapeake Bay Act typically prevent new construction within 100-feet of our waterways and thus reduces increased exposure to erosion; however, erosion does cause additional problems for our navigable waterways, as the eroded sediments can fill channels and create a hazard for water-based transportation and businesses.

Eastern Shore of Virginia Hazard Mitigation Plan 2021

**Table 7: Accomack County - Areas Experiencing Coastal Erosion**

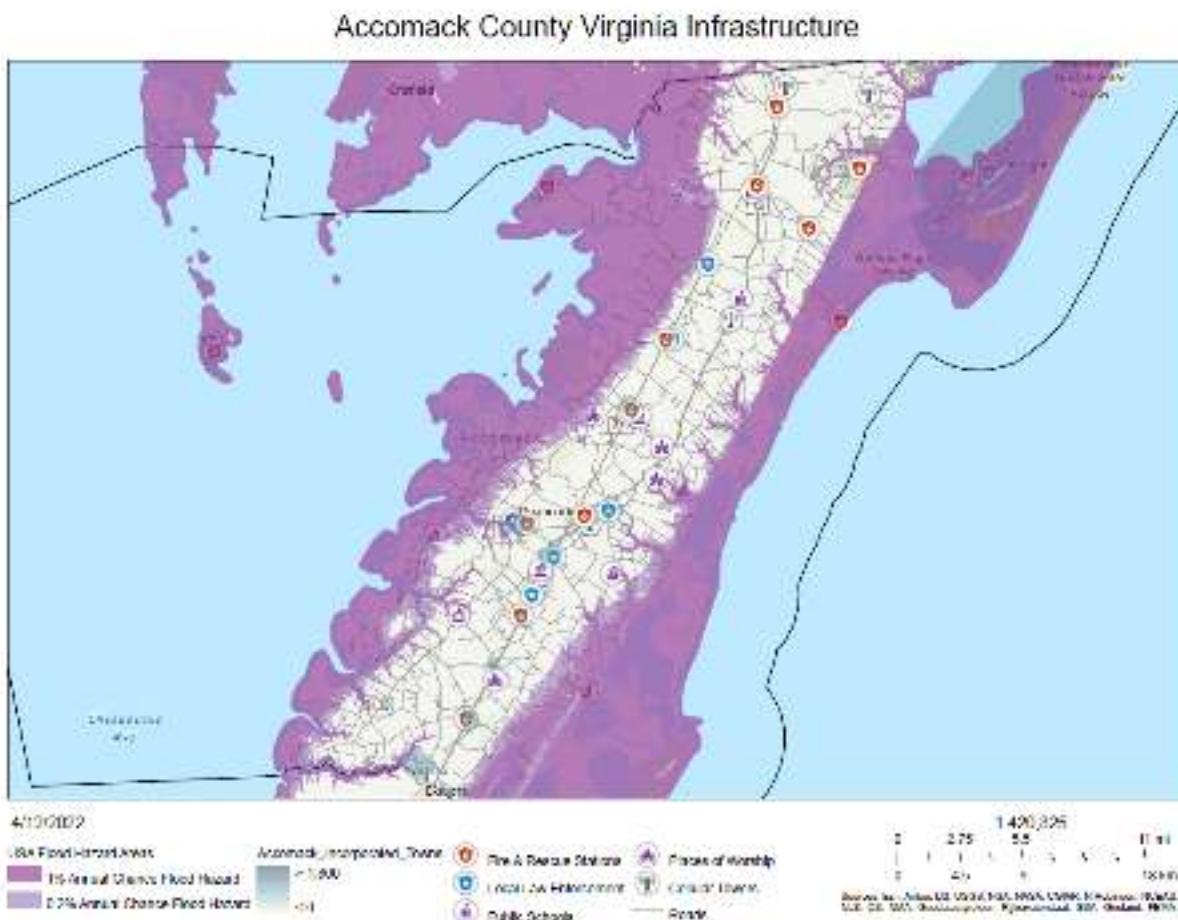
Area	Location Description	Erosion Rate (feet/year)	Mitigation Strategy	Other
<b>Critically Eroding Areas</b>				
Tangier Island, & Upwards	All coastlines, western shore of Tangier least in danger due to existing seawall	10+	Jetties, Seawalls, Enhancing the Upwards, Reinforcement of the eastern shoreline, Extend seawall on eastern shoreline	
Sluitkill Neck	Between Pungoteague and Matchotank Creeks	4-5 On Bayshore, 1.5 on mainland	Retain as is. Unsuitable for residential or recreational development	Includes Finneys, Scarborough, and Parker Islands
<b>Severely Eroding Areas</b>				
Saxis			Beach nourishment, Groynes, Jetty, Breakwater	
Scarboroughs Neck	Northern shoreline of Occohannock Creek	5	Continue as agricultural use	Unsuitable for residential development. Suitable for recreational camping.
Parkers Marsh	Between Chesconessex and Onancock Creeks	5	Retain as state natural area. Restrict development at Crystal Beach to relatively low value seasonal residences	Includes residentially developed Crystal Beach area
Freeschool Marsh	Between Saxis and mainland	1.9-4.9 (maximum along Saxis waterfront)	Retain as is.	Most is set aside as a wildlife refuge
<b>Moderately Eroding Areas</b>				
Hyslop Marsh	Between Craddock and Back Creeks	2-3	Retain as is.	None.
Nandua Creek	Southwestern Accomack Co.	2-3 in lower creek, 0 in upper creek	Continue as agricultural and lowdensity residential use	Lower creek unsuitable for residential development
Broadway Neck	Between Matchotank Creek and East Point	2 south of Thicket Point, no data for north of Thicket Point	High flood hazard should be considered before future development	The presence of old beach defenses at East Point indicates history of moderate erosion
Onancock Creek	Central Accomack Co. Bayside	Moderate erosion of sand beaches	Restrict additional development on lower part of creek	Localized erosion in areas such as at the end of Bailey Neck
Big Marsh	Between Chesconessex and Deep Creeks	0-3	Continue as agricultural and lowdensity residential use	Includes Schooner Bay development
Parksley	Between Hunting and Young Creeks	2 along beaches, 0 along remainder of creeks	Retain as marshland or agriculture	None.
Michael Marsh	Between Cattail and Messongo Creeks	1.3-1.7 along shore facing Beasley Bay	Retain as is.	Most is set aside as part of Saxis Wildlife Management Area

## Accomack County

### COASTAL FLOODING

According to the 2015 FEMA Flood Risk Report, 311.5 square miles of Accomack County are in the SFHA and 144.6 square miles are in the V zone. This is approximately 68% and 31% respectively of land area (excluding marsh or emergent wetlands) using the land cover data from NOAA. The three largest landholders are the Commonwealth of Virginia, the Federal Government, and The Nature Conservancy (TNC). Of non-federal land in the SFHA, over 70% is maintained in open space (Personal communications, Tom Brockenbrough, Floodplain Administrator, March 2, 2021).

**Figure 6: Accomack County Flood Hazards to Infrastructure**



The total economic loss estimated by Hazus® for a 1-percent-annual-chance flood event is \$145.54 million, which represents 10.06% of the total replacement value of the scenario buildings. The Hazus® model indicates that over 65,000 tons of debris would be generated during such flooding event. The quantity of generated debris will likely create accommodation challenges for the landfill, consequently forcing trucks inland for debris processing and disposal. Hazus® estimates the number of households expected to be displaced from their homes and the associated potential evacuation in the event of a 1-percent-chance flood. Additionally, Hazus® estimates the number of those displaced individuals that will require accommodations in temporary public shelters. The model indicates approximately 767 households, or 2,301 individuals, will be displaced due to the flood event. Displacement includes households evacuated from within or very near the inundated area. Of these, 382 out of the County's 33,164 total

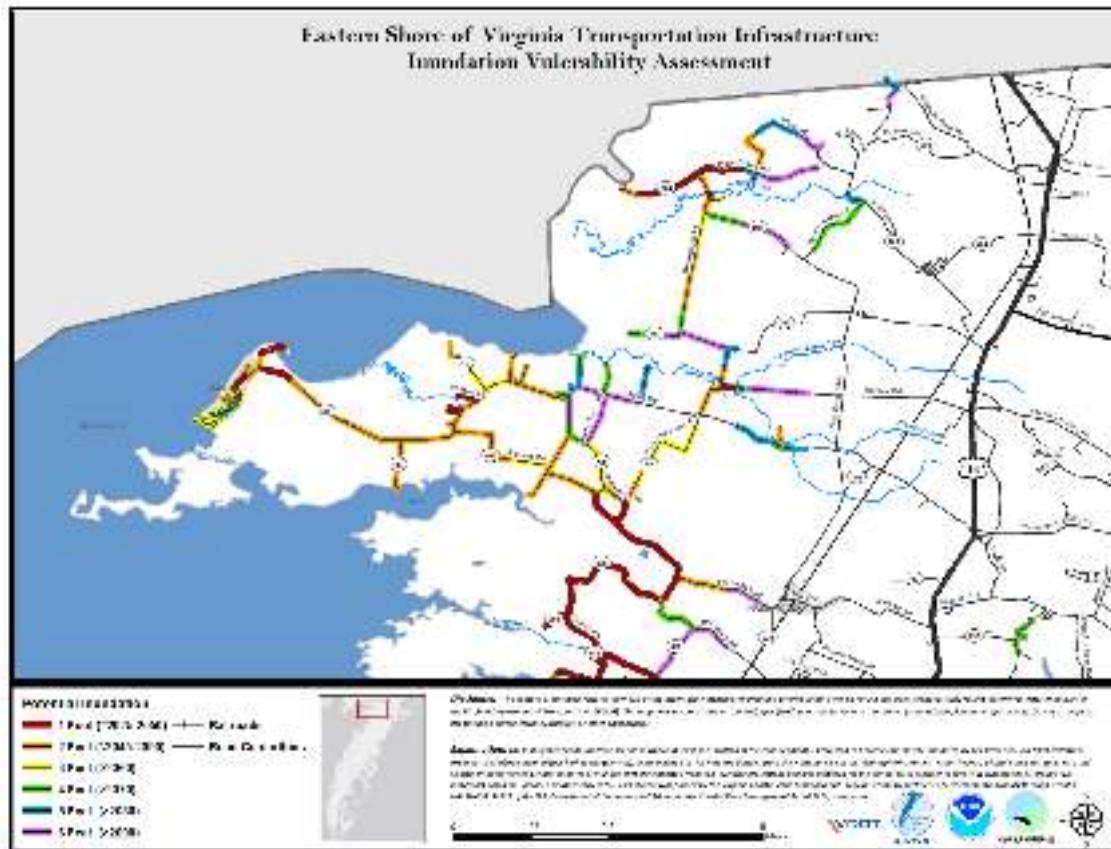
## Eastern Shore of Virginia Hazard Mitigation Plan 2021

population will seek out temporary public shelters. Following Hurricane Sandy in 2012, there were over 200 reported home damages in the County; however, within two weeks, roughly half of these had already been repaired and a quarter were being processed with their respective insurance companies. Between 15 and 20 homes received volunteer assistance for their repairs and two residents from two homes relocated off of the Eastern Shore.

### SEA LEVEL RISE

Based on 2010 U.S. Census data, 4,623 people in the County are on land below 3-feet elevation and 6,957 people are below 5 feet. In 2010, Accomack County had 33,164 people in total. Of the County's 1,014 miles of roads, 31 miles (3.1%) will be inundated with 1-foot of sea level rise (SLR) (estimated year 2025-2050), 115 miles (11.3%) with 2 feet (2045-2090), and 183 (18%) with 3 feet (post-2060) (*ESVA Transportation Infrastructure Inundation Vulnerability Assessment*, 2015). Another study by VIMS estimated 326 miles of roads in Accomack County were vulnerable to 1.5 feet of relative SLR when combined with a storm surge of 3 feet. Even small amounts of sea level rise make rare floods more common by adding to tides and storm surge. With 3 feet of sea level rise, there are many towns, unincorporated communities, and economically critical facilities (including NASA WFF and various working waterfront areas) that would be disconnected, inaccessible, or have the majority of the roads inundated with 3 feet of relative SLR. Without significant engineering solutions in the coming years, it should be expected that the livelihood and safety of communities and the integrity of the roadways in the County will largely decline. Figure 5 shows a map from the *Transportation Infrastructure Inundation Vulnerability Assessment* of one of the most susceptible areas to SLR effects in the County. According to a 2014 report prepared by Climate Central, the County has 41,816 acres of land below 5 feet MHHW.

**Figure 7: Northwestern Accomack County Transportation Infrastructure Inundation Vulnerability Assessment**



## STORM WATER FLOODING

Local officials identified various areas in the unincorporated portions of the County that have stormwater flooding problems. These areas include, but are not limited to:

- New Church; Rt. 13 & Rt. 175
- Sanford
- Especially Neil Parker Rd (Sanford)
- Pastoria
- Mappsville
- Bayside Rd between Shields and Craddockville
- Family Dollar Store in Tasley
- Intersection of Locustville Rd & Drummondtown Rd
- Clam
- Messongo
- Belinda

The causes are typically from soil type, elevation, lack of proper ditch design and maintenance, or any combination of these.



**Figure 8: Accomack County  
Storm Water Flash Flooding -  
July 1, 2016. Photo by Shannon  
Alexander**



## Eastern Shore of Virginia Hazard Mitigation Plan 2021

Intense rain events, such as that on Friday July 1, 2016, can come without warning and have serious impacts to travel and safety, as shown in Figure 6. Slow moving storms that moved over Accomack County brought nine inches of rain by evening in the Parksley area, where southbound U.S. 13 was forced to close. Throughout the County, homes were surrounded by and often inundated by water. The gauge in Onley measured 8.58-inches of rain. Ambulances and fire rescue vehicles struggled to reach individuals in need of aid. Luckily, there are alert systems in place that, if signed up for, will send alerts when such a flash flood warning is in effect; however, often times waters are already rising by the time these alerts are issued.

Educating residents about the risks associated with storm water flooding and standing water, such as septic contaminants and mosquito-borne illnesses, is an important step in mitigating potential negative impacts to the population.

### HAZARDS OF LOCAL SIGNIFICANCE

Other hazards for Accomack County are described in the Regional Chapter and include, but are not limited to, above and underground storage tanks, snow and ice, fire and drought, fish kills, and biological hazards.

#### WATER QUALITY

Since many people in the County rely on the fisheries and aquaculture industries, fish kills and the declining health of the Chesapeake Bay can severely impact the residents and the economics of the entire Region. In addition, bacterial impairments can discourage tourism and recreational use of our beaches and waters.

#### MOSQUITOS

Mosquito-borne illnesses, such as West Nile and Zika Virus, pose a potential risk, especially with standing water from intense rain events and subsequent stormwater flooding.

#### SNOW AND ICE STORMS

With snow and ice storms, there are often school closures, power outages, isolated communities (by water – Tangier, and roads to many locations), and economic issues from damages to agriculture, water lines, etc.

#### FIRE AND SMOKE

According to ACS estimates, in 2019, 2,369 (17.6%) of Accomack County houses are heated with fuel oil, kerosene, etc., another 2,905 (21.6%) with bottled, tank, or LP gas, and 227 (1.7%) use utility gas as the primary house heating source. In times of low humidity and high winds, the County is susceptible to field and forest fires as well.

## Accomack County

### CRITICAL FACILITIES

The following table lists the critical facilities and their relative importance to the County.

**Table 8: Accomack County Critical Facilities**

Facility	Hazards	People Affected	Loss Potential	Relocation Potential	Retrofit Potential
<b>County-Owned Properties</b>					
Public Schools: Tangier Combined, Chincoteague Combined, Arcadia Middle & High, Nandua Middle & High, and Pungoteague, Accawmacke, Metompkin, Kegotank, and Chincoteague Elementary	Storm Water, Coastal Flooding (Tangier & Chincoteague), Wind, Fire, Ice	20,000+	Major Disruption	Yes	Yes
911 Communications	Wind, Fire, Ice	45,000+	Devastating	Yes	Yes
Sheriff's Office & Jail Complex	Wind, Fire, Ice	33,000+	Devastating	No	Yes
Health Department	Wind, Fire, Ice	33,000+	Major Disruption	Yes	Yes
Social Services	Wind, Fire, Ice	20,000+	Major Disruption	Yes	Yes
Administration Building	Wind, Fire, Ice	33,000+	Minor Disruption	Yes	Yes
Public Safety Building	Storm Water, Wind, Fire, Ice	33,000+	Major Disruption	Yes	Yes
Fire Training Center/Emergency Operation Center	Wind, Fire, Ice	33,000+	Major Disruption	No	No
Building & Grounds Maintenance Shop	Storm Water, Wind, Fire, Ice	33,000+	Minor Disruption	Yes	Yes
Veteran's Affairs Office	Wind, Fire, Ice	5,000+	Minor Disruption	Yes	Yes
County Garage	Storm Water, Wind, Fire, Ice	33,000+	Major Disruption	Yes	Yes
Industrial Parkway, Service Rd, & Atlantic Dr	Storm Water, Wind, Fire, Ice	20,000+	Minor Disruption	No	Yes
Airport Complex	Storm Water, Wind, Fire, Ice	3,000+	Major Disruption	No	Yes
North & South Landfills	Storm Water, Coastal Flooding, Wind, Fire, Ice	33,000+	Major Disruption	No	Yes
Mappsville Communications Tower	Wind, Fire, Ice, Lightning	33,000+	Major Disruption	Yes	Yes
Planning Office	Wind, Fire, Ice	33,000+	Minor Disruption	Yes	Yes
Lumber Mill Complex (Joynes Neck Rd)	Storm Water, Wind, Fire, Ice	33,000+	Inconvenience	No	Yes
Convenience Centers: Chincoteague, Fisher's Corner, Horntown, Makemie Park, Grangeville, Painter, Tasley	Storm Water, Coastal Flooding, Wind, Fire, Ice	33,000+	Major Disruption	Yes	Yes
<b>County-Owned &amp; Operated Public Utilities</b>					
Industrial Park Water & Wastewater Systems	Wind, Fire, Ice, Flooding	33,000+	Major Disruption	No	Yes
Leachate Treatment Plant	Wind, Fire, Ice, Flooding	33,000+	Major Disruption	No	Yes
Accomac Water System	Wind, Fire, Ice, Flooding	2,000+	Major Disruption	No	Yes
Health Dept. Water System	Wind, Fire, Ice, Flooding	33,000+	Major Disruption	No	Yes
Court Systems Buildings Complex	Wind, Fire, Ice, Flooding	10,000+	Major Disruption	No	Yes
DSS Water & Wastewater Systems	Wind, Fire, Ice, Flooding	3,000+	Major Disruption	No	Yes

## FINDINGS

1. During a 1-percent-annual-chance flood event, the total economic losses are estimated at approximately \$145.54 million. During the same chance wind event, the total property damage loss equals roughly \$72 million. If these Hazus® estimates are combined, which is a likely scenario during a hurricane, the damages are over \$217 million. A high-wind storm system that also produced 1-percent-annual chance flooding is a significant threat to the County.
2. During a 1-percent-annual-chance flood event, 767 households, or 2,301 individuals, would be displaced from their homes. An estimated 382 of these individuals would be forced to seek out temporary public shelter. Coastal flooding is the greatest threat to the County.
3. With the 2015 updates to the FIRM, 4.6 square miles, including 1,111 buildings, were removed from the SFHA and 41.2 square miles, including 300 buildings, were removed from the V zone. From April of 2011 to January of 2016, there has been a decrease of 602 policies in the unincorporated areas. This number is estimated to continue to increase as more residents learn that flood insurance is no longer required. The changes in the FIRM are thought to create a sense of decreased vulnerability to flooding, and the resulting drops in policies may increase the rebound time for the County and its residents following a flood event.
4. According to 2016 NFIP data, there are 38 repetitive loss properties and 3 severe repetitive loss structures in the County. It is possible both of these numbers have increased over the last five years.
5. As of 2021, the Towns of Keller, Melfa, and Painter do not participate in the NFIP but experience stormwater flooding. Many areas of stormwater flooding are not identified by the current FIRMs. Residents and business owners in these areas cannot currently purchase flood insurance or be eligible for some loan opportunities. Often, drainage ditches are the culprit behind storm flooding, thus maintenance and re-evaluation of many systems may be needed to address this hazard.
6. High winds from a 1-percent-annual-chance event are predicted to cause at least moderate damage to 230 buildings and completely destroy 16. Property damages and economic losses would total approximately \$72 million. Although this is significant, it is not even half of the damage incurred by a 1-percent-annual-chance flooding event. The majority of these damages are to residential structures.
7. Most of the worst coastal erosion in Accomack County has occurred on the bay shoreline. Erosion also causes shoaling of channels and creeks, thus hindering waterway navigation and increasing maintenance dredging needs and costs.

## Accomack County

8. There have been several factors that have increased the risk in the County since 2011. These include an increase in the number of vacant homes, an increase in the number of manufactured homes, an increase in the number of homes with no vehicle available, and an increase in the number of non-English speaking residents.
9. The County has identified other additional hazards including winter storms, sewage spills, drought, wildfire, hazmat incidents, heat waves, biohazards, and well contamination. Furthermore, the County faces secondary hazards from flooding such as poultry kills and mosquito-borne disease, which could potentially impact the health of residents and the local economy. Of concern for wildfire and structure fire is the increasing difficulty with which the fire companies are having in securing sufficient volunteers to offer complete services.

# CHAPTER 30: MITIGATION STRATEGIES DEVELOPMENT

The first iteration of the Eastern Shore Hazard Mitigation Plan was developed in November 2004. At that time, members of the Steering Committee determined the vision for the Eastern Shore during and after a natural hazard event. In May 2011, the Committee revisited the original vision, updated the status of past strategies, and developed new goals and projects. In June of 2016, the Eastern Shore Hazard Mitigation Steering Committee agreed to maintain the Vision Statement as written and included in the 2011 Plan. In the Spring of 2021, the Committee revisited the 2016 Plan and updated locality information and strategies and again developed new goals and projects.

## VISION STATEMENT

As a result of planning and mitigation actions, damage and disruption will be minimized during natural hazard events. Federal and state agencies cooperate with the local government and guide necessary resources to the governments for recovery activities. To the extent possible, residents will be self-sufficient and will have taken responsibility for their own economic and physical protection. Infrastructure smoothly functions throughout the event and the recovery period following.

## GOAL DEVELOPMENT

The Committee's goals were informed by several sources of information listed below.

- Eastern Shore Hazard Identification and Risk Assessment (ESHIRA) findings
- Previous products from ESHIRA development
- Lessons of other natural hazard events
- Current initiatives such as the regional Eastern Shore Disaster Preparedness Coalition

## IDENTIFIED ISSUES

Several issues confront the Eastern Shore in a time of disaster. Representatives from the localities identified several issues. These are included below.

The Eastern Shore Hazard Identification and Risk Assessment showed that not all residences at risk to flooding have a flood insurance policy on them. In addition, many of those residences that have a policy do not appear to have contents coverage. The most common type of residential flood damage on the Eastern Shore is contents damage.

The Eastern Shore Hazard Identification and Risk Assessment identified numerous areas where storm water flooding occurs. It is not clearly understood what the problem is at all of these sites, and the lack of information hinders drainage and stormwater management projects.

There is a shortage of shelter space during natural hazard events due to a lack of manpower and availability of safe structures to safely operate the shelters.

After the natural hazard event, the counties' limited staff are overwhelmed by administrative requirements for the disaster.

## MITIGATION GOALS

The Eastern Shore Hazard Mitigation Steering Committee identified the following goals to work toward. Goal 1 was revised slightly for language. Goal 2 was amended to include language for post-hazard event response. Goal 3 was unchanged. Goal 4 was revised to model FEMA's Community Lifelines. Goal 5 was revised slightly to incorporate all populations.

**Goal 1 – The Hazard Mitigation Plan will serve as a guide to local governments for comprehensive mitigation to include public education and ongoing hazard assessments.**

**Goal 2 – Improve resiliency through harnessing community partnerships (residents, businesses, local governments, and other community partners) working to minimize disruption during and following hazard events.**

**Goal 3 – Local governments encourage self-sufficiency and personal responsibility for managing risk.**

**Goal 4 – Local governments will work to improve infrastructure for resiliency and provide the appropriate redundancies for the operations of critical infrastructure during an event.**

**Goal 5 – Local governments will make efforts to reach all populations during preparation to, response of and mitigation of all risks.**

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## MITIGATION PROJECT DEVELOPMENT

The Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee collectively identified specific mitigation projects that would benefit the entire region. Accomack County, Northampton County, and the Town of Chincoteague developed specific mitigation strategies to address each of the five regional mitigation goals described above. In order to implement the identified strategies, each locality developed mitigation projects specific to their locality. Non-participating towns are currently not eligible for FEMA Hazard Mitigation Assistance grant award funds. Participating towns indicated that mitigation projects included in their respective county's mitigation strategies, when relevant, should also apply to the town.

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### PROJECT PRIORITIZATION

Prioritization ranking is directly based on the rank of the hazard(s) which it addresses. A ranking of 1 indicates a “highest” level of priority and indicates that the mitigation action would address at least one of the highest ranked hazards (high wind, coastal erosion, coastal flooding, stormwater flooding, and pandemic). A ranking of 2 indicates “higher” level of priority and indicates that the highest ranked hazard that the mitigation action would address would be one of the medium ranked hazards (well contamination, biological hazards, storm surge, non-coastal flooding, and road and highway). A ranking of 3 indicates “high” level of priority and indicates that the mitigation action only addresses one or more of the low prioritized hazards (substance use and overdose, communications failure, active threat, electrical energy failure, and tornado). Because the prioritization of the hazards took into account the potential number of affected structures, impacts, likelihood of success, and availability of implementable mitigation options, this way of ranking the mitigation actions incorporates and carries on these fundamental criteria. Rankings for all of the hazards are found in Table 1 of Chapter 3: Risk Assessment. Also, in Chapter 3 (pages 1 and 2), you’ll find more information about the criteria for the ranking of the hazards.

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## ADOPTION

Adoption Resolutions of this plan are included at the end of the plan in **Appendix E**.

# CHAPTER 31: ACCOMACK COUNTY MITIGATION STRATEGIES

## INTRODUCTION

Accomack County is the largest county with respect to area and population on the Eastern Shore of Virginia. There are 14 incorporated towns within the County. These towns include: Accomac, the majority of Belle Haven, Bloxom, Chincoteague, Hallwood, Keller, Melfa, Onancock, Onley, Painter, Parksley, Saxis, Tangier, and Wachapreague. The Town of Chincoteague's mitigation projects are found in its own plan section in Chapter 32. The other towns in Accomack County were invited to contribute to the Eastern Shore of Virginia Hazard Identification and Risk Assessment (ESHIRA) and Hazard Mitigation Plan. The Town of Accomac and the Town of Painter joined the planning process for the first time. Belle Haven is the only town in the County that did not participate.

## PLAN MAINTENANCE

The Emergency Management Coordinator will review the Hazard Mitigation Plan every year prior to the July 1 deadline for the Local Capability Readiness Assessment (LCAR). The Coordinator will evaluate the plan and review progress made during the previous years on the goals and projects in the plan for all of Accomack County and the incorporated towns within the County. The Coordinator will use the LCAR criteria for hazard mitigation to evaluate the hazard mitigation program. Progress will be reflected in the LCAR. The Coordinator will also recommend any revisions to the Board of Supervisors. By July 1, 2022, the Coordinator will assemble a Committee or represent Accomack County on a Committee to update the plan. Towns will have an opportunity to be represented on the Committee. The Committee will work to complete the updates by the fifth-year anniversary of the adoption of the plan. During the plan maintenance process, the community will have opportunity, through advertised public hearings, to comment on plan revisions and updates prior to the Board of Supervisors approving them.

Accomack County and the incorporated towns each have a Comprehensive Plan for their respective jurisdiction. The Emergency Management Coordinator will provide input and plan materials to the planning group responsible for updating the Comprehensive Plan and any other relevant planning efforts. During updates of the Comprehensive Plan and other relevant planning efforts, the Hazard Mitigation Plan will be reviewed and appropriate material incorporated into the updates.

See Chapter 2, page 7 and 8 for additional information about plan maintenance and evaluation.

## IDENTIFIED MITIGATION GOALS & STRATEGIES – ACCOMACK COUNTY

**Goal 1 - The Hazard Mitigation Plan will serve as a guide to local governments for comprehensive mitigation to include public education and ongoing hazard assessments.**

Strategy 1.1 - Train County staff for mitigation duties.

Strategy 1.2 – Promote mitigation programs throughout the County.

**Goal 2 - Improve resiliency through harnessing community partnerships (residents, businesses, local governments, and other community partners) working to minimize disruption during and following hazard events.**

Strategy 2.1 - Reduce damages from flooding.

Strategy 2.2 – Reduce damages from non-flooding natural disasters, if that type of event occurs.

**Goal 3 - Local governments encourage self-sufficiency and personal responsibility for managing risk.**

Strategy 3.1 - Educate the public about their responsibility to respond safely and effectively during a disaster.

Strategy 3.2 - Educate the public about their responsibility in reducing and insuring their own risks.

**Goal 4 - Local governments will work to improve infrastructure for resiliency and provide the appropriate redundancies for the operations of critical infrastructure during an event.**

Strategy 4.1 - Maintain safe traffic flow in case of wide scale power loss.

Strategy 4.2 - Maintain emergency service functions in case of wide-scale power loss.

**Goal 5 - Local governments will make efforts to reach all populations during preparation to, response of and mitigation of all risks.**

Strategy 5.1 – Define and identify special needs populations in the County.

Strategy 5.2 - Assure migrant population has access to County emergency response efforts.

Strategy 5.3 - Assure Tangier Island residents have access to County emergency response efforts.

## IDENTIFIED MITIGATION PROJECTS – ACCOMACK COUNTY

<b>Goal 1 - Local Governments Guide a Comprehensive Mitigation Program Including Public Education and Ongoing Hazard Assessments</b>							
<u>Strategy 1.1 - Train County staff for mitigation duties.</u> <u>Strategy 1.2 – Promote mitigation programs throughout the County.</u>							
<b>Priority Rank</b>	<b>Accomack County – Goal 1: Description of Projects</b>	<b>Hazard(s) Addressed</b>	<b>Responsible Department</b>	<b>HMP Year/Start Timeline</b>	<b>Status as of 2016</b>	<b>Status as of 2021</b>	<b>Add'l. Info.</b>
1	Set a regional compatibility standard for emergency communications	ALL	ESDPC	2006/2006	Ongoing	Ongoing	
1	Upgrade communications systems and provide for backup in the event of a communication failure	ALL	ESDPC	2006/2009	Not Complete	Not Complete	Funding needed
1	Research allowed reimbursement under a Presidentially Declared Disaster and offer to train staff to take on emergency response tasks for pay during disaster events	ALL	Accomack Co. Administration	2006/2007	Ongoing	Ongoing	
3	Institute a recruitment program for volunteer firefighters. Publicize details on how to volunteer on the County website.	Fire	Accomack Co. Administration	2006/2007	Ongoing	Ongoing	On County website
1	Formalize and maintain the Residential Mitigation Project Waiting List	ALL	AC B&Z	2011/Ongoing	Ongoing	Ongoing	
1	Promote Hazard Mitigation at local community events and meetings.	ALL	Accomack Co. Emergency Management (ACEM)	2011/Ongoing	Ongoing	Ongoing	
1	Emergency radio communications within the region are to be interoperable.	ALL	ES 911 Commission	2011/2011	Ongoing	Ongoing	
1	Assess and define County staff emergency response responsibilities during disaster events and incorporate these duties into their job descriptions.	ALL	Accomack Co. Administration	2011/2012	Ongoing	Ongoing	
1	Offer county staff CERT training.	ALL	Accomack Co. Administration	2011/2013	Ongoing	Ongoing	Annual classes offered

## Accomack County Mitigation Strategies

Priority Rank	Accomack County – Completed Projects	Hazard(s) Addressed	Responsible Department	HMP Year/Start Timeline	Status as of 2016	Status as of 2021	Add'l. Info.
---	Produce Responder Bilingual Cards with English on back. An example of the type of message to be included is "Do not drink the water."	ALL	Health Dept. and the Eastern Shore Disaster Preparedness Coalition (ESDPC)	2006/2006	Complete*	---	
---	Obtain more changeable warning signs	ALL	VDOT	2006/2006	Complete	---	
---	Offer county staff free CERT training during office hours in the late afternoon or early morning with the employees using personal time one Saturday to complete the training.	ALL	Accomack Co. Administration	2006/2007	Complete	---	
1	Obtain funding for a generator hookup for the Eastern Shore Community College	Flood, Ice & Snow, Wind	Eastern Shore Community College	2006/Post-declared disaster	Ongoing	Complete	
1	Send a letter to the Town of Keller Council recommending the Town join the National Flood Insurance Program so that federal mitigation funds can become available for use within the flood zones in the Town in case of disaster.	Flood	Accomack Co. Building & Zoning (ACB&Z)	2006/2007	Not Complete	Complete	
1	Send letters to Town Councils of Accomac, Bloxom, Melfa, Onley, Painter, and Parksley advising the Towns that joining the National Flood Insurance Program will allow residents with stormwater flooding problems to purchase flood insurance.	Flood	AC B&Z	2006/2007	Partially Complete	Complete	Accomac, Bloxom, Onley, and & Parksley currently participate in the NFIP

\*Spanish Health and Emergency Preparedness informational brochures have been produced and are available to the Hispanic population through a variety of outlets.

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

<b>Goal 2 - Residents, Businesses, Local Governments, and other Community Partners Will Work Independently and Together to Minimize Community Disruption Through Planning and Mitigation Activities</b>							
<u>Strategy 2.1 - Reduce damages from flooding.</u> <u>Strategy 2.2 – Reduce damages from non-flooding natural disasters, if that type of event occurs.</u>							
Priority Rank	Accomack County – Goal 2: Description of Projects	Hazard(s) Addressed	Responsible Department	HMP Year/Start Timeline	Status as of 2016	Status as of 2021	Add'l. Info.
1	Formalize and maintain the Residential Mitigation Project Waiting List	ALL	Accomack Co. Building & Zoning (ACB&Z)	2006/2006	Ongoing	Ongoing	
1	Drainage Survey of Nelsonia, north of Fisher Corner and Route 13	Storm Water Flood, Biohazard	VDOT, Accomack Co. Public Works	2006/2008	Not Complete	Not Complete	Must coordinate with VDOT
1	After any presidentially declared disaster, manage Residential and Commercial Mitigation Projects that address the most critical damage that has occurred.	ALL	ACB&Z	2006/Post-declared disaster	Ongoing	Ongoing	
1	Continue a comprehensive drainage plan that identifies specific projects to improve drainage.	Flood	Accomack Co. Public Works, VDOT	2011/Ongoing	Ongoing	Ongoing	
1	Amend the future land use map and zoning ordinance to direct high-density development away from critically eroding shorelines identified as high erosion areas (loss of greater than one foot per year) in the VIMS Shoreline Situation Report for Accomack County.	Erosion	Accomack Co. Planning	2011/Ongoing	Ongoing	Ongoing	
1	Mitigate public infrastructure against damage caused by natural disasters. For example, hurricane shutters, flood-proofing, etc.	ALL	Accomack Co. Public Works	2011/Post-declared disaster	Ongoing	Ongoing	
1	Mitigation of flood prone properties (to include, but not limited to acquisition, elevation, relocation, and dry and wet flood proofing of flood prone structures, and mitigation reconstruction for NFIP defined SRL properties only).	Flood	ACB&Z	2011/Post-declared disaster	Ongoing	Ongoing	
3	Develop programs to encourage conservation of barrier islands, marsh land, forested areas, and creek corridors. When consistent with habitat conservation goals, alternatives to fee-simple ownership, such as conservation easements or lease-back agreements should be encouraged to keep property on the tax rolls and in productive use.	Flood, Erosion	Accomack Co. Administration, The Nature Conservancy, Eastern Shore of Virginia Land Trust	2011/Ongoing	Ongoing	Ongoing	
1	Maintain the Residential Mitigation Project Waiting List	ALL	ACB&Z	2011/Ongoing	Ongoing	Ongoing	

## Accomack County Mitigation Strategies

<b>Priority Rank</b>	<b>Accomack County – Completed Projects</b>	<b>Hazard(s) Addressed</b>	<b>Responsible Department</b>	<b>HMP Year/Start Timeline</b>	<b>Status as of 2016</b>	<b>Status as of 2021</b>	<b>Add'l. Info.</b>
---	Incorporate the Eastern Shore of Virginia Hazard Mitigation Plan into the Accomack County Comprehensive Plan.	ALL	Accomack Co. Planning	2011/During next Comp. Plan update	Not Started	Complete (2014 Amended County Comp Plan)	
---	Amend the future land use map and zoning ordinance to direct highdensity development away from critically eroding shorelines identified as high erosion areas (loss of greater than one foot per year) in the VIMS Shoreline Situation Report for Accomack County.	Erosion	Accomack Co. Planning	2006/Ongoing	Complete*	---	
---	Manage a Residential Elevation and Mitigation Project, using benefit-cost analysis provided by FEMA to target structures at risk to flooding.	Flood	Accomack Co., Towns of Onancock, Tangier, Wachapreague, Saxis and Belle Haven	2006/Post-declared disaster	Complete**	---	
---	In the Town of Belle Haven, dig ditches along King Street near the ESO to improve drainage.	Storm Water Flood, Biohazard	VDOT, Accomack Co. Public Works	2006/2008	Complete.	---	
---	Produce a comprehensive drainage plan that identifies specific projects to improve drainage.	Flood	Accomack Co. Public Works	2006/2008	Complete	---	

\*The Future Land Use Map was updated in 2012. The Zoning Ordinance is up to date

\*\*2011 – 2016 Project Status included in each town's mitigation project list

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

Goal 3 - Local Governments Encourage Self-sufficiency and Personal Responsibility for Managing Risk							
<u>Strategy 3.1 - Educate the public about their responsibility to respond safely and effectively during a disaster.</u> <u>Strategy 3.2 - Educate the public about their responsibility in reducing and insuring their own risks.</u>							
Priority Rank	Accomack County – Goal 3: Description of Projects	Hazard(s) Addressed	Responsible Department	HMP Year/Start Timeline	Status as of 2016	Status as of 2021	Add'l. Info.
1	Send out information encouraging residents to purchase contents and structure flood insurance to all homes and businesses located in the County's regulated flood zones.	Flood	Accomack Co. Public Safety	2006/Yearly	Ongoing	Ongoing	Funding done semi-regularly in repetitive loss areas
1	Put out an education brochure on tree plantings benefits. Consider using the information developed by VDEM for Hurricane Isabel.	Erosion, Flood	ACEM	2011/2012	Not Started	Not Started	
1	Put out an education brochure on benefits from burying property power lines. Consider using the information developed by VDEM for Hurricane Isabel.	Ice & Snow, Wind, Fire	ACEM	2011/2012	Not Started	Not Started	
1	Disseminate information encouraging residents and businesses to purchase contents and structure flood insurance.	Flood	ACEM	2011/2012	Ongoing	Ongoing	In brochure mailed to all residence as well as handed out during preparedness talks
1	Maintain an Emergency Management website that contains emergency preparedness information for residents and businesses.	ALL	ACEM	2011/Ongoing	Ongoing	Ongoing	A subset of the County website and has information on there
3	Include details of volunteer opportunities on the County website.	ALL	Accomack Co. Admin.	2011/2012	Not Started	Ongoing	
1	Produce an emergency preparedness brochure that includes local information to be mailed to residents and businesses.	ALL	ACEM	2011/2013	Ongoing, Pending Funding	Ongoing	Sent in 2017, needs to be sent again, Funding
1	Disseminate information on wind-protection systems (hurricane shutters, etc.) to residents and businesses.	Wind	ACEM	2011/2012	Not Started	Ongoing	Information handed out during presentations
1	Provide FEMA mitigation-related publications to residents and businesses via the public library.	ALL	ACEM	2011/2012	Ongoing	Ongoing	Information handed out during presentations

## Accomack County Mitigation Strategies

<b>Priority Rank</b>	<b>Accomack County – Completed Projects</b>	<b>Hazard(s) Addressed</b>	<b>Responsible Department</b>	<b>HMP Year/Start Timeline</b>	<b>Status as of 2016</b>	<b>Status as of 2021</b>	<b>Add'l. Info.</b>
---	Publish an Annual Press Release about Emergency Preparedness	ALL	Accomack Co. Emergency Management (ACEM)	2006/Yearly	Complete, Ongoing	---	
---	Investigate the potential for an increased CRS rating to reduce flood insurance premiums.	Flood	Accomack Co. Planning	2006/2007	Complete	---	
---	Create a Surge Inundation Map and identify evacuation zones and the nearest shelter for distribution on the County's website and in local schools and libraries	Flood	Accomack Co. Public Safety	2006/2006	Complete	---	

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

<b>Goal 4 - Local Governments Will Work to Ensure That Infrastructure Will Continuously Function During and After a Hazard Event</b>							
<u>Strategy 4.1 - Maintain safe traffic flow in case of wide scale power loss.</u> <u>Strategy 4.2 - Maintain emergency service functions in case of wide-scale power loss.</u>							
<b>Priority Rank</b>	<b>Accomack County – Goal 4: Description of Projects</b>	<b>Hazard(s) Addressed</b>	<b>Responsible Department</b>	<b>HMP Year/Start Timeline</b>	<b>Status as of 2016</b>	<b>Status as of 2021</b>	<b>Add'l. Info.</b>
1	The following traffic lights should be retrofitted to have backup power installed in order of importance: <ol style="list-style-type: none"><li>1. Four Corners Traffic Light (Rt. 13 and Rt. 179), T's Corner Traffic Light (Rt. 13 and Rt. 175), Traffic Light on Chincoteague Road (Rt. 175)</li><li>2. Rt. 13 and Rt. 187 in Nelsonia</li><li>3. Rt. 13 &amp; Rt. 180, Wachapreague Rd.</li><li>4. Rt. 13 &amp; Madigan Way at Wal-Mart in Onley</li><li>5. Rt. 13 &amp; entrance to Food Lion Shopping Center at T's Corner</li></ol>	Ice & Fire, Wind	VDOT	2006(1-2) 2011(3-5)/2007	Pending	Pending	Funding allocation and priorities
1	Encourage implementation of emergency generator power serving public water and wastewater systems.	Ice & Snow, Wind	Accomack Co. Public Works	2011/2013	Not Started	Not Started	Funding
<b>Priority Rank</b>	<b>Accomack County – Completed Projects</b>	<b>Hazard(s) Addressed</b>	<b>Responsible Department</b>	<b>HMP Year/Start Timeline</b>	<b>Status as of 2016</b>	<b>Status as of 2021</b>	<b>Add'l. Info.</b>
---	Ensure all Accomack County Fire Stations are wired for generator hook-up.	Ice & Snow, Wind	Accomack Co. Public Safety	2006/Post-declared disaster	Complete	---	
---	After consultation with the Hazard Mitigation Planning Committee, that included input from the Accomack Sheriff's Office, the following traffic lights were retrofitted to have backup power installed: <ol style="list-style-type: none"><li>1. Rt. 13 and Rt. 176 in Parksley</li><li>2. Rt. 13 and Rt. 626 in Melfa</li><li>3. Rt. 13 and Rt. 182 in Painter</li></ol>	Ice & Snow, Wind	VDOT	2006/2007	Complete	---	
1	Obtain funding for a generator hookup for the Eastern Shore Community College.	Ice & Snow, Wind	ESCC	2011/Post-declared disaster	Ongoing	Complete	New building will have a commercial generator

## Accomack County Mitigation Strategies

<b>Goal 5 - Local Governments Will Make Efforts to Reach Special Needs Populations</b>							
<b>Priority Rank</b>	<b>Accomack County – Goal 5: Description of Projects</b>	<b>Hazard(s) Addressed</b>	<b>Responsible Department</b>	<b>HMP Year/Start Timeline</b>	<b>Status as of 2016</b>	<b>Status as of 2021</b>	<b>Add'l. Info.</b>
1	Coordinate with Town Staffs to man town shelters	ALL	Accomack Co. Administration	2006/2007	Not Complete	Not Complete	Staff
1	Investigate a paid reservist program to man up to 7 emergency shelters.	ALL	Accomack Co. Administration	2006/2008	Not Complete	Not Complete	Staff
1	Approach local growers thru the Migrant Council to ask for tax-deductible donations to support and offset sheltering costs for migrants during natural disasters.	ALL	Accomack Co. Administration	2006/2008	Not Complete	Not Complete	Staff/ Coordination
1	Provide busing for evacuated Tangiermen from Crisfield, Maryland to shelters in Somerset County or bring them to Accomack County shelters. Prepare Tangier residents before any storms on where and how this system will work.	Flood, Wind, Ice & Snow	Accomack Co. Public Safety	2006/2006	Not Complete	Not Complete	Funding/ Coordination
1	Define special needs populations in the County.	ALL	ACEM	2011/2012	Ongoing	Ongoing	
1	Develop an emergency coordination plan for defined special needs populations in the County.	ALL	ACEM	2011/2013	Ongoing	Ongoing	
1	Assure that the residents of Tangier Island have access to emergency shelters on the mainland during a disaster.	ALL	ACEM	2011/Ongoing	Ongoing	Ongoing	Will be housed in existing shelters on the mainland
1	Disseminate Spanish language emergency preparedness information to the Hispanic community via camps, churches, Telemon, and other primarily Hispanic outlets.	ALL	ESDPC	2011/Ongoing	Ongoing	Ongoing	This is in progress as well as information on how to access emergency notifications via phone

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

<b>Priority Rank</b>	<b>Accomack County – Completed Projects</b>	<b>Hazard(s) Addressed</b>	<b>Responsible Department</b>	<b>HMP Year/Start Timeline</b>	<b>Status as of 2016</b>	<b>Status as of 2021</b>	<b>Add'l. Info.</b>
---	Produce County-specific emergency information in Spanish	ALL	ESDPC	2011/Ongoing	Ongoing	Complete	
---	Develop a plan for sheltering of household pets.	ALL	ACEM	2011/2013	Not Started	Complete	
---	Produce County-specific emergency information in Spanish	ALL	Accomack Co. Administration & Public Safety	2006/2007	Complete		
---	All public buildings that are slated for renovation or construction will be evaluated for designation of Red Cross Shelter or refuge of last resort status	ALL	Accomack Co. Public Safety	2006/Ongoing	Complete		
---	Approach local growers thru the Migrant Council to educate them about appropriate measures to take when a disaster is threatening the area while migrants are working.	ALL	Accomack Co. Administration	2006/2007	Complete		
---	Provide a mass notification system for relay of emergency information to residents and visitors.	ALL	Accomack Co. Administration	2011/Post-declared disaster	Not Complete	Complete, Ongoing	CodeRED

Accomack County Mitigation Strategies

## IDENTIFIED MITIGATION PROJECTS – ACCOMACK COUNTY TOWNS

<u>Town</u>	<u>Action</u>	<u>Hazard(s) Addressed</u>	<u>Responsible Party</u>	<u>Strategy</u>	<u>HMP Year/Start Timeline</u>	<u>2016 Status</u>	<u>2021 Status</u>	<u>Add'l. Info.</u>
Accomac	Conduct regular maintenance of the ditches and stormwater drains to ensure adequate drainage to mitigate stormwater flooding	Stormwater Flooding, Biohazard	VDOT; Town Council	2.1, 2.2, 4.1	2017	-	Ongoing	
Accomac	Remove dilapidated structures	Wind, Fire	Town Council	1.2, 2.1, 2.2	2021	-	Ongoing	
Accomac	Extend and clean out drainage ditches to the drain field north of Lilliston Ave in order to mitigate stormwater flood damage to Lilliston properties	Stormwater Flooding, Biohazard	VDOT; Town Council	2.1, 2.2, 4.1	2022	-	Not Started	
Accomac	Retrofit undersized box culverts on Front St and Back St and conduct regular maintenance of culverts in order to mitigate stormwater flooding	Stormwater Flooding, Biohazard	VDOT; Town Council	2.1, 2.2, 4.1	2022	-	Not Started	
Bloxom	Incorporate the Eastern Shore of Virginia Hazard Mitigation Plan into the Bloxom Town Plan.	ALL	Town Staff	2.1, 2.2	During next Town Plan update	Not Started	Ongoing	No Town Plan update yet.
Bloxom	Mitigate against natural disasters.	ALL	Town Staff, Residents	2.1, 2.2	Post-declared disaster	Ongoing	Ongoing	
Bloxom	Join the National Flood Insurance Program.	Flooding	Town Staff	1.1	Post-declared disaster	Not Started	Complete	
Bloxom	Retrofit the undersized box culverts in Bloxom to mitigate stormwater flooding.	Stormwater Flooding, Biohazard	VDOT	2.1	Post-declared disaster	Not Started	Not Started	VDOT
Bloxom	Promote Hazard Mitigation at local community events and meetings. Acquire or develop materials to cater to the increasing diversity of the population.	ALL	Town & County Staff	3.1, 3.2, 5.1	2011	Ongoing	Ongoing	

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

Bloxom	Regular maintenance of the stormwater drains and the ditches to prevent flooding.	Stormwater Flooding, Biohazard	VDOT, Town Staff, Residents	2.1, 4.1	2017	Not Started	Ongoing	
Bloxom	Build a staging area (point of distribution), ideally with electric (and generator), water, and minimum commercial equipment (such as microwave, refrigerator, etc.). Ideal location is the Town Square area.	ALL	Town, FEMA	1.2, 4.2	2017	Not Started	Not Started	Funding
Bloxom	Groundwater resources research, particularly to address shallow well concerns.	Well Contamination, Drought	Town, Ground Water Committee	1.2, 3.2	2017	Not Started	Not Started	Funding
Bloxom	Dredge the ditches in order to alleviate stormwater flooding damages and dangers.	Stormwater Flooding, Biohazard	VDOT	2.1, 4.1	2011	Complete	Complete	
Hallwood	Incorporate the Eastern Shore of Virginia Hazard Mitigation Plan into the Hallwood Town Plan.	ALL	Town Staff	2.1, 2.2	During next Town. Plan update	Ongoing	Ongoing	
Hallwood	Mitigate flooding and wind hazards in Hallwood.	Flooding	Town, FEMA, Residents	2.1, 2.2	Post-declared disaster	Ongoing	Ongoing	
Hallwood	Retrofit the undersized box culverts in Hallwood to mitigate stormwater flooding problems.	Stormwater Flooding, Biohazard	VDOT	2.2	Post-declared disaster	Not Started	Not Started	VDOT
Hallwood	Promote Hazard Mitigation at local community events and meetings.	ALL	Town & County Staff	3.1	2011	Not Started	Ongoing	
Hallwood	Conduct public education and outreach efforts within Town to raise awareness and promote participation of the NFIP.	Flooding	Town Staff, Coordinator (*if regional position created/funded)	3.1	2011	Ongoing	Ongoing	
Hallwood	Provide educational information to residents about the burn permit process.	Fire	Town Staff, County Emergency Management	3.1	2011	Ongoing	Ongoing	
Hallwood	Investigate the use of large drainage ditches as fuel breaks to mitigate wildfires.	Stormwater Flooding, Fire	Town Staff, County Emergency Management	2.2	2011	Not Started	Not Started	Lack of Staff, Funding

## Accomack County Mitigation Strategies

Hallwood	Encourage water conservation among residents during droughts.	Drought	Town & County Staff	3.2	2011	Ongoing	Ongoing	
Hallwood	Removal of dilapidated structures	Wind, Stormwater Flooding	Town Council	1.2, 2.1, 2.2	2016	Ongoing	Ongoing	
Hallwood	Work with residents to ensure that they are paying the appropriate amount for their NFIP flood insurance policies, since there are residents paying higher than necessary premiums in Town.	Flooding	Town Staff, Coordinator (if regional position created/funded)	3.1	2011	Complete	Complete	
Keller	Incorporate the Eastern Shore of Virginia Hazard Mitigation Plan into the Keller Town Plan.	ALL	Town Staff	2.1, 2.2	During next Town. Plan update	Not Started	Ongoing	No Town Plan update yet
Keller	Promote Hazard Mitigation at local community events and meetings.	ALL	Town & County Staff	3.1	2011	Not Started	Ongoing	Lack of Staff
Keller	Join the National Flood Insurance Program.	Flooding	Town Staff, Residents	1.1	2011	Not Started	Ongoing	In process of joining
Keller	Cooperate with Accomack County to implement the Emergency Operations Plan to put residents at less risk during an emergency.	ALL	Town & County Staff	1.1	Post-declared disaster	Ongoing	Ongoing	
Keller	Maintain and ensure adequate drainage ditches to mitigate stormwater flooding problems in Keller.	Stormwater Flooding, Biohazard	VDOT, Town must request	2.2	2011	Not Started	Ongoing	
Melfa	Incorporate the Eastern Shore of Virginia Hazard Mitigation Plan into the Melfa Town Plan.	ALL	Town Staff	2.1, 2.2	During next Town. Plan update	Not Started	Not Started	No Town Plan update yet
Melfa	Promote Hazard Mitigation at local community events and meetings.	ALL	Town & County Staff	3.1	2016	Not Started	Not Started	Lack of Staff
Melfa	Cooperate with Accomack County to implement the Emergency Operations Plan to put residents at less risk during an emergency.	ALL	Town & County Staff	1.1	Post-declared disaster	Ongoing	Ongoing	
Melfa	Maintain and ensure adequate drainage ditches to mitigate stormwater flooding problems in Melfa. Install culvert pipes where needed to mitigate stormwater flooding on Woodland Avenue and anywhere else needed.	Stormwater Flooding, Biohazard	VDOT, Town Staff	2.2	2016	Not Started	Ongoing	
Melfa	Construct a pavilion facility with electricity for use as a staging area following a hazard event.	ALL	Town, FEMA	4.2	2016	Not Started	Not Started	Funding

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

Melfa	Purchase a mobile generator that can be used at any facility (including the pavilion distribution area) during a prolonged power outage.	Wind, Snow, Ice	Town, FEMA	4.2	2016	Not Started	Not Started	Funding
Onancock	Incorporate the Eastern Shore of Virginia Hazard Mitigation Plan into the Onancock Town Plan.	ALL	Town Staff	2.1, 2.2	During next Town. Plan update	Ongoing	Complete	2021 update in progress
Onancock	Mitigate the Town's infrastructure against flooding and wind.	Wind, Coastal Flooding, Stormwater Flooding	Town, Residents, FEMA	2.1, 2.2	Post-declared disaster	Ongoing	Ongoing	
Onancock	Retrofit Town sewage pump station and manholes to prevent damages from flooding and maintain continuous operation during flood events.	Coastal Flooding, Stormwater Flooding	Town Public Works	4.2	Post-declared disaster	Not Started	Not Started	Funding
Onancock	Retrofit the Onancock Town Office, Police Department Office, and Town fuel tank pumps for generator hookups.	ALL	Town, FEMA	4.2	Post-declared disaster	Not Started	Not Started	Funding
Onancock	Purchase portable generator (for fuel tank pumps, etc.)	Wind, Coastal Flooding, Stormwater Flooding, Snow, Ice	Town, FEMA	4.2	2016	Not Started	Not Started	Funding
Onancock	Participate in the Community Rating System (CRS) to create a discount for Town residents.	Flooding	Town Staff, Residents, Coordinator (*if regional position created/funded)	1.2, 3.2	2016	Not Started	Not Started	Staffing
Onancock	Promote Hazard Mitigation at local community events and meetings.	ALL	Town & County Staff	3.1, 5.2	2016	Not Started	Ongoing	Lack of outreach materials
Onancock	Cooperation with Accomack County to implement the Emergency Operations Plan to put residents at less risk during an emergency.	ALL	Town & County Staff	1.1	Post-declared disaster	Ongoing	Ongoing	

## Accomack County Mitigation Strategies

Onancock	Removal of dilapidated structures.	Wind, Coastal Flooding, Stormwater Flooding, Fire	Town Staff	1.2, 2.1, 2.2	2021	-	Ongoing	
Onancock	Conduct Storm Water Management studies and draft plans	Coastal Flooding, Stormwater Flooding	Town Staff	2.2	2021	-	Not Started	Staffing
Onley	Incorporate the Eastern Shore of Virginia Hazard Mitigation Plan into the Onley Town Plan.	ALL	Town Staff	2.1, 2.2	During next Town Plan update	Not Started	Complete	
Onley	Mitigate the Town's Infrastructure against flooding and wind.	Wind, Stormwater Flooding	Town, Residents, FEMA	2.1, 2.2	Post-declared disaster	Ongoing	Ongoing	
Onley	Join the National Flood Insurance Program.	Flooding	Town Staff, Residents, Coordinator (*if regional position created/funded)	1.1	2011	Not Started	Complete	
Onley	Promote Hazard Mitigation at local community events and meetings.	ALL	Town & County Staff	3.1	2011	Not Started	Ongoing	
Onley	Take the necessary actions to satisfy prerequisites for mitigation funding (e.g., maintain stormwater event log).	Stormwater Flooding, Biohazard	Town Public Works	1.1	2011	Not Started	Not Started	Staffing
Onley	Cooperate with VDOT to mitigate stormwater drainage in Onley.	Stormwater Flooding, Biohazard	VDOT, Town	2.1	2011	Not Started	Ongoing	
Painter	Incorporate the Eastern Shore of Virginia Hazard Mitigation Plan into the Painter Town Plan.	ALL	Town Staff	2.1, 2.2	During next Town Plan update	-	Not Started	No Plan update yet
Painter	Maintain and ensure adequate drainage ditches to mitigate stormwater flooding problems.	Stormwater Flooding, Biohazards	VDOT, Town Staff	2.1, 2.2, 4.1	2021	-	Ongoing	
Painter	Cooperate with Accomack County to implement the Emergency Operations Plan to put residents at less risk during an emergency.	ALL	Town & County Staff	1.1	2021	-	Ongoing	

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

Painter	Mitigate against natural disasters	ALL	Town, Residents, FEMA	2.1, 2.2	2021	-	Ongoing	
Parksley	Incorporate the Eastern Shore of Virginia Hazard Mitigation Plan into the Parksley Town Plan.	ALL	Town Staff	2.1, 2.2	During next Town Plan update	Not Started	Not Started	No Plan update yet
Parksley	Mitigate against natural disasters.	ALL	Town, Residents, FEMA	2.1, 2.2	2016	Ongoing	Ongoing	
Parksley	Retrofit the undersized box culverts in Parksley to mitigate stormwater flooding.	Stormwater Flooding, Biohazard	VDOT, Town must request	2.1	2011	Not Started	Not Started	Funding
Parksley	Coordinate with VDOT for proper maintenance of roads that need to have the levels lowered.	Stormwater Flooding, Biohazard	VDOT, Town	2.1	2016	Not Started	Not Started	Funding
Parksley	Promote Hazard Mitigation at local community events and meetings. Acquire or develop materials to cater to the increasing diversity of the population.	ALL	Town & County Staff	3.1, 3.2, 5.1	2011	Ongoing	Ongoing	
Parksley	Regular maintenance of the stormwater drains and the ditches to prevent flooding.	Stormwater Flooding, Biohazard	VDOT – Town must request	2.1, 4.1	2016	Not Started	Not Started	
Parksley	Develop multi-lingual emergency plans, preparedness handouts, and evacuation plans.	ALL	Town & County Staff	1.3, 3.2, 5.1, 5.2	2016	Not Started	Ongoing	
Parksley	Backup power for electric substation supplying Parksley and resistors on feeder lines from the substation.	Wind, Snow, Ice	ANEC, County	4.2	2016	Not Started	Not Started	Funding
Parksley	Establish weather station.	Wind, Stormwater Flooding, Snow, Ice, Extreme Heat, Drought	NWS, Town must initiate	3.1, 3.2	2016	Not Started	Not Started	Funding
Parksley	Additional street lighting.	ALL	Town	1.2	2016	Not Started	Complete	
Parksley	Retrofit the pavilion roof (staging area and farmers market location) to withstand higher wind conditions.	Wind	Town, FEMA	1.2, 2.2, 4.2	2016	Not Started	Ongoing	
Parksley	Acquire generator for the Town Office.	ALL	Town, FEMA	4.2	2016	Not Started	Not Started	Funding

## Accomack County Mitigation Strategies

Parksley	Install evacuation signage.	ALL	Town, County, State	3.1	2016	Not Started	Not Started	Funding
Saxis	Incorporate the Eastern Shore of Virginia Hazard Mitigation Plan into the Saxis Town Plan.	ALL	Town Staff	2.1, 2.2	During next Town Plan update	Not Started	Not Started	No Plan update yet
Saxis	Retrofit the Saxis Town Hall and Firehouse to protect against wind and flood hazards.	Wind, Coastal Flooding, Stormwater Flooding	Town, FEMA	2.1, 2.2	Post-declared disaster	Not Started	Complete	
Saxis	Obtain funding to construct an erosion control structure along the western shoreline of the Town.	Coastal Erosion	Town must initiate	2.1	Post-declared disaster	Actively Seeking Funding	Actively Seeking Funding	
Saxis	Retrofit harbor infrastructure to mitigate against wind, coastal erosion and flooding.	Wind, Coastal Erosion, Coastal Flooding, Stormwater Flooding	Town must initiate	2.1	Post-declared disaster	Actively Seeking Funding	Actively Seeking Funding	
Saxis	Promote Hazard Mitigation at local community events and meetings.	ALL	Town & County Staff	3.1	2011	Ongoing	Ongoing	
Saxis	Explore CRS	Flooding	Town Staff, Coordinator (*if regional position created/funded)	2.1	-	Not Started	Ongoing	
Saxis	Education and outreach to new and transient or seasonal guests or residents.	ALL	Town & County Staff	3.1, 3.2	-	Not Started	Ongoing	
Tangier	Incorporate the Eastern Shore of Virginia Hazard Mitigation Plan into the Tangier Town Plan.	ALL	Town Staff	2.1, 2.2	During next Town Plan update	Not Started	Not Started	No Plan update yet
Tangier	Mitigate erosion, flooding, and wind hazards in Tangier.	Wind, Coastal Erosion, Coastal Flooding, Stormwater Flooding	Town, FEMA	2.1, 2.2	Post-declared disaster	Ongoing	Ongoing	

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

Tangier	Retrofit the undersized box culverts in Tangier and have regular maintenance to ensure culverts are not blocked to mitigate stormwater flooding problems.	Stormwater Flooding, Biohazard	VDOT, Town must request	2.1	Post-declared disaster	Not Started	Not Started	Funding
Tangier	Retrofit critical facilities in Tangier with backup power supplies.	Wind, Coastal Flooding, Stormwater Flooding, Snow, Ice	Town	4.2	2011	Ongoing	Ongoing	
Tangier	Obtain funding to purchase an emergency boat for the Tangier Fire Department to better protect residents and structures from fire damage during flood events	Coastal Flooding, Stormwater Flooding, Fire	Town, FEMA	4.2	2011	Not Started	Not Started	Funding
Tangier	Promote Hazard Mitigation at local community events and meetings.	ALL	Town & County Staff	1.1, 1.2, 3.1, 3.2, 5.1, 5.3	2011	Ongoing	Ongoing	
Tangier	Properly maintain and regularly sample the Town wells to ensure safe water supply and a system that is able to cope with a dynamic natural system.	Well Contamination	Town	2.1, 2.2	2016	Ongoing	Ongoing	
Tangier	Retrofit the electric line elevated power point on Watts Island, which is currently being negatively impacted by erosion, to ensure continued, uninterrupted power on the Island.	Wind, Coastal Erosion, Coastal Flooding	ANEC	2.1, 2.2, 4.1	2016	Ongoing	Ongoing	ANEC willing, permit process challenging
Tangier	Repair and reinforce the sea wall on the western shore of the Island to reduce erosion and protect the airfield.	Coastal Erosion, Coastal Flooding	FEMA, USACE, Town must request	2.1, 2.2, 4.2	2016	Ongoing	Complete	
Tangier	Create shoreline protection on the eastern shore of the Island.	Coastal Erosion, Coastal Flooding	FEMA, USACE, Town must request	2.1, 2.2	2016	Ongoing	Ongoing	Working with A-NPDC
Tangier	Investigate use of sediment (from dredging operations) to address marsh loss.	Coastal Erosion, Coastal Flooding	FEMA, USACE, Town must request	2.1, 2.2	2016	Ongoing	Ongoing	Working with A-NPDC

## Accomack County Mitigation Strategies

Tangier	Work towards having the health center as the location for an emergency shelter, as it is the best rated against winds, etc.	ALL	Town	2.1, 2.2	2016	Not Started	Ongoing	
Tangier	Create and implement a mosquito control plan to prevent potential illnesses such as Zika.	Biohazard	Town	2.1, 3.2	2016	Not Started	Not Started	Funding
Tangier	Work with VDOT on current issues with the roads and on a long-term plan for addressing flooding and SLR.	ALL	VDOT, Town must request	2.1, 2.2, 4.1	2016	Not Started	Not Started	Funding, VDOT
Wachapreague	Incorporate the Eastern Shore of Virginia Hazard Mitigation Plan into the Wachapreague Town Plan.	ALL	Town Staff	2.1, 2.2	During next Town Plan update	Not Started	Ongoing	
Wachapreague	Mitigate the Town's Infrastructure against flooding and wind.	Wind, Coastal Flooding, Stormwater Flooding	Town, FEMA	2.1, 2.2	Post-declared disaster	Ongoing	Ongoing	
Wachapreague	Manage a Residential Elevation and Mitigation Project, using benefit-cost analysis provided by FEMA to target structures at risk to flooding.	Coastal Flooding	Town	2.1	Post-declared disaster	Ongoing	Ongoing	
Wachapreague	Attain "High Water" and "Flooding" signs to be used primarily along Atlantic Ave. during flood events.	Coastal Flooding, Stormwater Flooding	Town	4.1	Post-declared disaster	Ongoing	Complete	
Wachapreague	Cooperate with VDOT to mitigate stormwater drainage in Wachapreague.	Stormwater Flooding, Biohazard	VDOT, Town must request	2.2	2011	Ongoing	Ongoing	
Wachapreague	Conduct public education and outreach efforts within Town to raise awareness and promote participation of the NFIP.	Flooding	Town Staff, Coordinator (*if regional position created/funded)	3.1	2011	Ongoing	Ongoing	
Wachapreague	Conduct public education and outreach efforts within Town to raise awareness of hazard mitigation.	ALL	Town & County Staff	3.1	2011	Ongoing	Ongoing	
Wachapreague	Develop and implement a plan to use available funds (from the County perhaps) to start a clean-up of all Town drainage ditches.	Stormwater Flooding, Biohazard	VDOT, Town	1.2, 2.1	2016	Not Started	Ongoing	

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

Wachapreague	Encourage Town residents to maintain any ditches connected to their properties.	Stormwater Flooding, Biohazard	Town, Residents	3.2	2016	Not Started	Ongoing	
Wachapreague	Develop project(s) that would minimize major storm wave damage to the Town's commercial and residential structures by rebuilding the berm/dyke on the east side of the Wachapreague Channel.	Coastal Erosion	FEMA, USACE, Town must request	1.2, 2.1	2016	Ongoing	Not Started	Working with USACE
Wachapreague	Identify and implement program(s) to reduce the loss of marshes and bay grasses and support their enhancement from increased exposure due to the erosion of the southern portion of Cedar Island.	Coastal Erosion	FEMA, USACE, Town must request	1.2, 2.1	2016	Ongoing	Ongoing	Working with USACE
Wachapreague	Relocate Wachapreague Town Hall out of the 7-foot Flood Plain.	Coastal Erosion, Coastal Flooding	Town & County Staff	2.1, 2.2	2021	-	Not Started	
Wachapreague	Relocate Wachapreague Fire Company Station out of the 7-foot Flood Plain.	Coastal Erosion, Coastal Flooding	ALL	1.1, 2.1 2.2	2021	-	Not Started	

# APPENDIX A: REFERENCES

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# APPENDIX B: HAZUS® RISK ANALYSIS

## HAZUS® RISK ANALYSIS

Hazus® version 5.1 is a nationally standardized risk modeling methodology that identifies areas with high risk for natural hazards and estimates physical, economic, and social impacts of earthquakes, hurricanes, floods, and tsunamis.

Managed by FEMA's Natural Hazard Risk Assessment Program, Hazus® partners with other federal agencies, research institutions, and regional planning authorities to ensure the latest scientific and technological approaches are applied to determine potential losses from disasters and to identify the most effective mitigation actions for minimizing those losses.

Hazus® can quantify and map risk information such as:

- **Physical Damage** to residential and commercial buildings, schools, critical facilities, and infrastructure.
- **Economic Loss** to include job loss, business interruptions, and repair and reconstruction costs.
- **Social Impacts** to include estimates of displaced households, shelter requirements, and populations exposed to floods, earthquakes, hurricanes, and tsunamis.
- **Cost Effectiveness** of common mitigation strategies, such as elevating structures in a floodplain or retrofitting unreinforced masonry buildings.

Each Hazus® model uses inventory information (buildings, infrastructure, and population), hazard extent and intensity data, and damage functions to estimate the impacts of disasters. Estimated impacts vary by model, but include building damages, economic losses, displaced households, casualties, debris, and the loss of function for essential facilities. Two specific model for the Eastern Shore of Virginia were evaluated to update the current hazard mitigation plan.

The Hazus® Flood Model calculates physical damage and economic loss due to coastal flooding. Losses are calculated using functions that relate the depth and type of flooding to the degree of damage for various categories of buildings.

The Hazus® Hurricane Model estimates physical and economic damage to buildings due to wind and windborne debris. Wind hazard data are generated at the census track level. The model considers gusts, terrain roughness, and tree coverage data for incoming hurricanes, historic storms, or probabilistic hazards.

Because the Eastern Shore is roughly 70 miles long, storm events affect areas of the Shore differently, depending upon their direction of approach, approach speed, circumference, and other factors. The Steering Committee and Accomack-Northampton PDC staff chose to reflect the results of the 100-year scenarios, or 1-percent-annual-chance storm event, to present in the Hazard Mitigation Plan. The software offers other scenarios and their associated wind speed as well as flood impacts, as the Hazus® model offers a wide variety of variables.

## HAZUS® METHODOLOGY

The Hazus® Methodologies generated an estimate of the consequences to a community from a natural hazard scenario or from a probabilistic hazard. The resulting “loss estimate” will generally describe the scale and extent of damage disruption that may result from a potential event. The following information can be obtained.

- *Quantitative Estimates of Losses* in terms of direct costs for repair and replacement of damaged buildings and system components, direct costs associated with loss of function, (e.g., loss of business revenue and relocation costs), casualties, household displacements, quantity of debris, and regional economic impacts.
- *Functionality Losses* in terms of loss-of-function and restoration times for critical facilities such as hospitals, components of transportation and utility systems, and simplified analyses of loss-of-system-function for electrical distribution and potable water systems.
- *Extent of Induced Hazards* in terms of exposed population and building value due to potential flooding or fire following an earthquake.

To generate this information, the Hazus® Methodology contains baseline inventory data to include:

- Classification systems used in assembling inventory and compiling information on the building stock, the components of transportation and utility systems, and demographic and economic data.
- Standard calculations for estimating type and extent of damage and for summarizing losses.
- National and regional databases containing information for use as baseline (built-in) data useable in the calculation of losses, if there is an absence of user-supplied data.

## HAZUS® SOFTWARE

The Hazus® software uses GIS technologies for performing analyses with inventory data and displaying losses and consequences on applicable tables and maps. The Flood Model allows practitioners to estimate the economic and social losses from flood events; however, this model requires data to be applied to each report and can vary based on adopted methodology.

### DATA ELEVATION MODEL SELECTION

The data needed to obtain the Digital Elevation Model Selection (DEMs) is available for download and is part of developing the Coastal Flood Model.

**Figure 1: Hazus® Software: Data Elevation Model Extent**



## SHORELINE IDENTIFICATION

The user of Hazus® also needs to identify the shorelines that will impact the community prior to creating the Coastal Flood Model.

- Hazus® has a built-in default national shoreline that is delineated by county. In Study Regions that are sub-county or a combination of multiple sub-counties all of the associated shorelines of the counties will be brought in. This is by design to account for coastal flooding at specific locations that does not necessarily originate from the closest shorelines to those locations.
- Once the shorelines have been selected, the next step in the process is to characterize the chosen shorelines.

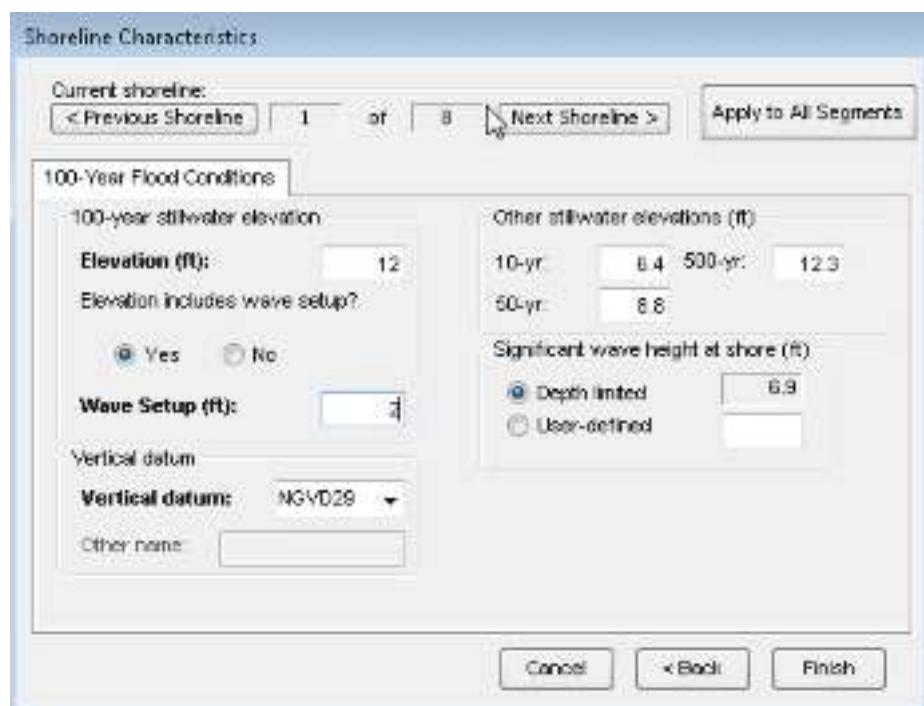
**Figure 2: Hazus® Software: New Scenario Selection**



### SHORELINE CHARACTERIZATION

Shoreline Characterization – Stillwater Flood Conditions represent the water surface absent wave height and wave runup. Data that is developed and provided by FEMA under the Flood Insurance Study (FIS) was used in both Accomack and Northampton Counties as well as the incorporated areas. This data is authorized by the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. The elevation at Stillwater for a 1-percent event are listed in the document and used in each Hazus® Coastal Flood Model. A wave setup was set at a default of two feet per recommendation of Hazus® Help Desk for this region.

**Figure 3: Hazus® Software: Shoreline Characteristics**



## DATA AND MODELING ISSUES

Although the Hazus® software offers users the opportunity to prepare comprehensive loss estimates, it should be recognized that uncertainties are inherent in any estimation methodology, even with state-of-the-art techniques. Any region or city studied will have an enormous variety of buildings and facilities of different sizes, shapes, and structural systems built over a range of years under varying design codes. A variety of components contribute to transportation and utility system estimations in certain hazard models.

There are also insufficient comprehensive data from past events or laboratory experiments to determine precise estimates of damage based on different measures of hazard severity, such as known flood depths or wind speeds. To deal with this complexity and lack of data, buildings and components of systems are grouped into categories based on key characteristics. The relationships between measures of hazard severity and average degree of damage with associated losses for each building category are based on current data and available theories.

The results of a natural hazard loss analysis should not be looked upon as a prediction. Instead, they are only an estimate, as uncertainty inherent to the model will be influenced by quality of inventory data and the hazard parameters.

Current models often extended beyond the boundaries of the towns impact quality of the data. In most cases, larger models, such as a census tract or county model, were defined correctly and aligned geographically with the size of the community, and the number of housing units compared favorably to Census numbers. Other model data was determined to be unreliable without additional information from FEMA and the NFIP.

The most significant challenge while running the Hazus® models was the lack of historical approaches and data from previous years. Not having access to certain historical models did not allow for the Steering Committee to evaluate and provide discrepancies.

FEMA HAZUS® Program: <https://www.fema.gov/flood-maps/products-tools/hazus>

# APPENDIX C: MEETINGS & OUTREACH

This appendix includes the agendas, meeting summaries, and advertisements (when available) for all Hazard Mitigation Plan Steering Committee meetings. They are presented in chronological order.

## JURISDICTION MEETINGS

Below is a table indicative of meetings held with each participating jurisdiction to present and review their respective draft chapters, ensuring the accuracy and acquiring first-hand accounts of past hazard events. Meetings were held with administrative staff, town councils, mayors, and/or police officers in the jurisdiction. Due to social distancing guidelines to fight the spread of COVID-19, the majority of these meetings were held virtually through; however, six of the listed jurisdictions elected to meet in-person.

**Table 1: Locality Meeting Dates**

Jurisdiction	Meeting Date
Accomack County	March 2, 2021
Town of Accomac	July 15, 2021
*Town of Bloxom	March 16, 2021
*Town of Chincoteague	April 7, 2021
*Town of Hallwood	May 24, 2021
*Town of Keller	April 16, 2021
Town of Melfa	June 8, 2021
Town of Onancock	March 31, 2021
Town of Onley	March 30, 2021
*Town of Painter	May 26, 2021
Town of Parksley	March 25, 2021
Town of Saxis	April 7, 2021
Town of Tangier	April 29, 2021
Town of Wachapreague	March 17, 2021
Northampton County	March 22, 2021
Town of Cape Charles	March 23, 2021
Town of Cheriton	March 25, 2021
Town of Eastville	May 25, 2021
Town of Exmore	March 23, 2021
*Town of Nassawadox	May 5, 2021

\*Indicates Meeting Held In-Person

## STEERING COMMITTEE MEETINGS

Due to social distancing guidelines and to fight the spread of COVID-19, all Hazard Mitigation Plan Steering Committee meetings were held virtually. The Kick-Off meeting was held in December 2020 and the Final Plan Review meeting occurred in October 2021. The following sections include the agenda and summary for each Steering Committee meeting held.

# Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee Meeting

- Welcome, the meeting will begin shortly!
- Please remain muted to prevent background noise during introductory and guest presentations.
  - Difficulty with your audio? Click the up arrow by the "Mute" mic symbol
  - You can also click the mic symbol to mute and unmute yourself
  - If you've called in via phone you can mute & unmute by pressing \*
- If possible, please turn your video ON so we can see the face that goes with the voice – especially during the breakout sessions. You can do this by clicking the video camera symbol.
  - If you are having difficulty with your video, click the up arrow by the video camera symbol.
- Use the Chat feature to communicate with participants & hosts!
  - Change your name to be correct and add affiliation by clicking the ellipsis (3 dots) at the top right of your video feed or the 'more' option when you hover over your name in the participant list.
  - If you cannot use the chat, please contact Ashley Mills at 757-787-2936 x127



## DECEMBER 1, 2020 KICK-OFF HMP STEERING COMMITTEE MEETING

### AGENDA



## Eastern Shore of Virginia Regional Hazard Mitigation Plan Update

### AGENDA

*Tuesday December 1<sup>st</sup>, 2020, 1 p.m. – 3 p.m.*

#### *Virtual Event Zoom*

<https://zoom.us/j/7577872936?pwd=QTNJdmhCc3pWdVNUZ0ZWYnVJdWpWUT08>  
Meeting ID: 757 787 2936  
Passcode: 7577872936  
Dial In by Phone: 301 715 8592 US (Washington D.C)

#### Welcome and Introductions

#### Brief Hazard History of the Shore

#### Hazard Mitigation Planning – Requirements & Process

#### BREAK

#### **Planning Activity 1: Steering Committee & Planning Council**

##### **Participant Expectations**

##### **Establish dates & times for Steering Committee meetings**

#### ***Planning Activity 2: Review ES Hazards & Ranking Process***

*Italicized items will only be completed if time permits.*



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## ATTENDANCE AND MEETING SUMMARY

### Eastern Shore Hazard Mitigation Plan

Summary of December 1, 2020 Kickoff Meeting held Virtually via Zoom 1:00-3:00PM

*Presentations, support documents, and other resources can be found at [h  
tt://www.a-npdc.org/accomack-northampton-planning-district-commission/coastal-resources/h  
azard-mitigation-planning/](http://www.a-npdc.org/accomack-northampton-planning-district-commission/coastal-resources/hazard-mitigation-planning/).*

**Steering Committee Members Present:**

Thomas Beasley, Town of Bloxom  
Greg Hardesty, Town of Cheriton  
Jeb Brady, Town of Cape Charles  
Tom Brockenbrough, Accomack County  
Jackie Davis, Town of Cheriton  
Keith Greer, Town of Parksley  
Robert Williams, Town of Wachapreague  
Arthur Leonard, Town of Chincoteague  
Susan McGhee, Northampton County  
Jayme Salazar, Town of Onley  
Bryan Rush, Town of Chincoteague

**Steering Committee Members Absent:**

Charles Pruitt, Accomack County (alt pres)  
Town of Painter  
Town of Accomac  
Town of Saxis  
Town of Exmore  
Town of Eastville  
Town of Tangier  
Town of Nassawadox  
Town of Keller  
Town of Belle Haven  
Town of Hallwood  
Town of Onancock  
Town of Melfa

**Steering Committee Alternates Present:**

Jeanette Eby, Town of Bloxom  
Danny Siegert, Town of Parksley  
Mark Bowden, Town of Chincoteague  
Billie Jean Miles, Accomack County  
Chris Guvernator, Accomack County

**VDEM Present:**

Bruce Sterling, Region V Coordinator  
Harrison Bresee, All Hazards Planner

**A-NPDC Staff Present:**

Shannon Alexander  
Jessica Steelman  
Bobbie Wert  
Drew Williams, Berkley Group  
Thomas Hicks, Berkley Group

**Planning Council Members Present:**

Susan Bates, The Nature Conservancy  
Jill Bieri, The Nature Conservancy  
Mark Belknap, A&N Electric Cooperative  
Lynn Brankley, A&N Electric Cooperative  
Scott Hall, ESCC  
Julie Head, ES SWCD  
Chris Isdell, VDOT  
Robie Marsh, ESVA Chamber of Commerce  
Paul Muhly, Accomack County  
Hali Plourde-Rogers, ESLT  
Evelyn Shotwell, Chincoteague Chamber  
Curtis Taylor, A&N Electric Cooperative

## Meetings & Outreach

### Welcome and Introductions

Shannon Alexander, Accomack-Northampton Planning District Commission (A-NPDC) Director of Planning welcomed participants and guided all participants to introduce themselves, identify their affiliation, if they've been

### Brief Hazard History of the Shore

Jessica Steelman, Coastal Planner for A-NPDC, reviewed the Eastern Shore's hazard history. High winds, coastal flooding, and coastal erosion from hurricanes, tropical storms, and nor'easters, constitute the majority of hazards.

Storm records date back to the 1600, but data are lacking regarding the extent of damage for most of the historical storms. What can be said is they occur with some regularity and the category of storm does not necessarily dictate its potential for danger. Storm track, speed, and direction, current ground conditions (i.e. soils that are already saturated from a recent storm), tide cycle, and other factors contribute to its potential to cause harm to people and property.

Other hazards discussed included storm water flooding from brief, high intensity rainfall that exceeds stormwater drainage capacity, blizzards and other ice and snow events, drought, pandemic/biohazards, and extreme heat and cold.

### Hazard Mitigation Planning - Requirements & Process

Shannon Alexander described Hazard Mitigation Planning as a plan of policies and sustained actions to reduce or eliminate the long-term risk to human life and property from hazards. At their most basic, the plans require jurisdictions to identify hazards and their vulnerabilities to them, and then identify goals, strategies and actions to reduce losses caused by these hazards.

The plan not only improves conditions before disasters, but also guides post-disaster recovery. A well-coordinated plan can be integrated into other plans, such as comprehensive plans, housing plans, and transportation plans, and can be implemented through local tools such as county zoning and building ordinances.

Once goals are set and strategies developed, mitigation actions are selected and prioritized. The plan is sent to VDEM and FEMA for approval and local units of government adopt it by resolution. From there, communities work towards meeting their goals, documenting progress, and updating the plan with additional strategies.

Communities that participate in hazard mitigation planning, and that adopt the final plan, are eligible for FEMA hazard mitigation grants. Some mitigation grants are pre-disaster, but large

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

amounts also become available during disaster recovery. Those localities that choose not to participate in hazard mitigation planning will not be eligible for any mitigation funding.

### Planning Activity 1: Steering Committee & Planning Council

#### *Participant Expectations*

Shannon Alexander explained the Steering Committee and Planning Council roles. The Steering Committee is made up primarily of representatives of participating county and town governments. They will vote on the contents of the plan, because they are the ones who will have to adopt the plan in the end. The Planning Council is a wide-reaching stakeholder group that will participate throughout the process, offering expertise and experience. Planning Council members will be invited to attend all Steering Committee meetings and will receive all agenda and supporting materials.

A-NPDC staff and partners with the Berkley Group, LLC will provide technical assistance, process management, and accountability for meeting state and federal plan requirements.

#### *Establish dates & times for Steering Committee meetings*

After much discussion, the third Tuesday of each month at 2:00pm was chosen for the monthly virtual meetings.

### Planning Activity 2: Review ES Hazards & Ranking Process

Shannon Alexander showed a table representing the hazards and their ranks included in the 2006, 2011, and 2016 iterations of the Plan. She quickly reviewed the process and stated that the first meetings of the Committee in 2021 would be completing this process.

The meeting ended at approximately 3:10 p.m.

## JANUARY 19, 2021 HMP STEERING COMMITTEE MEETING

### AGENDA



## Eastern Shore of Virginia Regional Hazard Mitigation Plan Update

### AGENDA

*Tuesday January 19, 2021, 2 p.m. – 4 p.m.*

*Virtual Event Zoom*

<https://zoom.us/j/99345792642?pwd=T2pIZTNBUTq0eCtWR0dDZHdHb3hwQT09>

Meeting ID: 993 4579 2642

Passcode: 7577872936

Dial In by Phone: (301) 715 – 8592 US (Washington D.C)

**Welcome and Introductions**

**Roll Call**

**Election of the Chair and Vice Chair**

**In-Kind Contributions**

**Vision Statement and Mitigation Goals**

**Project Roadmap and Deliverables**

**BREAK**

**Hazard Identification and Risk Assessment**

***Sample Locality Review***

*Italicized items will only be completed if time permits.*



**FEMA**



## ATTENDANCE AND MEETING SUMMARY

### Eastern Shore Hazard Mitigation Plan

Summary of January 19, 2021 Steering Committee Meeting held Virtually via Zoom 2:00-4:00pm

*Presentations, support documents, and other resources can be found at  
<http://www.a-npdc.org/accomack-northampton-planning-district-commission/coastal-resources/hazard-mitigation-planning/>*

**Steering Committee Members Present:**

Susan McGhee, Northampton County  
Jeb Brady, Town of Cape Charles  
Tom Brockenbrough, Accomack County  
Jamyre Salazar, Town of Onley  
Bryan Rush, Chincoteague Emergency Services  
Michael Tolbert, Town of Chincoteague

**Steering Committee Members Absent:**

Charles Pruitt, Accomack County (alt pres)  
Town of Painter  
Town of Accomack  
Town of Saxis  
Town of Exmore  
Town of Eastville  
Town of Tangier  
Town of Nassawadox  
Town of Keller  
Town of Belle Haven  
Town of Hallwood  
Town of Onancock  
Town of Melfa  
Town of Cheriton  
Town of Parksley  
Town of Wachapreague

**Steering Committee Alternates Present:**

Jeanette Eby, Town of Bloxom

**VDEM Present:**

None

**A-NPDC Staff Present:**

Shannon Alexander  
Drew Williams, Berkley Group  
Thomas Hicks, Berkley Group  
Jon McCoy, Berkley Group

**Planning Council Members Present:**

Scott Hall, ESCC  
Hali Plourde-Rogers, ESLT  
Evelyn Shotwell, Chincoteague Chamber

## Meetings & Outreach

### Welcome and Introductions

Shannon Alexander, Accomack-Northampton Planning District Commission (A-NPDC) Director of Planning, and Thomas Hicks, The Berkley Group, welcomed participants and directed participants to take roll call using an online form.

### Election of Chair & Vice Chair

Shannon Alexander and Thomas Hicks discussed the need for a Chair and Vice Chair of the committee and provided a brief overview of the process from the previous iteration of the plan. The floor was opened for discussion and to nominate candidates for Chair and Vice Chair. The decision was made to table the selection of Chair and Vice Chair until the following meeting. Members can be nominated using this link: <https://www.sli.do/> and entering the code #88712.

### In-Kind Contributions

Shannon Alexander went over the In-Kind Contributions form, which is a requirement for grant tracking purposes. Committee Members must use the online In-Kind Match Form to record their work during the planning process. Members can fill out this form using by clicking this [link](#).

### Vision Statement & Mitigation Goals

Thomas Hicks led the group through a discussion of the current vision statement and opened the floor to discuss any changes to the statement. The groups offered some critiques, which the consultant will incorporate and bring back for discussion at the following meeting.

Thomas Hicks discussed the current mitigation goals. Committee members were asked to reflect on the goals and come back to the following meeting ready to discuss any potential changes.

### Project Roadmap & Deliverables

Thomas Hicks discussed the five areas of the project roadmap, including a review of community capabilities, the hazard identification and analysis, the development of mitigation strategies, public involvement, and the final review.

### Hazard Identification & Risk Assessment

Thomas Hicks reviewed the need for and requirements of the hazard identification and risk assessment portion of the mitigation plan. Committee members were asked to help identify the critical risks to the Eastern Shore using an [online form](#) to rank a wide variety of hazards. This information will be used to develop hazard models in HAZUS.

### Homework

Jonathan McCoy discussed homework for the committee members. The members were asked to review their locality's chapter of the current hazard mitigation plan and make note of information that will require updating. A-NPDC staff will update the Census data (population, housing data, etc) but committee members should review transportation data, community services and facility data, land use

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

data, and recent storm data. The Town of Hallwood was reviewed and areas in need of updating were highlighted as an example.

### Next Meeting

The meeting ended at approximately 3:40. The next meeting will be held on February 16.

## Meetings & Outreach

### OUTREACH

**EASTERN SHORE REVIEW HAZARD MITIGATION PLAN**

### Steering Committee Meeting

Next Meeting: Tuesday, January 19th  
2:00pm - 4:00pm

Meeting held at the 3rd Floor meeting room in 2500 Con. All are welcome to attend.

The Planning Committee is excited to host the first ever meeting for the Regional Hazard Mitigation Plan update. This will be the second time ever that people specifically involved in the local mitigation plan have been invited to participate. Remember, all localities should have a representative attend and/or a local liaison who is involved with the regional process invited. Thank you for your commitment!

**Meeting Agenda:**

- Welcome and Introductions
- Roll Call
- Election of the Chair and Vice-Chair
- Financial Contributions
- Vision Statement and Mitigation Goals
- Project Roadmap and Deliverables
- DRRAK
- Hazard Identification and Risk Assessment
- Sample Locality Review

[Click for PDF of Meeting Agenda](#)

**Meeting Log-in:**  
[www1.surveymonkey.com/r/DRRAK](http://www1.surveymonkey.com/r/DRRAK)  
Meeting ID: 500-4200-2642  
Passcode: 19118208  
Dial-in by Phone: (202) 712-1262

**IMPORTANT Action Items for Committee Members**  
To be completed PRIOR to the meeting.

**Item 1: Review the Meeting agenda listed above.**

**Item 2: Review the Public comment letter sent to members over the summer prior to today's meeting via the County's email listserve.**

**Item 3: Review the proposed budget for the meeting. The proposed budget is \$1,000.00 for the meeting, including the cost of refreshments and a meal.**

**Item 4: Please review and update the DRAFT list of members of the Steering Committee and any changes in the list of Planning Council representatives (including liaison). Please note for the next action item, contact me if you have any changes made to your locality.**

[View the DRRAK Page on our website](#)

**FEMA**  

Eastern Shore Review Hazard Mitigation Plan  
DRRAK

[View the DRRAK Page on our website](#)

**IMPORTANT Action Items for Committee Members**  
To be completed PRIOR to the meeting.

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**Item 4: Please review and update the DRAFT list of members of the Steering Committee and any changes in the list of Planning Council representatives (including liaison). Please note for the next action item, contact me if you have any changes made to your locality.**

[View the DRRAK Page on our website](#)

Planning Committee Meeting for General Communities, February 23-25 2022

DRRAK's Office for Coastal Management will be holding a planning committee meeting for general communities in Maryland. This is a 3-day meeting with a mix of virtual and in-person participation. Participants will be asked to attend virtually and in-person, depending on their location. Dates and times are as follows:

- Wednesday, February 23, 2022: 10:00 AM - 12:00 PM (ET)
- Thursday, February 24, 2022: 10:00 AM - 12:00 PM (ET)
- Friday, February 25, 2022: 10:00 AM - 12:00 PM (ET)

**Local Committees:**

- Anne Arundel County
- Calvert County
- Charles County
- Dorchester County
- Frederick County
- Garrett County
- Howard County
- Kent County
- Maryland State
- Montgomery County
- Prince George's County
- St. Mary's County
- Talbot County
- Washington City
- Wicomico County

**DRRAK:**  
Planning Committee, Eastern Shore Review Hazard Mitigation Plan  
Meeting ID: 500-4200-2642  
Passcode: 19118208  
Dial-in by Phone: (202) 712-1262

Eastern Shore of Virginia Hazard Mitigation Plan 2021

## FEBRUARY 16, 2021 HMP STEERING COMMITTEE MEETING

### AGENDA



## Eastern Shore of Virginia Regional Hazard Mitigation Plan Update

### AGENDA

*Tuesday February 16, 2021, 2 p.m. – 4 p.m.*

*Virtual Event Zoom*

<https://zoom.us/j/99345792642?pwd=T2pIZTNBUTg0eCtWR0dDZHdHb3hwQT09>

Meeting ID: 993 4579 2642

Passcode: 7577872936

Dial In by Phone: (301) 715 – 8592 US (Washington D.C)

**Welcome**

**Roll Call**

**Round Robin**

**Election of the Chair and Vice Chair**

**Vision Statement & Mitigation Goal Modifications**

**Locality Meetings & HMP Chapter Update**

**BREAK**

**Round Robin**

**HIRA Facilitation**

**Next Steps**

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

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### ATTENDANCE AND MEETING SUMMARY

#### Eastern Shore Hazard Mitigation Plan

Summary of February 16, 2021 Steering Committee Meeting held Virtually via Zoom 2:00-4:00pm

*Presentations, support documents, and other resources can be found at  
<http://www.a-npdc.org/accomack-northampton-planning-district-commission/coastal-resources/hazard-mitigation-planning/>*

*Members may access a recording of this call at: [tinyurl.com/4wn6p937](https://tinyurl.com/4wn6p937)*

**Steering Committee Members Present:**

Susan McGhee, Northampton County  
Jeb Brady, Town of Cape Charles  
Tom Brockenbrough, Accomack County  
Jamye Salazar, Town of Onley  
Bryan Rush, Chincoteague Emergency Services  
Michael Tolbert, Town of Chincoteague  
Robert Williams, Town of Wachapreague  
Matthew Spuck, Town of Onancock  
Jackie Davis, Town of Cheriton  
Thomas Beasley, Town of Bloxom

**Steering Committee Alternates Present:**

Jeanette Eby, Town of Bloxom

**VDEM Present:**

Harrison Bresee, VDEM

**A-NPDC Staff Present:**

Shannon Alexander  
Jessica Steelman  
Thomas Hicks, Berkley Group  
Jon McCoy, Berkley Group

**Steering Committee Members Absent:**

Town of Painter  
Town of Accomac  
Town of Saxis  
Town of Exmore  
Town of Eastville  
Town of Tangier  
Town of Nassawadox  
Town of Keller  
Town of Belle Haven  
Town of Hallwood  
Town of Melfa  
Town of Parksley

**Planning Council Members Present:**

Scott Hall, ESCC  
Hali Plourde-Rogers, ESLT  
Evelyn Shotwell, Chincoteague Chamber  
Susan Bates, The Nature Conservancy

## Meetings & Outreach

### Welcome and Introductions

Shannon Alexander, Accomack-Northampton Planning District Commission (A-NPDC) Director of Planning, and Thomas Hicks, The Berkley Group, welcomed participants and directed participants to take roll call using an online form.

Shannon Alexander thanked participants for their engagement and reiterated the importance of the hazard mitigation planning process and the plan's impact on the community. The Hazard Mitigation Plan is required by FEMA for various funding opportunities, as well as positioning the communities for funding through the upcoming Community Flood Preparedness Fund.

### Round Table Discussion: *What historic storm/event impacted your community the most?*

Committee members were asked to share what historic storm or event impacted their communities the most. A range of events were discussed, including Hurricane Andrew, the 1962 Ash Wednesday storm, Hurricane Gloria in 1985, Hurricane Isabel, 2009 twin Nor'easters, Hurricane Irene, Hurricane Sandy, 1999 Hurricane Floyd and the storm of 1933. These storms share high winds and heavy precipitation as common factors. Drainage issues compound the heavy precipitation events to create risk for the community.

### Discussion of Chair & Vice Chair

In review of Federal guidelines, it was determined that a chair and vice chair are not a necessity for the hazard mitigation planning process. Shannon Alexander proposed to the steering committee that the planning process move forward in a collaborative fashion, forgoing a formal chair and vice chair. A unanimous vote by all localities present was taken and the steering committee decided to proceed without a formal chair and vice chair.

### Adoption of Vision Statement

Jonathan McCoy covered the proposed changes to the vision statement from the January meeting. All committee members present voted unanimously to adopt the new vision statement, which reads:

"Planning and mitigation actions minimize damage and disruption during hazard events. Federal and state agencies cooperate with the local governments and guide necessary resources to the governments for recovery activities. To the extent possible, residents should be self-sufficient and should have taken responsibility for their own economic and physical protection. Infrastructure smoothly functions throughout the event and the recovery period following."

### Locality Meetings & Review

Shannon Alexander announced the addition of a new planner to the planning district commission staff. The new planner, Ashley Mills, will begin conducting virtual (or potentially some in-person) one-on-one meetings with representatives of each local government by Mid-March and will likely continue these meetings through April. These meetings will be held to review and develop the draft chapters of the plan.

Round Table Discussion: What is the biggest risk to your community today?

Jonathan McCoy led the group through a discussion of the biggest risks to their communities today. Many answers were given, including flooding from both flood waters and coastal flooding, high winds, and wave action in coastal communities during high surf. Overwhelming existing infrastructure in the region was another risk, including telecommunications, sewer systems (both the collection systems and private septic systems), and the ability to provide potable drinking water. Environmental concerns were also a major risk factor, with the loss of natural environment areas being a potential impact on both health and economic activities. An additional risk factor involves rocket launches from Wallops Island. This facility is a driver for tourism and is heavily impacted by weather. It can also severely disrupt travel and tourism activities in the event of a rocket launch failure. Pandemic concerns were discussed in light of the current COVID-19 pandemic.

Through this discussion it was highlighted that prior to worrying about costs of mitigation projects, the risk associated with hazard events must be fully discussed in the plan. This will assist in the pursuit of mitigation funding.

HIRA Facilitation

Tommy Hicks reviewed the high, medium, and low hazard priorities from the 2016 HMP. The survey from the January meeting divulged 55 different potential risks facing the Eastern Shore. Tommy led the group through a HAZUS report conducted on Northampton County, identifying the potential impacts from hazard events.

Using the survey results and reports pulled from HAZUS, Tommy Hicks identified high priority, medium priority, and low priority hazard. Shannon also reinforced the option for localities to include a hazard in their own chapter of the HMP that may not have risen to the high, medium, or low list, if they feel it is an important concern for their locality. The committee and council members discussed these hazard rankings and decided locality representative's present unanimously chose to rank the hazards as follows:

Four high risk factors:

- High Wind Events
- Coastal Flooding
- Coastal Erosion
- Non-Coastal Flooding
- Biological Hazards

Six medium risk factors were identified:

- Water and Wastewater Quality and Management
- Road and Highway
- Substance Use and Overdose
- Communications Failure

Six low risk factors were identified:

- Active Threat
- Electrical Energy Failure

## Meetings & Outreach

- Tornado
- Invasive Environmental Disease

### Next Meeting

The meeting ended at 4:00 p.m. The next meeting is scheduled for March 16.

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

### OUTREACH

The image contains two side-by-side screenshots of outreach materials.

**Left Screenshot:** A flyer titled "Steering Committee Meeting". It includes the text: "Next Meeting: Tuesday, February 10th, 2:00pm - 4:00pm". Below this, it says: "Meeting will be held at the Eastern Shore Regional Hazard Mitigation Plan office (200 E Main Street, Suite 100, Virginia Beach, VA 23462).". The flyer also lists the "Meeting Agenda" and "Guests Invited".

**Right Screenshot:** A screenshot of the FEMA website. At the top, it says "Dial-in Phone: (800) 715-8552" and "Web: [www.fema.gov/hazard-mitigation-plan](#)". Below this, there is a section titled "IMPORTANT Action Items for Committee Members" with the sub-instruction "To be completed PRIOR to the meeting". It lists several items, including "Item 1: Hazard Mitigation Plan (HMP) Call and Plan Update", "Item 2: Assess Existing Mitigation Measures", "Item 3: Review and Update the Plan", and "Item 4: Consideration of the HMP". At the bottom of the page, there is a "Visit the HMP Performance Matrix" button and the FEMA logo.

## Meetings & Outreach

### MARCH, 16, 2021 NO HMP STEERING COMMITTEE MEETING HELD

In lieu of the March 16<sup>th</sup> meeting, one-on-one meetings with each jurisdiction were organized, with the majority of these meetings held during the month of March.

#### JURISDICTION MEETING TRACKING

Locality	Chapter Review Date	Review Method	Complete?	Locality Representative(s) Present
Accomack County	03/02/2021	Email/Phone	Yes	Tom Brockenbrough
Accomac	07/15/2021 @ 4:30	Phone	Yes	Pat Smith
Bioxom	03/16/2021 @ 12:00	In-Person	Yes	Jeanette Eby
Chincoteague	04/07/2021 @ 2:00	In-Person	Yes	Bryan Rush, Mike Tolbert, Mark Bowden
Hallwood	05/24/2021 @ 10:00	In-Person	Yes	Danny Shrievies, Jackie Poulson
Keller	04/16/2021 @ 10:45	In-Person	Yes	Teresa Guy, Beth Hart
Melfa	06/08/2020 @ 2:00	Phone	Yes	Charles Wilbur
Onancock	03/31/2021 @ 1:00	Virtual	Yes	Matt Spuck
Onley	03/30/2021	Email/Phone	Yes	John Spivey
Painter	05/26/2021 @ 10:00	In-Person	Yes	Kerri Atkinson, Connie Campbell
Parksley	3/25/2021 @ 10:00	Virtual	Yes	Lauren Lewis
Saxis	04/07/2021 @ 10:00	Virtual	Yes	Donna Croushore
Tangier	04/29/2021 @ 10:00	Virtual	Yes	Laurie Thomas
Wachapreague	03/17/2021 @ 2:00	Virtual	Yes	Robert Williams, Taylor Dukes
Northampton County	03/22/2021 @ 10:00	Virtual	Yes	Susan McGhee
Cape Charles	03/23/2021 @ 9:00	Virtual	Yes	Jeb Brady
Cheriton	03/25/2021 @ 1:00	Virtual	Yes	Jackie Davis
Eastville	05/25/2021 @ 10:00	Virtual	Yes	David Eder, Jim Sturgis
Exmore	3/23/2021 @ 1:00	Virtual	Yes	Robert Duer, Taylor Dukes
Nassawadox	05/05/2021 @ 10:00	In-Person	Yes	Patsy Stith, Andrea Fox, Kim Fitzpatrick

# Eastern Shore of Virginia Hazard Mitigation Plan 2021

## OUTREACH

The screenshots show two versions of a webpage for the "Steering Committee Meeting". Both versions include a header with the "EASTERN SHORE REGIONAL HAZARD MITIGATION PLAN" logo, a main title "Steering Committee Meeting", a subtitle "Although the March meeting is CANCELLED, we still need your time and input this month!", and a list of participants.

**Participants:**

- Chair: Jim McNeely  
Dorothy Beale, Town of Gloucester  
Davy Hendley, Town of Chincoteague  
Dwight Miller, Town of Corcoran  
Peter Neumann, Town of Crosswater Creek  
Adrienne P. O'Neil, Town of Accomack  
Mark O'Neill, Town of Franklin  
Chris Taylor, No. Accomack County  
Robert Miller, Town of Pungo  
Adam Morris, Town of Gloucester  
Bobby Williams, Town of Chincoteague  
Lynne Barnes, Town of Middlesex  
Steve Brown, Town of Accomack  
Stephen M. Gaskins, Town of Franklin  
John Thomas, Town of Pungo  
Jeffrey Tamm, Town of Gloucester  
James Morris, Town of Middlesex  
John D. Miller, Town of Franklin  
John R. Hall, Town of Pungo  
Diane Morris, Town of Gloucester  
Mark Morris, Town of Franklin  
Christopher, Town of Middlesex
- Staff:**  
Dawn Anderson, Director of Planning  
Cynthia Clegg, Deputy Director  
Kathy Miller, Project Planner  
Consolidated Planning Unit  
Community Planning Unit
- ROOM:**  
Doris Whitley, Room # C-201  
Main Room, 2nd Floor, Planning Building

**Click to download your committee meeting agenda**

**Click to view the HMP Page on our Website to find provider meeting information**

**Participants:**

- Chair: Jim McNeely  
Dorothy Beale, Town of Gloucester  
Davy Hendley, Town of Chincoteague  
Dwight Miller, Town of Crosswater Creek  
Peter Neumann, Town of Corcoran  
Adrienne P. O'Neil, Town of Accomack  
Mark O'Neill, Town of Franklin  
Chris Taylor, No. Accomack County  
Robert Miller, Town of Pungo  
Adam Morris, Town of Gloucester  
Bobby Williams, Town of Chincoteague  
Lynne Barnes, Town of Middlesex  
Steve Brown, Town of Accomack  
Stephen M. Gaskins, Town of Franklin  
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John D. Miller, Town of Franklin  
John R. Hall, Town of Pungo  
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- Staff:**  
Dawn Anderson, Director of Planning  
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Kathy Miller, Project Planner  
Consolidated Planning Unit  
Community Planning Unit
- ROOM:**  
Doris Whitley, Room # C-201  
Main Room, 2nd Floor, Planning Building

**Click to download your committee meeting agenda**

**Click to view the HMP Page on our Website to find provider meeting information**

## APRIL 20, 2021 HMP STEERING COMMITTEE MEETING

### AGENDA

#### EASTERN SHORE REGIONAL HAZARD MITIGATION PLA



### Eastern Shore of Virginia Regional Hazard Mitigation Plan Update

#### AGENDA

*Tuesday April 20, 2021, 2 p.m. – 4 p.m.*

*Virtual Event Zoom*

<https://zoom.us/j/99345792842?pwd=T2oIZTNBUTq0eCtWR0dDZhHb3hwQT09>

Meeting ID: 993 4579 2842

Passcode: 7577872936

Dial In by Phone: (301) 715 – 8592 US (Washington D.C)

**Welcome**

**Roll Call**

**Round Robin**

**Key Takeaways and Updates**

**Summary: Resilience, New Federal Money, Broadband, Large Scale Infrastructure**

**RAFT Presentation**

**Locality Meetings & HMP Chapter Updates**

**BREAK**

**Goal and Strategy Development**

***Demonstrations of Resources\****

**Next Steps**

***\*Time permitting***

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

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### ATTENDANCE AND MEETING SUMMARY

#### Eastern Shore Hazard Mitigation Plan

Summary of April 20, 2021 Steering Committee Meeting held Virtually via Zoom 2:00-4:00pm

*Presentations, support documents, and other resources can be found at  
<http://www.a-npdc.org/accomack-northampton-planning-district-commission/coastal-resources/hazard-mitigation-planning/>*

*Members may access a recording of this call at: [tinyurl.com/4wn6p937](http://tinyurl.com/4wn6p937)*

**Steering Committee Members Present:**

Susan McGhee, Northhampton County  
Jeb Brady, Town of Cape Charles  
Tom Brockenbrough, Accomack County  
Bryan Rush, Chincoteague Emergency Services  
Robert Williams, Town of Wachapreague  
Matthew Spuck, Town of Onancock  
Jackie Davis, Town of Cheriton  
Patsy Stith, Town of Nassawadox  
Charles Wilbur, Town of Melfa

**Steering Committee Members Absent:**

Town of Painter  
Town of Accomac  
Town of Saxis  
Town of Exmore  
Town of Eastville  
Town of Tangier  
Town of Keller  
Town of Belle Haven  
Town of Hallwood  
Town of Parksley  
Town of Onley

**Steering Committee Alternates Present:**

Jeanette Eby, Town of Bloxom  
Sarah Dickey, Accomack County

**VDEM Present:**

Harrison Bresee, VDEM

**A-NPDC Staff Present:**

Shannon Alexander  
Ashley Mills  
Thomas Hicks, Berkley Group  
Jon McCoy, Berkley Group

**Planning Council Members Present:**

Evelyn Shotwell, Chincoteague Chamber  
Susan Bates, The Nature Conservancy

**Planning Council Members Absent:**

Hali Plourde-Rogers, ESLT  
Scott Hall, ESCC

## Meetings & Outreach

### Welcome and Introductions

Shannon Alexander, Accomack-Northampton Planning District Commission (A-NPDC) Director of Planning, and Thomas Hicks, The Berkley Group, welcomed participants and directed participants to take roll call using an online form.

Shannon Alexander shared that she has accepted a position in the Department of Conservation and Recreation, Natural Heritage Division and that her last day with the PDC is May 6. Ashley Mills, the new Regional Planner with the PDC, and the Berkley Group will ensure the plan moves forward in Shannon's absence.

### Round Table Discussion: What has been your experience with debris removal?

Committee members were asked to share their experience with debris removal. Mayor Stith, Town of Nassawadox, shared her experience on removing derelict structures as a mitigation action prior to a hazard event. The group discussed the difficulties of removing derelict structures and brainstormed funding programs to assist with the removal of these structures. Harrison Bresee, VDEM, suggested the mitigation program through FEMA to address repetitive loss properties. He will research further for other programs available to address derelict structures as well.

Tom Brockenbrough shared the removal of the Whispering Pines Hotel but was unsure of the funding sources for removal. Susan McGhee shared that public works deals with debris removal and are trained annually to do so. Matthew Spuck asked if any locality has ordinances for spot blight abatement. Shannon shared the Town of Parksley has ordinances, as well as both counties.

### Key Takeaways and Updates

Shannon Alexander shared a brief presentation of upcoming programs and opportunities to benefit the local governments. These include:

- The Community Flood Preparedness Fund managed by the Department of Conservation and Recreation. The public comment period ends May 12.
- RAFT Community Workshop on "Building Resiliency into Comprehensive Planning" on April 23 from 9-11:30am.
- Chesapeake Bay Preservation Act Amendments.
- New Federal Relief Funds.
- Broadband Update.
- Large Scale Infrastructure.
- Rebuilding American Infrastructure with Sustainability and Equity (RAISE) applications (formerly BUILD and TIGER) are due July 12, 2021.
- VDOT Revenue Sharing Program.
- VA Department of Conservation and Recreation Recreational Trails Program grant is open April 1-June 30. Virginia Land Conservation Foundation funding will be open next winter for the FY22 application cycle.

Shannon Alexander's presentation is available with hyperlinks in the PDF version of the PowerPoint presentation.

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

### RAFT Status Update

Wie Yusuf, Professor and Assistant Director of Old Dominion University's Institute for Coastal Adaptation and Resilience, shared a presentation on the Resilience Adaptation Feasibility Tool (RAFT). This intent of this presentation was to update the steering committee with RAFT's recent projects. Her presentation is available in the PDF version of the PowerPoint presentation.

### Locality Meetings & HMP Chapter Updates

Ashley Mills, Regional Planner, met with several localities to update their chapters of the HMP. Robert Williams asked if there is a date the Wachapreague chapter would be completed. Ashley Mills indicated there is no date currently set for completion of that chapter, however, the deadline for adoption of the plan by each jurisdiction is January 2022.

Thomas Hicks and Shannon Alexander discussed potential methods to ensure the plan is reviewed and updated annually. An annual review and update will ensure the plan is current and easier to update at the five-year update.

### Mitigation Strategies

Thomas Hicks led a discussion on the update to the mitigation goals. The committee decided to adopt regionwide mitigation goals with specific projects defined at the local level. Strategic Goal 1 was adopted without changes. The committee decided to amend Strategic Goal 2 to include language for post-hazard event response. The committee discussed a greater focus on education to address repetitive loss structures in the strategies for Strategic Goal 3. No changes were made to the wording of Strategic Goal 3. The Federal Emergency Management Administration (FEMA) "Community Lifelines" guided the development of Strategic Goal 4. The steering committee expressed a desire to capture each community's individual needs but agreed to the direction of Strategic Goal 4. Specific needs are recommended to be included in each locality's mitigation programs. The committee discussed including the migrant agricultural worker population as a specific strategy under Strategic Goal 5. Accomack and Northampton communities utilize services to target the migrant population for education and outreach regarding hazard events. The committee directed Berkley Group staff to further research other locality efforts to address migrant populations in hazard mitigation plans.

### New Resources

Thomas Hicks shared FEMA's Geospatial Resource Center, a virtual tool that provides content to local governments to assist in hazard modeling. This tool is useful to combine with existing GIS capabilities. Some of the other programs included in this tool are the Prioritization Operations Support Tool, Lifeline Dashboards, Crowdsourcing-Partner Products, and the Storm Simulation Tool in Hurrevac.

### Next Steps

The next steps of the project will be to review the existing regional mitigation objectives from the previous edition of the plan. Localities will need to review these objectives and determine if they have been accomplished or if they need to be brought into the new plan. Berkley Group and ANPDC staff will work together to send these mitigation objectives to the localities for their review.

## Meetings & Outreach

Steering committee members will receive a link to approve the strategic goals and strategies as amended during the meeting. Ashley Mills requested any locality who has not already met with her individually to update their individual chapter to make an appointment with her at amills@a-npdc.org

### Next Meeting

The meeting ended at 4:00 p.m. The next meeting will be held on May 18.

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

### OUTREACH

**EASTERN SHORE REGIONAL HAZARD MITIGATION PLAN**

### Steering Committee Meeting

Next Meeting: Tuesday, April 20th  
2:00pm - 4:00pm

Meeting details for the meeting can be found at [https://www.esrhp.org/meetings](#)

Joining the Steering Committee Meeting is the first step in the Eastern Shore Hazard Mitigation Plan update.

We enjoyed meeting with many of you over the last few weeks to update your respective hazard mitigation plans. Thank you for your participation!

Be advised, all local governments are encouraged to attend and/or have their stakeholders in the region have been invited to the Regional meeting.

**MEETING AGENDA**

- Welcome
- Roll Call
- Amend Rules
- Key Takeaways and Updates
- Eastern Shorelines, New Political Boundary, Broadband, Long Range Infrastructure
- RPP
- Locality Meetings & Homeowner Update
- RPPM
- Local & Strategic Development
- Documentation of Stakeholders
- Next Steps

[Click for PDF of Meeting Agenda](#)

**Meeting Day Information:**  
[Meeting Day Information](#)  
[Meeting Day Location](#)  
[Meeting Day Date](#)  
[Meeting Day Time](#)  
[Meeting Day Address](#)

**Meeting: April 19th | 1:00 – 4:00pm**  
Meeting Room B, University Building One, 4th Floor, 400 Academy Street

**Upcoming Resiliency and Hazard Mitigation Related Opportunities**

April 19th, 2021: Resiliency and Hazardous Materials: The Resiliency and Hazardous Materials Working Group is reviewing the local hazard and resilience plan for the area of 401-000, but the findings are general and relevant across the state.

April 20, 2021: New Home Builders who are located in a RPP area, are invited to our RPP New Home Builders meeting to learn more about the RPP and how RPP can support your through your home building process. Details to come.

[New Home Builders Meeting](#)

May 11th, 2021: Project Review 200: [Project Review 200](#) is now open for registration. This is a great opportunity to learn more about the project review process.

[Project Review 200](#)

Thank you very much and we look forward to meeting with you soon!

Attn: Brian K. Johnson and Andrea M. Miller

[View the RPP page on our website](#)

[Learn More About Resiliency Planning](#) | [Learn More About Hazard Mitigation Planning](#)

**EASTERN SHORE REGIONAL HAZARD MITIGATION PLAN**

### REMINDER: Steering Committee Meeting

Next Meeting: THIS Tuesday, April 20th  
2:00pm - 4:00pm

Meeting details for the meeting can be found at [https://www.esrhp.org/meetings](#)

MEETING INFORMATION AND REGISTRATION INFORMATION BELOW THE AGENDA AND ATTACHED FILE

**Meeting Agenda**

- Welcome
- Roll Call
- Amend Rules
- Key Takeaways and Updates
- Eastern Shorelines, New Political Boundary, Broadband, Long Range Infrastructure
- RPP
- Locality Meetings & Homeowner Update
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[Click for PDF of Meeting Agenda](#)

**Meeting Day Information:**  
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**Upcoming Resiliency and Hazard Mitigation Related Opportunities**

April 19th, 2021: New Home Builders who are located in a RPP area, are invited to our RPP New Home Builders meeting to learn more about the RPP and how RPP can support your through your home building process. Details to come.

[New Home Builders Meeting](#)

April 23rd, 2021: The RPP Community Rating System: The RPP Project Team is hosting a virtual meeting to discuss the RPP Community Rating System. This is a great opportunity to learn more about the rating system.

[The RPP Community Rating System](#)

**BUILDING RESILIENCY INTO COMPREHENSIVE PLANNING**  
presented by:  
The RPP Project Team

**APRIL 23, 2021 | 9-11:30 AM**

**THE RPP COMMUNITY RATING SYSTEM**  
presented by:  
Wendy Weller

[REGISTER HERE](#)

**RPP Project Area: "Planning for Resiliency" is presented."The video is only one tool dedicated to learning resiliency in action and not a step-by-step guide to implementation. It is also not the final version of the RPP, but the audience can see what is currently available [here](#).**

[View the RPP Project Area](#)

The RPP's Business Sector Association and Partnership are now available to view online. To view and learn more about the association and partnership, visit [the RPP Business Sector Association and Partnership](#) or [the RPP Partnership](#).

**The Planning Director is excited to have the next area meeting for the Regional Hazard Mitigation Plan!**

We enjoyed meeting with many of you over the last few weeks to update your respective hazard mitigation plans. Thank you for your participation!

Be advised, all local governments and their respective local and regional stakeholders in the region have been invited - thank you for your involvement!

## Meetings & Outreach

View this page on our website

**EASTERN SHORE REGIONAL HAZARD MITIGATION PLAN**

### Steering Committee Meeting

Meeting Follow Up from Tuesday, April 20

Meeting agenda and follow up materials can be found at [this link](#) or [this page](#).

**Greetings all,**

We like to thank everyone for participating in the April 20th meeting, and meeting for the Regional Hazard Mitigation Plan update! As a result of the meeting, several highlights have been developed:

**Item 1:** The majority of the members on the NHCMPC and the presentation by [John S.](#)

**Item 2:** During the April 20th meeting, the group discussed the Goals and Strategies for the hazard mitigation plan. Given the interests of the members attending to have the Goals and Strategies represent the Eastern Shore to assist with future grant applications and projects. The Committee decided the 2018 HMP and made recommendations on an updated set of Goals and Strategies. The edits have now been included for year adoption here, or by scrolling the GRI note at the top of the page. The adoption of these goals will initiate the next stage of the planning process, which includes the identification of mitigation objectives and projects for local communities.

**Item 3:** The survey completed shows a general lack of support for the proposed mitigation plan and a lack of concern for the overall grouping. This was used to facilitate discussion on what the critical issues are and to determine the next steps in preparation for adoption in 2023-2026. More information about the findings can be found in the [44NFOO analysis](#).

**Item 4:** If you have questions or needs, please email [Anney Miller](#) and [GRI](#) and we will individually respond to your concerns. Thank you and stay safe!

Thank you very much and good luck to all,

Ashley Mills

**Funding Department**  
2020 NC Resiliency Grant Application and Administration  
The City managers are looking forward to preparing RFP's for the new 2020-2026 HMP to receive funds for hard hazard mitigation projects around the region and the application process. Read the [RAFT website](#).

**SWOT Webinar Series** were conducted on Federal Funding Opportunities, opportunities for grants, and how to apply for them. [SWOT](#) is a department run by [John S.](#)

**Our Virginia Coastal Trust (VCT) is** working on a second round of better storm preparedness grants. They are currently finalizing the application for the 2021-2026 HMP and would like to have the updated version of the plan ready to be submitted by June 2021. [VCT](#) [Community Survey](#)

**CSIA Great American Clean-Up**  
In honor of Earth Day, help protect our environment by picking trash and debris from our local waterways.  
[CSIA](#) [Volunteer Form](#)  
Contact [CSIA](#) for more information.

**Coastal Resilience**  
Coastal Resilience, formerly known as the Coastal Protection and Restoration Authority, is a federal agency that funds coastal resilience projects across the country. [CSRA](#) [Project Database](#)

**VA Dept. of Planning**  
Virginia Department of Planning  
Dawn Williams, Regional Planner  
Chris Womack, Regional Planner  
Kathy Johnson, Regional Planner  
Matt Gould, Alan of Kinston, NC  
Chris Williams, Regional Planner

**VADP**  
Virginia Department of Planning  
Regional Planner, Region 1  
Dawn Williams, Regional Planner  
Chris Womack, Regional Planner  
Kathy Johnson, Regional Planner  
Matt Gould, Alan of Kinston, NC  
Chris Williams, Regional Planner

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**CSIA**  
Coastal States Association  
Regional Planner, Region 1  
Dawn Williams, Regional Planner  
Chris Womack, Regional Planner  
Kathy Johnson, Regional Planner  
Matt Gould, Alan of Kinston, NC  
Chris Williams, Regional Planner

**EASTERN SHORE BUSINESS RESILIENCY TRAINING**

Join us for the first ever Eastern Shore Business Resiliency Training on May 11-12, 2021. This training will provide business owners and managers with the skills and knowledge to prepare their businesses for potential disasters.

**Program Guest Speakers:**

**REGISTER @ REBRANDLY/RESILIENTESVA**

**May 11 - Day 1**  
10am-3pm  
What Resiliency Planning for Businesses Looks Like  
• What is Resiliency Planning?  
• What does it look like?  
• How do you implement it?  
• What are the benefits?  
• What are the challenges?

**May 12 - Day 2**  
10am-3pm  
Key Business Operations for the Opportunity and Economic Recovery  
• Key Business Operations for the Opportunity and Economic Recovery  
• Key Business Operations for the Opportunity and Economic Recovery  
• Key Business Operations for the Opportunity and Economic Recovery  
• Key Business Operations for the Opportunity and Economic Recovery

**Join us for a 6-week virtual course!**

**FEMA**   

[www.resilientesva.com](#) | [Facebook](#) | [Twitter](#)

**the RAFT community workshop**

**BUILDING RESILIENCY INTO COMPREHENSIVE PLANNING**  
presented by  
The RAFT Project Team

**APRIL 23, 2021 9-11:30 AM**

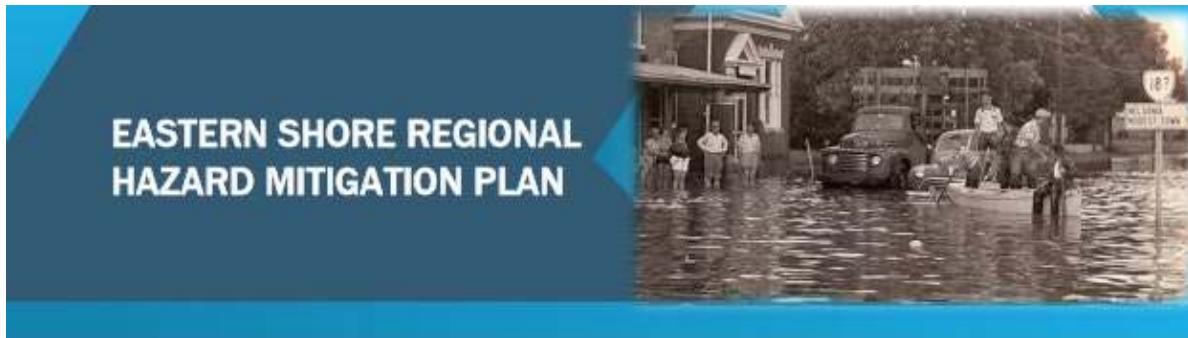
**THE NFIP COMMUNITY RATING SYSTEM**  
presented by  
Wetlands Watch

**REGISTER HERE**

MAY 18, 2021 HMP STEERING COMMITTEE MEETING

---

AGENDA



**Eastern Shore of Virginia  
Regional Hazard Mitigation Plan Update**

**AGENDA**

*Tuesday May 18, 2021, 2 p.m. – 4 p.m.*

*Virtual Event Zoom*

<https://zoom.us/j/99345792842?pwd=T2pJZTNBUUc0eC1WR0dDZHdHh3hwPT09>

Meeting ID: 993 4579 2842

Passcode: 7577872936

Dial In by Phone: (301) 715 – 8592 US (Washington D.C)

**Welcome**

**Roll Call**

**Round Robin**

**Strategic Goals & Strategies**

**Locality Meetings & HMP Chapter Updates**

**BREAK**

**Online Exercise**

**Regional Mitigation Objectives**

**Next Steps**

## Meetings & Outreach

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### ATTENDANCE AND MEETING SUMMARY

#### Eastern Shore Hazard Mitigation Plan

Summary of May 18, 2021 Steering Committee Meeting held Virtually via Zoom 2:00-4:00pm

*Presentations, support documents, recordings, and other resources can be found at  
<http://www.a-npdc.org/accomack-northampton-planning-district-commission/coastal-resources/hazard-mitigation-planning/>*

**Steering Committee Members Present:**

Susan McGhee, Northampton County  
Jeb Brady, Town of Cape Charles  
Robert Williams, Town of Wachapreague  
Patsy Stith, Town of Nassawadox  
Thomas Beasley, Town of Bloxom  
Tom Brockenbrough, Accomack County

**Steering Committee Members Absent:**

Town of Painter  
Town of Accomac  
Town of Saxis  
Town of Exmore  
Town of Eastville  
Town of Tangier  
Town of Nassawadox  
Town of Keller  
Town of Belle Haven  
Town of Hallwood  
Town of Melfa  
Town of Parksley

**Steering Committee Alternates Present:**

Jeanette Eby, Town of Bloxom

**A-NPDC Staff Present:**

Ashley Mills, A-N PDC  
Thomas Hicks, Berkley Group  
Jon McCoy, Berkley Group  
Aaron Berryhill, Berkley Group

**Planning Council Members Absent:**

Scott Hall, ESCC  
Hali Plourde-Rogers, ESLT  
Evelyn Shotwell, Chincoteague Chamber  
Susan Bates, The Nature Conservancy

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

### Welcome and Introductions

Thomas Hicks, The Berkley Group, welcomed participants and directed participants to take roll call using an online form. He gave a round of introductions and detailed the changes to the planning team working on the Hazard Mitigation Plan. He explained the In-Kind contributions tracking form and asked for all work on this project to be tracked using the google drive link to ensure that funding for projects and grants can be maximized.

### HMP Updates

Thomas Hicks and Ashley Mills provided a brief review of updates on the plan. Ashley informed the committee that she has recently met with many of the towns and counties involved in this process to obtain the updated chapter information.

### Round Table Discussion: How can the region use the hazard mitigation plan to develop relationship that will improve local infrastructure?

Committee members were asked to share how they felt that the hazard mitigation plan can be used to develop relationships to improve local infrastructure. Some respondents mentioned that they have been working on drainage but are lacking the funding and equipment to complete the necessary projects to improve drainage. Committee members identified cooperation issues with private landowners as a concern for maintaining drainage ditches as well. Thomas Hicks reiterated that the HMP can be a tool to apply for and secure funding for specific projects.

Since the issues facing local communities includes a lack of funding as well as policy guidance, the plan can help to clarify the process for making infrastructure improvements. The plan can also help to build the necessary relationships and connections with relevant actors to make necessary infrastructure improvements.

### Discussion of Strategic Goals and Strategies

The results of the survey were explained, demonstrating overall acceptance of goals and strategies. The committee discussed changes to Strategic Goal #3 and #5.

Committee members explained that not all communities participate in the Community Rating System (CRS) program and do not identify repetitive loss areas. FEMA conducts the identification of repetitive loss areas in these locations and identification is not the responsibility of local communities. The committee decided to amend Strategic Goal #3 to include FEMA's role in the process.

Committee members suggested including coastal towns in Strategic Goal #5. Committee members felt that coastal towns and island residents face similar issues in disaster and emergency response. Berkley Group staff and A-NPDC staff will review and incorporate these suggestions into the plan.

### Round Table Discussion: What are your recollections of storm events in the past 5 years?

The 2016 HMP includes testimonials, quotes, and archived memories of storm events during the five years prior to drafting that plan. Jonathan McCoy asked for input about recent community experience with

## Meetings & Outreach

storm events to include in the drafting of this plan. He encouraged committee members to share personal testimonials, as well as photos of storm events, either on the call or by email ([jon.mccoy@bellc.net](mailto:jon.mccoy@bellc.net)).

### Regional Mitigation Objectives

Thomas Hicks explained the purpose of the Mitigation Objectives and the need for these objectives to be specific, targeted, and actionable. These objectives have been ongoing for many years and should be assessed for this plan to understand if they have been completed or need to be included in this update. The committee members were asked to complete a form (<https://arcg.is/bf54K>) to verify the status of their locality's mitigation objectives. Berkley Group and A-NPDC staff will use this information in drafting the plan.

### Next Steps

The next steps for the project will be to update and draft content of plan chapters. This content will be initially presented in the next June meeting. The meeting ended at 3:15 p.m. The next meeting will be held on June 15.

# Eastern Shore of Virginia Hazard Mitigation Plan 2021

## OUTREACH

**Steering Committee Meeting**  
Next Meeting: Tuesday, May 18th  
2:00pm - 4:00pm

Meeting agenda: [Meeting agenda](#) | [Minutes from the April meeting](#) | [Action items from the April meeting](#)

The Eastern Shore Regional Hazard Mitigation Plan update. We appreciate all of your efforts towards this project.

Key actions have been identified in the first wave of the Plan. Please let us know if any of them still apply. If you have not already done so, please let us know if any changes need to occur to the update. This is discussed at the April 20th meeting - I will only take action if needed.

Please let us know if any of the items in my newsletter require further action or if they have changed. Thank you for your continued support.

**Meeting Agenda**

- Welcome
- Roll Call
- Approval Policy
- Strategic Goals & Strategic Objectives
- Locality Mitigation & HMP
- Disaster Recovery
- Disaster Exercises
- Hazard Mitigation
- Dissemination
- Next Steps
- Voting members

[View the POF of Meeting Agenda](#)

[Meeting Log & Minutes](#)

Meeting: Tuesdays 2:00pm-4:00pm  
Phone: 1(877)275-0504  
Email: [ESRHM@esrhm.org](mailto:ESRHM@esrhm.org)

The minutes from the April meeting can be found [here](#).

Anthony Brown at the City of Annapolis joined the group during the April 12th meeting for the second day of the plan. He was the co-chair of the committee that developed the City's local hazard mitigation plan and has been instrumental in the development of the state's HMP and local hazard mitigation plans. The City of Annapolis has also been included for more information by scanning the QR code on the top of the page. The City of Annapolis has also included an attachment of the planning process which includes the identification of mitigation objectives and processes for local governments.

**Upcoming Readiness and Hazard Mitigation Related Opportunities**

[Local HMP Information Session: The Responsibility to Prepare](#): This meeting will provide an update on planning activities in your community for hazard mitigation and resilience. It will also discuss the importance of local hazard mitigation planning. [Register here](#)

**The Virginia Cyber Task Force (VCTF)**: A monthly teleconference where you can learn about recent cyber threats and best practices. The VCTF is a collaborative effort between state and local government agencies and the private sector. Please take part in this monthly meeting. [Get involved here](#)

This is a monthly teleconference where you can learn about recent cyber threats and best practices. [Register here](#)

**FEMA Region 4 Webinar: Preparing for the Next Hurricane**  
Date: June 16, 2021 | Time: 10:00 AM - 11:00 AM  
Location: [Zoom](#)

Thank you very much and we look forward to hearing back from all our members,  
Anthony Brown

[View the April Page on our website](#)

**Steering Committee Meeting**  
Meeting Follow Up from Tuesday, May 18th

Meeting agenda: [Meeting agenda](#) | [Minutes from the April meeting](#) | [Action items from the April meeting](#)

Meeting: Tuesdays 2:00pm-4:00pm-5:00pm

Anthony Brown, the City of Annapolis, and the State of Maryland participated in the May 18th ESRHM meeting for the Regional Hazard Mitigation Plan update. As we are approaching deadline, there are several actions items below that are crucial for our mitigation plan completion.

**Item 1:** The survey of flooding can be found [here](#) or [here](#) for more information.

**Item 2:** Please complete the Mitigation Objectives survey for your locality using the QR code provided or by clicking [here](#). "Please do not hesitate to call or email me if you have any questions or concerns." - Anthony Brown, City of Annapolis, and I thank him for his response to this item.

**Item 3:** Please go to [this link](#) to complete the Local Update Survey. Your location is under your name, address, organization and location of survey and location.

**Item 4:** We request your assistance in getting your local hazard mitigation plan updated every 5 years. One year seems shorter and photo to Anthony Brown and [Jan McCay](#) at [jmcay@esrhm.org](#) Please include photo of the hazard mitigation plan or more of your local hazard mitigation plan. The photo can show, who they are and what mitigation is done.

**Item 5:** Please let any ODMR office know if your locality, town, city, county, or county seat for your jurisdiction are planned to move or plan as well. This would be extremely helpful in creating the map and priorities portion of the Plan.

Thank you very much and enjoy the rest of your day.

**Upcoming Readiness and Hazard Mitigation Related Opportunities**

**Local HMP Information Session: The Responsibility to Prepare**: This meeting will provide an update on planning activities in your community for hazard mitigation and resilience. It will also discuss the importance of local hazard mitigation planning. [Register here](#)

**FEMA Region 4 Webinar: Preparing for the Next Hurricane**  
Date: June 16, 2021 | Time: 10:00 AM - 11:00 AM  
Location: [Zoom](#)

**FEMA General Information Circular 18**  
Date: June 18, 2021 | Time: 10:00 AM - 11:00 AM  
Location: [Zoom](#)

**FEMA Regional Planner**  
Contact: Jennifer Clegg, [Jennifer.Clegg@fema.dhs.gov](#)  
Information: [Planning, Training, and Exercises](#)  
Date: June 22, 2021 | Time: 10:00 AM - 11:00 AM  
Location: [Zoom](#)

**FEMA**  
Contact: Jennifer Clegg, [Jennifer.Clegg@fema.dhs.gov](#)  
Information: [Planning, Training, and Exercises](#)  
Date: June 22, 2021 | Time: 10:00 AM - 11:00 AM  
Location: [Zoom](#)

[View the May Page on our website](#)

## JUNE 15, 2021 HMP STEERING COMMITTEE MEETING

### AGENDA



**EASTERN SHORE REGIONAL  
HAZARD MITIGATION PLAN**

**Eastern Shore of Virginia  
Regional Hazard Mitigation Plan Update**

**AGENDA**

**Tuesday June 15, 2021, 2 p.m. – 4 p.m.**

**Virtual Event Zoom**

<https://zoom.us/j/99345792642?pwd=T2oZTNBUTq0eCtWR0dQZHdHb3hwQT09>  
Meeting ID: 993 4579 2642  
Passcode: 7577872936  
Dial In by Phone: (301) 715 – 8592 US (Washington D.C)

**Welcome**

**Roll Call**

**Round Table**

**Presentation on the National Flood Insurance Program (NFIP)**

**BREAK**

**Chapter Reviews**

**Timeline**

**Questions/Concerns**

**Next Steps**

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

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### ATTENDANCE AND MEETING SUMMARY

#### Eastern Shore Hazard Mitigation Plan

Summary of June 15, 2021 Steering Committee Meeting held Virtually via Zoom 2:00-4:00pm

*Presentations, support documents, recordings and other resources can be found at  
<http://www.a-npdc.org/accomack-northampton-planning-district-commission/coastal-resources/hazard-mitigation-planning/>*

#### Steering Committee Members Present:

Susan McGhee, Northampton County  
Tom Brockenbrough, Accomack County  
Bob Williams, Town of Wachapreague  
Patsy Stith, Town of Nassawadox

#### Steering Committee Alternates Present

Jeanette Eby, Town of Bloxom

#### Steering Committee Members Absent:

Town of Painter  
Town of Accomac  
Town of Saxis  
Town of Exmore  
Town of Eastville  
Town of Tangier  
Town of Keller  
Town of Belle Haven  
Town of Hallwood  
Town of Melfa  
Town of Parksley

#### A-NPDC Staff Present:

Ashley Mills, A-N PDC  
Thomas Hicks, Berkley Group  
Jon McCoy, Berkley Group  
Aaron Berryhill, Berkley Group

#### Planning Council Members Absent:

Scott Hall, ESCC  
Hali Plourde-Rogers, ESLT  
Evelyn Shotwell, Chincoteague Chamber  
Susan Bates, The Nature Conservancy

## Meetings & Outreach

### Welcome and Introductions

Thomas Hicks, The Berkley Group, welcomed participants. He gave a round of introductions for the planning team working on the Hazard Mitigation Plan. Ashley Mills from A-NPDC also provided a brief introduction and explained the In-Kind contributions tracking form. This form collects information on all work conducted on the project by various stakeholders. Using a google drive link, this form tracks activity to ensure that funding for projects and grants can be maximized.

### Funding Announcement

Thomas started by sharing a new funding announcement for the Community Flood Preparedness Fund from the Virginia Department of Conservation and Recreation. Local communities should consider obtaining funding from this grant as they consider flooding hazards in their communities and begin to adopt the Hazard Mitigation Plan later this year.

### Round Table Discussion: What recent funding opportunities has your community secured? Do you have any advice to share regarding your experience?

Committee members were asked to consider the discussion question about local funding opportunities for local communities related to hazard mitigation. Some respondents stated that most recent hazard mitigation efforts have been funded by money from local taxes, but that many communities are optimistic that the bail out money from the federal government can help fund hazard mitigation needs. Expertise and time to write grant applications is one barrier to receiving grant funding.

To improve access to grant funding, towns may coordinate grant writing and application strategies with their respective counties and with the PDC. Proactive strategizing for grants will be more successful in receiving funding as well. Finally, communities should also be careful to make sure that any outside help that works on grant funding truly understands the needs of the local community.

### Presentation on the National Flood Insurance Program

The presentation on the National Flood Insurance Program was postponed for this meeting due to a last-minute cancellation from the presenter.

### Chapter Updates

Next, the planning team provided an update of the progress of finalizing the draft of the Hazard Mitigation Plan. Thomas and Jon gave an overview of each chapter in the plan that explained the status of each chapter and any remaining needs.

*Chapter 1:* This chapter gives a broad overview of the hazards in the Eastern Shore along with any recent updates. Thomas noted that the previous plan version covered major storm events up until Hurricane Sandy. He asked committee members if there were any notable storm events since that time that would be worth mentioning in the first chapter.

One attendee noted a storm in the summer of 2019 that downed multiple trees on Chincoteague and Assateague Islands. Committee members also noted a strong storm from 2018 that caused damage to roads. That storm specifically washed out the main road to Hillsborough and VDOT had to completely

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

reconstruct the road. The links below were shared during the meeting that provide pictures and descriptions of some of the recent storm events discussed in the meeting.

<https://www.delmarvanow.com/story/news/local/virginia/2019/05/16/washed-out-hillsborough-road-accomack-county-reopens-after-repairs/3691097002/>

<https://www.flickr.com/photos/vadot/albums/72157706484077335>

*Chapters 2 & 3:* These chapters discuss the overall planning process as well as the initial risk assessment of local hazards. These chapters are mostly complete and document the recent planning process for this plan. They also address the possible risks of various hazards in each community.

*Chapters 4-7:* These chapters expand on the high hazard risks identified in Chapter 3. This includes High Wind, Coastal Erosion, Coastal Flooding, Stormwater, Pandemic. These chapters are almost complete and have been updated with new references and adjusted to be consistent with the rest of the plan. The remaining need for these chapters is updated stories, details, and personal accounts as well as photos of recent hazardous events. Jon requested that committee members assist with providing any relevant information.

*Chapter 8:* This chapter takes a regional view of hazard mitigation while the subsequent chapters dive into the details for each respective local community. This chapter has been revised from previous iterations of the plan to remove redundant and repetitive information.

*Chapters 9-26:* These chapters address county and local community specific needs. Ashley has been in touch with each community to draft these chapters. These chapters are almost complete, but local communities are encouraged to respond to any outstanding requests from Ashley.

*Chapters 27-30:* These chapters contain the mitigation strategies for the localities. Thomas reminded the committee to update their mitigation objectives using the survey link (<https://arcg.is/bf54K>). Thomas stressed the importance of the mitigation objectives and encouraged all committee members to provide their update.

### Timeline

The meeting concluded with a brief overview of the timeline for the project. The project is on schedule and a complete draft will be submitted to the Virginia Department of Emergency Management (VDEM) by August 1. VDEM will provide input and feedback on the draft for the planning team to address and change. Tentatively, a call will be scheduled in October to address any final needs and provide direction for proceeding towards final adoption by local communities at the end of year.

### Next Steps

The next steps for the project will be to complete all updates to the plan. A-NPDC staff will reach out to localities to ensure their chapter content is accurate. This content will be compiled into a complete draft to submit to VDEM by August 1. The meeting ended at 3:00 p.m.

## Meetings & Outreach

### OUTREACH

**EASTON SHIRE REGIONAL HAZARD MITIGATION PLAN**

### Steering Committee Meeting

Next Meeting: Tuesday, June 19th  
2:00pm - 4:00pm

Meeting agenda for Tuesday, June 19th, 2018, 2:00pm - 4:00pm

The Planning District is excited to host the 10th 2018 meeting for the Regional Hazard Mitigation Plan update. We appreciate all our local partners for their support.

Key action items were distributed in the last week of May. Please take special note of the 10th item. This item is extremely important please contact the lead DCP contact to update your local mitigation objectives.

Meeting contact: [esrhp@eastonshire.vic.gov.au](mailto:esrhp@eastonshire.vic.gov.au) or [www.esrhp.vic.gov.au](http://www.esrhp.vic.gov.au) for further information.

**Meeting Agenda:**

- Welcome
- Bell Call
- Minutes Review
- Presentations on the RHP
- BRPAK
- Impact Review
- Timeline
- Guidelines/Governance
- Next Steps
- Adjournment

**CBA or PDF of Meeting Agenda**

**Meeting Information:**  
[www.esrhp.vic.gov.au](http://www.esrhp.vic.gov.au)  
and [www.esrhp.vic.gov.au/meetings.html](http://www.esrhp.vic.gov.au/meetings.html)

Meeting ID: 1621 8879 7402  
Dial-in: 1300 131 059

The meeting invite may be found [here](#).

Please review and/or contribute to the meeting agenda and minutes during this meeting.

**Visit the Mitigation Action Plan website:**

**FEMA**

More Mitigation Options [www.esrhp.vic.gov.au/more-mitigation-options](http://www.esrhp.vic.gov.au/more-mitigation-options)

View the [Plan](http://www.esrhp.vic.gov.au/plan)

**Item 2: Please complete the Mitigation Objectives survey for your locality using the QR code provided or by clicking here.**

"Please see Mitigation Objectives. If you have specific questions or need further details, please speak to your local authority, council and yourself. This will assist us in updating the survey."



**Item 4: Participants were asked to complete the survey to determine what they think is most important when developing their mitigation plan. These findings will be extremely helpful in creating the revised Mitigation Objectives of the Plan.**

**Item 5: Participants were using COVID-19 related grants to prepare their locality for resilience. These grants can help reduce damage whilst also increasing safety. Small grants are available and photons in [Janet's Mailbox](https://tinyurl.com/yd6yqjwz).**

**Impactful Upcoming Resiliency and Hazard Mitigation Related Opportunities:**

DCH Regional Disaster Recovery and Resilience Program - \$10 million - 2020 Community Flood Recovery Program grant round. Details will be released later this year, however funding has already been allocated across the state.

**Hazardous Materials Response and Recovery (HMRR) program:**  
The HMRR program is designed to assist councils and local government areas to respond to and recover from emergency situations involving hazardous materials. It is a grant program that provides funding to councils and local government areas to respond to and recover from emergency situations involving hazardous materials.

The Rehabilitation to Resilience (R2R) program that will provide grants to councils and local government areas to respond to and recover from emergency situations involving hazardous materials. For more information, visit [www.esrhp.vic.gov.au/r2r](http://www.esrhp.vic.gov.au/r2r).

**PGMIS - Project Officer - Victorian State Medical Evacuation Team Position at the Royal Victorian Medical Centre (RVMC) - [www.esrhp.vic.gov.au/pgmis](http://www.esrhp.vic.gov.au/pgmis)**

**PGMIS Region 2: [www.esrhp.vic.gov.au/pgmis-region-2](http://www.esrhp.vic.gov.au/pgmis-region-2)**

# Eastern Shore of Virginia Hazard Mitigation Plan 2021

## Meetings & Outreach

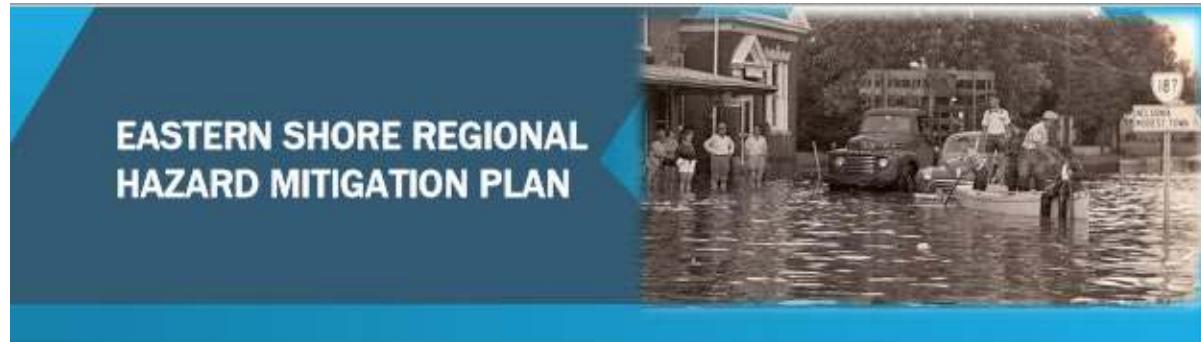
## NO HMP STEERING COMMITTEE MEETINGS – JULY, AUGUST, SEPTEMBER

During the June 15<sup>th</sup> meeting, the Hazard Mitigation Steering Committee, along with the A-NPDC and those involved in the Planning Council, determined the next Steering Committee meeting would be held again in October. This allowed time to complete the Plan draft prior to October's meeting for the Committee to review and comment. A-NPDC continued regular communication efforts with Steering Committee members through email blasts, website updates, person emails, and phone calls.

## OUTREACH

## OCTOBER 19, 2021 HMP STEERING COMMITTEE MEETING

### AGENDA



## **Eastern Shore of Virginia Regional Hazard Mitigation Plan Update**

### **AGENDA**

*Tuesday October 19, 2021, 2 p.m. – 4 p.m.*

*Virtual Event Zoom*

<https://zoom.us/j/99345792642?pwd=T2piZTNBUTp0eCtWR0dDZHdHb3hwQT09>

Meeting ID: 993 4579 2642

Passcode: 7577872936

Dial In by Phone: (301) 715 – 8592 US (Washington D.C)

**Welcome**

**Roll Call**

**Round Robin**

**Grant Programs**

**Locality Board Meetings**

**Adoption Process**

**Plan Update**

**Next Steps**

## Meetings & Outreach

---

### ATTENDANCE AND MEETING SUMMARY

#### Eastern Shore Hazard Mitigation Plan

Summary of October 19, 2021 Steering Committee Meeting held Virtually via Zoom 2:00-4:00pm

*Presentations, support documents, and other resources can be found at  
<http://www.a-npdc.org/accomack-northampton-planning-district-commission/coastal-resources/hazard-mitigation-planning/>*

*Members may access a recording of this call at: [tinyurl.com/4wn6p937](http://tinyurl.com/4wn6p937)*

**Steering Committee Members Present:**

Susan McGhee, Northampton County  
Jeb Brady, Town of Cape Charles  
Tom Brockenbrough, Accomack County  
Bryan Rush, Chincoteague Emergency Services  
Laurie Chamberlain, Town of Onley  
Bshpil ?, Unknown

**Steering Committee Members Absent:**

Town of Painter  
Town of Accomac  
Town of Saxis  
Town of Exmore  
Town of Eastville  
Town of Tangier  
Town of Keller  
Town of Belle Haven  
Town of Hallwood  
Town of Parksley  
Town of Wachapreague  
Town of Onancock  
Town of Cheriton  
Town of Nassawadox  
Town of Melfa

**Steering Committee Alternates Present:**

Jeanette Eby, Town of Bloxom  
Sarah Dickey, Accomack County

**VDEM Present:**

Chris Bruce

**A-NPDC Staff Present:**

Anne Doyle  
Thomas Hicks, Berkley Group

**Planning Council Members Present:**

**Planning Council Members Absent:**  
Hali Plourde-Rogers, ESLT  
Scott Hall, ESCC  
Evelyn Shotwell, Chincoteague Chamber  
Susan Bates, The Nature Conservancy

## Eastern Shore of Virginia Hazard Mitigation Plan 2021

### Welcome and Introductions

Tommy Hicks, The Berkley Group, welcomed participants and directed participants to take roll call.

Anne Doyle introduced herself and welcomed everyone to the committee as the Director of Planning for the Eastern Shore Planning District.

### Key Takeaways and Updates

This meeting provided an overview of local, state, and federal grants which are available for the region to consider assisting in preparedness and mitigation activities. The presentation is available with hyperlinks in the PDF version of the PowerPoint presentation.

An update was provided on each of the HMP Chapters, and the review conducted by VDEM. The current schedule will allow the final document to be available for submittal and adoption by localities. FEMA has still not been able to provide information on the National Flood Insurance Program even after many requests. The next steps are to move the plan forward using the existing data sets in the NFIP.

### Locality Meetings

Tommy Hicks discussed the council and board meeting schedules for each month and requested that any community needing the HMP to be submitted to the board agenda a month prior to board adoption to please contact Ashley Mills.

### Next Steps

This meeting concluded the 6 HMP Meetings needed to help develop the plan. After VDEM reviews, the chapters will be posted to the Eastern Shore Planning District's website prior to adoption at the community level.

## Meetings & Outreach

## OUTREACH

A flyer for the Eastern Shores Regional Hazard Mitigation Plan Steering Committee Meeting. The top half features a blue gradient background with white text. The title 'Steering Committee Meeting' is in large, bold, blue font. Below it, 'Final Meeting: Tuesday, October 19th' and '2:00pm - 4:00pm' are in smaller blue font. The bottom half has a light gray background with black text. It includes a 'Project Update' section with a bulleted list of topics, a 'Thank you!' message, and a 'Chair Note: Strategic' section. At the bottom, there's a 'Building Resilient Infrastructure and Communities' section with contact information, and a 'Upcoming Workshops' section.

A flyer for the Eastern Shore Regional Hazard Mitigation Plan. It features a blue header with the text 'EASTERN SHORE REGIONAL HAZARD MITIGATION PLAN' and a large green title 'Steering Committee Meeting'. Below the title is the subtitle 'FINAL Meeting: Tuesday, October 19th 2:00pm - 4:00pm'. A note below states 'Attendance by the Six Trustees of each member of ESRHP. All are open to the public.' The main body text reads: 'The Planning District Commission is excited to host the final 2001 meeting for the Roanoke-Hampton-Fairfax project. Please feel free to approach any of the trustees about this project.' There is also a note about the location being off-site. At the bottom, there is a section titled 'Attention' with instructions for attendees, a list of names for the steering committee, and contact information for the steering committee chair.

Eastern Shore of Virginia Hazard Mitigation Plan 2021

## APPENDIX D: RESOLUTIONS OF ADOPTION

The following section contains each jurisdiction's adopted resolutions for the Eastern Shore of Virginia Hazard Mitigation Plan 2021.

# Resolution

## Eastern Shore of Virginia Hazard Mitigation Plan 2021 Accomack County, Virginia

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the County's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the County; and

WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including Accomack County; and

WHEREAS, the efforts of Accomack County, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Board of Supervisors of Accomack County, Virginia that the sections pertaining to Accomack County in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for Accomack County, Virginia.



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Michael Mason, County Administrator

May 18, 2022  
Date Adopted

## Resolution

Eastern Shore of Virginia Hazard Mitigation Plan 2021

Town of Accomac, Virginia

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the Town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Accomac; and

WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Accomac; and

WHEREAS, the efforts of the Town of Accomac, the Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in an update of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Town of Accomac, Virginia, that the sections pertaining to the Town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022, is hereby approved and adopted for the Town of Accomac, Virginia.

Mayor, Patricia Smith

Mayor Patricia Smith

8/17/22

Date

## Resolution

### Eastern Shore of Virginia Hazard Mitigation Plan 2021 Town of Bloxom, Virginia

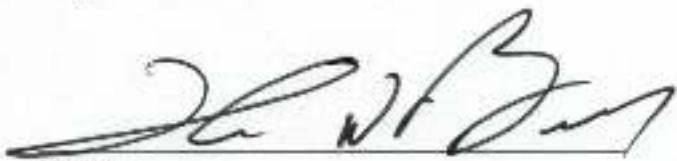
WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Bloxom; and

WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Bloxom; and

WHEREAS, the efforts of the Town of Bloxom, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Town of Bloxom, Virginia that the sections pertaining to the town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for the Town of Bloxom, Virginia.

  
\_\_\_\_\_  
Mayor

Date

5-3-20



## RESOLUTION

### Eastern Shore of Virginia Hazard Mitigation Plan 2021 Town of Chincoteague, Virginia

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Chincoteague; and

WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Chincoteague; and

WHEREAS, the efforts of the Town of Chincoteague, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Town of Chincoteague, Virginia that the sections pertaining to the town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for the Town of Chincoteague, Virginia.

**Dated:** May 2, 2022

Town Council of the Town of Chincoteague

Christopher D. Riddle  
Jeff P. Bowles

Ellen W. Richardson

William T. H. Miller

Steve W. Taylor

Jay Savage

Attest: Michael J. Tolbert  
Michael J. Tolbert, Town Manager

# Resolution

## Eastern Shore of Virginia Hazard Mitigation Plan 2021 Town of Hallwood, Virginia

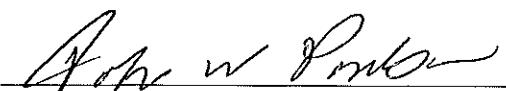
WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

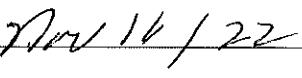
WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Hallwood; and

WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Hallwood; and

WHEREAS, the efforts of the Town of Hallwood, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Town of Hallwood, Virginia that the sections pertaining to the town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for the Town of Hallwood, Virginia.

  
\_\_\_\_\_  
John W. Parker  
Mayor

\_\_\_\_\_  
  
Nov 16 / 22  
Date

# Resolution

## Eastern Shore of Virginia Hazard Mitigation Plan 2021 Town of Keller, Virginia

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Keller; and

WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Keller; and

WHEREAS, the efforts of the Town of Keller, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Town of Keller, Virginia that the sections pertaining to the town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for the Town of Keller, Virginia.

Beth  
\_\_\_\_\_  
Mayor

6/8/2022  
\_\_\_\_\_  
Date

# Resolution

## Eastern Shore of Virginia Hazard Mitigation Plan 2021 Town of Melfa, Virginia

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Melfa; and

WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Melfa; and

WHEREAS, the efforts of the Town of Melfa, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Town of Melfa, Virginia that the sections pertaining to the town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for the Town of Melfa, Virginia.



Mayor Charles Wilbur



8/17/2022  
Date

# Resolution

## Eastern Shore of Virginia Hazard Mitigation Plan 2021 Town of Onancock, Virginia

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Onancock; and

WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Onancock; and

WHEREAS, the efforts of the Town of Onancock, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Town of Onancock, Virginia that the sections pertaining to the town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for the Town of Onancock, Virginia.



Mayor



Date

# Resolution

## Eastern Shore of Virginia Hazard Mitigation Plan 2021 Town of Onley, Virginia

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Onley; and

WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Onley; and

WHEREAS, the efforts of the Town of Onley, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Town of Onley, Virginia that the sections pertaining to the town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for the Town of Onley, Virginia.



Lee Pearson  
Vice-Mayor

November 8, 2022  
Date

## Resolution

### Eastern Shore of Virginia Hazard Mitigation Plan 2021 Town of Painter, Virginia

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Painter; and

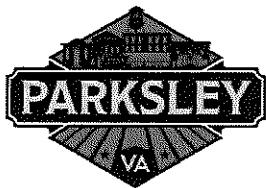
WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Painter; and

WHEREAS, the efforts of the Town of Painter, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Town of Painter, Virginia that the sections pertaining to the town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for the Town of Painter, Virginia.

Connie W. Campbell  
Mayor

May 9, 2022  
Date



## Resolution

### Eastern Shore of Virginia Hazard Mitigation Plan 2021 Town of Parksley, Virginia

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Parksley; and

WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Parksley; and

WHEREAS, the efforts of the Town of Parksley, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Town of Parksley, Virginia that the sections pertaining to the town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for the Town of Parksley, Virginia.

Mayor

05/09/2022

Date

*Shorely Unexpected!*

# Resolution

## Eastern Shore of Virginia Hazard Mitigation Plan 2021 Town of Saxis, Virginia

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Saxis; and

WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Saxis; and

WHEREAS, the efforts of the Town of Saxis, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Town of Saxis, Virginia that the sections pertaining to the town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for the Town of Saxis, Virginia.

Janice Drew  
Mayor

May 12th 2022  
Date

A handwritten signature "Janice Drew" is written over a horizontal line. Below the signature, the word "Mayor" is handwritten. A second line below contains the handwritten date "May 12th 2022".

## Resolution

### Eastern Shore of Virginia Hazard Mitigation Plan 2021 Town of Tangier, Virginia

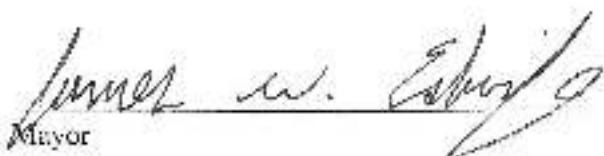
WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Tangier; and

WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Tangier; and

WHEREAS, the efforts of the Town of Tangier, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Town of Tangier, Virginia that the sections pertaining to the town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for the Town of Tangier, Virginia.

  
James W. Ebury  
Mayor

7/13/2022  
Date:

# Resolution

## Eastern Shore of Virginia Hazard Mitigation Plan 2021 Town of Wachapreague, Virginia

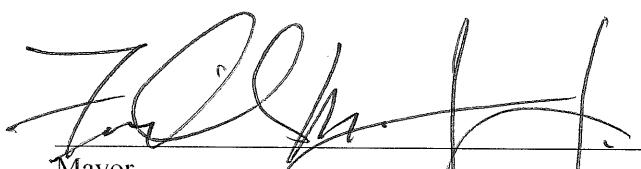
WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Wachapreague; and

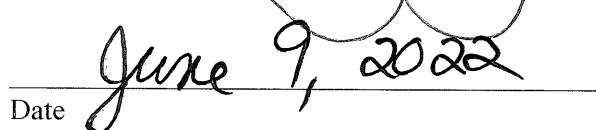
WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Wachapreague; and

WHEREAS, the efforts of the Town of Wachapreague, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Town of Wachapreague, Virginia that the sections pertaining to the town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for the Town of Wachapreague, Virginia.



Mayor



Date June 9, 2022

# Resolution

## Eastern Shore of Virginia Hazard Mitigation Plan 2021 Northampton County, Virginia

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the County's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on Northampton County; and

WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including Northampton County; and

WHEREAS, the efforts of Northampton County, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by Northampton County, Virginia that the sections pertaining to the County in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for Northampton County, Virginia.



County Administrator  
Charles Kolakowski

April 26, 2022  
Date

# **RESOLUTION 20220519**

## **Eastern Shore of Virginia Hazard Mitigation Plan 2021 Town of Cape Charles, Virginia**

**WHEREAS**, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

**WHEREAS**, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Cape Charles; and

**WHEREAS**, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Cape Charles; and

**WHEREAS**, the efforts of the Town of Cape Charles, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

**NOW, THEREFORE, BE IT RESOLVED** by the Town of Cape Charles, Virginia that the sections pertaining to the town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for the Town of Cape Charles, Virginia.

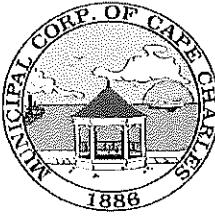
Adopted by the Town Council of the Town of Cape Charles on May 19, 2022.

By:

\_\_\_\_\_  
Mayor Dize

Attest:

\_\_\_\_\_  
*Lisby Hume*  
\_\_\_\_\_  
Town Clerk



**Municipal Corp. of  
Cape Charles**

The undersigned Clerk of the Council of the Town of Cape Charles, Virginia (the "Town"), hereby certifies that:

1. A meeting of the Council of the Town (the "Council") was duly called and held on May 19, 2022 (the "Meeting").
2. Attached hereto is a true, correct and complete copy of Resolution 20220519 (the "Resolution") of the Town entitled as recorded in full in the minutes of the Meeting, duly adopted by a majority of the members of the Council present and voting during the Meeting.
3. A summary of the members of the Council participating at the Meeting and the recorded vote with respect to the foregoing Resolution as set forth below:

<b>Member Name</b>	<b>Present</b>	<b>Absent</b>	<b>Voting</b>		
			<b>Yes</b>	<b>No</b>	<b>Abstaining</b>
William Dize, Mayor	X				
Steve Bennett	X		X		
Andy Buchholz	X		X		
Andrew Follmer	X		X		
Paul Grossman	X		X		
Tammy Holloway	X		X		
Ellen O'Brien	X		X		

4. The Resolution has not been repealed, revoked, rescinded or amended and is in full force and effect on the date hereof.

Witness my signature and the seal of the Town of Cape Charles, Virginia this 19<sup>th</sup> day of May 2022.

(Seal)

\_\_\_\_\_  
Clerk of the Council  
Town of Cape Charles, Virginia

# Resolution

## Eastern Shore of Virginia Hazard Mitigation Plan 2021 Town of Cheriton, Virginia

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Cheriton; and

WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Cheriton; and

WHEREAS, the efforts of the Town of Cheriton, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Town of Cheriton, Virginia that the sections pertaining to the town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for the Town of Cheriton, Virginia.



Jacqueline V. Davis  
Mayor

4-27-22  
Date

## Resolution

### Eastern Shore of Virginia Hazard Mitigation Plan 2021 Town of Eastville, Virginia

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Eastville; and

WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Eastville; and

WHEREAS, the efforts of the Town of Eastville, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Town of Eastville, Virginia that the sections pertaining to the town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for the Town of Eastville, Virginia.

  
Mayor \_\_\_\_\_  
\_\_\_\_\_  
Date May 5, 2022

# Resolution

## Eastern Shore of Virginia Hazard Mitigation Plan 2021 Town of Exmore, Virginia

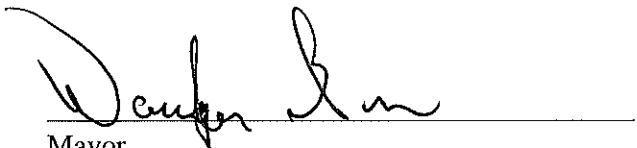
WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Exmore; and

WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Exmore; and

WHEREAS, the efforts of the Town of Exmore, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Town of Exmore, Virginia that the sections pertaining to the town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for the Town of Exmore, Virginia.



\_\_\_\_\_  
Mayor

\_\_\_\_\_  
Date

05/02/2022

# Resolution

## Eastern Shore of Virginia Hazard Mitigation Plan 2021 Town of Nassawadox, Virginia

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, an Eastern Shore Hazard Mitigation Plan Steering Committee comprised of members of the business community, non-profit organizations, and local officials was convened in order to study the town's risks from and vulnerabilities to natural hazards and to make recommendations on mitigating the effects of such hazards on the Town of Nassawadox; and

WHEREAS, the Accomack-Northampton Planning District Commission updated a regional Hazard Mitigation Plan including the Town of Nassawadox; and

WHEREAS, the efforts of the Town of Nassawadox, Eastern Shore of Virginia Hazard Mitigation Plan Steering Committee members, and the Accomack-Northampton Planning District Commission have resulted in the development of a regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED by the Town of Nassawadox, Virginia that the sections pertaining to the town in the Eastern Shore of Virginia Hazard Mitigation Plan dated April 2022 is hereby approved and adopted for the Town of Nassawadox, Virginia.

Patricia S. Smith  
Mayor

September 26, 2022  
Date

*Respecting the Past, Creating the Future:*

# **Accomack County Comprehensive Plan**



**Adopted: May 14, 2008**  
**Amended: February 19, 2014**  
**Amended: January 20, 2016**  
**Amended: October 17, 2018**

# ***Accomack County Comprehensive Plan***

\*The following information reflects the 2008 Comprehensive Plan.

## ***Board of Supervisors:***

*The Honorable Ron S. Wolff, Chairman  
The Honorable Steve D. Mallette, Vice-Chair  
The Honorable Grayson C. Chesson  
The Honorable Laura Belle Gordy  
The Honorable John C. Gray  
The Honorable Donald L. Hart, Jr.  
The Honorable Sandra Hart Mears  
The Honorable E. Philip McCaleb  
The Honorable Wanda J. Thornton*

## ***Recent County Supervisors:***

*Mr. Gregory L. Duncan  
Ms. C. Reneta Major*

## ***Planning Commission:***

*Mr. E. Phillip Hickman, Chairman  
Ms. Stella Rohde, Vice-Chair  
Mr. James T. Frese  
Mr. C. Robert Hickman  
Ms. Tammy James  
Mr. Robert L. Nock  
Mr. Leander Roberts, Jr.  
Mr. Herbert A. Thom  
Mr. E. Bryan Turner*

## ***Recent Planning Commissioner:***

*Mr. William A. Sprague*

# *Accomack County Comprehensive Plan*

## *Stakeholder Group:*

*Mr. James N. Belote, III*

*Mr. Joshua Bundick*

*Mr. Bill Chandler*

*Mr. Mark Glackin*

*Mr. L. Bruce Holland*

*Ms. Miriam E. Riggs*

*Mr. David Sabatino*

*Mr. Gene Wayne Taylor*

*Mr. Thomas M. Wescott*

## *Senior Staff:*

*Steve B. Miner, County Administrator*

*Mark B. Taylor, County Attorney*

## *Department of Planning Staff:*

*James M. McGowan, AICP, Director of Planning*

*Tom Brockenbrough, GIS Coordinator*

*Norman Pitt, Erosion and Sediment Control Inspector*

*Andrea Stone, Environmental Planner*

*Tonya Taylor, Administrative Assistant*

*Rob Testerman, Land Use Planner*

## **Introduction**

### **Purpose**

The overall purpose of the Comprehensive Plan is to guide the future social, economic and physical development of Accomack County so as to ensure the provision of adequate, quality, community facilities and services and the maintenance of a healthy, safe, orderly, and harmonious environment.

### **Preface**

The Accomack County Comprehensive Plan was rewritten in 1997. This document is an update of the 1997 Plan. Like the earlier Plan, it contains information, policies, and programs for the county to implement in order to manage development and resources in a manner most beneficial to the citizenry. \*The Future Land Use Plan (Chapter 6) was updated and amended on February 19, 2014 by the Accomack County Board of Supervisors.

This document is the result of significant effort on the part of the Accomack County Planning Commission, Accomack County Board of Supervisors, the staff of the Accomack County Department of Planning and Department of Building and Zoning, and the citizens of Accomack County.

The preparation of this document drew upon the efforts and information from many agencies and organizations including the Virginia Coastal Resources Management Program and the Chesapeake Bay Local Assistance Department.

The Accomack County Comprehensive Plan is divided into several chapters. The first chapter is an overview of the plan revision process and the legislative authority that enables Accomack County to plan for the future development of the county. The second and third chapters inventory existing conditions. The fourth chapter includes a discussion of issues and concerns facing Accomack County. The fifth chapter presents the county's goals for the future and outlines objectives, policies, and recommended actions designed to achieve those goals. The sixth chapter, which was amended on February 19, 2014, contains the future land use plan which includes the future land use map and proposed land use categories to be considered in the development of future revisions to the county's zoning and subdivision ordinances.

## **Acknowledgments**

The Accomack County Planning Commission and Board of Supervisors acknowledge the following agencies and organizations for the provision of information, assistance and support during the 1997 Comprehensive Plan revision process, and information from many of these resources was also part of the update process in 2006-07.

Accomack County Stakeholder Group  
Accomack County Department of Building and Zoning  
Accomack County Department of Planning  
Accomack County Department of Parks and Recreation  
Accomack County Department of Public Works  
Accomack County Office of the Tax Assessor  
Accomack-Northampton Housing Redevelopment Corporation  
Accomack-Northampton Planning District Commission  
Eastern Shore of Virginia Ground Water Committee  
Environmental Health Division of the Virginia Department of Health  
Natural Resource Conservation Service  
Shellfish Sanitation Division of the Virginia Department of Health  
U.S. Environmental Protection Agency  
U.S. Fish and Wildlife Service  
Virginia Department of Conservation and Recreation, Division of Chesapeake Bay Local Assistance  
Virginia Department of Conservation and Recreation, Planning and Recreation Resources Division  
Virginia Department of Conservation and Recreation, Natural Heritage Division  
Virginia Department of Environmental Quality  
Virginia Department of Environmental Quality, Virginia Coastal Program  
Virginia Department of Historic Resources  
Virginia Department of Transportation  
Virginia Institute of Marine Science  
Virginia Marine Resources Commission  
Weldon Cooper Center for Public Service

Consulting assistance was provided by the team of Herd Planning & Design, Ltd., Renaissance Planning Group, Draper Aden Associates, Williamsburg Environmental Group, and MarshWitt Associates.

***Special thanks to all of the citizens who took part in the planning process by participating in the public forums, and attending Planning Commission and Board of Supervisor meetings.***

## Contents

	Page
<b>Introduction .....</b>	a-1
<b>Executive Summary .....</b>	i
<b>Chapter 1: The Planning Process and Virginia Code Requirements</b>	
The Planning Process.....	1- 2
A Vision for the Future of Accomack County .....	1-4
Enabling Authority.....	1-6
<b>Chapter 2: Inventory and Existing Conditions: The Natural Environment</b>	
Climate .....	2-2
Soils .....	2-3
Water .....	2-9
Air Quality .....	2-40
Plants and Animals .....	2-45
Shoreline Erosion .....	2-62
Sea Level Rise .....	2-67
Storms .....	2-67
<b>Chapter 3: Inventory and Existing Conditions: The Developed Environment</b>	
Population .....	3-2
Land Use .....	3-8
Housing .....	3-20
The Economy.....	3-23
2015 Accomack County Joint Land Use Study.....	3-25
Transportation .....	3-47
Waste Disposal .....	3-59
Recreation .....	3-62
Capital Improvement Plan .....	3-64
Cultural Resources .....	3-67

## **Chapter 4: Issues and Concerns**

Development .....	4-2
The Local Economy.....	4-15
The Seafood Industry.....	4-20
Agriculture .....	4-25
Pollution Control .....	4-28
Groundwater Management .....	4-31
Waste Disposal .....	4-35
Transportation .....	4-36
Cultural Resources .....	4-38
Recreation .....	4-39
Information Needs .....	4-56
Citizen Involvement .....	4-57
Implementation .....	4-57

## **Chapter 5: Goals, Objectives, Policies, and Recommended Actions**

Goals, Objectives, Policies, and Recommended Actions .....	5-2
Action Plan .....	5-23

## **Chapter 6: Future Land Use Plan**

Future Land Use Plan .....	6-2
Future Land Use Analysis – Opportunities and Constraints .....	6-14
Future Land Use Plan Concept .....	6-18
Future Land Use Maps .....	6-25

## **Appendix A – Results of Joint Work Session of Planning Commission &..... Land Use Planning Stakeholders Group on Land Use Planning Issues and Options**

## **Appendix B – Joint Land Use Study Executive Summary, Recommendations..... and Strategies – *adopted 1/20/2016***

## **Appendix C – Five Year Update Amendment – *adopted 10/17/2018*..... C-1**

## **Bibliography .....** BIB-1

### **Maps:**

2-A Hydrologic Unit Boundaries.....	2-12
2-B VPDES Discharge Sites.....	2-17
2-C Restricted/Condemned Shellfish Areas .....	2-24
2-D Chesapeake Bay Preservation Areas .....	2-30
2-E Public Water Supply Wells .....	2-35
2-F Groundwater Recharge Spine .....	2-36

2-G Federally Regulated Underground Storage Tanks .....	2-37
2-H Tidal Wetlands .....	2-48
2-I Shoreline Erosion .....	2-63
2-J Flood Zones .....	2-69
2-K Hurricane Storm Surge .....	2-73
3-A 2000 Census Tracts .....	3-3
3-B Election Districts .....	3-5
3-C Zoning Districts .....	3-12
3-D Publicly Owned Conservation Lands .....	3-18
3-E Conservation Easements .....	3-19
3-F Enterprise Zones .....	3-28
3-G Joint Land Use Study Operational Footprint.....	3-38
3-H Joint Land Use Study Accident Potential Zones .....	3-40
3-I Joint Land Use Study Noise Contours .....	3-42
3-J Joint Land Use Study Rocket Range Hazard Areas .....	3-45
3-K Transportation Network .....	3-48
3-L Existing 2003 Traffic .....	3-52
3-M 30 Percent Growth .....	3-54
3-N 50 Percent Growth.....	3-55
3-O 100 Percent Growth.....	3-56
3-P Accomack County Bicycle Plan Proposed Facilities .....	3-58
3-Q Coastal Public Access Locations .....	3-63
3-R Virginia Landmarks Register .....	3-69
4-A Incorporated Towns .....	4-3
4-B Rural Villages .....	4-4
4-C Soils Suitable for Septic Systems .....	4-8
4-D Agricultural and Forestal Districts .....	4-23
4-E Prime Agricultural Soils .....	4-24
6-A Opportunities and Constraints Analysis .....	6-16
Future Land Use – Accomack County .....	6-26
Future Land Use – Election District 1 .....	6-27
Future Land Use – Election District 2&3 .....	6-28
Future Land Use – Election District 4&5 .....	6-29
Future Land Use – Election District 6&7 .....	6-30
Future Land Use – Election District 8&9 .....	6-31

**Tables:**

Impaired Waters – TMDL Priority List.....	2-14
VPDES Sites .....	2-16
Groundwater Withdrawal Permits .....	2-20
Impaired Shellfish Waters .....	2-25
Condemned Shellfish Grounds .....	2-27
Federal Air Quality Standards .....	2-40

Registered Air Pollution Sources .....	2-42
Global Rank of Species .....	2-56
Species of Greatest Conservation Need .....	2-59
Population by District, 1930-1990 .....	3-4
Population by Election District, 2000 .....	3-4
Age Distribution .....	3-6
Race Distribution of Population .....	3-6
Population Growth 1980-2000.....	3-6
Population Projections .....	3-7
Farms in Accomack County .....	3-8
Trend in Forested Acres, Accomack County .....	3-9
Construction Starts, 1990-2006 .....	3-9
Subdivision of Land, 1990-1996 .....	3-10
Subdivision of Land, 1997-2005 .....	3-10
Buildout Analysis of Original and Alternative Agricultural Zoning Regulations .....	3-11
Estimate of Future Groundwater Needs for Residential Uses .....	3-15
Accomack County Land in Conservation Ownership .....	3-17
Housing Characteristics .....	3-20
Housing Conditions .....	3-21
Housing Units Authorized by Permits .....	3-22
Largest Employers in Accomack County .....	3-23
Property Tax Rates, 1996, 2005 .....	3-25
Employment by Sector, 2006 .....	3-26
Unemployment Rates .....	3-26
Household Income .....	3-29
Employed Civilian Population 16 Years and Over .....	3-30
2000 Route 13 Average Daily Traffic (ADT) Volumes .....	3-43
Tons of Solid Waste Received Annually at Landfills .....	3-54
Tons of Solid Waste Landfilled Annually.....	3-54
New Housing Units.....	4-6
Water Quality Test Sites .....	4-22
Farm Ownership .....	4-26
Land Use in the Groundwater Recharge Spine, 1996 .....	4-32
Acreage of Irrigated Land .....	4-33
Accomack County Recreation .....	4-40
Existing and Projected Needs .....	4-48
Acreage of Future Land Use Areas .....	6-24

## Accomack County Comprehensive Plan

# Executive Summary

### **Introduction**

Accomack County is a unique place – a historic, coastal community with cultural roots in early settlements of Native Americans, Europeans and Africans; a fragile, ecologically rich, and productive natural environment of national and international significance; a highly productive and innovative agricultural and seafood economy; a popular and widely known destination for tourism, recreation, and retirement; and a place with huge potential for future economic productivity and innovation in terms of sustainable natural resource and technology industries.

Through a series of studies, meetings, and work sessions during 2005, 2006, and 2007, the County Planning Commission, Stakeholder Group, County staff, consulting team, and local citizens created this updated plan, in accord with the requirements of the Code of Virginia.

### **Vision for the Future**

The updated Comprehensive Plan supports a vision for the future of Accomack County that recognizes the County's unique qualities and outstanding potential as a leading agricultural and seafood producer, as well as an excellent place for families and retirees to live, and for tourists to visit. If the policies of this plan are successfully implemented, the County will achieve its vision and have a future in 20 to 30 years that could be described as follows:

*Accomack County is a tranquil, rural community of small towns and villages set in a rural landscape of farms, forests, creeks, wetlands, and shorelines. Agricultural activities are productive, and profitable, yet are managed to limit impacts on the County's fragile and valuable groundwater and surface water resources. Clean water resources support seafood and shellfish industries, vibrant tourism, and healthy rural settlements and downtowns. The local economy is based on adding value to local natural resource products. All land use activities follow best management practices to maintain the health of the natural systems that underpin the local economy and culture.*

*The number of people and jobs continues to increase gradually, through new development and revitalization. Growth occurs mainly in and around the towns and villages where public facilities and services are most efficiently provided, as well as in small residential subdivisions clustered on farmland. Limited development occurs along the shorelines to protect water quality and quantity. Employment continues to grow, producing a range of jobs at all levels of skill and income, in small and medium-sized enterprises that are compatible with the County's fragile natural systems. The housing supply expands to match the job growth, and provides adequate housing for the full range of household income levels in the County.*

*In making investments and applying regulations to achieve this vision of the future, the County balances the desire for individuals to develop land as they wish, with the essential need to protect the natural, cultural and economic resources that provide sustenance to the entire*

*community, thus ensuring that the County's overall wealth and well-being continues to steadily increase in a manner that is sustainable for future generations.*

*As the County grows and changes, it maintains the essential natural and cultural qualities that both natives and new arrivals cherish: an agricultural landscape, clean air and water, healthy and expansive wildlife habitats, historic neighborhoods and downtowns, efficient government services, friendly and helpful neighbors, and a strong sense of community.*

## Defining the Problem

The fundamental problem facing the County is that the demand for growth is coming from outside economic and demographic pressures that are beyond the County's direct control, yet the County has very fragile, finite and critical natural resources, and very limited fiscal and infrastructure resources, to accommodate those pressures. Thus, in order to support existing and new residents with adequate public services, the County also needs to expand its economy and employment base in a manner that supports its other goals. Further, the short-term individual economic interests of landowners (such as groundwater withdrawals, sewage disposal and development opportunities) often conflict with the long-term sustainability of the natural resources countywide.

## Major Planning Issues

**Agricultural and Forestal Land Preservation:** Agriculture is a major element of the County's culture and economy. In 1997 There were approximately 82,560 acres of land in 22 Agricultural and Forestal Districts. In 2007 there are approximately 80,215 acres in the 22 districts, nearly a 2.8 percent decrease from 1997. The best farmland is also the best land for development. Conflicts occur between home owners and farm operators, and between agriculture and fisheries.

**Groundwater Protection:** Groundwater is the only drinking water source for Accomack County. The aquifer is recharged by rainwater infiltration. The area that recharges the deep aquifer is in a strip of land that runs along the central portion of the peninsula. There is a limited supply of groundwater and it is prone to contamination from land uses and saltwater intrusion.

**Natural Resource Preservation:** The County's natural resources base, including forests, fields, marsh, creeks, bays, and barrier islands, has economic, aesthetic, and recreational value, as well as being valuable habitat for a variety of wildlife.

**Physical Constraints to Development:** The main physical constraints to development in Accomack County are soil suitability for septic systems, flood hazard, and shoreline erosion.

**The Route 13 Corridor:** The mix of local and through-traffic creates a dangerous situation. Route 13 is a major thoroughfare and part of the National Highway System. Maintaining capacity and safety as traffic increases is critical to the county's future.

**Central Water and Wastewater Treatment\*:** The prospects for achieving a compact, traditional growth pattern that protects agricultural and environmental resources will be greatly increased if central water and wastewater facilities are available to more areas, in concert with the overall future land use plan. \*Please see Chapter 6 for updated information.

**Character, Pattern and Form of Development:** Many of the county's goals can be achieved or enhanced if new development occurs in a compact, traditional pattern and form, similar to what exists in the County's existing historic towns and villages. Expansion around towns is often difficult due to the pattern of land use regulation and overall lack of infrastructure.

**Affordable Housing:** Most new housing is built for incoming residents and the second-home market, and does not meet the need for adequate housing for the existing population.

**Economic Development:** Better economic development efforts are needed to expand existing businesses and industries, including aerospace, tourism, agriculture, forestry, and fisheries, to provide more jobs, better wages, and increase the tax base.

**Fiscal Impacts of Growth:** As residential growth and population expand, the demand for services expands. Job growth and economic development must keep pace in order to maintain a reasonable fiscal balance.

**Balance of Needs:** Short-term individual desires must be balanced with long-term community needs.

## Analysis and Forecasts of Change

**Analysis.** Substantial analysis of available data was carried out during 2005-07, including many hours of public deliberation in a series of work sessions conducted by the Planning Commission, Stakeholder Group and Board of Supervisors. Analytical work included:

1. Analysis of land use, environmental and demographic data
2. Forecasts of future population and land development needs
3. Detailed examination of the major environmental and cultural elements of every area of the County, using the County's GIS data base
4. Preparation and evaluation of alternative future land use scenarios
5. Creation and evaluation of updated policies and actions to achieve the goals of the plan in light of the forecasts of future needs

The updated plan maintains many of the overall goals, policies and actions of the 1997 plan, but provides additional and updated analysis of the County's current conditions and projected future needs. Thus, it also contains new policies and actions, including a refined Future Land Use Map and a clear growth management strategy for achieving the County's desired future.

The key element of the updated plan is the revised Future Land Use Map, which will better help the County successfully manage development and accommodate population growth while enlarging the local economy and preserving key resources.

**Forecasts.\*** Driven by outside growth pressures, current trends indicate that the County will add between 7,900 and 15,300 new people by the year 2030, requiring between 2,000 and 5,000 additional acres of land to be converted to residential and civic uses. This plan provides policies to

guide that development so that it has maximum benefit and minimum impact on the County while still balancing the various desires of individual property owners with the broader public good. The aim of this plan is to provide a policy framework for the County that will accommodate expected population and employment growth while also achieving the County's vision. \*Please see Chapter 6 for the updated forecast.

## Growth Management Strategy

The policies and actions set forth in Chapter 5 of the plan, as well as the Future Land Use Map and supporting policies set forth in Chapter 6, provide a strong framework for managing growth in the County during the coming years. Taken as a whole, these policies and actions create a planning framework with the following **key strategic objectives**:

1. **Natural Resources.** Conserve natural resources, including farmland, forests, tidal and non-tidal wetlands, surface water, fisheries, and ground water.
2. **Economic Development.** Promote compatible economic development and job growth, including the agriculture, seafood, and tourism industries.
3. **Affordable Housing.** Maintain an adequate supply of affordable housing.
4. **Rural Character.** Preserve the county's small-town feel and rural character.
5. **Public Services.** Provide efficient and cost-effective public service delivery.

In order to achieve these objectives, the **overarching, cohesive growth management** strategy is to:

- **Conserve the County's finite and fragile groundwater supply** by accommodating new development near the central spine and northern portions of the County where groundwater withdrawals have the least impact, while limiting new development near the shorelines.
- **Conserve the County's fiscal resources** by locating new development and infrastructure in well-designed, human-scale, compact, mixed-use developments in and around existing towns and villages, as incremental, natural extensions of existing settlements.
- **Enhance the County's economic base** by expanding compatible and sustainable natural resource industries, and compatible, low-impact industries.
- **Provide adequate housing for all households** in the County by facilitating well-designed, higher density housing in and around existing towns, facilitating incremental expansions of existing rural villages, and providing incentives for affordable housing development.

## Major Actions to Implement the Plan

The key strategies will be implemented through several major methods:

1. **Future Land Use Map.** The County will use the Future Land Use Map to guide all decisions regarding growth, development, and public infrastructure. This will focus public infrastructure investments in and around existing towns and villages, including central water and sewer service, and limit development in outlying areas through zoning regulations and operational programs (such as agricultural and forestal districts).
2. **Rezoning Decisions.** The County will use the specific criteria set forth in Chapter 6 for making decisions about rezoning property.
3. **Natural Resource Conservation.** The County will enact a variety of policy, regulatory, and program tools to preserve farmland, shorelines, water resources, and other natural resources. These tools include adopting a Planned Unit Development (PUD) district to ensure coordinated development in and around designated communities, encouraging rural cluster development for residential growth that occurs on farm and forest lands, revitalizing Agricultural and Forestal Districts (AFD), promoting best management practices (BMP) for agricultural and forest uses, applying Chesapeake Bay protection standards to the Seaside areas, and adopting the state's stormwater management code for new development.
4. **Affordable Housing.** The County will encourage expansion of existing communities in a compact, mixed-use pattern, and will adopt an Affordable Dwelling Unit ordinance (ADU).
5. **Economic Development.** The County will encourage compatible economic development through ensuring that prospective industrial sites are properly zoned for development, protecting water quality to support aquaculture and other marine industries, and promoting the expansion of the "distributed workforce" (using broadband internet access).

The Planning Commission recommends the following priorities for implementation actions:

1. Zoning Ordinance Amendments (Actions 1-a, 2-a, 4-b)
2. Groundwater and Surface Water Protection (Actions 5-b, 5-g, 6-b, 6-1, 6-f)
3. Affordable Housing (Actions 11-a, 11-b, 11-c, 11-d, 11-e)
4. Transportation (Actions 10-a, 10-f)
5. Recreation (Actions 4-e, 9-e, 9-f, 10-c)

## Future Land Use Categories

**Conservation Areas:** will preserve and protect Accomack County's areas of ecological importance on which development of any intensity would be damaging or unsafe. Areas in the conservation district include marshland and the undeveloped barrier islands.

**Agricultural Areas:** will provide an area for the production of agricultural and forestry products. The County's target outcome for this area in the long-term is to have as little new non-farm development as possible, through zoning regulations, Agricultural and Forestal Districts, cluster development, conservation development designs, and conservation easements. Cluster

development is a technique in which a tract of land is subdivided into roughly the same number of lots as would be permitted under regular zoning, but the cluster lots each have a smaller area, so that they can be located on a small portion of the tract, leaving the remainder of the tract in open space or in lots that are larger than the average size.

**Rural Settlement Areas:** will allow for low density, rural residential development to provide home sites for those who chose to live on relatively large tracts of land outside of the County's villages and towns. Clustering options could be provided to allow smaller individual lot sizes if a portion of the development site is set aside as open space.

**Residential Areas:** will allow for new residential development in existing communities for those who chose to live on moderately sized lots. New Residential Areas should be located adjacent to existing residential areas located outside of flood zones that have roads with adequate capacity and soils with good septic suitability.

**Village Development Areas:** will allow for a mix of residential and commercial uses in keeping with the traditional development pattern of Accomack County's villages and towns (subject to wastewater treatment capability). These areas should be compact, with interconnected street networks, parks, sidewalks and a mix of uses, convenient to both motor vehicles and pedestrians.

**Commercial Areas:** will provide appropriate locations for a broad range of business activities which may be characterized by heavy traffic, noise, or other factors that could be considered a nuisance to residential uses.

**Industrial Areas:** will provide suitable locations for industrial activities with minimal interference from, or impact to, adjacent land uses.

Further, more than 60 discreet actions for implementing the plan are identified. These are organized under each major policy in Chapter 5, and at the end of the chapter are also organized as a list of four types of actions:

- Zoning and Regulatory Actions
- Planning and Research Actions
- Operational Programs
- Capital Investments and Construction

In addition to these four categories, specific actions are identified for implementing the Transportation and Affordable Housing plans.

## Summary and Conclusion

The updated Comprehensive Plan clarifies Accomack County's vision for the future, and affirms the long terms goals for future change. It calls for a strategy of focusing growth in and around existing communities and away from the shorelines and farmland in order to conserve important agricultural and natural resources. It also proposes a variety of policies and actions to implement that strategy. These strategies include making land use and public facility decisions in accord with the new Future Land Use Map, adopting new zoning districts to accommodate expected development needs

(including affordable housing), identifying and rezoning key industrial sites, and promoting the construction of new and expanded central water and wastewater systems in specific areas.

If followed, the updated Comprehensive Plan will enable the County to achieve its vision to conserve natural resources, provide expanded opportunities for jobs and housing, and sustain Accomack County's rural way of life.

## **Chapter One:**

### **The Planning Process and Virginia Code Requirements**

## The Planning Process

### Introduction

Chapter 1 provides an overview of the process used for creating the updated Comprehensive Plan, and references to the enabling legislation that provides the basis for local comprehensive planning in Virginia.

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#### Planning

**“Plan-ning** n (1748): the act or process of making or carrying out plans; specif: the establishment of goals, policies, and procedures for a social or economic unit  
<city ~> <business ~>”  
Webster’s Ninth New Collegiate Dictionary

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Planning is an opportunity for the citizens of a community to shape their destiny. Planning is a continuous process by which a community: (a) assesses its current situation, needs, problems, and resources; (b) determines desired future characteristics; (c) establishes public policies designed to achieve the desired future; and (d) uses established policies to influence the public and private decisions which create change. Such a process is intended to enable the community to anticipate needs and problems related to physical development and population growth in order that sufficient time may be available for development of appropriate responses. The planning process also serves to foster rational allocation of scarce resources to satisfy the community’s priority needs and to avoid or minimize problems.

The comprehensive plan is the primary vehicle through which local governments conduct this process. The Code of Virginia requires that every locality in the state adopt a comprehensive plan and review it at least every five years. A comprehensive plan generally consists of: (a) an inventory of available resources and analysis of existing conditions; (b) goals and objectives; (c) future plans; and (d) recommendations for implementation. Some specific benefits which can be realized through the planning process include:

- Future-oriented, rather than reactive and crisis-oriented decision making;
- Fewer “crisis” situations requiring immediate attention or unanticipated public expenditures;
- Rational, consistent objectives for land use decisions;
- Greater cost efficiency for both public and private projects;
- Increased federal and state awareness of county needs, problems, and attitudes;
- Opportunity for communication between the public and the governing body; and
- Greater public assurance that Accomack County will remain a desirable place to live and work.

**Public Participation:** In 1997 the Accomack County Planning Commission produced a plan which accurately represented the desires of the community to the greatest degree possible. State code requires that the Planning Commission seek public participation in the form of a public hearing. This process allows for the public to comment on the finished draft plan prior to it being sent to the Board of Supervisors for approval.

In preparing the update to the 1997 Comprehensive Plan, the County held two public forums in September 2006, one at Nandua High School and the other at Arcadia High School. These forums focused on land use issues, since those concerns are central to the plan update. The forums were well attended with approximately 40 citizens attending each session, in addition to members of the Planning Commission and Board of Supervisors. Participants identified key issues and opportunities for future land use in the County and marked up maps in small work groups to show those ideas in a graphic format. These ideas were incorporated into the land use recommendations contained in the updated Plan. Summaries of the results of these meetings are included in the Appendix to this Plan.

The results of these meetings were used by the County to create a draft Future Land Use Map which focused on each major area of the County. These maps were presented to the public for review and comment at a series of public meetings held in January and February 2007. Subsequently, the Planning Commission held several work sessions to review and refine the Future Land Use Map.

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**The Planning Commission**

The Accomack County Planning Commission consists of nine members appointed by the Board of Supervisors. Each member serves a four year term. The primary purpose of the Planning Commission is to advise the Board of Supervisors on matters pertaining to land use planning and development. The Planning Commission is also responsible for subdivision and conditional use permit review.

The current Commissioners are:

E. Phillip Hickman  
Chairman  
William A. Sprague  
Vice-Chairman  
James T. Frese  
Robert C. Hickman  
Robert L. Nock  
Herbert A. Thom  
Leander Roberts, Jr.  
Stella Rohde  
E. Bryan Turner

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## A Vision for the Future of Accomack County

The Vision set forth in the 1997 Plan was updated by the Planning Commission in 2007, based upon citizen input during 2005, 2006, and 2007, as follows:

The updated Comprehensive Plan supports a vision for the future of Accomack County that recognizes the County's unique qualities and outstanding potential as a leading agricultural and seafood producer, as well as an excellent place for families and retirees to live, and for tourists to visit. If the policies of this plan are successfully implemented, the County will achieve its vision and have a future in 20 to 30 years that could be described as follows:

*Accomack County is a tranquil, rural community of small towns and villages set in a rural landscape of farms, forests, creeks, wetlands, and shorelines. Agricultural activities are productive, and profitable, yet are managed to limit impacts on the County's fragile and valuable groundwater and surface water resources. Clean water resources support seafood and shellfish industries, vibrant tourism, and healthy rural settlements and downtowns. The local economy is based on adding value to local natural resource products. All land use activities follow best management practices to maintain the health of the natural systems that underpin the local economy and culture.*

*The number of people and jobs continues to increase gradually, through new development and revitalization. Growth occurs mainly in and around the towns and villages where public facilities and services are most efficiently provided, as well as in small residential subdivisions clustered on farmland. Limited development occurs along the shorelines to protect water quality and quantity. Employment continues to grow, producing a range of jobs at all levels of skill and income, in small and medium-sized enterprises that are compatible with the County's fragile natural systems. The housing supply expands to match the job growth, and provides adequate housing for the full range of household income levels in the County.*

*In making investments and applying regulations to achieve this vision of the future, the County balances the desire for individuals to develop land as they wish, with the essential need to protect the natural, cultural and economic resources that provide sustenance to the entire community, thus ensuring that the County's overall wealth and well-being continues to steadily increase in a manner that is sustainable for future generations.*

*As the County grows and changes, it maintains the essential natural and cultural qualities that both natives and new arrivals cherish: an agricultural landscape, clean air and water, healthy and expansive wildlife habitats, historic neighborhoods and downtowns, efficient government services, friendly and helpful neighbors, and a strong sense of community.*

The comprehensive plan is one tool for achieving that vision. Plans are a way of taking stock of the community and setting out a path to achieve goals, whether it is to protect the things we like or to improve conditions that are unacceptable. According to the Code of Virginia, the comprehensive plan is "made with the purpose of guiding and accomplishing a coordinated, adjusted and harmonious development of the territory which will, in accordance with present and probable future needs and resources best promote the health, safety, morals, order, convenience, prosperity and general welfare of the inhabitants."

Planning is necessary if our visions are to be achieved. Planning is a cyclical process that responds to the changing world, always grounded firmly in the community's vision for the future. It is easy, when there are no immediate threats apparent and few signs of change taking place, to dismiss long range planning as unnecessary, especially when more immediate needs and situations demand our attention. Change, however, is seldom readily apparent. Change occurs gradually and often goes unnoticed until it is too late to do anything about it and a community's prosperity, resources and way of life can slip through its fingers with little notice. Planning recognizes the need to constantly monitor the pulse of the community, forces citizens to look closely at what is happening around them and make decisions about their future, and empowers them with the resources to achieve their visions. Through the Comprehensive Plan and the process involved in creating it, citizens of Accomack County have an opportunity to shape their future.

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**What is a plan?**

A Comprehensive Plan is an official document that is formally adopted by the Board of Supervisors. Goals and policies are established for guiding the long term land use and infrastructure changes in the county. The Code of Virginia requires that all local governments prepare a plan and review it every five years.

In Virginia, the Comprehensive Plan is a guide. The Plan is not an ordinance; it establishes broad policy framework for local regulations and public investments, but is not as narrow or binding as an ordinance.

State law requires that zoning ordinances and capital improvement programs be based on the Comprehensive Plan. Recent Virginia Supreme Court decisions have required that rezonings be in accordance with the Comprehensive Plan.

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## Enabling Authority and Virginia Code Requirements

The Accomack County Comprehensive Plan was prepared in accordance with the following sections of the Code of Virginia.

### The “Dillon Rule”

The Dillon Rule, put forth by Judge John F. Dillon in *Commentaries on the Law of Municipal Corporations* (1873), holds that the powers of local governments are limited to those expressly granted by the state. Under this rule, whenever doubt exists as to whether a locality has a certain power, the courts will rule against the locality. The result is that a locality must seek enabling legislation for every new program or ordinance it wishes to implement, if enabling authority does not already exist.

**§ 15.2-2223. (Effective July 1, 2007) Comprehensive plan to be prepared and adopted; scope and purpose.** - *The local planning commission shall prepare and recommend a comprehensive plan for the physical development of the territory within its jurisdiction.*

*Every governing body in this Commonwealth shall adopt a comprehensive plan for the territory under its jurisdiction by July 1, 1980.*

*In the preparation of a comprehensive plan the commission shall make careful and comprehensive surveys and studies of the existing conditions and trends of growth, and of the probable future requirements of its territory and inhabitants. The comprehensive plan shall be made with the purpose of guiding and accomplishing a coordinated, adjusted and harmonious development of the territory which will, in accordance with present and probable future needs and resources, best promote the health, safety, morals, order, convenience, prosperity and general welfare of the inhabitants, including the elderly and persons with disabilities.*

*The comprehensive plan shall be general in nature, in that it shall designate the general or approximate location, character, and extent of each feature, including any road improvement and any transportation improvement, shown on the plan and shall indicate where existing lands or facilities are proposed to be extended, widened, removed, relocated, vacated, narrowed, abandoned, or changed in use as the case may be.*

*As part of the comprehensive plan, each locality shall develop a transportation plan that designates a system of transportation infrastructure needs and recommendations that may include the designation of new and expanded transportation facilities and that support the planned development of the territory covered by the plan and shall include, as appropriate, but not be limited to, roadways, bicycle accommodations, pedestrian accommodations, railways, bridges, waterways, airports, ports, and public transportation facilities. The plan should recognize and differentiate among a hierarchy of roads such as expressways, arterials, and collectors. The Virginia Department of Transportation shall, upon request, provide localities with technical assistance in preparing such transportation plan.*

*The plan, with the accompanying maps, plats, charts, and descriptive matter, shall show the locality's long-range recommendations for the general development of the territory covered by the plan. It may include, but need not be limited to:*

- 1. The designation of areas for various types of public and private development and use, such as different kinds of residential including age-restricted, housing, business, industrial, agricultural, mineral resources conservation, active and passive recreation, public service, flood plain and drainage, and other areas;*
- 2. The designation of a system of community service facilities such as parks, sports playing fields, forests, schools, playgrounds, public buildings and institutions, hospitals, nursing homes, assisted living facilities, community centers, waterworks, sewage disposal or waste disposal areas, and the like;*
- 3. The designation of historical areas and areas for urban renewal or other treatment;*
- 4. The designation of areas for the implementation of reasonable groundwater protection measures;*
- 5. A capital improvements program, a subdivision ordinance, a zoning ordinance and zoning district maps, mineral resource district maps and agricultural and forestal district maps, where applicable;*
- 6. The location of existing or proposed recycling centers; and*
- 7. The location of military bases, military installations, and military airports and their adjacent safety areas.*

*The plan shall include: the designation of areas and implementation of measures for the construction, rehabilitation and maintenance of affordable housing, which is sufficient to meet the current and future needs of residents of all levels of income in the locality while considering the current and future needs of the planning district within which the locality is situated.*

*The plan shall include: a map that shall show road improvements and transportation improvements, including the cost estimates of such road and transportation improvements as available from the Virginia Department of Transportation, taking into account the current and future needs of residents in the locality while considering the current and future needs of the planning district within which the locality is situated.*

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#### **Public Hearings**

The public hearing process for adoption of plans and ordinances is specified by State Code. The Planning Commission may not recommend nor the Board of Supervisors adopt a Comprehensive Plan or amendments thereof, until a public hearing has been held. Notice of the public hearing must be published once a week for two successive weeks in a newspaper having general circulation in the county. The notice will specify the time and place of the hearing at which persons may appear and present their views. The Planning Commission and Board of Supervisors may hold a joint public hearing.

Following a public hearing, the Planning Commission may either approve, amend and approve, or disapprove the plan. If the plan is approved, the Commission recommends the plan to the Board of Supervisors. The Board of Supervisors then conducts a public hearing and either approves and adopts, amends and adopts, or disapproves the plan. If the plan is disapproved, it is returned to the Planning Commission for reconsideration, with written reasons for disapproval. The Commission has sixty days to reconsider the plan and resubmit it to the Board of Supervisors.

In its 2007 Session, the Virginia General Assembly passed new legislation requiring localities with a population of at least 20,000 and population growth of at least 5% between the latest census years (which includes Accomack County) to incorporate urban development areas in its Comprehensive Plan. This new and important legislation is shown below.

*§ 15.2-2223.1. Comprehensive plan to include urban development areas; new urbanism.*

*A. Every county, city, or town that has adopted zoning pursuant to Article 7 (§ 15.2-2280 et seq.) of Chapter 22 of Title 15.2 and that (i) has a population of at least 20,000 and population growth of at least 5% or (ii) has population growth of 15% or more, shall, and any county, city or town may, amend its comprehensive plan to incorporate one or more urban development areas. For purposes of this section, population growth shall be the difference in population from the next-to-latest to the latest decennial census year, based on population reported by the United States Bureau of the Census. For purposes of this section, an urban development area is an area designated by a locality that is appropriate for higher density development due to proximity to transportation facilities, the availability of a public or community water and sewer system, or proximity to a city, town, or other developed area. The comprehensive plan shall provide for commercial and residential densities within urban development areas that are appropriate for reasonably compact development at a density of at least four residential units per gross acre and a minimum floor area ratio of 0.4 per gross acre for commercial development. The comprehensive plan shall designate one or more urban development areas sufficient to meet projected residential and commercial growth in the locality for an ensuing period of at least 10 but not more than 20 years, which may include phasing of development within the urban development areas. Future growth shall be based on official estimates and projections of the Weldon Cooper Center for Public Service of the University of Virginia or other official government sources. The boundaries and size of each urban development area shall be reexamined and, if necessary, revised every five years in conjunction with the update of the comprehensive plan and in accordance with the most recent available population growth estimates and projections. Such districts may be areas designated for redevelopment or infill development.*

*B. The comprehensive plan shall further incorporate principles of new urbanism and traditional neighborhood development, which may include but need not be limited to (i) pedestrian-friendly road design, (ii) interconnection of new local streets with existing local streets and roads, (iii) connectivity of road and pedestrian networks, (iv) preservation of natural areas, (v) satisfaction of requirements for stormwater management, (vi) mixed-use neighborhoods, including mixed housing types, (vii) reduction of front and side yard building setbacks, and (viii) reduction of subdivision street widths and turning radii at subdivision street intersections.*

*C. The comprehensive plan shall describe any financial and other incentives for development in the urban development areas.*

*D. No county, city, or town that has amended its comprehensive plan in accordance with this section shall limit or prohibit development pursuant to existing zoning or shall refuse to consider any application for rezoning based solely on the fact that the property is located outside the urban development area.*

*E. Any county, city, or town that would be required to amend its plan pursuant to this section that determines that its plan accommodates growth in a manner consistent with this section, upon adoption of a resolution certifying such compliance, shall not be required to further amend its plan.*

*F. Any county that amends its comprehensive plan pursuant to this section may designate one or more urban development areas in any incorporated town within such county, if the governing body of the town has also amended its comprehensive plan to designate the same areas as urban development areas with at least the same density designated by the county.*

*G. To the extent possible, state and local transportation, housing, and economic development funding shall be directed to the urban development area.*

(2007, c. 896.)

The urban development areas (UDAs) to be designated by Accomack County to comply with the new statute relate to other state law concerning the imposition of road impact fees, which localities like Accomack County are now enabled to impose. The County is specifically enabled to exclude UDAs from the imposition of road impact fees as a means of providing incentives and promoting new development to occur in the UDAs, as follows:

*§ 15.2-2320. Impact fee service areas to be established.*

*The locality shall delineate one or more impact fee service areas within its comprehensive plan. Impact fees collected from new development within an impact fee service area shall be expended for road improvements benefiting that impact fee service area. An impact fee service area may encompass more than one road improvement project. A locality may exclude urban development areas designated pursuant to § 15.2-2223.1 from impact fee service areas.*

(1989, c. 485, § 15.1-498.3; 1992, c. 465; 1997, c. 587; 2007, c. 896.)

Road impact fee service areas are designated as part of a local road improvement program, as follows:

*§ 15.2-2321. Adoption of road improvements program.*

*Prior to adopting a system of impact fees, the locality shall conduct an assessment of road improvement needs benefiting an impact fee service area and shall adopt a road improvements plan for the area showing the new roads proposed to be constructed and the existing roads to be improved or expanded and the schedule for undertaking such construction, improvement or expansion. The road improvements plan shall be adopted as an amendment to the required comprehensive plan and shall be incorporated into the capital improvements program or, in the case of the counties where applicable, the six-year plan for secondary road construction pursuant to § 33.1-70.01.*

*The locality shall adopt the road improvements plan after holding a duly advertised public hearing. The public hearing notice shall identify the impact fee service area or areas to be designated, and shall include a summary of the needs assessment and the assumptions upon which the assessment is based, the proposed amount of the impact fee, and information as to how a copy of the complete study may be examined. A copy of the complete study shall be available for public inspection and copying at reasonable times prior to the public hearing.*

*The locality at a minimum shall include the following items in assessing road improvement needs and preparing a road improvements plan:*

- 1. An analysis of the existing capacity, current usage and existing commitments to future usage of existing roads, as indicated by (i) current and projected service levels, (ii) current valid building permits outstanding, and (iii) approved and pending site plans and subdivision plats. If the current usage and commitments exceed the existing capacity of the roads, the locality also shall determine the costs of improving the roads to meet the demand. The analysis shall include any off-site road improvements or cash payments for road improvements accepted by the locality and shall include a plan to fund the current usages and commitments that exceed the existing capacity of the roads.*
- 2. The projected need for and costs of construction of new roads or improvement or expansion of existing roads attributable in whole or in part to projected new development. Road improvement needs shall be projected for the impact fee service area when fully developed in accord with the comprehensive plan and, if full development is projected to occur more than 20 years in the future, at the end of a 20-year period. The assumptions with regard to land uses, densities, intensities, and population upon which road improvement projections are based shall be presented.*
- 3. The total number of new service units projected for the impact fee service area when fully developed and, if full development is projected to occur more than 20 years in the future, at the end of a 20-year period. A "service unit" is a standardized measure of traffic use or generation. The locality shall develop a table or method for attributing service units to various types of development and land use, including but not limited to residential, commercial and industrial uses. The table shall be based upon the ITE manual (published by the Institute of Transportation Engineers) or locally conducted trip generation studies, and consistent with the traffic analysis standards adopted pursuant to § 15.2-2222.1.*

The new authority may be read as an opportunity or as a curse. It appears that the 2007 requirement that localities plan for growth in relatively dense “urban” development areas and first-ever broad authorization of local imposition of road impact fees reflect the General Assembly’s resolve that future growth must be more compact and recognition that the Commonwealth is falling behind in the planning, funding and completion of transportation infrastructure improvements necessary to maintain our citizen’s quality of life. These legislative changes may be the beginning of a trend in Richmond to delegate hard choices about transportation planning and funding to the localities. What is clear is that state resources being committed to transportation are not keeping pace with either population growth or inflation. Consequently, bare compliance with the UDA planning requirement without implementation of the impact fee authority would not appear to serve the future quality of life in Accomack County. However, thoughtful implementation of the new road impact fee authority may help Accomack County direct future growth, protect our environment, and enhance quality of life in our community.

**§ 15.2-2224. Surveys and studies to be made in preparation of plan; implementation of plan.**

- *A. In the preparation of a comprehensive plan, the local commission shall survey and study such matters as the following:*

*1. Use of land, preservation of agricultural and forestal land, production of food and fiber, characteristics and conditions of existing development, trends of growth or changes, natural resources, historic areas, groundwater, surface water, geologic factors, population factors, employment, environmental and economic factors, existing public facilities, transportation improvements, the need for affordable housing in both the locality and planning district within which it is situated, and any other matters relating to the subject matter and general purposes of the comprehensive plan....*

*2. Probable future economic and population growth of the territory and requirements therefor.*

*B. The comprehensive plan shall recommend methods of implementation and shall include a current map of the area covered by the comprehensive plan. Unless otherwise required by this chapter the methods of implementation may include but need not be limited to:*

- 1. An official map;*
- 2. A capital improvements program;*
- 3. A subdivision ordinance; and*
- 4. A zoning ordinance and zoning district maps.*
- 5. A mineral resource map; and*
- 6. A recreation and sports resource map.*

**The Presumption of Validity**

Legislative actions, i.e. a locality's law-making authority, enjoy the presumption of validity. This means that, in a court of law, the party challenging the land use decision of a local governing body bears the burden of proving that the governing body's decision should be invalidated. The Virginia Supreme Court has stated the following rule about presumptive validity concerning a legislative land use decision: The original presumption of the validity of a legislative land use decision is in favor of the local governing body.

However, when the private property owner opposing the decision can make a basic (*prima facie*) case that the action of the local governing body has been unreasonable (arbitrary and capricious), the burden of proof shifts to the local governing body. The local governing body must then show that the correctness of its decision is at least fairly debatable - at least that reasonable men can differ as to the correctness of the decision - before the court will allow the locality to prevail.

[In other words, if the choice between two land uses is "fairly debatable" then the Board of Supervisors' choice shall prevail.]

Source: Zoning and Subdivision Law in Virginia, Stephen P. Robin.

**§ 15.2-2225. Notice and hearing on plan; recommendation by local commission to governing body.** - *Prior to the recommendation of a comprehensive plan or any part thereof, the local planning commission shall give notice in accordance with § 15.2-2204 and hold a public hearing on the plan. After the public hearing, the commission may approve, amend and approve, or disapprove the plan. Upon approval, the commission shall by resolution recommend the plan or part thereof, to the governing body and a copy shall be certified to the governing body.*

**§ 15.2-2226. Adoption or disapproval of plan by governing body.** - *After certification of the plan or part thereof, the governing body after a public hearing with notice as required by § 15.2-2204 shall proceed to a consideration of the plan or part thereof and shall approve and adopt, amend and adopt, or disapprove the plan. In acting on the plan or part thereof, or any amendments to the plan, the governing body shall act within ninety days of the local planning commission's recommending resolution.*

**§ 15.2-2227. Return of plan to local planning commission; resubmission.** - *If the governing body disapproves the plan, then it shall be returned to the local planning commission for its reconsideration, with a written statement of the reasons for its disapproval. The commission shall have sixty days in which to reconsider the plan and resubmit it, with any changes, to the governing body.*

**§ 15.2-2228. Adoption of parts of plan.** - *As the work of preparing the comprehensive plan progresses, the local commission may, from time to time, recommend, and the governing body approve and adopt, parts thereof; any such part shall cover one or more major sections or divisions of the county or municipality or one or more functional matters.*

**§ 15.2-2229. Amendments.** - *After the adoption of a comprehensive plan, all amendments to it shall be recommended, approved and adopted, respectively, as required by § 15.2-2204. If the governing body desires an amendment it may direct the local commission to prepare an amendment and submit it to public hearing within sixty days after formal written request by the governing body. In acting on any amendments to the plan, the governing body shall act within ninety days of the local planning commission's recommending resolution.*

**§ 15.2-2230. Plan to be reviewed at least once every five years.** - *At least once every five years the comprehensive plan shall be reviewed by the local commission to determine whether it is advisable to amend the plan.*

**§ 15.2-2230.1. Public facilities study.**

*In addition to reviewing the comprehensive plan, the planning commission may make a study of the public facilities, including existing facilities, which would be needed if the comprehensive plan is fully implemented. The study may include estimations of the annual prospective operating costs for such facilities and any revenues, including tax revenues that may be generated by such facilities. For purposes of the study, public facilities may include but need not be limited to water and sewer lines and treatment plants, schools, public safety facilities, streets and highways. The planning commission may forward the study to the local governing body or any other local, regional, state or federal agency that the planning commission believes might benefit from its findings.*

**§ 15.2-2231. Inclusion of incorporated towns in county plan; inclusion of adjacent unincorporated territory in municipal plan.** - *Any county plan may include planning of incorporated towns to the extent to which, in the county local commission's judgment, it is related to planning of the unincorporated territory of the county as a whole, provided, however, that the plan shall not be considered as a comprehensive plan for any incorporated town unless recommended by the town commission, if any, and adopted by the governing body of the town. Any municipal plan may include the planning of adjacent unincorporated territory to the extent to which, in the municipal local commission's judgment, it is related to the planning of the incorporated territory of the municipality; provided, however, that the plan shall not be considered as comprehensive plan for such unincorporated territory unless recommended by the county local commission, if any, and approved and adopted by the governing body of the county.*

**§ 15.2-2232. Legal status of plan.** - A. *Whenever the local commission shall have recommended a comprehensive plan or part thereof for the county or municipality and such plan shall have been approved and adopted by the governing body, it shall control the general or approximate location, character and extent of each feature shown on the plan. Therefore, unless such feature is already shown on the adopted master plan or part thereof or is deemed so under subsection D, no street or connection to any existing street, park or other public area, public building or public structure, public utility facility or public service corporation facility other than railroad facility, whether publicly or privately owned, shall be constructed, established or authorized, unless and until the general location or approximate location, character, and extent thereof has been submitted to and approved by the local commission as being substantially in accord with the adopted comprehensive plan or part thereof. In connection with any such determination the commission may, and at the direction of the governing body shall, hold a public hearing, after notice as required by § 15.2-2204.*

*B. The commission shall communicate its findings to the governing body, indicating its approval or disapproval with written reasons therefore. The governing body may overrule the action of the commission by a vote of a majority of the membership thereof. Failure of the commission to act within sixty days of such submission, unless the time shall be extended by the governing body, shall be deemed approval. The owner or owners or their agents may appeal the decision of the local commission to the governing body within ten days after the decision of the commission. The appeal shall be by written petition to the governing body setting forth the reasons for the appeal. The appeal shall be heard and determined within sixty days from its filing. A majority vote of the governing body shall overrule the commission.*

*C. Widening, narrowing, extension, enlargement, vacation or change of use of streets or public areas shall likewise be submitted for approval, but paving, repair, reconstruction, improvement, drainage or similar work and normal service extensions of public utilities or public service corporations shall not require approval unless involving a change in location or extent of a street or public area.*

*D. any public area, facility or use as set forth in subsection (a) which is identified within, but not the entire subject of, a submission under either § 15.2-2258 for subdivision or provision 8 of § 15.2-2286 for development or both may be deemed a feature already shown on the adopted master plan, and therefore, excepted from the requirement for submittal to and approval by the commission or the governing body; provided that the governing body has by ordinance or resolution defined standards governing the construction, establishment or authorization of such public area, facility or use or has approved it through acceptance of a proffer made pursuant to § 15.2-2303*

*E. Approval and funding of a public telecommunications facility by the Virginia Public Broadcasting Board pursuant to Article 12 (§ 2.2-2426 et seq.) of Chapter 24 of Title 2.2 shall be deemed to satisfy the requirements of this section and local zoning ordinances with respect to such facility with the exception of television and radio towers and structures not necessary to house electronic apparatus. The exemption provided for in this subsection shall not apply to facilities existing or approved by the Virginia Public Telecommunications Board prior to July 1, 1990. The Virginia Public Broadcasting Board shall notify the governing body of the locality in advance of any meeting where approval of any such facility shall be acted upon.*

*F. On any application for a telecommunications facility, the commission's decision shall comply with the requirements of the Federal Telecommunications Act of 1996. Failure of the commission to act on any such application for a telecommunications facility under subsection A submitted on or after July 1, 1998, within ninety days of such submission shall be deemed approval of the application by the commission unless the governing body has authorized an extension of time for consideration or the applicant has agreed to an extension of time. The governing body may extend the time required for action by the local commission by no more than sixty additional days. If the commission has not acted on the application by the end of the extension, or by the end of such longer period as may be agreed to by the applicant, the application is deemed approved by the commission.*

## **Chapter 2**

### **Inventory and Existing Conditions: The Natural Environment**

## Chapter 2

### Inventory and Existing Conditions: The Natural Environment

#### Introduction:

Accomack County's location at the tip of the Delmarva Peninsula between the Atlantic Ocean and the Chesapeake Bay provides a unique environment that is rich with natural resources. Accomack's mild climate, productive soils, and abundant wetlands, support a unique way of life that depends on these resources for farming, fishing, aquaculture, and tourism. Chapter 2, The Natural Environment, documents these resources and establishes the need to manage our resources wisely to support Accomack County's unique way of life.

#### Climate

The climate in Accomack County is mild in the winter and hot and humid in the summer, with south/southwest prevailing winds. The tables below list average temperatures recorded at Wallops Island and Painter. Differences in temperatures at these two sites are attributed to the fact that the southern end of the county is narrower than the northern end and is thus more susceptible to the Ocean and Bay's moderating influences on temperatures.

#### Temperature:

##### Average Daily Temperatures

Location	Winter	Summer
Wallops Island	37.1°F	73.7°F
Painter	39.1°F	75°F

##### Average Winter Minimum and Summer Maximum Temperatures

Location	Winter	Summer
Wallops Island	30.03° F	81.6°F
Painter	30.3°F	84.7°F

#### Growing Season:

The approximate frost-free growing season lasts about 270 days, stretching from April 11 to November 4 on average. (<http://www.nass.usda.gov/va/accomack.pdf>)

**Precipitation:** Precipitation is well distributed throughout the year and adequate for most commonly grown crops. The average annual rainfall is 41.9". Fifty percent of annual precipitation falls during the months of April through September. The average seasonal snowfall is 6 inches. The greatest snow depth at any one time during the periods of record was 6 inches.

## Soils

The suitability and limitation of soils in Accomack County have a significant impact upon development and agricultural use. The character of soils is a factor in the selection of agricultural sites, the design, layout, and grading of roadways, structure foundations, and sanitary operation of septic tanks.

**Soil Characteristics:** Soils factors such as percolation, depth, absorption, shrink-swell conditions, wetness, and filtering action all affect development. These factors are dependent on the soil characteristics of texture, slope, and depth.

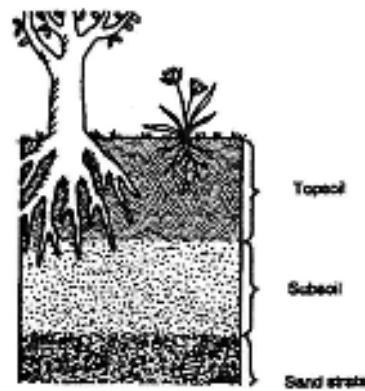
**Texture:** Soils are made up of various size particles known as clay (very fine particles), silt (fine particles), and sand (course particles). Particle content varies with each soil type. The distribution of each particle type within a soil determines its texture. Soil texture determines the stability of a soil and its porosity or ability to drain surface water. Drainage capability increases with the amount of large size particles, thus a sandy soil drains better than a clay soil.

**Slope:** The terrain of Accomack County is generally level with surface features ranging from the flat foreland bordering the Chesapeake Bay to the level upland plain occupying the central and most of the eastern sections of the county. The majority of the county is less than 1% slope and, on an average, the slope does not exceed 2%. However, in some terrain and in hilly sections, the slope reaches up to 15%. Elevation ranges from sea level to 45 feet above sea level.

**Depth:** The depth of soil to the water table affects the suitability of the soil for development and agricultural use. Where the water table is high, surface soils will be excessively wet, making them unsuitable for crop cultivation or construction sites. The average depth to water table in Accomack County is about 18 inches.



Soil porosity and texture depend on the percentages of clay, silt and sand particles in the soil.



A typical soil cross section

**County Soil Types:** Accomack County lies wholly within the Atlantic Coastal Plain, a large physiographic division extending along the Atlantic and Gulf seaboards. The soil materials of the county were originally deposited in coastal waters and are among the most productive in the entire Atlantic Coastal Plain region.

For the most part, the soil profile for Accomack County consists of eight to ten inches of loam to sandy loam topsoil and roughly thirty inches of sandy loam subsoil. Below forty-four inches there is a continuous sand strata. A seasonally high water table determines, to a large degree, the use of these soils for agricultural and development purposes.

A general soil survey was completed for the county in 1917. However, this survey was not sufficient for determining land use capabilities on a site-by-site basis. A more comprehensive soil survey was completed for the county in 1988 by the U. S. Department of Agriculture, Soil Conservation Service. This survey, while more site specific than the previous survey, does not replace the need for site testing of soil suitability prior to development. However, the soil survey is useful for identifying the general location of soil types. Based on this information, the important characteristics of soils such as if the soil type will adequately support development can be identified. After the general location of a soil type has been identified and its characteristics noted, proper land use management procedures can be developed and implemented.

Soil types identified in the survey have been grouped into associations. A soil association is an area of land comprised of one or more soil types that occur in a characteristic pattern. The association may consist of soils that are similar or that differ widely in important characteristics. Each soil association, however, has a certain repeating pattern of soils distribution and other features that give it a characteristic landscape. The following section discusses each association and its related soil types.

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Carolina Bays, also known as whale wallows, are shallow, oval depressions that do not have a natural drainage outlet. The technical term for a Carolina Bay is Poquoson. These land forms appear along the Atlantic Coastal plain from Florida to New Jersey.

These elliptical depressions are surrounded by an elevated rim with gently sloping ridges. In aerial photography, rims of Carolina Bays appear higher in elevation and lighter in color than the interior. Most Carolina Bays contain standing water, unless they have been drained. The rims are well drained and roads and buildings have been built on some of this high land.

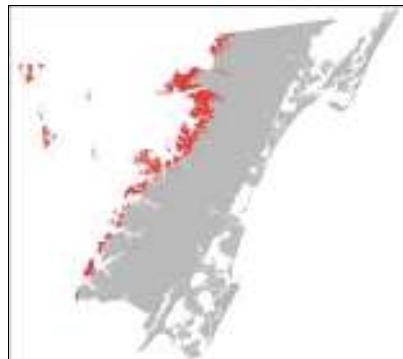
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**Soils Associations:****Melfa-Hobucken:**

This soil association comprises approximately 8% of the county. The soils of this association are level, poorly drained, loamy soils found in brackish tidal marshes. Below are the classifications for each soil type in this association:

*Melfa* is a poorly drained, mucky soil which is frequently flooded. This soil is found in tidal marshes and is useful as wildlife habitat.

*Hobucken* is a poorly drained, flat, loam soil which is frequently flooded. This soil is found in tidal marshes and is useful as wildlife habitat.



Melfa

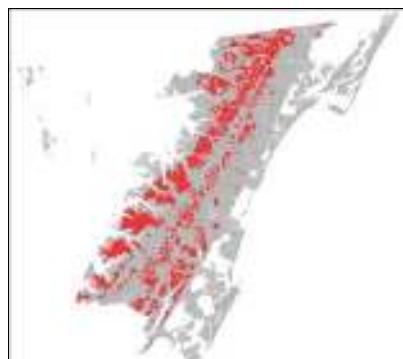
**Nimmo-Dragston-Munden:**

This soil association comprises approximately 17% of the county. These soils were formed in marine and fluvial sediments and are found on coastal plain uplands and creek terraces. They are nearly level and poorly drained to moderately well drained. Below are the classifications for each soil type in this association:

*Nimmo sandy loam* is a nearly level, very deep and poorly drained soil that is located on flats and in depressions of Carolina bays. These soils are poorly suited to cultivated crops due to wetness and low organic matter content. The main use of this soil is woodland.

*Dragston fine sandy loam* is a nearly level, very deep and somewhat poorly drained soil that is located on flats, rims of depressions, and in depressions. When adequately drained this is prime farmland and is primarily used for cultivated crops and woodlands.

*Munden sandy loam* is a nearly level, very deep and moderately well drained soil that is found on broad flats and in depressions. This soil is prime farmland and used mainly for cultivated crops. Some areas are in woodland.



Nimmo



Dragston

### Nimmo-Arapahoe-Polawana:

This soil association comprises approximately 19% of the county. The soils of this association are found primarily on flats, depressions, and area adjacent to drainageways. These are nearly level, poorly drained, loamy and sandy soils that formed in marine and fluvial sediments. Below are the classifications for each soil type in this association:

*Nimmo sandy loam* is a nearly level, very deep and poorly drained soil that is located on flats and in depressions of Carolina bays. These soils are poorly suited to cultivated crops due to wetness and low organic matter content. The main use of this soil is woodland.

*Arapahoe mucky loam* is a nearly level, very deep and very poorly drained soil that is located on flats and in depressions of Carolina bays. This soil is used mostly for woodland and wildlife.

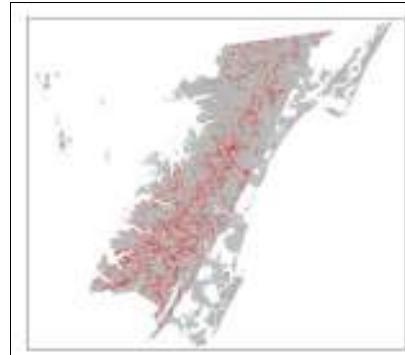
*Polawana mucky sandy loam* is a very poorly drained, frequently flooded soil found adjacent to drainageways. This soil is suitable for woodland and wildlife use.

### Bojac-Munden-Molena:

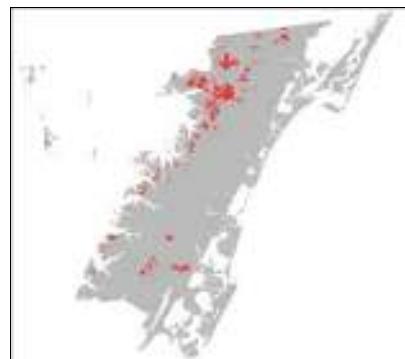
This soil association comprises approximately 34% of the county. These are nearly level to steep, moderately well drained to excessively drained, loamy and sandy soils. These soils were formed in marine and fluvial sediments and have high organic matter content. Below are the classifications for each soil type in this association:

*Bojac loamy sand* is a gently sloping, very deep and well drained soil that is located on side slopes and rims of Carolina bays. This soil is mainly used for cultivated crops and residential development. The main limitations are droughtiness, slope and erodibility.

*Bojac sandy loam* is nearly level, deep and well drained soil that is located on broad flats. These soils are prime farmland and used mostly for cultivated crops and residential development.



Munden



Arapahoe



Polawana



Bojac

*Bojac fine sandy loam* is a nearly level, very deep and well drained soil located on broad flats in the southwestern and northeastern sections of Accomack County. This soil is prime farmland and used mainly for cultivated crops and residential development.

*Munden sandy loam* is a nearly level, very deep and moderately well drained soil that is found on broad flats and in depressions. This soil is prime farmland and used mainly for cultivated crops. Some areas are in woodland.

*Molena loamy sand* is moderately sloping to very steep soil that is very deep and somewhat excessively drained. This soil is used mainly for woodland and wildlife. Cultivated crops are unsuited to this soil due to severe erosion hazard and low available water.

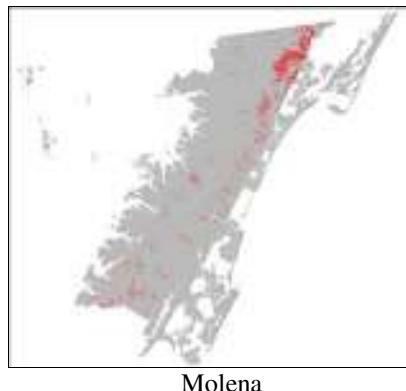
#### Chincoteague:

This soil association comprises 16% of the county. These are level, very poorly drained soils found in tidal salt marshes. These soils are frequently flooded and poorly suitable for anything other than wildlife habitat.

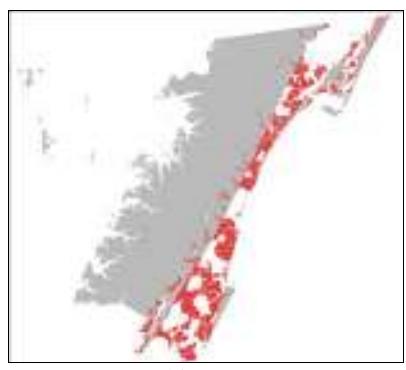
#### Camocca-Fisherman-Beaches:

This soil association comprises approximately 6% of the county. These are moderately well drained to poorly drained, nearly level to gently sloping soils which were formed by marine and fluvial sediments. These soils are found in marshes, dunes, and adjacent beaches. Below are the classifications for each soil type in this association:

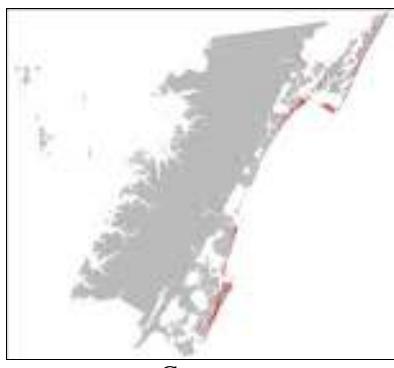
*Fisherman fine sand* is a nearly level to gently sloping soil that is very deep and moderately well drained. It is located in depressions and undulating areas associated with dunes and marshes on the barrier islands. This soil is used mainly for wildlife habitat and recreation.



Molena



Chincoteague

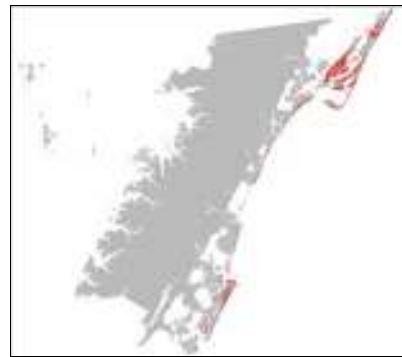


Camocca

*Fisherman-Camocca complex* is a combination of two intermingled soils. Fisherman soil is moderately well drained and the Camocca soil is very poorly drained. These soils are located in depressions and on undulating areas associated with dunes and salt marshes on the barrier islands. These soils are used mainly for wildlife and recreation.

*Fisherman - Assateague complex* is a nearly level to very steep soil that is very deep. The Fisherman soil is moderately well drained, and the Assateague soil is excessively drained. These soils are used mainly for wildlife habitat and recreation. Crops are unsuited to these soils.

*Beaches* are nearly level to moderately sloping units of sand sediment located between the barrier islands and the Atlantic Ocean and along the Chesapeake Bay shoreline. This soil is mainly used for recreation and wildlife habitat.



*Fisherman*



*Assateague*



*Beaches*

## Water

**Surface Water:** Accomack County is located on a narrow strip of land at the lower end of the Delmarva Peninsula bordered to the east by the Atlantic Ocean and the west by the Chesapeake Bay. There are eighteen tidal creeks on the Seaside and twelve tidal creeks on the Bayside. A large portion of the freshwater in these creeks is supplied from groundwater discharge (approximately 80%).

Although surface water is not used as a source of drinking water in Accomack County, it is an important resource for irrigation water and for shellfish, finfish, and other wildlife habitat. According to Eastern Shore Agricultural Extension Agents, farm ponds supply 85% of the amount of water used for irrigation.

Some of these ponds are used to store water that has been pumped from underground. Also, dams have been built in some tidal creeks to provide irrigation water.

**Threats to Water Quality:** Contamination threats to surface water quality come from point sources and nonpoint sources. Point sources of pollution are obvious pipe discharges into surface waters. Examples of point sources include sewage treatment plants and factories. Nonpoint source pollution enters water indirectly, through the travel of water over land and through the ground. As water moves, it picks up and carries away pollutants, transporting them over the surface or underground and eventually into creeks and streams. Examples of nonpoint source pollution include erosion and runoff from agricultural fields, construction and logging operations, leaching from septic systems and septage lagoons, and stormwater runoff from impervious surfaces such as roads, parking lots, and building roofs.

A 2004 report by the Virginia Institute of Marine Science (VIMS) on the *Economic Activity Associated with Clam Aquaculture in Virginia* illustrates the importance of water quality to Accomack County's economy. The Eastern Shore of Virginia aquaculture industry produces 75 percent of Virginia's hard clams. The value of Eastern Shore hard clam production rose from an estimated \$4,100,000 in 1991 to \$23,900,000 in 2004, with a direct



Accomack County is bordered by the Chesapeake Bay and Atlantic Ocean and crossed by 30 tidal creeks.

local economic output of \$29,600,000. Personal income associated with initial clam aquaculture sales in 2004 was \$9,200,000. The overall economic impacts from Eastern Shore hard clam aquaculture are an increase in economic output of \$48,800,000 and an overall increase in personal labor incomes of \$15,800,000. The 2007 VIMS *Shellfish Aquaculture Situation and Outlook Report* states that aquaculture of hard clams continues to expand in Virginia, which leads the nation in the culture of hard clams.

**Wastewater Discharges:** Within Accomack County there are several industries which discharge wastes directly into surface waters. The largest are Perdue, Inc., which discharges approximately 1.97 million gallons per day (MGD) into Parkers Creek, and Tyson's which discharges an average of 0.87 MGD into Sandy Bottom Branch, and the NASA Wallops Flight Facility with an approximate flow of 0.80 MGD into Hog Creek and 0.03 MGD into Mosquito Creek. The Town of Onancock's wastewater treatment plant discharges into the north branch of Onancock Creek and has a design flow of 0.25 MGD. Six seafood facilities have VPDES permits for surface water discharge. The remainder of discharge permits belong to an assortment of schools, packing facilities, and residential facilities.

**Erosion and Sedimentation:** Erosion and sedimentation occurs when materials such as soil, nutrients, and chemicals are suspended in and transported by water. These suspended materials are transported away from their original location and deposited elsewhere, usually in surface water down gradient from the original site. Sediment is generated by soil erosion and runoff from land disturbing activities such as agricultural tillage and construction work. High velocity runoff from impervious surfaces such as roads and parking lots increase sedimentation. The use of plastic mulch in agricultural fields can increase the amount and velocity of water leaving the field and may increase loading of chemicals to downstream surface waters. Sedimentation not only pollutes our waters, it fills in our creeks and harbors and results in costly dredging projects.

**Nutrient Enrichment:** Nutrient enrichment is the result of an over abundance of nitrates and phosphates in the water. These fertilizers enter water from point and nonpoint sources of pollution. Sources of nutrient enrichment include industrial discharges, agricultural, forestry, and urban runoff, sewage treatment plants, septic tanks, animal feedlots, and boat discharges. Nutrient enrichment can result in growth explosions of phytoplankton. When these algae die they use valuable oxygen to decompose, depleting the waters of dissolved oxygen and possibly causing fish kills.

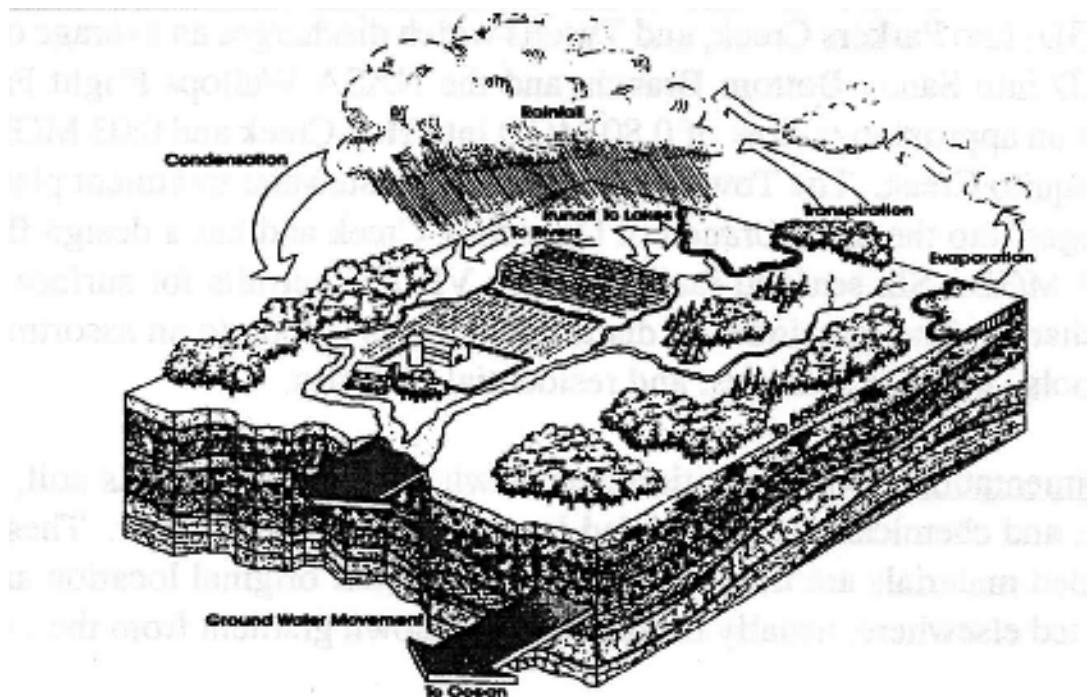
A 2007 VIMS study, *Application of a Nitrogen Loading Model to Gargathy Bay Watershed, Accomack County, VA: Implications for Future Development*, documents the potential impact of land use activities on the amount of non-point source pollution entering coastal waters. The study concludes that intense land development and intense poultry production will result in increased nitrogen loads and adversely affect the water quality of ground water and the adjacent coastal bays.

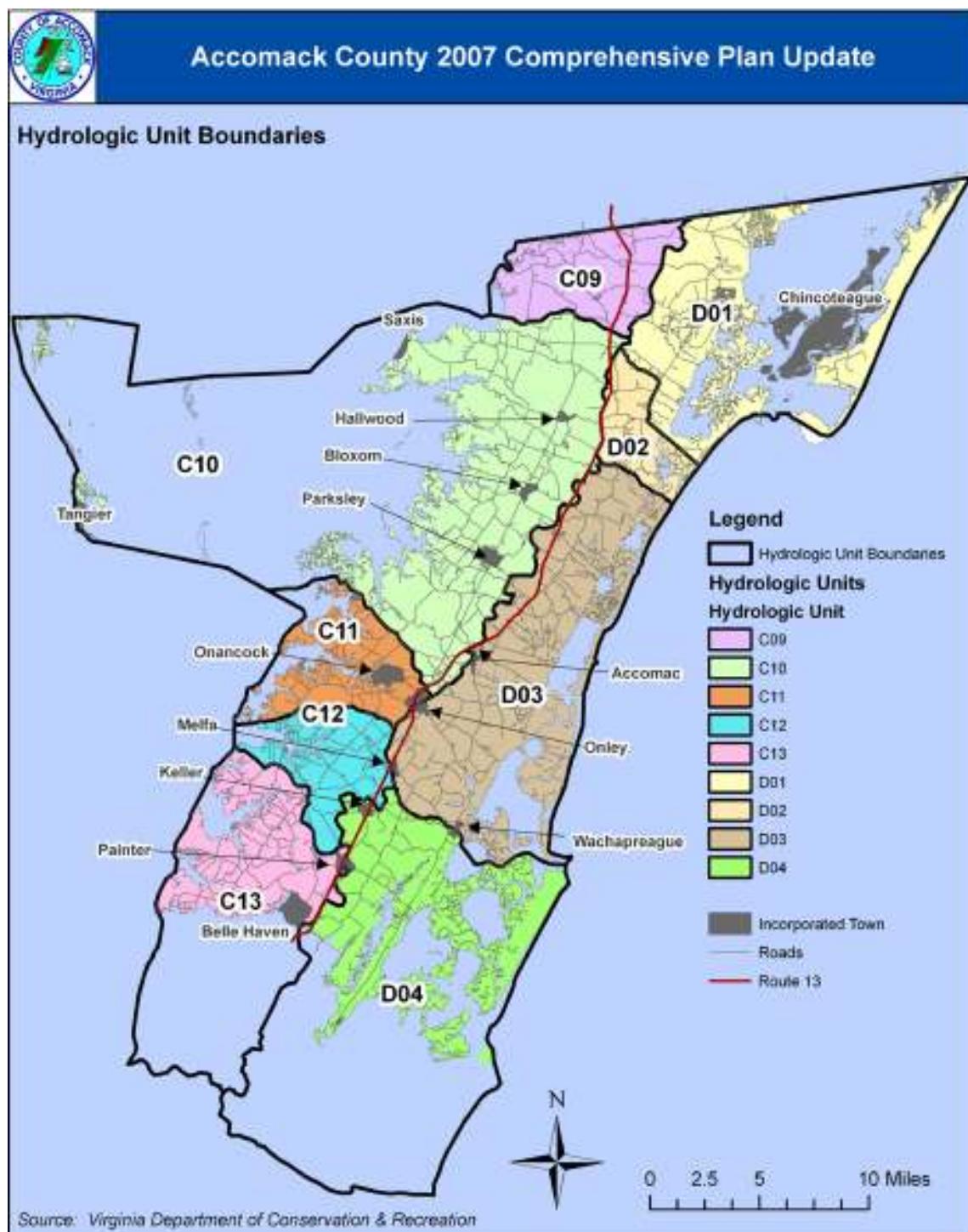
The dissolved oxygen standard for surface water in Accomack County is a daily average of 5 milligrams of oxygen per liter of water (5 mg/l). There are some indications that

small creeks which lack the ability to flush themselves, like Accomack County's creeks, have naturally low levels of dissolved oxygen.

For example, a study conducted on Parker Creek by the Virginia Institute of Marine Science found that dissolved oxygen concentrations in Parker Creek at the time of the study frequently fall below 4 mg/l and average less than 5 mg/l on a daily basis. The low level of dissolved oxygen in Parker Creek has been attributed to the fact that it is the receiving creek for Perdue, Inc. treated wastewater. The VPDES permits for Perdue and Tyson Foods discharges allow a minimum of 6.5 mg/l of dissolved oxygen; (a level that the companies' monitoring reports for 1996 indicated they were meeting). The Parkers Creek study also found observations of dissolved oxygen concentrations below 5 mg/l in creeks which are not impacted by industrial discharges, suggesting that dissolved oxygen concentrations below 5 mg/l are a natural occurrence. DEQ VPDES permit monitoring data for Perdue from 2002 through 2007 shows that the 6.5 mg/l standard is being met.

The **hydrologic cycle** traces the flow of water in its solid, liquid, and vapor states through its various pathways and reservoirs.



**Map 2-A**

**Fecal Coliform Bacteria:** The presence of fecal coliform bacteria is a water quality indicator for groundwater and surface water. Fecal Coliform is found in the intestinal tracts of warm blooded animals and, while not necessarily harmful in itself, it is indicative of fecal contamination and the possible presence of pathogenic organisms.

Although surface water in Accomack County is not utilized for human consumption, fecal coliform is a concern with respect to surface water if there are high levels in an area used for recreation or shellfish harvesting. State water quality standards require that in all surface waters, except shellfish waters, the fecal coliform bacteria shall not exceed a geometric mean of 200 fecal coliform bacteria per 100 ml of water for two or more samples over a calendar month period, or a fecal coliform bacteria level of 7,400/100 ml in 10% of samples in any given month.

Municipal discharges along with individual systems which discharge directly into surface water are the major sources of fecal coliform bacteria entering the surface water. Septic systems may leach fecal coliform bacteria into surface waters. This leaching occurs where septic systems have been placed at a higher density than the soil can accommodate or in soils that are too wet to function properly. Problems sometimes exist around boat marinas due to the direct discharge of waste into the water when pump-out facilities are unavailable. Run-off from wild and domestic animal wastes can also contribute to fecal coliform pollution.

There are eight facilities authorized to discharge fecal coliform into surface waters in Accomack County. All of the facilities are required to limit the monthly average of fecal coliform to less than 200 parts per ml. Five of the facilities are permitted to discharge no more than 400 parts per ml. A review of the monitoring data for 1996 showed great swings in the concentration of fecal coliform in discharges among facilities with permits in both monthly average and maximum releases. In several instances the maximum discharge was in excess of 200 parts per ml. DEQ VPDES permit monitoring data from 2002 through 2007 shows that the Tyson fecal coliform standards are currently being met. The DEQ data shows that Perdue had fecal coliform violations on two occasions between 2002 and 2007.

**Water Quality Standards:** State Water Control Law mandates the protection of existing high quality state waters and provides for the restoration of all other state waters to a condition that will permit all reasonable public uses and support the propagation and growth of all aquatic life that might be reasonably expected to inhabit those waters. The adoption of water quality standards is one method the state uses to accomplish this goal. Established standards describe the level of water quality necessary to meet and maintain reasonable and beneficial uses such as swimming and other water based recreation, public water supply and the propagation and growth of aquatic life. Virginia's standards are intended to protect all state waters for recreational use and for the propagation of a balanced population of fish and wildlife. Through the protection of these two uses, which usually require the most stringent standards and the highest degree of protection, other usually less restrictive uses like industrial water supply, irrigation and navigation are usually also protected.

**Impaired Waters:** Virginia has developed an Impaired Waters Total Maximum Daily Load (TMDL) Priority List program to identify state waters in need of restoration. Virginia has 381 TMDLs, and 14 of them are located in Accomack County. TMDL refers to the total amount of pollution a water body can absorb without being unusable for its intended use, such as shellfishing, swimming, and fishing. Many of the waters in

Virginia that do not meet water quality standards fail because of bacterial levels above the water quality standards that are designed to protect waters for swimming use, but other waters are also impaired as a result of pH, temperature, sediment, toxic chemicals, and other impairments. The following table is the Impaired Waters TMDL Priority List for development of TMDLs in Accomack County.

**Impaired Waters  
2002 303(d) Total Maximum Daily Load  
(TMDL) Priority List  
Source: DEQ, 2002**

Water Body	Stream Name	Size	Cause	Source	First Listing	TMDL Due
VAT-C09R	UT* to Pitts Creek	5.96 Miles	Dissolved Oxygen, pH	Unknown	2002	2010
VAT-C10E	Messongo Creek	0.01 Sq. Mi.	Dissolved Oxygen; Fecal Coliform	Unknown	2002	2010
VAT-C10E	Holdens Creek	0.01 Sq. Mi.	Fecal Coliform	Unknown	1996	2010
VAT-C10R	Sandy Bottom Branch	1.24 Miles	Copper; General Standard (Benthic); Nutrients – TP	Unknown	1996	2010
VAT-C10R	UT* to Sandy Bottom Branch	1.65 Miles	General Standard (Benthic); Fecal Coliform; Nutrients- TP	Unknown	1996	2010
VAT-C11E	Onancock Creek, Central Br.	0.02 Sq. Mi.	Fecal Coliform	Unknown	1998	2010
VAT-C11E	Onancock Creek, North Br.	0.03 Sq. Mi.	Fecal Coliform; Dissolved Oxygen	Unknown	2002	2010
VAT-C11E	Onancock Creek, Southern Br.	0.01 Sq. Mi.	Fecal Coliform	Unknown	2002	2010
VAT-D02E	Assawoman Creek	0.05 Sq. Mi.	Dissolved Oxygen; Fecal Coliform	Unknown	2002	2010
VAT-D02R	Petit Branch	1.79 Miles	Fecal Coliform; General Standard (Benthic)	Unknown	1996	2010
VAT-D03R	Ross Branch	3.11 Miles	General Standard (Benthic)	Unknown	2002	2014
VAT-D03R	Parker Creek	2.26 Miles	General Standard (Benthic); Fecal Coliform	Unknown	1994	2010
VAT-D03R	Gargathy Creek	4.66 Miles	General Standard (Benthic)	Unknown	2002	2014
VAT-D03R	UT* to Folly Creek	1.61 Miles	General Standard (Benthic)	Unknown	2002	2014

\* UT stands for Unnamed Tributary

**Regulation:** Water resources and water pollution in Virginia are regulated by the Virginia Department of Environmental Quality (DEQ), the Virginia Department of Conservation and Recreation (DCR), the State Water Control Board, and the Environmental Protection Agency (EPA). They administer programs created by the federal Water Pollution Control Act of 1972 (commonly known as the Clean Water Act), the federal Water Quality Act of 1987, and a 1984 amendment to the federal Resource Conservation and Recovery Act.

Virginia's water permit programs include the Virginia Pollutant Discharge Elimination System (VPDES) permit, Virginia Pollution Abatement (VPA) permit, Virginia Water Protection (VWP) permit, Corrective Action Plan (CAP) permit (for underground storage tanks), groundwater withdrawal permit, surface water withdrawal permit, and Virginia Stormwater Management Program permit (VSMP).

In addition to permitting on an individual basis, DEQ has made an effort to streamline the permitting process through the use of general permits and permits-by-rule. These permits are issued for facilities with similar industrial, remedial or sanitary processes. For general permits, DEQ develops, with EPA, requirements for category-specific permits and adopts the permits through the regulatory process. Individual facilities within the Commonwealth are then able to apply for and be covered by the umbrella of a general permit. General permits are currently in place for petroleum cleanups, non-metallic mineral mining operations, confined animal feeding operations, stormwater discharges (from construction activities and from industrial operations), sanitary sewage discharges of less than 1,000 gallons per day, seafood processors, non-contact cooling water, ready-mix concrete plants, fish farms, car washes, and poultry growing operations.

With permits-by-rule, an applicant is deemed to have a permit upon filing specified information with DEQ. Generally, these permits are used for categories of facilities that have very simple permit requirements and pose minimal threat to the environment. The information submitted is certified by a professional engineer as being accurate and in compliance with regulatory requirements. DEQ currently uses permits-by-rule for yard waste composting facilities, energy recovery or incineration facilities for solid waste, waste transfer stations, and materials recovery facilities for solid waste. Increased permitting efficiency will be achieved in the future through the use of general permits and permits-by-rule wherever possible. These streamlined permits save the applicant time and money.

Virginia Pollution Discharge Elimination System: Facilities that discharge waste from any pipe



The Department of Environmental Quality administers state and federal environmental programs, issues environmental permits and ensures compliance with regulations; coordinates planning among Virginia's environmental programs, and helps build partnerships on environmental issues among business and industry, local governments, and interested citizens and groups.

DEQ's programs include agriculture, Air Check Virginia, air quality, avian influenza, brownfield/land renewal, Chesapeake Bay Program, citizen monitoring, Clean Marina Program, computers & electronics recycling, construction assistance, energy technologies (Virginia Information Source for Energy), enforcement, environmental education, environmental excellence, environmental impact review – federal consistency, environmental management, eProcurement, federal facilities, groundwater protection, innovative technology, ISO 14001, ozone and particle pollution monitoring, petroleum programs, pollution prevention, Pollution Response Program- Report Pollution, power plants, recycling & litter prevention, SARA Title III, small business assistance, superfund, total maximum daily loads, toxic release inventory, Virginia Coastal Program, vehicle emissions inspections, Virginia Naturally, voluntary remediation, waste management, waste tires, wastewater engineering, wastewater treatment, water quality, water resource management, water supply planning, and wetlands.

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or ditch into surface waters are required to obtain a Virginia Pollution Discharge Elimination System (VPDES) Permit. Map B shows the location of VPDES permitted sites in Accomack County. Typical requirements of a VPDES permit include limits on concentrations and quantities of pollutants, proper operation and maintenance of facilities, discharge monitoring, record keeping, and reporting of data to DEQ, and a requirement to be open to inspections. A limit is set for discharge and the facility must submit monthly monitoring reports to DEQ. The following table shows the facilities in Accomack County with VPDES permits.

**VPDES Sites**  
Source: DEQ, 2007

Facility Name	Design Flow (MGD)	Receiving Stream
Oak Hall Shopping Center	0.0100	X-trib to Tunnels Mill Br to Bulbegger
Tyson Foods Inc.	2.0000	Sandy Bottom Branch
Sunset Bay Utilities - South	0.0395	Chincoteague Channel
Taylor Landing	0.0120	Chincoteague Channel
Town of Onancock – Waste Water Treatment Plant	0.2500	N. Bran. of Onancock Creek to Chesapeake Bay
Hampton Inn and Suites	0.0100	Chincoteague Bay
Perdue Farms Incorporated	3.0000	Parker Creek to Metompkin Bay
Perdue Farms Incorporated	3.0000	UTRIB to Folly Creek
Comfort Suites Hotel – Chincoteague	0.0090	Chincoteague Bay
Whispering Pines Motel	0.0190	UTRIB to Deep Creek
Whispering Pines Motel	0.0190	Groundwater
Chincoteague Landmark WWTP	0.0350	Chincoteague Channel
Birchwood Housing Development	0.0350	Chincoteague Channel
Accomack County - N Landfill Leachate Treatment	0.0200	Assawoman Creek
Cardinal Village	0.0060	UTRIB to Tunnels Mill Br to Bulbegger
Tangier Town	0.1000	Chesapeake Bay
US NASA – Wallops Flight Facility	0.3000	UTRIB to Little Mosquito Creek
US NASA – Wallops Flight Facility	0.3000	UTRIB to Jennys Gut
US NASA – Wallops Flight Facility	0.3000	UTRIB to Simoneaston Bay
Accomack County – Pungoteague Elementary	.0090	Xtrib to Warehouse Prong to Pungoteague Creek
Sunset Bay Utilities - North	0.0250	Chincoteague Channel to Chincoteague Bay
Shore LifeCare at Parksley	0.0200	N.F. Parker Creek to Parker Creek
Accomack County – Kegotank Elementary	0.0090	Unnamed ditch to Messongo Creek
VDOT – Route 13 Information Center	0.0200	Ditch to Pitts Creek
Chincoteague Town – Water Treatment Plant	0.0200	Chincoteague Channel
US Coast Guard Group – Eastern Shore	0.0060	Chincoteague Channel

**Map 2-B**

Six seafood facilities in Accomack County are approved to discharge with a Consent Order in Lieu of a VPDES permit. Special exceptions have been made for seafood processing facilities with an expired VPDES permit while DEQ completes final regulations on a general VPDES permit for seafood processors. Additional information on DEQ's VPDES program can be found at [www.deq.state.va.us/vpdes](http://www.deq.state.va.us/vpdes).

**Virginia Pollution Abatement Permit:** A Virginia Pollution Abatement (VPA) Permit is required for any operation that proposes to manage pollutants without resulting in a point source discharge to surface waters. VPA permits are required for land application of sewage sludge, animal waste, or industrial waste and for closed systems that reuse and recycle waste water. Excluded are vessels, run-off from fields and orchards, return flows from irrigation, land disposal of pollutants otherwise permitted and discharges into otherwise permitted treatment systems.

Typical requirements of a permit include prohibition of discharge of pollutants to surface waters, waste storage and disposal requirements, a nutrient management plan for manure disposal, best management practices such as berms and buffer strips to protect surface water, groundwater monitoring to detect possible contamination, and sludge monitoring to determine concentration of pollutants.

**Virginia Water Protection Permit:** This permit is required for any project that requires federal permits for discharge of dredge material or fill in a waterway or wetlands, or work or construction in a navigable waterway. Typical requirements of a Virginia Water Protection Permit include alteration of the design or scale of the proposal, requirements to employ specific construction practices, and limitations on disturbances during certain times of the year.

**Underground Storage Tank Corrective Action Plan Permit:** A Corrective Action Plan permit may be required by DEQ after initial abatement measures for any person or entity having an underground storage tank that has discharged petroleum or a controlled substance into the surrounding soil or onto the surface. Typical requirements of a Corrective Action Plan Permit include satisfactory completion of initial response to a release of material, completed abatement measures, site characterization, removal of released product, all reporting required for the release, and a complete Corrective Action Plan for the site problems caused by the release, including descriptions of the site and the release, remediation methods to be used, and a schedule of completion.

As of January 29, 2005, DCR has been responsible for the issuance, denial, revocation, termination, and enforcement of NPDES permits for the control of stormwater discharges from MS4s and land disturbing activities under the Virginia Stormwater Management Program (VSMP). The VSMP permit program is authorized under the Virginia Stormwater Management Act. DCR uses both individual and general permits for stormwater discharges.

Any owner or operator of construction activities equal to or larger than one acre are required to apply for registration coverage under the General Permit for Discharges of Stormwater from Construction Activities. Owners/operators of construction activities larger than 2,500 square feet and less than one acre located in Chesapeake Bay Preservation localities are also required to apply for registration coverage.

In addition, construction activity (i) of less than one acre yet part of a common plan of development of sale disturbing one or more acres, and (ii) having the potential to discharge stormwater, requires coverage under the *VSMP General Permit for Discharges of Stormwater for Construction Activities*.

Additional information on DCR's VSMP program can be found at  
[http://www.dcr.virginia.gov/soil\\_&\\_water/vsmp.shtml](http://www.dcr.virginia.gov/soil_&_water/vsmp.shtml).

**Ground Water Withdrawal Permit:** Any person or entity wishing to withdraw 300,000 or more gallons of groundwater per month in the Eastern Virginia Ground Water Management Area or the Eastern Shore Ground Water Management Area must obtain a Ground Water Withdrawal Permit. Accomack and Northampton Counties are located in the Eastern Shore Groundwater Management Area. Typical permit requirements include demonstration of the need for the amount of water applied for, predication of the area of impact, which is defined as the area in any aquifer that will experience at least one foot of groundwater level declines due to the proposed withdrawal, a plan to mitigate impact to pre-existing users within the area of impact, a conservation and management plan that requires the use of water-saving plumbing and processes, a water loss reduction program, a water use education program and mandatory use reduction during water shortage emergencies, a limit to the annual amount of groundwater that may be withdrawn (a monthly limit is also generally included), and potential groundwater levels and groundwater quality monitoring. The 1992 Ground Water Management Act requires qualifying Agricultural uses to have permits.

Groundwater withdrawal permits put a limit on the amount of water that can be withdrawn. The permitted amount allowed for each facility may include a grandfathered amount plus an amount based on historical use. Perdue Farms, Tyson Foods, the Town of Chincoteague, the Town of Tangier, and the Town of Parksley have historic uses for which permits have not been issued. Permits are being developed for these facilities. The following table lists Groundwater Withdrawal Permits in Accomack County that have been issued:

**Groundwater Withdrawal Permits**

Source: DEQ, 2007

<b><u>Owner Name</u></b>	<b><u>Owner City</u></b>	<b><u>Annual Permitted Amount</u></b>	<b><u>Gallons per Day</u></b>
Integrated Fisheries International Limited	Easton	95,000,000	260,274
Town of Onancock	Onancock	61,000,000	167,123
Shore LifeCare Incorporated	Parksley	6,800,000	18,630
Trails End Utility Company Incorporated	Oak Hall	15,700,000	43,014
US NASA – Wallops Island Flight Facility	Wallops Island	13,300,000	36,438
Commonwealth Chesapeake Power Station	Omaha	61,400,000	96,693
Eastern Shore Yacht and Country Club	Melfa	25,000,000	68,493
Emily Rae Heflen	Virginia Beach	31,000,000	84,932
Accomack County	Tasley	5,453,000	14,940
Virginia Landing – National American Corporation	Quinby	8,000,000	21,918
Batista Madonia Sr. (multiple permits)	Mulberry	394,596,000	1,081,084
William Earl Dennis (multiple permits)	Wattsville	7,700,000	21,096
William M. Daley	Onancock	3,700,000	10,137
Ronald Graunke	Mt. Airy	1,800,000	4,932
Taylor and Fulton Inc. (multiple permits)	Mappsville	76,600,000	209,863
Gordon L. Sturgis	Exmore	4,400,000	12,055
Agnes B. Willard	Painter	1,400,000	3,836
Robert Van Dessel	Parksley	3,400,000	9,315
David Van Dessel	Parksley	4,500,000	12,329
Ace 1971 and Gigi 1971 Trust (multiple permits)	Mappsville	30,000,00	82,192
500 Group, LLC	Melfa	10,900,000	29,863
Richard F. Hall III (multiple permits)	Accomac	148,400,000	406,575
Donald L. Fitchett	Melfa	8,400,000	23,014
Milton Douglas Evans	Accomac	106,000,000	290,411
Nell Thomas, Pres. c/o Dorothy Nell Thomas, VP (multiple permits)	Onancock	250,000,000	684,932
Kuzzens Incorporated (multiple permits)	Exmore	183,571,000	502,934
BAR-RAB, L.L.C	Lewes	30,124,000	82,531
Ellen Wessels	Bloxom	21,517,000	58,951
Virginia Dept. of Conservation and Rec'n	Richmond	40,340,000	110,521
Byrd Foods, Incorporated	Parksley	13,500,000	36,986
Alice Russell	Leemont	34,560,000	94,685
June Sterling	Parksley	93,060,000	254,959
Ann Godwin	Onancock	22,650,000	62,055
Gerald Wilgus	Bethany Beach	21,517,000	58,951
Toni Trepanier	Hallwood	10,900,000	29,863

The Virginia Department of Health: The Virginia Department of Health (VDH) regulates the placement of wells and septic systems. Virginia has statewide septic regulations but the state code allows localities to adopt more stringent regulations.

*Septic Systems:* Septic systems are natural, on-site, wastewater treatment and disposal systems. These systems use bacteria to clean wastewater. Water and waste are transported out of a building and into the septic tank. In the septic tank, biodegradable solids are broken down by bacteria and converted to liquid and gas and non-biodegradable solids settle out onto the bottom of the tank. The liquid waste then moves through pipes, by gravity flow or pumped pressure, into the drainfield. The drainfield consists of a series of underground pipes laid over a bed of gravel. The liquid leaves the pipes and percolates down through the gravel and soil below. Organisms in the soil perform the final wastewater treatment.

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**Eastern Shore Ground Water Management Area**

In 1976, the Virginia State Water Control Board designated the Eastern Shore as a "Ground Water Management Area." The Eastern Shore was the second area in the state to be given this designation. The designation was based on findings of groundwater level declines, well interference, and localized groundwater contamination.

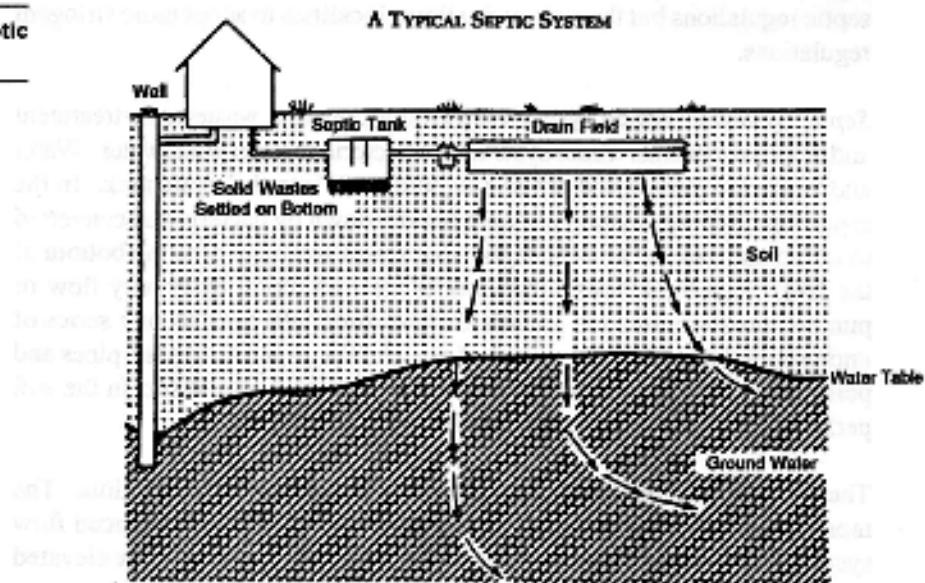
Ground Water Management Area designation means that all water users that withdraw more than 10,000 gallons per day are subject to a state permitting process. At the time the designation was made, ten major existing industrial and municipal withdrawals became grandfathered and did not have to go through the permitting process.

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There are several types of septic systems approved for use in Virginia. The most commonly used include conventional septic systems, enhanced flow systems, low pressure distribution systems, and, less frequently, the elevated sand mound system. Conventional systems are the most widely used, the most economical and the easiest to maintain. A conventional system consists of a tank, a distribution box which splits effluents off to the drainfield lines, and a drainfield consisting of a series of parallel trenches dug on contour and filled with 13 inches of stone and four inch pipe. An enhanced flow system varies from the conventional system in that a pump is added to improve distribution of effluent to the drainfield. A conventional system may also have a pump to overcome gravity, but it does not necessarily aid distribution. The pump in an enhanced flow system is carefully sized to wet all of the absorption area.

Low pressure distribution systems are also similar to conventional systems, except that the low pressure distribution system uses a pump and a set of small diameter pipes with holes every three to five feet to distribute the wastewater. This pressure dosed system uses all of the absorption field on every pump cycle. A gravity system uses less than 15% of its field at any given time and a few square feet of soil within the drainfield area may treat all of the effluent. Research has shown that systems that dose an absorption field last significantly longer than gravity fed systems. Also, because this type of system uses each square foot of soil in the treatment and disposal process, better effluent treatment is achieved. The Health Department's sewage handling and disposal regulations allow absorption areas to be reduced by up to 50% when low pressure distribution is used. This can be beneficial on lots with small areas of suitable soil. These systems are more expensive to install because they require a pump, more expensive pipe, and more skill to install than a conventional system.

**Diagram of a typical septic system**



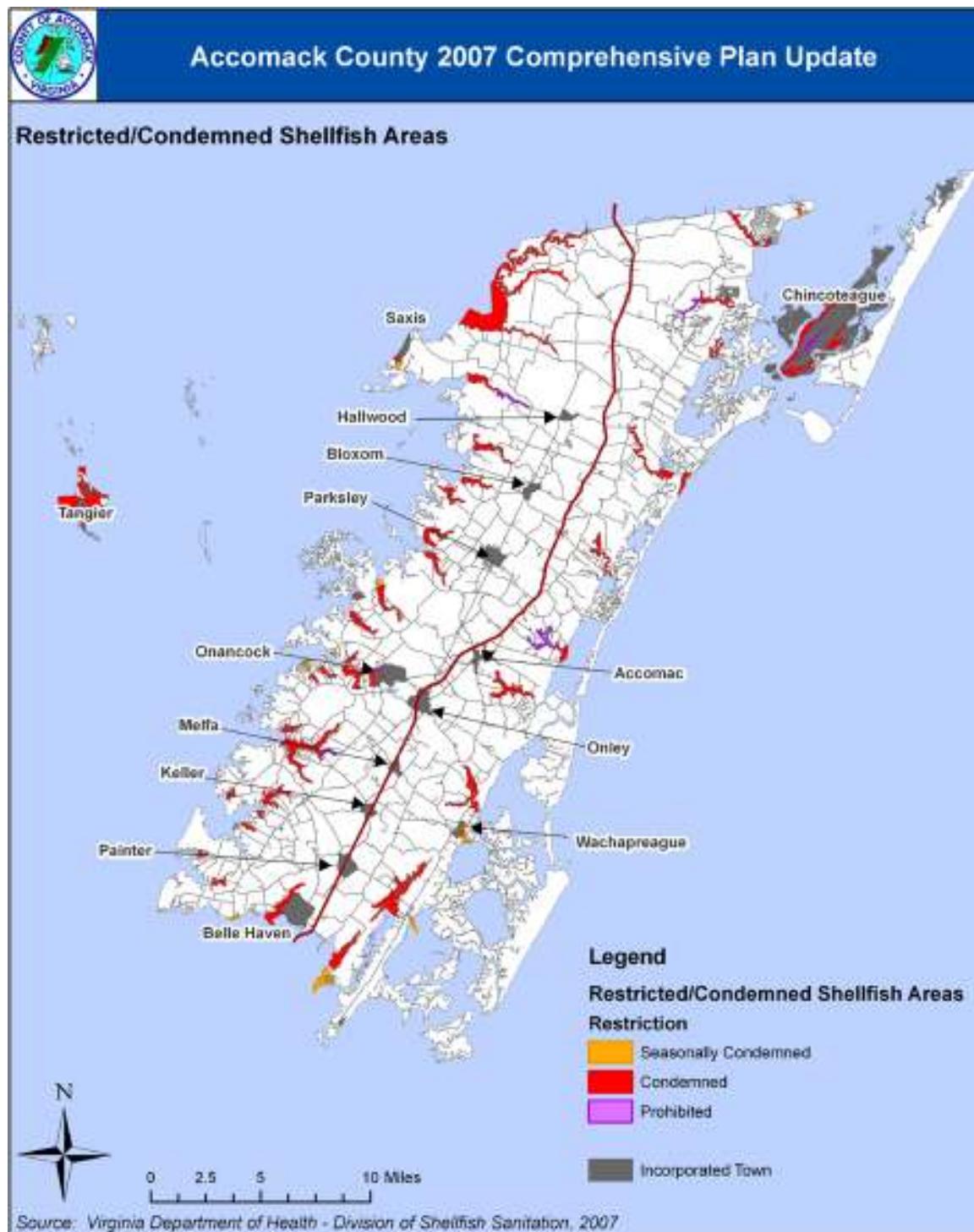
The elevated sand mound is a system built above ground that partially treats the effluent before applying it to the soil below the mound. The mound consists of one foot of graded sand placed over plowed top soil. A small low pressure system is placed in a gravel filled trench over the sand. The system is then covered with top soil and seeded. Effluent is pumped to the mound after receiving primary treatment in the septic tank. Effluent treatment occurs when the wastewater passes through the sand in the mound and continues into the soil below the mound. According to the Health Department, elevated sand mounds provide better sewage treatment than any other system regularly permitted in the state. Elevated sand mound systems use less area than other systems and may be the only option for limited spaces. The construction of elevated sand mound systems can cost two to five times that of a conventional system. The Health Department has modified its regulations to permit alternative systems, such as those using peat moss.

**Septic System Approval:** The Health Department issues two types of approval for septic systems. A construction permit contains a design for a specific system, at a specific location, for a specific use and is valid for 18 months. The permit expires after 18 months and a new application must be filed, complete with re-evaluation of the site under current regulations. A certification letter does not contain a system design and has no expiration date. The letter is a commitment by the Health Department to issue a permit at any time in the future on a specific site. The Health Department conducts an on-site evaluation for each septic system permit application. The site is evaluated for soil depth. Most research shows that two to four feet of well drained soil is needed to clean waste water. The site is also evaluated for how fast the soil will move water, or

“perc.” Soils that perc too quickly can contaminate groundwater. Those that perc too slowly can cause sluggish plumbing flow and produce sewage overflows.

*Septic System Maintenance:* The Health Department suggests that septic tanks be pumped out once every three to five years. Pumping removes solids that have accumulated in the tank. If left unpumped, solids will clog the soil where the wastewater is absorbed, leading to system failure. The county currently requires that all septic systems on the Bayside be pumped out at least once every five years. This is a requirement of the Chesapeake Bay Preservation Overlay District and does not apply to septic systems on the Seaside of the county. Accomack County updated its septic system database in 2006 and is notifying property owners of the septic system pumpout requirement on a five-year cycle.

*Groundwater Contamination:* A properly functioning septic system will effectively treat biodegradable solids and liquids. Chemical wastes such as used engine oil, gasoline, pesticides, paints, solvents, and photographic chemicals cannot be broken down by the bacteria in the septic system or soil. These substances move through the system, sometimes killing the useful bacteria, and exit in the same form they entered, posing a threat to groundwater quality.

**Map 2-C**

**Impaired Shellfish Waters**  
**Source: VDH, 2007**

VAT-D01E	Jennys Gut	0.01 Sq. Mi.	VDH Shellfish Restriction	Unknown	2002
VAT-D01E	Big Simoneaston Cr	0.01 Sq. Mi.	VDH Shellfish Restriction	Unknown	2002
VAT-D01E	Toms Cove Boat Basin	0.001 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-D01E	Andrews Landing Gut	0.03 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-D01E	Black Point Drain	0.05 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-D01E	Assateague Channel/ Sheepshead Creek	0.23 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-D01E	Drainage ditch	0.01 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-D01E	Chincoteague Channel/ Fowling Gut	0.61 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-D01E	Greenbackville Harbor	0.02 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-D01E	Swans Gut Creek	0.14 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-D01E	Mosquito & Little Mosquito Creek	0.18 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-D01E	Cockle Creek	0.11 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C09E	Pocomoke Sound & Pocomoke River	2.6 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C10E	Deep Creek	0.3 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C10E	Starling Creek	0.08 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C10E	Messongo Creek	0.32 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C10E	Bagwell Creek	0.06 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C10E	Hunting Creek	0.22 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C10E	Young Creek	0.19 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C10E	Guilford Creek	0.2 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C10E	Muddy Creek	0.32 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C11E	Chesconessex Creek	0.19 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C11E	Finneys Creek	0.1 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C11E	Matchotank Creek	0.08 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C11E	Cedar Creek	0.06 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C11E	Onancock Creek	0.36 Sq. mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C12E	Pungoteague Creek	0.41 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C12E	Taylor Creek	0.17 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C13E	Craddock Creek	0.08 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C13E	Nandua Creek: Back Creek	0.04 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998

<b>Impaired Shellfish Waters (cont'd)</b>					
VAT-C13E	McLean Gut	0.03 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C13E	Occhobanock Creek	0.46 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C13E	Nandua Creek	0.15 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-C13E	Kusian Cove	0.03 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-D02E	Assawoman Creek and Womans Bay	0.36 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-D03E	Parker Creek	0.09 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998
VAT-D03E	Folly Creek	0.29 Sq. Mi.	VDH Shellfish Restriction	Unknown	1998

**Shellfish Waters:** State Water Quality Standards require that all open ocean or estuarine waters capable of propagating shellfish or specific areas where public or leased private shellfish beds are present, including those waters on which condemnation or restriction classifications are established by the State Department of Health, have a fecal coliform value of not more than 14 parts per 100 milliliters.

The Virginia Department of Health's Division of Shellfish Sanitation condemns portions of water bodies due to hazards or when water quality standards are not met. In condemned areas it is illegal to remove shellfish for any purpose, except by permit granted by the Virginia Marine Resources Commission (VMRC). With a VMRC permit, shellfish may be removed from a condemned area

under the following conditions; the water temperature must be above 50 degrees Fahrenheit and the shellfish must be out of the condemned area for at least 15 days before harvesting. In accordance with the National Shellfish Sanitation Program, areas around certain point source discharge are prohibited. Shellfish cannot be removed from prohibited areas. The only prohibited area in Accomack County is around the Town of Onancock Sewage Treatment Plant.

As of January 1, 1997, the Bureau of Shellfish Sanitation has condemned 8,740 acres of productive shellfish grounds in Accomack County. This represents a 9% increase over the amount of acreage condemned in 1992 (8,033 acres). Map C shows the location of condemned shellfish grounds. In comparison, as of July 1, 2007, the Virginia Department of Health, Division of Shellfish Sanitation had condemned approximately 7,587 acres of shellfish grounds within Accomack County. This represents an approximate 6% decrease in condemned acreage.

#### Division of Shellfish Sanitation

The Division of Shellfish Sanitation functions under the Virginia Department of Health as the state agency responsible for assuring that shellfish harvested and sold in Virginia are safe for consumers in accordance with the National Shellfish Sanitation Program. The National Shellfish Sanitation Program is monitored by the U.S. Food and Drug Administration to insure compliance by shellfish growing states. Shellfish, as defined by the National Shellfish Sanitation Program, are all edible species of oysters, clams, mussels, and scallops.

Since they are filter feeders, shellfish can filter large amounts of water thereby concentrating suspended bacteria and viruses in their tissues. In the early 1900's public health authorities in the U.S. began relating a large number of illnesses to raw shellfish consumption and initiated guidelines for sanitary controls.

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Pollution of Condemned Shellfish Grounds is being addressed by DEQ's TMDL

program. A TMDL study is currently being prepared for Occohannock Creek, and will make recommendations to reduce fecal coliform pollution. Since fecal coliform is produced by humans, pets, livestock, and wildlife, an implementation strategy will be developed to reduce fecal coliform pollution in the watershed.

### Condemned Shellfish Grounds

<b>Creek</b>	<b>1992 Acres</b>	<b>2007 Acres</b>
Pocomoke Sound and Pocomoke River .....	1,843	1,663
Starling Creek .....	48	58
Messongo and Guilford Creek.....	243	377
Messongo Creek.....130 Acres to 180 Acres		
Muddy Creek.....136 Acres		
Guildford Creek.....70 Acres to 96 Acres		
Young Creek.....43 Acres to 60 Acres		
Hunting and Deep Creek .....	715	450
Deep Creek .....355 Acres to 177 Acres		
Doe Creek .....106 Acres		
Hunting Creek .....142 Acres to 108 Acres		
Bagwell Creek .....112 Acres to 165 Acres		
Tangier Island .....	1,098	1029
Chesconessex Creek .....	120	153
Onancock and Matchotank Creeks.....	491	449
Onancock Creek .....299 Acres to 281 Acres		
Finneys Creek .....45 Acres to 43 Acres		
Parkers Creek .....59 Acres to 76 Acres		
Cedar Creek .....38 Acres to 40 Acres		
Poplar Cove.....10 Acres		
Pungoteague Creek .....	414.....	578
Pungoteague and Taylor Creeks —371 Acres to 492 Acres		
Underhill Creek .....43 Acres to 58 Acres		
Warehouse Prong.....27 Acres		
Butcher Creek .....	52	
Nandua and Currituck Creeks.....	220.....	235
Nandua Creek, Kusian Cove..... 163 Acres to 144 Acres		
McLean Gut .....39 Acres to 33 Acres		
Boggs Gut.....22 Acres		
Back Creek.....18 Acres to 36 Acres		

***Condemned Shellfish Grounds (cont'd)***

Craddock Creek .....	93.....	76
Occohannock Creek.....	148....approx...	175
Machipongo River.....		569
Folly Creek .....	236.....	209
Finney Creek.....		273
Parker Creek .....	59.....	146
Gargathy Creek .....	75.....	88
Assawoman Creek and Womans Bay.....	235.....	171
Little Cat Creek.....		62
Little Simoneaston and Big Simoneaston Creeks.....		26
Cockle Creek .....	165	
Little Mosquito Creek .....	102.....	133
Swans Gut Creek .....	91.....	77
Cockle Point Harbor.....		22
Greenbackville Harbor .....	13.....	38
Chincoteague Island and Adjacent Areas .....	596.....	464
Chincoteague Channel/		
Fowling Gut .....	388 Acres to 337 Acres	
Andrews Landing Gut .....	21 Acres to 12 Acres	
Black Point Drain .....	32 Acres to 29 Acres	
Toms Cove Boat Basin .....	2 Acres	
Lewis Creek.....	0.6 Acres	
Drainage Ditch.....	5 Acres	
Assateague Channel/		
Sheepshead Creek/ Oyster Bay.	148 Acres to 85 Acres	
<b>Total Condemned Acres .....</b>	<b>8,740</b>	<b>7,587</b>

**Water Quality Restoration:** Virginia is using two programs, Total Maximum Daily Load (TMDL) and Chesapeake Bay Tributary Strategies, to plan for and implement the restoration of our surface waters.

**Total Maximum Daily Load (TMDL) Program:** The TMDL Program provides the management framework for restoring water quality in Virginia's impaired streams, rivers, lakes and estuaries. The major steps under the TMDL program include development of the TMDL, development of the TMDL Implementation Plan, and implementation of the plan to restore water quality. A TMDL is currently being prepared for Occohannock Creek.

**Chesapeake Bay Tributary Strategy Program:** Virginia's Tributary Strategy Program was developed in response to the 2000 Chesapeake Bay Agreement to improve the Bay's water quality. The Eastern Shore Tributary Strategy was developed in 2005, and includes in proposed projects to reduce non-point source pollution from agriculture, forestry, and urban development, including water quality BMPs, shoreline buffer restoration, and upgrading municipal sewage treatment plants. Further information is available at:  
<http://www.naturalresources.virginia.gov/Initiatives/WaterQuality/FinalizedTribStrats/easternShore.pdf>

Chesapeake Bay Preservation Overlay District: In 1991, the Chesapeake Bay Preservation Overlay District was added to the county's Zoning Ordinance to bring Accomack County into compliance with the Virginia Chesapeake Bay Preservation Act. The purpose of the District is to protect existing high quality state waters, restore all other state waters to a condition or quality that will permit all reasonable public uses and will support the propagation and growth of all aquatic life, safeguard waters from pollution, prevent any increase in pollution, reduce existing pollution, and promote water resource conservation. Performance standards are included in the regulations with the goal of preventing a net increase in nonpoint source pollution from new development, achieving a 10% reduction in nonpoint source pollution from redevelopment, and achieving a 40% reduction in nonpoint source pollution from agricultural uses. Map D shows the approximate location of Resource

#### Protection Areas and Resource Management Areas in Accomack County.

Land in the Overlay District is that which, if improperly developed, could contribute to the significant degradation of the water quality of the Bay and its tributaries. The Overlay District is divided into two segments, the Resource Protection Area (RPA) and the Resource Management Area (RMA). The RPA is the portion of the District which comprises lands at or near perennial streams or the shoreline. The RPA consists of land that performs ecological and biological processes or is sensitive to impacts which may result in significant degradation to the quality of state waters. Lands included in the RPA are tidal wetlands, non-tidal wetlands that are connected by surface flow and are contiguous to tidal wetlands or water bodies with perennial flow, and tidal shores. In addition, a 100-foot vegetated buffer strip landward of the other components and along perennial tributary streams is included in the RPA to retard runoff, prevent erosion and filter nonpoint source pollution from runoff.

The intent of the 100-foot vegetative buffer is to minimize the effects of human activities on the Resource Protection Areas. Development activity within this area is restricted in order to maintain the functional value of the buffer. Trees may be pruned or removed to provide sight lines and vistas, with County approval, if they are replaced with vegetation which is effective in meeting the intent of the buffer. The vegetated buffer area retards

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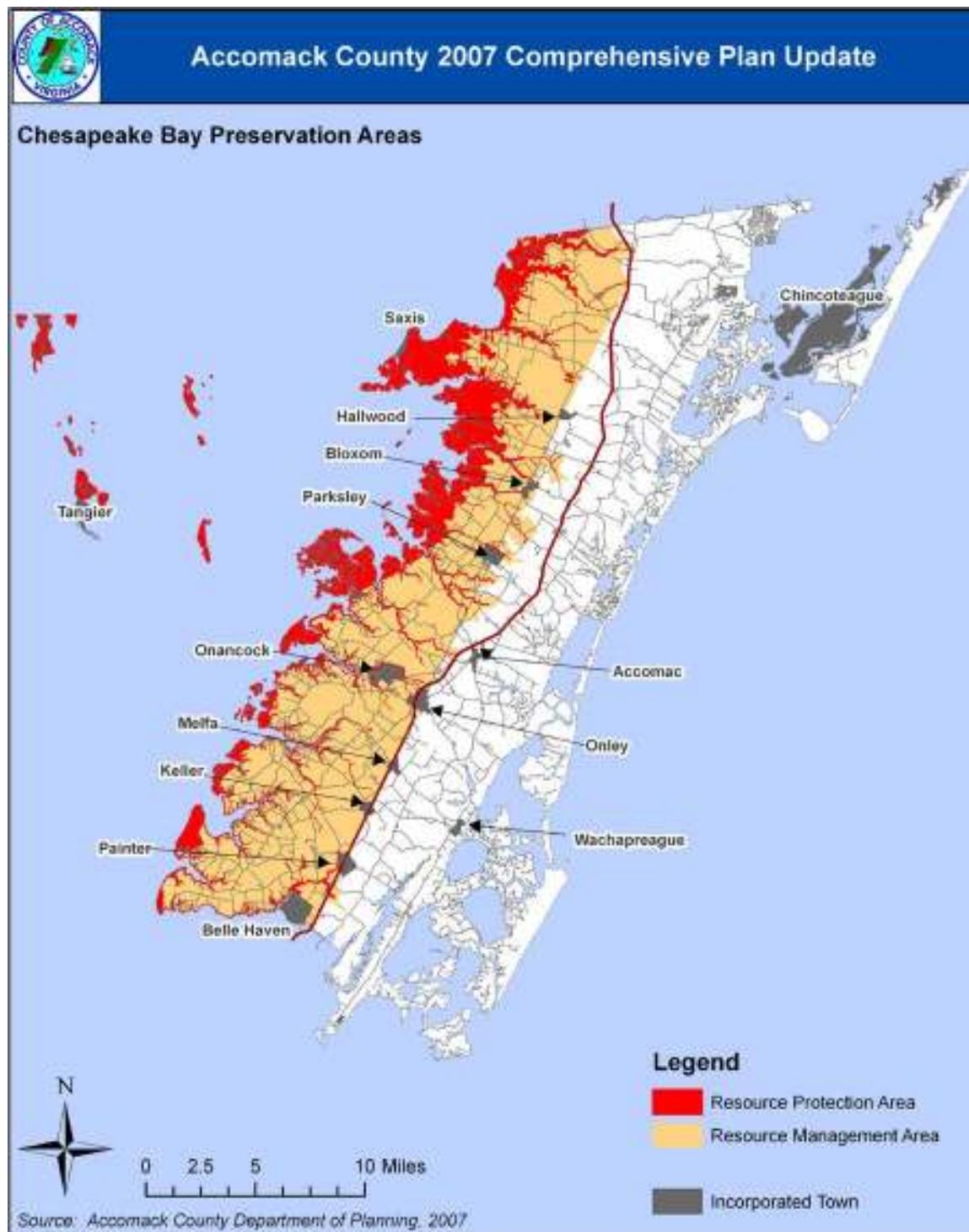
#### The Bay Act

The Virginia General Assembly enacted the Chesapeake Bay Preservation Act in 1988. The Bay Act established a cooperative program between state and local government aimed at reducing nonpoint source pollution. The Bay Act Program is designed to improve water quality in the Chesapeake Bay and its tributaries by requiring wise resource management practices in the use and development of environmentally sensitive land features.

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runoff, prevents erosion, filters nonpoint pollution and is presumed to achieve a 75% reduction in sediment runoff as well as a 40% reduction of nutrients.

### Map 2-D



The buffer may be reduced on parcels recorded prior to October 1, 1989, if imposition of the buffer results in the loss of a buildable area on the lot. In this event the modification shall be the minimum necessary to achieve a reasonable buildable area for a principal structure and utilities. If possible, an area equal in size to the encroachment into the buffer must be established in another location on the lot.

For agricultural fields, the buffer may be reduced to 50 feet if federal, state, or locally-funded best management practices are being implemented that achieve water quality protection, pollutant removal, and water resource conservation equivalent to the buffer area. The buffer may be further reduced to 25 feet if a soil and water quality conservation plan approved by the local Soil and Water Conservation District is implemented the land.

Because the land within an RPA is so sensitive, development is very restricted. The permitted development within RPAs include water-dependant uses (e.g. marinas and piers), or the redevelopment of already existing structures. Passive recreation facilities are also permitted within RPAs. Passive recreation facilities include uses such as paths and trail ways.

Land within the Resource Management Area (RMA) portion of the Overlay District is that which if improperly used or developed, has the potential for causing water quality degradation or diminish the functional value of the Resource Protection Area. Features of land which constitute a RMA are flood plains, non-tidal wetlands, highly erodible soils, and highly permeable soils. All land west of the Eastern Shore Railroad tracks as well as a five hundred foot buffer around Chesapeake Bay tributaries which extend east of the tracks have been designated as a RMA. Within the Overlay District, allowable land uses must be developed in accordance with overlay district standards in addition to those of underlying zoning districts. Development in Resource Protection Areas is allowed only if the use is water-dependent or constitutes redevelopment, and complies with performance standards. All development and redevelopment in the Overlay District in excess of 2,500 square feet of land requires approval of a development plan which includes impervious surface limits, erosion and sediment control measures, and water quality impact analysis. Further information on Virginia's Chesapeake Bay Preservation Act can be found at:  
<http://www.cblad.state.va.us/>.

Seaside Water Quality Protection: Implementation of the Chesapeake Bay Preservation Act on the Bayside points to the benefits of implementing similar water quality measures on the Seaside. While Accomack County is not required to implement the Chesapeake Bay Preservation Act requirements on the Seaside, the Virginia Code allows local governments to use these provisions to protect water quality in other watersheds. Given Accomack County's concerns about protecting Seaside water quality for aquaculture, other fisheries, recreation, and tourism, requirements similar to the Chesapeake Bay Preservation Act should be implemented on the Seaside.

**Ground Water:** The Eastern Shore was formed through the deposition of sediment during the period of glacial retreat. The sediments were layered through the different geologic time periods, forming both the land mass and the aquifer system. A number of separate aquifers were formed, but the potable water supply is limited to the two upper aquifers. The upper aquifer, called the Columbia aquifer, is unconfined and between 80 and 100 feet thick. It is used primarily for private on-site domestic wells and agricultural irrigation.

The next aquifer is the Yorktown-Eastover multi-aquifer system. The Yorktown-Eastover aquifer is confined and ranges primarily from 80 to 350 feet thick, although it is much deeper in the northern portion of Accomack County. The aquifer consists of coarse shelly sands found in three layers separated by clay confining units. These confining units serve to protect the aquifer from many water quality threats, but they also act to impede the amount and rate of recharge to the aquifer. Groundwater found in the aquifers below the Yorktown-Eastover is brackish and thus not used.

#### **Ground Water Management Area Designation**

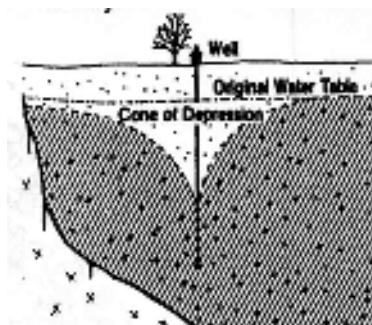
In 1976, Virginia designated the Eastern Shore as a “Ground Water Management Area.” This designation was based, at the time, on the following findings:

- Groundwater level declines have been observed in two sections of Accomack County;
- Interference between wells has been observed in the same two sections of Accomack County;
- Some evidence of localized groundwater contamination has been observed in the water table aquifer of Accomack County but not in the confined aquifers;
- Even though the groundwater supplies in Accomack County are not overdrawn and are not expected to be in the near future, it should be recognized that they may overdraw in some areas in the future if water withdrawals are not distributed throughout the region. Further, saltwater intrusion has not been observed to date but may occur in the future if heavy groundwater withdrawals are concentrated in any one area.

This designation by the state means that major users of groundwater (those who withdraw over 300,000 gallons per month) must obtain a permit before pumping. This provides some protection against well interference and over pumping of the aquifer.

#### **Well Interference**

The natural path and flow rate of groundwater can change dramatically through groundwater well pumping. Wells will draw in water from all directions and can increase the flow rate. The drawing-in action of a well creates a cone of depression around the well site. It is called a cone because, when the well withdraws groundwater, the water table surrounding the well lowers, creating slopes that become increasingly steep closer to the well. The geologic characteristics of the aquifer and the rate and duration of pumping will affect the size and shape of the cone. This cone may draw down the water level over a large enough area to cause wells that were previously deep enough to draw water to run dry.



**Groundwater Use:** Groundwater is the only viable drinking water source on the Eastern Shore. Seven towns on the Eastern Shore have municipal water supply systems, and approximately 25 small public water supplies serve subdivision and mobile home parks. The remaining population derives its water supply from private domestic wells. Map E shows the major public water supply wells in Accomack County.

Agriculture and industry are the most water-intensive land uses on the Eastern Shore. Water withdrawal for crop irrigation is significant, with the Eastern Shore accounting for 62% of the reported statewide total for irrigation water use. Estimating the quantity of water used for irrigation can be complicated because the acreage irrigated and amount of water applied vary from year to year depending on weather, crops, and economics. Major industrial users include two poultry processing plants which account for 42% of the total permitted industrial withdrawals on the Eastern Shore of Virginia.

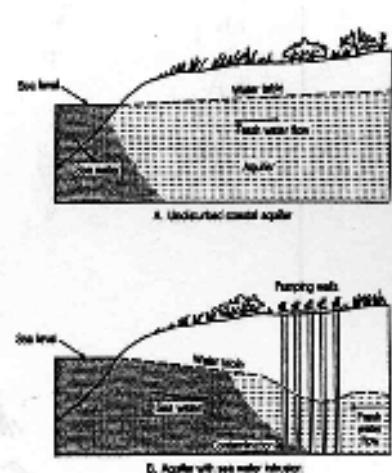
A study conducted in 1992 by the Eastern Shore of Virginia Ground Water Study Committee reported that 4.5 million gallons per day were being withdrawn at the time from the Yorktown-Eastover Aquifer for industrial and public water supply use. Permits from the State

Water Control Board at the time allowed withdrawals of up to 15.6 million gallon per day (MGD) from the Yorktown- Eastover Aquifer. The Groundwater Study report estimated the recharge rate of water to the Yorktown-Eastover Aquifer as 11 MGD. The Ground Water Study reported that, if groundwater withdrawals of over 11 MGD (the permitted level at the time for industrial uses and public water supplies was 15.6 MGD) were to occur, problems of well interference and salt water intrusion, already observed at the time near the largest industrial water uses, would be greatly enhanced. A more recent study and simulation which was conducted by the Richmond Regional PDC reported that an estimated 5.51 million gallons per day were being withdrawn from the Yorktown-Eastover Aquifer. Accomack County accounted for 3.94 million gallons per day.

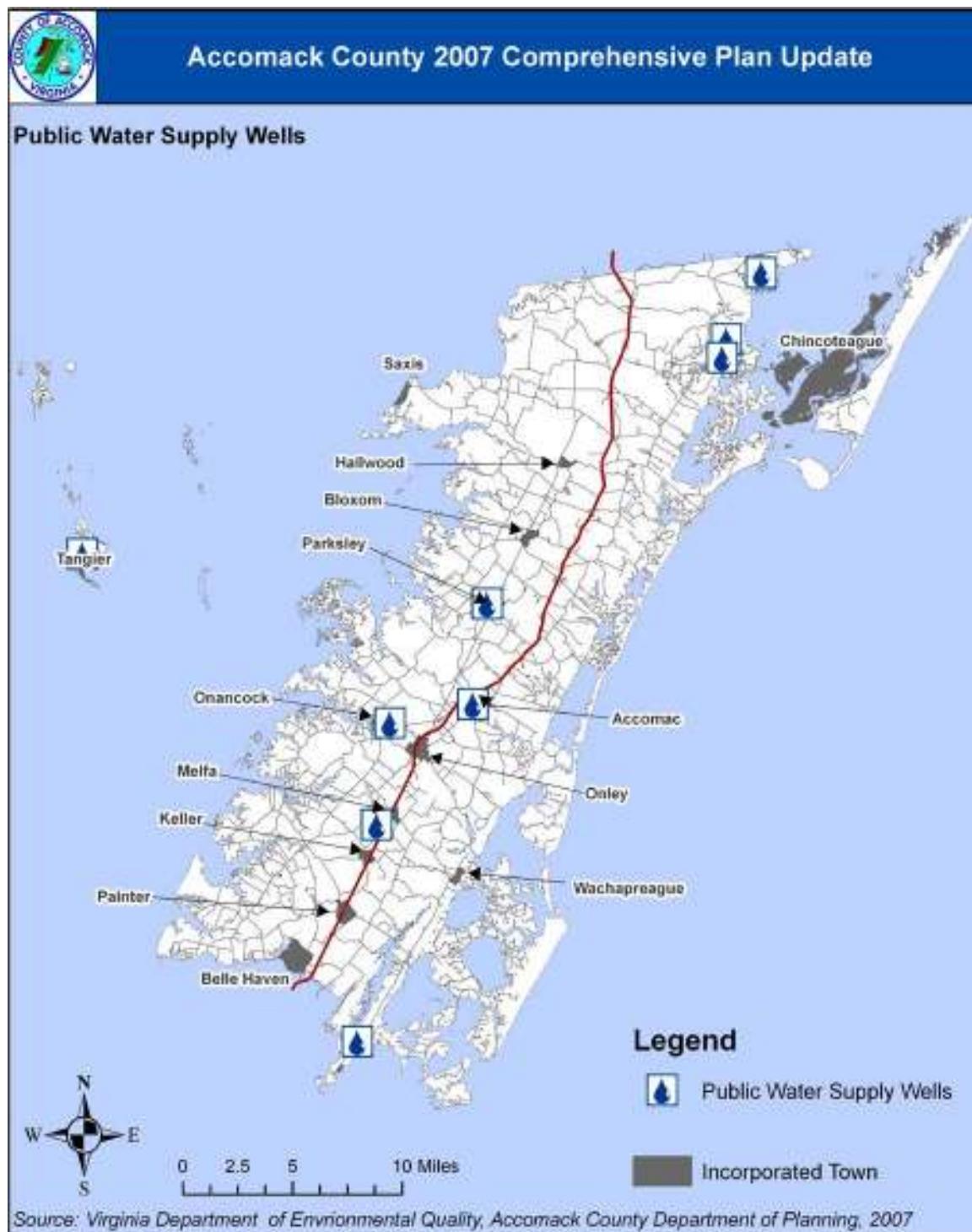
A 1991 study conducted by the U.S. Geological Survey, *Hydrogeology and Analysis of the Ground-Water-Flow System of the Eastern Shore, Virginia*, recognized that groundwater demand from increased industrial, commercial, municipal, and agricultural growth on the Eastern Shore has caused water level declines. This study used groundwater model scenarios of hypothetical increases in withdrawals to predict the impact such withdrawals would have on the groundwater supply. The study found that

### Saltwater Intrusion

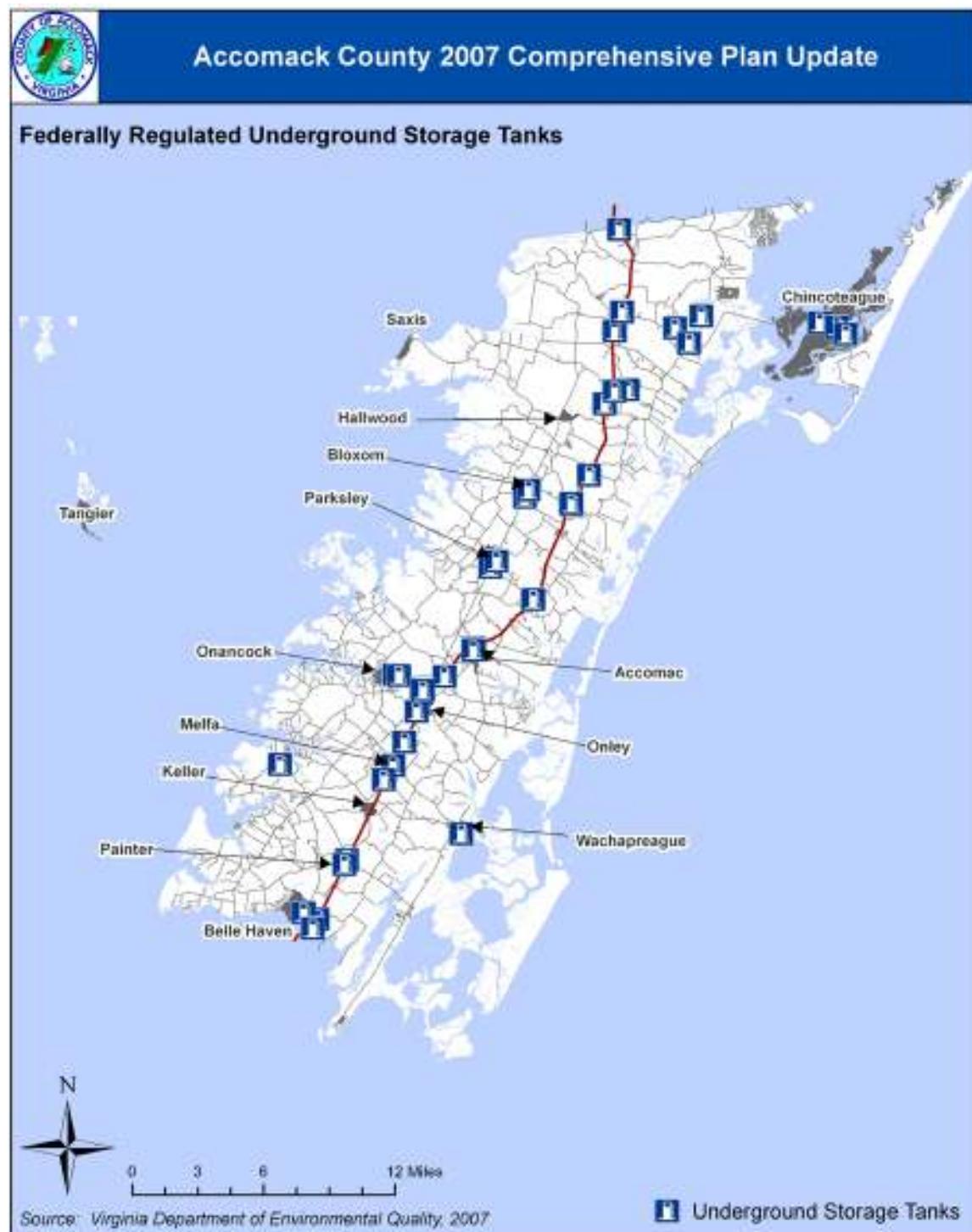
In coastal areas, the fresh water aquifer is in contact with the ocean and bays. If the water table within the aquifer is above sea level, the intrusion of salt water is repelled and little or no contamination occurs. However, if groundwater use lowers the water table to below sea level, a wedge of seawater can intrude into the aquifer. Once this occurs, salt and brackish water may begin to appear in wells.



(1) water levels continue to decline as withdrawals increase and could result in well interference among major groundwater users, (2) increases in withdrawals result in a decrease in the amount of off-shore fresh water recharge, (3) water-level declines associated with increased withdrawals cause slight movements of the saltwater/freshwater interface over a 50 year simulation period, (4) increased withdrawals near the shoreline cause off-shore water level declines and a reversal in the direction of groundwater flow that could induce vertical leakage of saltwater into the freshwater parts of the uppermost confined aquifer, and (5) withdrawals near the center of the peninsula cause less landward movement of the saltwater-freshwater interface than withdrawals near the shoreline.

**Map 2-E**

**Map 2-F**

**Map 2-G**

**Groundwater Recharge:** The only source of freshwater recharge to the aquifer system is rainwater infiltration. The 1992 Ground Water Study found that the primary source of recharge to the Yorktown-Eastover aquifer is located along a 5,000 foot wide strip which occupies the central portion of the peninsula. Map F shows the location of the recharge spine.

Pressure from the freshwater lens provides a boundary which prevents the movement of saltwater from mixing with the freshwater. Freshwater, through recharge and other aquifer characteristics, is constantly moving through the aquifer to maintain this pressure. Decreases in recharge, combined with increased withdrawals could lead to intrusion of saltwater into the freshwater aquifer.

**Sources of Pollution:** Water quality in the upper, unconfined Columbia aquifer is threatened by the many land uses that discharge, leach, or dispose of contaminants into the ground. Some of these threats include septic systems, agricultural fertilizers, manure storage and animal waste disposal, septic lagoons and landfills. Map G shows the location of the registered underground storage tanks in Accomack County.

**Technical Analysis and Justification for Ground Water Ordinances:** In 2001, the A-NPDC published the study *Technical Analysis and Justification for Ground Water Ordinances on the Eastern Shore of Virginia*. The report used ground water computer models to estimate the impact of lawn fertilizer, pesticides, and residential water use on ground water quality and supply. The study recommends that homeowners apply fertilizer at the minimum rate needed for their soil and grass type, and that new developments with 50 or more lots and average lot sizes between 0.25 and 0.5 acres should have a central water supply and a wastewater treatment system. Water conservation measures or alternate well design, including shallow irrigation wells, are recommended for developments with 50 or more lots. The study concludes that impacts to ground water resources are more severe along coastal shorelines. The study is available at: <http://www.a-npdc.org/groundwater/publications.html>.

**Groundwater Concerns:** There are two major concerns regarding groundwater in Accomack County, quantity and quality. Groundwater quantity is limited by the nature of the aquifers and must be carefully managed to prevent overuse that can result in saltwater intrusion. Groundwater quality depends on proper management of land use activities that can contaminate our aquifers. In recognition of our limited groundwater supply and the potential for contamination, the U.S. Environmental Protection Agency designated the Eastern Shore of Virginia a Sole Source Aquifer in 1997. The designation provides protection to the Shore's water supply by requiring the EPA to review proposed projects on the Shore that are receiving federal financial assistance to ensure they do not endanger our water supply. The EPA Sole Source Aquifer designation excludes Tangier Island and Chincoteague Island.

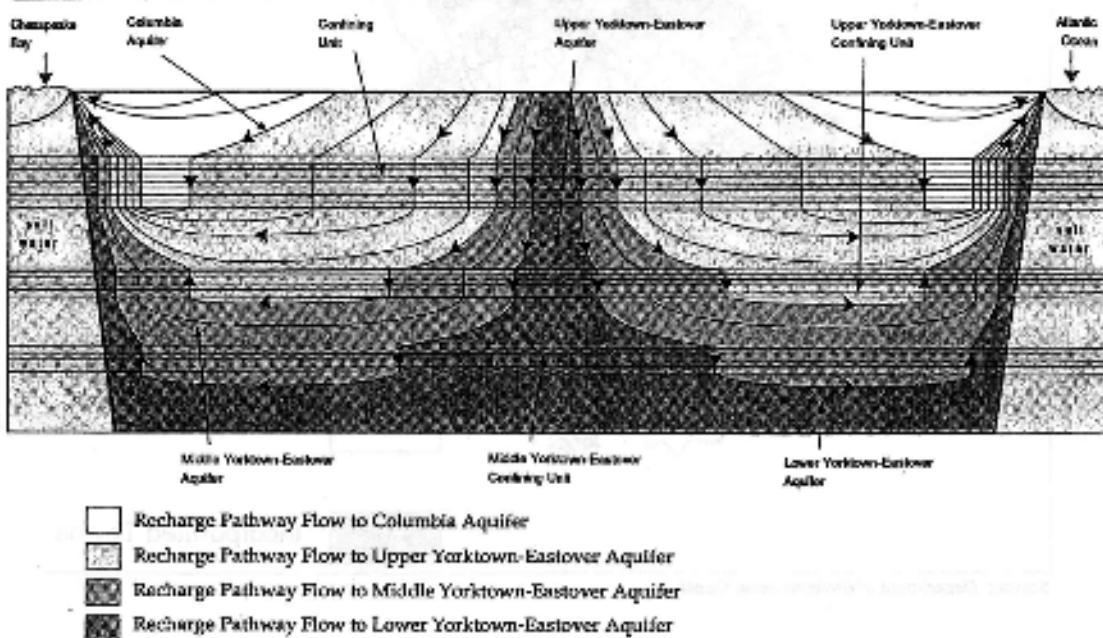
**US Geological Survey Ground Water Model Update:** The US Geological Survey (USGS) is currently updating the Eastern Shore Ground Water Model. The model will be used to estimate groundwater supply and the potential for contamination, and to evaluate

ground water withdrawal permit applications. As groundwater management tools improve, Accomack County will be better able to plan for future development without threatening our groundwater supply. Additional information on USGS groundwater research in Virginia is available at: <http://water.usgs.gov/wid/html/va.html>

**Eastern Shore of Virginia Ground Water Committee:** Since 1990, the Eastern Shore of Virginia Ground Water Committee has worked with Eastern Shore local governments, as well as with state and federal agencies, to study our ground water system and improve our knowledge on how to manage this limited resource. Further information on the Eastern Shore of Virginia Ground Water Committee and groundwater reports, data, and educational materials is available at: <http://www.a-npdc.org/groundwater/>

**Conceptual Hydrogeologic Model of Non-Pumping Groundwater Conditions on the Eastern Shore of Virginia**

Source: *Ground Water Supply Protection and Management Plan for the Eastern Shore of Virginia*



## Air Quality

Air quality is important to human health, the health of domestic and wild plants and animals, the prevention of corrosion to materials such as paints and metals, and the maintenance of visibility levels. Air quality is measured by the concentration of pollutants in the air (referred to as “ambient concentration”). Primary ambient air quality standards have been established based on the level of pollutant concentration present in air which is considered hazardous to human health. Secondary ambient air quality standards have been established for levels which threaten human welfare (health of domestic and wild plants and animals, the prevention of soiling (corroding) of materials (paint, metal, etc.) and the maintenance of natural levels of visibility). The degree of harm associated with a pollutant depends on the exposure “dose.” The exposure dose is a function of the average concentration of the pollutant and the duration of the exposure. In order to address the dosage factor, ambient air quality standards are established for set exposure periods of the established concentration. The table below lists ambient air quality standards which have been established in the United States.

### Federal Air Quality Standards

Source: EPA, 2007

Pollutant	Primary Standard	Secondary Standard
<b>Particulate Matter (as PM-10)</b>		
Annual arithmetic mean (3 Yr. Average)	50 ug/m <sup>3</sup>	50 ug/m <sup>3</sup>
Maximum 24 hr. concentration	150 ug/m <sup>3</sup>	150 ug/m <sup>3</sup>
<b>Particulate Matter (as PM-2.5)</b>		
Annual arithmetic mean (3 Yr. Average)	15 ug/m <sup>3</sup>	15 ug/m <sup>3</sup>
Maximum 24 hr. concentration <sup>(1)</sup>	65 ug/m <sup>3</sup>	65 ug/m <sup>3</sup>
<b>Sulfur Dioxide</b>		
Annual arithmetic mean	(0.03 ppm) 80 ug/m <sup>3</sup>	----
Maximum 24 hr. concentration*	(0.14 ppm) 365 ug/m <sup>3</sup>	----
Maximum 3 hour concentration*	----	(0.5 ppm) 1300 ug/m <sup>3</sup>
<b>Carbon Monoxide</b>		
Maximum 8 hour concentration*	9 ppm (10mg/m <sup>3</sup> )	----
Maximum 1 hour concentration*	35ppm	
<b>Ozone</b>		
1 hour standard <sup>(2)</sup> Maximum daily hourly average concentration	0.12 ppm (235 ug/m <sup>3</sup> )	0.12 ppm (235 ug/m <sup>3</sup> )
8 hour standard Maximum daily hourly 8 hour average concentration	0.08ppm	0.08 ppm
<b>Nitrogen dioxide</b>		
Annual arithmetic mean	0.053 ppm (100 ug/m <sup>3</sup> )	0.053 ppm (100 ug/m <sup>3</sup> )
<b>Lead</b>		
Maximum arithmetic mean over a quarter	1.5 ug/m <sup>3</sup>	1.5 ug/m <sup>3</sup>

\*Not to be exceeded more than once a year per site.

(1) Three-year average of 98<sup>th</sup> percentile concentration.

(2) Even though a new 8-hour ozone standard was adopted in July 1997, the 1 hour standard continues to apply as of May 2004.

**Pollutants:** Air pollutants for which there are registered emission sources in Accomack County include particulates, Lead, Carbon Monoxide, Sulfur Dioxide, Nitrogen Dioxide, Volatile Organic Chemicals, Ammonia and Chlorine. A brief description of each pollutant and its potential impacts is given below.

**Particulates (PM10):** Suspended particulate matter includes dust, soot (carbon), asbestos, lead, cadmium, chromium, arsenic, beryllium nitrate, and sulfate salts. Lead compounds (all poisonous) include tetraethyl lead (formerly used as a gasoline antiknock additive) and oxides used in mortars and pigments. Continued exposure to lead, through inhalation of fumes or sprays and ingestion of food containing lead, can result in a cumulative chronic disease called lead poisoning.

**Carbon Monoxide (CO):** colorless, odorless, tasteless, extremely poisonous gas that is less dense than air under ordinary conditions. When air containing as little as 0.1% carbon monoxide by volume is inhaled, the oxygen carried by hemoglobin is replaced by the carbon monoxide, resulting in fatal oxygen starvation throughout the body.

**Sulfur Dioxide (SO<sub>2</sub>):** A colorless, suffocating gas which is a product of burning coal or oil. Chronic exposure can increase chances of respiratory infections and lung cancer. Causes corrosion to stone, concrete, metals, and paints.

**Nitrogen Dioxide (NO<sub>2</sub>):** A secondary pollutant, formed in the air from a chemical reaction between nitrogen and oxygen. Nitrogen Dioxide is a yellowish brown gas with a pungent, choking odor. This gas causes a characteristic brown haze. Chronic exposure can increase chances of respiratory infections and lung cancer.

**Volatile Organic Compounds (VOC):** Gaseous and liquid compounds containing carbon and hydrogen, including methane, butane, ethylene, benzene, and benzopyrene.

**Ammonia (NH<sub>3</sub>):** Ammonia is a colorless gas and a common molecule given off by living organisms. It is used to make fertilizers, animal foods, synthetic fibers, glues and explosives. It may enter the environment through natural organic matter decomposition, run-off from agricultural fields or feedlots, municipal waste treatment plant discharges, oil refinery and chemical manufacturing effluents, or atmospheric fallout. Short term health effects of exposure may include irritation of the mouth, nose, and throat. Higher levels may irritate the lungs, causing coughing and/or shortness of breath.

**Chlorine (Cl):** Chlorine is a greenish yellow gas with an irritating odor. Chlorine is a natural element of common occurrence. It is produced as a gas to be used extensively as a fabric bleach, for purifying water, for disinfecting, and for making synthetic rubber, plastics, and a large number of chlorinated chemicals. Exposure can cause irritation of the eyes, nose, and throat, and also tearing, coughing and chest pain. Higher levels burn the lungs and can cause a build up of fluid in the lungs (pulmonary edema) and death.

**Sources of Air Pollution:** Sources of air pollution is Accomack County which are

required to register with the Virginia Department of Environmental Quality (DEQ) are listed below.

**Regulation:** Air pollution sources in Virginia are regulated by the Virginia Department of Environmental Quality (DEQ), the Air Pollution Control Board, and the U.S. Environmental Protection Agency (EPA). These agencies administer programs created by the federal Clean Air Act. DEQ issues permits for emission sources in order to maintain ambient air quality standards established by the EPA. The EPA has established standards for total suspended particulates (TSP), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), Ozone (O<sub>3</sub>), and lead (Pb). Existing emission sources are required to use “reasonably available control measures,” and new emission sources are required to use “best available control technology,” to meet national ambient air quality standards.

The Department of Environmental Quality also enforces federal standards for hazardous air emissions. EPA has established standards for eight hazardous air pollutants (arsenic, asbestos, benzene, beryllium, mercury, radionuclides, vinyl chloride, and coke oven emissions). Virginia has established threshold limits for 600 additional hazardous or toxic compounds. The threshold limit is the lowest concentration at which a pollutant is estimated to be hazardous to human health. If these limits are exceeded, the source can reduce the emission to meet the limits; prove to the Department’s satisfaction that the limits are met; or, petition the Department to raise the limit. Newly permitted emission sources are also required to use Best Available Control Technology to control offensive odors. For existing or unanticipated sources of odor, the Department takes enforcement action, beginning with analysis of the problem and requiring a plan to correct it. Virginia’s air permit program includes existing source registration and standards, minor new or modified source construction permits, major new or modified source construction permits, Prevention of Significant Deterioration (PSD) permits, and operating permits.

#### Registered Air Pollution Sources

Source: DEQ, 2007

Commonwealth Chesapeake Power Station .....	New Church
US NASA – Wallops Flight Facility – Main Base.....	Wallops Island
US NASA – Wallops Island.....	Wallops Island
Tyson Foods Inc. .....	Temperanceville
Perdue Farms Incorporated .....	Accomac
Branscome Inc. – DBA Branscome Eastern Shore....	Oak Hall
Old Dominion Electric Cooperative.....	Belle Haven
Old Dominion Electric Cooperative.....	Onancock
Old Dominion Electric Cooperative.....	Accomac
KMX Chemical Corporation.....	New Church
Conectiv Delmarva Generation Inc.....	Tasley
Shore LifeCare at Parksley.....	Parksley
Island Crematory.....	Chincoteague
Ryan Lee Brady Farm.....	Atlantic

**Prevention of Significant Deterioration Permit:** Any person or entity intending to construct a new air pollution source; or to modify, relocate or reactivate an existing source that will emit 250 tons per year of any regulated pollutant or combination of regulated pollutants, must apply for a Prevention of Significant Deterioration Permit. Also, any of 28 specific industries identified by DEQ that will emit 100 tons per year of a regulated pollutant must apply for a permit. These industries include fossil fuel fired power plants of more than 250 million Btu per hour heat output, coal cleaning plants with thermal dryers, kraft pulp mills, Portland cement plants, primary zinc smelters, iron and steel mill plants, primary aluminum ore reduction plants, municipal incinerators capable of charging more than 250 tons of refuse per day, primary copper smelters, hydrofluoric acid plants, sulfuric acid plants, nitric acid plants, petroleum refineries, lime plants, phosphate rock processing plants, coke oven bottles, sulfur recovery plants, carbon black plants (furnace process), primary lead smelters, fuel conversion plants, sintering plants, secondary metal production plants, chemical process plants, fossil fuel burners (or combinations thereof) totaling more than 250 million Btu per hour heat input, petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels, taconite ore processing plant, glass fiber processing plants, and charcoal production plants. The stationary sources must be designed so that any additional emissions will not exceed the increment of pollution allowed for the area. Typical requirements of a permit include demonstration that the design incorporated the “Best Available Control Technology,” evidence that local zoning requirements are satisfied, and extensive predictive emissions modeling.

**State and Federal Operating Permits:** A state operating permit is required for any stationary source of air pollutants. Federal Title V operating permits are required for major stationary sources, plus any source subject to “Maximum Achievable Control Technology” requirements and those subject to “New Source Performance Standards” under the federal Clean Air Act. A major source under both state and federal operation permits is one that emits, or has the potential to emit, 100 tons or more per year of any criteria pollutant; for Title V permits, a source that emits 10 tons per year or more of any hazardous air pollutant or 25 tons per year of any combination of hazardous air pollutants. Operating permits typically include requirements for emission rates, emission controls, fuels, fuel consumption, visibility, operation and maintenance, record keeping, reporting, inspection, and permit review.

**Existing Sources Registration and Standards:** Registration is required for any existing (constructed before March 17, 1972 or reconstruction before December 10, 1976) stationary source that exceeds threshold amount of fugitive dust, odor or any other criteria pollutants from emission causing processes, exceeds national emission standards for hazardous air pollutants, maximum achievable control technology standards, or toxic pollutants under Virginia Air Toxics Regulation. Registered existing sources are typically required to report types and amounts of pollutants emitted, operate the source in compliance with maximum allowable levels of emissions as defined in the applicable rules, and conduct ambient air quality monitoring as directed by DEQ.

**Minor New or Modified Source Construction Permit:**

This permit is required of any person or entity intending to construct a new air pollution source, or to modify, relocate or reactivate an existing source not exempted by state regulation. A modification is any change to the facility or process, including hours of operation, which increases the potential to emit an air pollutant or causes a pollutant to be emitted that was not previously emitted. Stationary sources must control their emission using the "Best Available Control Technology" for each criteria pollutant and "Maximum Achievable Control Technology" for regulated hazardous air pollutants, certain identified toxic pollutants must be limited to specified levels, and procedures are established for measuring and recording emissions.

**B.A.C.T**

Under the 1977 Clear Air Act, new sources of emission must achieve a level of control at least as good as that obtained by using the best technological system of continuous emission reduction. This requirement is referred to as the use of "Best Available Control Technology," or "BACT." Best Available Control Technology levels are defined by the Environmental Protection Agency for each industry, based on control system performance and costs. The control system selected as the performance standard must have been "adequately demonstrated" to be achievable in practice, although it does not have to have been routinely achieved in the industry.

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**Major New or Modified Source Construction Permit:** This permit is required for any person or entity intending to construct a new stationary air pollution source or to modify, relocate or reactivate an existing source of a "criteria pollutant" for which the area is designated nonattainment. A modification is any change to the facility or process, including hours of operation, which increase the potential to emit an air pollutant or causes a pollutant to be emitted that was not previously emitted. Stationary sources in a nonattainment area must control their emission with the "Best Available Control Technology" for the criteria pollutants that meet the standard. For volatile organic compounds and nitrogen oxides, the more restrictive "Lowest Available Emission Rate" must be achieved.

**Air Quality Monitoring:** According to the Virginia Department of Air Pollution Control, there are no air quality monitoring stations on the Eastern Shore. Most areas of the state meet the primary ambient air quality standards, with the exception of the Northern Virginia, Richmond, and Hampton Roads areas, which are nonattainment areas for ozone. It can probably be safely assumed that air quality in Accomack County does not exceed any ambient air quality standards. The establishment of an air quality monitoring station in the county, however, would allow for the detection of any air quality deterioration and the study of long term trends.

**Odors and Noise:** Although Accomack County is a rural area, offensive odors from facilities such as poultry processing plants should be minimized. Noise from industrial facilities should also be minimized. In order to limit the impact of odors and noise, new industrial facilities should be located away from residential areas. New residential development should not be encouraged near industrial facilities.

## Plants and Animals

Accomack County supports populations of a wide variety of species of plants and animals. Many of these species have economic or recreational importance to the county and several are rare, threatened, or endangered species which have found habitat suitable for survival on the Eastern Shore.

**Biodiversity:** Biodiversity is a term used to describe the collection of plants, animals and other living organisms which make up an ecosystem. For example, the Chesapeake Bay is home to an estimated 2,700 species. These species make up the Bay's biodiversity. Scientists have found that maintaining this diversity of species in an ecosystem is important because the survival of each of these species is interconnected. Managing for biodiversity is not so much a matter of keeping all the parts of every community, but maintaining balance in the community. A broad range of species need to be present in any community in large enough numbers to fulfill their roles in that community. For example, it is speculated that the oyster population in the Bay was once great enough to filter all of the Bay's waters every few days. It would take today's reduced oyster population about a year to accomplish this task. Thus, decrease in the oyster population affects water quality which, in turn, has an impact on many other species.

**Habitats:** Accomack County offers large areas of undeveloped wildlife habitats. Important habitats include forests, open fields, creeks and creek corridors, wetlands, and the barrier islands. These areas provide sustenance to wildlife which are important to the county's seafood industry, hunting, tourism, nature watching, and sport fishing. Accomack County's natural areas and the rich wildlife and finfish and shellfish communities it supports are a part of the area's heritage and important to many industries as well as the quality of life for county residents.

**Forests:** Large amounts of Accomack County are covered in woodlands (32%). Loblolly pine is the primary tree species in these areas due to the fact that it thrives in poorly drained, sandy soils. Most of the soils which would support hardwood stands have been cleared and converted to cropland or residential uses. About a quarter of the county's forest land contains solid hardwood stands, the remainder is made up of pine or a pine/hardwood mix. Wooded areas provide habitat for white-tailed deer, raccoon, gray squirrel, opossum, cottontail rabbit, otter, wild turkey, quail, mourning dove, woodcock, and numerous breeding and migrating neotropical and temperate songbirds. Historically, the forests of Accomack and Northampton Counties likely supported small populations of federally endangered Delmarva Fox Squirrels; however, no naturally occurring populations currently exist on the lower Delmarva Peninsula. Maintaining diversity in forest type and age class will provide habitat for the greatest number of species across all taxa. Forest acreage can be increased by reforesting abandoned and unsuitable cropland with native forest crops. Additional information on Accomack's forests is included in the 2002 U.S. Census of Agriculture for Accomack County:

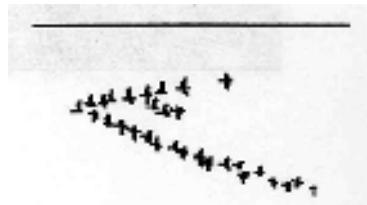
<http://www.nass.usda.gov/va/accomack.pdf>

**Open Land:** Cropland, pasture, meadows, and areas overgrown with grasses, herbs, shrubs, and vines provide habitat for several species of wildlife, including woodcock, bobwhite quail, songbirds, butterflies, cottontail rabbits, and red and gray foxes.

**Barrier Islands:** The Atlantic coast barrier islands provide important breeding habitat for shorebirds (i.e., federally threatened piping plovers, state threatened Wilson's plovers, American oystercatchers, willets, and killdeer), seabirds (i.e., state threatened gull-billed terns, least terns, common terns, royal terns, sandwich terns, black skimmers, brown pelicans, laughing gulls, herring gulls, and great black-backed gulls), wading birds (i.e., white ibis, glossy ibis, great egrets, snowy egrets, tri-colored herons, green herons, little blue herons, black-crowned night herons, yellow-crowned night herons), waterfowl (i.e., American black ducks, mallards, gadwalls, and Canada geese) clapper rails, and raptors (state threatened peregrine falcons and bald eagles and northern harriers). The barrier islands also represent critical stopover sites for thousands of migrating shorebirds such as red knots, dunlin, sanderlings, ruddy turnstones, whimbrels, and various species of sandpipers, plovers, godwits, and dowitchers. Assateague Island currently supports the only viable population of the federally endangered Delmarva Fox Squirrel whose distribution used to extend into Northampton County. This population stems from the translocation of 30 squirrels from Maryland on to the lower half of Assateague Island between 1968 and 1971. Assateague Island also provides habitat for non-native Chincoteague ponies thought to have swum ashore from a wrecked Spanish vessel in the 1600's and the Asian sika elk which were released on the island in the 1920's a herd of wild ponies.

The barrier islands of Virginia's Eastern Shore, and the adjacent seaside lagoon system represent one of the last remaining vestiges of pristine coastal habitats on the Eastern Seaboard. Together they comprise a community which is not only unique in this country, but in the world. The string of islands, many of which are owned and managed by the Nature Conservancy, (i.e., parts of Metompkin and Cedar Islands, Parramore Island, Revel Island, Hog Island, Cobb Island, Little Cobb Island, Ship Shoal Island, Myrtle Island, and Smith Island) while rest are owned and/or managed by USFWS and the state of Virginia, has been designated by the United Nations as a World Biosphere Reserve in recognition of it's great ecological value. Because of their ownership status, all 14 barrier islands are protected in perpetuity from future development. The barrier islands located in Accomack County include Assateague Island, Wallops Island, Assawoman Island, Metompkin Island, Cedar Island, Revel Island, and Parramore Island. The remaining Virginia barrier islands are located in Northampton County.

**Wetlands:** The county has approximately 109,508 acres of tidal wetlands. Tidal wetlands have been identified as some of the most productive ecosystems in the world. Because tidal wetlands trap nutrients from both land and sea, their productivity dwarfs that of all but a few other exceptional ecosystems. They provide essential resting, wintering and nesting grounds for many species of migratory waterfowl, other



The irregular "V" formation of migrating Canada Geese

waterbirds and songbirds. These birds, along with other wildlife, find nourishment and rest in the same lush marsh grass which produces detritus. Detritus, bacterially decomposing grass, is the basis of the food chain that feeds oysters, clams, scallops, crab larvae and newborn fish. It has been calculated that 90% of the commercial fish and shellfish caught in the area are dependent, during at least part of their lives, upon tidal wetlands. Among these are menhaden, oysters, clams, and crabs. In addition, tidal flats attract thousands of birds during their spring and fall migrations, and the numerous creeks and channels provide refuge for a wide variety of ducks and geese.

Tidal wetlands in the Commonwealth of Virginia have been defined, by the Wetlands Act, Title 62.1, Section 13.2, Code of Virginia, as "all land lying between and contiguous to mean low water and an elevation above mean low water equal to the factor 1.5 times the mean tide range at the site..." The definition is further specified to include tidal vegetated wetlands and tidal non-vegetated wetlands. Tidal vegetated wetlands include such features as swamps, marshes, bogs and similar areas. Non-vegetated tidal wetlands include such features as beaches, tidal flats and similar areas. The general location of tidal wetlands areas in Accomack County are shown on Map H.

**Vegetated Tidal Wetlands:** Vegetated tidal wetlands in Accomack County are divided into two natural categories, the massive salt marshes along the Atlantic Ocean shoreline situated behind the barrier islands and the extensive brackish marshes on the Chesapeake Bay shoreline and bay islands. The salt marshes, dominated by salt marsh cordgrass, total approximately 46,452 acres. The brackish marshes, most of them dominated by Black Needlerush, total approximately 23,918 acres. The total for the county, the largest acreage of tidal marshes for any county in Virginia, is approximately 70,470 acres.

**Map 2-H**

The ecological significance of an area can be estimated on the basis of the number of species of vegetation present, the potential productivity of the dominant forms and the relative value of those forms to wildlife, both terrestrial and aquatic. Not all grasses and shrubs in tidal wetlands have equal values to all types of animal life that might be present, and these variations provide the means for placing varying levels of significance on different wetland units.

The Virginia Institute of Marine Science (VIMS) has identified twelve marsh types and grouped them into five classifications based on the estimated total environmental value of an acre of each type.

*Group One* marshes have the highest values in productivity, wildfowl and wildlife utility and are closely associated with fish spawning and nursery areas. They also have high values as erosion inhibitors, which is important to the shellfish industry.

*Group Two* differs from Group One only in the fact that the amount of detritus produced is less readily available to the marine environment. This is because Group Two marshes grow at higher elevations and consequently less tidal action exists to flush the detritus into adjacent waterways. However, these marshes have very high values in protection of water quality and acting as buffers against coastal flooding.

*Group Three* contains two marsh plants that are quite dissimilar in properties. The yellow pond lily marsh is not a significant contributor to the food chain, but it does have high value to wildlife and waterfowl. Black Needlerush has a high productivity factor but a low availability value because it grows at higher elevations. Black Needlerush does rank high as an erosion and flood buffer.

*Group Four* is valued primarily for the diversity and bird nesting area it adds to the marsh ecosystem and somewhat as an erosion buffer.

*Group Five* marshes have very few values as either a habitat, detritus producer or erosion control agent.

The most vegetatively diverse area of tidal marsh in Accomack County is found between Pitts Creek (Maryland State line) and Holden's Creek. The only tidal freshwater marsh in Accomack County is found in this area at the upper end of Pitts Creek, near the Maryland border. This tidal marsh contains a rich variety of marsh grasses. Because of the uniqueness of this marsh, consideration should be made for its preservation.

**Non-vegetated Tidal Wetlands:** Non-vegetated tidal wetlands are those coastal environments between mean higher high water and mean lower low water in which no vascular plants grow. They occur adjacent to tidal marshes, beaches and other shorelines. The seaside, because of its greater tidal range, contains non-vegetated intertidal flats at least as extensive as tidal marshes.

Non-vegetated tidal wetlands are among the most valuable of coastal environments in supporting coastal resources. They share valuable attributes with both tidal marshes and subaqueous estuarine habitats. Primary productivity in intertidal areas is larger than in open waters because of the greater supply of light and nutrients available in very shallow areas.

Intertidal areas are widely recognized as important nursery and feeding grounds for important fishes and crustaceans and for the prey which support them. In addition, shellfish such as oysters and clams inhabiting non-vegetated wetlands constitute a resource of notable commercial and recreational importance. Nonvegetated tidal wetlands constitute the principal feeding ground of shorebirds and many waterfowl which exploit benthic animal prey. Some birds specialize in protected mud flats, while others forage only on exposed sandy beaches.

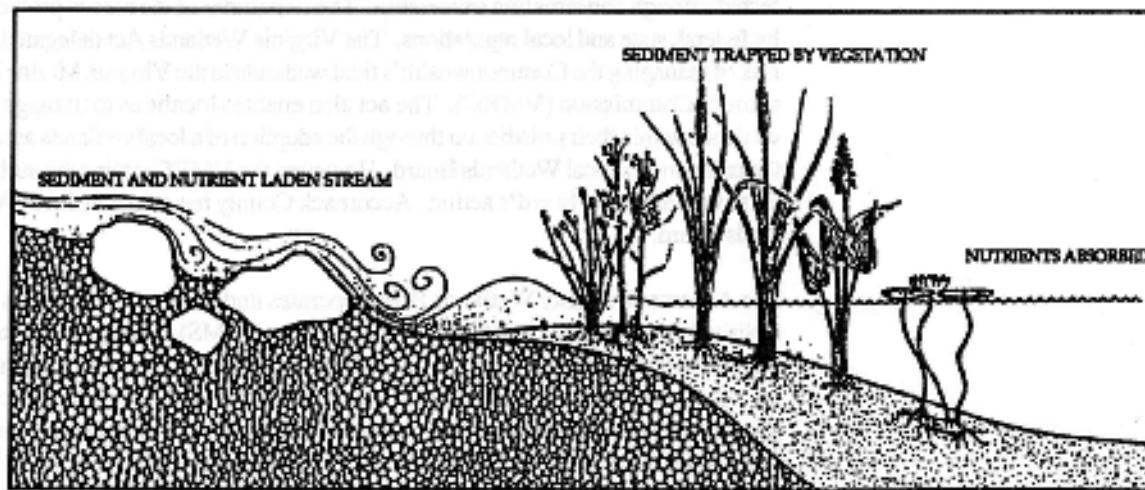
**Impacts on Wetlands:** According to the Accomack County Tidal Marsh Inventory, 1977, by the Virginia Institute of Marine Science, in Accomack County the major damage to tidal wetlands stem from dredge and fill operations. Dredging is usually performed to create or to maintain existing channels in order to provide water access to land or to other waterways. Sometimes it is performed to obtain fill to create land; in many of these situations channels are dredged to create "waterfront" properties to which high real estate values may be attached.

Dredging may destroy productive bottoms directly by mechanical disruption or indirectly through the creation of silt which drifts with the currents and smothers the oysters, clams, fish eggs and larvae, and beds of marine vegetation in areas beyond the actual site of dredging.

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**Vegetated tidal wetlands filter sediment and nutrients from runoff.**

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In addition, the dredging of a channel may alter the velocity of water flow in and out of the tidal marsh. This may lead to sedimentation problems in the future or may affect the rate in which beneficial marsh detritus is flushed into the marine environment.

When tidal marshes are filled, their biotic productivity and diversity is greatly reduced, and only slowly do these areas recover to viable natural segments of the environment. Their recovery, in addition, is to a habitat more upland in nature. This reduces the amount of detritus that contributes to the food chain and subsequently causes reduced values to the marine ecosystem.

The Island District, because of the high values of its tidal wetland areas and the high development pressure affecting those wetlands was selected by the United States Environmental Protection Agency (EPA) for any extensive wetland survey. The results of the survey, which were presented to Chincoteague in 1986, are to be used by the agencies which manage tidal and non-tidal wetlands.

Massive damage to tidal wetlands has taken place from Swans Gut Creek to the vicinity of Powell Creek, an area now known as Captain's Cove. Dredged channels have been cut through the tidal marsh and spoil deposited on the marsh surface. Damage has also occurred in the tidal wetlands of the Greenbackville-Franklin City area, again by dredge and fill operations. Overwash and spoil disposal have adversely affected the tidal marshes on Upper Metompkin Island, immediately south of Gargatha Inlet. There are a number of tidal wetlands that have been altered by dredge and fill operations in the area around Metompkin Bay to Wachapreague. These include Parker Creek, Walston Creek, the mouth of Folly Creek and the western shoreline of Burton's Bay. A number of tidal marshes have been impacted by unconstrained spoil.

**Wetlands Protection:** Much of the wetlands area in Accomack County is protected through conservation ownership. The remainder of the area is protected by federal, state and local regulations. The Virginia Wetlands Act delegated the task of managing the Commonwealth's tidal wetlands to the Virginia Marine Resources Commission (VMRC). The act also enables localities to manage the wetlands within their jurisdiction through the adoption of a local wetlands act and the creation of a local Wetlands Board. However, the VMRC retains the authority to veto any local board's action. Accomack County has an active local Wetlands Board.

The Accomack County Wetlands Board operates under the general criteria established by the Virginia Institute of Marine Science (VIMS). This general criteria states that, provided significant marine fisheries, wetlands and wildlife resources are not unreasonably detrimentally affected, alteration of the shoreline or construction of shoreline facilities may be justified in order to (1) gain access to navigable waters by commercial, industrial, and recreational interests for which it has been clearly demonstrated that waterfront facilities are required or by owners of land adjacent to waters of navigable depth or waters which can be made navigable with only minimal adverse impact on the environments, and (2) protect property from significant damage or loss due to erosion or other natural causes.

Alteration of the shoreline is ordinarily not justified (1) for purposes or activities which can be conducted on existing fastlands and which have no inherent requirement for access to water resources, (2) for purposes of creating waterfront property from lots and subdivisions which are not naturally contiguous to waters of navigable depth or waters which can be made navigable by substantial alteration or destruction of marine resources, (3) when damage to properties owned by others is a likely result of the proposed activity, (4) when the alteration will result in discharge of effluents which impair wetlands, water quality or other marine resources, or (5) when there are viable alternatives which can achieve the given purpose without adversely affecting marshes, oyster grounds or other natural resources.

Other general criteria followed by the Wetlands Board include that the utilization of open-pile type structures for water access are preferred over the construction of solid structures or dredging and filling, that channels, fills and structures should be designed to withstand the stress of the marine environment and minimize the need for future maintenance activities, and that high density development in or immediately adjacent to wetlands and/or other floodplains is discouraged.

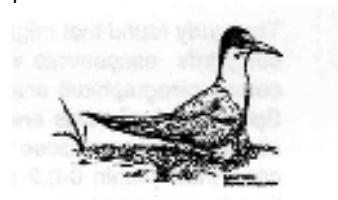
The Wetlands Board also follows specific criteria for certain types of projects including shoreline protection strategies and filling and dredging material disposal. Specific criteria for shoreline protection strategies include that shoreline protection structures are justified only if there is active, detrimental shoreline erosion which cannot be otherwise controlled, that the planting of marsh grass is the preferred means of stabilization for shores experiencing mild to moderate erosion, that erosion control structures

should ordinarily be placed landward of any existing and productive marsh vegetation, and that sloped rock or riprap revetments and gabions are generally preferred over vertical structures. Specific criteria for filling and dredge material disposal include that filling should be confined to the area land-ward of any wetlands, that controlled disposal of dredged material on highland property is the preferred method, and that dredge spoil disposal areas should be constructed to minimum criteria to ensure that sedimentation is controlled.

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### Habitat Creation

The improper placement and containment of dredge spoil material can adversely impact wetlands and destroy habitat. The U.S. Fish and Wildlife Service's Atlantic Coast Piping Plover Recovery Plan recommends the use of dredge spoil deposition to create shore bird habitat. The plan states that spoil of suitable material (sand, pebble, shell mix) has proven to be suitable habitat for beach nesting birds such as the piping plover and least tern.



**Natural Communities:** Accomack County is home to many significant natural communities, including some that are found nowhere else in Virginia.

**Sea-level Fens:** A unique and extremely rare type of coastal wetland, sea-level fens are only documented in Sussex County, Maryland, and Accomack County, Virginia. These fens are distinguished from a marsh or a bog by unique hydrological regimes and vegetation associations. In general, sea-level fens are open, freshwater wetlands located at the upland edges of wide, ocean side tidal marshes. Vegetation consists of an unusual combination of northern bog plants and southern tidal freshwater wetlands plants. The number of rare species documented in fens is significant. For some of these species, the Virginia sea-level fens represent the southernmost extent of their range and the only habitat that supports these species in the state. The greatest threat to sea-level fens is groundwater pollution. Possible movement of fertilizers and wastes into the groundwater from nearby developments or agricultural fields could lead to increased nutrient levels in the fen. Increased nutrient levels could disrupt soil characteristics and plant species that naturally exist in fen conditions. Virginia has protected the Mutton Hunk Fen, on the Seaside near Gargatha, as a 425-acre Natural Area Preserve.

**Migratory Songbirds:** In 1993, the Department of Environmental Quality released a report on Neotropical Migratory Songbird Migration that resulted from observation of songbird migration patterns over the Delmarva and Cape May peninsulas. The report stresses the importance of protecting migratory stopover habitats. The study found that migratory songbirds concentrate within certain geographical areas. Specifically, migrants are more abundant in areas close to all coastlines (within 0-0.9 miles) than in equivalent areas farther from the coast (0.9-1.9 miles); Bay coastal zones have higher densities of migrants than seaside coastal zones or interior regions; migratory songbirds are more abundant on barrier islands than the coastal mainland; and migrants are associated with particular habitats on a species specific basis.

**Chesapeake Bay Beach Habitat of the federally threatened Northeastern Tiger Beetle:** This species primarily inhabits the Chesapeake Bay region of Maryland and Virginia. Historically found from the Chesapeake Bay north to Massachusetts, only two remnant populations remain in Massachusetts, while all other historical populations along the east coast outside the Chesapeake Bay area are extirpated. This species inhabits wide, white, highly dynamic, sandy beaches bordering the eastern and western shores of the Chesapeake Bay. Threats to this species include shoreline development, beach stabilization, high recreational use, pesticides, and natural events including winter beach erosion, flood tides, and hurricanes.

**Migratory Songbird Corridor:** The Atlantic migratory flyway covers the entire Atlantic coast. Significant stopover areas for land birds in this flyway occur within coastal habitats from Cape May, New Jersey to Cape Charles, Virginia. Many species of neotropical songbirds spend up to one-third of each year migrating. During this phase of their annual cycle, the birds are faced with many hazards. It is estimated that half of the birds that leave their northern range in the autumn will not make it back in the spring. One reason

for this is the high amount of energy required to make the journey of several hundred to several thousand miles. Many migrants are unable to find sufficient food resources needed to maintain their energy reserves. Other reasons for such high mortality rates include predation, exposure, and unfavorable weather and wind conditions. Migrant land birds depend on large tracts of undisturbed Forested and scrub-shrub habitats where they can rest and refuel before resuming their long journeys south. Stopover sites that are comprised of large contiguous forest blocks, particularly deciduous and mixed forests that support a high diversity of insects and fruits, provide suitable stopover habitat for the greatest number of species. More specifically, forests consisting of several layers of vegetation provide the greatest amount of feeding and resting niches for migratory songbirds dense undergrowth and closed canopy of trees provide cover from predators. Shrub-scrub habitats including those occurring along shorelines and dominated by bayberry and high tide brush also serve as important staging areas.

Over the years, human activities have affected the survivorship of songbirds migrating between breeding and wintering grounds. Many migrants travel at night over urbanized areas. Lights illuminating tall structures such as high rise buildings, communication towers and bridges can cause large flocks of birds to become disoriented and fly into these edifices. One of the greatest threats humans pose to migrant landbirds is the widespread reduction in high quality stopover habitats, especially at migration bottlenecks where large numbers of resting and feeding birds congregate such as peninsulas and mountain passes. The lower Delmarva Peninsula is a well known example of such a bottleneck; as such special efforts should be made to conserve large contiguous tracts of forests and shrub-scrub habitats.

***Extensive Marshes for Marsh Nesting Birds:*** These habitats provide resting, nesting and feeding habitat for numerous bird species whose population status is either unknown or declining. In Accomack County these include, but are not limited to, Black Rails, Soras, Virginia Rails, Little Blue Herons, Henslow's Sparrows, Saltmarsh Sharp-tailed Sparrows, Black Ducks, and Northern Harrier. Recent studies in Virginia, conducted by the Center for Conservation Biology, College of William and Mary, suggest that the number of bird species found in a marsh is directly related to the size of the marsh. It can therefore be assumed that Accomack County's extensive marshes provide important habitat for a large variety of marsh-nesting birds. The minimum marsh size to support significant marsh bird communities appears to be between 10 and 15 acres. The primary threat to marsh nesting birds is loss or degradation of marsh habitat. Where marsh vegetation is disturbed by heavy equipment or changes in water hydrology the common reed, a tall wetland grass, often invades the area. Once established, common reed aggressively displaces native vegetation and produces large stands which have little value to wildlife.

**Migratory Songbirds** In 1993, the Department of Environmental Quality released a report on Neotropical Migratory Songbird Migration that resulted from observation of songbird migration patterns over the Delmarva and Cape May peninsulas. The report stresses the importance of protecting migratory stopover habitats. The study found that migratory songbirds concentrate within certain geographical areas. Specifically, migrants are more abundant in areas close to all coastlines (within 0-0.9 miles) than in equivalent areas farther from the coast (0.9-1.9 miles); Bay coastal zones have higher densities of migrants than seaside coastal zones or interior regions; migratory songbirds are more abundant on barrier islands than the coastal mainland; and migrants are associated with particular habitats on a species specific basis.



**Natural Heritage Resources:** The Code of Virginia established a program within the Department of Conservation and Recreation to protect habitats of rare, threatened, and endangered plant and animal species; exemplary natural communities, habitats, and ecosystems; and other natural features of the Commonwealth. These protected resources are given the label of "Natural Heritage Resources." The Department of Conservation and Recreation has provided the county with a list of Natural Heritage Resources in Accomack County. Species which are believed to be sufficiently rare or threatened to merit an inventory of their status and location are listed on the tables that follow.

**Ranking System:** Ranking systems have been developed to designate a species' rarity based on its range-wide status. A species' global rank is based on its level of occurrence world-wide, whereas its state rank is based on its occurrence within the boundaries of the state of Virginia. Species which are fairly common in other parts of the country but seldom found in Virginia will have different global and state ranks.

**Protection Status:** The U.S. Fish and Wildlife Service and the National Marine Fisheries Service identify species which receive protection under the Federal Endangered Species Act. Federal status lists a species as endangered, threatened, or as proposed or candidates for listing.

**Fisheries Management:** The Virginia Marine Resources Commission is responsible for tracking finfish and shellfish landings in Virginia waters. This provides information on the economic contribution to the County as well as an inventory of aquatic life in County waters. During 1992, 2,351,459 pounds of finfish were sold dock-side in Accomack at a value of \$1,209,789. Total landings for shellfish were 845,956 pounds with an economic value of \$1,258,308. The economic value of the landings represents 4% of all landings in Virginia. This data is anticipated to change drastically in future years as the method of reporting this data has changed. Prior to 1993, the Virginia Marine Resources Commission reporting system for catches was voluntary reporting by seafood dealers. Information is now being assembled from mandatory reporting by fishermen and not the dealer.

The 2005 VIMS report *The Importance of Commercial and Recreational Fishing* estimates the economic contributions of fisheries to Virginia's economy. The study measures fisheries sales/output, income/value added, and the number of full and part-time jobs

generated by expenditures on commercial harvesting and recreational angling. The value of Accomack County's 2005 commercial fisheries/landings was \$13,695,000, or 9.5 percent of Virginia's total landings. Accomack County's total 2005 commercial fisheries value added economic impact was \$1,480,000. The direct value of Accomack County's 2005 recreational angling was \$23,151,000, or 7.7 percent of Virginia's total value. Accomack County's value added total was \$29,971,000.

	Common Name	Global Rank	State Rank	Federal Status	State Status
Plants	Seabeach Amaranth	G2	S1	LT	LT
	Sea-beach Knotweed	G3	S1S2		
	Blue maiden-cane	G4	S1		
	Prairie False-indigo	G4	S1		
	Southern Beach Spurge	G4G5	S2		
	Horse-tail Spikerush	G4	S1		
	Salt-marsh Spikerush	G4	S1		
	Low Frostweed	G4	S1		
	Big-head Rush	G4G5	S2		
	Golden Puccoon	G4G5	S1		
	Elongated Lobelia	G4G5	S1		
	Salt Marsh Goosegrass	G3G5	S1		
	Awned Mountain-mint	G4	S1		
	Few-flowered Beakrush	G4	S1		
	Long-beaked Baldrush	G4	S1		
	One-flower Sclerolepis	G4	S1		
	Large Cranberry	G4	S2		
	Puerto Rico Peatmoss	G5	S1S2		
	Sea-beach Sedge	G5	S1		
	Hazel Dodder	G5	S2?		
	Smartweed Dodder	G5	S2?		
	Umbrella Flatsedge	G5	S1		
	White-top Fleabane	G5	S2		
	White Buttons	G5	S1		
	Ten-angle Pipewort	G5	S2		
	Seaside Heliotrope	G5	S1		
	Northern St. John's-wort	G5	S2		
	Brown-fruited Rush	G5	S1		
	Sheep-laurel	G5	S2		
	Big Floating-heart	G5	S1		
	Joint Paspalum	G5	S2		
	White Beakrush	G5	S2		
	Slender Marsh Pink	G5	S2		
	Whorled Nutrush	G5	S2		
	Fraser's Marsh St. John's-wort	G5	S1		
	Southern Bladderwort	G5	S2		
	Colombia Water-meal	G5	S1		
	Virginia Least Trillium	G3T2	S2	SOC	

	Common Name	Global Rank	State Rank	Federal Status	State Status
<b>Animals</b>	Piping Plover	G3	S2B,S1N	LT	LT
	Spectral Tiger Beetle	G3G4	S1		
	Loggerhead (Sea Turtle)	G3	S1B,S1N	LT	LT
	Saltmarsh Sharp-tailed Sparrow	G4	S2B,S3N		SC
	Peregrine Falcon	G4	S1B, S2N		LT
	Black Rail	G4	S2B,S2N		
	Brown Pelican	G4	S1B,S3N		SC
	Least Tern	G4	S2B		SC
	Great Egret	G5	S2B,S3N		SC
	Wilson's Plover	G5	S1B		LE
	Northern Harrier	G5	S1S2B,S3S4N		SC
	Little Blue Heron	G5	S2B,S3N		SC
	Snowy Egret	G5	S2B,S3N		
	Tricolored Heron	G5	S2B,S3N		SC
	Bald Eagle	G5	S2S3B,S3N	LT,PDL	LT
	Black-necked Stilt	G5	S1B		
	Glossy Ibis	G5	S2B,S1N		SC
	Sora	G5	S1B,S2N		
	Virginia Rail	G5	S2B,S3N		
	Black Skimmer	G5	S2B,S1N		
	Caspian Tern	G5	S1B,S2N		SC
	Gull-billed Tern	G5	S2B		LT
	Bronze Copper	G5	S1		
	Delta-spotted Spiketail	G5	S1		
	Northeastern Beach tiger Beetle	G4T2	S2	LT	LT
	Delmarva Fox Squirrel	G5T3	S1	LE	LE

### Global Ranking System

Rank	Description
G1 .....	Extremely rare and critically imperiled with 5 or fewer occurrences or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
G2 .....	Very rare and imperiled with 6 to 20 occurrences or few remaining individuals; or because of some factor (s) making it vulnerable to extinction.
G3 .....	Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range; or vulnerable to extinction because of other factors.
G4 .....	Common and apparently secure globally, though it may be rare in parts of its range, especially at the periphery.
G5 .....	Very common and demonstrably secure globally, though it may be rare in parts of its range, especially at the periphery.
GH.....	Formerly part of the world' biota with expectation that it may be rediscovered.
GX .....	Believed extinct throughout its range with virtually no likelihood of rediscovery.
G? .....	Unranked, or, if following a ranking, rank uncertain (ex. - G3?).
G_Q.....	The taxon has a questionable taxonomic assignment, such as G3Q.
G_T .....	Signifies the rank of subspecies or variety. For example, a G5T1 would apply to a subspecies of a species that id demonstrably secure globally (G5) but the subspecies warrants a rank of T1, critically imperiled.

### **State Ranking System**

<b>Rank</b>	<b>Description</b>
S1.....	Extremely rare and critically imperiled with 5 or fewer occurrences or very few remaining individuals in Virginia; or because of some factor(s) making it especially vulnerable to extirpation in Virginia.
S2.....	Very rare and imperiled with 6 to 20 occurrences or few remaining individuals in Virginia; or because of some factor(s) making it vulnerable to extirpation in Virginia.
S3.....	Rate to uncommon in Virginia with between 20 and 100 occurrences; may have fewer occurrences if found to be common or abundant at some of these locations; may be somewhat vulnerable to extirpation in Virginia.
S4.....	Common and apparently secure with more than 100 occurrences; may have fewer occurrences with numerous large populations.
S5.....	Very common and demonstrably secure in Virginia.
SH .....	Formerly part of Virginia biota with expectation that it may be rediscovered.
SX.....	Believed extirpated from Virginia with virtually no likelihood of rediscovery.
SE .....	Exotic; not believed to be a native component of Virginia's flora.
SU .....	Possibly rare, but status uncertain and more data needed.
S_? .....	Rank uncertain; for example, an S2? denotes a species with rarity that may range from S1 to S3, an SE? means a species may or may not be native to Virginia.

### **The Virginia Wildlife Action Plan**

In 2000, the U.S. Congress began to address the need for conserving all wildlife by creating the [State Wildlife Grants](#) program. This new funding is being used by states, including Virginia, to conserve wildlife and habitats, especially those that are rare or in decline, and to proactively keep other species from becoming less common. In addition to providing this critical new funding, Congress asked each state to develop a comprehensive plan - an Action Plan - for proactive management of all wildlife and the network of habitats that support them. The [Virginia Wildlife Action Plan](#) (WAP) provides a common vision for wildlife conservation across the Commonwealth, identifying the important steps that we must all take to keep common species common and to prevent further decline, or possible extinction, of imperiled species. The Virginia Department of Game and Inland Fisheries which is responsible for managing the state's wildlife resources completed the WAP in 2005 which is available on line at <http://www.BeWildVirginia.org/wildlifeplan/>.

Accomack County supports 11% (99/925) of the state's species of greatest conservation need (SGCN). These species were broken into four tiers that offer a finer resolution of conservation need than what is currently afforded by state and federal ranking of endangered, threatened and species of special concern. The four tiers of imperilment are defined as follows:

**Tier I.** Critical conservation need. Faces an extremely high risk of extinction or extirpation. Populations of these species are at critically low levels, face immediate threat(s), or occur within an extremely limited range. Intense and immediate management action is needed.

**Tier II.** Very high conservation need. Has a high risk of extinction or extirpation. Populations of these species are at very low levels, face real threat(s), or occur within a

very limited distribution. Immediate management action is needed for stabilization and recovery.

**Tier III.** High conservation need. Extinction or extirpation is possible. Populations of these species are in decline, have declined to low levels, or are restricted in range. Management action is needed to stabilize or increase populations.

**Tier IV.** Moderate conservation need. The species may be rare in parts of its range, particularly on the periphery. Populations of these species have demonstrated a declining trend or a declining trend is suspected which, if continued, is likely to qualify this species for a higher tier in the foreseeable future. Long term planning is needed to stabilize or increase populations.

**Table #. List of species of greatest conservation need (and associated tier rankings) known to occur in Accomack County broken by taxa.**

Tier	Common Name	Scientific Name
<b>Birds</b>		
I	Plover, piping	<i>Charadrius melanotos</i>
I	Plover, Wilson's	<i>Charadrius wilsonia</i>
I	Falcon, peregrine	<i>Falco peregrinus</i>
I	Sparrow, Henslow's	<i>Ammodramus henslowii</i>
I	Tern, gull-billed	<i>Sterna nilotica</i>
I	Rail, black	<i>Laterallus jamaicensis</i>
I	Sapsucker, yellow-bellied	<i>Sphyrapicus varius</i>
I	Warbler, black-throated green	<i>Dendroica virens</i>
II	Eagle, bald	<i>Haliaeetus leucocephalus</i>
II	Heron, little blue	<i>Egretta caerulea caerulea</i>
II	Owl, northern saw-whet	<i>Aegolius acadicus</i>
II	Sparrow, saltmarsh sharp-tailed	<i>Ammodramus caudatus</i>
II	Tern, least	<i>Sterna antillarum</i>
II	Wren, winter	<i>Troglodytes troglodytes</i>
II	Bittern, American	<i>Botaurus lentiginosus</i>
II	Duck, American black	<i>Anas rubripes</i>
II	Oystercatcher, American	<i>Haematopus palliatus</i>
II	Rail, king	<i>Rallus elegans</i>
II	Skimmer, black	<i>Rynchops niger</i>
II	Tern, royal	<i>Sterna maxima maximus</i>
III	Harrier, northern	<i>Circus cyaneus</i>
III	Heron, tricolored	<i>Egretta tricolor</i>

III	Ibis, glossy	<i>Plegadis falcinellus</i>
III	Night-heron, yellow-crowned	<i>Nyctanassa violacea violacea</i>
III	Owl, barn	<i>Tyto alba pratincola</i>
III	Wren, sedge	<i>Cistothorus platensis</i>
III	Bittern, least	<i>Ixobrychus exilis exilis</i>
III	Brant	<i>Branta bernicla brota</i>
III	Night-heron, black-crowned	<i>Nycticorax nycticorax hoactii</i>
III	Redhead	<i>Aythya americana</i>
III	Tern, common	<i>Sterna hirundo</i>
IV	Blackbird, rusty	<i>Euphagus carolinus</i>
IV	Bobwhite, northern	<i>Colinus virginianus</i>
IV	Catbird, gray	<i>Dumetella carolinensis</i>
IV	Chat, yellow-breasted	<i>Icteria virens virens</i>
IV	Chuck-will's-widow	<i>Caprimulgus carolinensis</i>
IV	Creeper, brown	<i>Certhia americana</i>
IV	Cuckoo, yellow-billed	<i>Coccyzus americanus</i>
IV	Dowitcher, short-billed	<i>Limnodromus griseus</i>
IV	Dunlin	<i>Calidris alpina hudsonia</i>
IV	Flycatcher, willow	<i>Empidonax traillii</i>
IV	Godwit, Hudsonian	<i>Limosa haemastica</i>
IV	Godwit, marbled	<i>Limosa fedoa</i>
IV	Grebe, horned	<i>Podiceps auritus</i>
IV	Grosbeak, rose-breasted	<i>Pheucticus ludovicianus</i>
IV	Heron, green	<i>Butorides virescens</i>
IV	Kingbird, eastern	<i>Tyrannus tyrannus</i>
IV	Knot, red	<i>Calidris canutus rufus</i>
IV	Meadowlark, eastern	<i>Sturnella magna</i>
IV	Nuthatch, brown-headed	<i>Sitta pusilla</i>
IV	Ovenbird	<i>Seiurus aurocapilla</i>
IV	Parula, northern	<i>Parula americana</i>
IV	Pewee, eastern wood	<i>Contopus virens</i>
IV	Plover, black-bellied	<i>Pluvialis squatarola</i>
IV	Rail, clapper	<i>Rallus longirostris crepitans</i>
IV	Rail, Virginia	<i>Rallus limicola</i>
IV	Scaup, greater	<i>Aythya marila</i>
IV	Sparrow, field	<i>Spizella pusilla</i>
IV	Sparrow, grasshopper	<i>Ammodramus savannarum pratensis</i>
IV	Sparrow, seaside	<i>Ammodramus maritimus</i>
IV	Swallow, northern rough-winged	<i>Stelgidopteryx serripennis</i>
IV	Swift, chimney	<i>Chaetura pelagica</i>
IV	Tanager, scarlet	<i>Piranga olivacea</i>
IV	Tern, Forster's	<i>Sterna forsteri</i>

IV	Tern, roseate	<i>Sterna dougallii dougallii</i>
IV	Thrasher, brown	<i>Toxostoma rufum</i>
IV	Thrush, wood	<i>Hylocichla mustelina</i>
IV	Towhee, eastern	<i>Pipilo erythrophthalmus</i>
IV	Vireo, yellow-throated	<i>Vireo flavifrons</i>
IV	Warbler, black-and-white	<i>Mniotilla varia</i>
IV	Warbler, Canada	<i>Wilsonia canadensis</i>
IV	Warbler, Kentucky	<i>Oporornis formosus</i>
IV	Warbler, prairie	<i>Dendroica discolor</i>
IV	Warbler, prothonotary	<i>Protonotaria citrea</i>
IV	Warbler, worm-eating	<i>Helmitheros vermivorus</i>
IV	Warbler, yellow	<i>Dendroica petechia</i>
IV	Waterthrush, Louisiana	<i>Seiurus motacilla</i>
IV	Whimbrel	<i>Numenius phaeopus</i>
IV	Whip-poor-will	<i>Caprimulgus vociferus</i>
IV	Woodcock, American	<i>Scolopax minor</i>
IV	Wren, marsh	<i>Cistothorus palustris</i>
<b>Mammals</b>		
II	Squirrel, Delmarva Peninsula fox	<i>Sciurus niger cinereus</i>
III	Squirrel, Southeastern fox	<i>Sciurus niger niger</i>
IV	Cottontail, Appalachian	<i>Sylvilagus obscurus</i>
<b>Amphibians</b>		
IV	Frog, New Jersey chorus	<i>Pseudacris feriarum kalmi</i>
IV	Spadefoot, eastern	<i>Scaphiopus holbrookii</i>
<b>Reptiles</b>		
I	Turtle, loggerhead sea	<i>Caretta caretta</i>
II	Terrapin, northern diamond-backed	<i>Malaclemys terrapin terrapin</i>
III	Turtle, spotted	<i>Clemmys guttata</i>
III	Turtle, eastern box	<i>Terrapene carolina carolina</i>
IV	Snake, eastern hog-nosed	<i>Heterodon platirhinos</i>
<b>Terrestrial Insects</b>		
II	Beetle, northeastern beach tiger	<i>Cicindela dorsalis dorsalis</i>
<b>Fishes</b>		
III	Shiner, emerald	<i>Notropis atherinoides</i>
IV	Eel, American	<i>Anguilla rostrata</i>
IV	Lamprey, least brook	<i>Lampetra aepyptera</i>
IV	Swampfish	<i>Chologaster cornuta</i>
IV	Topminnow, lined	<i>Fundulus lineolatus</i>
<b>Aquatic Invertebrates</b>		
III	Amphipod, tidewater	<i>Stygobromus indentatus</i>

## Shoreline Erosion

Accomack and Northampton Counties possess approximately 70% of Virginia's total oceanfront shoreline and 15% of the state's tidal shoreline. The inland Seaside shoreline is relatively protected by the barrier islands, marshes and bays that lie between the shoreline and the Atlantic Ocean. The barrier island shoreline and Bayside shoreline are susceptible to erosion. The following information is summarized from the Virginia Institute of Marine Sciences (VIMS) Shoreline Situation Reports published in 1975 and 2002. Since the 2002 study does not include erosion rates in feet and does not cover the entire Seaside, the 1975 study is used to provide that information.

**Bayside:** Erosion on Accomack County's Bayside shore is generally less than that of most of the counties with Bay shorelines. This is attributable to the extremely broad near shore zone, the sheltering of the subaqueous platform west of Tangier Sound, and the great extent of the marsh areas. Wind generated waves are the primary cause of erosion on the Bayside. The growth and height of wind generated waves are factors of the over water distance across which the wind blows (known as fetch), wind speed, wind duration, and water depth. In Accomack County, most severe erosion occurs from northeasters and storm fronts that bring strong north and northwest winds. Northeasters force additional water into the Bay, causing storm surges that can reach two or three feet above the normal high tide level. As the storm passes, the winds shift to the northwest or north and pile up water on the western side of the Shore. The average erosion rate for Bay shoreline in Accomack County (excluding Tangier Island) is 2.2 feet per year. This average dips to 1.6 feet per year for areas with marsh margins and rises to almost 3 feet per year for shorelines with sand beaches.

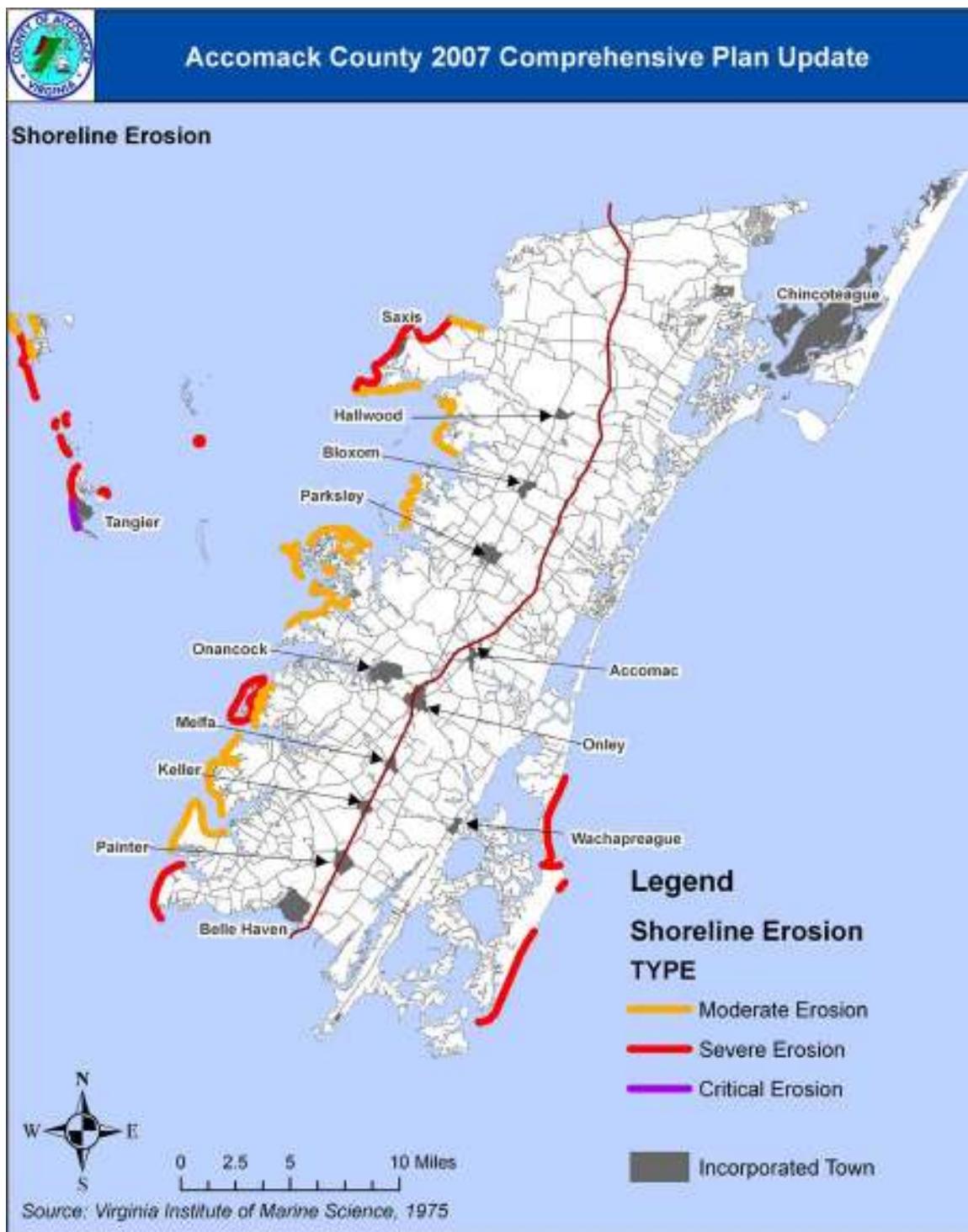
**Seaside:** Accomack County's Seaside is bordered by a series of barrier islands. The most serious barrier island erosion occurs when northeasters and hurricanes bring storm surge and intense wave action. The storm surge lifts the water level to one to three feet above normal, allowing high waves to wash over the island, pulling sand into the ocean, filling marsh and inlets and sometimes breaching the island. A barrier island's natural response to storm impact is to roll over on itself; the beach front retreats, former marsh deposits are excavated and washover raises marshland behind the island. Erosion rates on Accomack County's barrier islands range from seven to seventeen feet per year. The land on the seaside's interior is, for the most part, protected from erosion by the complex of barrier islands, marsh and bays that lie between the mainland and the Atlantic Ocean.

The Virginia Institute of Marine Sciences (VIMS) conducted a new shoreline situation report for Accomack County in 2002. The report defines erosion as either "low", "high", or "undercut". A bank is defined as low erosion if there is minimal erosion on the bank face or toe, a marsh is defined as low erosion when there are no obvious signs of erosion, and a beach is defined as low erosion if the beach is accreting. To be classified as high erosion, a bank must include slumping, scarps, and exposed roots. A marsh that has high erosion has the marsh edge eroding or loss of vegetation. A beach with high erosion has an eroding beach or is non emergent at low tide. Erosion at the toe of a bank indicates that the bank is undercut. Locations with moderate and severe ratings are further specified as being critical or non-critical. The erosion is considered critical if buildings, roads, or other structures are endangered. The 2002 VIMS *Accomack County Shoreline Situation Report* is available at:

<http://ccrm.vims.edu/gisdatabases.html>

The following evaluation of shoreline erosion is from the 1975 report. Map I depicts areas with moderate to severe rates of erosion.

### Map 2-I



**Critically Eroding Areas:**

***Sluitkill Neck (Segment 6A):*** 1.9 miles along the boundary between Klondike Point on Pungoteague Creek and Indian Point on Matchotank Creek. Includes Finneys, Scarborough and Parkers Islands. Erosion rate on the bayshore of the islands is 4 to 5 feet per year. The erosion rate on the mainland is 1.5 feet per year. The large expanse of marsh shore both on the islands and the mainland, together with the general low elevation and relief of the subsegment preclude any major development either for residential use or recreation.

**Severely Eroding Areas:**

***Scarboroughs Neck (Segment 2A):*** 3.2 miles from Powells Bluff at the entrance to Occohannock Creek to the marshy point at the entrance of Craddock Creek. Erosion rate is 5 feet per year. Low potential for residential use primarily due to the high flood hazard and secondarily to the expense involved in constructing effective shore erosion defenses. Best use is to remain with agricultural and tree crop production. Recreational camping, particularly in the Bull Cove area, may be developed to advantage, provided no substantial permanent structures are involved and that adequate sewage disposal facilities are established.

***Parkers Marsh (Segment 8A):*** 2.4 miles along the shore-fastland boundary between Onancock and Chesconessex Creeks. Crystal Beach at the end of Route 782 and the inland part of South Chesconessex are included in this section. Erosion rate is 5 feet per year and there is a 1 foot per year accretion rate to the south at Ware Point. No erosion is indicated by the study in the area north of Back Creek, but local property owners state that there is about 1 foot per year loss along the sand area at Crystal Beach. The marsh areas to the south of Back Creek are already well designated as a state natural area (Parkers Marsh Natural Area). It would seem desirable to reserve the marshes to the north for the same purpose as they are more or less contiguous. The fastland area near Crystal Beach is too low to justify extensive development and probably should be restricted to occupation by relatively low value seasonal residences.

***Freeschool Marsh (Segment 11B):*** 4.7 miles along the shore-fastland boundary between Messongo Creek and Holdens Creek. This segment includes the peninsula south of the Pocomoke Sound, on which the town of Saxis is located. Erosion rates of 3.2 feet per year between Pig Point and North End Point, 4.9 feet per year between North End Point and Starling Creek (Saxis waterfront), 3.6 and 4.4 feet per year between Starling Creek and Long Point, and 1.9 feet per year between Long Point and Back Creek. Nearly the whole of Freeschool Marsh is set aside as a wildlife refuge. Saxis Island is very limited in area, has no satisfactory beaches, and is probably developed to near its maximum for shellfish industry and supporting population.

**Moderately Eroding Areas:**

***Hyslop Marsh (Segment 2C):*** 2.9 miles from the mouth of Craddock Creek across the mouth of Back Creek to Milbys Point at the north end of Hyslop Marsh. Erosion rate is 2-3 feet per year. At present the area should be left as is.

## SEAS

The Virginia Department of Conservation and Recreation's Shoreline Erosion Advisory Service (SEAS) promotes environmentally acceptable shoreline erosion control measures to protect private property and reduce sediment and nutrient loads to the Chesapeake Bay and other waters of the Commonwealth. SEAS was created in 1980 by the General Assembly to work one-on-one with landowners experiencing erosion problems. Since its creation SEAS has provided technical advice about shoreline erosion problems to more than 6,300 clients. In addition, the program promotes research for improved shoreline management techniques to protect and enhance Virginia's shoreline resources.

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**Nandua Creek (Segment 3):** 5.1 miles along the main axis of Nandua Creek, including Back Creek, Curratuck Creek, McLean Gut, Boggs Gut and Kusian Cove. Erosion rate is between 2 to 3 feet per year at exposed beach areas in the lower creek; no erosion noted on the upper creek. Nandua Creek is very attractive in its present state. It appears undesirable to develop the creek as it is surrounded by creeks of greater commercial capacities. The fastland surrounding the lower creek is too low in elevation to be suitable for residential development. The upper creek seems well suited for its present use, agriculture and low density residential.

**Broadway Neck (Segment 6B):** 1.9 miles along the shore-fastland between Matchotank Creek and the northeast end of East Point. Erosion rate south of Thicket point is 2 feet per year. No figures are given for the rate at Broadway Landing or East Point, but the presence of old groins and bulkheads indicates a history of moderate erosion along the shore north of Thicket Point also. No erosion is evident in Matchotank creek or in the smaller creeks. Replacement of existing beach defenses will improve presently developed areas. High flood hazard should be considered before future development.

**Onancock Creek (Segment 7):** 4 miles from the bayside boundary to the head of Central Branch. Moderate erosion at sand beaches, such as at the end of Bailey Neck. On the upper creek, where low bluffs are close to the water, there are local areas of erosion. The lower part of Onancock Creek is too susceptible to flood damage to permit a recommendation for additional development. There are some areas on the upper reaches and branches which would permit additional low density residential development. There is already considerable boating, and increasing the traffic would also increase the danger of water pollution.

**Big Marsh (Segment 8C):** 1.5 miles along the shorefast boundary between Chesconessex Creek and Deep Creek. Erosion rate is moderate at present but the development area might become critical during floods. Erosion rates vary from 0 to 3 feet per year. There is not enough fastland behind the marsh between Chesconessex and Deep Creek for any sort of development other than low density residential or agricultural. The present development at Schooner Bay was probably unwise. No other development on the marshes should be permitted, both because of the low elevation and unstable substrate and because of the value of the natural marsh to the estuarine food chain.

**Parksley (Segment 10B):** 3 miles along the shore-fastland boundary between the north

bank of Hunting Creek and the middle of Young Creek. Erosion rate is slight to moderate, critical along the bay shore. Erosion rates are up to 2 feet per year at various exposed sand beach areas. There is no erosion noted in the creeks. The area is primarily marshland which should be preserved as a primary food source for shore and near shore life. The adjoining fastland is low and suitable for lumber and agriculture.

**Michael Marsh (Segment 11A):** 1.9 miles along the shore-fastland boundary between Cattail Creek and Messongo Creek. Erosion rate is 1.3 to 1.7 feet per year along the part of the shore facing Beasely Bay. Almost the total marsh is set aside as part of the Saxis Wildlife Management Area. The adjacent fastland area is low and suitable for timber production. The creeks are shallow and, being within or adjacent to the wildlife sanctuary, should not be exploited.

**Shoreline Hardening:** Accomack County's residents have constructed miles of shoreline erosion control structures in an attempt to cease or slow erosion. There has been no comprehensive survey done of Accomack County's erosion control structures, but many applications for new erosion control structures are approved each year. Structural practices such as jetties, groins, riprap, and bulkheads are the most expensive and most potentially damaging options for erosion control. These structures can impede the natural inland migration of wetlands and impact other natural processes such as the natural movement of sand. With the impending threat of sea level rise and the predicted increase in the intensity and frequency of storms resulting from global climate change, the Wetlands Board should, where applicable, discourage waterfront property owners from installing bulkheads and other types hardened structures in ecologically sensitive coastal areas. Sloped rock or riprap revetments and gabions are preferable to vertical structures. Non-structural alternatives can be effective in certain conditions, saving the property owner money and having less impact on the environment. Most non-structural alternatives involve the use of marsh areas for natural protection and may involve planting marsh grass or cutting trees that are shading the marsh. "Living shorelines" are considered another viable shoreline management option in areas where moderate erosion is occurring. "Living shorelines" are designed to enhance natural shoreline habitat while providing erosion control benefits. They also allow for natural coastal processes to occur, such as the expansion and migration of marshes, through the strategic placement of plants, stone, sand fill, and other structural and organic materials. For additional information on line go to <http://www.deq.state.va.us/coastal/livingshore.html>.

**Information Needs:** The best information currently available on shoreline erosion in Accomack County is the Shoreline Situation Reports prepared by the Virginia Institute of Marine Sciences in 1975 and 2002. Information on shoreline structures is limited to the 2002 report and permit information collected by the county since the 1970's. A comprehensive shoreline management plan needs to be conducted to evaluate the shoreline erosion problem in Accomack County and determine the effectiveness of erosion control structures. This plan would divide the county's shoreline into planning segments in which shoreline processes and materials are similar, identify and evaluate shoreline erosion and accretion patterns within those segments, inventory the type, location and condition of existing erosion control structures, evaluate whether structures have been

effective or are aggravating erosion problems, identify areas where control structures should be avoided, identify areas which require stabilization, and examine shoreline areas characterized by high erosion rates in relation to existing and proposed land use. The Virginia Institute of Marine Sciences has developed a Comprehensive Coastal Inventory for the state which includes data that would be useful for such a study. Identification of erosion control structures could be achieved through review of permits issued by the local Wetlands Board, examination of aerial photography, and field surveys. The VIMS Comprehensive Coastal Inventory is available at: <http://ccrm.vims.edu/index.html>

## Sea Level Rise

According to the Virginia Institute of Marine Sciences (VIMS), historic rates of sea level rise were always estimated at approximately one foot per century. Sea level has been rising since the last Ice Age, but modern rates of sea level rise are estimated to be 1.5 to 3 times the historic rate. In addition to threatening buildings, roads, and other development, sea level rise can destroy natural habitats such as tidal wetlands. In order to protect tidal wetlands from sea level rise, coastal management strategies will need to be developed that allow tidal wetlands to migrate inland over time. The US EPA is working on improving knowledge of sea level rise and climate change, and more information is available at: <http://www.epa.gov/climatechange/effects/coastal/index.html>

The most current information on global climate change can be found in the IPCC Fourth Assessment Report which is available on line at <http://www.ipcc.ch/ipccreports/ar4-wg2.htm>.

The County should evaluate the impacts of climate change and sea level rise on groundwater and water quality and marshlands.

## Storms

Accomack County is subject to frequent storm activity including northeasters, tropical storms and hurricanes. These storms bring local flooding and considerable shoreline erosion.

**History:** Accomack County has experienced several major storms since the early settlement of the area. A brief history of major storms to hit the area is given in the following paragraphs:

***The August 23, 1933,*** hurricane passed directly over the lower Chesapeake Bay area, then moved north up the west side of the bay. In addition to damage from tidal flooding, high winds caused much damage to roofs, communication lines and other structures.

***The hurricane of September 1936*** passed approximately 20 miles east of Cape Henry on the morning of the 18th. High tides and gale force winds caused much damage throughout the lower Chesapeake Bay area and Eastern Shore as the storm moved to the northeast. Late crops were destroyed and approximately 60,000 broiler chickens were killed. The loss in crops was estimated at \$250,000 and other damage amounted to another \$250,000.

***The northeaster of October 6, 1957,*** with wind gusts of 60-70 miles per hour, moved north just east of Cape Hatteras during the evening of the 5th, then turned northwest to move

through the lower portion of the Chesapeake Bay on the 6th. Heavy rains and gales extended west through central Virginia. The greatest property damage occurred in the coastal areas where heavy seas and high tides battered structures, grounded vessels, and disrupted transportation. The town of Wachapreague reported tides of four feet above normal.

**Hurricane Donna, which occurred on September 12, 1960,** skirted the Virginia coast on the morning of the 12th before moving to the northeast. Strong winds, heavy seas, and severe flooding occurred along the Chesapeake Bay shoreline of the Eastern Shore from Cape Charles north, causing extensive damage. Winds of up to 100 miles per hour were recorded in Chincoteague and 4.5 inches of rain fell in a 24 hour period.

**The northeaster of March 6-8, 1962** caused flooding of major proportions from New York to Florida. This storm, which came to be known as the Ash Wednesday Storm, was unusual for a northeaster since it was caused by a low pressure cell which moved from south to north past Hampton Roads and then reversed its course to the south again. Waves from Chincoteague Bay were breaking on the High School. Five homes on Chincoteague Island were destroyed in addition to nearly 1,000 homes which had water in them. This storm wiped out the poultry industry on Chincoteague as well as killing one hundred of the Assateague Ponies. The northeaster brought with it high volumes of water and high waves which battered the mid-Atlantic coastline for several days.

**The northeaster of March 29, 1984,** caused significant flooding on the bayside of Accomack County. The storm brought winds of up to 46 mph which piled up tidal waters, resulting in flooding which sent water pouring into homes at East Point, Checonessex, Mears, Saxis, and Sanford. Accomack County saw its worst tidal flooding since 1962 as a result of this storm.

**Hurricane Gloria, on September 27, 1985,** caused significant flooding and wind damage in Accomack County. The Chesapeake Bay Bridge Tunnel recorded winds from 79 to 90 mph and NASA recorded 4.27 inches of rainfall during the storm. Accomack County suffered an estimated \$2 million in damage to mobile homes, houses, boats, docks, and property as a result of the storm.

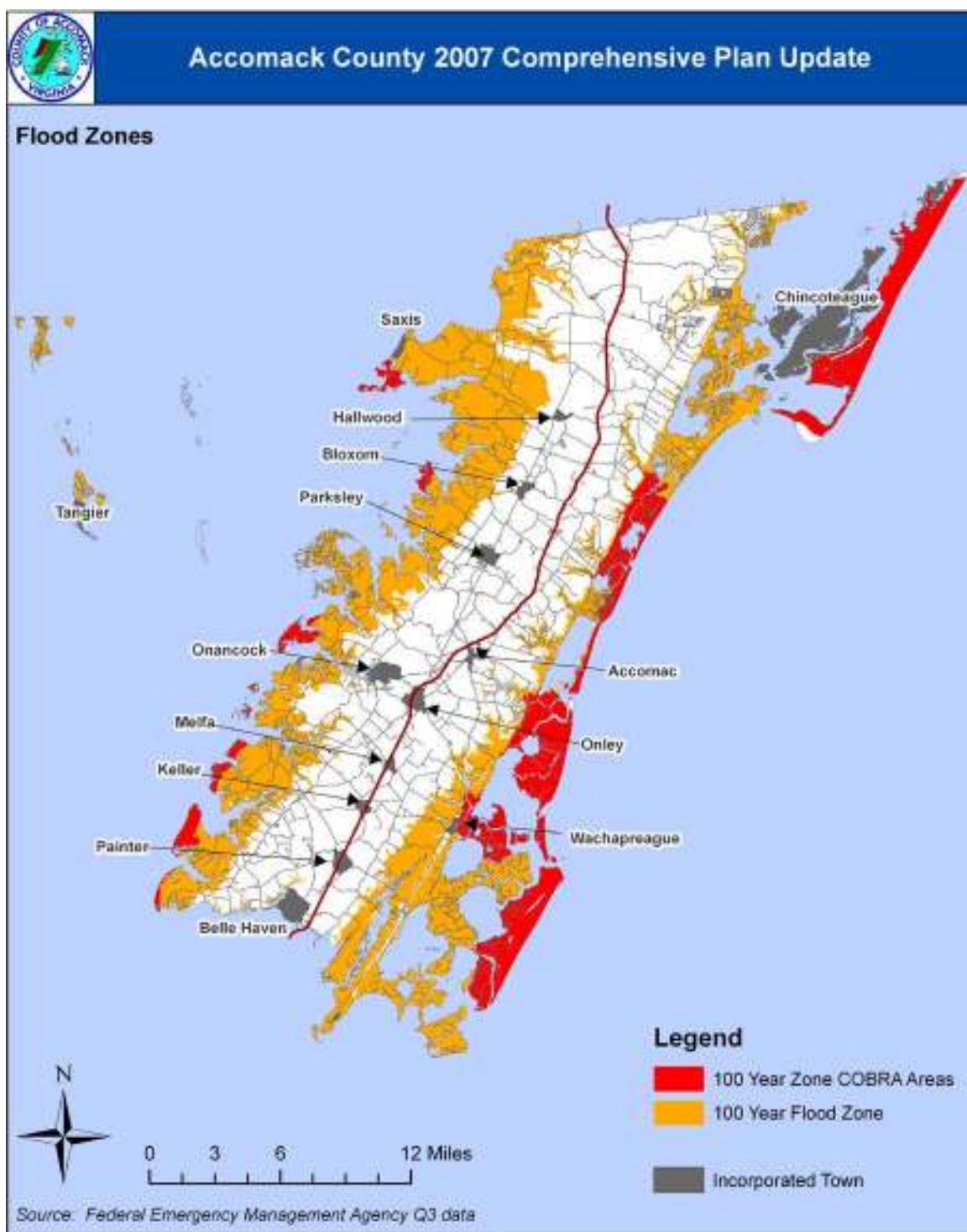
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### 100 Year Floods

For the purposes of managing development and assessing risk within areas prone to flooding, the Federal Emergency Management Agency (FEMA) developed the concept of the "100 year flood." The 100 year flood does not refer to a flood that happens once every 100 years, but rather a flood level that has a probability of occurring once every 100 years (i.e. has a 1% chance of occurring in any given year). A flood insurance study was prepared for Accomack County in 1982 which identifies height of flood waters during a 100 year flood and predicts the area within the county that would be flooded and at what level flooding would occur. Information from this study was used to develop Flood Insurance Rate Maps (FIRMs) which are used by insurers to determine flood insurance requirements and by the county to regulate development in flood prone areas.

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### Map 2-J



**The northeaster of October 30, 1991**, is also known as the “Great Halloween Storm.” A northeaster merged with passing tropical storm, Grace, to create a very powerful system. The storm remained off shore but produced considerable damage. Many piers were lost, as well as a motel. Observations at the Virginia Coast Reserve noted sea waves of up to 35 feet in height. This storm changed the landscape of many of the barrier islands, which

absorbed the brunt of the storm.

**Hurricane Fran, of September, 1996**, brought considerable wind damage to the Shore. This storm made landfall on the coast of North Carolina, September 6, 1996, as a category 3 hurricane. The Eastern Shore experienced a great deal of damage from wind and several spin-off tornados struck the area.

**The Nor'easter of February 3 and 4, 1998**, battered eastern Virginia with an extended period of gale to storm force onshore winds due to the slow movement of the storm. The entire island of Chincoteague was underwater, in addition, the causeway was closed. The flooding was to the extent that some buildings had water in them and some families had to evacuate. The water rose high enough to cover the hoods of police cars. Some hotels in Wachapreague also endured some flooding.

**Hurricane Floyd on September 15 and 16, 1999**, was a Category 1 hurricane as it crossed the Wakefield WFO county warning area. Flooding of five to seven feet due to the storm surges occurred in central parts of the Chesapeake Bay, engulfing areas of Accomack County. Some homes in the County were flooded with three to six feet of water. Three hundred buildings endured flood damage as a result of Hurricane Floyd.

**Hurricane Irene on October 17 and 18, 1999**, was a Category 1 hurricane which was intensifying at the time it reached the Wakefield County warning area. It brought heavy rain to the southeastern parts of Virginia along with sustained wind speeds of 27 mph at Wallops Island. The highest recorded speeds at Wallops Island were 39 mph.

**Hurricane Isobel, September 2003**, flooded parts of Wachapreage, Oyster, Tangier, and Saxis. The tide monitor in Wachapreague was swept away, however, the Chesapeake-Bay Bridge Tunnel reported a surge of 7.4 feet and the surge registered 6.4 feet at Kiptopeke. The high winds produced salty air, which killed many crops, as well as coating power lines, which caused power outages until rainfall after the hurricane washed the salt off the lines.

**Hurricane Ernesto on September 1, 2006**, scraped eastern and southeastern Virginia. The remnants of the storm were sustained wind speed that reached 56 mph at Wallops Island and had gusts as strong as 76 mph.

**Risks:** The amount and extent of damage caused by any tidal flood depends on the topography of the flooded area, the rate of rise of floodwaters, depth and duration of flooding, exposure to wave action, and extent of development in the floodplain. The depth of flooding during these storms depends on the velocity, direction and duration of the wind, and the astronomical tide. The duration of flooding depends on the duration of tide-producing forces. Fortunately, tidal flooding is usually characterized by a gradual increase in water levels, which under normal conditions, permits orderly and timely evacuation from encroaching floodwaters. The greatest potential for flood damage in Accomack County comes from flooding of low lying shorelines along the Chesapeake Bay. Bayside areas lying lower than eight feet above mean sea level would be flooded during a 100 year storm

event. The highest elevation of flood waters recorded in Accomack County is 9.2 feet above mean sea level. Map J shows the location of the 100 year floodplain. Accomack County consists of 284,931 acres of land and marsh. Of those 284,931 acres, 126,667 acres are in the 100 year flood zone. There are approximately 16,755 addressed structures in the unincorporated part of Accomack County, 3,577 of which are in the flood zone. These numbers represent a significant potential hazard to residents and property owners of the county and demonstrate the need to take measures to lessen the possible impact of flood events on the area. Moreover, the frequency and intensity of major storm events and storm surges along the Atlantic is expected to increase as a result of sea level rise and global climate change.

**Floodplain Management:** In January of 1995, the Accomack County Board of Supervisors adopted the Accomack County Floodplain Management Plan. The plan was developed as a comprehensive examination of sources of flooding, flooding history, and existing flood protection programs to determine what further measures, if any, are needed to adequately protect the residents of the county from flood hazards. The plan discusses existing development regulations in the floodplain, the preservation of floodplain areas as open space, and suggests additional floodplain management measures such as educational outreach projects, drainage system maintenance, and lower density zoning districts in the floodplain. The county currently has a class 8 designation from the National Flood Insurance Program (NFIP) Community Rating System (CRS) which encourages community and state activities beyond those required by the NFIP.

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### The Community Rating System

The Community Rating System (CRS) was established by the Federal Insurance Administration in 1987 to, "encourage, by the use of flood insurance premium adjustments, community and state activities beyond those required by the NFIP." Communities which participate in CRS receive points for activities they undertake which reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. Each community is assigned a classification based on their total points. Residents of the community are rewarded with reduced premium rates. Accomack County is currently a class 8 community receiving a 10% premium reduction.

There are currently 1,597 National Flood Insurance policies in Accomack County with a total coverage of \$129,952,000. Annual flood insurance premiums are \$527,004. There have been \$822,901 in claims in Accomack County since 1978.

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In August 2006, Accomack County adopted the Eastern Shore of Virginia Hazard Mitigation Plan (HMP). The HMP was developed by the Accomack-Northampton Planning District Commission (A-NPDC) with financial and technical assistance from the Virginia department of Emergency Management. Accomack County staff participated in development of the plan, which contains the following findings:

1. 22% (61,717 acres) of all the land in Accomack County is in the V zone. The V zone is the area with waves 3 feet or greater during a 100-year storm.
  - a. 61% of this land is held in some form of conservation ownership.

2. 64,950 acres are in the A zone. The A zone is the area with waves less than 3 feet during a 100-year storm.
  - b. Most structures located in a flood zone are in this area.
3. In Accomack County, a 100-year storm event would affect approximately 3,933 structures. It would generate an estimated \$109 million in residential losses; an expected \$76 million would be covered by flood insurance.

The HMP recommends the following Goals and Strategies:

**1. LOCAL GOVERNMENTS GUIDE A SMOOTH MITIGATION PROGRAM.**

**Strategy:** Train county staff for mitigation duties.

**2. RESIDENTS BUSINESSES AND LOCAL GOVERNMENT PROMOTE MINIMAL COMMUNITY DISRUPTION THROUGH RESIDENTIAL AND COMMERCIAL MITIGATION ACTIVITIES**

**Strategy:** Reduce damages from flooding.

**Strategy:** Reduce damages from non-flooding natural disasters if that type of event occurs.

**3. RESIDENTS ARE SELF SUFFICIENT AND TAKE RESPONSIBILITY FOR MANAGING THEIR OWN RISK**

**Strategy:** Educate the public about natural hazards and what is expected of them in an event.

**Strategy:** Educate the public about their responsibility in reducing and insuring their own risks.

**4. LOCAL INFRASTRUCTURE WILL CONTINUOUSLY FUNCTION DURING AND AFTER A NATURAL HAZARD EVENT**

**Strategy:** Maintain safe traffic flow in case of wide scale power loss.

**Strategy:** Maintain emergency fire service functions in case of wide scale power loss.

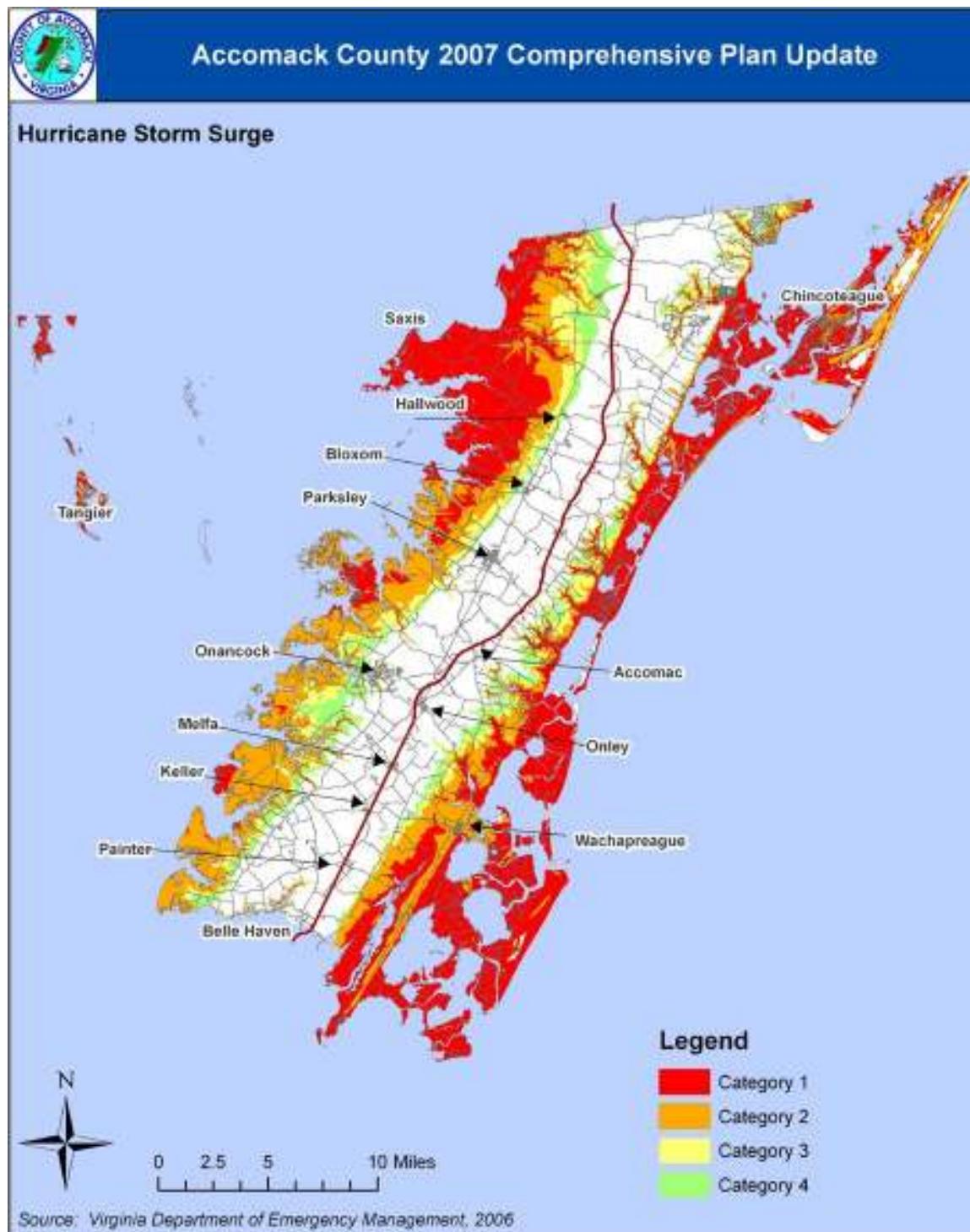
**5. LOCAL GOVERNMENTS MAKE SPECIAL EFFORTS TO REACH SPECIAL NEEDS POPULATIONS**

**Strategy:** Reach out to migrant workers to ensure their safety while maintaining shelter space for a voluntary or mandatory evacuation.

**Strategy:** Institute an arrangement providing evacuees from Tangier Island transportation to shelters.

The Eastern Shore of Virginia Hazard Mitigation Plan is available online at:

<http://www.a-npdc.org/hazardmitigation>

**Map 2-K**

## **Chapter 3**

### **Inventory and Existing Conditions: The Developed Environment**

## Chapter 3

### Inventory and Existing Conditions: The Developed Environment

#### Introduction:

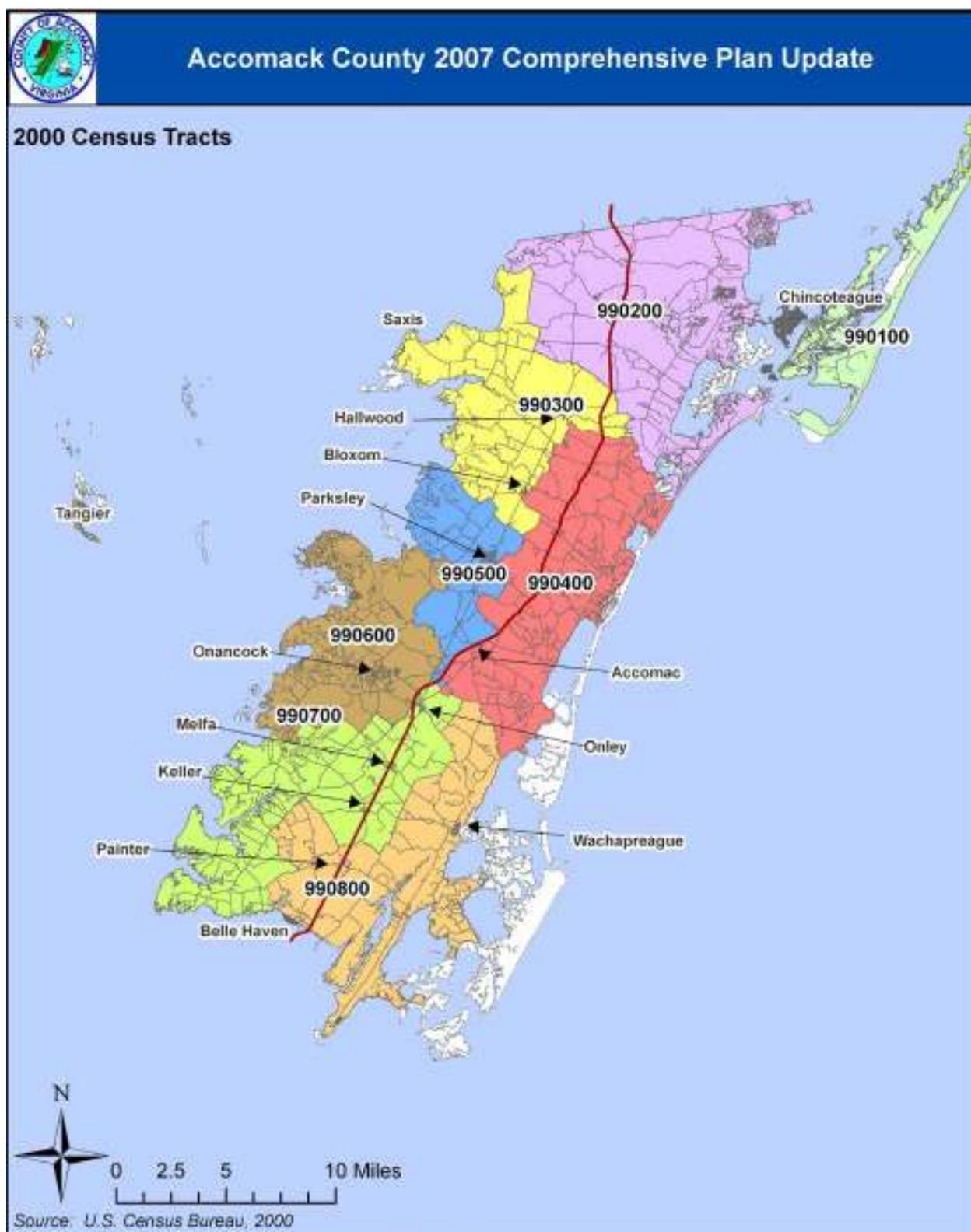
Accomack County's settlement pattern has evolved and changed with changes in the economy, technology, and demographics. Historically it featured a pattern of small towns, villages and hamlets interspersed among farms and forests. In more recent years, rural subdivisions have become more common, as has commercial and industrial development located outside of traditional towns and village centers. Chapter 3, The Developed Environment, documents the County's land use and development patterns, and how they relate to the local natural environmental resources.

#### Population

Until recently, Accomack County experienced an overall decline in population over the last fifty years. In 1930, Accomack County contained a population of 35,854 persons. In the following years of decline, the lowest population recorded for the county was 29,004 people in 1970. Between 1970 and 1980, Accomack County experienced its first substantial population increase since 1930. From 1970 to 1980, the recorded population for Accomack County increased by 2,264 persons. After 1980, the population stabilized and only increased by 435 persons between 1980 and 1990.

The Census figures for 2000 showed a sharp increase of 6,602 persons since 1990. However, the County reviewed the Census data and determined that a large error had been made in the Horntown area and the actual increase was closer to 2,785 persons. The estimated revised County figures, with a total 2000 population of 34,488, were used by the County for redistricting and, where possible, have been used to update this plan. The 2000 Census Tracts are shown on Map 3-A. It is anticipated the 2010 Census will provide a more accurate picture of growth in Accomack County.

Historically, approximately 50% of the total population is located in the southern Pungoteague and Lee Districts. The Lee District has been the largest district, containing an average of 28.1% of the county's total population since 1930. The Island district has been the smallest district, containing an average of 10.7% of the county's population since 1930. The county's magisterial district boundary lines were redrawn after the 1970 and 1980 census counts. The district boundary lines were redrawn in an attempt to balance voter populations according to U.S. Department of Justice guidelines. The redistricting created minor geographic shifts of district boundary lines, along with the shifting of Tangier Island from the Lee District to the Metompkin District in 1970 and to the Atlantic District in 1980. The effect of redistricting on population projections is to reduce the value of historic data in calculating future district populations. The 1970 redistricting, which affected population counts in the 1980 census, had a minimal balancing effect. The 1980 redistricting has, however, balanced the population of the county districts, with each district containing roughly 22% of the county's total population with the exception of the Island District.

**Map 3-A**

### Population by District, 1930 -1990

Source: U.S. Census Dept.

Year	Atlantic	Lee	Metompkin	Pungoteague	Island
<b>1930</b>	7,476 (21%)	10,576 (29%)	6,394 (18%)	8,226 (23%)	3,182 ( 9%)
<b>1940</b>	6,632 (20%)	10,576 (29%)	5,835 (18%)	7,669 (23%)	3,349 (10%)
<b>1950</b>	7,695 (23%)	9,562 (28%)	5,592 (17%)	6,917 (20%)	4,066 (12%)
<b>1960</b>	6,095 (20%)	9,020 (30%)	5,796 (19%)	6,254 (20%)	3,470 (19%)
<b>1970</b>	6,464 (22%)	8,102 (29%)	5,796 (19%)	5,607 (19%)	3,258 (11%)
<b>1980</b>	6,261 (20%)	8,833 (29%)	6,449 (20%)	6,170 (20%)	3,555 (11%)
<b>1990</b>	7,214 (23%)	7,240 (23%)	6,917 (22%)	6,750 (22%)	3,582 (11%)

The County undertook a re-districting process after the 2000 Census, creating the districts shown in the following table and on Map 3-B, *Election Districts*.

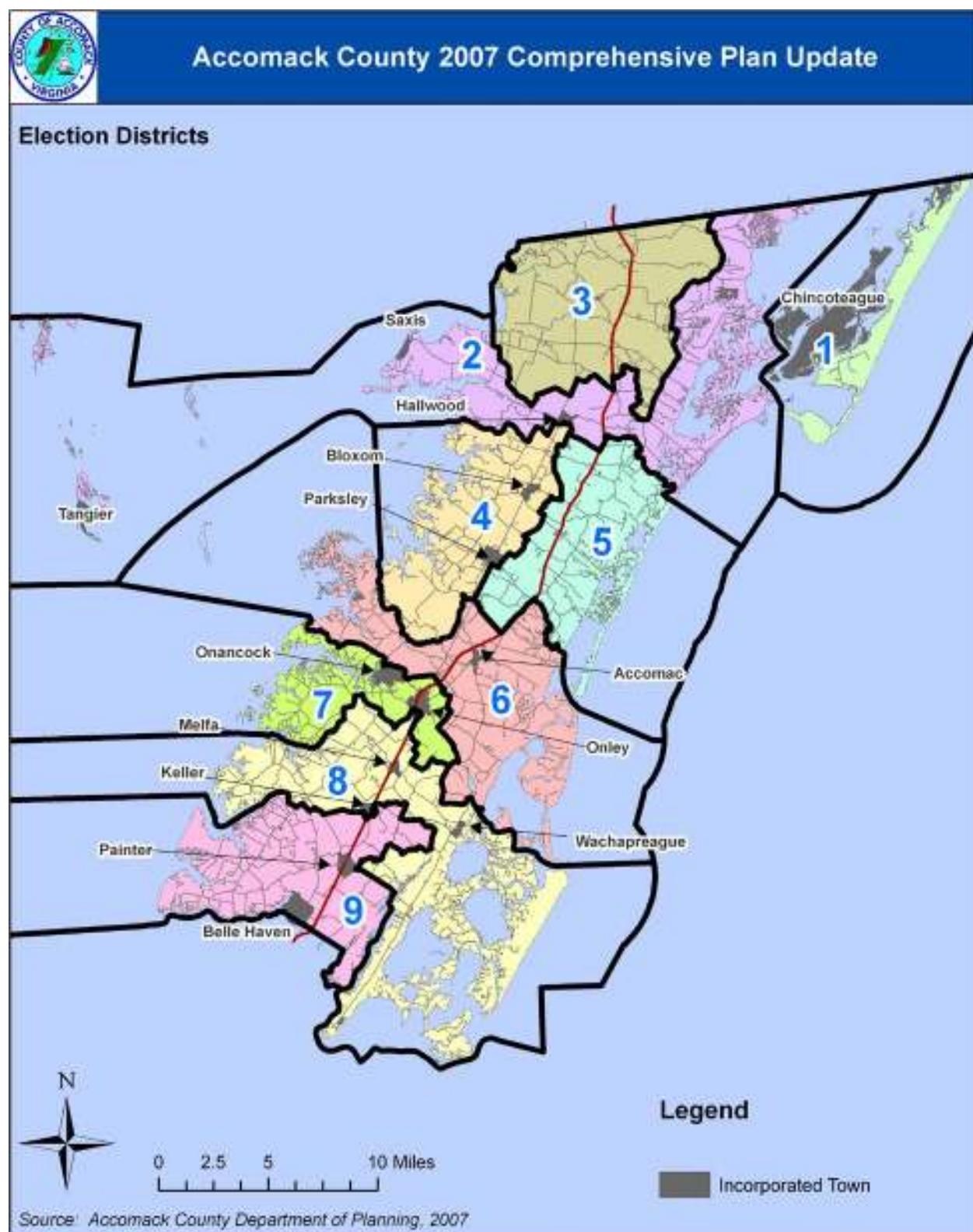
### Population by Election District, 2000

Source: Accomack County Department of Planning  
(corrected from U. S. Census data using County data)

<b>District 1</b>	3,906	(11%)
<b>District 2</b>	4,023	(12%)
<b>District 3</b>	3,868	(11%)
<b>District 4</b>	3,693	(11%)
<b>District 5</b>	3,996	(12%)
<b>District 6</b>	3,659	(11%)
<b>District 7</b>	3,701	(11%)
<b>District 8</b>	3,725	(11%)
<b>District 9</b>	3,917	(11%)
<b>TOTAL</b>	<b>34,488</b>	

**Population Change Factors:** The trends in population change factors for Accomack County are: 1) in the 1950's and 1960's births exceeded deaths, but not enough to offset out-migration, which was the cause of population loss, 2) in the 1970's and early 1980's deaths outnumbered births, but enough in-migration occurred to result in population growth, and 3) in the late 1980's and early 1990's, deaths continued to outnumber births and in-migration slowed to lead to a more stable population.

**Age Distribution:** The trends in age distribution over the past four decades reflect three population trends. First, the "Baby Boom" of the 1950's is apparent as 1990 populations in the age groups from 25 to 44 years of age were higher than the 1960, 1970 and 1980 populations. This "bulge" has continued moving through the population during the 1990's as the 35-44 and 45-54 age groups increased in size. Second, the birth rate has slowed, as evidenced by the lower 1980 and 1990 population in the 0-9 age group, although this trend seems to have stabilized since 1990. Third, there is evidence of Accomack County's attraction as a retirement community in higher 1990 populations in the 65-85 age groups. This latter trend seems to have stabilized as well, during the 1990s.

**Map 3-B**

**Age Distribution;  
Total population within each age group and percentage of total population**

Source: U.S. Census Dept.

*(Does not account for corrections to total County population based on County data)*

<b>Age Group</b>	<b>1960</b> <b>Total %</b>	<b>1970</b> <b>Total %</b>	<b>1980</b> <b>Total %</b>	<b>1990</b> <b>Total %</b>	<b>2000</b> <b>Total %</b>
<b>0-4</b>	3,095 10%	2,104 7%	2,046 7%	1,994 6%	2,336 6%
<b>5-9</b>	2,998 9%	2,596 9%	2,124 7%	2,071 7%	2,695 7%
<b>10-14</b>	2,757 9%	2,894 10%	2,490 8%	2,174 7%	2,655 7%
<b>15-19</b>	2,185 7%	2,531 9%	2,661 9%	2,000 6%	2,585 7%
<b>20-24</b>	1,421 5%	1,569 5%	2,292 7%	1,792 6%	2,175 6%
<b>25-34</b>	3,348 11%	2,729 10%	4,074 13%	4,595 15%	4,311 11%
<b>35-44</b>	3,810 12%	3,254 11%	3,156 10%	4,237 13%	5,716 15%
<b>45-54</b>	3,717 12%	3,562 12%	3,458 11%	3,434 11%	5,167 13%
<b>55-64</b>	3,249 11%	3,303 11%	3,757 12%	3,525 11%	4,274 11%
<b>65-74</b>	2,653 9%	2,690 9%	3,100 10%	3,312 10%	3,505 9%
<b>75-84</b>	1,168 4%	1,414 6%	1,602 5%	1,947 6%	2,129 6%
<b>85+</b>	--	--	--	--	755 2%
<b>Total</b>	<b>30,635</b>	<b>29,004</b>	<b>31,268</b>	<b>31,703</b>	<b>38,305</b>

**Race Distribution:** The distribution of Accomack County's population by race remained relatively constant between 1960 and 1990. The total nonwhite population declined by 4%, and the white population increased by 4% during that period. However, between 1990 and 2000 the total non-white population increased from 35% to 37%, due in part to an increase in the Hispanic population from 1.4% to 5.4%, against a decrease in the black population from 34.5% to 31.6%. This trend has continued in the current decade, with the Hispanic population rising to 7.6% in 2004, while the black population declined to 30.1%.

**Race Distribution of Population, 1960 –2000**

Source: U.S. Census Dept.

*(Does not account for corrections to total County population based on County data)*

<b>Year</b>	<b>1960</b>	<b>1970</b>	<b>1980</b>	<b>1990</b>	<b>2000</b>
<b>White</b>	18,779 (61%)	18,086 (62%)	19,753 (63%)	20,598 (65%)	24,276 (63%)
<b>Non-White</b>	11,856 (39%)	10,918 (38%)	11,515 (37%)	11,105 (35%)	11,105 (37%)

**Population Growth for 1980-2000:** Data from the U. S. Census shows that Accomack County's population growth rate between 1980 and 1990 averaged just over one-tenth of one percent per year. Using the corrected data, the growth rate was about 6 times greater between 1990 and 2000, averaging just under 1% per year. The growth rate for Virginia as a whole between 1990 and 2000 was slightly over 1.3% annually.

<b>Year</b>	<b>1980</b>	<b>1990</b>	<b>2000</b>	<b>Population Growth 1980-2000</b>
<b>Population.</b>	31,268	31,703	34,488	Source: U. S. Census
<b>Average Annual Rate</b>		0.14%	0.9%	

**Population Estimates for 2000-2005:** The Weldon Cooper Center's population estimates for 2000-2005 indicate that Accomack County's total growth over the last five years was 2.1% (0.5% average annually), less than the growth rate during the 1990's, and less than the total 6.9% growth for the state as a whole over the five year period. However, these estimates are likely based on the official 2000 U. S. Census estimates which are not consistent with local data available to the County.

**Population Projections:** Population projections act as a tool to give elected officials, government administrators and planners a rough idea of how many people will need to be served in the future.

Based on the official 2000 Census data, the Virginia Employment Commission projects Accomack County's population to grow from 38,305 in 2000 to 46,500 by 2030, a 21 percent total increase and an average annual growth rate of about two-thirds of one percent (0.65%). This would be less than the rate the County grew during the decade of the 1990s. If the growth trends of the 1990s continue (about 2% annually), the County's population would reach 69,000 by 2030. Please note that the actual numbers in the following VEC forecasts are based upon the higher base line population estimate for 2000 of the U.S. Census.

Year	2000	2010	2020	2030	
<b>Pop. Proj.</b>	38,305	41,300	44,500	46,500	<b>Virginia Employment Commission Population Projections</b>
<b>Year</b>	<b>2000</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>	<b>Trend Forecast at average annual rate of 2%</b>
<b>Pop. Proj.</b>	38,305	46,700	56,900	69,400	

Accomack County has prepared the following revised forecasts based on the County's corrected estimate for the year 2000 population total.

Population Forecast based on recent “trend” rate:

Year	2000	2010	2020	2030	
<b>Pop. Proj.</b>	34,488	37,350	40,446	43,800	<b>Revised Trend Forecast at average annual rate of 0.8%</b>
<b>Year</b>	<b>2000</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>	<b>Revised “Trend Plus” Forecast at average annual rate of 1.4%</b>
<b>Pop. Proj.</b>	34,488	39,630	45,540	52,300	

Population Forecast based on “trend plus” rate (similar to overall statewide average):

Year	2000	2010	2020	2030	
<b>Pop. Proj.</b>	34,488	39,630	45,540	52,300	<b>Revised “Trend Plus” Forecast at average annual rate of 1.4%</b>
<b>Year</b>	<b>2000</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>	<b>Revised “Trend Plus” Forecast at average annual rate of 1.4%</b>
<b>Pop. Proj.</b>	34,488	39,630	45,540	52,300	

## Land Use

Accomack County contains approximately 602 square miles of land and water reaching out to Tangier and Smith Islands to the west, to the Atlantic Ocean to the east, the Maryland state line to the north, and the Northampton County line to the south. The area directly affected by this plan is the upland area of the county and the tidal lands immediately adjacent to the upland. This area is approximately 476 square miles and can be subdivided into three basic geographic features; mainland, marsh and barrier islands. According to a survey conducted by the Accomack-Northampton Planning District Commission in 1989, land use in Accomack County was 5.8% residential, 0.2% commercial, 1% industrial (includes Wallops Flight Facility), 36.8% cropland, 42.5% woodland, 13.4% parks, conservation or vacant land, and 0.3% institutional. 1996 satellite land use imagery shows that less than 2% of the county is developed, 35% is crop and field, 39% is wooded, and 24% wetlands. The following is an analysis of recent change and trends.

**Overall Land Use Pattern:** As noted below, Accomack County's landscape consists mostly of farms, forests, and marshlands, interspersed with towns, villages and hamlets. The County's traditional land use pattern continues to provide the basic framework for human settlement, although in recent years, transportation and communication technologies have allowed people to settle in more dispersed patterns, on relatively isolated rural lots, rather than in compact villages and hamlets. Alternatives to the dispersed development patterns are addressed in Chapter 4.

**Cropland:** Agriculture is the dominant land use in Accomack County. According to the 1992 Census of Agriculture, there were 279 farms in Accomack County, covering 91,568 acres of land, 69,420 acres of which was harvested cropland. This compares to 318 farms, 91,056 total acres and 70,096 acres of cropland in 2002 (the date of the most recent Agricultural Census). The average farm size was 328 acres in 1997, compared to 286 acres in 2002. Total cropland in Accomack County decreased by 1,711 acres between 1987 and 1992 (from 74,134 acres to 72,423 acres), but increased to 73,294 by 2002. In summary, the average size of farms decreased but the number of farms increased and the amount of land in production has remained largely stable. This is a common general trend that can be observed in many growing areas in Virginia, although it is opposite of the overall statewide trend.

In 1997, the county had approximately 82,851 acres of land in 22 Agricultural and Forestal Districts. In 2007, there were approximately 80,215 acres of land in the 22 Agricultural and Forestal Districts, nearly a 2.8 percent decrease. These districts were created in recognition of their economic, ecological, and aesthetic value. Among the benefits to landowners is that land within these districts is protected by Right to Farm legislation from local regulations that would interfere with farm operation. The reduction in Agricultural and Forestal District acreage from 1997 to 2007 reflects the removal of land from districts at the owner's request, due to no longer meeting minimum area requirements or for residential subdivisions and other land development.

**Farms in Accomack County**  
Source: U.S. Census of Agriculture

	<b>Farms (number)</b>	<b>Land in Farms (acres)</b>	<b>Harvested Cropland (acres)</b>	<b>Average Farm Size (acres)</b>
<b>1992</b>	279	91,568	69,420	328
<b>1997</b>	268	92,452	71,493	345
<b>2002</b>	318	91,056	70,096	286

**Poultry Operations:** Accomack County ranks third among jurisdictions in Virginia in broiler chicken production (2002). There are a significant number of poultry operations in Accomack County and additional poultry houses are being built each year. Permits were issued for 43 poultry houses from 2001 through 2007. These growers supply the Tysons and Perdue poultry processing plants. Poultry houses are an intensive form of livestock production that involves certain land use considerations. Odors, noise, light, and hours of operation at poultry houses may conflict with surrounding uses.

**Forested Land:** According to the USDA-Forest Service, in 1991 there were about 94,507 acres of forest in Accomack County. In 2001, the Forest Service estimated that the acreage had increased to 128,033 acres. The forested land consists of approximately 64,598 acres of loblolly pine, 33,049 acres of loblolly/hardwood, 11,845 acres of sweet gum/yellow poplar, 11,858 acres of mixed hardwood, and 6,694 acres of swamp chestnut oak/cherrybark oak. Of the total forest acreage, there are 51,454 acres of large diameter, 41791 acres of medium diameter, and 34788 acres of small diameter trees.

#### Trend in forested acres, Accomack County

Source: USDA-Forest Service

Year	Acres
1956	111,300
1965	103,300
1976	114,092
1986	102,592
1991	94,507
2001	128,033

#### Construction Starts, 1990-2006

Source: Accomack County Building Permits (categories combined)

Year	Res.	Com.
1990	253	21
1991	265	6
1992	316	10
1993	275	15
1994	316	15
1995	335	10
1996	292	15
1997	252	15
1998	285	10
1999	323	19
2000	308	11
2001	306	7
2002	322	14
2003	374	4
2004	344	13
2005	433	4
2006	319	11
<b>Total</b>	<b>5,318</b>	<b>200</b>

Res. = Number of permits issued for new frame construction or manufactured housing.  
Com.= Number of permits issued for new commercial structures.

**Residential Development:** During the seven-year period from 1990 through 1996, 392 subdivision lots were recorded and 2,052 new residential structures (conventional and modular) created. Housing starts represented about a 2% annual increase in housing units, a 10% increase since the 1990 census.

Year	1990	1991	1992	1993	1994	1995	1996	Total	Subdivision of Land, 1990-1996
New subdivisions	1	2	4	5	0	6	4	18	Source: Accomack County subdivision approvals
Number of lots	30	30	126	59	0	81	32	326	

During the four year period from 1997 through 2000, 200 lots in 22 subdivisions were recorded, an average of 50 lots per year. In contrast, during the five-year period from 2001 through 2005, 60 subdivisions with 407 lots were recorded (many of the divisions were two, three, and four lot subdivisions) and 2,087 new residential structures created (conventional, manufactured, and modular), an average of 81 lots per year. From January 2005 through August 2007, 63 major subdivision applications were submitted with a total of 2,174 lots on 3,900 acres. To date, 14 of these subdivisions received final approval and have been recorded, with a total of 452 lots on 984 acres. These 2005-2007 subdivision application figures do not include new minor subdivisions or new family subdivisions. In April 2007, a GIS analysis of unimproved parcels in Accomack County estimated that there are approximately 8,831 small unimproved non-wetland parcels outside of incorporated towns ranging in size from 1,000 square feet to two acres. Housing starts represent about a 2.0% average annual increase in occupied year-round housing units, the same as the 2% annual increase in the seven years prior to the initial adoption of this Comprehensive Plan.

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total	Subdivision of Land, 1997-2005
New subdivisions	5	2	7	8	5	9	14	20	12	82	Source: Accomack County subdivision approvals
Number of lots	46	13	91	50	63	30	68	147	99	607	

### Zoning Capacity for Future Development

Existing zoning classifications and future development capacity are major considerations for understanding the potential development that will affect all of the county's resources and systems: farmland, forests and vegetative cover, wildlife habitat, groundwater, transportation safety and capacity, emergency services, schools, etc. U.S. Census data, zoning classifications, and existing traffic data provide important points of reference for future decisions about the County's transportation and land use planning and management.

The 2000 U.S. Census reported that Accomack County had a population of 38,305. There were a total of 19,550 housing units in 2000, with 16,965 year-round units and 2,585 seasonal housing units. This is a ratio of over 6:1 year-round units to seasonal units. The average number of persons per year-round household was 2.5. These numbers will be used to estimate future development and traffic under different population scenarios.

The following *Zoning Map* shows the location of the current Accomack County zoning classifications. As the map indicates, Accomack County's predominant zoning category is Agricultural, with many smaller clusters of residential zoning.

During 2006, the County conducted a “build-out” analysis of what the original Agricultural Zoning District would allow if all of the maximum amount of residential structures permitted by the zoning were to actually be built. The results of this analysis are shown in the following table.

### **Buildout Analysis of Original and Alternative Agricultural Zoning Regulations - 2006**

<b>Alternative Scenarios Tested*</b>	<b>Total Dwelling Units at Full Build-out</b>
<b>1. Original A District Opt. 1 (No Constraints)</b> Assumes no constraints other than original A District zoning regulations, with 30,000 square-foot minimum lot size.	159,666
<b>2. Original A District Opt. 2 (Soil Constraints)</b> Assumes soil constraints and original A District zoning regulations, with 30,000 square-foot minimum lot size.	114,168
<b>3. Alternative Zoning Regulations Opt. 1</b> Assumes no development on wetlands and density of one dwelling per 10 acres plus 2 bonus lots for clustering.	27,171
<b>4. Alternative Zoning Regulations Opt. 2</b> Assumes no development on wetlands, consideration of soil limitations, and density of one dwelling per 10 acres plus 2 bonus lots for clustering.	23,036

\*Assumptions and process for all scenarios:

Non-Tidal (Developable) Parcels created for the study as follows:

- Exclude non-Ag zoning (Commercial, Industrial, Residential, Towns)
- Exclude all Federal, State, TNC, Conservation, lands and easements (including partial parcel easements of TNC)
- Exclude Flood areas zoned ‘VE’
- Exclude Tidal (Estuarine) Wetlands
- Exclude all Roads, Railroads and ROWs represented as parcel polygons
- Exclude all polygons less than 4,000 square feet and tiny polygon slivers created by the erase operations.
- If parcel has up to 20% Bojac soil, assume 50% developable; if up to 50% Bojac, assume 90% developable; if more than 50% Bojac, assume 100% developable.

**Map 3-C**

This analysis preceded final action by the Board of Supervisors in adopting amendments to the A District which increased the minimum lot size for non-cluster lots from 30,000 square feet to five acres, with provisions for clustering houses on 30,000 square-foot cluster lots and providing two bonus lots for choosing the cluster option. The approximate effect of a 5 acre minimum lot size would be to allow roughly twice as many lots as the 10 acre minimum scenario shown in the preceding table, plus a number of additional lots due to the bonus for clustering. Thus, the total yield for the new regulations is estimated to be on average about three acres per lot. The full build-out under the new A District zoning would therefore be expected to be approximately 50,000 lots.

### Terminology

Note the difference between the terms “lot size” and “density”. *Density* refers to the total number of lots on a tract divided by the total area of the tract, which yields a measure of average “lots per acre”. The size of individual lots on that tract may vary from the average density because some lots could be smaller than average and others could be larger than average.

Also note the difference between “regular” or conventional lots and “cluster” lots. *Regular lots* are formed when a tract is divided into roughly uniform-sized lots of the minimum permitted lot size. *Cluster lots* are formed when the same number of lots are created, but each has a smaller area, so that they can be “clustered” onto a portion of the tract, leaving the remainder of the tract in open space or in lots that are larger than the average size. The following illustrations compare a conventional subdivision of “regular” five acre lots, with a clustered subdivision incorporating “cluster” lots.



Source: Herd Planning & Design, Ltd.

## **Residential Development and Ground Water Supply**

The 1992 Eastern Shore of Virginia Ground Water Supply and Management Plan estimated that there are approximately 5.5 to 22 million gallons per day (MGD) of ground water available from the Eastern Shore of Virginia's confined aquifers. An average estimate is 11 MGD. In 1988, public, industrial, commercial and agricultural users held withdrawal permits for approximately 15 MGD, although only 5 MGD was actually used.

Using a factor of 250 GPD per dwelling unit, or 100 GPD per person at 2.5 persons per household, the estimated ground water use for Accomack County's 16,965 year-round units is approximately 4,241,250 GPD. If the County's original Agricultural Zoning District had remained in place, at full build-out of 160,000 year-round dwelling units, ground water use from residential uses alone would be approximately 40,000,000 GPD. A simple rule of thumb for ground water use is: 4,000 units using 250 GPD equals 1,000,000 GPD.

As daily use approaches 40 million GPD, total withdrawal becomes a serious issue, in terms of the finite capacity of the groundwater aquifers. Despite this long term concern, a more immediate concern is the risk of saltwater intrusion as the aquifers are depleted. This is already occurring in some areas along the shorelines of the County.

Further, it is reasonable to assume that in the future, Accomack will use an increasing proportion of the total groundwater used on Virginia's Eastern Shore, because it has a larger population than Northampton County and is likely to grow faster in absolute terms. Accomack County's current population is about three times that of Northampton County,

The following table shows expected groundwater use for existing and future residential development in Accomack County, using the very conservative assumption that its proportion of total groundwater use remains constant in relation to Northampton County.

### Estimate of Future Groundwater Needs for Residential Uses

Average Daily Groundwater Use <sup>1</sup> (1,000's GPD)	Year							
	2000	2010	2020	2030	2040	2050	2060	2070
<b>Total Groundwater Recharge for Eastern Shore</b>	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000
<b>Total Groundwater Available for Accomack Co.<sup>2</sup></b>	8,250	8,250	8,250	8,250	8,250	8,250	8,250	8,250
<b>Alternative Scenario 1:</b>								
Total Year Round Dwellings	13,024	13,940	14,620	15,810	17,000	18,820	19,210	28,662
Daily Residential Water Use in Accomack County with <b>VEC growth forecast</b>	3,256	3,485	3,655	3,953	4,250	4,705	4,803	7,266
Remaining Groundwater Recharge	4,994	4,765	4,595	4,297	4,000	3,545	3,447	984
<b>Alternative Scenario 2:</b>								
Total Year Round Dwellings	13,024	15,878	19,346	23,596	28,764	35,020	42,500	52,020
Daily Residential Water Use in Accomack County at <b>Trend growth rate<sup>3</sup></b>	3,256	3,970	4,867	5,899	7,191	8,755	10,625	13,005
Remaining Groundwater Recharge	4,994	4,280	3,383	2,351	1,059	-505	-2,375	-4,755

<sup>1</sup>Total year-round residential dwelling use only; assumes 250 gpd per unit; does not include public, agricultural, commercial and industrial uses. Agricultural, commercial and industrial uses have permits allowing for the total withdrawal of approximately 4,986,525 gallons per day.

<sup>2</sup>Assumes ¾ of Eastern Shore capacity is used in Accomack

<sup>3</sup>Assumes an average annual growth rate of 2% after 2030.

The above analysis clearly demonstrates that prior to amending the A District regulations from the 30,000 square-foot minimum lot size to a 5 acre density, the County had too much zoning capacity for residential development in relation to the groundwater supply, both in terms of recharge and in terms of total capacity. The problem can be summarized as follows:

- If, on the one hand, the County's population were to grow at the rate forecast by VEC, individual residential users would not withdraw groundwater at a rate that exceeds the rate of recharge for the next 50 years and beyond, even though the remaining zoning capacity at that time will still be far in excess of what is needed.

- Yet, on the other hand, if the County's population growth rate were to continue at the current trend, the resulting amount of development would exceed the recharge rate before 2050, potentially causing serious environmental, economic, and/or financial problems in the County. (Note that these estimates of future recharge rates only consider individual residential users, and do not include public, agricultural, industrial or commercial users, which may in fact, require far more groundwater use than individual residential users. When existing 2007 agricultural, industrial, and commercial permits are considered, approximately 5 million GPD, Accomack County's remaining recharge capacity is very limited.)

This shows that in either case, the previous zoning capacity for residential development was excessive, and by amending the A District density provisions as it did in June, 2006, the County has taken an important step in protecting the groundwater supply in the long term.

Despite this action, however, saltwater intrusion problems are likely to continue to worsen in the near term, especially in vulnerable areas near the shorelines. Further, total groundwater supply is still a potential long-term problem that needs to be monitored, and saltwater intrusion is a current, immediate problem.

Therefore, the County's planning strategy must remain aimed at avoiding over-committing a supply of land far in excess of what is needed or what can be supported by the groundwater supply. Rather, the zoning capacity should be kept in reasonable balance in relation to the need for residential development so that the County can better predict the location and patterns of residential uses, and can plan accurately for providing services to the new residents. In that way, the County can gradually upgrade all of its infrastructure capacities to serve the growing population.

**Commercial/Industrial:** Commercial construction activity has been fairly slow but steady, with 77 new commercial, retail, or professional buildings constructed during the six years prior to 1997, and 76 permits from 1997 through 2002. From 2003 through 2006 there were 37 new commercial/industrial structures. The most sizable commercial construction projects were a hatchery expansion at the Tysons poultry processing plant and three new starts in the industrial park. The county has a 360 acre industrial park, located adjacent to the county's airport in Melfa. One hundred and twenty acres of the park are improved with streets, water and sewer. The industrial park currently houses the Eastern Shore Chamber of Commerce, a manufacturer of housing components, a manufacturer of aircraft components, a manufacturer of computer components, a specialty foods distributor, and an underground utilities contractor. The proposed Wal-Mart store in Onley, planned for construction in 2008, will add over 150,000 square feet of retail space.

**Conservation:** As of 2007, a fairly large portion of Accomack County was in conservation ownership, as shown on Map 3-D, *Publicly Owned Conservation Lands*. These lands are owned and managed by the National Park Service, U.S. Fish and Wildlife Service, Virginia Department of Game and Inland Fisheries, the Virginia Department of Conservation and Recreation, The Nature Conservancy, and The Chesapeake Bay Foundation. The federal government owns 9,459 acres on Assateague Island, 550 acres on Chincoteague Island, 1,434 acres on Assawoman Island, 174 acres on Metompkin Island, 1,250 acres on Cedar Island, and 3,376 acres on Wallops Island (3,000 acres owned by NASA). The Commonwealth of Virginia owns 750 acres of Parkers Marsh, 5,574 acres of Saxis Marsh, 425 acres at the Mutton Hunk Fen, and 19,491 acres of marshland on the Seaside.

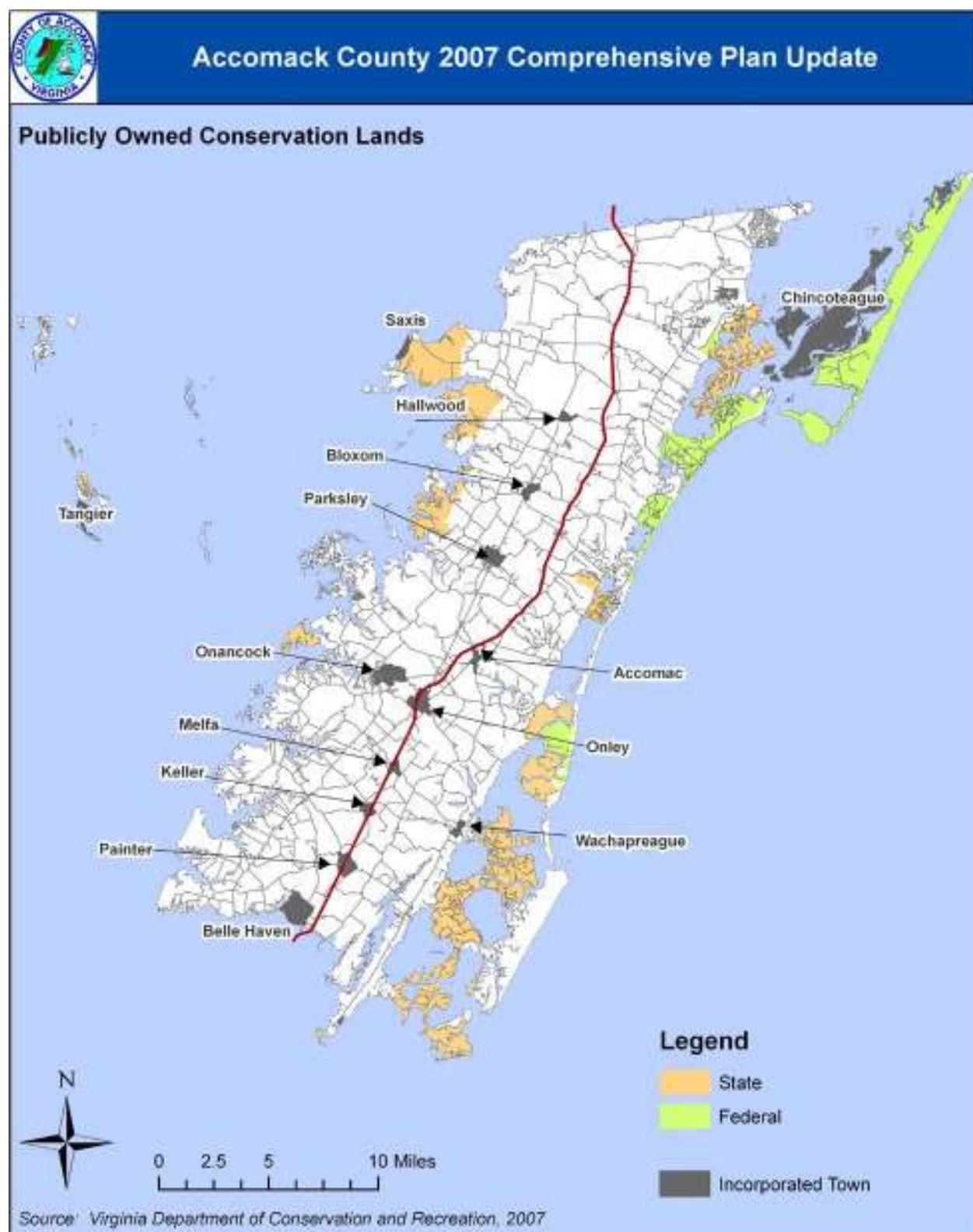
In 2007 there were 11,002 acres of land under conservation easements, as shown on Map 3-E, *Conservation Easements*.

### **Accomack County Land in Conservation Ownership**

Source: Accomack County Office of the Tax (1996)

<b>Management</b>	<b>Location</b>	<b>Acreage</b>
USFWS .....	Assateague .....	7,465
USFWS .....	Chincoteague .....	550
USFWS .....	Wallops .....	1,284
USFWS .....	Assawoman Island.....	1,434
USFWS .....	Metompkin Island.....	174
USFWS .....	Cedar Island .....	1,250
VA DCR.....	Parker's Marsh .....	750
VA DCR.....	Mutton Hunk Fen.....	425
VA DGIF .....	Saxis Marsh .....	6,177
VA DCR.....	Seaside Marsh .....	19,491
TNC .....	Parramore & Revel Islands .....	7,692
CBF .....	Fox Island .....	500
CBF .....	South Point Marsh .....	437
<b>Total .....</b>		<b>47,272</b>

USFWS=U.S. Fish & Wildlife Service, VA DCR= Virginia Department of Conservation and Recreation, VA DGIF=Virginia Department of Game & Inland Fisheries, TNC=The Nature Conservancy, CBF=Chesapeake Bay Foundation.

**Map 3-D**

**Map 3-E**

## Housing

**Existing Housing Stock:** According to the 1990 census, there were 15,840 housing units in Accomack County, and 12,653 of those units were occupied at the time of that census. Since then the number of housing units has increased to 19,550, with 15,229 occupied, according to the 2000 census. Of the existing housing stock, 19.2% were built between 1990 and March of 2000, 16.7% were built between 1980 and 1989, 26.7% built between 1960 and 1979, 17.6% built between 1940 and 1959, and 20.2% built prior to 1940. Detached single unit homes were the predominant housing type (13,724). There were 3,208 mobile home or trailer units, comprising 25% of the existing housing stock. There were 611 multi-unit homes in Accomack County in 1990. Population per household has remained steady at 2.5 per occupied dwelling. The following data from the 1990 and 2000 censuses shows these changes and trends.

### Housing Characteristics

Source: U. S. Census

Characteristic	1990	2000
Total housing units	15,840	19,550 (23% increase)
Occupied housing units	12,653 (79.8%)	15,299 (78.3%)
Owner-occupied housing units	11,848 (74.8%)	11,482 (75.1%)
Renter-occupied housing units	4,815 (30.4%)	3,817 (24.9%)
Vacant housing units	3,187 (20%)	4,251 (21.7%)
Mobile home	3,208 (25%)	4,512 (23.1%)
Age (more than 30 years old)	7,445 (47%)	9,462 (48%)
(less than 10 years old)	2,851 (18%)	3,910 (20%)

**Housing Costs:** The median value of owner-occupied housing in Accomack County increased significantly between 1980 and 1990, and again between 1990 and 2000. According to the U.S. Census Bureau, the median value in 1980 was \$26,700, \$52,700 in 1990 and \$79,300 in 2000. This increase could be due in part to the higher value of new houses constructed in the 1980s and 1990s.

The median selected monthly ownership costs (mortgage payments, real estate taxes, hazard insurance, utilities and fuels) increased from \$552 a month for homeowners with a mortgage in 1990, to \$750 a month in 2000. For homeowners with no mortgage, ownership costs increased from \$183 a month in 1990 to \$240 in 2000. The median rent for housing in Accomack County was \$335 in 1990 and \$446 in 2000.

The Accomack-Northampton Regional Housing Authority administers the Section 8 Rental Assistance Program to help lower income people obtain adequate housing. This program is funded with federal and county funds. Under the rental assistance program, participants pay up to 30% of their income towards rent and the program pays the remainder, up to the fair market rental price. In 1996 there were 133 families participating in the rental assistance program in Accomack County. In 2007, 482 families were participating, a 362 percent increase from 1996.

**Substandard Housing:** The following table compares 1990 data to 2000 data.

According to the 1990 Census, 7.5% of the county's housing units lacked complete plumbing facilities, 4.9% lacked complete kitchen facilities, and 6.9% had neither a septic system nor public sewer hook-ups. The 2000 Census reported that 2.9% of the county's housing units lacked complete plumbing facilities, 2.4% lacked complete kitchen facilities. Although the Health Department will allow for replacement of existing privies, the county's building code will not allow new homes to be constructed without indoor plumbing.

#### Housing Conditions

Source: U. S. Census

Condition	1990	2000
Lack complete plumbing	1,188      7.5%	404    (2.6%)
Lacking complete kitchen facil.	776      4.9%	248    (2.4%)
No telephone	4,815    (30.4%)	649    (4.2%)

Over the last 30 years, both the number of vacant housing units and the number of occupied housing units have increased, suggesting that some of the county's older housing is being abandoned. Through a combination of attrition and rehabilitation, substandard housing in Accomack County is diminishing.

The Accomack-Northampton Housing and Redevelopment Corporation rehabilitated over 100 units of substandard housing-between 1990 and 1996, and rehabilitated or constructed an additional 504 units from 1997 through 2007. The Accomack-Northampton Housing and Redevelopment Corporation, Accomack-Northampton Regional Housing Authority, Virginia Eastern Shore Economic Empowerment and Housing Corporation, Eastern Shore Area Agency on Aging, and Habitat for Humanity offer housing rehabilitation services.

In 1994, the Accomack County Board of Supervisors identified the communities of Savagetown, Locust Mount, Metompkin, and Graysville as priorities for housing rehabilitation assistance. At that time, the Board of Supervisors requested that the Accomack-Northampton Planning District Commission and the Accomack-Northampton Housing and Redevelopment Corporation explore sources of Federal and State funding that could address the needs of these communities. Since 1994, housing rehabilitation programs have been completed in three of these four communities, with the exception of Graysville. In 2007, the Accomack Manor Senior Housing Project was completed as a public/private partnership using partial funding from the Virginia Community Development Block Grant Program. Accomack County's current rehabilitation priorities are the communities of Savagetown/Cats Bridge, Locust Mount, Metompkin, Accomack Manor, Graysville, Wishart's Point, East Horntown, and Gospel Temple Road.

**Housing Units Authorized by Permits**

Source: Accomack County Building Permits

Year	Units
1990 .....	253
1991 .....	265
1992 .....	316
1993 .....	275
1994 .....	316
1995 .....	335
1996 .... ....	292
1997 .....	252
1998.....	285
1999.....	323
2000.....	308
2001.....	306
2002.....	322
2003.....	374
2004.....	374
2005.....	433
2006.....	319

**Manufactured Housing:** The Virginia General Assembly passed legislation during their 1995 session which severely limits the county's control over manufactured housing. This legislation, effective as of July 1, 1995, allows any manufactured home which has a HUD approval sticker to be placed, by right, in an Agricultural zoning district. These homes may have been manufactured as early as 1976, when the HUD labeling program started. Prior to the effective date of this legislation, Accomack County allowed double-wide manufactured homes and single-wide manufactured homes with A-frame roofs, house type siding, and a masonry foundation, by right in both Agricultural and Residential zoning districts. Older manufactured homes required a special use permit from the Board of Zoning Appeals. This legislation has a particular impact on Accomack County due to the fact the 93% of the county is currently zoned as Agricultural.

**Regional Housing Assessment:** In 2002, the Accomack-Northampton Planning District Commission completed the *Regional Housing Assessment* in cooperation with Accomack and Northampton counties. The report analyzes the Eastern Shore's multi-faceted housing market, which ranges from gated communities to homes without indoor plumbing. The Eastern Shore's middle and upper income segments of the housing market are quite healthy, but is underserved regarding condominiums, upscale apartments, independent living, assisted living, and nursing homes. For the lower income segment, housing is a symptom of underlying socioeconomic conditions, and 26 percent of the Eastern Shore's households have housing problems that include cost burdens, overcrowding, and substandard conditions. The inability to pay rent leads to credit problems, which inhibits the upward mobility of rented households to homeownership. Low household incomes on the Eastern Shore can be traced to lower educational attainment, fewer job options, and a chronic history of poverty and unemployment.

The report stresses the need for central water and sewer to provide small, affordable lots and higher density housing, as well as the need for additional rental housing for those who simply cannot qualify for mortgages. The report outlines nine strategies with goals and actions to increase rental housing; promote home ownership; provide housing for the homeless, persons with disabilities, and migrant workers; revitalize neighborhoods; improve credit and capital; provide counseling and support services; and develop infrastructure to enable housing on small, affordable lots.

The 2002 *Regional Housing Assessment* can be found on the A-NPDC web site at:  
<http://www.a-npdc.org/housEXECSUMM.pdf>

## The Economy

**The Local Economy:** Accomack County's economy is based primarily on agriculture, manufacturing, services and public administration. The county's major industries are two poultry processing plants operated by Perdue and Tyson. These two plants combined account for approximately one quarter of the jobs in Accomack County. The NASA Wallops Flight Facility and related services also account for a large portion of the local economy. The Flight Facility and related contractors provide approximately 1,000 jobs.

### Largest Employers in Accomack County

Source: Virginia Employment Commission (October 4, 2007)

Industry	Type
Perdue Products .....	Poultry Processing .....
Tyson Farms. ....	Poultry Processing .....
Accomack County School Board	Local Government
County of Accomack	Local Government
NASA .....	Federal Agency .....
Eastern Shore Community Services	Alcohol and Drug Abuse Information and Treatment
Shore Memorial Hospital	Hospital
Byrd Food	
The Cube Corporation	NASA Contractor
Intrepid USA Inc.	Healthcare Services
Eastern Shore Community College	
Lockheed Martin Service Inc.	
EG & G. Inc	
Food Lion	
Eastern Shore Ambulance	

**Traditional Industries:** Agriculture and seafood production are the Eastern Shore's traditional industries. The waters of the Atlantic Ocean and Chesapeake Bay support the local seafood industry and create a warming effect on the area's climate, providing a long growing season for agriculture. As a result of these conditions, Accomack County ranked third among Virginia localities in total value of agricultural products sold in 2002, and ranked first in Virginia in vegetable production.

According to the 2002 Census of Agriculture, the market value of agricultural products sold in Accomack County was \$109,133,000. Total farm production expenses were \$80,600,000. The average net return per farm was \$94,546. A decade earlier, in 1997, the market value of agricultural products sold in Accomack County was \$71,806,000. Total farm production expenses were

\$56,811,000. The average net return per farm was \$50,292.

The county's proximity to major markets makes the area suitable for production of market crops, thus the state's investment of \$2.3 million in the construction of the Eastern Shore Farmers Market to promote the distribution of Eastern Shore produce.

**Forestry:** Accomack County's forests are an important economic asset to both the owners of the forests and those that work in the wood products industry. Wood products that are produced by the county's forests include saw logs, poles and pilings, and pulpwood. The fact that loblolly pine is the most preferred species for salt treated lumber makes it a resource of considerable economic importance. Secondary products that are produced as a result of the harvesting process include firewood, bark (for mulch), and sawdust. Virginia Department of Agriculture statistics indicate that timber is the second most valuable agricultural crop in Virginia, ahead of field crops, vegetables, and tobacco, with only poultry and egg crops having a higher market value. Forest related employment in Accomack County consists of jobs in timber harvesting, sawmilling, trucking, firewood production, forest management and consulting, timber stand improvement, and reforestation.

The value of timber has increased steadily since the 1970's and timber demand is projected to increase into the 21st century. These trends should provide incentive for land owners to keep land in forests rather than converting it to a different land use. Economic benefits can be increased through better utilization of the forest resource at the time of harvest. Improved management techniques can shorten the amount of time of harvest. Improved management techniques can shorten the amount of time it takes to grow valuable sawtimber from 55-70 years to 35-45 years.

**Agricultural Promotion:** In 2006 Virginia Tech prepared a report on *Recommendations for Creation of a Plan to Promote the Agriculture Industry in Accomack County, Virginia*. The report analyzes Accomack County agricultural and land use data and identifies the following four strategies and 16 recommendations to improve Accomack's agricultural economy:

### **Strategy 1: Land Conservation**

1. Maintain use-value assessment within the county.
2. Reinvigorate Agricultural and Forestal Districts within the County.
3. Initiate a purchase of development rights (PDR) program within the county.
4. Implement an agricultural protection lease agreement program within the county.

### **Strategy 2: Better Ways to Accommodate Development**

5. Amend the existing agricultural zoning ordinance to provide more incentives for clustering.
6. Implement incentive zoning within the county.
7. Add a Planned Unit Development (PUD) classification to the county zoning ordinance.
8. Consider a Transfer of Development Rights (TDR) Program.
9. Establish Urban Service Areas (USAs) within the county.
10. Institute maximum residential lot sizes within the agriculturally zoned areas of the county.

### **Strategy 3: Education**

11. Work with Virginia Cooperative Extension to implement programs to educate the non-farm community within the county on agricultural issues.

12. Clearly communicate support of agricultural education programs in public schools and youth programs.
13. Collaborate with Virginia Cooperative Extension to educate county residents on smart growth techniques.

#### **Strategy 4: Economic Development for Agriculture**

14. Institute an Agriculture Industry Council
15. Establish a staff position within the county with the title Director of Agriculture Development [Promotion of the agricultural industry will be the responsibility of the Director of Economic Development – see policy 8-i]
16. Conduct a review of the present agricultural zoning ordinance to ensure that appropriate commercial activities are allowed.

**Tourism:** Virginia's Eastern Shore Tourism Commission currently promotes the Shore as a tourist destination. Traditionally, tourism in Accomack County has been focused primarily on the county's natural assets, such as the Chincoteague ponies, Assateague Beach, camping, fishing, and hunting. In recent years there has been a new focus on other activities such as bicycling, kayaking, bird watching, local art and crafts, specialty shops, seasonal festivals, and historic towns. The Eastern Shore hosts an annual Birding Festival to promote nature tourism and regular bike tour weekends are being scheduled. Tourism is a vital part of the economy and is the growing industry. In 2005, Virginia's Eastern Shore Tourism Commission developed the *Virginia's Eastern Shore Tourism Strategy*, which calls for Accomack and Northampton counties and their towns to work together to "brand" the Eastern Shore for tourism. Further information on local tourism can be found on the Virginia's Eastern Shore Tourism Commission web site at: <http://www.esvatourism.org/home.asp>

**Taxes:** Accomack County's real property tax rate in 1997 was \$0.62 per \$100 of value for real estate and \$3.22 per \$100 of value for personal property. In 2005, the real property tax rate was \$0.57 and the personal property rate varied among the districts, ranging from \$3.13 to \$3.26.

#### **Property Tax Rates, 1996, 2005**

Source: 1996, 2006 Virginia Review of State and Local Government

	<b>Real estate tax (per \$100 of value)</b>		<b>Personal property tax (per \$100 of value)</b>		
	<b>1996</b>	<b>2005</b>	<b>1996</b>	<b>2005 (nominal)</b>	<b>2005 (effective)</b>
Accomack County.....	\$0.62.	\$0.57	\$3.22	\$3.13 to \$3.26	\$2.41 to \$2.51
Average for Va. Counties	\$0.69	\$0.69	\$3.38	n/a	n/a
Median for Va. Counties ..	\$0.66	\$0.67	\$3.50	n/a	\$2.50
Average for Va. Cities ....	\$1.04	\$0.98	\$3.83	n/a	n/a
Median for Va. Cities .....	\$1.11	\$0.98	\$4.20	n/a	\$2.61

**Work Force:** According to 2000 census data, there are 18,116 individuals in Accomack County's work force. Of these, 9,542 are male and 8,574 female. This shows an increase in the workforce in Accomack County by 3,180 individuals since the 1990 census. Twenty-eight percent of county residents have had some post-high school education, compared to the 25% in the 1990 census. Sixty-two and one half percent of county residents 18 years or older have a high school education or better. Approximately twenty-five percent of those 18 years or older have

had one or more years of post-high school education, 6.8% have a Bachelors degree from a four year college and 2% have graduate or professional degrees.

**Employment:** According to the 1990 census, 93% of the civilian work force in Accomack County is employed. The 2000 Census shows that the percentage of those employed in the work force has dropped to 92%. The county's unemployment rate has ranged from 4.4% to 8.1% over the last ten years. This rate has been about two points higher than the state average. Services and wholesale/retail trade are the largest employment sectors with each employing approximately one quarter of the working population. The table below breaks down employment by industry. Eighty-four percent of the county's employed residents work within Accomack County, 9% work outside of Virginia and 7% find employment in Virginia, but outside of Accomack County.

### **Employment by Sector, 2006**

Source: Virginia Employment Commission  
(some categories combined)

<b>Sector</b>	<b>Employed</b>		<b>% of Total</b>	
	<b>1995</b>	<b>2006</b>	<b>1995</b>	<b>2006</b>
Agriculture, forestry & fishing	397	278	3.7%	2%
Construction	564	672	5.3%	6%
Manufacturing	3,626	3,202	34.1%	26%
Transportation & public utilities	370	187	3.5%	2%
Wholesale trade	299	187	2.8%	2%
Retail trade	1,590	1,101	15.0%	9%
Finance, insurance & real estate	344	379	3.2%	3%
Services	3,013	3,548	28.4%	29%
Public administration [government].	415	2,595	3.9%	21%
Total	10,618	12,149	100%	100%

### **Unemployment Rates.**

Source: Virginia Employment Commission and  
E.S. of Virginia Economic Development Commission

	<b>Accomack</b>	<b>Va.</b>	<b>U.S.</b>
<b>1985</b>	7.8	5.6	7.2
<b>1990</b>	5.9	4.3	5.5
<b>1995</b>	8.1%	4.5	5.6
<b>2000</b>	3.9%	2.3%	4.0%
<b>2005</b>	4.4%	3.5%	5.1%

**Income:** The median household income in 1989, as reported in the 1990 census, was \$20,431. The 2000 census reported that median household income in 1999 had increased to \$30,250, with 1,353 families below poverty level (13%), and 6,788 individuals below (18%). Tables in this chapter show the distribution of household incomes in Accomack County.

**Economic Development:** Accomack County actively promotes business development through

the recruitment of new industry, local business starts, and growth of existing business. Agencies involved in economic development for the county include the Eastern Shore Chamber of Commerce, the Eastern Shore Tourism Commission, and the Virginia Eastern Shore Economic Empowerment and Housing Corporation. Economic development activities include development of the Virginia Spaceflight Center, NASA Wallops Flight Facility, Mid-Atlantic Regional Spaceport, Wallops Research Park, Workforce Development Center, Broadband, Farmers Market and Airport Industrial Park, and the acquisition of Enterprise Community, Enterprise Zone, and Free Trade Zone designation for portions of the county.

***Enterprise Community/Enterprise Zone Designation:*** In December of 1994, parts of Accomack and Northampton Counties were designation as a federal Enterprise Community and state Enterprise Zone. The Eastern Shore Enterprise Community is one of thirty rural Enterprise Communities nationwide.

The Enterprise Community designation is the result of the federal government's Empowerment Zones and Enterprise Communities Initiative to direct federal resources towards impoverished rural areas. The Enterprise Community Program, administered by the U.S. Department of Agriculture, provides successful applicants with \$3 million and special consideration for a variety of competitive federal loan, grant, and technical assistance programs for a period of ten years. The original zone boundaries were expanded in 1996 to include all of Northampton County and census tracts 9907 and 9908 in Accomack County. The Accomack County tracts cover an area from Onley south. Map 3-F shows the geographic extent of the Enterprise Zone designation.

**Map 3-F**

**Household Income.**

Source: 1990 Census; 2000 Census.

<b>1989 Income</b>	<b>Households</b>	<b>1999 Income</b>	<b>Households</b>	<b>Percent</b>
Less than \$5,000	1,355	Less than \$10,000	2,186	14.3
\$5,000 - \$9,999	1,582			
\$10,000 - \$12,499	935	\$10,000 - \$14,999	1,339	8.8
\$12,500 - \$14,499	762			
\$15,000 - \$17,499	806	\$15,000 - \$24,999	2,799	18.3
\$17,500 - \$19,999	759			
\$20,000 - \$22,499	720			
\$22,500 - \$24,999	673			
\$25,000 - \$27,499	713	\$25,000 - \$34,999	2,599	17.0
\$27,500 - \$29,999	497			
\$30,000 - \$32,499	579			
\$32,500 - \$34,999	437			
\$35,000 - \$37,499	393	\$35,000 - \$49,999	2,591	17.0
\$37,500 - \$39,999	307			
\$40,000 - \$42,499	320			
\$42,500 - \$44,999	183			
\$45,000 - \$47,499	200			
\$47,500 - \$49,999	193			
\$50,000 - \$54,999	366	\$50,000 - \$74,999	2,238	14.7
\$55,000 - \$59,999	139			
\$60,000 - \$74,999	353			
\$75,000 - \$99,999	227	\$75,000 - \$99,999	793	5.2
\$100,000 - \$124,999	48	\$100,000 - \$149,999	515	3.4
\$125,000 - \$149,999	24			
\$150,000 or more	75	\$150,000 - \$199,999	65	0.4
		\$200,000 or more	145	0.9

**Employed civilian population 16 years and over**

Source: 2000 Census.

<b>Occupation</b>	<b>Number</b>	<b>Percent</b>
Management, professional, and related occupations	4,026	24.2%
Service occupations	2,774	16.7%
Sales and office occupations	3,675	22.1%
Farming, fishing, and forestry occupations	982	5.9%
Construction, extraction, and maintenance occupations	1,835	11.0%
Production, transportation, and material moving occupations	3,326	20.0%
<b>Total</b>	<b>16,618</b>	<b>100.0%</b>
<b>Industry</b>	<b>Number</b>	<b>Percent</b>
Agriculture, forestry, fishing and hunting, and mining	1,050	6.3%
Construction	1,357	8.2%
Manufacturing	2,945	17.7%
Wholesale trade	697	4.2%
Retail trade	1,963	11.8%
Transportation and warehousing, and utilities	581	3.5%
Information	199	1.2%
Finance, insurance, real estate, and rental and leasing	702	4.2%
Professional, scientific, management, admin., and waste management services	940	5.7%
Educational, health and social services	2,696	16.2%
Arts, entertainment, recreation, accommodation and food services	1,567	9.4%
Other services (except public administration)	740	4.5%
Public administration	1,181	7.1%
<b>Class of Worker</b>	<b>Number</b>	<b>Percent</b>
Private wage and salary workers	11,945	71.9%
Government workers	3,029	18.2%
Self-employed workers in own not incorporated business	1,591	9.6%
Unpaid family workers	53	0.3%

The Virginia Eastern Shore Economic Empowerment and Housing Corporation (VESEEH) has been established to administer the Accomack-Northampton Enterprise Community program. VESEEH directs use of the federal funds in accordance with the strategic plan submitted to the U.S. Department of Agriculture during the application process. The strategic plan addresses economic development, education, community development, infrastructure, public safety, human services, and environmental protection.

The Enterprise Community operates under the following guiding principles:

- (1) The community will use the federal investment in combination with other local, state and private resources to renew and revitalize its once productive economy. This will be accomplished principally through development of programmatic and financial infrastructure to promote development of locally owned and operated business enterprises and by supporting existing industry.

(2) Sustainable development strategies will provide leadership for concerted action to protect and capitalize on Northampton and Accomack's world class natural, cultural, historic and human assets for the ongoing benefit of all citizens.

(3) Strategies to promote sustainable community and economic development will involve concerted public and private actions to facilitate increased financial investment in the designated census tracts. Key to realization of this goal will be the creation of community business incubation services where new local entrepreneurs can obtain information and technical assistance, and where financial institutions can disseminate information concerning their programs and available resources. (4) Programs and initiatives will be developed that build the capacity of community residents to sustain physical, social and economic improvements once the designation period expires. (5) To provide all residents of both counties with the knowledge, opportunities and resources to access decent, safe and affordable housing regardless of class or income. (6) To create equal opportunity within economic, educational and social aspects of life and provide the target communities with the resources to take complete charge of their collective futures.

The federal government provides no direct financial incentives for business in Enterprise Communities. However, when the county obtained Enterprise Community designation, the Commonwealth of Virginia also designated the area as a state Enterprise Zone. Enterprise Zone designation provides development and redevelopment incentives to encourage the private sector to invest in distressed areas. The following package of Enterprise Zone state tax incentives apply to development in the Enterprise Community/Enterprise Zone: (1) Ten-year general income tax credit against a business's state tax liability in an amount up to 80% in year one and 60% in years two through ten. (2) Real property improvement tax credit equal to an amount of up to 30% of qualified zone improvements with a maximum amount not to exceed \$125,000 within a five-year period. Rehabilitation projects must have a minimum investment of at least \$50,000 and an amount that equals the assessed value of the real property prior to the improvements being made, whichever is greater. New construction projects must have a minimum investment of at least \$250,000 in real property. The credit is refundable to the extent that if the business state tax liability is less than the credit allowed, the remaining balance would be refunded. (3) Investment tax credit against a business's state tax liability for businesses investing \$100 million and creating 200 jobs. The percentage amount is negotiable and could be worth up to 5% of the investment. (4) Job grants for jobs created by business start-ups and expansions by existing firms in amounts equal to \$1,000 per zone resident hired and \$500 for any other job per year. The maximum grant to any one firm per year is \$100,000 for a period of three consecutive years commencing with the first year. Businesses may qualify for additional job grant incentive periods provided there is additional job creation.

**The Accomack County Airport Industrial Park:** The Accomack County Airport Industrial Park contains 360 acres of property strategically located adjacent to the county's airport, U.S. Route 13 and the Eastern Shore Community College. The park also lies within the boundaries of the Accomack-Northampton Enterprise Zone. The park has 120 acres of building sites which are served by water, sewer and paved roads. Airport improvements include a new terminal building, eighteen new hangars, a new apron, new taxiway, and a jet fuel facility. The airport improvements connect the airport to the industrial park and farmers market. The airport currently handles approximately 10,000 take-offs and landings a year. The industrial park now houses the Eastern Shore Chamber of Commerce, the Accomack County garage, Altair Inc. (a

company that overhauls and repairs auxiliary power units for jet engines), Truss-Tech Inc. (a manufacturer of building components), Interad Inc. (a manufacturer communications electronics components), Blue Crab Bay Company, (a manufacturer of specialty foods), and Lucas Underground, (installs underground utilities).

**NASA Wallops Flight Facility/Mid-Atlantic Regional Spaceport/US Navy/NOAA:** The NASA Wallops Flight Facility not only hosts NASA and the Mid-Atlantic Regional Spaceport (MARS), it is the location of the US Navy's Naval Surface Combat System Center, Naval Support Activity, the National Oceanic and Atmospheric Administration (NOAA) data acquisition center, and the Marine Science Consortium (MSC). These facilities and operations provide the basis for one of Accomack County's most promising economic growth opportunities, including the proposed Wallops Research Park.

The NASA Wallops Flight Facility, the US Navy Surface Combat System Center, and related facilities are vital assets for our national defense system and are a major part of Accomack County's economy. With growing missions and hundreds of skilled, well paying jobs, these facilities also present opportunities to improve Accomack's economy, employ additional local residents, and add to our tax base. The NASA Wallops Flight Facility (WFF) and the Eastern Shore Defense Alliance (ESDA) are working with Accomack County to identify and address issues that affect the future development and viability of the following Wallops facilities:

- NASA Wallops Flight Facility (WFF)
- Mid-Atlantic Regional Spaceport (MARS)
- US Navy Surface Combat Systems Center (SCSC)
- US Navy Naval Support Activity, Wallops (NSAW)
- National Oceanic and Atmospheric Administration (NOAA) Data Acquisition Center
- US Coast Guard (USCG) Station Chincoteague (Under Dept. of Defense in time of war.)

Other military organizations that work in the Eastern Shore area include:

- US Navy Center for Surface Combat Systems, Dahlgren, VA
- US Navy Naval Surface Warfare Center (NSWC) Corona, CA
- US Navy Naval Surface Warfare Center (NSWC) Dahlgren, VA
- US Navy Naval Surface Warfare Center (NSWC) Port Hueneme, CA
- US Navy Naval Air Warfare Center (NAWC)
- US Air Force Space Command (AFSP) Det 12

The combined Wallops workforce of NASA, associated contractors, and the military operations is nearly 1,500 employees and growing. These operations attract 3,000 business visitors annually who patronize local motels, restaurants, and shops.

NASA WFF has estimated that in 2007, a total of \$184,000,000 was spent regionally at Wallops by NASA (\$107,000,000), the US Navy (\$70,000,000), and NOAA (\$7,000,000). Sixty-three percent of WFF employees live in Accomack County, two percent in Northampton County, and the remaining 35 percent in Maryland and Delaware. These facilities represent substantial public investment and, with new programs and growth, can continue to support and grow Accomack County's economy.

A 2003 study, *Economic Development Value of the U.S. Navy Surface Combat Systems Center at Wallops Island* Development conducted by Salisbury University, estimated the annual economic value of the US Navy facilities. This economic value study used multiplier factors to estimate the total economic value of the facilities, which results in numbers greater than the actual dollars spent. Accomack County's economy captured the largest share of this activity, or \$58,000,000 per year. The study showed that this dollar amount is equivalent to the total annual income and taxes generated by 10 percent of the County's population. The report is available at <http://beacon.salisbury.edu/scsc.pdf>.

Due to the geographic location in a rural area at the 38<sup>th</sup> parallel of latitude, on the Atlantic Ocean, and due east of Washington, DC, the Wallops facilities provide a unique location for efficient and safe low-cost rapid-response rocket launches and satellite deployment for NASA, DOD, and the commercial launch industry; open-ocean combat systems development, testing, and training; and ballistic missile defense. The SCSC is also the only location where realistic combat systems "interoperability" testing and training can be conducted without real ships. The close proximity to Naval Station Norfolk and Patuxent River Naval Air Station also provides for efficient operations with real ships and aircraft. The need to operate these facilities in an area with low population density is also compatible with local goals to foster the agricultural industry, conserve wildlife habitat, and promote tourism.

The ESDA has prepared a Needs Assessment for the Wallops Island facilities and believes that, "The collection of diverse organizations and assets at Wallops are uniquely positioned to contribute inestimable value to our nation; militarily, environmentally, and economically. The single greatest threat to that promise is the potential for encroachment (of many types) to 'strangle' future potential." WFF and ESDA have outlined the following issues and recommendations for the long-term growth and viability of the Wallops Island facilities:

1. Employee Housing

Because of the high-priced seasonal housing market, there is no significant year-round rental housing market in Accomack County. This presents a problem for Navy and Coast Guard personnel, as well as newly hired government and defense industry employees.

2. Transportation

The Route 175 corridor is narrow and substandard. With growth in the area, this road needs to be upgraded to improve safety and traffic capacity. While VDOT has made recommendations for this road in the 2002 *Route 13/Wallops Island Access Management Study*, no funding has been made available to make improvements. Road shoulders and improved public transportation are needed to get bicycles and pedestrians off the road and provide a way for low-wage workers to commute to work.

3. Broadband Access

Accomack County has limited access to high-speed internet connections. Many residents are constrained to dial-up speeds, thus limiting their ability to work from home, or engage in entrepreneurial and educational activities. The Virginia government and legislature

have recognized this limitation and funds have been appropriated to provide a high-capacity fiber cable up the Eastern Shore.

#### 4. Workforce Development

In order for local people to benefit from employment growth and the higher-paid positions at Wallops Island, local schools will need to improve math and science programs so local children can compete with other applicants. Improving local schools will also make Accomack County more attractive to highly skilled applicants with children who are considering locating in Accomack County. Through local workforce development programs, existing employees can also take classes to improve their skills and enhance their economic opportunities.

#### 5. Community Coordination

While there is some informal coordination, Wallops and ESDA identify the need for a mechanism to formally coordinate the efforts of Wallops Island organizations with Accomack County and other community interests.

**WALLOPS and ESDA RECOMMENDATIONS:** With regard to encroachment reduction and prevention, Wallops and the ESDA offer the following recommendations:

1. Explore the creation of noise awareness areas wherein prospective home buyers would be made aware of the potential of aircraft operation as well as possible RF EM aspects of choosing to live in the vicinity of Wallops as they conduct operations which support our national defense and other national purposes.
2. Explore the potential for use of conservation easements on land near areas of concern. Conservation easements would permit tourists and local residents to enjoy the biodiversity for which the Eastern Shore is famous, while also enjoying the economic benefits of the high-tech jobs and pay scales at Wallops.
3. Explore the potential of modifying existing zoning regulations to protect the economic vitality of Wallops while protecting residents' property rights. Several of these recommendations can be combined as appropriate to achieve an optimum mix of economic benefit and land use. There are several locations where the recommended actions have been successfully applied, including the nearby Naval Air Warfare Center at Patuxent River, MD.
  - a. Ensuring that all identified hazard areas have planning and zoning provisions to either protect compatible use, or as a minimum, potential incompatible uses are specifically not permitted by right. From a process standpoint, this would require a special use permit so that WFF as well as other adjacent property owners can comment on the special proposed use within identified hazard zones.
  - b. Limiting further population density in the Red Zones of the Airport and Launch Range Accident Potential Zones;

- c. Deed notices for all property owners in all potential impact areas (located in active airfield /launch range area, no quiet hours, subject to direction by local emergency management authorities, etc.)
- d. Miscellaneous other issues such as:
  - i. Restrictions on storm water management practices and other uses that attract wildfowl;
  - ii. Restrictions on the type of lighting so that it does not interfere or impair pilot's vision;
  - iii. Restriction on Radio Frequency (RF) emitter sources, generally the type of sources that require an FCC license. There are also other more minor notification requirements for local spectrum management issues.

**NASA Wallops Flight Facility (WFF):** In 1991, Accomack County and WFF worked together to create Accomack County Zoning Ordinance Article XIX, Airport Overlay District. This part of the Zoning Ordinance provides airport overlay districts around WFF and the Accomack County Airport to ensure that there are no obstructions with the potential for endangering the lives and property of airport users and County residents. The Airport Overlay District, which includes building height restrictions, also ensures that there are no obstructions that may reduce the size of areas available for landing, takeoff, and maneuvering of aircraft, thereby protecting the utility of the airports and the value of these substantial public investments.

With operations expanding at NASA WFF, there is growing concern about protecting flight operations and public safety through measures in addition to the Airport Overlay District. Based on discussions, letters and public meetings between NASA WFF and Accomack County in November 2005, the County agreed to consider developing actions to protect the operational environment and public safety near WFF.

## 2015 Accomack County Joint Land Use Study

**Joint Land Use Study (JLUS) Overview:** In 2010, the Navy conducted an internal encroachment study for Navy missions and operations at NASA Wallops Flight Facility (WFF). The study was conducted to determine if any non-Navy activities were impeding the performance of Navy operations with the recommendation that a Joint Land Use Study (JLUS) be undertaken to further explore existing and future land use compatibility issues associated with Navy missions at the WFF. As JLUS initiatives typically involve communities around military installations, the Accomack County JLUS is unique as it involves Navy and other Department of Defense (DOD) organizations that operate as tenants of WFF, a NASA (non-DOD) facility.

Beginning in 2012, the County undertook a substantial collaborative project known as the Accomack County Joint Land Use Study along with the Navy, NASA and a wide range of various other stakeholders in an effort to create a planning tool for Accomack County. The JLUS

includes relevant data, analysis, recommended actions and strategies to influence future County policy-making decisions regarding compatible land use in order to accomplish the following primary goals:

- Protect the health, safety, and welfare of Accomack County residents living or working in potentially impacted areas surrounding the installation;
- Sustain the economic vitality of the Accomack County community;
- Promote a cooperative land use planning process where Accomack County collaborates with NASA, Navy and other DOD and Federal agencies onboard or operating from Wallops Flight Facility (WFF) to safeguard their mission capabilities, and in doing so, retain their critical economic value to the County;
- Ensure engagement of local private property owners in the land use planning process.

**What is a joint land use study (JLUS)?** There are many positive interactions between a military installation and the local jurisdiction. However, the activities of either can have unintended impacts on the other. Changes in military operations may increase noise, dust or safety concerns on the surrounding areas, while new residential or commercial development may restrict the military's ability to operate or train. Determining compatible development patterns on and around the installation is needed to protect the long term, viable relationship between the installation and the local community.

A joint land use study (JLUS) is a project that brings local officials, military installation officials and the community together, in a collaborative effort, to discuss current and future needs, and to identify and promote compatible land use development patterns that are mutual beneficial to the military installation, the county and towns, and the citizens.

It was found by the study that there are five (5) potential impact factors/issues affecting WFF's operational impact on the community and the community's impact on installation operations:

- Aircraft Accident Potential Zones;
- Coastal Resiliency;
- Electromagnetic Interference (EMI) and Radar Interference;
- Aircraft Noise Zones
- Rocket Range Hazard Areas

**\*\*For more information please refer to the 2015 Accomack County Joint Land Use Study\*\***

**Operational Footprint:** The following map identifies the joint land use study area (shown as a dashed blue outline) where the WFF operations and county land uses overlap and potentially conflict. The operational footprint was determined based on the nature and extent of current, known plans and mission operations performed at WFF as of 2015. Operations are program and project-driven and can change from year to year as missions evolve or change.

The following map depicts the operational footprint which includes noise and aircraft accident potential zones (APZs) associated with airfield operations at WFF Main Base, range hazard area arcs associated with rocket launches at WFF Wallops Island, and additional considerations related to operations conducted by NAS Patuxent River. Radar communications associated with operations at NAS Patuxent River could be potentially impacted by tall structures (such as utility scale wind turbines) if constructed within defined operational boundaries or ‘view-shed’ of the sensitive radar systems used by NAS Patuxent River.

## **Map 3-G**



**Figure 1.4-X.**  
**Existing Land Use and**  
**the Operational Recipient**  
**Joint Land Use Study**

<sup>1</sup> Max Brügel Land 2013  
strategische Investitionen  
in den Raum und Zeitraum der  
Erneuerungswirtschaft, Berlin.

**Aircraft Accident Potential Zones (APZs):** Installations and airfields often experience increased development and residential population growth near their boundaries. Development of businesses and residential neighborhoods near an installation allows the neighboring community to provide services to the installation and its personnel and allows personnel to live near their work place. However, development near an installation or airfield may present risks to the surrounding community and be incompatible with aircraft and other operations. The Department of Defense (DOD) established the Air Installations Compatible Use Zones (AICUZ) program to assist local governments and communities in identifying and planning for compatible land use and development near military installations. The goal of the program is to protect the health, safety and welfare of civilians and military personnel and preserve an installation or airfield's operational capabilities.

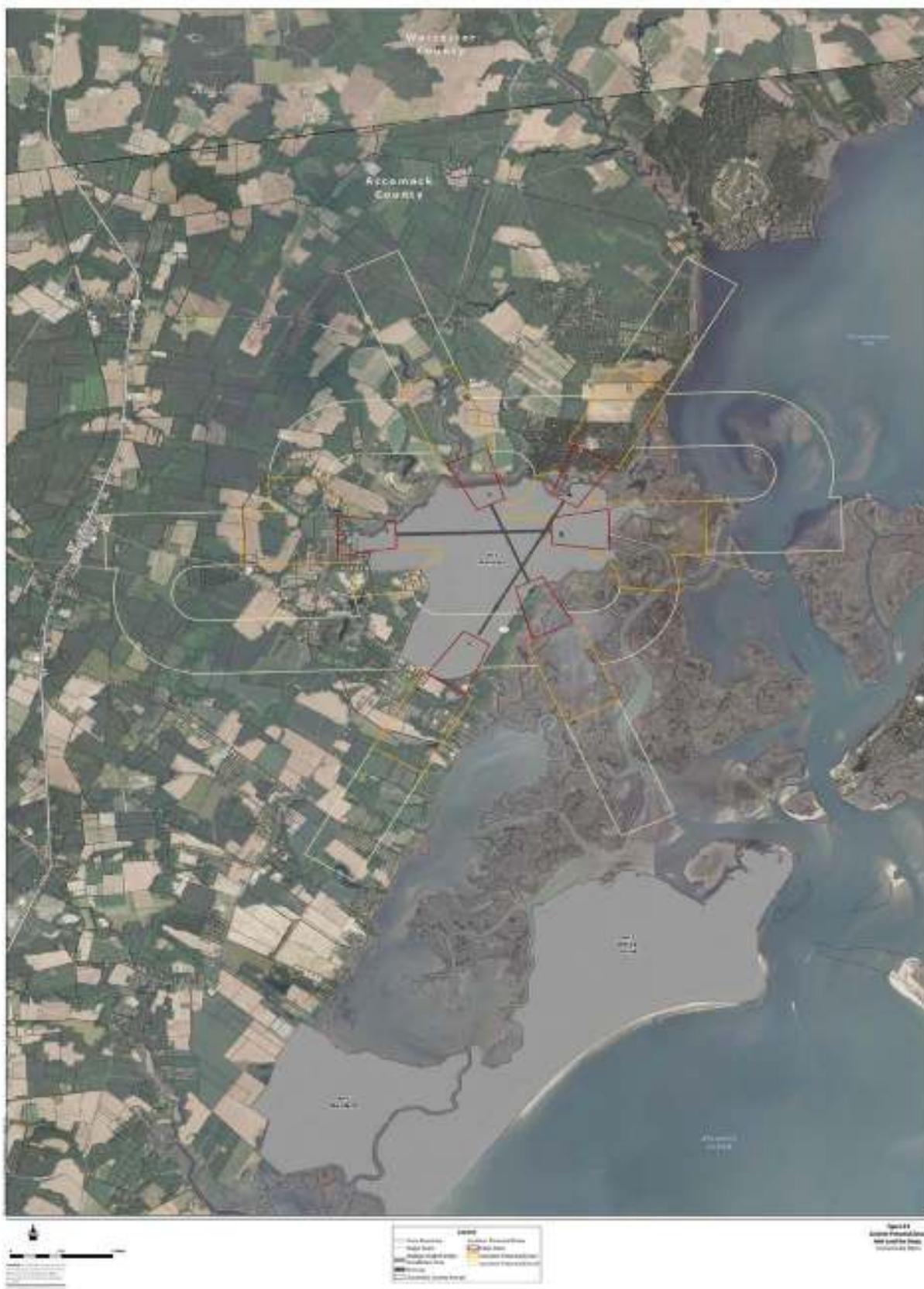
One land use planning component utilized within the AICUZ program is the designation of APZs. APZs are designated areas where the NAVY encourages land uses which are compatible with aircraft operations in order to minimize the risk to the public in the unlikely event of an aircraft mishap (NAVY 2008). APZs are the areas where the greatest potential for aircraft accidents exists based on historical accident data, and the type and mission of the aircraft in use. The locations of APZs are driven by the types of aircraft and types and numbers of aircraft operations that occur at the airfield (NAVY 2014).

**Clear Zones** (shown in red on following map): are located immediately beyond the runways and present the highest risk for aircraft accidents.

**APZ(1) and APZ(2)** (shown in orange and yellow, respectively, on following map): are located further from the end of the runway and the risk for aircraft accidents diminishes.

It is important to note that while APZ mapping is based on statistical evidence for the specific aircraft and mission, accidents can occur outside the mapped APZs.

**Map 3-H**



**Aircraft Noise Zones:** The DOD air installation guidance also covers aircraft noise. Noise is unwanted sound measured in decibels. Noise contours (see following map), or the areas of various noise levels are described in “decibels DNL.” DNL is a term to represent the average sound level generated by all aviation – related operations during a 24 - hour period. Below the threshold of 65 decibels DNL, noise is considered relatively low. For example, residential uses are not suggested in areas where aircraft noise is expected to exceed 65 decibels DNL, while recreational activities are not discouraged unless the noise exceeds 75 decibels DNL. Warehousing, agriculture, forestry, and fishing are considered compatible.

As shown on the following map, the area of noise exposure to aircraft operations is shown as a series of noise contours connecting points of equal value, i.e., points exposed to the same noise levels. Areas between the noise contours are called “noise zones.” The mapping of expected noise levels shown on the following map is based on acoustic modeling. However, given variables such as weather, actual flight paths, etc., actual noise levels/locations may vary.

**Map 3-I**

**Rocket Range Hazard Areas:** The rocket launches at WFF Wallops Island are not only a major catalyst to bring Government, academia and industry business and economic development to the Wallops area, but are also an attraction for both tourists and residents alike. Yet, these types of operations are inherently hazardous. As such, NASA develops and implements mission – specific safety plans - NASA's Range Safety Program - to ensure the protection of both members of the public and their property for all of its launches.

NASA's Range Safety Program is divided into two (2) primary areas – ground and flight safety. Ground safety considers potential hazards associated with activities such as fuel handling, assembly, and checkout for all prelaunch activities; occupational hazards; and crash, fire and rescue. Flight safety considers the potential risks to the public, NASA personnel, contractors and civilians from flight operations, including vehicle trajectory and dispersion.

As shown on the following map, the Rocket Range Hazard Areas consist of concentric rings (arcs) centered on the two (2) current and one (1) future planned orbital launch pads:

**10,000 Feet Arc:** The smaller of the two (2) hazard arcs, the 10,000 foot arc is NASA's planning level estimate for the area potentially requiring the most stringent controls, including clearing the zone of all people prior to launch, to protect the safety of the public and for the ability to launch. The primary hazards it is intended to protect against are the direct blast and debris generated in the event of a launch failure at or near the launch pad.

- Hazards: explosions, falling debris, dissipated toxic propellant vapors and distance focus overpressure (may shatter windows) if a vehicle failure occurs on pad or soon after launch.
- General Conditions: full evacuation of all residents is required or Wallops cannot launch certain orbital rockets. Current or new buildings would be at risk. Agriculture would be permitted, as long as the area is cleared of people.

**20,000 Feet Arc:** The larger arc, at 20,000 feet, depicts an area that may be susceptible to range hazards that are largely dictated by atmospheric conditions on launch day. In contrast to the 10,000 foot arc, the 20,000 foot arc would not likely require complete clearance, rather select areas within it could require special consideration, such as ensuring that large groups of people are not present or that building occupants are not in front of single – pane windows at launch.

- Hazards: dissipated toxic propellant vapors and distance focus overpressure (may shatter windows) if a vehicle failure occurs on pad or soon after launch.
- General Conditions: encourage compatible land uses. This rocket range hazard area should generally restrict dense population facilities such as gyms, theaters, school, trailer parks, multifamily dwelling, etc. No schools, hospitals, medical centers or other concentration of very young, very old or medically challenged should be considered a compatible use.

NASA coordinates all hazard area information with local law enforcement officials, and those officials are responsible for any notification and evacuations that may be necessary to protect the safety of the public.

The 10,000 and 20,000 feet arcs depict NASA's best estimate of the extent of launch hazard areas required for current planned and future missions. The actual hazard area requiring clearance is defined for each launch based on the specific hazards of that launch and historically have not exceeded 9,000 feet for Antares and Minotaur launches. While the extent of a hazard area will be tailored to each mission (and consequently could be smaller or larger), the 10,000 and 20,000 feet arcs depict the expected extent of those required for current and future missions. Rockets larger than the Antares or Minotaur classes may be of concern in the future. At the time of the JLUS study, implementing hazard arcs in excess of 10,000 feet have not been necessary; all orbital-class rockets (e.g. Minotaur, Antares) launched from WFF since late 2006 have required launch hazard areas between approximately 8,500 and 9,000 feet.

Recently the validity of these areas and the hazards experienced have been verified by the actual events and lessons learned from the ORB-3 rocket mishap on October 28, 2014.

**Map 3-J**



WFF has provided Accomack County with the information presented herein for informational and comparative purposes for consideration by the County in the Comprehensive Plan and for consideration of further zoning and compatible use restrictions in the WFF area. Based on this analysis and description of hazards, and the examples of how other municipalities in the Commonwealth of Virginia and elsewhere have treated these hazards, WFF trusts that Accomack County will find the proper balance between the public interest, economic development supported by the WFF mission, and public safety. WFF wants to work together with Accomack County to implement additional conditions necessary for the safety of the public, and for WFF to preserve the operational environment today, and for future large orbital launch programs that are currently scheduled that will make a substantial contribution to the economic development of the area. WFF is committed to being a good neighbor with property owners near its facilities, and feels that planned and compatible growth is the best way to overcome encroachment that threatens to interfere with, restrict, or even cancel WFF's existing programs.

**Wallop Research Park:** The Wallops Research Park (WRP) is a partnership between Accomack County, the Goddard Space Flight Center (GSFC), and the Marine Science Consortium (MSC) to provide a long term environment that attracts and maintains science, technology, and education. These programs supplement the core capabilities of GSFC, other WFF partners, and the MSC while contributing to the economic development of Accomack County and the surrounding region.

The WRP will provide the location, infrastructure and overall environment to attract and support economic growth through new commercial and educational institutions affiliated with WFF activities. The WRP will also house the supporting services that will enable these new enterprises, as well as support the resident County workforce, such as a business incubator and workforce training facilities. The WRP is currently developing a Master Plan to guide development of the facility.

**Comprehensive Economic Development Strategy (CEDS):** As part of the *Eastern Shore Comprehensive Economic Development Strategy* (CEDS) update in 2006, Virginia Tech held economic development summits in Accomack and Northampton counties. The summits focused on "asset-based economic development" and those in attendance identified local assets that can be developed to improve the Eastern Shore's economy. Virginia Tech produced a report, *Community Economic Development for the Eastern Shore: Summit Report*, that analyzes regional data and makes recommendations for economic development. Since most job growth takes place in the expansion of existing companies and as much as 80 percent of new jobs and investments come from existing industries, the report focuses on how the Eastern Shore can use its assets to improve our economy. Agriculture, manufacturing, aerospace, health care, and tourism are identified as the major sectors for economic growth. The report can be found on the Accomack County web site under Studies and Presentations at: <http://www.co.accomack.va.us/index2.html>

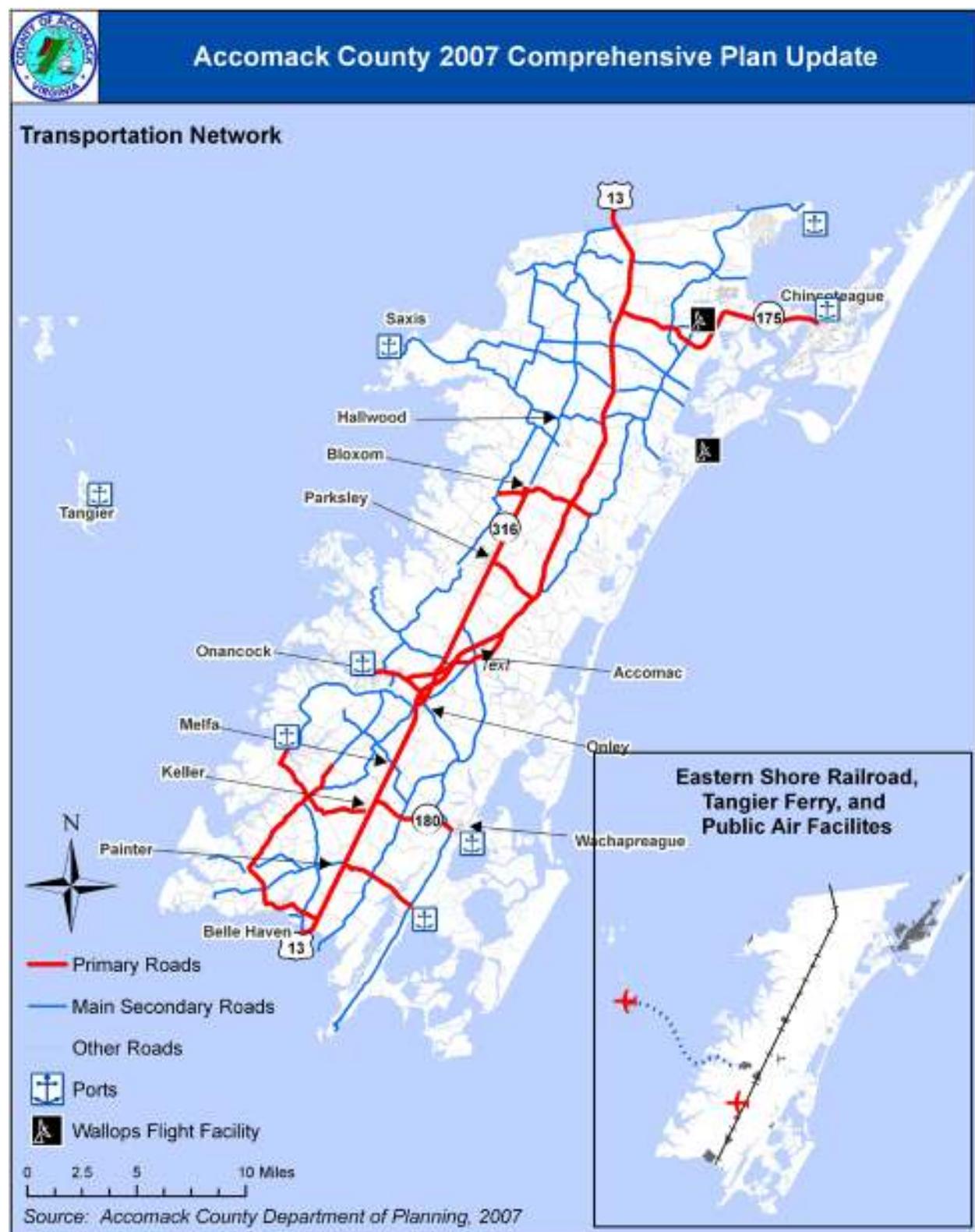
## Transportation

### Roadways

**U.S. Route 13:** Route 13 plays multiple roles in Accomack County. It provides efficient transport for through travelers, provides local access to services, jobs and homes, and serves as the gateway through which travelers enter the county. Trucks make up about 15% of the traffic on Route 13. Approximately one-third to one-half of the annual Route 13 traffic is through traffic, as opposed to local traffic. This estimate is approximate since more detailed surveys are needed to precisely count the number of vehicles whose purpose is solely to travel from the Maryland state line to the Northampton County line. Through traffic can include commercial and industrial trucks, tourists and Northampton residents traveling to Maryland. For these drivers, the function of Route 13 is for rapid and safe transport through Accomack County.

**Capacity and Level of Service:** Highway capacity is defined as the maximum number of vehicles that can use a specific section of roadway during a specific period of time. Capacity is usually expressed in terms of vehicles per hour and is dependent on roadway conditions, traffic conditions and control conditions (i.e. the number of lights, signage, turn restrictions, etc.). The quality of service provided by a highway is measured in terms of its level of service. Level of Service A represents free-flow. Vehicles can maneuver within the traffic stream and easily maintain the posted speed limit. Level of Service B is in the range of a stable flow. Drivers are somewhat restricted in maneuverability, but usually maintain the posted speed. Level of Service C is still in the zone of stable flow, but the maneuverability and speed are more restricted with higher traffic volumes. The drivers are more restricted in their freedom to select their speeds, to change lanes, or to pass. Level of Service D approaches unstable flow. Temporary restrictions to the traffic flow may cause substantial drops in the operating speed, the drivers have little freedom to maneuver to pass, and the comfort and convenience of the driver are lowered. Drivers usually tolerate this condition for short periods of time. Level of Service E represents the capacity of the facility. The traffic flow is unstable, there may be momentary stoppages in the traffic flow, and the vehicle operating speeds are very low. Level of Service F describes a forced flow condition usually with low operating speeds and traffic volumes that are below capacity. This is often described as stop-and-go conditions.

The *Route 13 Corridor Study* prepared by VDOT in 1989, analyzed the level of service for sections of Route 13. The analysis shows that the highway operates far below capacity. Traffic was consistently at level of service A during weekdays and stayed within levels of stable flow through weekend traffic increases. The *U.S. Route 13 Corridor Plan* prepared in 1999 showed that traffic was growing steadily. In 2002, VDOT prepared the *Route 13 / Wallops Island Access Management Study*. The study recommends major access management improvements throughout the corridor, including \$83,574,000 of improvements in Accomack County. The study also recommended adoption of a Highway Corridor Overlay District (HCOD) by local governments to help coordinate land development and highway access management to improve safety and maintain traffic capacity. Recommended access management measures include requiring left turn lanes, right turn lanes, shoulders, driveway spacing, and side street connections. The complete 2002 VDOT study is available online at: <http://www.virginiadot.org/projects/const-project.asp?ID=88>

**Map 3-K**

**The Chesapeake Bay Bridge Tunnel:** The Chesapeake Bay Bridge Tunnel serves to connect the Eastern Shore to the rest of Virginia and provides south bound passage for through traffic from the north. The Bridge Tunnel consists of two tunnels and a two lane span of bridge, crossing 17 miles of open water. In April, 1999, construction was completed on a parallel bridge span. The second span allows for each bridge to handle two lanes of one way traffic. This has improved safety on the bridge and lessened the likelihood of head-on collisions. Traffic from the two bridges merges into the existing two lane tunnels. In a study conducted by Wilbur Smith Associates for the parallel crossing project, it was found that traffic flows to the bridge-tunnel vary dramatically according to the season. Traffic during the summer months of July and August can be 50% to 60% higher than the average monthly traffic and 20% to 40% lower during the winter months of December to March. Origin-Destination studies conducted at the Bay Bridge-Tunnel found that 60% of all trips during the summer months were for recreational purposes. The most common points of origin or destination where Virginia Beach/Norfolk, Eastern North Carolina, New Jersey, New York, and the Eastern Shore. As of 2003, the average number of automobiles to cross the Chesapeake Bay Bridge Tunnel had increased by approximately 25%, from 7,690 per day to 9,641 per day. In order to accommodate the increased amount of traffic, authorities at the Chesapeake Bay Bridge Tunnel began studying a possible increase in tunnels, going to two tunnels, each with two lanes, for traffic going in each direction (<http://www.tollroadsnews.com/node/689>). The Chesapeake Bay Bridge Tunnel began using the EZpass toll system in November 2007 order to reduce commute times and increase convenience for those traveling across the Chesapeake Bay.

#### **2000 Route 13 Average Daily Traffic (ADT) Volumes**

Source: 2002 Route 13/Wallops Island Access Management Study

From	To	SPRING ADT	Percent Trucks	SUMMER ADT	Percent Trucks
Maryland State Line	Route 175	17,000	9%	21,500	10%
Route 175	N. Bus. 13 at Accomac	16,000	12%	19,000	10%
S. Bus 13 at Accomac	Route 179	16,000	14%	18,000	12%
Route 179	Bus. 13 at Onley	18,000	14%	19,000	12%
Bus. 13 at Onley	Keller	16,900	12%	18,500	10%
Keller	N. Bus 13 at Exmore	15,500	14%	18,500	12%
S. Bus 13 at Exmore	N. Bus 13 at Eastville	12,200	15%	13,500	13%
N. Bus 13 at Eastville	Bus 13 at Cheriton	8,500	17%	11,800	15%
Route 184	Bay Bridge Tunnel	8,500	19%	12,500	17%

**Through Traffic:** The goal of a road serving through traffic is to provide safe transport at the highest possible speed. Such roads are designed to be as straight as possible, have few traffic control devices, and have few access points to the roadway.

**Local Traffic:** The goals of a road serving local traffic is to provide safe access at lower speeds to stores, services, employment, and homes. These arterial roads tend to have numerous curb cuts, median crossovers, and traffic control devices.

**Strip Development:** Commercial land uses tend to prefer slower traffic so that the driver has sufficient time to observe signs and storefronts. At the same time, business feasibility studies tend to encourage locations on high volume roadways. The historic result has often been strip

development, where traffic congestion is generated by slow-moving traffic, making numerous turns on and off the roadway. Congested areas can lead to the construction of bypasses around the congestion. These bypasses, if improperly managed, can become the site of new congested strip development.

**Gateway:** Route 13 serves as a gateway to Accomack County. Most travelers entering the county arrive via Route 13. The highway should present a positive image of the community. This can be accomplished by maintaining the transportation efficiency of the road while also maintaining an attractive road corridor. The appearance of the corridor could be protected through landscaping requirements and sign regulations.

**Secondary Road Network:** Accomack County does not maintain any of the road system. All public roads are maintained by the state as part of the secondary highway system. This practice is common in rural areas of the state. Subdivision developers who create public roads are required to build them to state standards for acceptance into the highway system. The Department of Transportation is responsible for maintenance of the roads once they are accepted into the system. Generally, a subdivision road that has been built to state standards will be accepted into the highway system once three homes have been built on the road. The issues of subdivision roads and private versus public road requirements have received considerable attention over the last twenty years. The issue involves a conflict between the developer's goal to make a profit while selling subdivision lots at a marketable price and the government's goal to provide a safe, efficient road network. Prior to November 20, 1996, Accomack County's subdivision ordinance required that all roads in subdivisions be built to VDOT standards. The problem arose from the fact that divisions of land into less than five lots, or into any number of lots over three acres each, were exempted from the definition of a subdivision. The definition also did not include the resubdivision of land, so situations arose where a developer would divide a piece of land into several three acre parcels and then resubdivide each of these parcels into three one acre parcels, creating a large subdivision of one acre lots and circumventing the requirements for state roads. On November 20, 1996, Accomack County's Subdivision Ordinance was revised to define a subdivision as any division of land into three or more parts. The ordinance further defines a large lot subdivision as one in which each of the lots is three or more acres in size. Private roads are allowed in large lot subdivisions, but a statement must be recorded on the subdivision plat stating that the roads are not built to state standards and will not be maintained by the state or the county.

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**VDOT**

*The Virginia Department of Transportation (VDOT) is responsible for building, maintaining and operating the state's roads, bridges and tunnels and, through the Commonwealth Transportation Board, it also provides funding for airports, sea ports, rail, and public transportation.*

*In Accomack County, VDOT is responsible for all public roads.*

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## Analysis of Safety and Future Highway Conditions

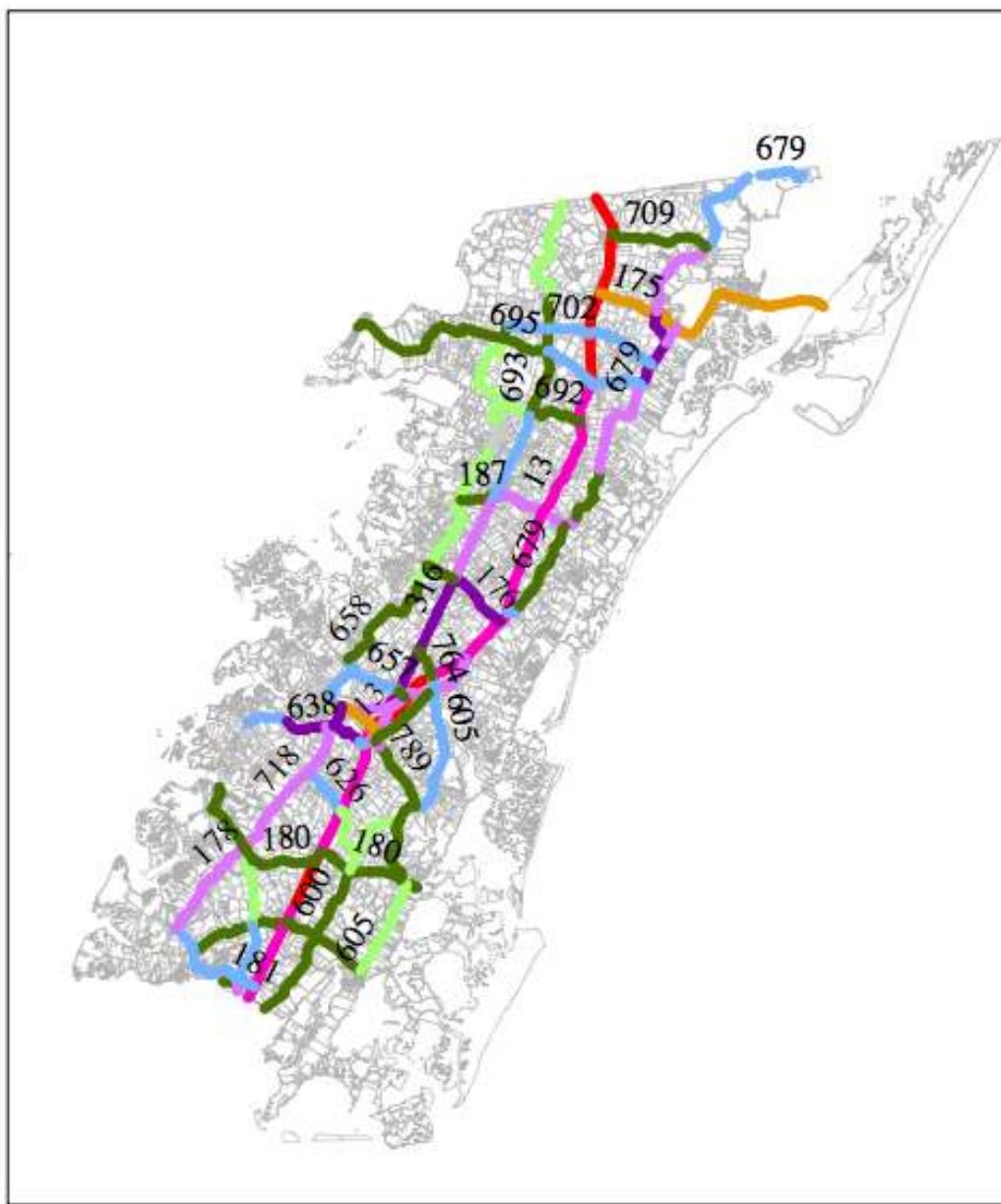
**U.S. Route 13.** U.S. Route 13 is Accomack County's major transportation facility, and one of only two four-lane roads in the County. On the Eastern Shore of Virginia, U.S. Route 13 extends for 69 miles from the Virginia-Maryland state line through Accomack County (37 miles) Northampton County (32 miles) to the Chesapeake Bay Bridge Tunnel. U.S. Route 13 links the Eastern Shore of Virginia with Maryland to the north and Hampton Roads to the south. Along with the Chesapeake Bay Bridge Tunnel, U.S. Route 13 also provides an alternative to Interstate 95 for traffic traveling between the Northeast, Tidewater Virginia, coastal North Carolina, and points south. In 2002 VDOT completed the U.S. Route 13 / Wallops Island Access Management Plan, which makes recommendations for physical improvements and implementation of local government access management regulations. The following discussion of U.S. Route 13 conditions also includes data for Northampton County in order to provide a regional perspective on the issues.

**Traffic Growth.** U.S. Route 13 traffic has been steadily growing over the years, and Average Daily Traffic (ADT) on the Eastern Shore of Virginia is expected to grow from a range of 12,000 to 21,500 in 2000 to a range of 24,000 to 33,000 by 2020. Traffic volumes in Accomack County are higher than in Northampton County due to the higher population and greater density of development. Traffic is growing and is expected to increase to 33,000 ADT in northern Accomack County by 2020.

**Traffic Safety.** Vehicle crash rates and fatalities on U.S. Route 13 are increasing. From 1997 through 1999, there were 37 fatalities along U.S. Route 13 on the Eastern Shore of Virginia. Of the 24 fatalities that had site identification, 16 were in Accomack County and 8 were in Northampton County. There were 17 fatal accidents in 2000 alone. The higher number of fatalities in Accomack County, despite a similar U.S. Route 13 length as in Northampton County, is likely due to higher traffic volumes and more side roads, roadside development, and driveways.

**Existing Traffic.** Map 3-J, 2003 *Traffic* shows the 2003 VDOT average daily traffic (ADT) data for Accomack County's major state roads. Since VDOT does not do traffic counts on all roads every year, most of these data are from 2003 or earlier. The major factors in traffic generation are population, trips per day per housing unit, and through-traffic on U.S. Route 13.

The 2003 *Traffic* map shows that most major roads in Accomack County had less than 5,000 ADT in 2003. The exceptions are U.S. Route 13, Business Route 13, and Routes 175 and 179. The higher ADT on these roads reflects the denser development and commercial activity near T's Corner, Chincoteague, Onley, and Onancock.

**Map 3-L****Draft Accomack County Transportation Element  
EXISTING 2003 TRAFFIC****Legend**

0 - 100	3500 - 5000
100 - 500	5000 - 10000
500 - 1000	10000 - 15000
1000 - 2000	15000 - 20000
2000 - 3500	20000 - 25000
	25000+

**Estimated Future Traffic.** In the long term, traffic growth in Accomack County will depend upon population growth, the location of new development, and through-traffic growth on U.S. Route 13.

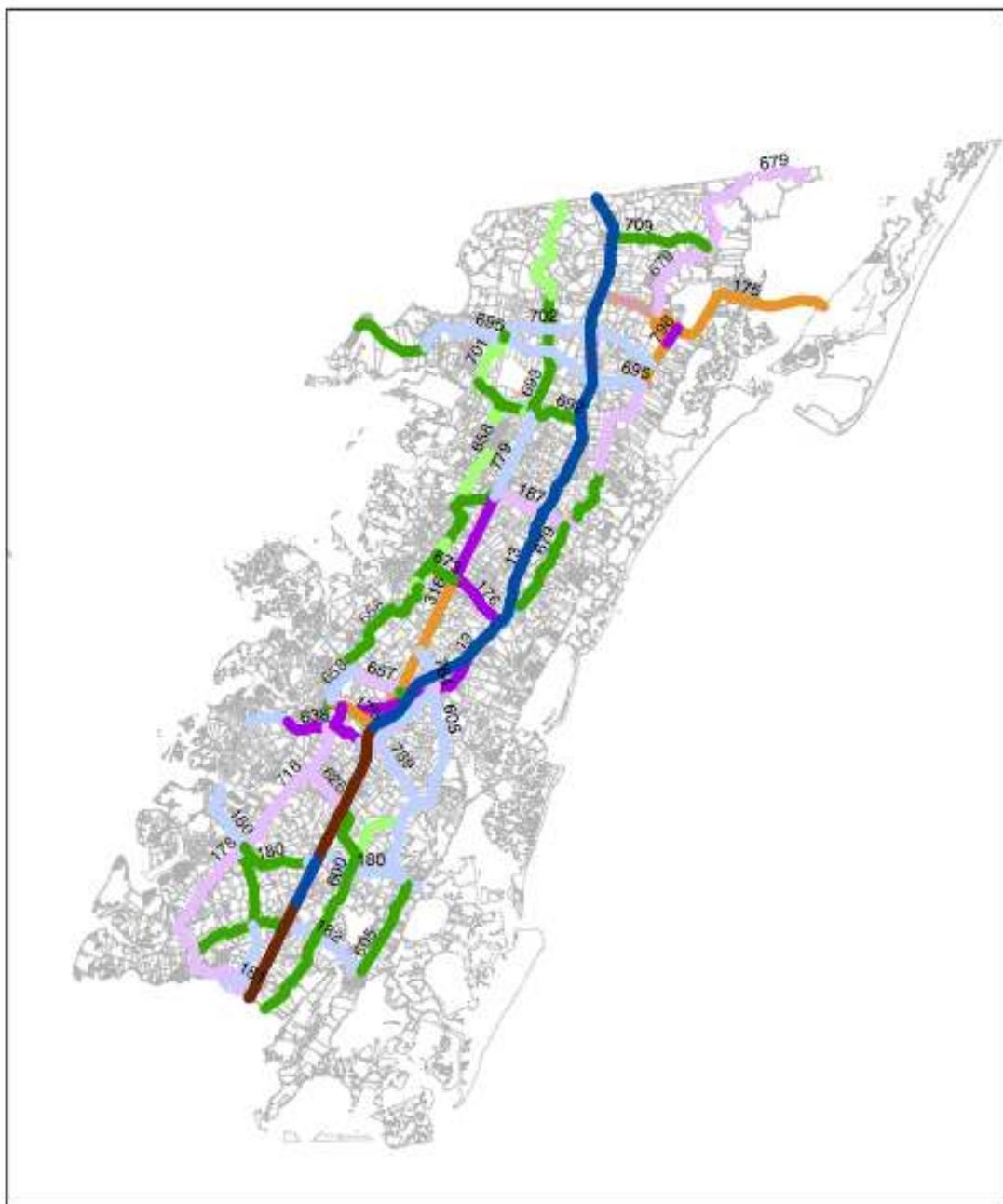
The following maps, *Estimated Future Traffic*, show how traffic would grow if Accomack County's 2000 population grew by 30 percent (49,796), 50 percent (57,457), and 100 percent (76,610). These maps were prepared by multiplying the existing main road traffic data by the same percentage as each population growth scenario. Traffic estimates for U.S. Route 13 were based on the local traffic growth factor of 1.1 percent/year and the through-traffic growth factor of 2.8 percent/year as calculated in the 2002 U.S. Route 13 / Wallops Island Access Management Study.

- **30 Percent Population Growth (49,796)** With a population of 49,796 and 25,415 total dwelling units, parts of Routes 679 and 316 would cross the 5000 ADT threshold. Part of Route 178 would reach 2,000 to 3,500 ADT. Traffic on most of U.S. Route 13 would grow to over 25,000 ADT. Business Route 13 in Accomac and Onley would exceed 3,500 ADT.
- **50 Percent Population Growth (57,457)** With a population of 57,457 and 29,325 total dwelling units, all of U.S. Route 13 would grow to over 25,000 ADT. Route 176 would exceed 5,000 ADT and part of Route 175 would exceed 10,000 ADT.
- **100 Percent Population Growth (76,610)** With a population of 76,610 and 39,100 dwelling units, U.S. Route 13 would reach over 30,000 ADT. Part of Route 175 would exceed 15,000 ADT and Route 126 would exceed 5,000 ADT.

This analysis of the *Estimated Future Traffic* maps shows that significant population growth under existing zoning will impact Accomack County's major roads. New rezonings and subsequent development will increase the intensity of future traffic in a given location. Applications for rezonings should be reviewed for traffic impacts and other transportation needs.

**Transportation Improvement Areas and Urban Development Areas:** To address Virginia's growing concern about how to manage growth and fund road improvements, the General Assembly passed legislation in 2007 to allow local governments to identify Transportation Improvement Areas (TIA) and Urban Development Areas (UDA). These new tools can help Accomack County require new development to pay for needed road improvements and focus growth in designated areas. In order to do this, Accomack County must designate TIAs and UDAs in the Comprehensive Plan.

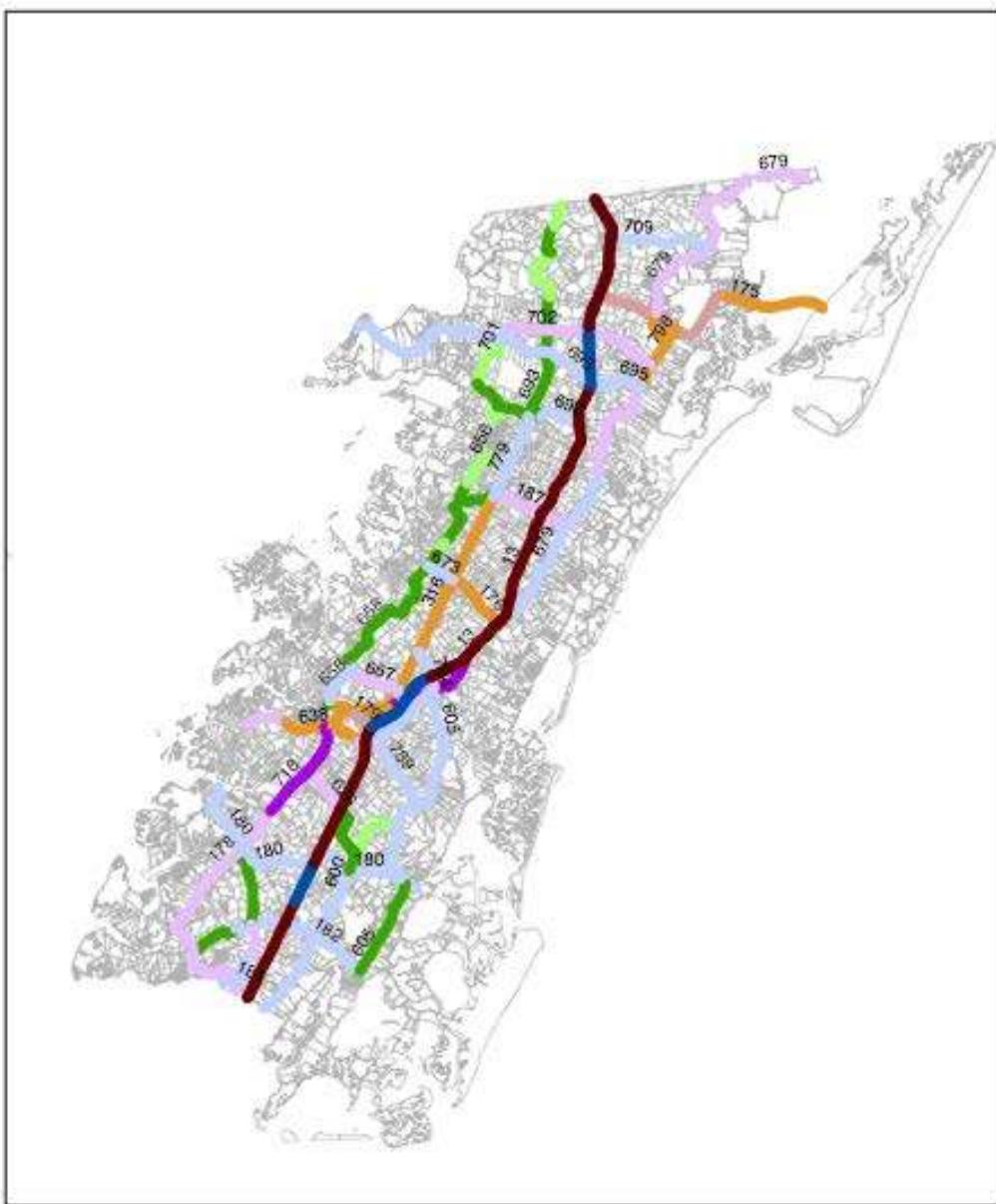
## **Map 3-M**



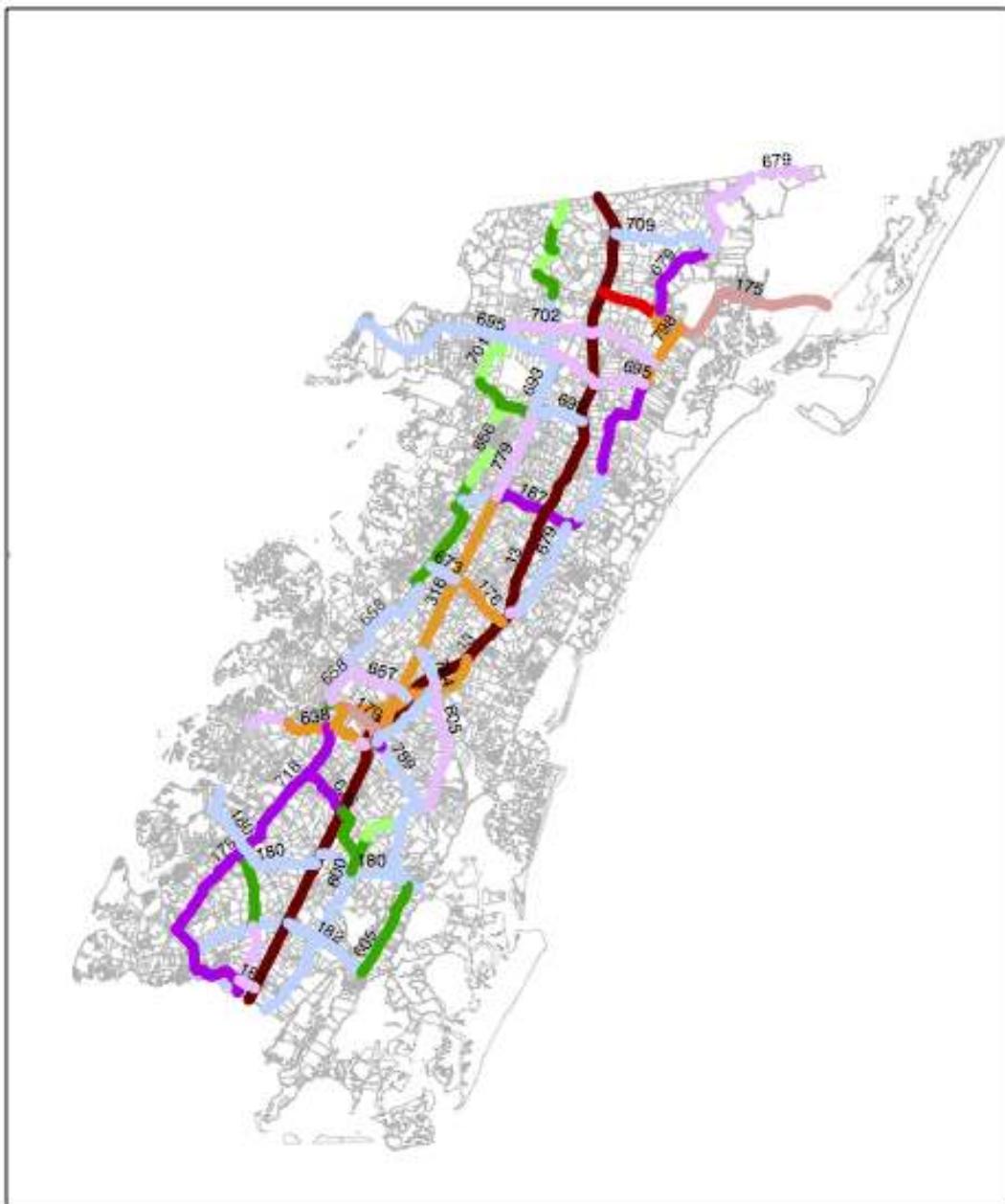
# Draft Accomack County Transportation Element 30 Percent Growth

## Legend



**Map 3-N**

## Map 3-O



## Draft Accomack County Transportation Element 100 Percent Growth

### Legend



## Public Transportation

In 1996, the Accomack-Northampton Transportation District Commission operated a pilot bus system called STAR Transit. This system started with two buses on two north-south routes stretching from Cape Charles to Chincoteague and added a third bus and route in Northampton County. The system operated beyond the expectations of its director during the first year. The most heavily traveled zone is between Cape Charles and the Onley area. STAR Transit is planning to build a new bus terminal and maintenance off U.S. Route 13 in Onley.

## Rail

The Bay Coast Railroad, formerly the Eastern Shore Railroad, has more than 90 miles of track that covers the length of Accomack and Northampton Counties. The line is connected to Maryland Rail to the north and the Norfolk-Southern line to the south. The southern connection is made by use of a barge which carries rail cars from the port of Cape Charles to the port of Hampton Roads. The Port of Hampton Roads is served by 70 steamship lines linking it with 100 foreign countries through 260 overseas ports.

## Air Service

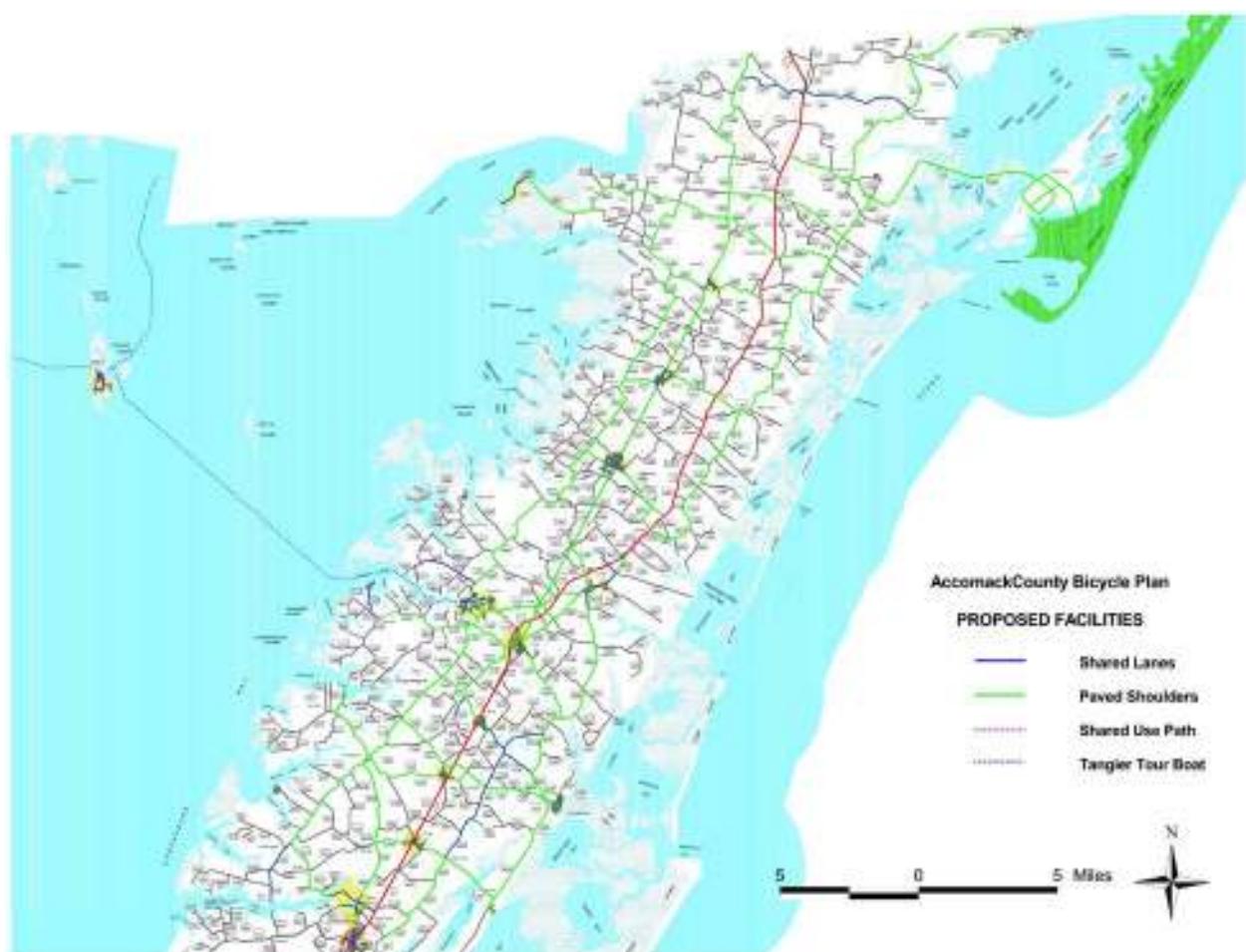
The Accomack County Airport is located adjacent to the Accomack County Industrial Park near the town of Melfa. The airport was originally constructed as a U.S. government facility during World War II. The airport has a 7,000 foot concrete runway capable of accommodating modern jets, and now has a jet fuel facility.

Commercial air service is provided 60 miles to the south through the Norfolk International Airport and 60 miles to the north through the Salisbury Airport. The Norfolk airport offers service from a full line of air carriers, includes air freight facilities, and has a customs office for foreign imports. The Salisbury airport is a regional facility which offers daily flights to major cities.

**Bicycle Facilities:** In 2004 Accomack County adopted the Eastern Shore Bicycle Plan, which identifies bicycle facilities throughout the County to improve safety for bicyclists and motorists. Map 3-N, *Bicycle Plan*. Shows the plan recommendations for shared lanes, paved shoulders, and shared use paths. In 2007 Accomack County amended the plan to extend the proposed Onley-Onancock Shared-Use Path from Onley to Nandua High School.

**Pedestrian Facilities:** Since all vehicle trips begin and end with pedestrian trips, it is important for Accomack County to include appropriate pedestrian facilities in all new development.

**Map 3-P**



## Waste Disposal

**Solid Waste and Recycling Collection System:** Accomack County has three different options for trash removal for its citizens. One option is the County's Convenience Centers. There are four Convenience Centers located in the County, with three more planned in the future. These centers are manned, and collect not only trash, but recycled items also. For recycling, into one bin citizens can drop off all types of paper items, cardboard, hard plastics, glass, and all types of metal cans. Items that can be recycled into their separate containers include waste oil, waste antifreeze, lead acid batteries, tires, cell phones, rechargeable batteries, ink cartridges, and scrap metal. There is also a Put and Take area where citizens can drop off reusable items that are in good condition. Patrons may take items from the Put and Take area any time the Centers are open.

Another option for citizens is a greenbox site. Greenboxes are enclosed roll off containers with a 40 cubic yard capacity. The sites are unmanned and the containers are serviced by county owned and operated vehicles. Items such as furniture, tires, and appliances must be delivered to a convenience center or to one of the county landfills. The county currently maintains 16 of these sites. As Convenience Centers are built, greenbox sites are removed from around that area with the result that once all Convenience Center sites are operational, all greenbox sites will be closed.

There are also private haulers in the county that can be hired for curbside pickup of trash.

**Litter Control:** The County has Litter Control employees assigned to pick up litter from roadways, county owned docks and ramps and around greenbox sites. In November of 2006, the County hired a Litter control Officer. The Litter Control Officer offers recycling and litter prevention education to school groups and various adult groups within the county and organizes community clean up programs. The Litter Control Officer also oversees roadside litter pickup, utilizing citizens who have been court ordered to do community service hours as part of their sentence. The community service program has become so successful that the Litter Control crew is now able to concentrate on greenbox sites and docks/ramps cleanup.

**Landfills:** Accomack County currently operates two landfills under permits from the Virginia Department of Solid Waste Management.

*Southern Landfill:* The southern landfill was purchased in 1973. The landfill is located at 16640 Hollies Church Road, Melfa, VA. The landfill is 113 acres in area, of which approximately 70 acres have been used. This landfill was constructed without a liner prior to adoption of the Department of Solid Waste Management's regulations on landfills. It has a stormwater management system in place to protect the area surface waters and a system of groundwater monitoring wells that allows for sampling of the area groundwater. This facility is scheduled to close by 2012.

*Northern Landfill:* The northern landfill was purchased in 1984. The landfill is located at 9403 Cutler Lane, Atlantic, VA. The site is approximately 140 acres in area, of which one approximately 20 acres have been used. This landfill is lined and has a leachate collection system that sends leachate to the adjacent county owned wastewater treatment plant. It has a stormwater management system in place to protect the area surface waters and a system of groundwater monitoring that allows for sampling of the area groundwater.

***Adopt-A-Highway***

VDOT administers the Adopt- A-Highway program. Volunteers agree to pick up litter on state maintained highways four times a year for two years. VDOT provides trash bags, vests, safety information and a highway sign with volunteer's name on it.

Virginia's program is the second largest in the country, with 50,000 participants.

VDOT sponsors two annual state-wide clean-ups, the Spring Clean-Up on the third Saturday of each April and the Great State Trash-Off on the third Saturday of October.

**Tons of Solid Waste Received Annually at Landfills**

Source: Accomack County Dept. of Public Works

	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
<b>Northern ....</b>	23,920 ..	22,443 ...	25,003 .	25,373 .	24,088 ..	21,025
<b>Southern ....</b>	18,876 ..	18,410 ...	22,090 .	27,771 .	28,655 ..	28,468
<b>Total .....</b>	42,796 ..	40,853 ...	47,093 .	53,144 .	52,743 ..	49,493

**Tons of Solid Waste Landfilled Annually**

Source: Accomack County Dept. of Public Works

	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
<b>Northern .....</b>	21,789 ...	20,329.	24,314.....	24,658.....	23,589 .....	20,256
<b>Southern .....</b>	18,000 ...	17,759.	21,437 ....	26,565.....	28,062.....	26,906
<b>Total .....</b>	39,789	38,088 ...	45,751.....	51,223.....	51,651.....	47,162

**Waste Stream:** The tables above show the amount of trash collected at the county landfills. All of this waste is not necessarily placed in the landfill. Tires, scrap metal, and lead acid batteries brought separately to the landfill are recycled. Construction debris and brush are reused whenever possible.

As the County continues to increase numbers of recycling collection sites and also increase the types of recyclable items accepted, the tonnage of solid waste being landfilled should decrease. In 2006, the state accepted recycle rate for the County was 16.3%.

**Public Safety**

Accomack County is served by a network of Volunteer Fire Companies and Rescue Squads supplemented by paid firefighters and emergency medical technicians. In 2007 the County hired a consultant to prepare a Public Safety System Capability Analysis. The draft report was released on September 2007, and the County, Volunteer Fire Companies, and Rescue Squads are reviewing the report and its recommendations. According to the draft report, in 2006 the Public Safety System in Accomack County was dispatched to a total of 5,056 incidents (Chincoteague numbers only include incidents when other County units responded to assist under mutual aid). These dispatches vary greatly from station to station throughout the County, although 85% of the incidents from 2006 occurred in the districts for the stations in Parksley, Oak Hall, Onancock, Bloxom, Melfa, and Onley.

Because there is a shortage of personnel at the fire departments in Accomack County, the draft report recommends that Fire and Rescue stations be carefully positioned throughout the county to ensure the proper response capabilities, as follows:

1. Proper spacing between stations should be calculated based on response time standards and incident call volume.
2. Stations need to be able to respond to provide both fire suppression and EMS care and transport.
3. Certain stations should be designated for regional response of special tactical units.

The draft Public Safety System Capability Analysis also suggests that a GIS analysis of the impact on response time and workload shift among response units be done to assess the cost-effectiveness of existing stations and their locations.

Important Comprehensive Plan considerations regarding Public Safety include the ability of existing fire and rescue stations to respond in a timely manner to incidents located at existing development and well as at planned development. As the County considers development proposals in the future, adequate fire and rescue response should be a primary consideration for approval. In order to insure adequate public safety, the County should consider developing mechanisms, such as proffers and impact fees, to fund adequate public safety facilities if they are not available for a given development site.

### **Public Wastewater Treatment**

In order to provide basic accommodations for housing and/or other development in areas in which the soils do not support septic systems, a shift towards public sewer is a necessity. In 2007, Accomack County hired a consultant to prepare a Draft Wastewater Action Plan, which was presented in October 2007. The draft plan calls for development and expansion of wastewater treatment systems in Accomack County communities as an alternative to septic systems. Central wastewater treatment can improve water quality by replacing failing septic systems, and also allows for traditional development patterns and density not possible with septic systems.

Public wastewater systems are generally composed of three components: treatment, conveyance, and collection facilities. Treatment facilities can be constructed to serve either a large or small service area. Conveyance facilities transport wastewater by means of pump stations and force mains. Collection facilities are usually gravity or vacuum sewers adjacent to the property of the service user. Previously, vacuum sewers have been recommended for use in Accomack County.

The draft report identifies failing septic systems and the unlined septic lagoons as the highest priority. These issues are a major factor in potential groundwater degradation as well as public health concerns. The Virginia Department of Health is currently working on a plan that will permit the cleaning and lining of existing septic lagoons or development of septic receiving stations at wastewater treatment facilities, thus enabling the closure of the lagoons completely.

A second priority is central Accomack County, which is the County's most densely populated area and includes a viable commercial district. If the County and the Town of Onancock were to

work together, they could begin construction of new collection facilities at the Town's perimeter and radiate outward until they reach the boundary of the service area.

The third priority in developing the Wastewater Action Plan is the Wallops Island Area. NASA's Wallops Flight Facility currently has unused capacity in its existing wastewater treatment plant and is willing to work towards a joint use. A possible service area to consider would include Wattsville, Atlantic, and Chincoteague.

## Recreation

**Parks:** Accomack County currently has limited public park facilities. Many of these facilities are operated through cooperative agreements. The Department of Parks and Recreation owns and maintains the tennis courts at Nandua High School, the ball fields and park at Arcadia High School, and a driving range at South Accomac Elementary School. The county has a lease agreement with the Town of Wachapreague in which they share maintenance of the town park in exchange for use of the ball fields, playgrounds, and picnic areas. The Navy has assisted with the construction of a playground at county owned Wallops Park and there are currently plans for the Navy to assist with improvements to the nature trail at that park. The county recently acquired the Wayside Park, located on U.S. Route 13 outside of Parksley, from the Department of Transportation. Wayside Park has been turned over to the Department of Parks and Recreation and is open for daytime use.

**Beach Access:** The only truly public beach area accessible by automobile in Accomack County is Assateague National Seashore. There are several sandy beaches along the Chesapeake Bay that have been traditionally used by the public but are privately owned. The barrier islands are also available for day use, but must be accessed by boat.

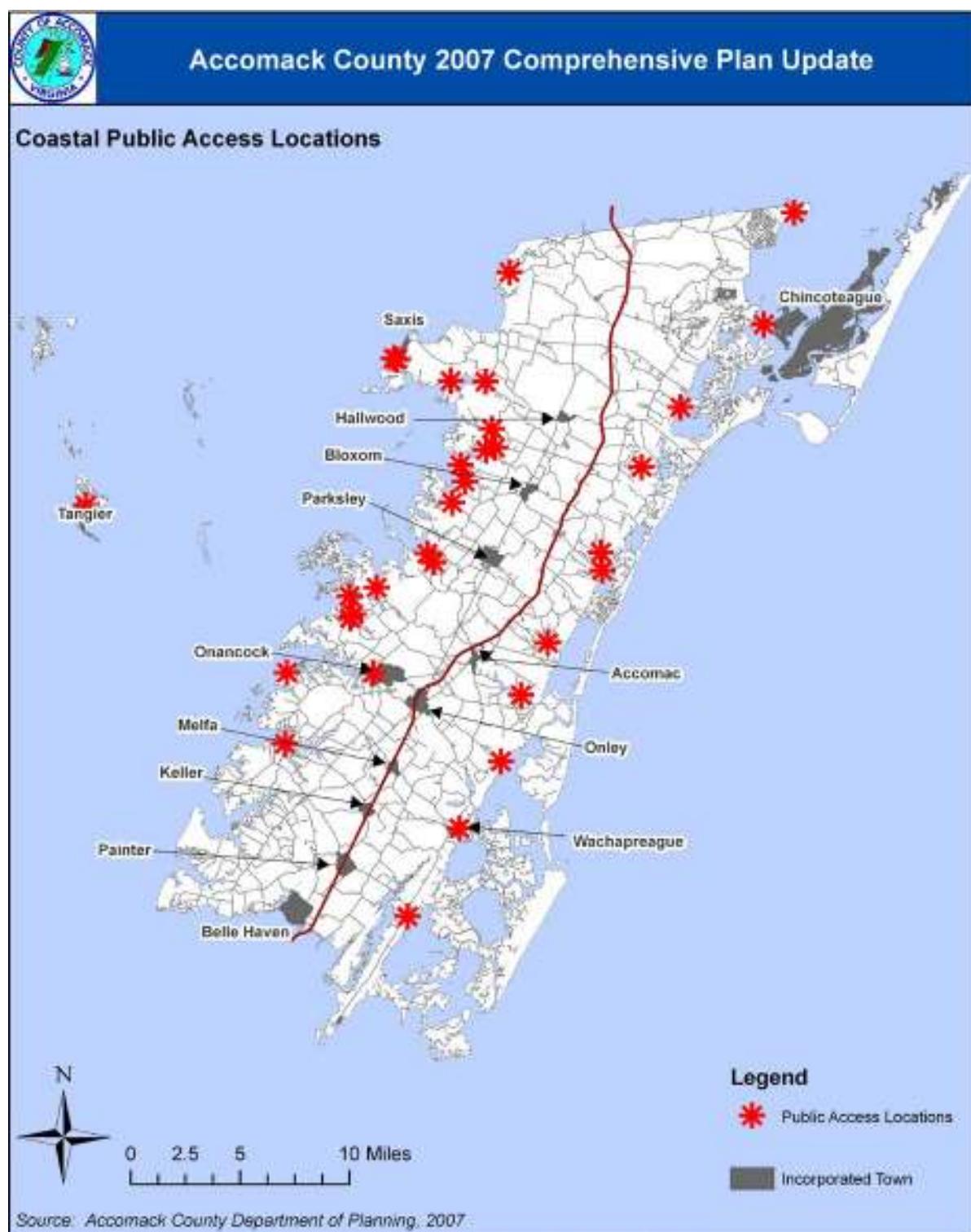
**Public Wildlife Areas:** There are a number of publicly owned natural areas and wildlife management areas in Accomack County. Depending on which agency manages the property, these are available for wildlife observation, hiking, canoeing, fishing, and hunting. Public areas include the Chincoteague National Wildlife Refuge, 750 acres at Parkers Marsh Natural Area and the 6,177 acre Saxis Wildlife Management Area.

**Coastal Public Access:** The County currently maintains 30 boat ramps, as shown on Map 3-O, *Coastal Public Access Locations*. These ramps vary in condition from unusable to brand new, and several of the ramps are for cartop boats only. In some cases, the County only owns the property that the ramp is located on and no surrounding parking area. In 2001, the County hired a consultant to prepare the *Accomack County Coastal Public Access Study*. The study inventoried all of the County's boat ramps and waterfront public access facilities, and made the following recommendations:

1. *Maintenance:* Reduce the number of access sites to 24, distributed geographically, to reduce redundancy and provide better maintenance.
2. *Development:* Develop and/or expand the following six sites to a higher usage type, and seek funding on an annual basis to make phased improvements: Wisharts Point, Pitts Creek, Queens Sound, South Chesconessex, Guilford Creek, and Deep Creek.

3. **New Sites:** Where obvious service gaps exist, the access study identified areas where new sites might be appropriate: Bayside access south of Pitts Creek, Bayside access at the southern end of the County, and Seaside access at Wisharts Point, which is the County's highest improvement priority.

**Map 3-Q**



**Sports Facilities:** The two high schools have tennis courts that are available after hours for public use. The Town of Chinoteague also maintains public tennis courts. Ball fields at the schools are also used for soccer, football and baseball. The Little League maintains baseball fields just outside of Parksley. Ball fields are also available at the parks in Wallops, Wachapreague, and Melfa. There is a public golf course at the Captain's Cove development, near Greenbackville. The private Eastern Shore Yacht and Country Club has a golf course, swimming pool and tennis courts. There is also a private pool in the Town of Onley.

**Recreation Centers:** Accomack County has no indoor recreation facilities except those in the public schools, and those are not open for regular public use. In 1999 the Eastern Shore Family YMCA opened in Onley and provides a wide range of activities for members, including fitness equipment and an indoor pool. The Department of Parks and Recreation has created a Capital Improvement Fund for the future creation of a county recreational facility and is developing a Parks and Recreation Plan.

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***The Eastern Shore Family YMCA***

*The 1997 YMCA feasibility study recommended construction. After a successful fundraising campaign, the Virginia's Eastern Shore Family YMCA opened in 1999*

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## Capital Improvement Plan

Virginia Code Section 15.2-2239 allows, “A local planning commission may, and at the direction of the governing body shall, prepare and revise annually a capital improvement program based on the comprehensive plan of the locality for a period not to exceed the ensuing five years.” In 2006 Accomack County prepared its first Capital Improvement Plan (CIP), which was updated in 2007. The CIP can be a valuable tool in planning for public facilities and providing a basis for new development to pay for public facilities. The following is a summary of Accomack County’s FY 2008 CIP.

## Accomack County, Virginia

*Capital Improvement Plan*

FY 2008 thru FY 2012

**PROJECTS BY DEPARTMENT**

Department	Project#	Priority	FY '08	FY '09	FY '10	FY '11	FY '12	Total
<b>Airport</b>								
T-Hangar Site, T/W Design, Construction	07-Air-001	0	30,000	275,000				305,000
Security Fencing (Phase II & III) - Construction	07-Air-002	0		125,000				125,000
Apron Expansion (Design, Construction)	07-Air-003	0		50,000	298,947			348,947
Partial Parallel Taxiway - North (Phase II)	07-Air-004	0			80,000	400,000		480,000
Airport Total		4	30,000	450,000	378,947	400,000		1,258,947
<b>Building &amp; Zoning</b>								
Engineering Copier	08-BZ-001			25,000				25,000
Building & Zoning Total				25,000				25,000
<b>Central Accounting</b>								
Comprehensive Software Upgrade	08-CA-001		230,000	720,000	540,000			1,490,000
Central Accounting Total			230,000	720,000	540,000			1,490,000
<b>E.S. Public Library</b>								
Bookmobile	08-ESPL-001	3		200,000				200,000
Building Consultant	08-ESPL-002	1	25,000					25,000
Library Remodeling	08-ESPL-003	3		75,000				75,000
E.S. Public Library Total		0	25,000	275,000				300,000
<b>Economic Development</b>								
Wallops Research Park Development	07-PWD-022			3,000,000				3,000,000
Economic Development Total				3,000,000				3,000,000
<b>Parks and Recreation</b>								
Central Parks & Recreation Facility	08-PR-001	5	230,000	660,000				890,000
Southern Parks & Recreation Facility	08-PR-002	5	230,000	155,000				385,000
Parks and Recreation Total			460,000	815,000				1,275,000
<b>Public Safety</b>								
Vehicle Replacement -1994 Ford Explorer	08-PS-001	0	30,000					30,000
Ambulance Purchase	08-PS-002	2	175,000					175,000
Vehicle Replacement (2002 Pick-up Truck)	08-PS-003	3				30,000	30,000	
EMS Station	08-PS-004	3		75,000	85,000	500,000	200,000	860,000
Vehicle Replacement (1996 Ford Crown Victoria)	08-PS-005	3		12,000				12,000
Storage Facility/Fire Safety/Hazmat/Emergency Mgmt	08-PS-006	3			30,000	75,000		105,000

Department	Project#	Priority	FY '08	FY '09	FY '10	FY '11	FY '12	Total
Backus Emergency Operations Center	08-PS-007	4					175,000	175,000
Emergency Power Generator - Co. Office Bldg	08-PS-008	3	88,000	25,000				113,000
<b>Public Safety Total</b>			<b>293,000</b>	<b>112,000</b>	<b>115,000</b>	<b>675,000</b>	<b>485,000</b>	<b>1,500,000</b>
<b>Public Works</b>								
Storm Drainage: Walking Excavator (Tag #654)	07-PW-001	0	275,000					275,000
Storm Drainage: Ford Truck (Tag #633)	07-PW-002	0	28,000					28,000
Buildings & Grounds, Operations: Mobile 21 Vehicle	07-PW-005	0			25,000			25,000
Solid Waste, North Landfill: Design Next Cell	07-PW-006	0	200,000					200,000
Public Works - Mobile 1, 1997 (Tag #523)	07-PW-007	0	25,000					25,000
Solid Waste, Geiger Service Vehicle #1 (1998)	07-PW-008	0	35,000					35,000
Solid Waste, Collection: Southern Transfer Station	07-PW-009	0	110,000	50,000	1,000,000			1,160,000
Solid Waste, Collection: Roll-off Truck #16 (2005)	07-PW-010	0			150,000			150,000
Solid Waste, N. Landfill: Dump Truck #17 (1994)	07-PW-011	0		80,000				80,000
Solid Waste, S. Landfill: Bay Back Opt IT14 (05)	07-PW-012	0			100,000			100,000
Solid Waste, N. Landfill: Bay Back Opt IT14 (2005)	07-PW-013	0			100,000			100,000
Solid Waste, N. Landfill: Bay Back Opt 963 Loader	07-PW-014	0				200,000		200,000
Solid Waste, Collection: Roll-Off Truck #22 (2001)	07-PW-015	0				150,000		150,000
Solid Waste, N. Landfill: Septage Upgrade (LTF)	07-PW-016	0	325,000					325,000
Solid Waste, North Landfill: Subcell 5 Prep	07-PW-017	0	120,744					120,744
Solid Waste, North Landfill: Subcell 6 Prep	07-PW-018	0		120,744				120,744
School Administration Office	07-PW-019	0	3,749,950					3,749,950
North Accomack Wastewater Treatment System	07-PW-020	0				7,000,000		7,000,000
Central Accomack Wastewater Treatment System	07-PW-021	0			7,000,000			7,000,000
Broadband Initiative	07-PW-022	0				3,000,000		3,000,000
County Administration Building	07-PW-023	0	1,608,210					1,608,210
Health Department Building	07-PW-024	0	1,927,900					1,927,900
Sheriff's Office	07-PW-025	0	286,810					286,810
County Administration Annex	08-PW-015	0	3,344,600					3,344,600
South Landfill Dump Truck (1985)	08-PW-017	2	90,000					90,000
Wastewater Treatment Facility	08-PW-018	1	320,000	5,180,000				5,500,000
Collections - Utter Control Vehicle LCS (2001)	08-PW-019	3				100,000		100,000
North Landfill - Compactor 826 (2005)	08-PW-020	3					500,000	500,000
Landfills - Slope Mower (1997)	08-PW-021	1	34,000					34,000
Landfills - NLF Tipping Floor	08-PW-022	3			75,000			75,000
Veteran's Affairs Building Roof	08-PW-023	2	38,000					38,000
Parking Lots	08-PW-024	3		250,000				250,000
Queen Sound Access Road	08-PW-025	1	400,000					400,000
Haberton Ride-on Dock	08-PW-026	3		90,000				90,000
Multi-purpose Maintenance Tractor	08-PW-027	3	38,000					38,000
Maintenance Building	08-PW-028	3		80,000				80,000
Quincy Harbor Improvements	08-PW-029	3	125,000					125,000
Garage Dump Truck Mobile 29 (1993)	08-PW-16	2	90,000					90,000
<b>Public Works Total</b>			<b>13,171,214</b>	<b>5,860,744</b>	<b>11,488,000</b>	<b>7,488,000</b>	<b>500,000</b>	<b>38,431,928</b>
<b>GRAND TOTAL</b>			<b>17,234,214</b>	<b>8,232,744</b>	<b>12,483,947</b>	<b>8,425,000</b>	<b>905,000</b>	<b>47,280,905</b>

## Cultural Resources

**Cultural Resources:** The Eastern Shore has a rich history and many surviving cultural treasures. Towns, homes, farms, churches, roads, waterways, and people are woven into the county's cultural fabric. This is evident to any visitor who happens down one of the county's back roads, winding around productive farm fields and forests of pines, through small villages with maybe a store, a church and several large old homes, past an open field with an oyster shell drive leading to a traditional Eastern Shore long house set back from the main road, and ending at a spot where the pavement meets the water's edge and deadrises float at a dock piled high with crab pots. Accomack County is fortunate to have a cultural history which is still very much alive in its traditional industries, churches, homes, and families.

**History Overview:** Archaeological digs have found evidence of humans on the Shore as early as 8,000 to 10,000 B.C. Prior to European settlement, the Shore was populated by a number of Indian tribes. It was these natives of the area the named the land, "Accawmacke," meaning, "land beyond the waters." Local Indian tribes included a group of families (the Accohanocks, Curratocks, Nasswattocks, Magothas, Mattawames) who called themselves, "Ginga skins" and were ruled by a tribal leader who held court at Great Nasswattock (now Nassawadox). Other tribes included the Assateagues, Chicoteagues, Kickotanks, and Matchipungoes. These tribes all belonged to the Powhatan nation, but due to geographical isolation, had little communication with the Powhatans on the mainland. Algonquin speaking Indians settled near the Maryland border and were more closely related than the Nanticokes to the North than to the Powhatans of the lower shore. The first recorded European to visit the Eastern Shore was Giovanni de Verrazano, who arrived in 1524. Captain Bartholmew Gilbert of England visited the area in 1603 and Captain John Smith explored the Eastern Shore in 1608. The first permanent English settlement on the Shore was settled in 1620 by Thomas Savage along what is now known as Cherrystone Creek in Northampton County. Accomack County was founded in 1663. The county courthouse was originally located in Onancock and moved to a site midway between the Atlantic Ocean and Chesapeake Bay in 1786. That site is now the town of Accomac. The Shore was originally all one county. In 1673, the border was settled to divide the area into two separate counties. The southern county was named "Northampton," after the birth place of Colonel Obedience Robins, who came to the Shore from a shire northwest of London and was a friend of King Debedeavon. The northern county retained the name, "Accomack," as given by its native people.

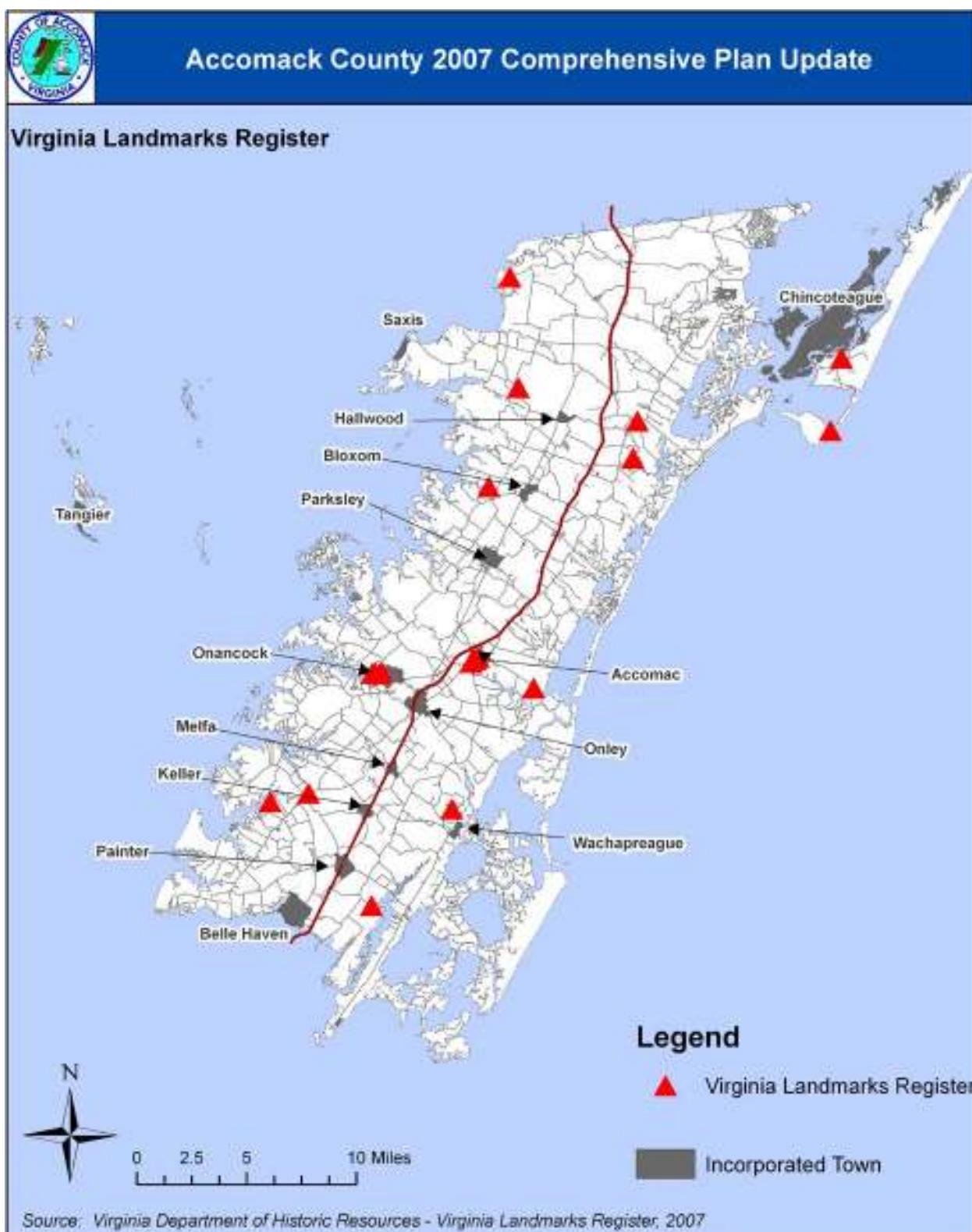
European settlers began to settle on the Shore in large numbers in the 1630s and timberland was cleared for the planting of crops. Food for sustenance and tobacco were the primary crops until the steamboat era began in the early 1840s. Use of the steamboat allowed local farmers to expand from staple crops to commercial vegetable production. Sweet potatoes, beans, peas, cotton, flax, fire wood, tobacco, and oysters where shipped up and down the coast. The introduction of rail service in 1884 allowed for further expansion of the produce market and for the export of perishable items such as strawberries and seafood.

**Architecture:** The Eastern Shore has a unique style of architecture exemplified by the long house, or "big house, little house, colonnade, kitchen." This style developed from the local practice of starting out with a small, modest house and detached kitchen, and as a family became more prosperous, building a larger house next to the first and connecting the two with a colonnade. There are many fine examples of this style still standing and in use in Accomack

County. The county also has many old farm houses, stately town residences, waterfront estates, churches, government buildings, stores, and schools.

**State and National Designated Landmarks:** There are a number of sites in Accomack County that are on Virginia's register of historic landmarks and the National Register of Historic Places. Properties included on these registers are historically, architecturally or culturally significant. Accomack County sites include Saint James Episcopal Church, Bowman's Folly, Hopkins and Brother Store, Kerr Place, Wessels Root Cellar, Saint George's Episcopal Church, Wharton Place, Assateague Lighthouse, the Mercantile Building, the Mason House, Pitts Neck Farm, the Debtor's Prison, the Scarborough House Archaeological Site, the Edmond Bayly House, Shepherd's Plain, Arbuckle Place, and the Assateague Beach Coast Guard Station. Also, the towns of Accomac and Onancock have state designated historic districts. Virginia Historic Landmarks Register Sites are shown on Map 3-P.

**Museums:** Accomack County has several museums dedicated to the area's history and natural resources. Most of these museums are located in the Chincoteague area, including the Assateague National Seashore Visitors Center, Chincoteague National Wildlife Refuge Visitors Center, the Oyster Museum, and the NASA Wallops Island Visitor Center. The Town of Parksley has the Eastern Shore Railway Museum and an antique car museum, and the Town of Onancock is home to the Kerr Place Historic House and Museum.

**Map 3-R**

*Chapter Four: Issues and Concerns*

*Adopted May 14, 2008*

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## **Chapter 4**

### **Issues and Concerns**

## **Chapter 4** **Issues and Concerns**

### **Introduction:**

The natural and cultural resources identified in Chapters 2 and 3 point to many issues and concerns facing the County as it looks to the future. Chapter 4 examines those issues in more detail, connects many of the related themes that cross over between various resources, and identifies some of the “trade-offs” the County faces in terms of conflicting goals and opportunities. This analysis sets the stage for the policies and actions contained in Chapters 5 and 6.

### **Development**

**Cluster Development:** Haphazard spread of residential and commercial development throughout an area can lead to loss of important farmland and forestland, degradation of scenic vistas, adverse impacts on fragile natural resources, traffic congestion, decreased emergency response time, and costly and inefficient provision of government services. Directing growth towards designated growth areas which are carefully selected based on existing development patterns, transportation links, soil suitability, and location of fragile resources and environmental hazards, will result in safe, pleasant, and efficient development while protecting resources that are important to the county as a whole. Clustering development within specified growth areas allows development to capitalize on existing infrastructure investments and more efficiently and cost effectively provide infrastructure improvements in the future. Roads, drainage, schools, police protection, and emergency services can all be provided more efficiently when development is clustered. In order to ensure effective use of the areas outside of development clusters for agricultural, forestry, habitat, and recreational use, development outside of designated growth areas should be low density in nature. This density can be achieved through large minimum lot sizes, open space requirements for subdivisions and conservation area zoning. In June, 2006, the County adopted amendments to the A (Agriculture) Zoning District that permitted cluster development, including incentives of bonus lots for such developments, as well as an increase in the minimum lot size for non-cluster developments.

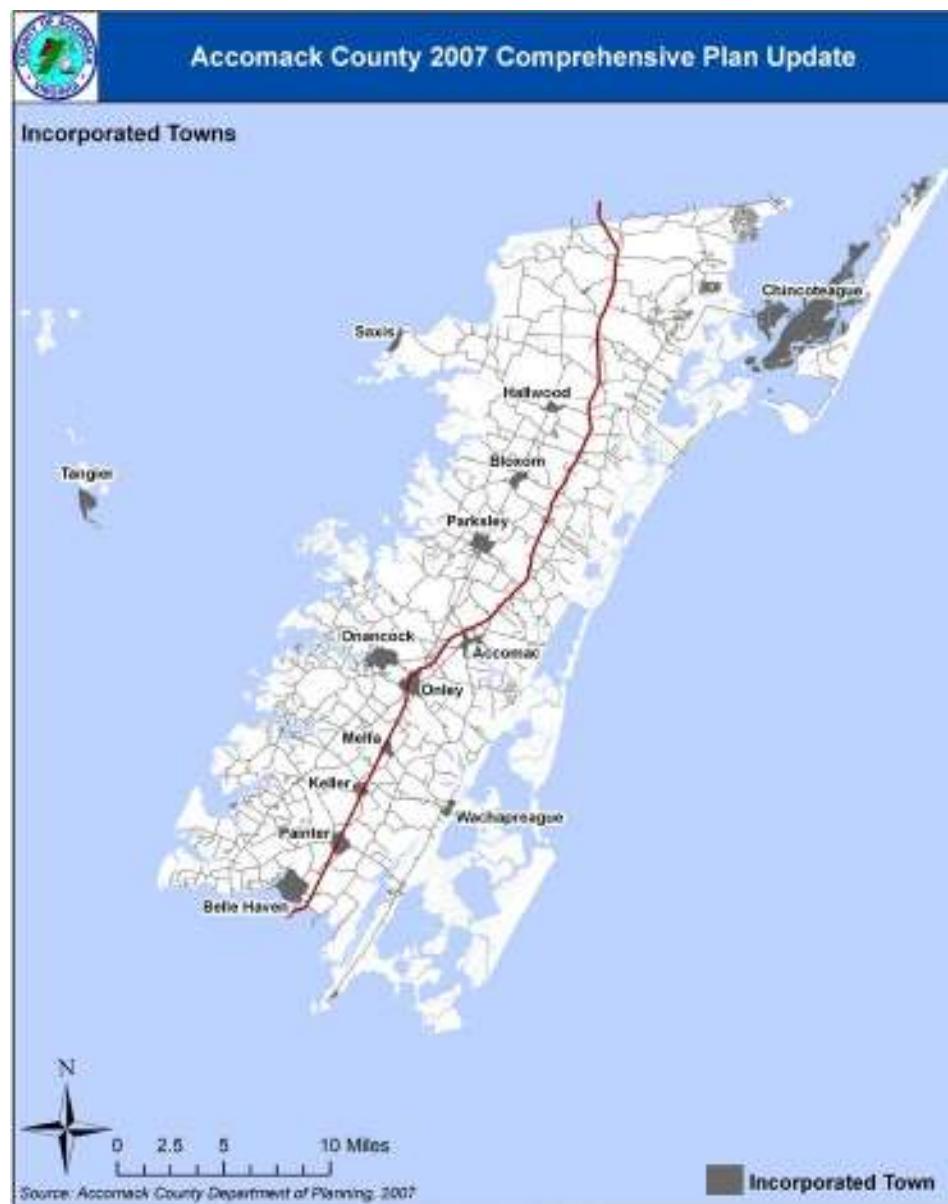
**Waterfront Development:** A good amount of waterfront development has occurred in Accomack County over the last ten to fifteen years. This development has been significant enough to warrant some concern about the impact it may have on the environment and personal safety. High density waterfront development can pose a significant threat to property and the environment. Forty-four percent of Accomack County is located in the 100-year floodplain, bordering the county’s creeks and marshland. Structures in this area are prone to repeated damage from flood events. The coastal fringes are also most susceptible to

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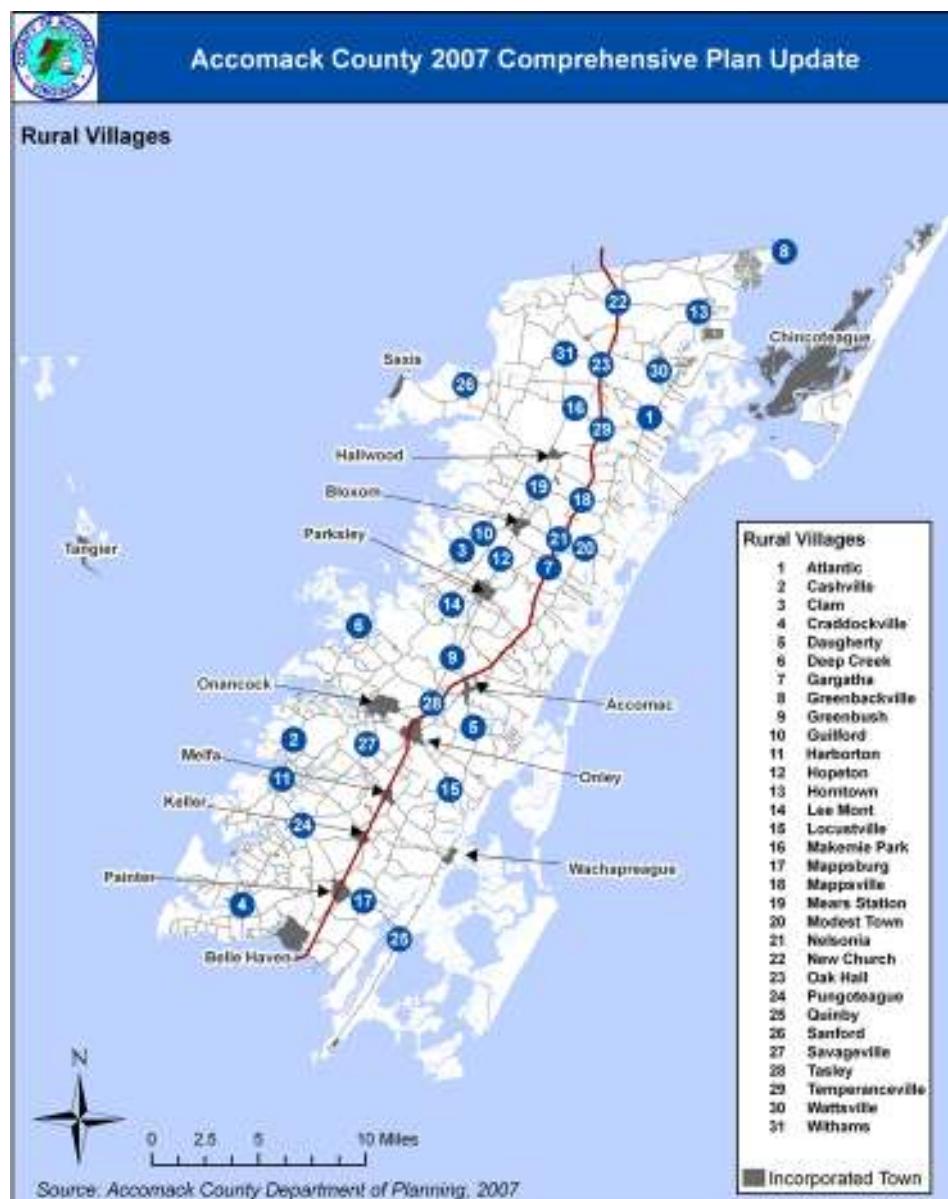
**A “Bundle of Rights”**  
When you own land, you are said to have a “fee simple” interest. This interest is like a bundle of sticks, each of which represents a right associated with the property. These rights include the right to farm, to extract minerals, to cut timber, to develop, and to do anything else with the property unless prohibited by law. These rights can be separated and transferred to other parties as “less than- fee interest.” An easement is one such less than-fee interest. In granting an easement, an owner gives up some of the rights in a property, as specified in the deed of easement. For example, an owner can give a neighbor the right to cross his property (a right-of-way). Under a conservation easement, the owner may give up all or most rights associated with construction on the property, often referred to as the “development rights.”

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**Map 4-A**



**Map 4-B**



saltwater intrusion in the groundwater aquifer from excessive pumping. Concentration of septic systems in close proximity to creeks and bays could lead to water pollution via contaminated groundwater leaching into surface waters. A proliferation of private piers on closely spaced waterfront lots also pose a threat to surface water quality. Currently, Accomack County's Zoning Ordinance does not include any specific requirements for waterfront development, except the 100-foot setback requirement of the Chesapeake Bay Preservation Overlay District. The 100-foot setback requirement should be implemented county-wide to provide the same level of water quality protection to Seaside and Bayside watersheds. Increased minimum lots sizes and water frontage requirements would limit the density of waterfront development and decrease the likelihood of impacts on water quality.

**Substandard Housing:** Lack of complete plumbing facilities, complete kitchen facilities, and adequate, safe heating remain problems for many Accomack County residents. Accomack County should continue to support the efforts of the Accomack-Northampton Housing Corporation, VESEEH, and other organizations that are addressing this problem. In order to provide adequate plumbing to more houses, the use of alternative septic systems should be pursued in cooperation with the Health Department. Enforcement of the building and fire safety codes will ensure that new housing stock meets minimum standards. The county has made use of Community Development Block Grant Program funds for rehabilitation work in communities with concentrations of substandard housing. The Board of Supervisors has prioritized the communities of Savagetown, Locust Mount, Metompkin, and Graysville for rehabilitation assistance. The Board of Supervisors has stated that these communities should receive priority in consideration for Community Development Block Grant Program funding and that other sources of funding should also be sought to address the needs of these communities. A Housing Plan was developed for Accomack County by the Accomack- Northampton Planning District Commission in 1977. The implementation of this plan lead to the creation of the Accomack- Northampton Housing and Redevelopment Corporation and has driven housing assistance and rehabilitation programs over the last twenty years. The county should consider creating an updated housing plan which includes an accurate survey of existing housing conditions, identification of housing needs, and a plan of action to address those needs. The county should seek assistance from the Accomack-Northampton Housing and Redevelopment Corporation in developing this plan and should assist in providing necessary funding.

**Manufactured Housing:** The Code of Virginia grants localities the authority to adopt and enforce building codes, safety standards, and land use ordinances to promote the public health, safety, convenience, and welfare. Section 15.2-2283 of the Code of Virginia authorizes the county to provide for the health, safety and general welfare of the public through zoning regulations and establishes the purposes of zoning regulations. Since 1995, §15.2-2290 requires all local governments to allow "the placement of manufactured houses that are on a permanent foundation and on individual lots shall be permitted, subject to development standards that are equivalent to those applicable to site-built single family dwellings within the same or equivalent zoning district."

The following table lists the number of permits issued for new housing units each year (conventional and manufactured) and the number of those permits that were issued for single-wide and doublewide manufactured housing. The general trend in recent years has been a reduction in the percentage of manufactured units.

Year	Housing Units	Man.Units	%
1990 ...	253 .....	166 ....	66%
1991 ...	265 .....	132 ....	50%
1992 ...	316 .....	170 ....	54%
1993 ...	275 .....	123 ....	45%
1994 ...	316 .....	157 ....	50%
1995 ...	335 .....	223 ....	67%
1996 ...	292 .....	191 ....	66%
1997....	252 .....	157 ....	62%
1998....	285 .....	190 ....	67%
1999....	323 .....	206 ....	64%
2000....	308 .....	204 ....	66%
2001....	306 .....	149 ....	49%
2002....	322 .....	180 ....	56%
2003....	374 .....	146 ....	39%
2004....	344 .....	144 ....	42%
2005....	433 .....	160 ....	37%
2006	319 .....		

Source: Accomack County Building Permits

The Code also allows valid, nonconforming mobile or manufactured homes to be replaced with newer one that meets the current HUD manufactured housing code. A number of older manufactured housing units have appeared in Accomack County which, due to age, deterioration, and general wear, provide living conditions which would generally be considered substandard. Some of these units are in condition which would not be approved as acceptable for conventionally built structures. Yet, because these units bear a HUD approval label, they must be allowed in agricultural zoning districts. The inability to regulate minimum standards for manufactured homes thus creates a significant safety hazard to citizens who reside in these units. Ninety-three percent (93%) of Accomack County is zoned as agricultural, reflecting the rural nature of the county. The county's zoning ordinance states that the agricultural zoning district, "is established for the specific purpose of facilitating existing and future farming operations, conservation of land and other natural resources, reducing soil erosion, protecting shellfish waters from pollution and reducing hazards from flood, fire and storm." Prior to the effective date of this legislation, Accomack County allowed double-wide manufactured homes and single-wide manufactured homes with A-frame roofs, house type siding, and a masonry foundation, by right in agricultural and residential zoning districts. Older manufactured homes were allowed in manufactured home parks or in agricultural and residential districts by special use permit from the Board of Zoning Appeals.

**Septic System Use:** Due to the lack of central wastewater treatment facilities, most new development in the county, whether residential, commercial, industrial, or institutional, requires individual wastewater treatment facilities, i.e. septic systems or package plants. Septic systems are an efficient and effective waste disposal method, if properly designed, installed, and maintained. Key aspects of good septic system design and maintenance include location in relation to wells and surface water, separation from the groundwater table and soil surface, soil suitability, and regular septic tank pump-out. It is important to understand the general suitability of soils for septic tank filter fields. The requirement of well drained soils, those that will effectively filter wastewater, is an influential factor to the development of the county. Either the soil on which development is to take place effectively filters wastewater or the waste must be

pumped to a soil that will. In general, the Health Department's Division of Environmental Health finds the following soils acceptable: Bojac Loamy Sand (BhB), Bojac Sandy Loam (BkA), and Bojac Fine Sandy Loam (BoA). These are soils which will drain, allowing septic waste to properly filter through the soil.

Failing septic systems create potential health and water quality problems. When a septic system stops working properly, untreated effluent can make its way to the surface, into shallow wells or into nearby surface waters. Septic systems can fail due to poor design or improper maintenance. Some of the most common causes of system failure are age of drainfield, lack of maintenance and shallow or seasonally high water tables. The hazards of septic system failure are addressed in the Chesapeake Bay Preservation Overlay District of the county's zoning ordinance through requirements for a reserve drainfield area and regular septic tank pump-out. Development in the Overlay District that uses a septic system must have a reserve drainfield area, equal in capacity to the installed system, set aside for future use in case the installed system fails. Septic systems located within the Overlay District must also be pumped out at least once every five years.

Pumping the sludge out of the bottom of a septic tank reduces that amount of suspended solids in the wastewater that goes into the drainfield, thus extending the life of the septic system by reducing the suspended solids that can clog the pores in the soil and cause the system to fail. The County should consider requiring septic system effluent pre-treatment in waterfront areas county-wide to better protect water quality. The pumping of septic waste effluent to a remotely located drainfield is a fairly common practice in Accomack County. This practice often results in effluent from multiple structures within a residential development being pumped to a small area of the development that has acceptable soils. The use of remotely located drainfields results in septic systems being more densely concentrated than they would be if the systems were located on individual lots. Very dense concentrations of septic systems limit the effectiveness of the soil in that area to absorb and filter septic waste. The location of these remote drainfield areas can be poorly marked and are often allowed to become overgrown in tall grass, shrubs and trees, making it difficult to locate and clear the area for drainfield placement.

Problems associated with remotely located drainfields could be addressed in the county's subdivision ordinance. Options available to address the potential impact of densely concentrated drainfields on water quality include requiring that drainfields be located on the parcel being served, limiting the percentage of lots in a development that may be served by remotely located drainfields, or regulating the density of remote drainfields through minimum separation distances or minimum lot size requirements. Currently, due to the Chesapeake Bay Overlay District reserve drainfield area requirement, the allowable density within a remote drainfield area on the Bayside is half the allowable density on the Seaside. Drainfield density should be limited county-wide through adoption of the reserve drainfield area requirement throughout the county.

**Map 4-C**



**Central Water and Sewer Systems:** Due to the need to use individual sewage disposal systems, development is currently dependent on good soils. This places development in competition with agriculture for the best land in the county. Provision of sewage treatment plants would allow development to occur in previously undevelopable areas, leaving the prime soils for agricultural use. However, the development of sewage treatment systems can be costly, may have adverse environmental impacts and, if not properly planned, can lead to uncontrolled growth within the service area. Centralized water and sewer systems could be beneficial to certain areas of the county, but such systems should be considered only in the county's designated growth areas. Also, any proposals for centralized water or sewer should be carefully analyzed to ensure that the demand for the system justifies construction costs and any environmental impacts. If demand justifies a system and the system would help development in designated growth areas, steps should be taken to ensure that environmental impacts are minimized and the service area should be carefully planned to prevent sprawl and haphazard development.

In order to achieve the traditional, compact pattern of development the County seeks, it will need to foster the provision of central wastewater treatment facilities in appropriate, planned locations. This may require public investment, and/or cooperation with private companies to provide such systems.

**Future Development Patterns:** The County's historic development pattern was generally compact and clustered, with most development occurring in towns, villages, and hamlets. The modern pattern of more dispersed or scattered land use does provides certain benefits, including rural lifestyle choices, but it also creates various impacts, including higher public service costs, interference with farming and forestry activities, and environmental impacts.

Thus, returning to a more traditional, compact settlement pattern while retaining some of the key benefits of dispersed development would help the County manage the costs of future growth, and respond to expected demographic, economic, and technological changes.

In October of 2005, at the beginning of the Comprehensive Plan update process, the Planning Commission and the Land Use Planning Stakeholders Group conducted a facilitated Joint Work Session on Land Use Planning Issues and Options. Some of the policy ideas from this work session that relate to issue of guiding future development patterns include:

*Problems:*

- *Zoning around existing towns is not adequate and this pushes people out into agricultural areas.*
- *It's too easy for development to come into agricultural areas. These areas lack adequate roads for residential development and it often creates conflict among users.*
- *There is a countywide lack of affordable housing.*
- *Expansion around existing towns is difficult because the soils are not suitable for septic systems and centralized wastewater treatment facilities are not available.*

**Solutions:**

- Concentrate new development in and around existing towns and communities. They are well situated, have good access and this will help revitalize these communities.
- Identify ways for larger new developments to reproduce the attractive village concept that is already found throughout the county.
- Encourage more commercial development in existing villages to serve residents and attract tourists.
- Use Planned Unit Developments (PUDs) with their own sewage treatment plants so development can occur in areas with poor soils for septic systems.

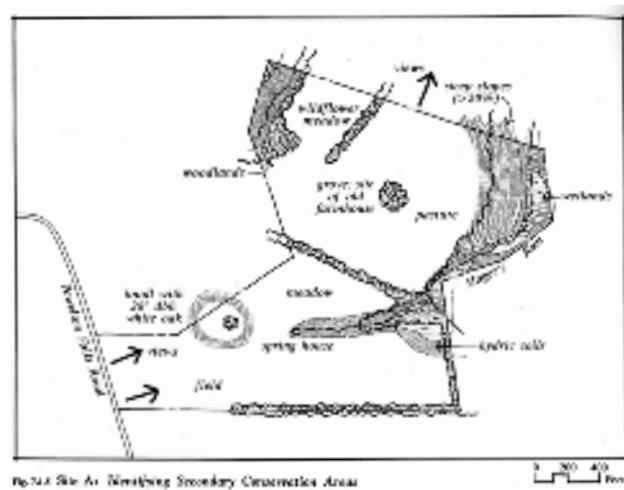
In addition to this and other work sessions, Randall Arendt evaluated the County's plans and ordinances and prepared two memoranda with recommendations for amendments. Among the key recommendations were to implement "conservation design" techniques for new rural residential developments, and to implement the principles of traditional village design for larger developments in and around existing communities. These principles are summarized below:

**Conservation Design**

Conservation or Open Space Design is technique for laying out rural subdivisions and/or for preparing concept development plans for rezoning applications in rural areas, outside of towns and villages. The process is detailed in "Designing Open Space Subdivisions" by Randall Arendt, published by The Natural Lands Trust, Inc., 1994, from which the following illustrations are excerpted. The process consists of four basic steps, as follows:

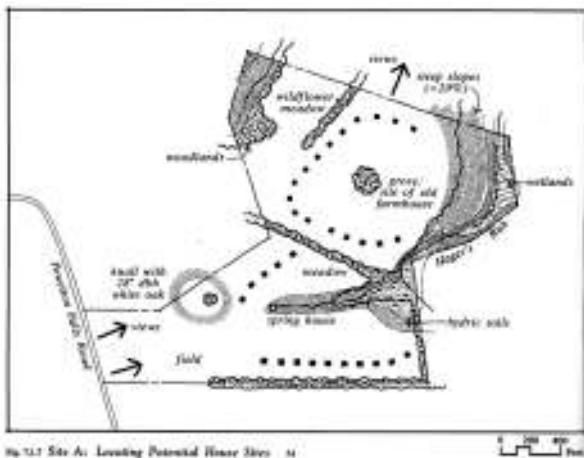
**Step One: Identify All Potential Open Space Areas on the Site**

*These areas are those that are most environmentally sensitive, most scenic, or most historically or culturally significant, and which would be most severely missed if they were destroyed by clearing or construction. Typically these would include wetlands, floodplains, and steep slopes.*



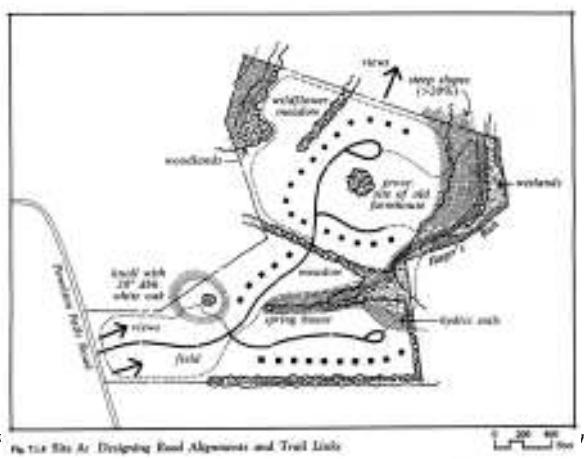
### Step Two: Locate House Sites

In modern rural development, lot value can be maximized by siting houses to maximize the views of open space or water features from as many lots as possible. This can be accomplished by using relatively narrow lot widths, and in some cases, single-loaded roads.



### Step Three: Design Road Alignments and Trails

Once open space has been reserved and house lots located, the roads to access those lots can be located. The road system should fit the topography and avoid long straight sections, and avoid crossing wetlands and water bodies to the greatest extent possible. Streets should be connected with each other and to adjacent properties where possible, and should avoid dead ends.



Responsible Land Use Plan

#### *Step Four: Draw Lot Lines*

*The final step is to draw lot lines to create separate parcels for each house site. Lot lines must provide adequate area for septic fields, as well as reflect any reservations for commonly owned open space, if that is a feature of the development.*



Traditional Village Development

The method outlined above for designing subdivisions is appropriate for rural areas, but not for areas within or adjacent to existing towns and villages. In those areas, many of the traditional features of those historic settlements should be reflected in new development. The benefits of incorporating traditional design features in new development include:

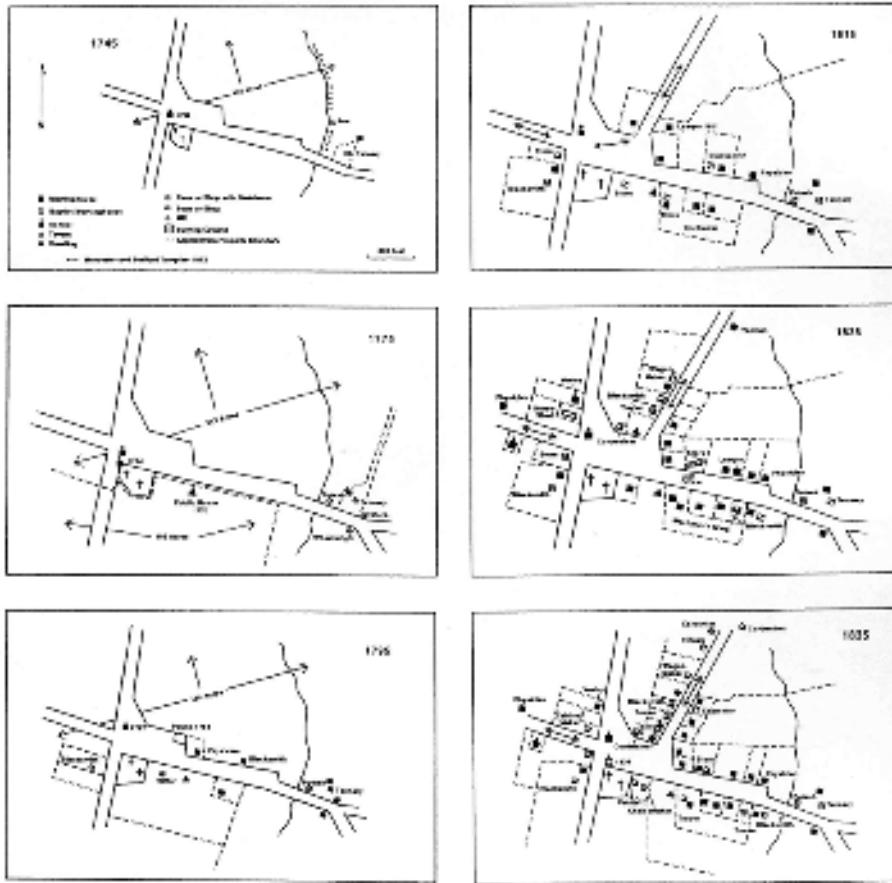
- Limit fiscal and environmental impacts
  - Provide a range of dwelling types and lot sizes, including affordable housing
  - Provide neighborhoods that are compatible with historic character and the tourism industry
  - Allow for fewer and/or shorter motor vehicle trips
  - Better meet changing market demand for pedestrian-friendly neighborhoods

Features of traditional village neighborhoods include the following (Note that not every historic village nor every new village will necessarily have all of these features, but these are typical).

- Mixed uses, dwelling types, and lot sizes
  - Relatively shallow front yards and deep rear yards
  - Front porches; Garages at the rear

- Parking on street and to the side or rear of buildings
- Interconnected street network
- Narrow pavement widths on local streets
- Views into the surrounding open landscape
- Civic sites in prominent locations within the village

Some of these features are shown in the graphics below, excerpted from “Crossroads, Hamlet, Village, Town”, PAS Report Number 487/488, 1999, by Randall Arendt, published by the American Planning Association.



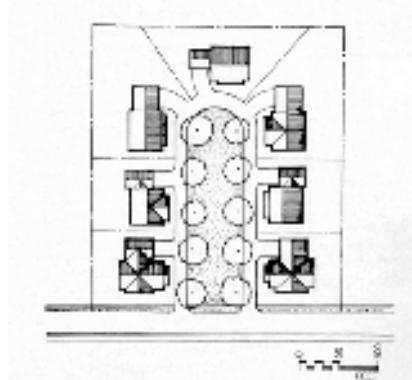
The above maps show the gradual historic evolution of a **New** England village around a crossroads.



Conventional “suburban” expansion of historic village



Expansion using traditional design patterns



Alternative to conventional “suburban” cul-de-sac



Narrow House (22') with rear garage allows better affordability

## **The Local Economy**

### ***Strategic Plan for Economic Development on the Eastern Shore***

***The Challenge:*** A strategic plan for economic development on Virginia's Eastern Shore was developed by a local economic development advisory council in 1994. That plan defined the challenge to successful economic development on the Shore as holding on to the area's history, heritage, and fragile unique natural assets, while attempting to capture new concepts and opportunities for economic growth. According to the plan, the keys to economic growth are; revitalizing and diversifying the economic base, promoting homegrown entrepreneurship, investing in the work force and, investing in infrastructure.

***Revitalizing and Diversifying the Economic Base:*** In revitalizing and diversifying our economic base, we must overcome a significant apprehensiveness toward economic development that arises from the misguided belief that economic development and environmental protection are mutually exclusive. This can be accomplished by conducting comprehensive regional strategic planning which seeks broad based input; employs a consensus building process; develops a vision for the region; and produces an action plan for implementation which targets economic development that is consistent with, and capitalizes on, the existence and preservation of our fragile ecological environment and unique Eastern Shore culture.

***Promoting Home Grown Entrepreneurship:*** By promoting home grown entrepreneurship, we can create new opportunities for businesses and jobs for people who already have a strong commitment to the region; who are already knowledgeable of the area's strengths and weaknesses; and who will not require special inducements to locate here. This approach has the added benefit of retaining a greater percentage of business profits locally – enhancing capital formation for further regional growth. Emphasizing this approach does not preclude attempting to attract suitable businesses to locate in the region. In fact, it will enhance the attractiveness of the region to prospective firms.

***Investing in the work force and infrastructure:*** Success in accomplishing economic development is highly dependent on the public sector's long-term commitment of resources for work force and infrastructure development. We must have the political will and leadership necessary to acquire the capital to improve the quality of our public school system; provide relevant training opportunities that will improve the quality of our labor pool; optimize those facets of our transportation system which support the economic activity envisioned by our strategic planning; develop regional solutions to water, waste water, and solid waste issues; and increase the supply and quality of housing for our citizens. Since the region is one of the poorest in the Commonwealth, financial assistance from the State is essential. We must, however, also examine our regional sources and uses of revenues to assure they are consistent with the priorities which emerge from our strategic planning.

***Recommendations:*** The following discussion includes information and recommendations from the *Strategic Plan for Economic Development on the Eastern Shore*, the Countryside Stewardship Exchange Report, and the Eastern Shore Economic Development Commission's Plan of Action.

***Business and Industrial Development:*** Exciting opportunities exist for the Eastern Shore to

attract and develop new businesses and industries, retain existing companies, and encourage expansion. Business and industry development can provide well paying jobs, a diversified tax base, improved quality of life, retention of our young people as they enter the work force, and a stable economy. To be successful in recruiting, developing and sustaining new industry, the Eastern Shore must pursue an economic development strategy that balances the needs of growth against those of protection of our ecological resources and rural character.

*Industrial Park:* The Shore's industrial parks and properties marketed by the Eastern Shore of Virginia Economic Development Commission are superb development assets. The Accomack County Airport Industrial Park is served by water, sewer, and paved streets and is strategically located adjacent to the County's airport, the Eastern Shore Community College, and U.S. Route 13.

*Foreign Trade Zone Designation:* NASA's Wallops Flight Facility, the Cape Charles Port area in Northampton County, and the Accomack County Airport Industrial Park have great potential as a Foreign Trade Zone (FTZ). A FTZ designation by the U.S. Department of Commerce would serve existing and future companies as an economic development incentive through the elimination or deferral of import duties. A Foreign Trade Zone application is currently being prepared by the Eastern Shore of Virginia Economic Development Commission.

*Small Business Development:* The development of micro-business enterprises would provide opportunities for the establishment of resident owned and operated or employee owned businesses. An Incubator/Business Center would provide the facilities, services, equipment, and expertise required by new and expanding local enterprises at a single location and at a cost that would increase the chances of those businesses succeeding. Such a center could be a partnership of local business service providers such as banks, chambers of commerce, local enterprise agencies, and local governments. The benefit of such a center lies in both the combined expertise gained from the partnership which would benefit regional economic development and individual gains for service providers through referrals.

Artisans and small production companies are a growing sector of the county's economy. Many producers of local arts, crafts, and food products would benefit from a marketplace which would sell and promote their products. A marketplace, located on Route 13, could provide this central outlet and encourage highway travelers to stop and shop in Accomack County. This concept has been developed successfully in North Carolina and West Virginia.

*Federal and Local Enterprise Zone Incentives:* In 1994, parts of Accomack County were designated as a Federal Enterprise Community and State Enterprise Zone. The state provides an incentive package for business in the Enterprise Zone but the federal government provides no incentives. The addition of a federal incentive package would be beneficial to promoting growth in the zone and Accomack County should support any efforts to have such incentives developed. In addition to the tax incentives provided by the state to businesses that locate in the Enterprise Zone, localities are encouraged to adopt local incentives. Although these incentives will not be of the same monetary impact as those provided by the state, they advertise the county's pro-business attitude. Examples of local incentives initiated by other localities include accelerated permit processing, crime prevention programs and education, waiver or reduction of certain permitting fees, real property rehabilitation tax abatement (i.e. five year, tax credit on

the increased assessed real property value resulting from rehabilitation work completed on commercial or industrial property), and machinery and tools tax credit (i.e. five year exemption from machinery and tools tax to qualified businesses). Some localities that give tax rebates base those rebates on the number of jobs that a business creates.

***Local Economic Assets and Issues***

***Commercial Space Activity:*** Virginia is uniquely positioned to capture a portion of the emerging market for commercial space activity. The existing infrastructure at NASA's Wallops Flight Facility provides maximum leverage for any new capital investment which targets this market.

Advantages include:

- (1) Satellite orbits, which provide coverage of the majority of the earth's populated land mass, can be launched from Wallops Flight Facility with less energy (i.e. less cost) than from any existing launch site in the U.S.
- (2) The Eastern Shore is a "radio frequency quiet" area making it an ideal location for ground stations supporting satellite operations
- (3) Wallops Flight Facility's mission and tempo of operations provide the launch schedule flexibility needed to profitably conduct commercial activity
- (4) Wallops Flight Facility has earned the reputation as a low cost/quick response utility – attributes compatible with commercial activity. Development of the Mid-Atlantic Regional Space Port (MARS) at Wallops Island is currently underway. The MARS handles commercial rocket and satellite launches. MARS has a significant impact on Accomack County's economy. In addition to revenue generated by Space Port activities, it is expected that additional support industries will locate in the vicinity of the facility. Development of the Wallops Research Park will help the county to capture a major sector of the emerging market for commercial space activity by supporting development of the MARS.

***Tourism:*** Virginia's Eastern Shore is a peaceful peninsula nestled between the Atlantic Ocean and the Chesapeake Bay. There is an abundance of natural scenic, recreational, and multi-cultural assets which offer saltwater fishing, beaches, bird watching, hunting, boating, antique shops, a unique style of architecture, and historic old homes. Tourism development must be carefully planned to create a diversity of attractions, have a low impact on the environment and link the interests and assets of existing businesses, communities, and individuals with the county's environmental and cultural assets for the benefit of the county as a whole.

The county's unique heritage and natural resources present opportunities for increased tourism activity. Tourism could be encouraged through extension of the heritage trail into Accomack County and development of museums and information points which would interpret Eastern Shore history and direct visitors to local points of interest. Signs on Route 13 could be used to entice travelers to venture off the highway and direct them towards towns, harbors, beaches, and points of interest. The Eastern Shore should have representation at the Virginia visitor center on



Route 13 to encourage travelers entering the state to explore the area. Special events such as the Seafood Festival, Harvest Festival, Garden Tour, and Eastern Shore Birding and Wildlife Festival and attractions such as beaches and parks should be actively promoted.

**Infrastructure:** Businesses investigate the quality of infrastructure, such as available facilities, utilities and the transportation network, when selecting locations for operation. These items must be given attention in order to be competitive with other areas also trying to attract new industry. Facilities: The availability of quality business facilities is important to recruitment efforts. There is a lack of existing modern industrial and office buildings in Accomack County for new business to move into. A prospective location is more attractive to a business if that business knows that either a building is ready for them to move into or that they will face few obstacles in obtaining the land and necessary permits to build. In order to stay competitive, some localities construct shell buildings to attract new business. Construction of these buildings can be funded through a revolving building fund. With a revolving fund, the Industrial Development Authority constructs industrial buildings, and when the first buildings are sold or leased, the proceeds are used to build more buildings. Another, less desirable, option is to establish a "ready-to-build" program which provides cleared and pre-permitted sites with building plans drawn, building costs estimated and sources of financing identified. With this option, prospective businesses can be assured that an approved building site is available. The county should research, and possibly establish a revolving fund for, the construction of speculative industrial buildings and consider the establishment of a "ready-to-build" program for new businesses.

**Sewage Disposal:** One town in Accomack County, Onancock, has central sewage collection and tertiary treatment facilities. The Accomack County Industrial Park has its own water supply and water tower and is connected to Onancock's sewage treatment plant. All other areas, including the incorporated towns, use various septic systems. Properly designed septic systems provide an effective and efficient method of waste disposal. Placement of septic systems, however, are dependent on the availability of suitable soils. Approximately 35% of Accomack County has soils that are suitable for septic system installation. Traditionally, the distribution of suitable soil has directed the distribution of residential and commercial development. As Accomack County continues to grow, it may be desirable to investigate alternatives to individual septic systems. Any central sewage treatment systems proposed should be designed to minimize impact on the environment and should serve compact development areas around villages and towns.

**Transportation:** The Eastern Shore has several major components of an effective and complete transportation system to support business activity and development. Accomack County Airport, with a 7,000 foot runway (5,000 feet lighted), is strategically located on the coastal North-South air routes and offers a low-activity destination, interim rest and refuel, and a possible training location for various sized commercial aircraft. Its location, adjacent to the Accomack Airport Industrial Park, gives added advantages for businesses requiring on or near airport locations and operations. U.S. Route 13, a major four-lane highway, connects Virginia to Maryland, and the Eastern Shore to the Virginia mainland via the Chesapeake Bay Bridge-Tunnel, an 18 mile long structure of multiple bridges and tunnels. U.S. Route 13 is the major transportation link for all commercial, industrial, and tourism activities on the Eastern Shore. Eleven interstate commercial carriers, primarily engaged in furnishing "over-the-road" trucking and common carrier services to the Eastern United States, are in operation on the Eastern Shore. The Eastern Shore Railroad (ESRR) provides rail service from Norfolk through the Port of Cape Charles to Pocomoke, Maryland and offers interline transport of products and material that is critical to many local businesses. Onancock and

Chincoteague harbors and waterways also offer additional locations for barge transport operations.

**Education:** Job training is closely linked to the creation of jobs. Residents must have the opportunity to pursue training for available jobs and new industry needs assurance that a trained work force will be available to fill necessary positions. The county is served by a public school system and the Eastern Shore Community College. Both offer significant services to business and industry. Enrollments suggest stable high school graduation numbers with college enrollment at 1,200. Of that number, 730 are at the Community College and 470 at other institutions.

Literacy/GED classes enroll 375 adults. The public school test scores and the percent of adults with high school diplomas are below state averages. High schools offer varied vocational programs and work closely with the college. In order to develop a work force that is well trained to fill the needs of local industry, business, education and community representatives should work together to identify local training needs and facilitate solutions. The public schools should also work to improve student performance and graduation rates, and pursue techprep, school-to-work transition, dual enrollment, technology utilization, and other options to increase student preparedness for the work force. In order to provide better opportunities for local residents, the County should encourage development of a 4-year college.

**Regional Cooperation:** The success of regional economic development efforts on the Eastern Shore requires an effective working relationship between various public and private organizations and individuals. The broad range of programs and projects being pursued by these interests represents a major commitment of valuable Eastern Shore resources. Since the success of these separate efforts depends upon a sustained commitment of resources over a long period of time, a high degree of cooperation is needed to jointly agree on regional priorities. An essential feature of this cooperation is the process for determining and assuring an equitable and adequate allocation of these limited resources to projects and programs that have the greatest potential to benefit the most people in our region. Accomack and Northampton County and town governments must play a leadership role in encouraging inter-county cooperation. Bi-county organizations such as the Eastern Shore of Virginia Economic Development Commission, Accomack-Northampton Planning District Commission, and the Accomack-Northampton Transportation District Commission can provide an effective framework for accomplishing projects which impact the whole Eastern Shore. Significant economies can be realized by combining resources and finding shore-wide solutions to critical infrastructure needs.

**Growth Trends:** Current trends show significant growth in service industries while the manufacturing and agriculture/seafood sectors are declining. Aquaculture and shellfish farming, however, are showing new growth potential and offer new business opportunities with intensive management and farming techniques. Tourism offers many opportunities to support development efforts. Eastern Shore tourism is primarily based on the area's natural, ecological, cultural and historical assets. Two new festivals have emerged on the Shore; one focused on the harvest season and its bounty and the other on nature and bird watching.

**Labor Pool:** The county's labor pool includes a large, under-utilized, low wage and unskilled labor force. Many workers are caught in a low skills/low wage economic trap. The most visible trends affecting the labor pool today are (1) college educated and skilled labor is relocating elsewhere for better paying, quality jobs off the Shore and (2) employment opportunities are declining. It is believed that those workers "out-migrating" would stay on the Shore if a broader range of employment were available. The Eastern Shore Community College provides

vocational training programs which serve many of the community's needs but continues to produce graduates that must leave the Shore to find work in their field.

**The Distributed Workforce, Telecommunications and the Quality of Life:** In 2005, roughly 12% of the workforce in the United States had become what economists call the "distributed workforce". This refers to people whose place of work need not be located near their place of residence due to their use of telecommunications technology. Many occupations are now able to use the internet and world wide web for day-to-day tasks, allowing them to live many miles from the center of their business. Examples include writers, sales people and consultants. Jobs in the distributed workforce tend to be high paying professional jobs, either independent entrepreneurs, or senior people in larger companies. This trend puts increasing value on a community's quality of life as a basis for economic development, since these types of employees have a wide range of choice as to where they reside. Accomack County has many quality of life factors that are attractive to segments of the distributed workforce, such as small towns, and high quality environmental resources for hunting, fishing and outdoor recreation. The County should strive to retain and enhance these factors as an underpinning of future economic development.

### **The Seafood Industry**

Seafood production is an industry that holds important ties to Accomack County's past and future. For years, watermen have made their living harvesting fish, crabs, oyster, and clams and many others were employed by seafood processing plants. Today, crab, oysters and clam quantities have declined and most of the seafood processing plants have gone out of business. Aquaculture, the farming of fish and shellfish, has become the seafood industry of the future. Clam aquaculture is now a \$30 to \$40 million dollar business on the Eastern Shore.

**Seafood Harvest:** Seafood catches continue to steadily decline. To compensate for decreased catch, watermen have tried extending their season and switching to species that are more abundant.

**Seafood Processing:** Many of the Shore's seafood processing plants have closed. Closure was brought on by both declining seafood harvests and the state's adoption of more stringent water quality standards. Some of the plants, faced with decreased profits were unable to afford to upgrade their plants to meet the new standards. The DEQ is now working on general permits for seafood processing plants which save the applicant money and streamline the application process. For these general permits, DEQ develops requirements for category-specific permits with EPA and adopts the permits through the regulatory process. Individual facilities in Virginia are then able to apply for and be covered by the umbrella of a general permit. This should relieve some of the burden placed on processors that are required to obtain a permit.

**Water Access:** Currently, watermen have little trouble gaining access to the Bay and Ocean to make their living. However, as waterfront development continues to increase and areas traditionally used by the public change hands, access could become more scarce. In recognition of the seafood industry's importance to Accomack County, effort should be made to ensure that adequate waterfront access is maintained for boat access and water dependent uses such as crab shedding.

**Aquaculture:** Fin and shellfish populations are declining while the demand for seafood continues to grow. Virginia's Eastern Shore has the reputation for good seafood, there is a large labor force, and markets are established. The area is bordered on the east by the Atlantic Ocean with a coast of pristine bays and creeks, and on the west by the nutrient rich Chesapeake Bay. The traditional seafood industry is in serious decline, but Virginia's Eastern Shore remains an ideal location for major shellfish and finfish aquaculture. Taking advantage of the location, reputation, work force and markets, aquaculture could continue to revitalize the local seafood industry. The county should work to identify the level of water quality necessary for viable aquaculture operations and establish standards to be maintained in waters supporting aquaculture. The County should work closely with the Virginia Department of Agriculture to protect water quality for aquaculture.

**Water Quality:** In the shellfish aquaculture industry, water quality is important because seawater from tidal creeks is used in raising young shellfish that are very sensitive to water conditions. In recent years, several aquaculture operations have suffered clam larvae mortalities attributed to water quality problems. At times these problems have been related to large-scale runoff in the greater Chesapeake Bay basin which Reduced salinities and at others to blooms of toxic dinoflagellates. In 1996, controversy arose between aquaculture operators and farmers accused of creating a pollution problem. The water quality problems were occurring in creeks downstream from agricultural fields in plasticulture production. Plasticulture is a method of farming that uses plastic ground covers to control soil moisture, reduce pesticide requirements and increase yields. Problems observed in shellfish hatcheries included chronic feeding inhibition and shell deformation in larvae and acute toxicity to larvae and juveniles. These occurrences are consistent with both heavy metal and organic toxicant contamination.

A study conducted by the Virginia Institute of Marine Science evaluated water quality in Seaside creeks in relation to the presence or absence of vegetable cultivation using plastic ground cover within the watershed. Eleven sites in six watersheds were tested. Sites were selected to represent a variety of surrounding land use. Since problems witnessed at the hatcheries indicated heavy metal toxicity, water at each site was tested for the presence of heavy metals. Each site was also tested for toxicity from insecticides. Insecticide toxicity was tested using grass shrimp, a common inhabitant of tidal marshes and creeks that is sensitive to insecticides.

### *Growing Clams*



*Growing clams is the basis of a million dollar aquaculture industry on the Shore. Hard clam operations hatch and feed clams in holding tanks until they are large enough (about 4 millimeters) to move outdoors. The small clams are placed in long sloughs of fresh, unprocessed seawater, to prepare them for planting in the shallows of coastal bays. The "grow-out" stage of the process is often handled by independents who work on a cooperative basis with the hatcheries. The entire process, from spawning tank to market, takes two and a half years. Producing high enough spawn rates from broodstock is essential to success. The Shore's aquaculture industry has experienced lower than usual spawn rates over the last several years.*

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### Water Quality Test Sites

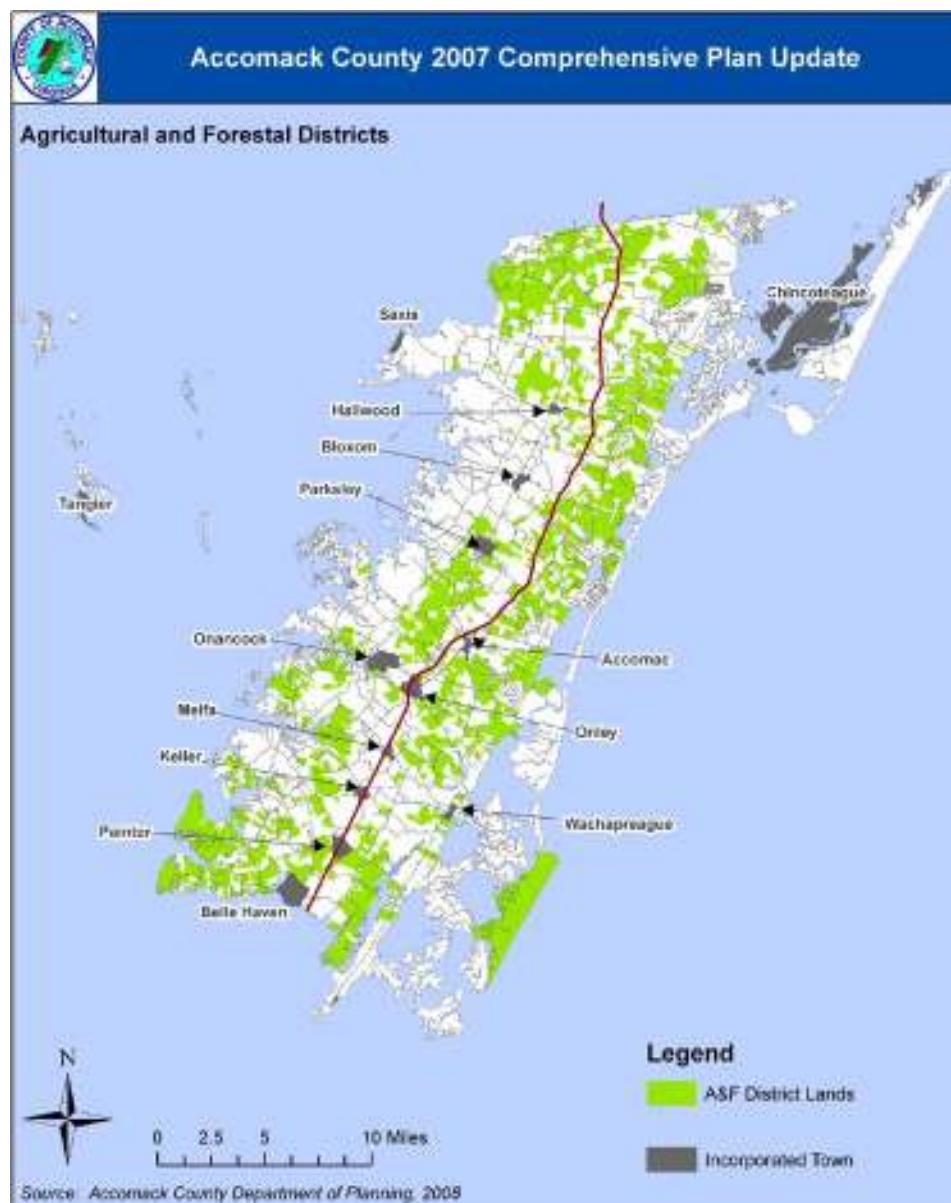
<b>Site</b>	<b>marsh &amp; open water</b>	<b>woodland</b>	<b>urban/res.</b>	<b>cropland</b>	<b>plasticulture</b>
Phillips .....	11% .....	32% .....	4% .....	53% .....	0%
Nickawampus ...	5% .....	38% .....	5% .....	51% .....	<1%
Indiantown .....	1% .....	35% .....	4% .....	47% .....	13%
Gargathy.....	7%.....	33%.....	4%.....	51%.....	5%
Finney .....	2% .....	40% .....	3% .....	46% .....	9%
Folly.....	6% .....	32%.....	7% .....	48% .....	7%

Evidence of metals toxicity was observed in filtered water samples collected from the upstream site at Gargathy Creek. Less toxicity was observed in the midstream site at Gargathy Creek. Metals toxicity was also observed in filtered samples from Finney and Nickawampus Creeks. A trace of toxicity was observed in unfiltered water samples from Wachapreague Channel and Indiantown Creek. At the upstream location on Gargathy Creek, complete mortality of the shrimp was observed after virtually every rainfall event. Available data indicates that this mortality was not associated with low salinity or dissolved oxygen levels. Coupled with observations of direct runoff from an adjacent tomato field, the implication of this finding is that agricultural practices in the immediate watershed are impacting living resources at this site.

A similar, but less severe, pattern of mortality in relation to rainfall was observed at the downstream site at Gargathy Creek. Mortality of shrimp was also observed at Indiantown Creek, but generally only after rainfall events in excess of 50 mm / 48 hr. The Finney Creek site experienced approximately 70% mortality after a large rainfall, but over 30% mortality was observed in Nickawampus Creek, which has almost no vegetable cultivation, following the same rainfall. Upstream stations at Folly Creek and Phillips Creek, along with downstream stations at Folly Creek and Wachapreague, experienced only minimal mortalities.

**Information Needs:** Additional information is needed on the role water quality and surrounding land use has on the seafood industry in order to effectively manage impacts. The recent controversy between the agriculture and aquaculture industries has lead to a good deal of research and study. The county should carefully monitor the results of these studies and take action to correct problems that are defined.

**Map 4-D**



**Map 4-E**



## **Agriculture**

**Viability:** Conditions which affect the viability of commercial farming include soils, farm size, land ownership, surrounding development patterns, taxes, and market conditions.

**Soils:** Soil factors such as permeability, depth, natural fertility, and drainage are important when considering the agricultural potential of a piece of land. In general, loamy soils are best suited for crop production, being of medium porosity they can hold enough water and air to support good crop growth. In Accomack County, bojac and munden are the soils best suited to crop production. Bojac soils are also the prime soils for residential and commercial development because they are the soils most suitable for septic systems. This creates competition between farmers and developers for the best soils.

**Farm size:** The geography of the Eastern Shore does not allow for large, contiguous farm tracts. The peninsula is narrow and land is bisected frequently by creeks. Efficient, large scale farming often requires the use of large high-speed equipment which requires large areas in which to maneuver. The USDA conducted a study in 1981 which determined that the most efficient corn-producing farms in the Midwest were about 640 acres. The study also found that efficiencies of 90% could be achieved on farms as small as 300 acres. The average farm size in Accomack County in 1992 was 328 acres. It increased to 345 acres by 1997, but fell to only 286 acres in 2002. It is important that viable farmland be protected from fragmentation by residential and commercial development.

**Land ownership:** Population increases and the resultant competition for land leads to higher land values. As land values increase, it becomes difficult for a farmer to purchase land for a new operation or expansion. Instead, farmers are forced to lease land. Non-farmer land owners are often reluctant to tie up the potential development value of their property with long term agricultural leases. When the land owner decides to sell or develop the land for another use, the farmer must find other land to farm. A side effect of non-farmer ownership of agricultural land is that, without a commitment to a long-term lease from the property owner, the farmer leasing the land may not be willing to invest in long-term soil improvement measures and soil quality can be adversely impacted over the long term.

**Taxes:** Real Estate taxes are usually based on fair market value which is derived from the "highest and best use" of that piece of property. As development pressures increase in a rural area, increasing property taxes can have a real impact on agricultural land owners. If farm land is in an area with development potential, that property may be taxed based on its potential as residential or commercial property rather than its current agricultural use. Agricultural use of the land may not produce enough income to offset increased taxes and may force property owners to pursue other uses for their land.

**Farm Ownership**

The following table lists Accomack County farm acreage by ownership for 1987, 1992, 1997 and 2002.

	<b>Acreage</b>			
	<b>1987</b>	<b>1992</b>	<b>1997</b>	<b>2002</b>
<b>Full owners ....</b>	10,740 .....	10,425	10,436	21,775
<b>Part owners ...</b>	66,621 .....	63,758	66,011	65,341
<b>Tenants .....</b>	12,414 .....	17,385	16,917	3,940

Source: Census of Agriculture, 1992, 1997, 2002.

Accomack County currently offers land use taxation for property in agriculture or forestry use. Under land use taxation, property is assessed at its agricultural or current use value instead of fair market value. The savings to owners of agricultural property can be significant. The land use taxation option affords relieve from pressures to remove land from agriculture and develop it to its "highest and best use." When land that has been in land use taxation is developed for more intensive use, roll back taxes must be paid by the property owner. One option the County may wish to consider to enhance the efficiency of the Use Value Taxation Program would be to limit eligibility to land that is within an adopted Agricultural and Forestal District (AFD).

**Surrounding land use:** Farming and residential development seldom successfully mix. As rural development increases and residential developments spring up in formerly agricultural areas, conflicts between the newcomers and surrounding farmers often occur. Agricultural practices which occur in once wide-open areas now pose nuisance problems for homeowners who have moved to the country. People who move to the country with bucolic visions of rural life are soon confronted with the realities of manure spreading, pesticide spraying and noisy farm equipment operating at all hours of the day. The result is an increase in complaints and nuisance lawsuits against farmers. When a farm is creating a nuisance that threatens neighboring property owners, the farmer is usually forced to modify or cease the offensive agricultural practices, regardless of whether the farm was there first. Accomack County currently requires that a statement be recorded on the plat of any subdivision created in an Agricultural zoning district, stating that, "These residential building lots are located in an area and zoning district specifically designated for agricultural activities, including horticulture and the raising of animals. Residents may expect the use of herbicides, pesticides, and fertilizers on adjacent agricultural fields, as well as other general agricultural activities, including plowing, spraying, pruning, and harvesting, which may occasionally generate dust, smoke, noise, and odor, and may also include changes from one specific agricultural activity to another."

In spite of this notice, conflicts still arise and it is best to keep these uses segregated. The conflict that arises from uses incompatible with agricultural operations illustrates the need for agricultural zoning that minimizes those conflicts. Currently, Accomack County's zoning ordinance allows uses such as single family housing, schools, churches, and post offices by right in an Agricultural district. In addition to those uses, all other uses are allowed by special use permit; specifically: camping facilities, light industry, retail stores, restaurants, office buildings, health care facilities, mobile home parks, duplexes, apartment buildings, banks, hotels, and motels. Many of the uses specified are not compatible with the use of land for agricultural

production and should be excluded from a district that takes the goal of agricultural production seriously. However, any such amendments should consider potential pressures for “spot” zoning for such intensive uses, due to the extensive coverage of the A District in Accomack County.

**Agricultural and Forestal Districts:**

In 1983, the Accomack County Board of Supervisors created 22 Agricultural and Forestal Districts with a total of 82,560 acres of land. In 2007, the total acreage is estimated to be 80,215 acres. Property owners made application for inclusion of their land in an Agricultural and Forestal District and those applications were considered by an Agricultural and Forestal District Advisory Committee, the Planning Commission, and the Board of Supervisors. In considering land for inclusion, the County reviewed the agricultural and forestal significance of land within the district (significance is evaluated based on soils, extent and nature of farm improvements, present status of farming and forestry, anticipated trends in economic conditions and technology, etc.), the nature and extent of land uses other than active farming or forestry, and local development trends and needs. The ordinances creating these districts state that land in the districts is “land which requires conservation and protection for the production of food and other agricultural and forestal products and as such is a valuable natural and ecological resource, providing open spaces for clean air and adequate and safe water supplies and other aesthetic purposes and is therefore valuable to the public interest.” Land in these districts qualified for land use taxation, under which land is taxed based its current, rather than “highest and best” use.

In 1994, the Board of Supervisors approved an amendment to each of the Agricultural and Forestal Districts to include a paragraph stating that, “In order to further the intent and purpose of this Ordinance, in accordance with provisions in § 15.2-4309, Code of Virginia, (1) any lands currently included, or subsequently added to, this District shall not be developed to any more intensive uses, other than for more intensive agricultural and/or forestal production, (2) nor shall any rezoning request for more intensive uses, nor any subdivision of lands be permitted within a District for other than agricultural and/or forestal uses, unless such lands are first approved for removal from the District, in accordance with § 15.2-4311 Code of Virginia. The state enabling legislation which allows for the creation of Agricultural and Forestal Districts has a stated purpose of providing “a means for a mutual undertaking by landowners and local governments to protect and enhance agricultural and forestal land as a viable segment of the Commonwealth’s economy and an economic and environmental resource of major importance.” The enabling legislation provides insurance that agricultural uses may continue unimpeded by local regulation by stating that, “No government shall exercise any of its powers to enact local laws or ordinances within a district in a manner which would unreasonably restrict or regulate farm structures or farming and forestry practices in contravention of the purposes of this chapter unless such restriction or regulation bear a direct relationship to public health and safety.” The legislation goes on to state that, “Local ordinances, comprehensive plans, land use planning decisions, administrative decision and procedures affecting parcels of land adjacent to any district shall take into account the existence of such district and the purposes of this chapter,” ensuring that local plans and regulations are consistent with the purpose of the Agricultural and Forestal Districts created. In 2006 the Agricultural and Forestal District Advisory Committee began reviewing the 22 A&F Districts and updating each A&F District ordinance. Review of the A&F Districts will be completed in 2008.

## Pollution Control

Much of Accomack County's economy is based on the wise use of natural resources. The key to continued utilization of these resources lies in promoting economic development that is compatible with the county's goal of protecting the natural resource base. Adverse environmental impacts can be minimized through the use of performance standards and Best Management Practices (BMPs) for all land uses. BMPs are conservation measures that can be used to lessen the impact a land use has on environmental resources. Effective BMPs have been developed for agricultural, industrial, commercial, and residential land uses. Traditionally, land use regulation and environmental protection have been achieved through specification standards with which allowable land uses and development activities are specified by zoning, subdivision ordinances and building codes. Specification standards indicate what one can or cannot do. Performance standards are increasingly being used for environmental regulation. Performance standards are concerned with results. Standards are set and the method of achieving those standards is left up to the developer. The difference between specification standards and performance standards can be illustrated through the example of a building code that mandates what materials can be used for a wall versus a code that states how the wall should perform, in terms of fire resistance and other factors. The specification code tends to stifle innovation while the performance code tends to encourage it. A performance code eliminates the need for the drafters of the code to know about and test all available materials and processes. Instead, the proponents of the new materials or process must prove that it performs as required. Performance standards work particularly well for environmental regulations where the goal, such as a particular water quality standard, is known and there is an ever evolving number of options available for achieving that goal.

**Erosion and Sediment Control:** Sedimentation is a source of nonpoint source pollution which impacts the quality of surface water. As sediment increases, it reduces the amount of light and oxygen available for living organisms in the water. As it settles, sediment covers and inhibits the respiratory functions of immobile bottom dwelling organisms such as oysters, clams and submerged aquatic vegetation. Sediment also acts as a carrier of other forms of pollution such as nutrients and toxic compounds. Erosion and sediment control regulations are principally concerned with the process of construction. Agriculture and forestry operations are exempt from the regulations. Accomack County has an erosion and sediment control ordinance which requires that construction activity be managed in a way that minimizes the potential for soil to leave the site. Projects in Accomack County must conform to the state's established minimum standards for erosion control.

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### Nutrients in Water

*Fertilizer and nutrients from farmland, household detergents and sewage stimulate excess algae growth in waterways. The algae die, respire and decay. If water has too much organic waste, such as dead algae, bacteria, which break down the waste, use more dissolved oxygen than usual, leaving reducing dissolved oxygen levels. Most aquatic life does well in water with oxygen concentrations of nine parts per million. Concentrations less than five parts per million will asphyxiate some species.*

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**Stormwater Management:** Impervious surfaces created by development prevent the natural infiltration of rain water into the soil. Rain flows off these surfaces in sheets, carrying with it pollutants that have collected on these surfaces, and concentrates and collects in low areas, often causing erosion and flooding. The first inch of rain carries away most of the pollutants which have accumulated on surfaces. Certain techniques can be used to control stormwater and reduce the likelihood of flooding, erosion and water pollution. Stormwater management regulations regulate the effects of development after construction by requiring that post construction water runoff quantity not exceed what would occur if the site was left in a natural condition and/or limiting the level of pollutants that leave the site. There are many options available to developers to meet these standards. Infiltration trenches are probably the most common devices used. They typically consist of a shallow trench two to ten feet deep, filled with coarse stone aggregate permitting water storage and gradual infiltration into the soil. Vegetated or grass swales are also commonly used. These are depressions in the ground which slow and trap runoff permitting infiltration. Filter strips and roof drainage systems that runoff to grass areas are similar approaches, though they may require more space and hold less capacity than trenches. Porous pavement, concrete grids and lattice blocks represent alternatives to the conventional impervious material used to build roads and parking areas. Recharge or percolation basins are another infiltration strategy and are usually built around stormwater collection outflows. Detention devices such as ponds or basins are very effective in collecting stormwater runoff and removing pollutants through the settling of sediment. Wetlands, both natural and man-made, are quite effective at absorbing rainwater and filtering out pollutants. It may not be desirable, however, to expose pristine natural wetlands to stormwater pollutants. To effectively use wetlands as filters or detention areas it may be necessary to incorporate pretreatment lakes to reduce sediment loads and remove certain types of pollutants (i.e. oil and grease). Accomack County's erosion and sediment control ordinance regulates the quantity of stormwater runoff for any project over 10,000 square feet in size. Developers are required to show that increases in the volume, velocity, and peak flow rate of stormwater runoff will not create erosion of properties or waterways downstream. The stormwater management regulations require that increased volumes of sheet flow that may cause erosion or sedimentation on adjacent property be diverted to a stable outlet, adequate channel or detention facility and that concentrated stormwater runoff leaving a development site must be discharged directly into an adequate natural or manmade receiving channel, pipe or storm sewer system.

Stormwater *quality* is regulated within the county's Chesapeake Bay Preservation Overlay District. These regulations require that stormwater runoff be controlled by the use of best management practices that achieve, for new construction, post-development nonpoint source pollution runoff load that does not exceed the pre-developed load and for re-development, post-development non-point source pollution loading that is ten percent less than the existing level. These stormwater quality standards are important in that, while stormwater quantity standards protect from flooding and erosion by requiring that runoff be diverted to an adequate receiving channel, no consideration is given to the quality of water entering that channel. The Bay Overlay District's nonpoint source pollution loading standards provide an additional level of water quality protection within the Chesapeake Bay watershed. No comparable protection is provided for Seaside water quality protection.

**Contamination from Septic Systems:** Researchers at Virginia Tech conducted an extensive literature search for the Virginia Health Department regarding the cause and effect relationship between on site wastewater disposal systems and ground and surface water pollution. The study

identified nitrates, bacteria, and viruses as the principle pollutants generated from onsite wastewater disposal systems (septic systems). It was found that groundwater has the greatest potential for pollution where septic systems occur in high density or are placed in soils with high water tables and/or coarse sand. The extent to which Virginia groundwaters are being polluted by septic systems is currently unknown. The study calls for further research to document the extent of groundwater pollution attributable to septic systems in Virginia, identify the areas within the state most susceptible to pollution, evaluate the maximum density of septic systems a recharge basin can safely support in terms of groundwater pollution, and establish standards for separation distances between septic systems and high water tables.

The report also recommends that alternate systems be developed to reduce the level of nitrates leaving the system. In 2000, the Health Department adopted new regulations for on-site sewage disposal, including regulations governing “alternative” onsite systems.

Although properly functioning septic systems are an effective means of treating biodegradable waste, septic systems are not designed to treat chemical waste. Engine oil, gasoline, paints, solvents, pesticides, and other chemicals disposed of in septic systems, exit the system untreated and pose a threat to the groundwater supply. An effort should be made to educate county citizens about this matter and safe, alternative disposal methods should be made available. Some counties hold an occasional household clean-up day to help citizens safely dispose of chemical waste.

**Agricultural “Bad Actors”:** Significant progress has been made towards the control of agricultural runoff through the voluntary use of Best Management Practices, responsible use of chemicals and fertilizers, and good land stewardship practices. There continue to be, however, certain “bad actors,” people who fail to manage their land responsibly to prevent pollution and degradation of resources. In 1996, the Virginia Legislature passed the Agricultural Stewardship Act, effective April of 1997, that holds these “bad actors” responsible for their actions. The Agricultural Stewardship Act allows citizens to make a complaint to the Virginia Department of Agriculture and Consumer Services against any agricultural activities that creates pollution. Pollution is defined by the Act as, “any alteration of the physical, chemical or biological properties of any state waters resulting from sedimentation, nutrients, or toxins.” The complaint is to be investigated by the local Soil and Water Conservation District and, if it is found that the activity does or will create pollution, the operator of that activity has sixty days to develop an agricultural stewardship plan that includes measures to prevent or cease the pollution.

At the time, the Accomack County Planning Commission supported the intent behind the Agricultural Stewardship Act but was concerned that the impact of this legislation, as written, will extend beyond the “bad actors,” to farm operators who are acting in good faith to control pollution runoff. Due to the Eastern Shore’s extensive shoreline and pattern of creeks and bays, most agricultural operations on the Shore, even with Best Management Practices in place, are going to produce some runoff to state waters at some point in operation. Care should be taken by the State and the local Soil and Water Conservation District to ensure that enforcement actions are directed towards the true “bad actors,” those who have not implemented pollution control measures, rather than farmers who manage their operations to control pollution but experience occasional runoff events.

**Air Quality Monitoring:** The state currently has no air quality monitoring stations on Virginia’s Eastern Shore. It is unlikely that ambient air quality standards are being exceeded on the Shore,

but monitoring equipment to confirm compliance is not available on the Shore. An air quality monitoring station would allow for the detection of air quality deterioration and the study of long term trends. The county should look into the possibility of having the state establish a monitoring station on the Shore or the possibility of establishing a monitoring station in cooperation with a university research station.

## **Groundwater Management**

### **Ground Water Supply Protection and Management Plan for the Eastern Shore of Virginia:**

*The Ground Water Supply Protection and Management Plan for the Eastern Shore of Virginia* was initiated in 1990 at the request of Accomack and Northampton Counties. A bi-county Ground Water Study Committee was formed to oversee the development of the plan. This study committee consists of two members from each county's Board of Supervisors, one citizen appointee by each Board, the County Administrator from each county, and the Executive Director of the Accomack-Northampton Planning District Commission. The consulting firm of Horsey Witten and Hegemann (HWH) assisted with preparation of the plan. The plan, which was adopted in 1992, summarizes information on groundwater hydrology, water withdrawals, land use threats, and current control mechanisms on the Eastern Shore. The Ground Water Plan recognizes the importance of understanding the water system as a whole in order to make future land use and development decisions designed to protect water supplies. An understanding of the flow patterns and locations of the recharge areas on the peninsula was seen as crucial, so a conceptual model was developed which took a three-dimensional approach. The key element of the model with respect to protecting the long term quality and quantity of groundwater in the Eastern Shore is the role played by the central spine of the peninsula. The center portion functions as the primary recharge source for the heavily used confined Yorktown-Eastover aquifer, and its protection is of utmost importance to the continued viability of the aquifer as a source of water. Recommendations were proposed to develop a comprehensive groundwater protection and supply management strategy which will maintain an adequate supply of high quality water for the future needs of the region. All recommendations listed below must take into account sea level rise.

### **Recommendations for Water Quality Protection:**

The 1992 HWH plan recommended the following:

#### ***Pursue water conservation measures with major industrial users:***

The Ground Water Study Committee has met with major industrial users, to recommend freshwater conservation possibilities. These include the use of lower quality water for effluent dilution, and the reduction in wastewater flows from treatment plants.

***Create an overlay protection zoning district to protect the spine recharge area to the Yorktown-Eastover aquifer:*** d upon the Wellhead Protection Area Map prepared by HWH, and the delineation of wellhead protection areas and recharge areas to the Yorktown-Eastover aquifer, Accomack County has considered but has not adopted a zoning overlay groundwater protection district.

***Underground Storage Tanks***

Underground storage tanks (USTs) pose a threat to groundwater in that older steel tanks that are not of double wall construction can corrode and leak contaminants into the soil. These leakages can continue undetected for a considerable amount of time. USTs are used primarily for fuel storage, either at retail establishments such as gas stations or home fuel oil supplies. The concentration of gas stations along Route 13, which runs along much of the groundwater recharge spine is a reason for concern.

**Review and revise county zoning and subdivision regulations:** Accomack County has revised its current zoning and subdivision regulations to incorporate some groundwater quality and quantity protection measures to control the density, location and the pattern of development. Additional measures are needed to designate the ground water recharge area, require central water supplies for large developments, and require shallow irrigation wells for new residential development.

**Land Use in the Groundwater Recharge Spine 1996**  
Source: Accomack County Dept. of Building, Planning & Zoning

Land Use	Acreage	Percent of Total
Agricultural/Vacant .....	8,832 .....	43.27%
Agricultural/Forested .....	8,673 .....	43.39%
Agricultural/Poultry .....	46 .....	.23%
Residential/General .....	828 .....	4.05%
Residential/Mobile Home .....	42 .....	0.20%
Commercial .....	129 .....	0.63%
Industrial .....	495 .....	2.42%
Public/Institutional .....	52 .....	0.25%
Incorporated Town .....	1,129 .....	5.51%
Route 13 right-of-way .....	214 .....	1.04%

**Incorporate groundwater protection requirements into site plan review :** Accomack County has revised its zoning ordinance to require that groundwater protection be considered in all major site plan reviews.

**Develop a private well ordinance to control the siting and construction of new wells:** Accomack County does not have a requirement, but most new private wells should be finished in the Yorktown-Eastover aquifer.

**Support the implementation of agricultural nutrient management plans:** The Soil Conservation Service, County Extension Agents, and the Eastern Shore Soil and Water Conservation District have continued their program of assisting farmers in developing nutrient management plans.

**Recommendations for Water Quantity Management:**

**Revise State Ground Water Act and Regulation to allow for reevaluation of existing permits:**

The State Ground Water Act now requires reevaluation of ground water withdrawal permits every 10 years.

**Develop an Eastern Shore Water Management District to manage water withdrawals:**  
No action has been taken on this recommendation.

**Control the siting and development of new water supply wells to prevent well interference and reduce the threat of saltwater intrusion:**

New wells using 10,000 gallons per day are required to have ground water withdrawal permits, which are evaluated for impacts such as overpumping and saltwater intrusion. However, large residential developments with individual wells are not required to have permits.

**Continue the accurate reporting of agricultural water withdrawals, by well location and depth:**  
Large agricultural water withdrawals are now required to have permits, and submit water use data.

**Continue the consideration of mandatory permitting of agricultural withdrawals after review of reporting data:**

Large agricultural water withdrawals are now required to have permits, and submit water use data.

**Protect open space and undeveloped land in the spine recharge area:**

To date, there has been no program to acquire open space or easements to protect the Zone 2 Recharge Area.

**General Recommendations:**

**Implement a land use/water quality data base:**

The A-NPDC works with a ground water consultant to update ground water data annually, but has not developed a centralized water quality data base for all water use on the Eastern Shore.

**Acreage of Irrigated Land**

<b>Year</b>	<b>Acreage</b>
1974 .....	4,097
1978 .....	5,388
1982 .....	6,345
1987 .....	9,132
1992 .....	7,889
1997 .....	9,399
2002 .....	9,716

Source: Census of Agriculture 1992, 1997, 2002

**Develop a public education program on groundwater:**

The Eastern Shore of Virginia Ground Water Committee developed materials and a web site on the importance of the groundwater resource on the Eastern Shore, and coordinates research conducted by the U.S. Geological Survey.

**Continued Research and Investigation:**

***Investigate the nature of recharge to the Yorktown-Eastover aquifer:*** USGS is updating the Eastern Shore Ground Water Flow Model to better estimate recharge and pumping impacts.

***Research dilute saltwater issues:*** DEQ has reactivated its ground water quality monitoring program, which was dormant for many years. The most recent data has been used to update the USGS ground water model.

***Investigate the Character of Pleistocene Paleochannels on the Eastern Shore:*** The USGS Ground Water Flow Model update includes better information on the paleochannels.

***Evaluate pesticide use on the Eastern Shore:***

Progress to date on pesticide impacts to ground water is unknown.

The impact of pesticide use on groundwater quality on the Eastern Shore should be studied. Currently, information is not available to accurately assess this potential source of contamination. The Virginia Department of Agriculture and Consumer Services, Office of Pesticide Management should be contacted to provide assistance in this effort. Since agriculture is planned as the predominant land use in the future, this effort should be a priority for future investigations.

***Support additional agricultural nutrient management research:*** Progress to date on nutrient management research is unknown.

***Revise the nitrogen model used in the study over time:***

Progress to date on revisions to the nitrogen model is unknown.

**Technical Analysis and Justification for Groundwater Ordinances**

In January, 2001, Malcolm Pirnie issued a Technical Analysis and Justification for Groundwater Ordinances on the Eastern Shore of Virginia, for the Accomack-Northampton Planning District Commission. This report contained findings and recommendations for action.

**The recommendations of the Malcolm Pirnie report included the following:**

- Homeowners apply the minimum fertilizer application rate for the soil and grass type on their lot.
- Centralized wastewater collection and treatment systems should be constructed for any new developments of 50 or more lots of 0.25 acres or less.
- Institute water conservation measures such as low flow plumbing fixtures, irrigation only in the evenings and metered irrigation, and landscaping that requires minimal water use.
- Use centralized water systems for larger residential areas (greater than 50 lots) to buffer the peak water demand. A centralized potable water system withdrawing from a confined aquifer with non-potable irrigation water supplied by individual residential wells pumping from the

water table aquifer provides the greatest protection from saltwater intrusion and loss of yield due to over pumping.

- All developments of 50 lots or greater should obtain their potable water supply from the upper Yorktown aquifer, and obtain non-potable (irrigation) water from the water table aquifer.

## **Waste Disposal**

**Recycling:** The County is required by the state to meet certain recycling levels. In addition to those mandated levels, increasing the amount of the waste stream that is recycled helps to extend the life expectancy of our landfills. The county currently has four solid waste convenience and recycling centers that collect paper, glass, and plastic. Additional centers of this type should be created to provide access for all county residents. A bottle deposit would further encourage residents to recycle glass bottles and reduce the amount of trash in the landfill. For this reason, the county should support any efforts to adopt bottle deposit legislation in Virginia.

**Litter:** Many of Accomack County's roadsides are cluttered with litter. This litter creates a bad image of the Shore for visitors, degrades the visual quality of the county for residents, and can pose a threat to water quality. The Virginia Department of Transportation conducts an adopt-a-road program in Accomack County in addition to general spring and fall clean-ups. Accomack County could cooperate with VDOT in organizing and providing support for two county-wide litter clean-up efforts annually. County support could be provided in the form of providing bags, providing trucks to pick up trash collected, assigning areas most in need of cleaning, and reducing tipping charges on clean-up days.

**Trash Collection:** Accomack County should re-evaluate it's greenbox collection system to ensure that the distribution of boxes is efficient and cost effective. Improvements may need to be made to some locations to make dumpster access safer and easier for elderly or handicapped citizens.

**Septage Lagoons:** All septic system waste pumped in Accomack and Northampton Counties by Bundick Well & Pump and Boggs Water and Sewage is currently being disposed of in three anaerobic lagoons located in Accomack County. Anaerobic stabilization of biodegradable organisms is a slow process characterized by bad odors and the possibility of contamination to groundwater and nearby surface water. Concentration of bacterial organisms in these ponds is close to that found in primary sewage sludge. Contamination threats lie in potential breaching of the earthen berms that contain the septage and leaching of pollutants through the bottom of the lagoon into the groundwater system. Health Department records indicate that lagoon berms have been breached on occasion, allowing contents to discharge onto the ground surface and drain into nearby streams. There were no comprehensive septage disposal regulations in Virginia until 1982. Accomack County's facilities were constructed prior to that time and consist of unlined ponds that are permitted for continued operation through "grandfathered" permits. The septage lagoons are regulated by the Virginia Department of Health, which will allow the facilities to continue operation as long as they do not threaten public health. The Health Department inspects the facilities quarterly and monitoring wells located around each of the septage lagoons are sampled annually for groundwater quality.

As of 1997, water samples do not indicate any impact on groundwater quality. The *Ground Water Management Plan* recommends that groundwater flow direction be modelled to ensure that monitoring wells are capturing recharge from the lagoons. The three facilities are located in fairly remote wooded areas, where there are few surrounding residents to be disturbed by odors associated with the lagoons. The Boggs lagoon is located northeast of the town of Wachapreague, in the Finney and Folly Creeks watershed. The closest stream to that site is an unnamed stream that drains to the headwaters of Nickawampus Creek. The southern Bundick lagoon is located just east of Coal Kiln, in the Machipongo River watershed. The closest stream to that site is an unnamed stream that drains to the Machipongo River. The northern Bundick lagoon is located near Atlantic, in the Chincoteague Bay watershed. The closest stream to this lagoon is an unnamed stream that drains to Wallops Mill Pond, which drains to Mosquito Creek. According to the Groundwater Management Plan, the northern Bundick lagoon lies within the groundwater recharge spine area, posing a serious threat to groundwater quality as deep as the lower confined aquifer. Use of the lagoons varies seasonally. The daily amount of septage received at Bundick's northern lagoon increases three to four fold during the summer months.

Both Accomack and Northampton County require that septic systems in Chesapeake Bay Resource Management Areas be pumped out once every five years. This requirement is expected to significantly increase the amount of effluent placed in the lagoons. If the existing facilities exceed their capacity, the local companies will be faced with the challenge of finding other means of disposal. Concerns about groundwater protection, odor, structural stability, and capacity for increased use; and the fact that septage waste from both Accomack and Northampton County is being disposed of in facilities that do not meet current standards, suggest that the county should pursue other options for septage disposal. The current state on-site sewage handling and disposal regulations require that septage be taken to approved facilities. Approved facilities include municipal sewage treatment plants or state-approved (lined) lagoons. As long as the existing facilities are allowed to remain in operation, there is little incentive for the haulers on the Eastern Shore to build lined lagoons. The only readily available alternative to disposal in lagoons would be use of the Shore's two municipal sewage treatment facilities, located in the towns of Onancock (Accomack County) and Cape Charles (Northampton County). The Onancock plant could be modified to handle septage. Funding assistance is available from the state for these kind of improvements and the town could recoup costs through fees charged to haulers for disposal. An alternative to expansion of the Onancock facility would be the development of a separate treatment system that could serve as a regional sewage treatment plant and septage disposal facility. Accomack County could require that septage be disposed of at a sewage treatment facility.

**Toxic Waste Disposal:** Industrial, agricultural and household chemicals are a special waste disposal problem. If disposed of improperly, they can cause health and environmental problems. The county should work with the Virginia Department of Agriculture and Consumer Affairs to develop a safe system for the disposal of pesticides and pesticide containers. The county could also hold annual household chemical clean-up days during which residents could bring paints, oil, yard and garden and household chemicals to collection centers for safe disposal.

## **Transportation**

**The U.S. Route 13 Corridor:** Proper management of the Route 13 corridor is vital to the future of Accomack County. Route 13 is a gateway to Accomack County. The highway is part of a

major east coast north-south transportation route, carrying people and goods to areas beyond Accomack County, bringing travelers who spend money at local gas stations, restaurants and hotels. Route 13 is also a local transportation link, connecting residents to stores, services, homes, and jobs. Measures must be taken to maintain the road's capacity to safely and efficiently carry through traffic while providing for the safety of local traffic entering and exiting the highway. It is important that Route 13's capacity to handle through traffic be maintained in order to avoid future construction of bypasses or a limited access highway, which would further dissect the county's countryside and isolate businesses on existing sections of the highway.

**The Route 13 Corridor Plan:** The U. S. Route 13 Corridor Plan was completed in 1999, and in 2002 VDOT completed the U.S. Route 13 / Wallops Island Access Management Plan, The results of these plans are discussed in Chapter 3.

**Setbacks:** Minimum setbacks for all uses need to be expanded along Route 13. Greater setbacks promote safety by improving sight lines, reducing curb cuts, by allowing room for shared entrances, reducing traffic noise, and insuring the availability of vacant land for future access roads in the more congested portions of the corridor. Accomack County's zoning ordinance currently requires a minimum setback of 50 feet in agricultural, residential, and industrial zones and 20 feet in commercial zones. A minimum setback of 200 feet from Route 13 would provide enough space for future access roads with a standard 50 foot right-of-way.

**Clustering:** The current high speed sections of Route 13 can be preserved if new commercial uses are grouped in existing commercial clusters. Examples of existing clusters along Route 13 are T's Corner, Nelsonia, Four Corners, Melfa, Painter, and Belle Haven. These areas already have traffic lights and reduced speed limits to manage local traffic.

**Site Plan Review:** Site plan review, as provided for in the zoning ordinance, should give attention to alternatives that minimize curb cuts, encourage joint entrances, and direct traffic to alternative entrances on smaller collector roads when possible. Conditional use permits are required for certain large development projects in Accomack County (over 5 acres in business districts and over 2 acres in agricultural districts), and can be used to require traffic management measures.

**Sign Ordinance:** The county's sign regulations should be reviewed to determine if there is a need to improve management of sign location, size and appearance. Any regulations pertaining to signs should seek a balance between marketing needs of local businesses and enhancing the appearance of Route 13. Off premise signs on Route 13 are regulated by the Virginia Department of Transportation. County regulation of signs should be consistent with VDOT's standards and requirements.

**Public Transportation:** The Accomack-Northampton Transportation District Commission is currently conducting a pilot public transportation program. This is a regional public transit system known as Shore Transit and Rideshare (STAR) that connects Eastern Shore towns and provides north-south transit on the Shore. The pilot program is grant funded. If the pilot program proves that there is a need for public transportation and a means of efficiently providing the service can be established, sources of continuing funding for the system should be sought. According to the 2000 U.S. Census, there are approximately 1,447 (9.5%) households in Accomack County with no vehicle present. A public transportation system will provide increased mobility for these residents.

**Heritage Trail:** Northampton County acquired grant funding for the Northampton County Heritage Trail in 1994. The funding came from the Department of Transportation's Intermodal Surface Transportation Enhancement (ISTEA) program. Accomack County made application in 1995 for grant funding to establish a heritage trail, but the project was not funded. The county should seek the cooperation of the Eastern Shore Historical Society and the Accomack-Northampton Planning District Commission to further the concept of a regional, Eastern Shore, heritage trail and identify funding sources. The Accomack County Heritage Trail would be a self-guided tour of Accomack County's cultural resources. The concept of the trail is to recognize and celebrate Accomack County's unique heritage while encouraging travelers to get off of Route 13 and visit some of the county's towns, restaurants and shops. Signage and a trail guide would direct visitors to sites of historic and cultural interest in the county. The trail would be designed for motorized and non-motorized travel.

**Non-Motorized Transportation:** Walking, jogging, bicycling, and horseback riding are all popular activities with residents and visitors. The nature of much of the county's road system, however, sometimes makes these activities dangerous. Most roads in Accomack County are characterized by a crowned surface, minimal width and deep ditches on either side. Few of the roads in the county have paved shoulders. The establishment of a system of trails providing safe areas for walking, jogging, bicycling, and horseback riding would improve recreational opportunities.

## **Cultural Resources**

**Historic Preservation:** It is important that historic preservation planning be integrated with the community's broader planning efforts. The Virginia Department of Historic Resources encourages localities to engage in historic preservation planning and to take a comprehensive approach that integrates planning into broader development plans including, land use and regulation, capital improvements, transportation, economic development, housing, open space, and recreation. The Department suggests a five step planning process that includes: identification of local historic properties; evaluation of current trends and influences on historic properties; community consensus on goals and priorities; identification of appropriate tools, strategies and action needed to achieve those community goals; and an action plan for implementation.

**Current Planning Efforts:** Currently, the county has made no effort to identify or protect historic resources. Application was made in 1995 to the Department of Historic Resources for grant funds to conduct a survey of historic architecture and to the Department of Transportation for grant funds to develop the Accomack County portion of the Heritage Trail. The Department of Transportation grant was not funded and the Department of Historic Resources grant was dependent on that grant for match funds, so no action was taken that year.

**Interpretive Opportunities:** In addition to recording and preserving the county's history, it is important that resources and information be accessible to citizens and visitors. Giving residents and visitors the opportunity to learn about the area's history and providing access to significant resources is important to creating and maintaining a strong identity for Accomack County. The county currently has several museums that do a good job of interpreting the area's natural resources; several that deal with specific aspects of history, such as transportation; and several

building museums such as Kerr Place, Locustville Academy, and the Debtors Prison. However, there is no interpretive center or readily available materials that comprehensively teach the history of Eastern Shore culture. A museum or series of museums that told the visitor about the area's unique culture, including history of agricultural production, the barrier islands, the seafood industry, nautical traditions, and architectural styles would be beneficial to the county. Both the Countryside Stewardship Exchange and the Regional Economic Development Council suggested the development of such facilities.

**Level of Concern:** In preparing the 1997 Comprehensive Plan, the citizen's advisory committee on development recommended that a historic resources survey be conducted, and 90% of newspaper survey respondents said that it was either important (35%) or very important (55%) to protect historic buildings. The Eastern Shore Historical Society has expressed interest in development of an architectural survey and the Heritage Trail and the county's application for funding of the Heritage Trail received letters of support from the towns of Accomac, Chincoteague, Onancock, Parksley and Wachapreague, the Accomack County Taxpayers Association, Citizens for a Better Eastern Shore, and the Nature Conservancy.

## **Recreation**

**Recreational Facilities:** The 2002 Virginia Outdoors Plan evaluates the recreational needs of each planning district in the state. This evaluation is based on the 2000 Virginia Outdoors Survey and 1995 Outdoor Recreation Areas and Facilities Inventory. The 1992 survey was a questionnaire mailed to a random selection of addresses in four regions of the state (Chesapeake Region, Urban Corridor, Piedmont Region, and Mountain Region). Responses were weighted according to 1990 census data to correspond with population data such as race, income, and property ownership. The table below lists the facility inventory and needs assessment for Accomack County. Activity clusters were developed for some activities, such water based recreation, which share the same resources. The Plan was updated in 2002, but data and analysis for Accomack and Northampton counties were combined. Therefore information from both plans is shown below.

**Accomack County**

<b>Activity</b>	<b>Activity Days</b>	<b>Demand</b>	<b>Units</b>	<b>Total Supply</b>	<b>Private Supply</b>	<b>Needs</b>
Baseball	79,153	16	fields	3	0	13
Basketball	265,214	63	goals	7	0	56
Bicycling	436,883	31	miles	NI		
Lake, River, Bay Use (combined)	957,750	14,684	water acres	428,684		-414,000
-Power boating	457,442	11,026	water acres	S		
-Sailing	46,104	399	water acres	S		
-Lake Fishing	37,521	211	water acres	S		
-Salt Water Fishing	372,533	2,095	water acres	S		
-Jet Ski / Personal Watercraft	27,447	430	water acres	S		
-Water Skiing/ Towed on Water	16,704	523	water acres	S		
Camping (*)	70,518	416	sites	5,305		-4,889
-Tent Camping	12,593	74	sites	1,699		-1,625
-Developed Camping	57,926	342	sites	3,606		-3,264
Fitness Trail Use	15,419	1	mile trails	1	0	0
Fields (combined)	456,671	96	fields	7	0	89
-Football	357,730	75	fields	NS		
-Soccer	98,941	21	fields	NS		
Stream Use (combined)	119,500	53	stream miles	0		53
-Stream Fishing	52,169	37	stream miles	S		
-Human-powered boating	57,052	15	stream miles	S		
-Rafting	4,934	1	stream miles	S		
-Tubing	5,345	1	stream miles	S		
Golfing	92,002	3	courses	3	4	0
Hiking/Backpacking	45,744	23	trail miles	26	2	-3
Horseback Riding	7,401	3	miles	4	0	-1
In-Line Skating	79,667	6	miles	NI		
Jogging/Running	678,454	54	mile trails	NI		
Nature Study/Programs	28,783	4	sites	3		1
Picnicking Away from Home	84,498	219	tables	1,065	750	-846
Skateboarding	21,587	7	sites	NI		
Snow Skiing or Snowboarding	10,794	0	ski lifts	0	0	0
Softball	186,575	33	fields	12	1	21
Sunbathing/ Relaxing on Beach	307,617	22	beach areas	574	49	-552
-Swimming Outdoor Area	146,793	15	beach areas	574		-559
-Swimming Outdoor Pools	132,093	6	pools	10	7	-4
-Swimming Indoor Pools	35,619	0	pools	0	0	0
Tennis	52,940	33	courts	16	3	17
Used a Playground	300,781	43	sites	10	2	33
Visiting Gardens	34,539	4	sites	NI		
Visiting Historic Sites	92,259	8	sites	NI		
Visiting Natural Areas	76,480	13	sites	NI		
Volleyball	145,199	43	courts	1	0	42
Went Hunting	142,475	23,364	acres	21,150		2,214
Went Shooting Total	84,293	48	fields	NI		
-Target	31,867	18	fields	NI		
-Skeet or Trap	19,120	11	fields	0		
-Other	19,428	11	fields	NI		
Drive for Pleasure	439,658	na	na	NI		
Motorcycle/ATV (combined)	18,812	9	miles	6	0	3
-Driving All-Terrain Vehicle	1,336	1	miles	NS		
-Driving Motorcycle Off-Road	17,475	8	miles	NS		
Driving 4-Wheel Drive Off-Road	39,062	na	na	NI		
Walking for Pleasure	2,060,032	na	na	NI		
Other	59,622	na	na	NI		

The 2000 activity days figure is a conservative estimate of the total number of days spent at each activity. The activity days figure is based on the number of individual persons in each survey household reported as participating, multiplied by the weight factor described above, multiplied by the median number of days spent by each participant within the survey region. Demand for facilities and recreation areas to support each activity was estimated using capacity standards developed by the Department of Conservation and Recreation. Supply estimates were taken from the statewide inventory of recreational areas and facilities that is maintained by the Department of Conservation and Recreation. Need was determined by subtracting the current supply from the current and projected demand for each activity or activity cluster. The figures on need apply only to the local level (i.e. Accomack County) and therefore, does not take into account imported demand such as tourism from outside the state or local area. A local surplus of capacity, such as water or beach resources in Accomack County, is reduced by visitors from outside. Also, the inventory includes private facilities, such as picnic tables and swimming pools located on campgrounds, that are not available for use by the general public. These discrepancies should be considered when planning for recreational facilities. The Outdoor Plan points to a local need for sports fields (football/soccer and baseball), basketball courts, tennis courts, playgrounds, bike and fitness trails, and a golf course. The Plan suggests meeting recreational needs through development of a number of small community parks and one larger county park. The community parks would be 20 to 50 acres in size and serve a 3 to 7 mile area and be located close to community population centers. A County Park would be between 50 and 150 acres in size, serve a large portion of the population and be located near the center of the county. Potential facilities at these parks include playgrounds, picnic facilities, tennis courts, ball diamonds, horseshoe courts, shuffleboard courts, basketball courts, volleyball courts, football/soccer fields, walking, hiking, biking, and fitness trails, natural areas, fishing lake access, beach and swimming access, swimming pool, parking area, and a recreation center. The county should consider creating additional parks and/or expanding existing parks to meet the needs of the citizenry. Response from a newspaper survey indicated that sixty-seven percent (67%) of respondents said that there is a need for public recreational facilities in Accomack County. After this survey was conducted, and appropriate funds raised, a YMCA was built in the County.

The Accomack County Department of Parks and Recreation is also trying to develop community recreation facilities. An option being considered is the conversion of school buildings and grounds that are no longer in use into recreation centers. Gymnasiums, ball fields, auditoriums, food preparation facilities, and classroom space in former school buildings could be utilized by the Parks and Recreation Department to provide increased recreational opportunities to county residents. As the county replaces older school facilities, their use as recreational facilities should be seriously considered. Kiptopeake State Park, located between Cape Charles and the Chesapeake Bay Bridge Tunnel, was developed in response to earlier studies which identified the need for passive recreational areas (parks, trails, picnic areas, etc.), as well as increased bay and ocean access. The 1996 Outdoors Plan identifies the potential for an additional state park in the area between Occahannock and Onancock Creeks in southern Accomack County. The plan states that, "this site would offer abundant shoreline on the Chesapeake Bay and several large creeks. The excellent marshes and beaches found here could contribute greatly to the Eastern Shore's supply of accessible water-oriented recreational opportunities." The Outdoors Plan encourages the development of recreational opportunities through the private sector. Privately developed campgrounds, golf courses, tennis courts, swimming pools, marinas, and indoor recreation facilities can help meet the demand for facilities. The Plan also points out that, of 38 favored

leisure activities ranked in the 1992 Virginia Outdoors Survey, Virginians ranked visiting historic sites number 5, visiting natural areas number 11, and visiting gardens number 16. The Plan recommends an analysis of these resources by the private sector to determine if any could be made available to the public and suggests that these could be linked to bed and breakfast opportunities, farming, the seafood industry, nursery and garden center operations, historic restorations, and other land-use developments. The concept could be expanded to include farmers markets, pick-your-own operations, and craft and collectibles fairs or markets.

**Beach Access:** Public beach access in Accomack County is limited for people who do not have access to a boat. There are several sandy beaches on the Chesapeake Bay that are used by the public, but are actually in private ownership. In the past, owners have denied access to beaches that have traditionally been used by the public. Mason's Beach, on the Chesapeake Bay, was used by locals for years until the property changed hands and a gate was constructed across the road leading to the beach. Because this beach had been used by the public for so long, most people assumed it would always be available and many were shocked when access was denied. The Department of Environmental Quality's Coastal Zone Management Program has funding available for the acquisition of public access areas. The county should consider trying to use these funds to ensure that the public continues to have access to waterfront and beach areas.

**Boat Ramps:** The county has a large system of public boat ramps that vary greatly in quality and condition. The newer harbors and boat launching facilities have authorities appointed for their maintenance. There is no maintenance plan or management system in place for the majority of the ramps. Some disputes have arisen over ownership of the ramps and adjacent parking areas. The county has prepared an inventory of the boat access system, noting the ownership, condition and level of use of each. The county uses the data to plan for repair and regular maintenance.

**Trails and Greenways:** The Virginia Outdoors Plan recommends the development of a trail and greenways plan that links existing and proposed trails and greenways into a regional network connecting existing and proposed recreational, natural, cultural, water, business/commercial, and other resources. The proposed Heritage Trail should be a component of this system. Appropriate roads for bicycle routes should be determined and assistance from the Virginia Department of Transportation should be sought to develop these routes. A scenic bike route system could connect the county's major attractions including wildlife areas, parks, historic sites and cultural resources.

The following data and analysis is from the 2002 Virginia Outdoors Plan.

#### **Region 22: Accomack-Northampton Planning District**

The Accomack-Northampton Planning District comprises the counties of Accomack and Northampton, and the towns of Accomac, Belle Haven, Bloxom, Cape Charles, Cheriton, Chincoteague, Eastville, Exmore, Hallwood, Keller, Melfa, Nassawadox, Onancock, Onley, Painter, Parksley, Saxis, Tangier and Wachapreague. Less than 1% of Virginia's population resides on the Eastern Shore. The 2000 Census population for the region is 54,208 people. Future planning decisions are being considered that could result in more intense development. There is a need to have comprehensive plans to protect open space and recreation resources, while accommodating development. However, this region is rich in natural resources and potential for recreational opportunities. The Eastern Shore contains a significant percentage of the state's saltwater shores, including most of the ocean frontage,

which remains largely unspoiled. Wide expanses of marshlands, shallow bays and winding channels, all guarded by a chain of barrier islands with unspoiled beaches, are located on the seaward side. The Chesapeake Bay side is characterized by islands, inlets, creeks and marshlands with sandy beaches toward the southern end. The whole region is a vast incubating and feeding ground for bird and sea life, and is of vital importance to fish and wildlife interests far beyond the borders of Virginia. The variety and quantity of resources makes the Eastern Shore of Virginia an important area for the development of ecotourism opportunities. Currently, the Virginia Outdoors Foundation holds 1,726 acres in easements to protect the scenic quality of the region. Due largely to the efforts of nonprofit and private organizations, nearly all of the barrier islands of Virginia have been acquired and are being preserved in their natural state in perpetuity. Some of these islands also offer opportunities for compatible public recreation. All or part of 10 islands have been acquired by The Nature Conservancy, three islands are managed by federal agencies and one island is maintained by the state as a natural area. Two marshland areas on the bay side are managed by the state: one for wildlife management and hunting, the other as a protected natural area. The state also owns extensive wetlands between the mainland and barrier islands on the seaside for wildlife management. Kiptopeke State Park is located on the southern end of the Northampton County, and is being developed to provide recreation opportunities and management of unique habitats. Although there is abundant water and open space in the Eastern Shore Region, access to and use of much of it is very limited. For example, many of the beach areas are either privately owned or difficult to reach, as is the case with the barrier island beaches. There is a need to provide public access to these barrier island beaches; however, such access must be sensitively designed for these fragile resource areas. Recent studies also have identified significant facility needs for close-to-home types of activities. The most pressing needs are for trails for walking, jogging, bicycle and horseback riding; soccer, baseball, and softball fields; and basketball courts. While there appears to be a surplus of camping and picnic facilities, it should be noted that the majority of picnic tables and the only in-ground pool are located at commercial campgrounds, and are not available for use by local residents. Earlier studies, which identified a need for passive recreational areas (parks, trails, picnic areas, etc.), as well as increased bay and ocean access, resulted in the acquisition of Kiptopeke State Park. Located between the community of Cape Charles and the Chesapeake Bay Bridge Tunnel, it is being developed (less than 1%) to highlight the wealth of the Eastern Shore's natural heritage. It provides public opportunities for camping, picnicking, beach swimming, boating access to the bay and a variety of educational programs directed towards the natural and cultural resources of the site. Local priorities on the Eastern Shore should include the development of a number of small community parks and at least two district parks, providing game fields and courts, picnic sites, swimming and trails. Certain immediate recreational needs may be satisfied by further developing existing park facilities. A study is under way to evaluate the possibility of connecting the Eastern Shore by ferry to the Northern Neck of Virginia. Establishment of a ferry service and terminal opens the possibility of co-locating a waterfront recreational facility. In addition, there is a bike plan being developed to improve overall bicycle access and safety throughout the Eastern Shore, including a designated bicycle facility from Maryland/Virginia state line to the Eastern Shore National Wildlife Refuge at the southern end of Northampton County. The following recommendations relative to resources in the region could contribute to regional open space and/or recreational opportunities for meeting current and future needs of area residents.

**Private sector.** The private sector plays a major role in the provision of recreational

opportunities in the Commonwealth. Developed campgrounds, golf courses, tennis courts, swimming pools, marinas and indoor recreation facilities help meet demands identified in the 2000 *Virginia Outdoors Survey*. An example would be the opening of the YMCA at Olney in 1999, which provides its members with a 25-meter indoor swimming pool, gymnasium, exercise equipment and scheduled recreational programs. Another example is the development of two golf courses by private sector companies in Northampton County. Many needs could be met through the efforts of private enterprise, organizations, or through cooperative efforts by the private sector and units of government. Private landowners with adequate land for hunting may want to consider opening their lands on a fee basis. There may be opportunities to establish shooting ranges and related programs. Streams, rivers and the Chesapeake Bay may offer opportunities for private landowners to permit launching and retrieving of boats. They could also provide lands for picnicking, camping and education. A fee could be charged to offset costs. Another alternative might be for landowners to enter into an agreement with a unit of government to provide water access for the public. The landowner would then be covered under the *Landowner Liability Law, Code of Virginia, Chapter 29.1-509* (page 408), which could provide some liability protection. Miles of streams and thousands of farm ponds lie on private lands in the Commonwealth. Much public demand for fishing can be met if the owners of these lands will allow public access for fishing. Once again, the *Landowner Liability Law* can be helpful in lessening liability exposure if public access is formalized through an agreement with a local governing body or state agency. The 2000 *Virginia Outdoors Survey* ranked water related activities in the top 10 preferred by Virginians. Of 39 favored leisure activities, Virginians ranked visiting historic sites 5th, visiting natural areas 11th, and visiting gardens 14th. There should be an analysis of these resources by the private sector to determine if any can be made available to the public. These could be linked to bed and breakfast opportunities, farming, the seafood industry, nursery and garden center operations, historic restorations, and other land-use developments. This concept should be expanded to farmers, markets, pick-your-own operations, craft and collectable fairs and waterman activities. This region has a wealth of existing open space and recreation opportunities. Integration of private sector operations would reinforce public programs and facilities and result in economic growth.

**Federal facilities.** *Chincoteague National Wildlife Refuge* is one of the most-loved refuges in the entire country. More than 1.4 million people flock there each year to bird watch, photograph wildlife, walk or hike along a wild beach, utilize the 14-mile accessible trail system and participate in interpretive and educational programs. More than 320 species of birds occur on the refuge, which is also home to several threatened and endangered species. Featuring more than 14,000 acres of beach, maritime forest, and freshwater and saltwater wetlands, Chincoteague Refuge is managed for migratory birds, native plants and animals, threatened and endangered species. Chincoteague also provides the public with unprecedented opportunities to enjoy wildlife-dependent recreation opportunities including hunting and fishing. A new educational and interpretive facility is scheduled to be completed by 2003 featuring exhibits, an auditorium and a classroom. The USFWS should continue to pursue funding sources to complete the facility as planned.

*Eastern Shore of Virginia National Wildlife Refuge* was established in 1984 when the US Fish and Wildlife Service obtained the old Cape Charles Air Force Base. This 752-acre refuge is located at the southern tip of the Delmarva Peninsula and is a hemispherically important stopover area for migrating neotropical bird species. The USFWS, with its

southern tip partners (the Commonwealth, local governments and the private sector) are identifying critical areas for habitat conservation in Northampton County. The refuge has a state-of-the-art visitor center, interpretive trails that include an historic coastal artillery site, wildlife observation areas and a photography blind. There is big game hunting for deer during the Virginia archery and gun seasons. The refuge has an extensive environmental education program and participates in a number of local festivals including the Eastern Shore Birding Festival. It has been identified as an anchor site in the *Birdwatcher's Guide to Delmarva* and is a proposed site for the Virginia Coastal Birding Trail. 1. The USFWS should continue to work closely with the National Park Service and private partners to optimize compatible recreational opportunities at Chincoteague National Wildlife Refuge and Assateague Island National Seashore while protecting sensitive beach habitat. 2. Studies of Assateague Island National Seashore should be completed to determine where appropriate support facilities could be located while preserving the integrity of the bays, dune systems and vegetation. Development of a transit system and improved bicycle facilities to supplement vehicle access to the island's recreational resources should be considered.

**State parks.** Due to the extremely high demand for public access to the waters of the Commonwealth, any waterfront property that becomes available on the major tidal rivers or their tributaries in the region should be evaluated for potential acquisition and development as a regional or state park. Any site acquired and developed on these waters would also help to meet the commitments of the *2000 Chesapeake Bay Agreement*. Projects identified in approved master plans need to be funded. State park master plans must be revisited by DCR staff every five years; any significant changes not identified in the current, approved master plan, or improvements/additions costing in excess of \$500,000, must go through the public participation process. 3. Projects identified in the approved Kiptopeke State Park Master Plan need to be funded. DCR has developed a partnership with birding interests to include the state park as a site in the birding trail. 4. The potential exists for a state park in the area between Occahannock and Onancock Creeks in southern Accomack County. This site would offer abundant shoreline on the Chesapeake Bay and several large creeks. The excellent marshes and beaches found here could contribute greatly to the Eastern Shore's supply of accessible water-oriented recreational opportunities as well as provide an opportunity to site a ferry landing.

**Natural Areas.** The following natural area preserves are located within the district: Parkers Marsh in Accomack County and Cape Charles Coastal Habitat, Savage Neck Dunes, William B. Trower Bayshore, and Wreck Island in Northampton County. The Department of Conservation and Recreation has, as of March 2001, documented 449 occurrences of 104 rare species and natural communities in the Accomack-Northampton Planning District. Five species are globally rare and three are federally threatened or endangered. Ninety conservation sites have been identified in the district; only 32 (36%) have received any level of protection through ownership or management by state, federal and nongovernment organizations. DCR recommends that the 58 unprotected conservation sites be targeted for future protection efforts. The appropriate method of protection will vary with each site but may include placing the site on Virginia's Registry of Natural Areas, developing a voluntary management agreement with the landowner, securing a conservation easement through a local land trust, acquiring the site through a locality or local land trust, dedicating the site as a natural area preserve with the current owner, or acquiring the site as a state natural area preserve. Wreck Island Natural Area Preserve in Northampton County is owned by DCR for

the natural heritage resources occurring there. Provision of appropriate public access to the island should be considered.

**Regional parks.** A regional open space plan that includes recreational and conservation opportunities should be undertaken. 6. Regional parks should be acquired and developed in both Accomack and Northampton counties. Both sites should provide trails, swimming, beach access and facility development for softball and basketball. Accomack County has identified a potential regional park site near Onancock, which is centrally located and has good development potential.

**Public water and beach access.** The Eastern Shore's rich and plentiful water resources are its primary recreational attraction. However, public access to the region's water resources for boating and beach use is very limited and should be increased. The *Chesapeake Bay Public Access Plan* could assist in determining areas of greatest need for additional public access. The current access study in Accomack County will further refine the access opportunities for that locality. In areas where public access can be enhanced, lands should be acquired or use agreements arranged to help meet this demand. Access considerations for the region include the following: 7. The Virginia Department of Game and Inland Fisheries should continue to provide additional access for public hunting, fishing and boating on the Eastern Shore's ocean, bays and marshes. 8. The USFWS should continue to work with partners to implement recommendations contained in the Refuge Comprehensive Conservation Plan that will improve access and enhance opportunities for compatible, wildlife-dependent recreation and environmental education. 9. The Eastern Shore of Virginia National Wildlife Refuge in Northampton County should be considered as a possible access point to those barrier islands suitable for some recreational use. 10. Barrier islands acquired as natural areas could offer additional limited access to water and beaches. 11. Access to the bay has been provided at Guard Shore located in Accomack County in the vicinity of the Saxis Wildlife Management Area, which is owned and managed by the Virginia Department of Game and Inland Fisheries. [The County recommends continued cleanup and improvement to Guard Shore, as well as the Burton Shore land owned by the County.] 12. Access to the Bay should be considered at Mason Beach in the vicinity of Pungoteague Creek in Accomack County.

**Scenic Rivers.** The following rivers should be evaluated to determine their suitability as Virginia Scenic Rivers: 13. Machipongo River 14. Onancock Creek 15. Occohannock Creek.

**Scenic highways and Virginia Byways.** There has been a tremendous interest in thematic trails including Civil War trails, the Wilderness Road Trail, the Birding and Wildlife Trails, the Revolutionary War trails, the African-American Heritage Trail system, and other driving tour routes. The next logical step after the *Scenic Roads in Virginia* map would be to develop a series of regional maps or booklets that describe and help locate the resources and services found in all sections of the state. The following roads have been recommended for consideration as Virginia Byways: 16. Route 180 in Accomack County from Harborton to Wachapreague. 17. Route 605 in Accomack County from Quinby through Wachapreague to Accomac. 18. Business Route 13, Route 178, and Route 179 from Accomac to Onancock, and Route 718 from Onancock to Pungoteague. 19. Route 600 in Accomack County from Route 603 north to Route 182 in Mappsbury. 20. Route 182 from Mappsbury to Quinby. 21. Route 679, the Seaside Road, from just north of Accomac through Atlantic to the Maryland state line. 22. Route 639, Business Route 13, and Route 184 from Oyster to Cape Charles.

**Trails and greenways.** Local and regionally initiated trail and greenway planning is important for identifying and providing communities with these resources. The Department of Conservation and Recreation recommends that each locality develop a trail and greenway plan as part of its comprehensive plan. In this plan, an effort should be made to link existing and proposed trails and greenways into a regional greenways network connecting existing and proposed recreational, natural, cultural, water, business/commercial and other resources the community deems desirable. Both Accomack and Northhampton counties are pursuing designations of Heritage Trails. The plan should be completed and strategies developed for its implementation. The Birding Trail should be designed and implemented for the resources found on the Eastern Shore. Localities, counties and cities should also determine appropriate roads for bicycle routes, and should work with the Virginia Department of Transportation to develop these routes by adopting local comprehensive pedestrian and bikeway plans as a component of their transportation plans. The Virginia Department of Transportation can include funds for bike trail construction projects only if the bikeway plan is included in the locality's approved transportation plan. A Scenic Byway/bike route system should be formed to connect all the major attractions of the Eastern Shore. This system should link wildlife refuges, parks, historic and cultural resources and scenic areas from Cape Charles to Maryland. The following are greenway/trail proposals for this region: 23. The abandoned Penn Central Railroad from Cape Charles to Eastern Shore National Wildlife Refuge should be protected as a greenway to be a wildlife corridor, as well as a possible multi-use trail. 24. The Virginia Coastal Birding and Wildlife Trail planned by the Virginia Department of Game and Inland Fisheries with support from the Virginia Department of Conservation and Recreation should be implemented and marketed to the public. Hostels 25. Hostels should be considered for location in the following areas: Assateague Island, Cape Charles and the central portion of the Eastern Shore.

**Table 2.2**  
**Existing and Projected Needs**  
**Accomack-Northampton (IPD #22)**

ACTIVITY	ACTIVITY/DAYS	Demand	Units	Total	Private Supply	2060 NEEDS	2010 DEMAND	2010 NEEDS
Boatlift	79,153	16	fields	3	0	13	14	11
Boatlift	745,314	63	fields	7	0	55	57	50
Boating	436,883	31	miles	N/A		28		
Lake, River, Bay Use (continued)	967,700	14,684	water acres	418,634	-414,003	13,340	-415,244	
Peter Souter	457,442	11,026	water acres	5		10,016		
Safri	46,186	395	water acres	5		362		
Lake Fishing	37521	211	water acres	5		192		
Sal/Water Fishing	372,633	2,095	water acres	5		1,506		
Jet/Ski Personal Watercraft (PWPC)	27,447	430	water acres	5		391		
Wine/Sailing/Jet-ski on Water	16,704	523	water acres	5		475		
Campsites (%)	705,18	416	sites	5,205	-4,009	378	-4,927	
Tent camping	12,593	74	sites	1,699	-1,625	67	-1,632	
Developed campsites	57,706	342	sites	3,605	-3,264	310	-3,296	
Horse Trail use	15,419	1	mile trails	1	0	0	1	0
Fish (continued)	456,671	96	fields	7	0	45	47	42
Scorrell	357,738	75	fields	85		63		
Sector:								
Stream Use (continued)	11,950	53	stream miles	0	53	48	48	
Stream Flow (%)	51,163	37	stream miles	5		31		
Non-impeded flow (%)	57,052	15	stream miles	5		13		
Fishing	4,934	1	500 can miles	5		1		
Trolling	5,245	1	stream miles	5		1		
Gaming	91,002	3	casinos	3	4	0	3	1
Hiking/Backpacking	45,744	72	trail miles	26	2	-4	21	-5
Horseback Riding	7,92	3	miles	4	0	-1	3	-1
In-Line Skating	79,657	6	trail	N/A		5		
Endurance Running	670,454	54	road craft	N/A		49		

5 - sum of 2000 Virginia Citizen Survey responses gathered from 1,000 households.

\* - 70% of 2000 Virginia Citizen Survey responses gathered from 1,000 households.

\*\* - 2000 Virginia Citizen Survey responses gathered from 1,000 households. In refers to areas with significant contrast in population density and demographics; need results may show a plus or minus sign where some sectors, especially in sparsely populated counties, will be required to adjust their results to local conditions.

**Existing and Projected Needs  
Accomack-Northampton (FD #22) Continued**

ACTIVITY	ACTIVITY DAYS	Demand	Units	Total Supply	Private Supply	2003 NEEDS	2010 DEMAND	2014 NEEDS
Nature Study Programs	28,733	4	5,005	3	1,035	793	846	199
Partying/Hiking from Home	84,418	219	tables					566
Snowshoeing	21,357	7	shoes	N/A			6	
Snow Skating or Snowboarding	10,734	0	ski lift	0	0	0	0	0
Skiing	18,575	33	fields	12	1	21	30	18
Surfing/Beach Relaxation Beach	207,617	72	bath towels	574	49	552	70	554
Swimming/Outdoor Area	146,793	15	towels/blankets	574		529	14	-60
Swimming/Outdoor Pool	132,693	6	pool	10	7	4	5	-5
Trekking/Indoor Pools	25,619	0	workout	0	0	0	0	0
Tents	52,940	33	square	16	3	17	30	14
Used Equipment	309,781	43	hats	10	2	33	39	19
Visiting Gardens	24,519	4	gloves	N/A			3	
Visiting Historic Sites	92,259	3	shirts	N/A			7	
Visiting Natural Areas	76,480	13	shirts	N/A			12	
Waterfall	145,179	41	square	1	0	42	39	28
Whitetail Hunting	142,675	23,264	scrubs	21,150		21,114	21,226	36
Whitetail Shooting Total	84,179	43	fields	N/A			43	
Tyng	31,167	14	fields	N/A			16	
Eastern Trap	19,120	11	fields	0		11	12	10
Other	19,438	11	fields	N/A			10	
Drive Ed Programs	437,638	0	ra	N/A			10	
Poverty/Equality (non-taxed)	18,117	3	ra				10	
Utility All-Terrain Vehicles	1,336	1	ra				1	
Direct Motorcycles Off-Road	17,675	8	ra	N/A			7	
Direct 4-Wheel-Drive Off-Road	35,062	0	ra	N/A			74	
Walking for Pleasure	2,000,032	0	ra	N/A			13	
Other*	59,622	0	ra	N/A			13	

\* = same as concerned NS = non-instructed agency only N/A = not measured (-) = indicates surplus.

The draft 2007 Virginia Outdoors Plan suggests that local priorities on the Eastern Shore should be the development of parks. The Shore should develop a number of “small community parks” and “at least two regional parks.” These parks would provide game fields and courts, as well as picnic sites, swimming, and trails.

The following is a list of recommendations set forward by the Virginia Outdoor Plan for meeting outdoor recreation needs in the region:

- Local, state, and federal agencies should ensure that adequate supplies of recreation and open space are provided to meet demands. These areas must also be sufficiently staffed, funded, and maintained.
- Activity user groups and local parks and recreation departments should continue to educate outdoor recreation enthusiasts to be aware of the impacts they have on others. This will minimize conflicts between users as well as increase economic and resource stability.
- The population should be provided with the appropriate number and venue of opportunities to enjoy and access outdoor environments. This should be ensured by local, state, and federal government.
- Responsible use of public lands should be taught by state and local DCR and local parks and recreation departments. Suggested teachings include *Leave No Trace* and *Tread Lightly!* Skills.
- Leadership and example in maintenance and operation on behalf of conservation and outdoor ethics should be provided by natural resource agencies such as DCR.
- Safe outdoor recreation environments should be promoted by management techniques used by property owners.
- Communities and land managers need to put forth a united front against crime by partnering with local law enforcement. Less crime will encourage more outdoor activity.

#### **Land Conservation**

In Accomack and Northampton Counties, 4,200 acres have been preserved since the beginning of the Eastern Shore Land Trust in 2003. Nearly all of the barrier islands have been acquired and are now being preserved in perpetuity. Land trusts operating on Virginia’s Eastern Shore include Chesapeake Bay Foundation, Virginia Eastern Shore Land Trust, APVA Preservation Virginia, Land Trust of Virginia, The 500-Year Forest Foundation, and Virginia Outdoors Foundation.

Some general recommendations for land conservation include:

- Conservation and preservation of open space should be continually promoted through methods such as land acquisition, conservation easements, stewardship agreements, the development of agricultural and forestall districts, and the outright purchase of land.
- Land conservation and sound land use decision-making must become important considerations in all land-planning efforts as population growth hastens development pressure. Land conservation efforts must be focused and prioritized by localities, state agencies, and private organizations. A method of targeting conservation efforts, using green infrastructure land planning techniques, geographic information systems, local comprehensive plans, and decision support systems such as the Virginia Conservation

- Lands Needs Assessment should be used in order to prioritize and focus these efforts.
- Partnerships between all agencies will be needed in order to meet conservation goals.

Specific recommendations for land conservation on Virginia's Eastern Shore:

- Continue **conservation efforts** with the Nature Conservancy and DCR on the seaside of Virginia's Eastern Shore for migratory bird habitat.

## **Green Infrastructure**

Regional recommendations for implementation of green infrastructure planning include:

- Green infrastructure should be secured by local governments through planning and zoning
- Local governments should adopt and implement the green infrastructure planning model. This will ensure that the development of their community is sustainable, as well as ensure a high quality of life for future generations.
- Local and regional agencies and conservation organizations should receive information and education about green infrastructure planning including guidance on local zoning initiatives that lead to changes in community design and transportation systems.
- Sources of funding for local government green infrastructure initiatives should be identified and obtained.

## **Trails and Greenways**

When developing an infrastructure that promotes public health, trail and greenway planning is important at the local and regional level. Some general recommendations for trails include:

- Local governments should have a trails and greenways component in their comprehensive plan. This should provide a variety of leisure trails and also promote pedestrian and bicycle transportation.
- Trail development, management, and maintenance should be funded by state, regional, and local governments in annual capital and operation budgets. The public's understanding of the connection between trails and public health should be strengthened by state, regional, and local governments. Policies should be established that support pedestrian and bicycle facilities in road construction.
- DCR should partner with the Planning District Commission to a) facilitate communications between trail providers, users, and policy makers, b) encourage the private sector to improve regional and statewide trail opportunities and support and c) focus on regional trail networks to establish a trunkline statewide trail system.
- Trail managers should provide information about their trails at the trailheads, in brochures, and on Web sites so that users can choose sections of trails based on their skill and capability level.
- 

Recommendations on trails and greenways that are specific to the Eastern Shore include:

- The **Central Accomack Bicycle Loop** will connect between the Towns of Onley,

- Accomac, and Onancock, along with connections to Nandua High School and Nandua Middle School
- Develop a trail connection between Kiptopeke State Park and Cape Charles Wildlife Management Area.

**Blueways & Water Access (Boating, Beaches & Swimming, Pier and Bank Fishing, Natural Area, Blueways)**

Despite a wealth of water and open space on the Eastern Shore, access to it is limited. Most of the beach areas for example, are either privately owned or difficult to reach, such as the barrier island beaches. Some beach access recommendations include:

- Cooperative agreements among localities and other agencies, as well as private landowners, are encouraged in order to meet the increasing need for public access to beaches and other water-related recreational activities.
- State land management agencies should identify strategies to make additional waterfront resources available for public use.
- Adequate support facilities and services, such as restrooms, concessions, etc. should be a priority for existing public beaches that may be jeopardized.

**Water Trail**

The Seaside Canoe/Kayak Water Trail is a guide that was developed by the Accomack Northampton Planning District Commission and the Virginia Coastal Management Program, the guide outlines 100 miles of paddling routes in the barrier island system. As a part of the water trail, Chincoteague and Wachapreague installed 6 canoe/kayak floating docks with funding from Virginia Coastal Program Funding. Water trail recommendations include:

- Encourage water trail improvements and linkages with recreational, cultural and natural resource destination resources.
- Navigable rivers should be managed as water trails.
- Regional, local governments and state agencies should work together to market water trails.
- Rest-stops and boat-in-only campgrounds along water trails should be encouraged.
- Areas that have adequate access and recreational seasonal flow levels should become numbered recommendations.
- 

Water access recommendations:

- Old ferry crossings/landing sites and bridges should be considered for opportunities for water access.

Specific water access recommendations for Accomack:

- Localities should look for opportunities to develop more public access for kayaking and canoeing both Bayside and Seaside.

**Historic and Landscape Resources**

General recommendations for historic and landscape resources include:

- The County should make every effort to identify historic and archaeological resources within each jurisdiction that can be used for economic, tourism, recreational and educational benefits.
- Local historic attractions, societies, museums, and other tourism organizations should build partnerships with the Virginia Associations of Museums, Virginia Civil War Trails, the Association for the Preservation of Virginia Antiquities/Preservation, the Virginia Main Street Program and others to enhance local heritage tourism, educational and recreational offerings.
- Local governments and private organizations owning historic properties in the region should be encouraged to manage those properties effectively for long-term protection of the public trust and to maximize public benefit consistent with the nature of the historic property.

General recommendations to support scenic resources:

- The County should conduct a visual resources assessment as part of their green infrastructure inventory and mapping process.
- Should ensure that protection and enhancement of scenic resources, visual character and viewsheds is included in the comprehensive plan.
- Develop corridor management plans for scenic byways, blueways, and greenways to assure preservation of the scenic quality of the corridor.

### **Scenic Highways/Virginia Byways**

These resources are a critical link for communities because driving for pleasure and visiting historic sites are in the top three recreational activities. To keep Accomack County an attractive and welcoming community, there inherent qualities must be preserved. General recommendations include:

- The County should recognize and nominate scenic roads for designation as Virginia Byways.
- The County should partner with other state, local and professional organizations to determine implementation strategies to protect the scenic assets of byway corridors.
- The following roads in Accomack County should be considered for inclusion as a Virginia Byway:
  - State Routes 182, 178, 13, 659, 679

### **Scenic Rivers**

In the Accomack-Northampton PDC, there are currently no designated scenic river segments. River resources may be more successfully protected by implementing the following general recommendations:

- Local government should nominate candidate streams and rivers for study and possible Scenic River designation.

- DCR should assist local government in development of planning tools that will afford special recognition and protection to Virginia's Scenic Rivers.
- The following river segments should be evaluated to determine suitability as a Virginia Scenic River:
  - Onancock Creek (entire tributary), Occohannock Creek (entire tributary), and Machipongo Creek (entire tributary).

### **Watershed Resources**

The Accomack-Northampton Planning District is divided into two watersheds, the Bayside Eastern Shore, and the Seaside Eastern Shore. The Bayside, drains into the Chesapeake Bay while the Seaside drains into the Atlantic Ocean. Regional and local government should protect the management of watersheds by integrating watershed management planning with local land use ordinances and comprehensive plans through DCR's Chesapeake Bay Preservation Act land use management initiative.

### **Environmental and Land Stewardship Education**

General recommendations regarding environmental and land stewardship education include:

- Federal, state, regional and local agencies will provide citizens access to stewardship education and conservation resources.
- They will also promote the value and benefits of outdoor experiences and their relationship to environmentally literate citizenry.

### **Federal Facilities**

In addition to the NPS and USFWS lands, the Eastern Shore also homes NASA's Wallops Station. The flight facility includes six launch pads, three blockouts for launch control and assembly buildings that support the preparation and launching of suborbital and orbital launch systems. The facility offers a well developed educational outreach program for visitors and the community.

### **National Parks**

General recommendations for the National Park Service include continuing collaborative efforts through the Chesapeake Bay Gateways and Water Trails Program on the Bayside of the Eastern Shore to connect people to heritage, outdoor recreation, and educational opportunities.

### **Transportation**

Transportation is integral to outdoor recreation. Recommendations relating to transportation in Accomack County include:

- Greater emphasis should be placed on providing alternatives to the use of private automobiles for daily activities. Transit systems, bicycle and pedestrian accommodations, improved community design, as well as a change in people's attitudes toward transportation alternatives will be needed for the transportation system of the

- future to meet capacity needs and energy constraints.
- Priority should be given to eliminating potential transportation barriers for the public, and improving the linkages of recreation areas across major transportation corridors.
  - Local government should encourage the development of a permanent process for integrating the recommendations of local public health agencies and active living into all phases of land use planning.
  - Implement the Eastern Shore of Virginia Bicycle Plan adopted by Accomack and Northampton Counties in 2004.
  - Town of Chincoteague Bicycle Plan adopted October 6, 1997.

### **Local & Regional Parks & Recreation**

General recommendation for local parks and recreation departments are:

- Localities should appoint a parks and recreation commission to provide citizen leadership with regard to parks and recreation issues and concerns. Commissions have been effective in many localities to enhance park areas and recreation programs.
- Commitments to the maintenance, management, and development of local parks and recreational systems are necessary. Localities should explore alternative methods of funding, such as set-aside ordinances, fees and charges and public/private partnerships. The establishment of a “friends group,” which could possibly evolve into a “park foundation,” should be considered for the local parks and recreation department. The citizens group could be a source of volunteers, as well as a source for community support and other resources.
- Local parks and recreation departments should initiate a structured volunteer program that recruits, trains, and retains volunteers, and recognizes their contributions to parks, programs and the overall quality of life in communities.
- All localities should develop and implement hiking and bicycling plans to connect parks, schools and neighborhoods. Encouraging biking and walking within the community can enhance community health and spirit.
- Consideration by localities of the benefit of a school/park cooperative agreement could enhance the use of school and park facilities. School systems and local parks and recreation departments should cooperate in the design of new or renovated facilities. In order to increase local access, localities should consider cooperative management for the recreational use of private, corporate, state, or federally owned lands.
- All public playgrounds, including school and park playgrounds, should meet or exceed the guidelines established by the United States Consumer Product Safety Commission and published in the USCPSC Handbook for Public Playground Safety.
- Site identification, master planning and development of small community parks to serve residents as well as at least two district parks, providing game fields and courts, picnic sites, swimming, trails, nature study and environmental education.

### **Private Sector**

The following recommendations have been made regarding the private sector of outdoor recreation:

- Encourage public outdoor recreation providers to partner with multiple private sector organizations.
- Recreational use agreements and/or easements should be encouraged for private property owners providing public recreation opportunities and to make more private lands available for recreation.
- Efforts should be made by DCR and local parks and recreation departments to make existing and potential private sector providers of outdoor recreation, especially where applicable to trails and greenways development, knowledgeable about the Virginia Landowner Liability Law.
- Local, state, and federal outdoor recreation providers should support corporate recognition programs and improve corporate recognition for small business willing to incorporate outdoor recreation needs in an environmentally friendly manner.

### **Information Needs**

Any discussion of land use management seems to center around the need for more and better information. As mentioned in various sections of this plan, only imperfect information is available on the topics of groundwater, water quality, causes of water degradation, etc. Lack of information makes it difficult for the governing body to make, and the public to accept, important land use management decisions. As long as the facts of an issue are debatable, it will be difficult to reach agreement on solutions. It is important that the county never stops collecting the best information available pertaining to the issues that will effect our future. Many federal, state and academic institutions are conducting research on the Shore which is relevant to the issues addressed in this plan. The county should actively seek partnerships to share and apply this information. Good information is key to sound decision making, but it is important not to let the search for the perfect data set be immobilizing. There will never be enough information to satisfy everyone. Although it may be tempting to put off making decisions due to lack of information, it can paralyze a locality's ability to act on issues. At times, the governing body will need to take action based on the best available information. The Comprehensive Plan has identified the following needs for further information:

- Scientific research should be conducted to establish safe standards for separation distances between septic systems and the groundwater table.
- Establish a system for the continuous monitoring of land use change by watershed.
- Conduct research to answer questions about the rate, volume, timing and distribution of recharge from the Columbia aquifer to the Yorktown- Eastover aquifer, saltwater movement into the Columbia and Yorktown- Eastover aquifers, suitability of paleochannels for water supply use, impact of pesticides of groundwater, and impact of agricultural nitrogen use on groundwater.
- Research the impact of runoff from land uses on water quality and aquatic life.
- Conduct a comprehensive shoreline situation report, updating erosion data and inventorying shoreline erosion control structures, docks, piers, and marinas.

- Identify most unique and sensitive habitats, i.e. those that are most in need of protection.
- Conduct a survey of Accomack County's historic resources.
- Work towards the further development of Best Management Practices for all land use.

## **Citizen Involvement**

During the preparation of the 1997 Comprehensive Plan, one of the items for which there was general consensus at the public forums was that citizens throughout the county continue to work together cooperatively to reach decisions about land use and natural resource policies and regulations. Most forum participants were pleased with the level of involvement afforded by the forum process and expressed interest in continued participation in the planning process. The question of "what's next?" was often asked. Citizens wanted to know that a system had been established by which they could continue to participate in the decision making process.

The public forums conducted for the plan update in 2006-07 also generated enthusiastic participation. The level of concern and interest in long-range planning seems to have increased since 1997, possibly due to the pressures for growth that the County has experienced in recent years.

**Communication:** Communication is important on all levels; between citizens and the governing body, between industries and interest groups, between industries and the governing body, between interest groups and the governing body, and amongst the general public. Improved communication can lead to improved understanding and cooperation among various stakeholders in the county.

**Opportunities for Involvement:** The Planning Commission's meetings are always open to the public and a public participation section is included during each meeting. Public Hearings are held in advance of the adoption of any new ordinances or ordinance amendments. In addition to these opportunities for public participation, the Planning Commission has held public forums, created citizen advisory committees, and for the 1997 Plan, conducted a newspaper survey. Public participation through the planning process for the Comprehensive Plan revision has been good, but there is always room for improvement. The Planning Commission and the Board of Supervisors should make every effort to allow and encourage citizen involvement in the decision making process. Possible options include additional forums and workshops, placement of information on the internet, the televising of meetings, and announcement of and the provision of background materials on issues up for discussion.

## **Implementation**

Those who participated in the planning process emphasized that the county should regularly update and closely follow its Comprehensive Plan and that the plan should be implemented

through fair and effective zoning practices and well planned public facilities and services. These sentiments were expressed by the public in 1996-97, as well as during 2006-07. Throughout the planning process, concern was expressed that plans would not be followed through and properly implemented. Those concerns are founded on the difficulties experienced with implementing previous local and regional plans, limited funding and staff availability for plan implementation and enforcement of regulations, and failure to get the plans approved by the Board of Supervisors.

**Regulatory Enforcement:** Enforcement of new and existing land use regulations at the local, state and federal level are important to the success of the Comprehensive Plan. Any land use regulation considered for adoption should be evaluated regarding the level of enforcement required. If the governing body is unable to provide the financial resources for effective long-term enforcement of the regulation, the measure should not be adopted. The failure to enforce adopted regulations sends out a message that the need for the regulation is not important enough to provide resources for and causes a great deal of frustration for citizens who believe that protective measures are being implemented. Therefore, caution should be used at the local level to ensure necessary resources for enforcement of locally adopted regulations and agencies at the state and federal level should be pressured to adequately enforce their regulatory programs.

**Inter-Governmental Cooperation:** Virginia's Eastern Shore consists of two counties and 19 incorporated towns. Each of the counties and towns have their own governing body and a certain amount of responsibility for activities within their boundaries. Yet, due to the physical, cultural and economic nature of the Shore, it would be unreasonable to think that the actions of one does not effect the other. Each county and each town derives its identity from being a part of Virginia's Eastern Shore, together making a region of significance. It is therefore important to recognize the individuality of each of the counties and towns, but cooperate on regional issues, making the best use of limited resources and protecting the value of the region as a whole. It can be expected that governing bodies will continue to make differing decisions, based on their individual perceptions of what is best for their locality, yet the counties and towns should cooperate and pool resources to gather data and evaluate alternative solutions so that those decisions are based on the same level of information.

## **Chapter 5**

### **Goals, Objectives, Policies, and Recommended Actions**

## Goals, Objectives, Policies, and Recommended Actions

### Introduction:

Chapter 5 sets forth the County's long term goals, the objectives that should be pursued in striving to reach those goals, and the Policies and Actions that should be carried out in order to achieve those goals and objectives. The many policies and actions are grouped under the most relevant objective, with a set of actions for each policy. At the end of the chapter, all of the actions are consolidated into major categories with key priorities identified.

## GOALS

**Have a strong, viable, rural community proud and supportive of its history, diversity, bountiful resources, traditional industries, and vision for the future.**

**Have safe, clean, convenient, and efficient community services and facilities for transportation, recreational opportunities, government services, and disposal of wastes.**

**Have a balanced, safe, and desirable pattern of land use that protects and conserves agricultural land, forest land, groundwater, surface water, wetlands and other valuable resources, providing an excellent resource base for wildlife habitat, recreation, agriculture, seafood industries, and tourism.**

## OBJECTIVES, POLICIES, AND RECOMMENDED ACTIONS

### Objective 1:

*Achieve safe, efficient development, compatible with Accomack County's traditional land use pattern and resource constraints by directing development towards existing population centers.*

The county should use the zoning and subdivision ordinances to direct development towards the most suitable locations. Information from the Accomack County Soil Survey, Ground Water Management Plan, Flood Insurance Study, and Shoreline Situation Report should be used to identify areas that are unsuitable or hazardous for development. The county should direct development towards existing population centers. Clustering development around designated growth centers allows for more efficient services (solid waste collection and disposal, emergency services, transportation services, water and sewer, etc.) and preserves large, unfragmented areas of land for agriculture, forestry, recreation, and wildlife habitat. Existing land use maps should be used to identify existing pockets of development.

The public benefits of a more compact pattern of residential land use are supported by much research and deliberation by the County, including the following studies, analyses and public planning sessions:

- Eastern Shore of Virginia Ground Water Supply and Management Plan, 1992, Horsley, Witten Hegemann, Inc.

- Hydrology and Analysis of the Groundwater Flow System of the Eastern Shore, Virginia, 1992, U.S. Geological Survey
- Technical Analysis and Justification for Ground Water Ordinances on the Eastern Shore of Virginia, 2001, Malcolm Pirnie
- U.S. Route 13 Corridor Plan, 1999
- Route 13 / Wallops Island Access Management Study, 2002
- Accomack Transportation Planning Workshop, November 30, 2004.
- Accomack County Buildout Analysis, 2005
- Transportation Analysis for the Comprehensive Plan, 2005
- Accomack County Planning Commission and Land Use Planning Stakeholders Group - Joint Work Session on Land Use Planning Issues and Options, October 24, 2005
- Planning Commission Work Session, November 22, 2005
- Comprehensive Plan Workshops, September 25 and 26, 2006
- Future Land Use Map Public Meetings, January 23, 24, 30, and February 8, 2007.

In addition to the above cited studies, the data and analysis contained in this Comprehensive Plan provides further rationale for the County to implement policies and regulations to achieve a more compact pattern of residential land use that will better protect the public health, safety and welfare than does the current trend pattern of scattered development. The County took important steps in that direction by adopting amendments to its Subdivision Ordinance and the Agricultural District of the Zoning Ordinance in 2006.

There are many multiple, mutually-supporting reasons for redirecting the patterns and densities of land use, including the following:

- Protection of the limited capacity of the groundwater supply, including the groundwater recharge spine, the only major source of drinking water for the County's population
- Protection of the limited capacity of the Route 13 highway corridor, the only major roadway providing access to the County from areas beyond its borders
- Maintaining an efficient, compact residential land use pattern in order to limit negative fiscal impacts of providing public services to scattered development
- Protecting the rural character and heritage of the County in order to support the tourist industry
- Protecting agricultural and forest lands to maintain available land resources, for that critical segment of the local economy
- Encouraging farmers to conserve and protect groundwater by using the shallow Columbia aquifer
- Protecting tidal wetlands to minimize shoreline erosion, flooding, and to improve surface water quality
- Protecting non-tidal wetlands to minimize flooding, maximize ground water recharge, and improve surface water and ground water quality

It is clear from the available data and analysis that the County needs to promote a shift in the pattern of future development from a scattered to a more compact pattern, due to the inherent limitations on the capacities of critical resources, including the groundwater supply and the capacity and safety of the Route 13 highway corridor, and the other resources cited above.

Further, circumstances have changed since the last update of the County's Comprehensive Plan. The County is now facing much higher development pressures than were envisioned in 1996, due in part to changes in the national and regional economies, changes in retiree settlement patterns and second-home markets, and changes in telecommunications technology that have created what is called the "distributed workforce" (workers who are able to live long distances from their place of employment due to telecom access). Looking ahead, it is critical that the County ensure that its land development regulations are in conformance with its long term goals, so that it can create the best chance of protecting the long term public health, safety and welfare, in the face of these and other such changes in circumstances.

**Policies:**

- 1-1 Allow new development to occur only in locations that contain soils suitable for development*
- 1-2 Direct development away from critically eroding shorelines, including shoreline setbacks on the Seaside and Bayside that adequately take into account accelerated sea level rise and increased storm surges.*
- 1-3 Encourage new residential development to occur in patterns and densities that minimize the impact on the agricultural, groundwater, surface water and fiscal resources of the County, and require new development to use innovative designs and all available technology to completely mitigate any such impacts.*
- 1-4 Encourage new residential and commercial development to occur in and around existing towns and villages, in accord with the future land use map of this Plan.*

**Recommended Actions:**

- 1-a Revise the Zoning Ordinance to create additional zoning districts to allow various types and densities of development to occur in a coordinated fashion.*

The county's current zoning ordinance has four zoning classifications (agricultural, residential, business, and industrial). The pattern of development should be better managed by creating additional zones which allow for a variety of commercial uses and residential densities, while protecting areas designated as important for agricultural use or environmental protection.

New "Rural Settlement" and "Village Development" districts would provide opportunities for creating new neighborhoods in proximity to existing Towns and settlements. Such districts should provide for a wide range of housing types, sizes and costs. These new districts could also conserve open land through the use of smaller lot sizes, allow community water and wastewater systems, and potentially reduce the number and length of motor vehicle trips. Expanding the area of existing Residential zoning districts, where soils are suitable for on-site septic systems, will provide additional sites for affordable housing in existing residential communities.

The new zoning district for the Village Development areas would be a “planned unit development” (PUD) district, designed to produce coordinated, mixed-use development that fits with the existing, traditional character of the County’s historic settlements. To achieve these features in the PUD district, various elements of “traditional neighborhood development” (TND) would be incorporated, including:

- Located only in designated Village Development areas, in accord with the Future Land Use Map.
- Located only in areas served by central water and sewer systems.
- Carefully designed streetscapes and street patterns, with mixed-uses, narrow, interconnected streets, pedestrian walkways, and civic sites including small parks and institutional uses
- A wide variety of housing types, sizes and costs.
- Compatibility with the County’s existing historic settlements in terms of character and scale.

*1-b Revise the Future Land Use and Zoning Maps to reflect the distribution of soils suitable for septic system use.*

Bojac is the soil type most suitable for agriculture and septic systems in Accomack County. The distribution of this soil is depicted in the Accomack County Soil Survey which was published by the U.S. Department of Agriculture, Soil Conservation Service in 1994. The distribution of residential land use on the future land use map should be revised, using the soil survey as a guide, to provide additional residential areas while conserving productive farmland.

*1-c Amend the future land use map and zoning ordinance to maintain a low density of development outside of designated growth areas, and to focus new development within designated growth areas.*

In order to ensure effective use of areas outside of development clusters for agricultural, forestry, habitat, and recreational use, development outside of designated growth areas should be low density in nature. Low density development can be achieved through large minimum lot sizes and clustering provisions to allow development on smaller lots to allow new housing while conserving farmland, forests, and open space.

In June, 2006, the County amended the existing Agricultural “A” District to increase the minimum lot size (decrease the overall intensity), and provide a clustering option within the district to allow houses to be clustered away from sensitive environmental resources, including productive farmlands. The amendments are also aimed at reducing the impact on groundwater resources by reducing the total amount of groundwater withdrawals compared to the old zoning densities, by allowing wells and drainfields to be dispersed at lower densities, and by allowing for the possibility of community wells, either initially or in the longer term. The encouragement of a clustered pattern of smaller lots at lower overall densities will also help protect groundwater recharge areas and reduce the need for residential irrigation.

In conjunction with limiting development in the agricultural areas, new growth should be

focused within designated growth areas where services can be most effectively provided. These “service areas” are essentially the areas designated for Village Development on the Future Land Use Map of this plan.

- 1-d Amend the future land use map and zoning ordinance to direct high density development away from shorelines, especially shorelines.*

The Virginia Institute of Marine Science has developed a Shoreline Situation Report for each coastal county in the state. In order to prevent property loss due to erosion and reduce the need for shoreline erosion control measures, high density development should be directed away from areas identified in the Shoreline Situation Report as high erosion areas (loss of greater than one foot per year). The future land use map and zoning ordinance should be amended in accordance with this policy.

The County’s 2006 amendments to the Agricultural Zoning District, with a 5-acre density and minimum lot size, also allows residential units to be clustered onto 30,000 square-foot lots while creating larger “remainder” lots that conserve farmland, forests, wetlands, and other environmental resources.

- 1-e Work closely and collaboratively with the incorporated Towns to coordinate land use decisions so that new development is located in accord with the future land use map to achieve the goals of the County as well as the goals of the Towns.*

The County should collaborate with the Towns to prepare detailed comprehensive plan elements for key areas adjacent to the Towns that are suitable for development, in order to achieve mutual planning goals and objectives. Top priorities for these “Area Plans” would include the Rt. 175 Corridor and the Onley/Onancock area.

- 1-f Develop a shoreline management plan to address shoreline erosion problems.*

A shoreline management plan should be developed to evaluate the shoreline erosion problem in Accomack County and evaluate the effectiveness of erosion control measures. The plan should identify areas with erosion problems, determine rates of erosion, consider adjacent land use, and evaluate the most effective means of control. The plan could be used by the Planning Commission and Board of Zoning Appeals for land use decisions and by the Wetlands Board in consideration of erosion control structure permits.

- 1-g Collaborate with local, regional, and state agencies in planning for climate change.*

Planning for climate change can help county decision makers address the problem of sea level rise, and assess potential economic opportunities in responding to changing business and industrial markets. Such efforts should be done in conjunction with other government entities, including Northampton County, A-NPDC, and the Virginia state government.

## **Objective 2:**

*Conserve unique and environmentally sensitive areas for open space, recreation and habitat protection.*

The county has a wide variety of open space areas including forests, creeks, beaches, and marshland. In addition to their natural beauty, these areas are beneficial for wildlife habitat, hunting, fishing, hiking and bicycling. Undeveloped areas provide aesthetic benefits, preserve the rural character of the Shore, and can produce tourism revenue. The county should protect open space through zoning and subdivision regulations. Sensitive areas, which are often expensive and unsafe to develop, should be designated as conservation zones. Through the subdivision ordinance and zoning ordinance, developers can be encouraged to cluster development within a portion of the development tract, leaving the remainder as open space. Lowering the overall permitted densities in the rural zoning districts, and allowing clustering on smaller lots, will also allow such resources to be better protected. Lastly, the County should implement green infrastructure planning.

**Policies:**

- 2-1 *Encourage the preservation of open space.*
- 2-2 *Encourage conservation of barrier island lands, marsh land, forested areas, and creek corridors for recreation and habitat conservation.*
- 2-3 *Identify and protect Accomack County's unique habitats.*
- 2-4 *Encourage the creation of additional wildlife habitat.*
- 2-5 *Implement green infrastructure planning.*

**Recommended Actions:**

- 2-a *Amend the zoning ordinance to provide incentives for clustered development to preserve open space and promote a more efficient pattern of development.*

The practice of clustering involves concentrating the bulk of a site's permissible density on only a portion of the parcel or site. This permits the undeveloped portion of the site to remain in an undeveloped, natural state. Houses may be clustered, for instance, to prevent destruction of important wetlands on the parcel or maximize distance from a creek or floodplain. Clustering is often encouraged by providing density bonuses as an incentive. If developers cluster development on a certain portion of the parcel, for instance, away from an important natural resource, the developer may be given permission to increase the number of dwelling units that may be built. Clustering can lead to a more efficient pattern of development and retain the bulk of land for agricultural and open space uses. Clustering is most effective when combined with a reduction in the overall residential density permitted, especially in areas zoned for agriculture. The recent Zoning Ordinance amendment to a 5-acre density, with clustering on 30,000 square-foot lots, advances both of these strategies.

- 2-b *Develop programs to encourage conservation of barrier islands, marsh land, forested*

*areas, creek corridors, and other environmentally sensitive areas.*

When consistent with habitat conservation goals, alternatives to fee-simple ownership, such as conservation easements or lease-back agreements, should be encouraged to keep property on the tax rolls and in productive use.

- 2-c *The county should work with the U.S. Fish and Wildlife Service and the Virginia Department of Conservation and Recreation's Natural Heritage Program to identify and protect unique habitats.*

Extensive study has been made of Eastern Shore wildlife habitats and additional studies are on-going. The county should review this data and work with representatives to identify habitat areas most in need of conservation. Areas such as marsh and islands that are unsuitable for development but have value for wildlife habitat and recreational use should be zoned as conservation/recreation districts.

### **Objective 3:**

*Implement the Comprehensive Plan through fair and effective zoning practices and well-planned public facilities and services.*

#### **Policies:**

- 3-1 *Use the future land use map and the policies of this Comprehensive Plan to guide decisions regarding land use, rezoning, special exception/special use permits, and the provision of public facilities and services.*

The Board of Supervisors has legislative discretion in approving applications for rezoning, conditional use permits, and special exception/special use permits, as well as decisions regarding the location, extent, and design of public facilities and services. Exercise of this discretion should be based closely on the policies and recommendations of this Plan, in order to create a prosperous, equitable, safe and harmonious future for the citizens of Accomack County.

- 3-2 *Require a "Commission Permit" before approving new or extended public facilities.*

§ 15.2-2232 of the Virginia Code provides for the Planning Commission to determine whether proposed public facilities are in conformance with the Comprehensive Plan. The County Planning Commission should exercise this authority in order to effectively implement the Comprehensive Plan.

- 3-3 *Build upon the process initiated by the 1994 Countryside Stewardship Exchange, 1997 Comprehensive Plan visioning workshops, and the 2006 and 2007 Comprehensive Plan workshops to define values and ensure that policies, plans, projects, and regulations are aligned with the community's goals.*

**Recommended Actions:**

- 3-a Revise the Accomack County Zoning and Subdivision Ordinances to be consistent with the recommendations of this plan.*

The zoning and subdivision ordinances are the primary land use regulations in Accomack County and the most effective tools available for implementation of the Comprehensive Plan. These ordinances should be updated and revised as the county's needs and goals change.

- 3-b Implement and update the Capital Improvements Program consistent with recommendations of the Comprehensive Plan.*

A Capital Improvements Program (CIP) is a five-year plan to guide the construction or acquisition of capital projects. It identifies needed capital projects, estimates their costs, ranks them by priority, lists the year each should be started, and determines the best method of paying for them within the community's fiscal capabilities. State Code requires that the CIP be consistent with the Comprehensive Plan. A CIP helps a locality prioritize projects, anticipate future capital facility needs, avoid poorly planned projects, and spread out the financial impact of expensive projects. Accomack County adopted its first CIP in 2006, and adopted an updated CIP in 2007.

- 3-c Seek public input in the development of local plans and regulations.*

All plans and ordinances should reflect the community's vision for the future. The Board of Supervisors and Planning Commission should continue to seek public participation in the planning process and the development of ordinances in order to ensure that policies adopted are consistent with community goals.

**Objective 4:**

*Recognize and protect the county's rural character, including historic resources and the character of villages and towns.*

The rural quality of Accomack County, embodied by agriculture, forestry and seafood operations, scenic views, low density development, historic homes, towns and villages, and a safe, quiet lifestyle, is highly valued by the community. The vision statement created for the 1997 Comprehensive Plan envisions a future when Accomack County is, "still a quiet, rural community and remains the "vegetable garden of Virginia." Effort should be made to further define the elements that most contribute to the desirable rural character of Accomack County. Once the important contributing elements are identified, policies for their protection can be developed.

**Policies:**

- 4-1 Direct development towards areas that are consistent with Accomack County's historic pattern of development.*

- 4-2 *Support efforts to identify and preserve significant cultural resources.*
- 4-3 *Encourage the use of conservation easements to preserve significant rural and agricultural lands.*
- 4-4 *Enhance opportunities for historical and cultural education.*

**Recommended Actions:**

- 4-a *Develop a definition of Accomack County's Rural Character.*

The County's rural character is a unique blend of farms, forests, crossroad hamlets, rural villages, and commercial enterprises. Preserving this mix of uses in its traditional pattern is a key purpose of this plan, and will be facilitated by a common understanding among citizens of how these components shape the County's rural character.

- 4-b *Develop within the framework of the Accomack County Zoning and Subdivision Ordinances procedures and guidelines which allow for a mix of residential and commercial uses in keeping with the traditional development pattern of our towns and villages.*

Traditionally, residential and certain commercial uses were mixed within towns and villages. This pattern of development is desirable in that it places users and providers of services in close proximity to each other and it furthers the goal of concentrating development in growth areas, preventing sprawl and preserving open space. Adoption of Rural Settlement and Village Development zoning districts would encourage such a traditional and efficient development pattern.

- 4-c *Conduct a survey of historic resources in Accomack County, in cooperation with the Virginia Department of Historic Resources.*

The Virginia Department of Historic Resources has shown considerable interest in conducting a survey of historic resources in Accomack County. Grant funding which requires a 50% cash match is available from the Department of Historic Resources for this survey. The survey would identify and place Accomack County's cultural resources in historical context. This information should then be used to evaluate the needs and priorities for protection of these resources.

- 4-d *Develop incentives to encourage the use of conservation easements to preserve significant rural and agricultural lands.*

Conservation easement programs have the advantages of relatively low per acre acquisition costs and private ownership and management responsibility. Lands under conservation easements continue to pay local property taxes, although they may be at lowered market values. The use of conservation easements in areas designated for agriculture, forestry or conservation could be encouraged by allowing additional density in developments that cluster building lots and place the remainder of the land under a conservation easement.

**4-e Continue the Eastern Shore Heritage Trail into Accomack County.**

This project would be a continuation of the trail which begins in Northampton County. The trail would combine routes for driving, bicycling, walking, and boating to view scenic areas and cultural sites. The trail would serve to promote and protect the rural nature and cultural history of the Shore and would encourage visitors to travel off Route 13, visiting restaurants, shops, motels and inns along the way. Funding for this project should be sought from the Virginia Department of Transportation's Transportation Enhancement Program.

**4-f Develop local heritage interpretive opportunities.**

Museums, visitor centers, information points, maps, and guide books should be developed to promote tourism and educate visitors and residents about the Eastern Shore's unique culture. The County should follow the recommendations of Virginia's Eastern Shore Tourism Commission and the 1994 Countryside Stewardship Exchange in developing interpretive facilities and materials, including a facility in Accomack County.

**4-g Open a dialogue about growth management with incorporated towns and unincorporated villages.**

The entire community – town dwellers and county dwellers alike – must face and embrace the necessity of coordinating land use planning between the County and the incorporated towns if the character of the community is to be preserved and enhanced. Particularly to the extent that they may become future towns or future additions to towns, existing unincorporated rural development areas should also be recognized as potential or even natural locations for additional development. Where suitable soils, road access, and other appropriate conditions and resources exist, planning for the clustering of limited future development alongside existing unincorporated rural settlements would preserve and enhance the existing character of Accomack County.

**Objective 5:***Conserve groundwater quality and quantity.*

Groundwater provides Accomack County's only potable water supply. Protection of groundwater quality and quantity is therefore critical. In 1992, the Ground Water Study Committee produced the *Ground Water Supply Protection and Management Plan for the Eastern Shore of Virginia* (Groundwater Plan). The plan recommends the development of a comprehensive groundwater protection and supply management strategy in an effort to maintain an adequate supply of high quality water for the future needs of the region. The following policy recommendations for groundwater protection are derived from that strategy.

**Policies:****5-1 Encourage the wise use of Accomack County's groundwater resources.**

- 5-2 *Manage potentially polluting land uses so as to minimize contamination threats.*
- 5-3 *Seek additional information on the groundwater aquifers, the recharge process, and contamination threats.*

**Recommended Actions:**

- 5-a *Use the latest research to clarify the location of the groundwater recharge spine boundaries and consider creation-of a groundwater protection overlay district within those boundaries.*

Future research should be conducted to identify the extent of the groundwater recharge area that was identified in the *Ground Water Supply Protection and Management Plan*.

Regulations, such as prohibiting the future siting of major polluting activities (landfills, septic lagoons, etc.) and requiring special permits based on performance standards and emergency management plans for uses such as underground storage tanks and toxic and hazardous materials, should be placed on land use within this zone.

As development occurs in an area, the amount of land covered with impervious surfaces (preventing infiltration) increases and groundwater infiltration decreases. The creation and expansion of impervious surfaces such as buildings and parking lots in the groundwater recharge spine should be limited in order to maximize groundwater recharge and minimize the effects of erosion and non-point source pollution. Impervious surface extents can be managed by regulating allowable density in the recharge area through minimum lot size requirements and establishing limits on the percentage of a development site that can be covered with impervious surfaces. Encourage the use of pervious pavement surfaces in these areas.

- 5-b *Review the potential impact of new development on groundwater in the permit process.*

Groundwater protection should be incorporated into development site plan review. Developers of projects that require conditional use permits should be required to estimate total groundwater usage and identify and mitigate potential negative impacts to groundwater quality and quantity from their development.

New water supply sources that tap the Yorktown-Eastover aquifer should be located in the central portion of the Eastern Shore peninsula. This approach will minimize both lateral intrusion from saltwater and vertical intrusion of saltwater through confining layers. New water supply sources should be screened in the upper and middle Yorktown-Eastover aquifer, avoiding the lower Yorktown-Eastover.

Screening only in the higher layers minimizes many of the problems of due to upconing of high chloride content water. Well fields rather than single wells to produce large volumes of water should be encouraged. A series of wells, each pumping a moderate amount of water, will create less upconing, less well interference, and less lateral intrusion than one or two high volume wells. New and existing water supply users should be encouraged to pump at moderate volumes on an extended basis and to use surface storage (tanks, lined ponds) rather

than pumping hard for short intervals to meet peak demands. The continual pumping of moderate volumes will allow a smaller upcone to develop and to stabilize, eliminating much of the problem of salt and freshwater mixing that occurs with intermittent pumping. A progressively enlarged mixing zone between fresh and saltwater will promote the intrusion of high chloride water into the freshwater zone. The use of water supplies from the unconfined Columbia aquifer should be encouraged in situations where water quality is of less concern. The Columbia receives considerably more recharge than the Yorktown-Eastover aquifer and, while its water quality is sometimes marginal as a potable water supply, the quality is perfectly adequate for a number of industrial, agricultural and even domestic uses. High volume users of water that do not need water of drinking quality standards should be urged to use the Columbia as a source where adequate flows can be achieved.

*5-c Amend the subdivision ordinance to limit the allowable density of remotely located drainfields.*

On-site septic system density is, effectively regulated through the zoning ordinance's minimum lot size requirements. There are no restrictions, however, on the allowable density of systems located on remote sites. Minimum separation distances or minimum lot size requirements for remote drainfields would limit the potential for water quality impacts from overly-dense concentrations of drainfields.

*5-d Amend the subdivision ordinance to require that the location of remotely located drainfields be recorded on the subdivision plat and that proper easements to those areas be provided.*

Remotely located drainfields should be recorded on the subdivision plat to ease future location of the drainfield areas. Easements should be provided for access to remote drainfields locations and these easements should be indicated on the subdivision plat.

*5-e Continue to conduct research on the geology of the aquifers, nature of recharge and contamination threats.*

Answers should be sought to questions about the rate, volume, timing and distribution of recharge from the unconfined Columbia aquifer to the Yorktown-Eastover aquifer, salt water movement into the Columbia and Yorktown-Eastover aquifers, suitability of paleochannels for water supply use, impact of pesticides on groundwater, and impact of agricultural nitrogen use on groundwater. Assistance for this research may be available from the US Geologic Survey, the Virginia Department of Environmental Quality, the Virginia Department of Agriculture and Consumer Services, the Office of Pesticide Management, and Virginia Tech.

*5-f Amend the zoning and subdivision ordinances as necessary to adequately protect groundwater supplies and to balance the supply and demand for residential land.*

*5-g Continually monitor available data for all key natural systems, particularly ground and surface water quality, so that warning signs of significant deterioration and risk to the well-being of the county can be identified as early as possible.*

## **Objective 6:**

*Protect high quality surface waters and restore degraded surface water-to an excellent level of*

purity for aquaculture and shellfish harvesting.

**Policies:**

- 6-1 Encourage and promote the use of Best Management Practices for all land uses.
- 6-2 Manage development so as to minimize impact on surface water quality from nonpoint source pollution.
- 6-3 Seek additional information on water quality within Accomack County's creeks, streams, and bays.

**Recommended Actions:**

- 6-a Encourage the use of Best Management Practices by agricultural and forestry operations to restore and protect surface water quality.

Agricultural operations are a major source of nonpoint source water pollution. The tillage of soil permits erosion which, in turn, takes with it pesticides, herbicides and fertilizers. Intensive, nontraditional methods of cultivation, such as the practice of growing vegetable crops under plastic mulch, make intensive use of chemicals and create impervious surfaces, creating special management problems. The County should work closely with the Virginia Department of Agriculture to protect water quality.

Best Management Practices (BMPs) that can be used to manage these problems include crop rotation, conservation tillage, diversions, sediment basins and other structural practices, and containment of animal wastes. The use of nutrient management plans should also be encouraged. Nutrient management plans should include soil nutrient testing, crop productivity recommendations, animal waste management, and fertilizer use record keeping.

Implementation of Forestry Best Management Practices helps to protect water quality by preventing erosion. Streamside management zones (SMZ) within 50 feet of streams and tidal marshes are mandatory. Within a SMZ 50 percent of the canopy can be harvested provided that the machines used to cut and remove the trees do not disturb the soils and create a potential erosion problem. The County should work closely with the Virginia Department of Forestry to protect water quality.

- 6-b Adopt the water quality Best Management Practices for development on the Seaside, including shoreline vegetative buffers, stormwater management, limits on impervious surface, septic system reserve drainfields, and a septic system pumpout requirement.

The Chesapeake Bay Preservation Act requires water quality Best Management Practices in the Chesapeake Bay Watershed. Similar requirements, including a 100-foot vegetated shoreline setback, should be adopted in the zoning ordinance to protect Seaside water quality for the seafood and aquaculture industries, tourism and recreation, and wildlife habitat.

- 6-c Require the use of better septic system technology, and improve septic systems as technology advances, on waterfront lots to protect surface water quality.

Improved septic system technology, such as pre-treatment, should be used on waterfront lots to protect surface water quality.

- 6-d Continue the County's June 2006 recommendation to the State to utilize great caution in the approval of wastewater discharge permits which clearly have the potential to cause long-term and irremediable water quality impacts to any public waters.*

Because the permitting of wastewater treatment plant effluent discharge automatically results in shellfish bed closures, Accomack County has adopted a policy of no new wastewater discharge to the Seaside to protect the County's valuable commercial and recreational shellfishing industry. All new development in the County with central wastewater treatment systems should be required to use alternative effluent disposal to prevent shellfish closures. The County should work with the State to consider establishment of Shellfish Enhancement Zones.

- 6-e Add marina, dock and pier development standards to the Zoning Ordinance.*

The zoning ordinance should provide some guidelines for density of private docks and piers and the location of commercial marinas. All new marinas should be required to provide pump-out facilities.

- 6-f Cooperate with government and private organizations to establish a water quality monitoring network in Accomack County.*

Several federal, state and private groups monitor surface water quality in Accomack County. These groups and their areas of coverage should be identified to ensure that sufficient water quality data is available county-wide. Where monitoring deficiencies are found, the County should work with agencies to develop additional monitoring programs.

- 6-g Continue to develop plans for the replacement of septic systems with central sewage facilities in more densely developed areas.*

Areas that have the greatest potential for future central sewage facilities should be identified, in accord with the Future Land Use Map. These should be areas with existing or potential development density to economically support a treatment facility. The pattern of distribution for these systems should reflect traditional village development. The extension of service outside designated areas should be avoided to prevent sprawl. Systems should be designed to accommodate septic wastes and septic haulers should be required to dispose in such facilities. Systems should be designed to use land application of treated wastewater.

- 6-h Consider public/private partnerships between the County and private developers to finance new or expanded wastewater treatment systems in accord with Action 6-g. A local government entity such as a service authority should be established to manage such systems.*

- 6-i Adopt and administer the State's model stormwater management regulations.*

As the County continues to develop, managing stormwater run-off becomes even more important, in terms of environmental quality, economic development, and public health and safety. New development and revitalization efforts should incorporate stormwater management techniques that meet these needs, while also allowing a compact, traditional development pattern in the village development areas.

**Objective 7:**

*Establish a “business friendly” environment that promotes economic development that is compatible with the county’s adopted objectives and vision for the future.*

**Policies:**

- 7-1 *Provide incentives to bring new businesses to Accomack County and encourage additional investment by existing businesses.*
- 7-2 *Support the Eastern Shore Chamber of Commerce and Virginia’s Eastern Shore Tourism Commission in their efforts to promote the Eastern Shore of Virginia.*
- 7-3 *Support programs that promote entrepreneurship and assist small and medium size businesses.*
- 7-4 *Support development of the Mid-Atlantic Regional Spaceport and the Wallops Research Park at the NASA Wallops Island facility, and consider NASA Wallops recommendations to address airport and launch range encroachment and safety issues, including deed notices.*
- 7-5 *Minimize the net economic impact of local regulations.*
- 7-6 *Encourage expansion of the “distributed workforce” in Accomack County through Broadband development.*
- 7-7 *Protect the visual and functional quality of the major highway entrances to the County as “gateways” important economic development resources that should reflect and enhance the image of the County as a tourist destination.*
- 7-8 *Protect the designated potential impact areas in the vicinity of the Wallops Island Regional Spaceport facility from intensive development, particularly residential development that may cause undue risk to public safety or impede the development and use of the spaceport as a major economic development resource.*

**Recommended Actions:**

- 7-a *Obtain Foreign-Trade-Zone designation for the Accomack County Airport Industrial Park, the Mid-Atlantic Regional Spaceport, and the Wallops Research Park.*

Foreign Trade Zone designation was recommended by the economic development advisory council. Foreign Trade Zone designation exempts import taxes for goods imported at that site, providing an additional incentive for business recruitment.

- 7-b *Explore local economic development incentives.*

Local incentives would serve to advertise the county’s pro-business attitudes. Local

incentives could be anything from accelerated permit processing and crime prevention programs to tax abatement for rehabilitation of commercial or industrial property.

- 7-c *Support the creation of a marketplace on U.S. Route 13 for the sale and promotion of local arts, crafts, and food products.*

Artisans and small production companies are a growing sector of the county's economy. The marketplace would provide an additional outlet for sale of their products, while also encouraging travelers to stop in Accomack County.

- 7-d *Research, and possibly establish, a revolving fund to construct industrial buildings and establish a "ready-to-build" program for new businesses in the Wallops Research Park and Accomack Airport Industrial Park.*

Available industrial buildings are a prime concern of businesses considering locating in an area. The availability of quality business facilities and approved business locations will make Accomack County more attractive to new industry. A revolving building fund for the construction of industrial and commercial facilities and a ready-to-build program which includes site preparation and permit approval are feasible options for attracting business with infrastructure.

- 7-e *Designate additional areas for industrial development, including the NASA Wallops Island facility and along the Bay Coast Railroad.*

Available industrial locations are needed for businesses serving the NASA Wallops Island facility and other Accomack County industries. The availability of suitable industrial sites with good transportation access will help Accomack County compete for new industry.

- 7-f *Consider the cost/benefit of local regulations on economic development.*

Local regulations can impact existing businesses and desirability of the area for new businesses. Regulations can also increase the desirability of a place for doing business by protecting the assets that attract customers and clients, and that support the production of goods. The county should be careful to balance these competing factors and consider the potential economic cost/benefit of any new regulations.

- 7-g *Identify and rezone suitable sites for industrial uses.*

Companies are more likely to relocate or expand to Accomack County if they can find sites that have appropriate industrial zoning in place. The County can identify and rezone such sites in advance, on its own motion, in general accord with the Future Land Use Map and other policies of this plan.

- 7-h *Protect the Gateway Entrances to the County.*

Through a variety of means, including zoning regulations, special use permit conditions, and public/private partnerships, the County can help to ensure that the visual quality of the key road entrances provide a welcoming image to visitors. Land uses should have low

intensities to reflect the County's essentially rural character, parking areas should be set back from the public right-of-way with substantial protective landscaping, and motor vehicle access points should be designed and coordinated to minimize the amount of "friction" along the major roadways. Major gateways to the County include, but are not limited to, Routes 13 and 679 (Fleming Road) at the Maryland border, and Routes 13, 178 (Belle Haven Road), and the Seaside Road (Route 600) at the Northampton County border.

## **Objective 8:**

*Achieve thriving and growing seafood, agricultural and forestry industries.*

### **Policies:**

- 8-1 *Direct development away from prime agricultural lands as designated by Agricultural and Forestal Districts.*
- 8-2 *Protect, restore and maintain water quality at a level that will meet the needs of seafood industries.*
- 8-3 *Ensure that adequate land area is available on which to conduct viable seafood, agriculture and forestry operations.*
- 8-4 *Strive to strike a balance between the needs of Accomack County's resource based industries, including agriculture, forestry and the seafood industry.*

### **Recommended Actions:**

- 8-a *Revise the future land use map and zoning ordinance to direct residential and commercial development away from land in Agricultural and Forestal Districts.*

The future land use map and zoning ordinance should be amended to direct residential and commercial development away from land in agricultural and forestal districts. The agricultural and forestal districts should be reviewed and updated every four years. The County should also develop "reverse setbacks" for residential and commercial development adjacent to land zoned Agricultural.

- 8-b *Monitor the effect of recent amendments to the Zoning Ordinance to ensure that they minimize obstructions to efficient and economical production of agricultural and forestal products.*

Amendments to the agricultural zoning district in 2006 were aimed at reducing the overall amount of potential residential development in order to mitigate the potential impact on surrounding farm operations and farmland, as well as on the groundwater supply. The effect of these amendments should be monitored to ensure they are effective.

- 8-c *Identify areas with existing aquaculture operations and areas particularly suitable for aquaculture.*

In order to promote aquaculture as an economically important industry in Accomack County, measures need to be taken to protect the resources necessary for viable operations. The county should work with the Waterman's Association and VIMS to identify areas in need of protection.

*8-d Ensure adequate waterfront access for commercial seafood operations.*

In the review of plans for waterfront developments and commercial marinas, consideration should be given to providing public waterfront access. Also, the county could designate areas on the future land use map for commercial waterfront use.

*8-e Maintain use-value assessment within the county.*

Use-Value assessment is a basic tool for agricultural land preservation. Consider implementation of a sliding scale of real estate tax deferral for AFD land owners who are committed to keeping their property in agriculture or forest use for extended periods as an additional incentive for preservation (i.e., greater tax benefit in return for longer period of commitment).

*8-f Revitalize Agricultural and Forestal Districts (AFD) within the County.*

The county has had a very successful AFD program, and the county has begun the process of reviewing and renewing these districts. The AFD program should be continued, promoted, and enhanced.

*8-g Implement an agricultural protection lease agreement program within the county.*

Agricultural protection leases are essentially short-term conservation easements. They may have durations as short as five years, but 10 to 20 years are recommended. Under a county-sponsored leasing program, the provisions of such easements and the compensation to the land owner could be established by the county in consideration of what is appropriate for Accomack.

*8-h Promote educational efforts to develop common understanding of the role of agriculture in the local community and economy.*

- 1) Work with Virginia Cooperative Extension and the Virginia Agricultural Experiment Station to implement programs to educate the non-farm community within the county on agricultural issues.
- 2) Clearly communicate support of agriculture education programs in public schools and youth programs.
- 3) Collaborate with Virginia Cooperative Extension and the Virginia Agricultural Experiment Station to educate county residents on smart growth techniques.

*8-i Promote agriculture as a key economic development component in the county.*

- 1) Institute an Agriculture Industry Council (AIC) to advise the Board of Supervisors on agricultural matters.
- 2) Establish a staff position within the County's Department of Economic Development to advise the AIC and to promote economic development in the county, with a focus on the agricultural industry.
- 3) Conduct a review of the present agricultural zoning ordinance to ensure that appropriate commercial activities are allowed.

**Objective 9:**

*Achieve safe and efficient provision of community services including, recreational facilities and solid waste collection and disposal.*

**Policies:**

- 9-1 *Encourage new development near existing communities and services to provide efficient delivery of public services.*
- 9-2 *Keep Accomack County's roadways litter free.*
- 9-3 *Reduce the amount of recyclable material that enters the landfill.*
- 9-4 *Enhance recreational opportunities for residents of Accomack County.*

**Recommended Actions:**

- 9-a *Continue the program to keep roadsides free from litter.*

The county should initiate and promote twice annual litter cleanups. Anti-litter educational programs should also be conducted in the county schools and at public events.

- 9-b *Continue restructuring the county's solid waste collection system.*

The solid waste collection system should be expanded to ensure that the collection of solid waste is efficient and cost effective. Locations should be designed to improve safety, ease of use, and appearance.

- 9-c *Develop an enhanced toxic waste disposal program.*

Safe methods of disposal of toxic wastes should be made readily available to county residents. The County should continue to work with the Eastern Shore of Virginia Ground Water Committee to hold an annual Household Hazardous Waste Collection for the disposal of pesticides and pesticide containers as well as other hazardous waste. A long-term goal should be year-round hazardous waste disposal at a centrally located solid waste convenience center.

- 9-d *Expand the program for the collection of recyclable materials to reduce the expense of burial of large quantities of waste in the landfills.*

The current system of recyclable collection sites should continue to be expanded upon to provide county-wide coverage. In addition, private and public service business and public service institutions should be strongly encouraged to recycle either through incentives or regulations.

- 9-e Develop a parks and recreation plan and acquire and develop recreational areas and facilities near population centers.*

The county is developing a parks and recreation plan and should consider developing additional recreation facilities throughout the county. Facilities should be provided for monitored youth activities and open community facilities such as parks and tennis courts.

- 9-f Update the coastal public access plan to improve access to the Bay and Ocean, including beaches, parks and forested lands.*

The coastal public access plan should be updated to identify the condition and ownership of public boat ramps, docks and piers. Additional access sites should be acquired in areas where a need is determined. Community piers should be developed to increase recreational fishing opportunities. New commercial marina facilities should be required to provide community access and community facilities.

## **Objective 10 - Transportation Plan:**

*Achieve a safe and efficient transportation system.*

### **Policies:**

*10-1 Maintain and protect U.S. Route 13's capacity as a thoroughfare.*

*10-2 Discourage strip development along transportation corridors.*

*10-3 Support the development of an effective public transportation network.*

*10-4 Maintain a safe and efficient roadway systems through a combination of public and private improvements aimed at meeting defined roadway needs.*

*10-5 Encourage all new streets to be accepted into the VDOT system*

*10-6 Designate Transportation Improvement Areas and Urban Development Areas, to better plan for and fund public road improvements.*

### **Actions:**

*10-a Implement Key Elements of the Route 13 Access Management Plan.*

Accomack County should work with VDOT to implement the key provisions of the Route 13 Access Management Plan to promote the concentration of access and development at major nodes, elimination of safety problems, storm water management facilities within the

rights-of-way to protect water quality, a transit program to connect the villages and major nodes within the corridor, and coordination of tourism attractions with Route 13 signage.

*10-b Revise the Zoning Ordinance to require a minimum 200 foot setback for structures located along Route 13.*

Setbacks should be increased for development along Route 13 for increased safety, improved access, and to allow for future changes in the traffic pattern. The Accomack County Zoning Ordinance currently requires a 100 foot setback for development on Route 13.

*10-c Develop a trails and greenways plan.*

The County should develop a trails and greenway plan that links existing and proposed recreational, natural, cultural, water, business/commercial and other resources. The proposed Heritage Trail should be a component of this system. The Accomack County Bicycle Plan should be included to connect the County's wildlife areas, parks, historic sites, and cultural resources.

*10-d Study the county's sign regulations and develop better standards to improve the county's appearance from the public road system, and the safety of motorists.*

*10-e Plan for and execute a program to enhance community safety and facilitate service delivery by improving unsafe and/or threatened transportation facilities including Route 13 and outlying roads.*

*10-f Carry out a countywide Transportation Needs Analysis to determine the specific needs for improvements within the 20-year policy planning horizon, as well as general needs in the 50-year conceptual planning horizon.*

## **Objective 11 – Affordable Housing Plan:**

*Achieve an adequate supply of affordable housing in the county.*

### **Policies:**

*11-1 Strive to reduce the amount of substandard housing in Accomack County and increase affordable housing options for residents.*

*11-2 Apply Objectives 1-4 for purposes of affordable housing:*

*Encourage new residential and commercial development to occur in and around existing towns and villages, in accord with the future land use map of this Plan.*

### **Actions:**

*11-a Create an updated Housing Plan.*

The county's Housing Plan should be updated to include updated information on housing conditions, an assessment of current housing assistance needs and a plan of action of meeting these needs. The county should cooperate with the Accomack-Northampton Housing and Redevelopment Corporation in development of this plan.

*11-b Continue to support and fund programs that improve substandard housing and increase affordable housing opportunities.*

The county should continue to support and participate in proven housing assistance programs such as the Community Development Block Grant and Rental Assistance programs and explore and cooperate in the development of additional programs that address the county's housing needs.

*11-c Apply action 1-a for purposes of affordable housing:*

Revise the Zoning Ordinance to create additional zoning districts to allow various types and densities of development to occur in a coordinated fashion.

*11-d Apply action 4-a for purposes of affordable housing:*

Develop within the framework of the Accomack County Zoning and Subdivision Ordinances procedures and guidelines which would allow for a mix of residential and commercial uses in keeping with the traditional development pattern of our towns and villages.

*11-e Adopt an Affordable Dwelling Unit ordinance (ADU)*

An Affordable Dwelling Unit ordinance (ADU) is a tool available to localities in accord with § 15.2-2305 of the Virginia Code. Such an ordinance would require that up to 12.5% of the dwellings in developments of 50 or more dwelling units at densities of more than one unit per acre be affordable (as defined) in return for density bonuses up to 20%.

## ACTION PLAN

The Planning Commission recommends the following priorities for implementation actions:

1. Zoning Ordinance Amendments (Actions 1-a, 2-a, 4-b)
2. Groundwater and Surface Water Protection (Actions 5-b, 5-g, 6-b, 6-1, 6-f)
3. Affordable Housing (Actions 11-a, 11-b, 11-c, 11-d, 11-e)
4. Transportation (Actions 10-a, 10-f)
5. Recreation (Actions 4-e, 9-e, 9-f, 10-c)

### Zoning and Regulatory Actions

Action	Responsible Agency	Completion Date	Source & Amount of Funding
<i>I-a Revise the Zoning Ordinance to create additional zoning districts to allow various types and densities of development to occur in</i>			

	<i>a coordinated fashion: Rural Settlement and Village Development Districts, using PUD techniques for the Village Development areas.</i>		
4- b	<i>Develop within the framework of the Accomack County Zoning and Subdivision Ordinances procedures and guidelines which would allow for a mix of residential and commercial uses in keeping with the traditional development pattern of our towns and villages.</i>		
1-c	<i>Amend the future land use map and zoning ordinance to maintain a low density of development outside of designated growth areas, and to focus new development within designated growth areas.</i>		
1-d	<i>Amend the future land use map and zoning ordinance to direct high density development away from shorelines.</i>		
2-a	<i>Amend the zoning ordinance to provide incentives for clustered development to preserve open space and promote a more efficient pattern of development.</i>		
3-a	<i>Revise the Accomack County Zoning and Subdivision Ordinances to be consistent with the recommendations of this plan.</i>		
5-a	<i>Use the latest research to clarify the location of the groundwater recharge spine boundaries and consider creation of a groundwater protection overlay district within those boundaries.</i>		
5-b	<i>Review the potential impact of new development on groundwater in the permit process.</i>		
5-c	<i>Amend the subdivision ordinance to limit the allowable density of remotely located drainfields.</i>		

Zoning and Regulatory Actions (*continued*)

Action	Responsible Agency	Completion Date	Source & Amount of Funding
5-d Amend the subdivision ordinance to require that the location of remotely located drainfields be recorded on the subdivision plat and that proper easements to those areas be provided.			
5-f Amend the zoning and subdivision ordinances as necessary to adequately protect groundwater supplies and to balance the supply and demand for residential land.			
6-b Adopt the water quality Best Management Practices for development on the Seaside, including shoreline vegetative buffers, stormwater management, limits on impervious surface, septic system reserve drainfields, and a septic system pumpout requirement.			
6-e Add marina, dock and pier development standards to the Zoning Ordinance.			
6-i Adopt and administer State's model stormwater management regulations.			
7-g Identify & rezone suitable sites for industrial uses.			
7-h Protect the Gateway Entrances to the County.			
8-a Revise future land use map & zoning ordinance to direct residential & commercial development away from land in Agric. & Forest. Districts.			
8-b Monitor the effect of recent amendments to the Zoning Ordinance to ensure that they minimize obstructions to efficient and economical production of agricultural and forestal products.			
8-d Ensure adequate waterfront access for commercial seafood operations.			
10-a Implement Key Elements of the Route 13 Access Management Plan.			
10-b Revise Zoning Ordinance to require a minimum 200 foot setback for structures located along Route 13.			

<i>11-e Adopt Affordable Dwelling Unit ordinance (ADU)</i>			
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**Planning and Research**

Action	Responsible Agency	Completion Date	Source & Amount of Funding
<i>1-b Revise the Future Land Use and Zoning Maps to reflect the distribution of soils suitable for septic system use.</i>			
<i>1-e Work closely and collaboratively with the incorporated Towns to coordinate land use decisions so that new development is located in accord with the future land use map to achieve the goals of the County as well as the goals of the Towns.</i>			
<i>1-f Develop a shoreline management plan to address shoreline erosion problems.</i>			
<i>2-c The county should work with the U.S. Fish and Wildlife Service and the Virginia Department of Conservation and Recreation's Natural Heritage Program to identify and protect unique habitats.</i>			
<i>3-b Implement and update the Capital Improvements Program consistent with recommendations of the Comprehensive Plan.</i>			
<i>3-c Seek public input in the development of local plans and regulations.</i>			
<i>4- c Conduct a survey of historic resources in Accomack County, in cooperation with the Virginia Department of Historic Resources.</i>			
<i>5-e Continue to conduct research on the hydrogeology of the aquifers, nature of recharge and contamination threats.</i>			
<i>6-a Encourage the use of Best Management Practices by agricultural and forestry operations to restore and protect surface water quality.</i>			
<i>6-d Continue the County's June 2006 recommendation to the State to utilize great caution in the approval of wastewater discharge permits which clearly have the potential to cause long-term and irremediable water quality impacts to any public waters.</i>			
<i>6-g Continue to develop plans for the replacement of septic systems with central sewage facilities in more densely developed areas.</i>			

Planning and Research Actions (*continued*)

Action	Responsible Agency	Completion Date	Source & Amount of Funding
7-e Designate additional areas for industrial development, including the NASA Wallops Island facility and along the Bay Coast Railroad.			
8-c Identify areas with existing aquaculture operations and areas particularly suitable for aquaculture.			
10-c Develop a trails and greenways plan.			
10-d Study the county's sign regulations and develop better standards to improve the county's appearance from the public road system, and the safety of motorists.			
11-a Create an updated Housing Plan.			

**Operational Programs**

Action	Responsible Agency	Completion Date	Source & Amount of Funding
2-b Develop programs to encourage conservation of barrier islands, marsh land, forested areas, and creek corridors.			
4- d Develop incentives to encourage the use of conservation easements to preserve significant rural and agricultural lands.			
4- f Develop local heritage interpretive opportunities.			
6-c Encourage the use of better septic system technology on waterfront lots			
6-f Cooperate with government and private organizations to establish a water quality monitoring network in Accomack County.			
7-a Obtain Foreign-Trade-Zone designation for the Accomack County Airport Industrial Park, the Mid-Atlantic Regional Spaceport, and the Wallops Research Park.			
7-b Explore local economic development incentives.			
7-f Consider the cost/benefit of local regulations on economic development.			
8-e Maintain use-value assessment within the county.			
5-g Continually monitor available data for all key natural systems, particularly ground and surface water quality, so that warning signs of significant deterioration and risk to the well-being of the county			

<i>can be identified as early as possible.</i>			
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*Operational Programs continued*

Action	Responsible Agency	Completion Date	Source & Amount of Funding
8-f Revitalize Agricultural and Forestal Districts (AFD) within the County.			
8-g Implement an agricultural protection lease agreement program within the county.			
8-h Promote educational efforts to develop common understanding of the role of agriculture in the local community and economy.			
8-i Promote agriculture as a key economic development component in the county.			
9-a Continue the program to keep roadsides free from litter. (initiate and promote twice annual litter cleanups, anti-litter educational programs)			
9-b Continue restructuring the county's solid waste collection system.			
9-c Expand the enhanced toxic waste disposal program.			
9-d Develop a program for the collection of recyclable materials to reduce the expense of burial of large quantities of waste in the landfills.			
11-b Continue to support and fund programs that improve substandard housing and increase affordable housing opportunities.			

**Capital Investments and Construction**

Action	Responsible Agency	Completion Date	Source & Amount of Funding
4-e Continue the Eastern Shore Heritage Trail into Accomack County.			
6-h Consider public/private partnerships between the County and private developers to finance new or expanded wastewater treatment systems in accord with Action 6-g. A local government entity such as a service authority should be established to manage such systems.			
7-c Support the creation of a marketplace on U.S. Route 13 for the sale and promotion of local arts, crafts, and food products.			
7-d Research, and possibly establish a revolving fund for the construction of industrial buildings and establish a "ready-to-build" program for new businesses in the Wallops Research Park and Accomack Airport Industrial Park.			
9-e Develop a parks and recreation plan and acquire and develop recreational areas and facilities near population centers.			
9-f Update the public access plan to improve access to the Bay			

<i>and Ocean, including beaches, parks and forested lands.</i>			
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### Actions for Implementing Transportation Plan

Action	Responsible Agency	Completion Date	Funding
<i>10-a Implement Key Elements of the Route 13 Access Management Plan.</i>			
<i>10-b Revise the Zoning Ordinance to require a minimum 200 foot setback for structures located along Route 13.</i>			
<i>10-c Develop a trails and greenways plan.</i>			
<i>10-d Study the county's sign regulations and develop better standards to improve the county's appearance from the public road system, and the safety of motorists.</i>			
<i>10-e Plan for and execute a program to enhance community safety and facilitate service delivery by improving unsafe and/or threatened transportation facilities including Route 13 and outlying roads.</i>			
<i>10-f Carry out a countywide Transportation Needs Analysis to determine the specific needs for improvements within the 20-year policy planning horizon, as well as general needs in the 50-year conceptual planning horizon.</i>			

### Actions for Implementing Affordable Housing Plan

Action	Responsible Agency	Completion Date	Funding
<i>11-a Create an updated Housing Plan.</i>			
<i>11-b Continue to support and fund programs that improve substandard housing and increase affordable housing opportunities.</i>			
<i>11-c Apply action 1-a for purposes of affordable housing:</i>  Revise the Zoning Ordinance to create additional zoning districts to allow various types and densities of development to occur in a coordinated fashion.			
<i>11-d Apply action 4-b for purposes of affordable housing:</i>  Develop within the framework of the Accomack County Zoning and Subdivision Ordinances procedures and guidelines which would allow for a mix of residential and commercial uses in keeping with the traditional development pattern of our towns and villages.			
<i>11-e Adopt an Affordable Dwelling Unit ordinance (ADU)</i>  An Affordable Dwelling Unit ordinance (ADU) is a tool available to localities in accord with § 15.2-2305 of the Virginia Code. Such an			

ordinance would require that up to 12.5% of the dwellings in developments of 50 or more dwelling units at densities of more than one unit per acre be affordable (as defined) in return for density bonuses up to 20%.			
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## **Chapter 6**

### **Future Land Use Plan**

**Introduction:**

This chapter of the Comprehensive Plan outlines the desired land uses for Accomack County. A number of physical factors including roads and transportation, natural resources, proximity to incorporated and unincorporated towns, soil types, proximity to surface water, availability of potable water, adequacy of septic system and/or sewer, and historical development patterns are weighed to create the Future Land Use Plan.

County goals, objectives, and policies along with demographic information, economic factors, resource availability, and other planning documents are also major considerations in the development of the Future Land Use Plan.

In 2008, Accomack County completed a major update revision to its Comprehensive Plan. The 2008 Comprehensive Plan update modified and evolved from the 1997 Accomack County Comprehensive Plan.

The Code of Virginia requires localities to review Comprehensive Plans every five (5) years. The following key factors have occurred since the 2008 Comprehensive Plan update and influence the 2013 review:

- The 2008-2009 national economic downturn
- The release of the 2010 census data
- The visual and anecdotal evidence suggesting that the physical landscape of Accomack County has not changed significantly since 2008

Given these factors, the Planning Commission and Board of Supervisors have determined that the 2013 Comprehensive Plan review will be limited primarily to the Future Land Use (Chapter 6) section of the Plan. Chapter 6 will contain new data and information. Readers of the Comprehensive Plan are advised that the Executive Summary, Chapter 3, and Chapter 4 contain older information and statistics and may be updated in the future as time and resources permit.

Important demographic and population information from the 2010 census, as well as population projections from the Weldon Cooper Center at the University of Virginia and information from other sources indicate significantly different trends than those noted in the 2008 Comprehensive Plan.

**Population and Projections:**

The 2010 census data revealed a population of 33,164 people in Accomack County, which is lower compared to the population of 38,305 people recorded in the 2000 census data. The 2010 Census QuickFacts for Accomack County can be viewed at the following link:  
<http://quickfacts.census.gov/qfd/states/51/51001.html>

In late 2012, the Weldon Cooper Center (WCC) released population projections for the Commonwealth of Virginia and information specific to Accomack County was provided. The following shows population projections released in 2012.

<b>2010 Census</b>	<b>2020 (WCC)</b>	<b>2030 (WCC)</b>	<b>2040 (WCC)</b>
33,164	33,432	33,568	33,661

The following is a comparison between the 2030 population projections in the 2008 Comprehensive Plan and the 2030 populations based on the Weldon Cooper projections that were released in November 2012.

<b>2030 Population Projections (2008 Comprehensive Plan)</b>	<b>2030 Population Projections (Weldon Cooper Center – November 2012)</b>
46,500	33,568

Other noteworthy information from the 2010 census and 2012 Weldon Cooper population projections are as follows:

- A percentage increase of residents age 55 or over and a slightly declining birth rate in the coming decades indicates that Accomack County has an aging population.
- The Hispanic population in Accomack County is increasing.
- On a percentage basis, the White and Black populations in Accomack County are decreasing while other race populations are increasing.

The Weldon Cooper Center population projection data can be viewed at the following link:  
<http://www.coopercenter.org/demographics/virginia-population-projections>

### **Land Demand:**

Based on the 2010 Census and Weldon Cooper Center population projections, no adjustments to the Future Land Use Plan Map are necessary.

### **Major Land Use Planning Issues:**

Several key issues directly affect planning for Accomack County land use. These issues address the relationship between land development and the County's resources. These issues include agricultural and forestry land preservation, groundwater protection, natural resource preservation, physical constraints to development, central water and wastewater treatment, the character of development, and the Route 13 highway corridor – all in the context of continuing population growth.

### Agricultural and Forestal Land Preservation

Agriculture and forestry are important parts of Accomack County's economy and identity. In 1997 the County had approximately 82,560 acres of land in 22 agricultural and forestal districts. In 2007, the acreage was 80,215, nearly a 2.8 percent decrease in ten years. The land in these districts is protected by state "right-to-farm" legislation which prohibits local governments from restricting agricultural uses within the districts. These districts also offer protection from conversion to other non-agricultural and non-forestal uses and interference from surrounding uses.

The pattern of development within the County can directly impact the viability of agricultural operations. Some of the most productive agricultural soils are also the most suitable for installation of septic systems. Therefore, agriculture is often in direct competition with residential development for land with prime soils. Much of the County's farmland also occupies land that would be desirable locations for waterfront home sites. Accomack County currently offers land use-value taxation on agricultural land, which bases taxes on the actual use of the land, rather than the fair-market value. This removes some of the pressure for land owners to develop agricultural land, although farm land continues to be subdivided and converted to residential use. This division of land results in pockets of residential development located in primarily agricultural areas. Fragmentation of farm land can affect a farm's viability, leaving tracts of land too small or segmented to farm efficiently. Conflicts often arise between home owners and farm operators over noise, dust, smell, chemical use, and hours of operation. The 2006 Agricultural Zoning District amendments allow clustering of residential development and provide the opportunity to buffer new residential development from intensive agricultural activity.

### Groundwater Protection

Groundwater is the only drinking water source for Accomack County. In 1976 the Virginia State Water Control Board designated the Eastern Shore as a Ground Water Management Area due to findings of groundwater level declines, well interference and localized groundwater contamination. Groundwater is supplied by the Columbia and the Yorktown-Eastover aquifers. The deeper, confined, Yorktown-Eastover aquifer is the county's drinking water source. This aquifer is recharged by rainwater infiltration. The 1992 Ground Water Supply Protection and Management Plan for the Eastern Shore of Virginia identified the area that recharges the deep aquifer as strip of land that runs along the central portion of the peninsula. The Plan calls for protection of this groundwater recharge spine from contamination threats and decrease in recharge rate due to creation of impervious surfaces. In 1997, the U.S. Environmental Protection Agency (EPA) designated the fresh ground water that supplies all drinking water on the Eastern Shore of Virginia as the Columbia and Yorktown-Eastover Multiaquifer System Sole Source Aquifer. The 1999 Technical Analysis and Justification for Ground Water Ordinances on the Eastern Shore of Virginia documents the need to manage new development to protect our limited supply of ground water.

### Natural Resource Preservation

The County's natural resources base, including forests, fields, marsh, creeks, bays, and barrier islands, has economic, aesthetic, and recreational value, as well as being valuable habitat for a variety of wildlife. High quality surface water is important to the seafood industry and recreational users. The marshes and bays support aquatic life that is important to the development of fisheries. Good soils are essential for productive agriculture. The barrier islands provide important habitat for shorebirds and recreational opportunities for residents and visitors. These resources, in combination, compose a natural system which is a unique asset to the Eastern Shore. Care must be taken to ensure that use of these resources does not degrade their value. Land that is not suitable for development, such as marsh land and the barrier islands, should be maintained in a natural state. Important habitat areas should be identified and the conservation of those areas encouraged. Best Management Practices should be used to lessen the impact of various land uses on natural resources.

### Physical Constraints to Development

Certain conditions of the physical landscape affect the suitability, safety and desirability of parts of the County for development. The main physical constraints to development in Accomack County are soil suitability for septic systems, flood hazard, and shoreline erosion. The distribution of soils types has profound impact on the pattern of development in Accomack County. The Town of Onancock and Tangier Island are the only areas in the county served by public sewage treatment systems. Since less than half of the soil in Accomack County is suitable for septic system use, large sections of the county are virtually undevelopable.

Some areas of Accomack County experience significant amounts of shoreline erosion. Faced with an eroding shoreline that moves closer to their home each year, homeowners often resort to shoreline hardening structures such as bulkheads, riprap, breakwaters, and jetties. These structures are seldom permanent solutions to the problem and can actually increase the problem. The areas of Accomack County with the highest erosion rates are Bayside marshland and the Seaside barrier islands, which are unsuitable for development. The impact in areas with moderate to low erosion rates can be lessened through limited allowable development densities and shoreline setback requirements.

### The Route 13 Corridor

The Route 13 highway corridor is a significant feature of the County's landscape. The highway runs north-south along a ridge of high land in the center of the peninsula, dividing the Shore into "Bayside" and "Seaside" segments. The highway carries traffic through the County, supporting businesses along the highway, and it carries local citizens up and down the Shore to employment, shopping and services, many of which are located within the corridor. This mix of local and through-traffic creates a dangerous situation. Traffic lights added on developed sections of the road to increase safety decrease the efficiency of the road for through-traffic. Route 13 is a major

thoroughfare and part of the National Highway System. If signals increase to the point that highway no longer functions effectively for through traffic, bypass and limited access alternatives may be sought. The Route 13 corridor should be managed to maintain its capacity to handle through-traffic in order to avoid construction of bypasses or a limited access highway which would further bisect the county and isolate existing businesses. Minimum setbacks from Route 13 should be expanded for all land uses. Increased setbacks will promote safety by improving site lines, allow room for shared entrances, reduce traffic noise, and ensure the availability of vacant land if future access roads are needed. In order to maintain the existing high speed sections of Route 13, future development should be limited to existing commercial centers such as T's Corner, Temperanceville, Nelsonia, Fisher's Corner at Route 176, Accomac, Onley, Melfa, Painter, and Belle Haven. These areas already have traffic signals and reduced speed limits to handle local traffic. Site plan review for development along Route 13 should be used to develop plans that minimize curb cuts, make use of joint entrances, and direct traffic to alternative entrances on collector roads when possible.

### **Municipal Wastewater:**

#### Central Accomack County

Accomack County owns and operates a wastewater collection system located in the central part of the County. The system is made up of a County-owned main (force main and gravity) and privately owned laterals. Service is provided to the Airport Industrial Park at the southern end and businesses along and close to Route 13 between Melfa and Four Corners Plaza in Onley. The line turns west just south of Four Corners Plaza and heads to Onancock.

A map of the Central Accomack Utility Service Area is found at the end of this (Municipal and Private Wastewater) section. The map indicates the County's interest in providing sewer and/or water in these areas.

Sewage treatment is provided by the Town of Onancock at its wastewater treatment by contract with the County. The current contract expires in 2019.

The County's collection system has a design capacity of 100,000 gallons per day. The current usage puts the collection system at approximately 25% of capacity at approximately 25,000 gallons per day (GPD).

Even with the planned connection of the new Riverside Hospital facility to the County's collection system, the County has plenty of collection capacity to accept additional customers. The County's treatment contract with the Town currently caps the amount treatment available at 80,000 GPD. With the imminent contract expiration, and anticipating a certain amount of sustained growth, current belief is that the County should have ready access to about 100,000 gallons of treatment capacity per day.

Given the availability of the system and the capacity to serve additional customers, new businesses, existing business which require the Department of Environmental Quality's (DEQ) approval for sewage disposal, and residential customers in close proximity should be encouraged to connect to the sewer system.

In addition to the standard reasons for encouraging connections to the County's system, there are some compelling local reasons to do so, and they are as follows:

- The County's sewage collection system is located within the identified groundwater recharge area and connections to the system are preferable to large flows of treated septic wastewater into the groundwater in this area.
- Areas along Route 13, where the sewage collection system exists, especially in the Onley area, experience high seasonal water tables. Connection to the system is a desirable alternative to conventional septic tank and drain field systems in this area, as conventional septic systems do not operate properly when inundated by ground water. Advanced septic systems are available that are better and less susceptible to these sorts of problems, but municipal wastewater solutions are anticipated to be less burdensome on individual owners/users.
- Land values along Route 13 are among the highest in the County, and septic tank and drain fields utilize land that could be used for other purposes if connected to the sewer system. This is especially important in the area where the County's collection system exists, as significant land is also required to be utilized for storm water management systems.

#### Town of Chincoteague

It is Accomack County's understanding that the Town of Chincoteague is investigating wastewater treatment and a collection system to initially serve the main commercial areas of the Town.

Accomack County supports the Town in its pursuit of a wastewater treatment facility and collection system located on the island. Accomack County has a vested interest in the Town of Chincoteague finding an appropriate solution for discharge of treated effluent from its wastewater treatment facility.

#### Other Parts of Accomack County

NASA owns and operates a wastewater treatment system at the NASA main-base. The system serves federal facilities in the main-base area and at Wallops Island. By agreement with Accomack County, the Wallops Research Park will be served by the NASA system.

At this time, there does not appear to be a need for municipally owned and operated wastewater systems beyond those already identified in this section. In the event that future municipal

wastewater treatment needs arise, it appears that small collection and treatment systems (under 100,000 gallons per day/treatment) may be adequate.

**Private Wastewater Treatment Systems and Public-Private Combined Systems:****Private Wastewater Treatment Systems**

Private Wastewater Treatment Systems requiring DEQ's approval should be sized and designed to service the users/development in a clearly-defined service area. The size and design of the wastewater system should correspond with the size of the existing or proposed development for which service is intended and must be constructed within the boundaries of the development. Private systems owned and operated by developers should be carefully scrutinized for quality of proposed construction, maintenance, and continuing financial viability.

The purpose of this is to assure quality infrastructure and to avoid sudden failures and shocks which may affect large numbers of citizens in the future should private ventures prove financially unstable and construction inadequate.

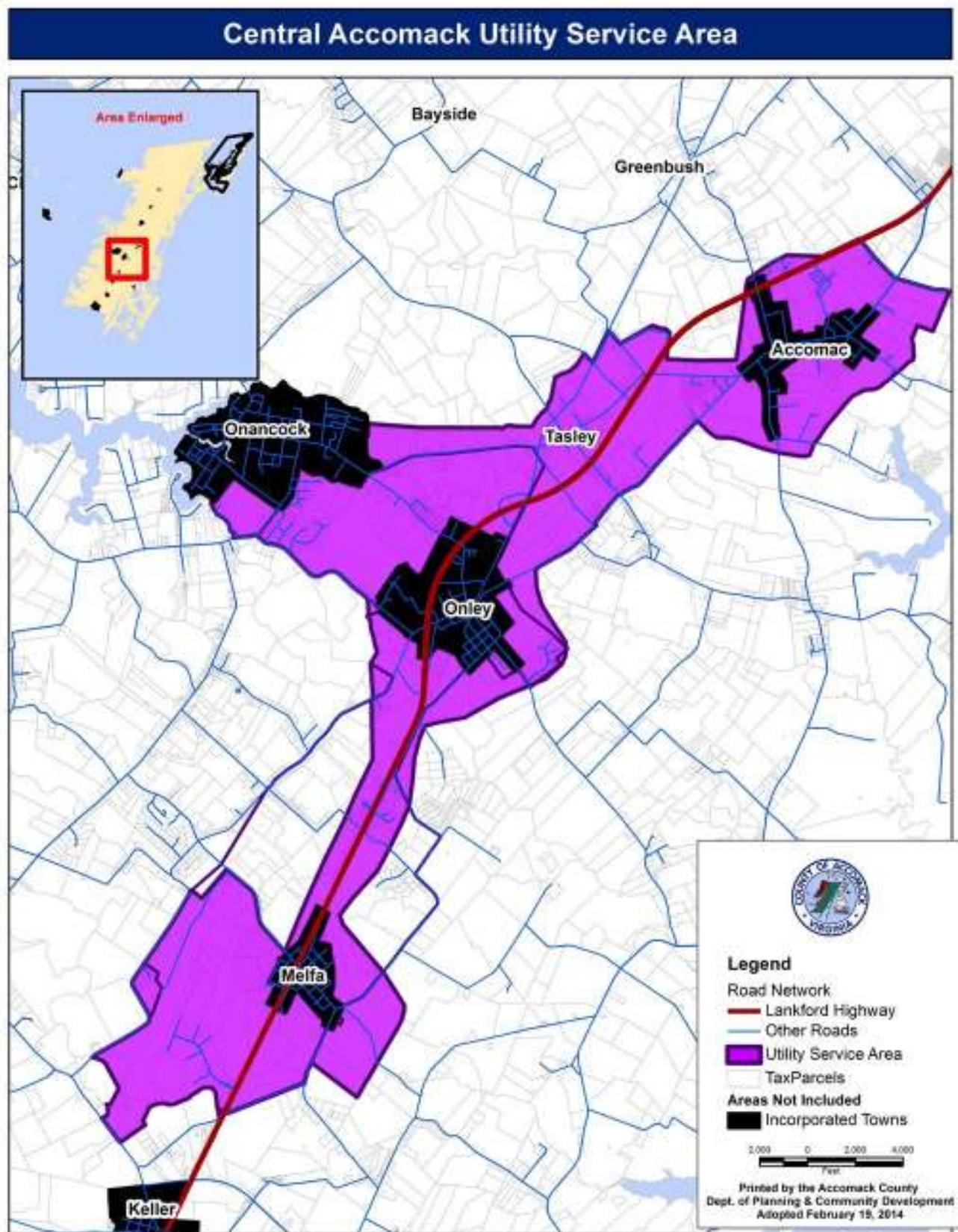
**Authority Owned and/or Public-Private Combined Systems**

Where it is desirable for the County to consider, an Authority Governed and/or Public-Private Combined Wastewater Treatment System may be proposed. Generally, such a system should have the majority of its ownership controlled by a municipal government (County or Town) or operations under superintending control of the same.

**Municipal Water:**

The County owns and operates a public water system at the Airport Industrial Park. Other municipal water systems are operated in Chincoteague, Onancock, Parksley and Tangier.

NASA operates a water system and services federal facilities in the Wallops area. NASA will provide water to the Wallops Research Park by agreement with Accomack County.



**Stormwater Runoff and Management:**

As of the adoption of this Comprehensive Plan update, new stormwater regulations at the State level have been adopted and local stormwater management ordinances and programs mandated.

Agricultural construction will be subject to the new stormwater regulations.

Since stormwater regulations and practices are changing, stormwater management is an emerging issue and monitoring is needed. In addition to the new stormwater regulations, the effects of stormwater runoff after heavy rain events are noteworthy, especially in recently developed parts of the County. Additional study of this matter is warranted.

Where practical, the County encourages the preservation of natural resources and use of applicable best management practices to minimize stormwater runoff and stormwater pollution. In many parts of the County, best management practices need to be designed to accommodate seasonal high water tables, flat terrain, discharge to tidal areas, and replicate or utilize natural drainage patterns.

Additional information on this subject may be found at the following websites:

<http://www.deq.virginia.gov/Programs/Water/StormwaterManagement.aspx>

[#TOPTITLE](http://library.municode.com/HTML/13191/level3/CO_CH106ZO_ARTXVICHBA PROVDI.html)

<http://www.co.accomack.va.us/departments/planning-and-community-development/planning/stormwater-management>

<http://www.co.accomack.va.us/departments/planning-and-community-development/services-and-fees/erosion-and-sedimentation-control>

**Coastal Resource Management:**

The following guidance is offered relative to Coastal Resource Management:

**Issue Statement**

Coastal ecosystems reside at the interface between the land and water, and are naturally very complex. They perform a vast array of functions by way of shoreline stabilization, improved water quality, and habitat for fishes; from which humans derive direct and indirect benefits.

The science behind coastal ecosystem resource management has revealed that traditional resource management practices limit the ability of the coastal ecosystem to perform many of these essential functions. The loss of these services has already been noted throughout coastal communities in Virginia as a result of development in coastal zone areas coupled with common erosion control practices. Beaches and dunes are diminishing due to a reduction in a natural sediment supply. Wetlands are drowning in place as sea level rises and barriers to inland migration have been created by construction of bulkheads and revetments. There is great concern on the part of the Commonwealth that the continued armoring of shorelines and construction within the coastal area will threaten the long-term sustainability of coastal ecosystems under current and projected sea level rise.

In the 1980s, interest arose in the use of planted wetlands to provide natural shoreline erosion control. Today, a full spectrum of living shoreline design options is available to address the various energy settings and erosion problems found. Depending on the site characteristics, they range from marsh plantings to the use of rock sills in combination with beach nourishment.

Research continues to support that these approaches combat shoreline erosion, minimize impacts to the natural coastal ecosystem and reinforce the principle that an integrated approach for managing tidal shorelines enhances the probability that the resources will be sustained. Therefore, adoption of new guidance and shoreline best management practices for coastal communities is now necessary to insure that functions performed by coastal ecosystems will be preserved and the benefits derived by humans from coastal ecosystems will be maintained into the future.

**Policy Statement**

In 2011, the Virginia Assembly passed legislation to amend §28.2-1100 and §28.2-104.1 of the Code of Virginia and added section §15.2-2223.2, to codify a new directive for shoreline management in Tidewater Virginia. In accordance with section §15.2-2223.2, all local governments shall include in the next revision of their comprehensive plan beginning in 2013, guidance prepared by the Virginia Institute of Marine Science (VIMS) regarding coastal resource management and, more specifically, guidance for the appropriate selection of living shoreline management practices. The legislation establishes the policy that living shorelines are the preferred alternative for stabilizing eroding shorelines.

This guidance, known as Comprehensive Coastal Resource Management Plan, is being prepared by VIMS for localities within the Tidewater region of Virginia. It explicitly outlines where and what new shoreline best management practices should be considered where coastal modifications are necessary to reduce shoreline erosion and protect our fragile coastal ecosystems. This guidance will include a full spectrum of appropriate management options which can be used by local governments for site-specific application and consideration of cumulative shoreline impacts. The guidance applies a decision-tree method using a based resource mapping database that will be updated from time to time, and a digital geographic information system model created by VIMS.

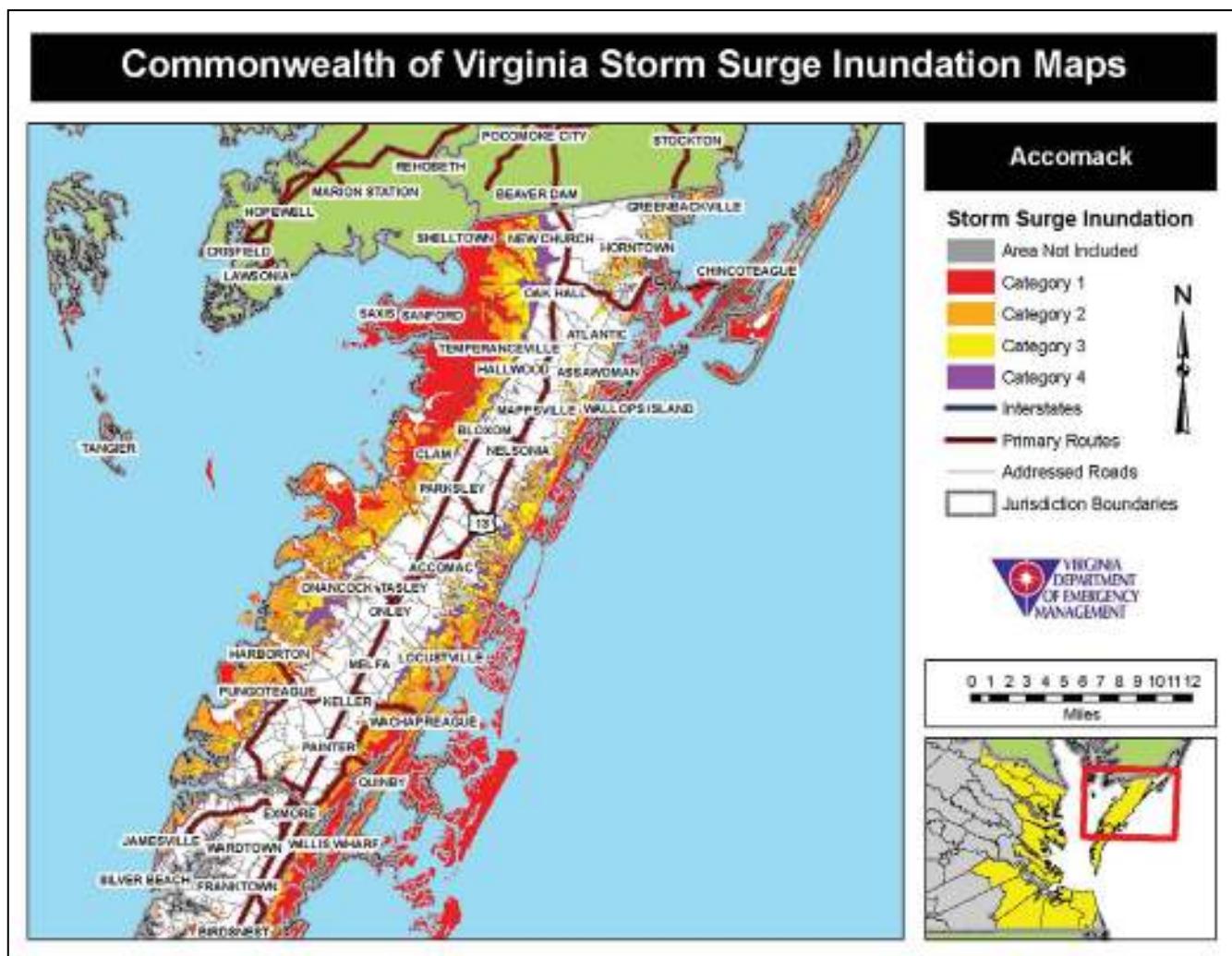
Recommendations:

- Refer to the guidance presented in the locality's Comprehensive Coastal Resource Management Plan (CCRMP) prepared by VIMS to guide regulation and policy decisions regarding shoreline erosion control.
- Utilize VIMS Decision Trees for onsite review and subsequent selection of appropriate erosion control/shoreline best management practices: <http://ccrm.vims.edu/decisiontree/index.html>.
- Utilize VIMS' CCRMP Shoreline Best Management Practices for management recommendation for all tidal shorelines in the jurisdiction.
- Consider a policy where the above Shoreline Best Management Practices become the recommended adaptation strategy for erosion control, and where a departure from these recommendations by an applicant wishing to alter the shoreline must be justified at a hearing of the board(s).
- Encourage staff training on decision making tools developed by the Center for Coastal Resources Management at VIMS.
- Follow the development of the state-wide General Permit being developed by VMRC.
- Ensure that local policies are consistent with the provisions of the permit.
- Evaluate and consider a city-wide permit to expedite shoreline applications that request actions consistent with the VIMS recommendation.
- Seek public outreach opportunities to educate citizens and stakeholders on new shoreline management strategies including Living Shorelines.
- Follow the development of integrated shoreline guidance under development by VMRC.
- Evaluate and consider a locality-wide regulatory structure that encourages a more integrated approach to shoreline management.
- Consider preserving available open spaces adjacent to marsh lands to allow for inland retreat of the marshes under rising sea level.
- Evaluate and consider cost-share opportunities for construction of living shorelines.

**Sustainability:**

Surface water (Atlantic Ocean, Chesapeake Bay, ponds, creeks, branches, guts, ditches, and wetlands) is a significant part of the County's landscape. With the amount of surface water evident, there is local interest in sea level rise/recurrent flooding, hurricane impacts/storm surge predictions, flooding due to Nor'easters, and flooding due to deferred ditch maintenance.

The following map which relates to storm surge is provided for informational purposes and in part, forms the basis for hurricane evacuations:



**Broad Constraints versus Site-Specific Constraints:**

The various important constraints to development in the County, such as poor soils for septic systems, and Agricultural and Forestal Districts (AFDs) can be viewed from two perspectives:

- 1) Broad constraints that apply generally to a large area
- 2) Site-Specific constraints that vary in intensity within the bounds of a specific tract of land or smaller area.

Land use policies should provide guidance for both of these perspectives. Areas with severe and consistent constraints should have generally restrictive policies applied to them (for example discouraging rezonings and infrastructure expansions), whereas areas with variable constraints in which some sites or portions of sites have few constraints while others nearby have severe constraints, could have more permissive policies. Further, some areas have inherent conflicts between opportunities and constraints, such as portions of the Route 13 corridor that fall within the spine groundwater recharge area. In these cases, site-specific policies may be applied that allow for some development while simultaneously ensuring that some land is also protected.

In general, the greater the constraints to development a property has, as shown on the land use analysis maps of this plan, the greater the restrictions the County will impose for on-site development of the property.

**Character of Development (traditional patterns, human scale, pedestrian access, etc.):**

Many of the county's community development and preservation goals can be achieved or enhanced if new development occurs in a compact, traditional pattern, similar to the pattern that exists in the County's existing historic towns and villages. This pattern would feature generally interconnected street networks, mixed uses in the core areas, relatively narrow neighborhood streets, a variety of lot sizes and building sizes, generally deep lots, a variety of front setbacks in residential neighborhoods, and houses typically featuring sitting porches as the most prominent element of the front facade, rather than garage doors. This concept is particularly important and relevant in the expansion areas of existing towns and villages, such as around Onancock and Onley.

**Future Land Use Analysis - Opportunities and Constraints:****McHarg Analysis**

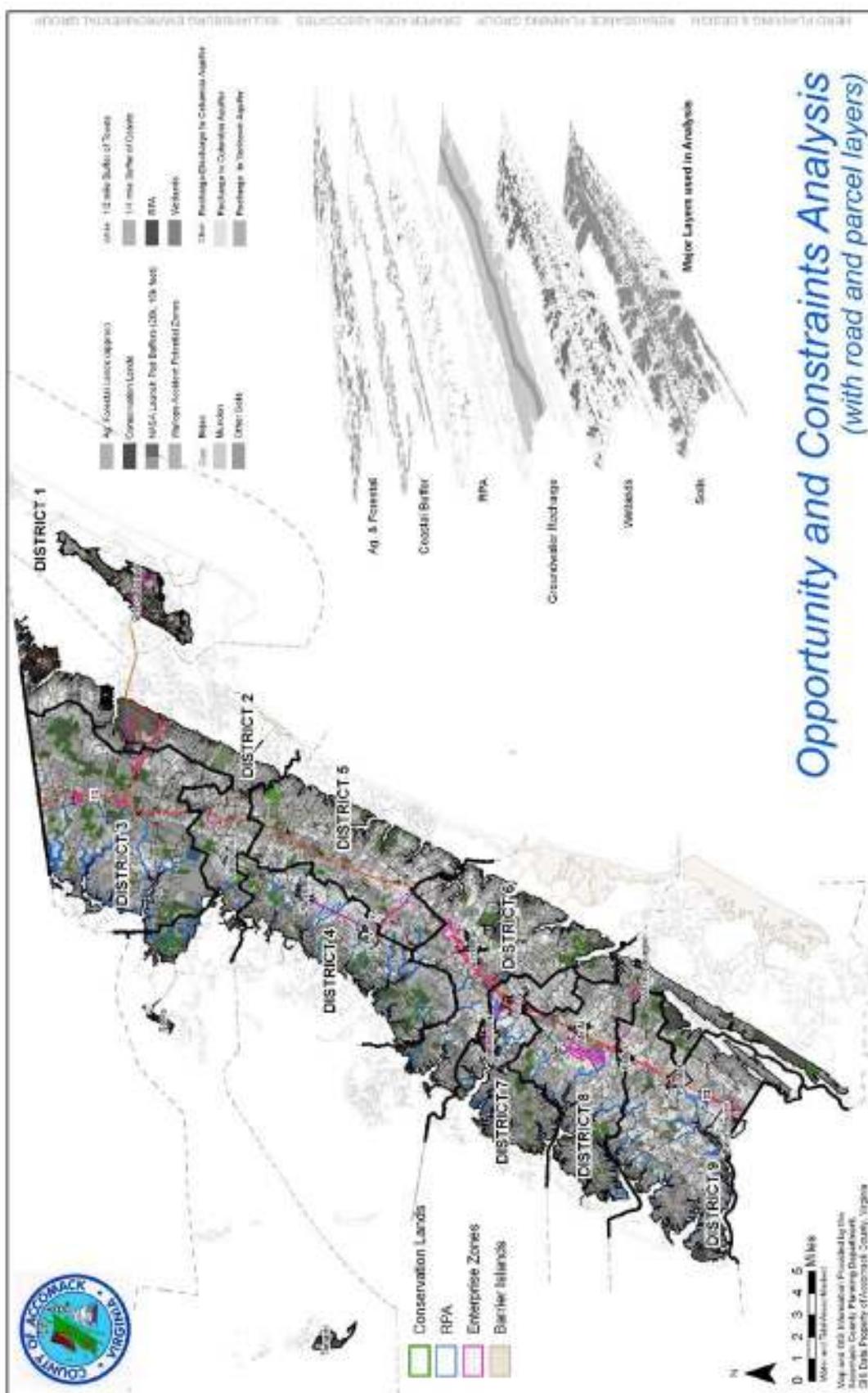
Accomack County is located on a narrow peninsula, with various environmental and public facility resource constraints that have a generally linear overall pattern. This geography lends itself to a "McHarg" analysis of land use opportunities and constraints. This type of analysis is named after its inventor, the planner and landscape architect, Ian McHarg, author of the classic planning book *Design With Nature*.

In this type of analysis, the major kinds of opportunities and constraints for human settlement are mapped. The maps are then overlaid on top of one another. When combined together into a single, multi-layer map, these overlays visually indicate the variations in levels of constraints for development between various areas. The resulting map shows the most suitable areas for future development.

This process was carried out in October, 2006, using the County's Geographic Information System data. The key factors or data layers that were incorporated into the McHarg layers as constraints and opportunities were the following and mapped in gray tones:

- Agricultural and Forestal Districts (AFD)
- Coastal Buffer (1/4 mile setback)
- Conservation lands (lands under easement)
- Chesapeake Bay Resource Protection Areas (RPA)
- Groundwater recharge spine (recharge to Columbia and Yorktown aquifers)
- Wetlands
- Soils (Bojac, Munden, others)
- Proximity to existing towns (within ½ mile radius)
- NASA launch pad buffers (20,000 and 10,000 feet)
- Wallops Airport Accident Potential Zones
- Existing Zoning (mapped as color layer)

In the initial analysis, each of these factors were given essentially equal or proportional weight in terms of importance. During the course of the Planning Commission review, some layers were examined individually, such as Bojac soils and Agricultural and Forestal Districts, in order to consider circumstances in which one factor might overwhelm all other considerations in terms of its importance as an opportunity or constraint to development. The McHarg Analysis is summarized on Map 6-A. \*Please note that the election districts on Map 6-A on the following page reflect the 2001 election districts, not the 2011 election districts.

**Map 6-A**

**Public Input:**

In addition to the GIS data, consideration was given to the input received from citizens at the public workshops in September 2006, regarding land suitability for development and conservation. At these workshops, a total of 15 small workgroups of citizens, representing a wide spectrum of viewpoints and geographic areas, brainstormed their ideas for the future land use pattern in the County, looking 20 to 30 years into the future. The amount of agreement among the groups was striking. The major themes that were broadly shared by the citizens at these meetings were:

- Concentrate development around existing towns and villages
- Provide for large lots (low density development) close to the water/shorelines
- Provide for smaller lots (higher density development) close to services (towns and villages)
- Cluster businesses on Route 13
- Preserve wetlands, groundwater, and agriculture.

The Draft Future Land Use Map was presented at a series of four public meetings in January and February 2007, and revisions were subsequently made based on public discussion and comments. Ideas and issues discussed at these meetings included:

- Affordable Housing
- Economic Development
- NASA
- Subdivisions/Existing Development
- Apply Chesapeake Bay Preservation Act to the Seaside
- Need for better Stormwater Management and Erosion and Sediment Control Ordinances
- Zoning Districts
- Zoning Ordinance Review
- Land Use Value Tax
- Tax Assessment
- Water Quality/Shellfish
- Agriculture/Seafood/Forestry
- Wastewater Treatment
- PUD (Planned Unit Development)
- Population/Carrying Capacity of the County
- Sea Level Rise
- Alternative Energy
- Waterfront Protection
- Public Safety
- Public Access
- Conservation Areas

- Drainage
- Infrastructure: Water & Sewer, Roads, Schools, Trash, Fire & Rescue
- Roads/Route 13
- Enterprise Zone
- Ground Water
- Septage Lagoons
- DEQ Policies
- Mobile Home Parks/Substandard Housing
- Poverty Map

### **Future Land Use Plan Concept:**

The following narrative is a description of the concept for Accomack County's land use plan. The plan is illustrated through the Accomack County Future Land Use Map. Components of the future land use plan are based on:

- 2010 Census and Weldon Cooper population projections as of October 2013,
- Growth and change indicators identified in the inventory section of this plan,
- Studies done by the Planning Commission in recent years,
- Input from citizens at large during the plan update process, described above,
- The "McHarg" analysis described above, and
- The policies set forth in Chapter Five.

It is important to note that many land areas in the County are suitable for more than one use, and thus, "trade-offs" must be weighed and judgments made as to priorities. An example is the conflict between the opportunity for development along the Route 13 corridor due to its good access, and the fact that it is also generally the most important area for groundwater recharge, a constraint to development. Another example are areas bordering the shorelines, which need to be preserved in order to maintain water quality for local water-related businesses, yet are also places where many people wish to live, due to the scenic quality and water access.

Overall guidelines for the future land use recommendations are generally consistent with those of the 1997 Comprehensive Plan, and are as follows:

- Because Accomack County has adopted Agricultural and Forestal Districts which recognize designated land as, "land which requires conservation and protection of food and other agricultural and forestal products and as such is a valuable natural and ecological resource," land in Agricultural and Forestal Districts should be designated as Agricultural on the Future Land Use Map, except for certain areas that may be particularly suitable for other types of uses in the long-term;

- Because most development occurring in Accomack County is dependent on septic systems for waste disposal and because the Health Department has identified Bojac soils as the soil type which will best support septic systems, areas which are not located in Agricultural and Forestal Districts and in which Bojac is the predominant soil type should be among those considered for future development.
- In order to encourage development which is in character with historic and existing development patterns, location and density of development should be in keeping with the pattern of development around villages and towns and should conform to the comprehensive plans of incorporated towns where applicable. Similarly, land along the Route 13 and Route 175 corridors generally offers good opportunities to accommodate future development. However, one of the major conflicts for land use designations is the fact that the Route 13 corridor generally coincides with the groundwater recharge area. Thus, some trade-offs in priorities must be made.
- Because of the importance and sensitivity of water resources to the County's economy, areas bordering the Bayside and Seaside shorelines, areas bordering creeks, and areas of wetlands, are not as suitable for development as most other areas.
- Because of the importance of groundwater to the County's future, the groundwater recharge spine is an area that should also be preserved to the extent feasible.

### **Land Use Categories:**

Land use categories were developed for the 1997 Comprehensive Plan to promote a balanced, safe and orderly pattern of development. These categories reflect traditional land uses as well as the goals, objectives and policies of the 1997 plan, and remain appropriate as an organizing framework for the updated plan.

These categories are used to develop revisions and updates to the Accomack County Zoning Ordinance and Subdivision Ordinance, and in decisions regarding rezoning and special permit approvals. However, these categories are not intended to be an all-inclusive list of districts for zoning ordinance revisions. Any additional categories or sub-categories that promote the stated goals, objectives and policies of this plan may be developed and proposed.

The general location of the land use categories described below are depicted on the Future Land Use Map. The Future Land Use Map designates the most desirable locations for various types of future development. A good deal of development has occurred over time in areas that have been determined to be undesirable for future development based on the criteria provided above. It is recognized that this existing development shall continue to exist in these areas and it is not proposed that areas currently zoned for a particular use be rezoned to a lesser use category. However, in areas where the existing zoning or pattern of use is inconsistent with that designated in the future land use plan, further extension of that use should be discouraged and development

in surrounding areas should be consistent with that proposed in this plan.

### Conservation Areas

The purpose of Conservation Areas is to preserve and protect Accomack County's areas of ecological importance on which development of any intensity would be damaging or unsafe. Areas that should be in the conservation district include marshland and the undeveloped barrier islands. Allowable uses in the Conservation Area would include docks and piers, duck blinds and wildlife observation platforms constructed in accordance with the rules and regulations of the Virginia Marine Resources Commission and the Accomack County Wetlands Board.

The County's target outcome for the Conservation Area in the long-term is to have no new development through regulations and conservation easements.

### Agricultural Areas

The purpose of Agricultural Areas is to provide an area for the production of agricultural and forestry products. Regulation of this area should minimize obstructions to the efficient and economical production of these products. Examples of the types of primary uses allowed in this district are agricultural and horticultural uses such as raising of crops, nurseries, orchards, vineyards, raising of livestock, forestry, poultry houses, sawmills, game preserves, and aquaculture operations. Residential uses would include housing for property owners, family of property owners, and those employed full-time on the property. Examples of secondary uses allowed in this area are single-family dwellings, accessory dwellings, cluster development, seasonal farm labor housing, public safety facilities, and other public uses.

The County's target outcome for this area in the long-term is to have as little new non-farm development as possible, through zoning regulations, Agricultural and Forestal Districts, cluster development, conservation development designs, and conservation easements. The target density for individual, developed properties in this area would be no greater than approximately one dwelling per five to ten acres, on average, and a far lower overall density. While a five to 10-acre density would, in theory, still exceed the ideal amount for these areas in the very long term, it would be low enough to limit the most serious and immediate impacts of residential development on natural resource systems, especially if carried out in a clustered pattern using conservation design techniques.

However, even a 10-acre average density would be excessive if it occurred on every farm. Further, at current growth rates such a level of development would not occur for several decades. It is therefore critical that the county continually monitor the rate, location, and impact of all rural residential development activity. The county's number one planning objective is to "direct development towards existing population centers." Development patterns should be measured against this objective on an annual basis. If the county observes a multi-year trend of increasing rates of rural subdivisions combined with decreasing amounts of land in Agricultural and

Forestal Districts, and/or in agricultural production, it should revisit the zoning regulations for residential development in the rural areas. Rezonings to higher intensities should not be approved in this area.

#### Rural Settlement Areas

The purpose of the Rural Settlement area is to facilitate rural residential growth complementary to and in the vicinity of existing residential villages and hamlets that dot Accomack County's countryside. Examples of secondary uses allowed in this area are accessory dwellings, cluster development, public safety facilities, and other public uses. Clustering options could be provided to allow smaller individual lot sizes if a portion of the development site is set aside as open space. New rural settlement areas should be located along, but not necessarily fronting, existing roads with adequate capacity, on soils with good septic suitability, and/or adjacent to existing settlements or subdivisions.

The County's target outcome for this area in the long-term is to blend new development with existing development in clustered, rural residential development that reflects and perpetuates the County's existing, historic land use pattern. Cluster development and conservation development designs are encouraged to blend with existing settlements. The target density for this area would be approximately one dwelling per two to three acres, on average. Rezonings to higher intensities should not be approved in this area.

#### Residential Areas

The purpose of Residential Areas is to allow for new residential development in existing communities for those who chose to live on moderately sized lots. Examples of secondary uses allowed in this area are home occupations, public safety facilities, and other public uses. New Residential Areas should be located adjacent to existing residential areas located outside of flood zones that have roads with adequate capacity and soils with good septic suitability.

The County's target outcome for Residential Areas in the long-term is to provide medium density residential development that reflects the surrounding area. The target density for this area would be approximately one dwelling per acre, on average. Rezonings to higher intensities should not be approved in this area.

#### Village Development Areas

The purpose of Village Development areas is to allow for a mix of residential and commercial uses in keeping with the traditional development pattern of Accomack County's villages and towns (subject to wastewater treatment capability). These areas should be compact, with interconnected street networks, parks, sidewalks and a mix of uses, convenient to both motor vehicles and pedestrians.

The County's target outcome for Village Development Areas is for the vast majority of future residential development to be located there, and that they be the major location of future neighborhood commercial and institutional development. Depending upon the mix of uses and the availability of central water and wastewater treatment, overall residential densities would be planned to be in the range of one-half to one acre per dwelling, on average, including a variety of lot sizes and dwelling types; thus net densities may be four dwellings per acre or higher. Rezonings to higher intensities, including Planned Unit Developments (PUD) should be encouraged in this area, provided that the policies of this plan are met, including the features listed above.

Development within designated Village Development Areas should occur in a pattern that blends with and complements the existing, traditional pattern of streets and lots within the historic areas. This would include generally narrow streets, a mixture of lot sizes and building types, generally narrow, deep lots, as well as walkways and on-street parking within the public right-of-way.

It is critical that new development, including the extension of central wastewater treatment systems, be phased such that development will generally extend outward from the existing core of existing towns and villages. As development occurs, it is also critical that all streets and walkways be interconnected into a loose, grid pattern in order to disperse traffic, provide multiple routes between destinations, and create a pedestrian-friendly streetscape.

In those places where a Village Development Area abuts the Route 13 corridor, it is essential that motor vehicle access be managed so as not to impede the efficiency and safety of Route 13. New development in such areas must keep new access points to Route 13 to an absolute minimum, must coordinate entrances and crossings with adjacent properties, and must provide necessary turn-lanes and any other safety measure that are appropriate to the specific site.

Multiple-family housing developments should generally be located in or near incorporated towns. Village Development areas are appropriate locations for apartments, condominiums, townhouses, and similar types of developments designed to satisfy rental and for sale market needs.

To the extent possible, multiple-family housing developments should be in close proximity to goods and services for the convenience of residents and to afford residents of the developments with transportation alternatives to personal vehicles, such as walking, biking, or using other transportation forms. Where appropriate, sidewalks, lighting, and other amenities should be provided.

The Planning Commission has identified a need for additional market rate multiple housing options for people working in the education, medical, and aerospace professions.

Planned Unit Developments in Village Development Areas should achieve the following:

- Promote mixed use developments.
- Generally be consistent with, and developed in accord, with the Village Development purpose, targets, and development types outlined above.
- That the development is of appropriate size and scale for the Eastern Shore of Virginia.
- That phasing of the development is linked to market conditions conducted by an analyst selected by the County and paid for by the applicant.
- That the PUD complements nearby development.
- Be designed and constructed to create a sense of place where building placement, sidewalks, trees, landscaping, parks, and other amenities are connected in a manner to encourage human interaction.

### Commercial Areas

The purpose of Commercial areas is to provide appropriate locations for a broad range of business activities which may be characterized by heavy traffic, noise, or other factors that could be considered a nuisance to residential uses. Examples of primary uses allowed in Commercial areas would include large-scale office complexes, banks, large-scale restaurants, theaters, large-scale retail stores, gas stations, service garages, recreational centers, warehouses and wholesale stores, funeral homes, large hotels and motels, public safety facilities, and other public uses.

The County's target outcome for this area is that it be the location of large scale, intensive commercial enterprises, but that such development be clustered at key access points on Route 13 or Route 175, with managed access, and street connections to adjacent properties. Future commercial development must be required to provide adequate stormwater management and ground water protection, and should be held to reasonable standards with regard to the aesthetics of site design, architecture, landscaping, and lighting to minimize adverse impacts on the surrounding community.

### Industrial Areas

The purpose of Industrial Areas is to provide a suitable location for industrial activities with minimized interference from or impact to adjacent land uses. Examples of allowable uses would include light manufacturing, food preparation and processing, bottling plants, electronics production, metal fabrication, garment manufacturing, recycling facilities, inter-modal transportation of goods, warehousing facilities, public safety facilities, and other public uses. Industrial Areas should be located near adequate transportation facilities, including highway, railroad, and waterway access points.

The County's target outcome for this area is that it be the location of large-scale, intensive industrial enterprises, with managed access, buffers and other regulatory controls to protect adjacent properties, and adequate stormwater management and groundwater protection.

**Amount of Land Designated:**

The total amount of land designed on the Future Land Use Map for each of the land use categories is shown in the table below. This total acreage is larger than the estimate of actual land demand, mainly due to the designation of substantial areas as “residential” which are aimed at reducing development pressure on the agricultural and conservation areas, and “rural settlement” areas, which are expansions of existing rural neighborhoods. In addition, some properties within each of the designated categories are either already developed or will not likely become developable in the foreseeable future. The “extra” total acreage suggests that the County needs to monitor development within the village development areas, including phasing development so it occurs as incremental extensions outward from the existing historic cores of each village area.

**Acreage of Future Land Use Areas**

Rural Settlement Area	3,002 Acres	/ 11 sites
Rural Settlement Area B	1,424 Acres	/ 5 sites
Residential Area	2,443 Acres	/ 11 sites
Village Development Area	5,141 Acres	/ 23 sites
Village Development Area B	1,821 Acres	/ 7 sites
Commercial Area	887 Acres	/ 9 sites
Industrial Area	1,997 Acres	/ 15 sites
Agricultural Area	182,243 Acres	
Conservation Area	69,545 Acres	

**Criteria for Evaluating Development Proposals to Implement the Land Use Plan:**

Proposals for development, including applications to rezone property to a more intensive zoning district, will be evaluated from the site specific viewpoint as well as from the overall viewpoint of the entire designated Future Land Use Area.

In making decisions about any proposal for development within any particular Future Land Use Area, the county will seek to achieve the proper balance or mix of land uses within the area, particularly with regard to the Village Development Areas. Because the Village Development Areas are depicted as general locations for a mix of urban uses, the county will monitor the balance of approved uses over the course of time. Thus, the approval of a particular use at a particular time within a Village Development Area does not mean that the same type of use will necessarily be approved later on an adjacent site, because a key purpose of this future land use area is to have the appropriate balance of uses and not necessarily all of one type.

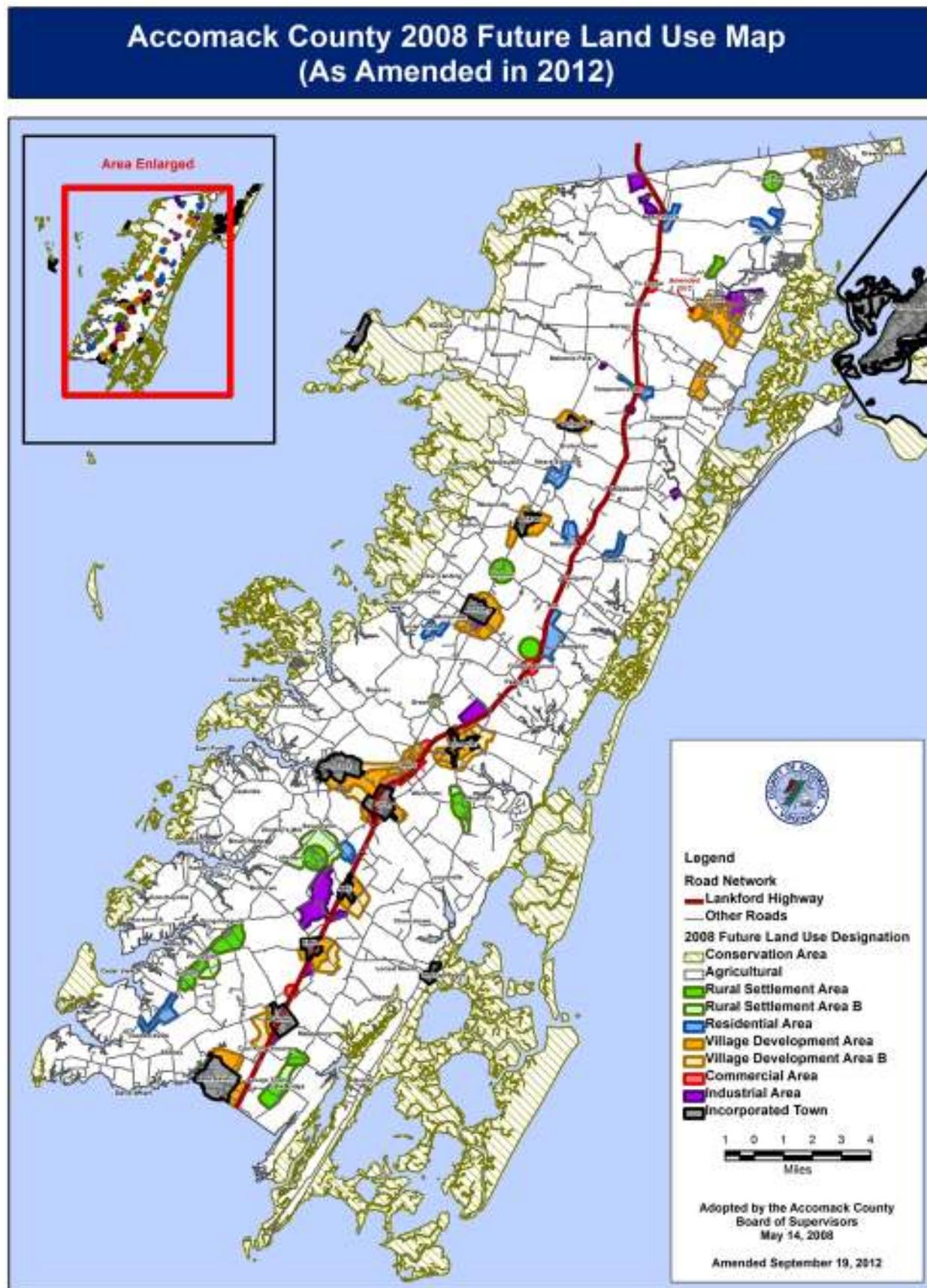
Applications to rezone property will be judged in light of all of the goals, objectives, and policies of this comprehensive plan, with the following criteria serving as primary factors. Failure to meet any one or more of these criteria may be sufficient basis to deny a rezoning. The relative importance given by the Board of Supervisors to each criterion will depend on the specific case,

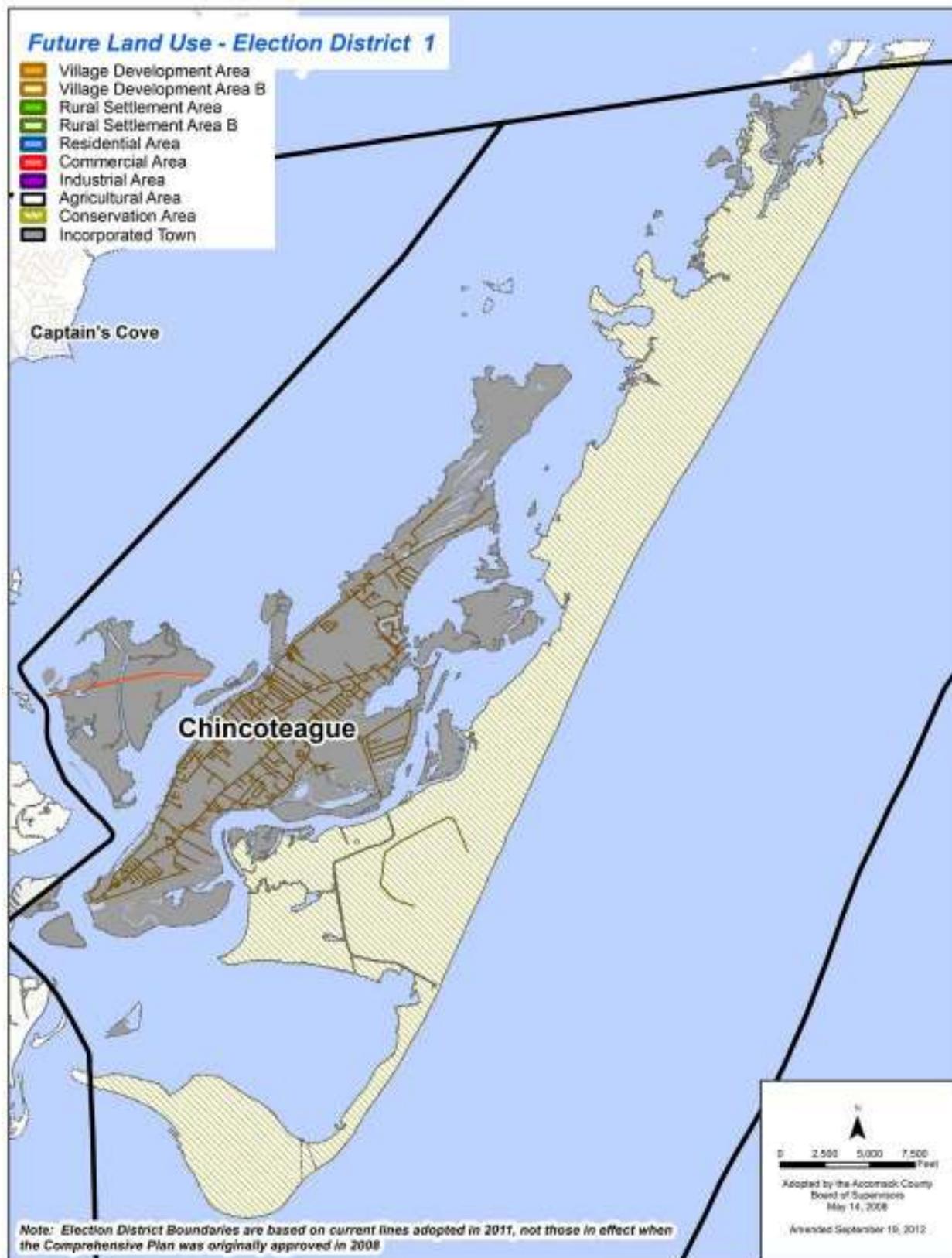
and the purposes of zoning as set forth in §15.2-2283 will also apply.

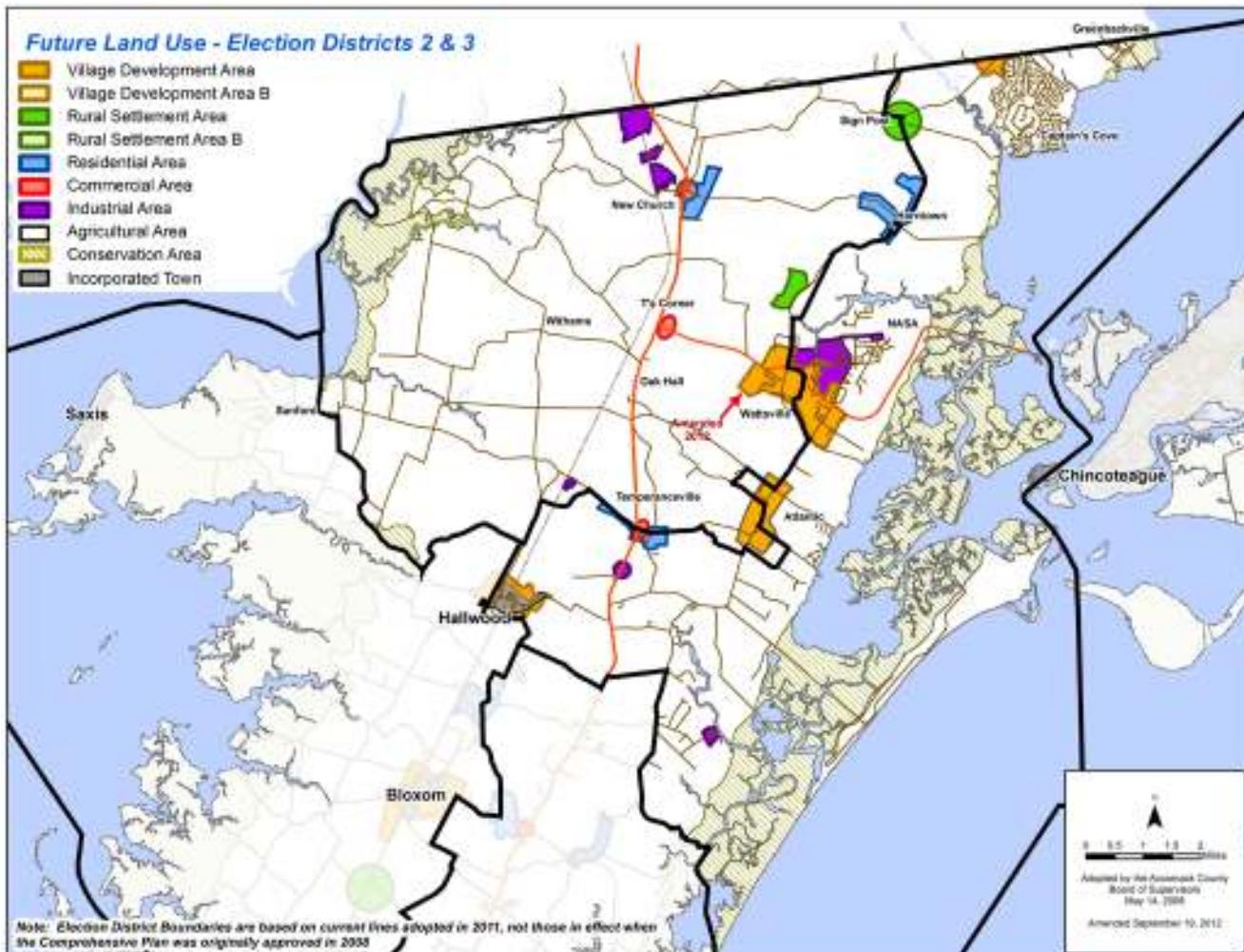
1. *Location* – the location of the proposal in relation to the Future Land Use Map designations (Chapter 6) and the location policies in the text of the plan (Chapter 5).
2. *Supply of zoned land* – whether or not the County currently has sufficient zoning capacity in the appropriate locations for the proposed uses, in relation to the projected land demand analysis contained herein.
3. *Adjacent uses* – whether the proposed uses are compatible with current and planned adjacent uses. (Consideration of proffered conditions to mitigate any incompatible aspects would also be a factor, as indicated in criterion #6).
4. *Public facility capacity* – the existing and planned capacity of water, wastewater treatment, roads (including traffic safety as well as capacity), schools, parks, emergency services, etc. (in the long term, the County should establish performance standards for public service delivery).
5. *Environmental impact mitigation* – whether the environmental impacts of the proposed uses can be adequately mitigated by the applicant.
6. *Proffered conditions* – whether the conditions proffered by the applicant are sufficient to mitigate all of the impacts caused by the development to a reasonable degree.
7. *Overall pattern of future development in the Future Land Use Area* – whether there is already a sufficient amount of land planned or approved for the proposed use, in which case the county may choose not to approve a rezoning that would add to that existing supply of zoned land.
8. *Density* – the density or intensity of proposed development on the site, as well as what the effect would be on the density of the overall area.
9. *Land use mix* – the mix of land uses on the site and what effect the proposed use would have on the overall land use mix in the area.
10. *Public input* – relevant factual information provided by the public that is received before or as part of a public hearing that would have an adverse impact on the health, safety, and welfare of the residents.

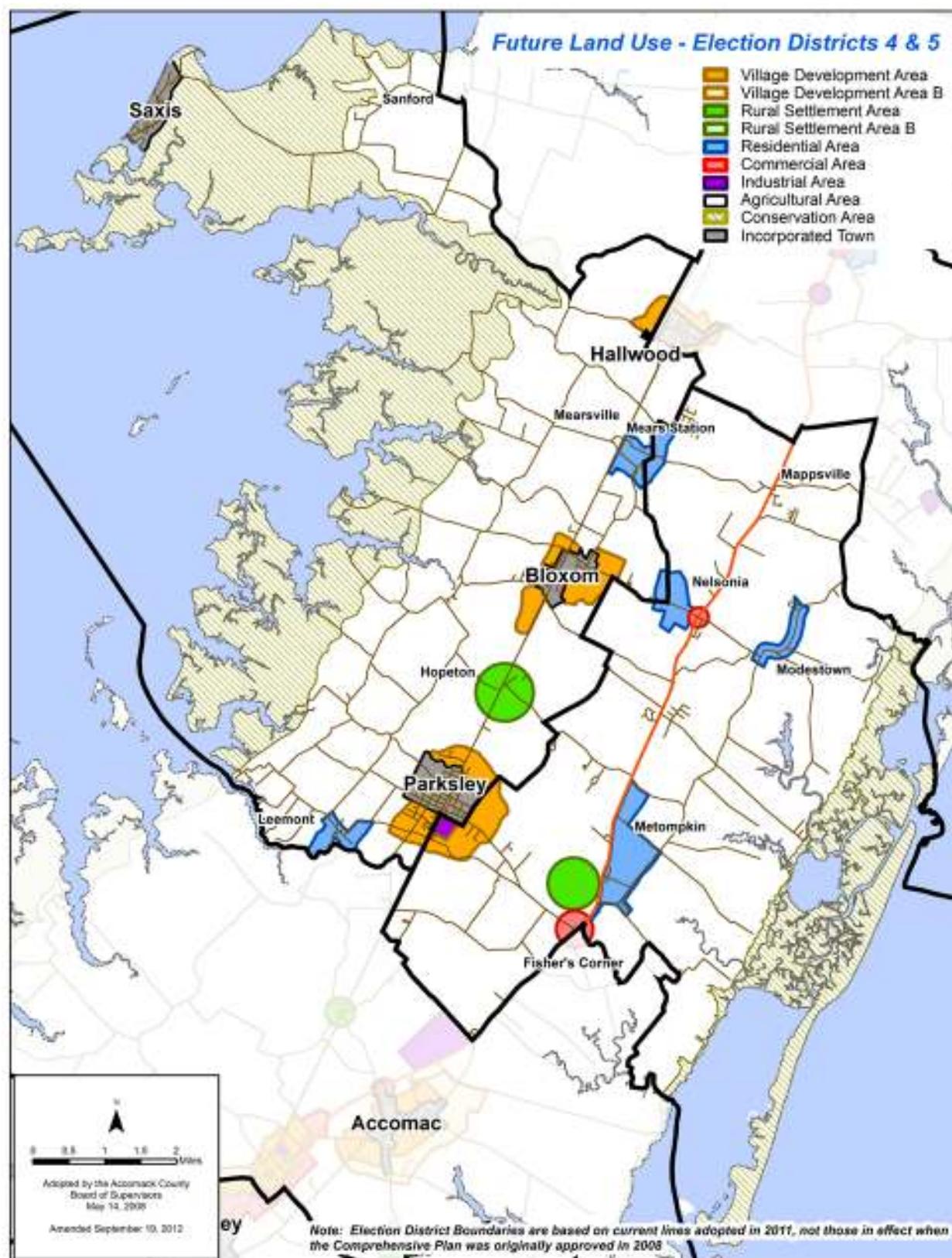
### **Future Land Use Maps:**

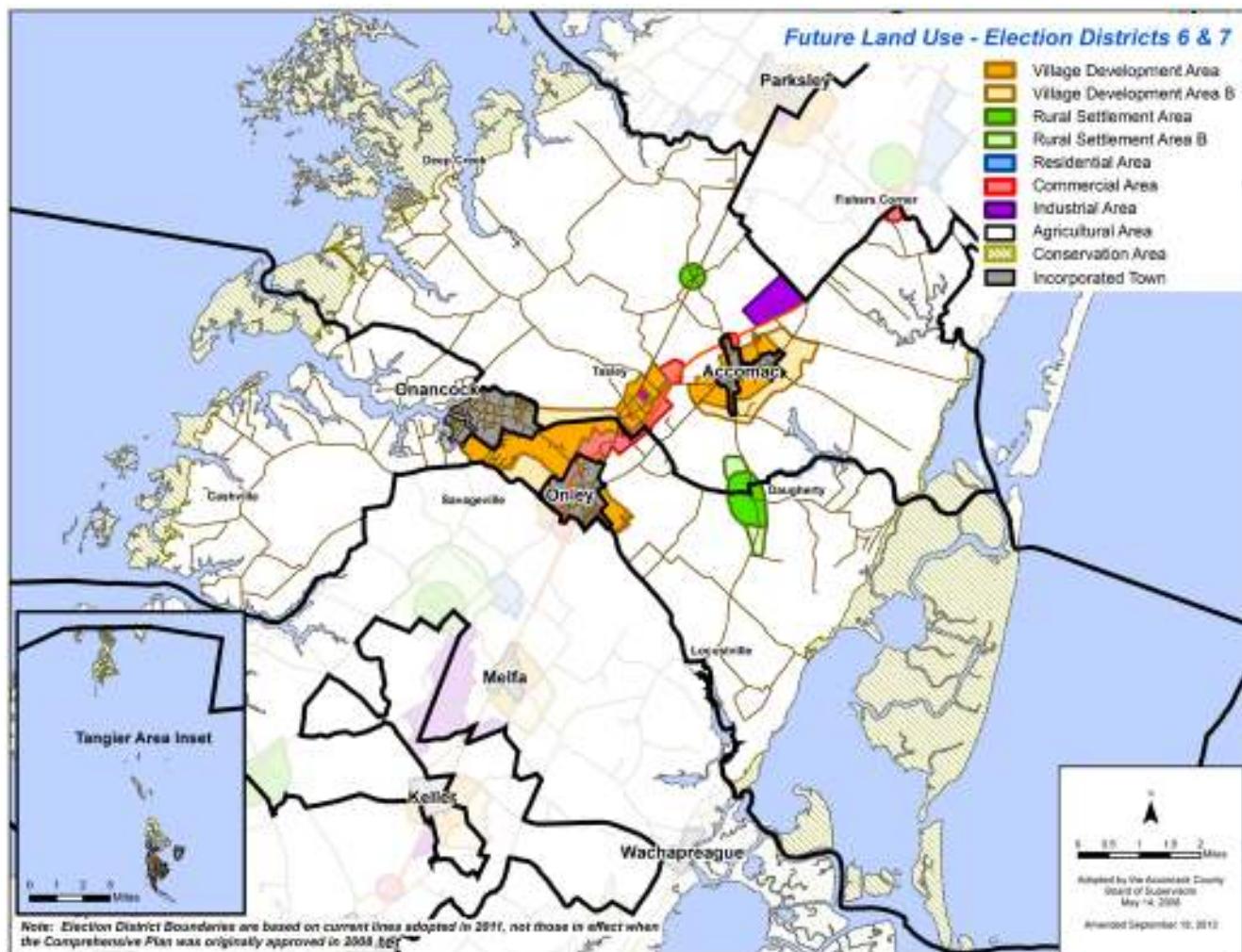
The following Future Land Use Maps show the 2008 Future Land Use Plan Maps, which have been updated to include the 2011 election district boundaries and to reflect the 2012 Future Land Use Amendment.

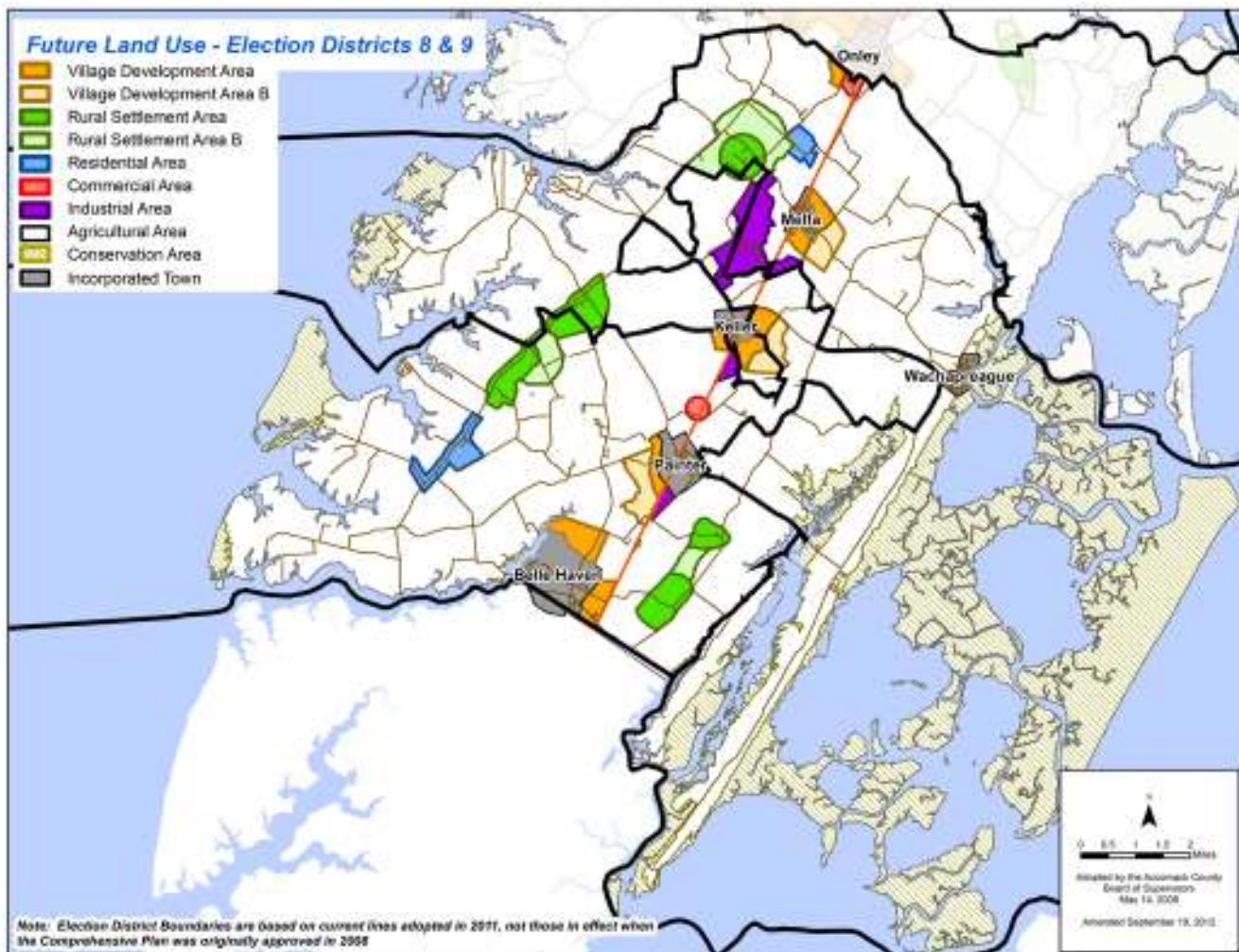












## **Appendix A**

### **Results of Joint Work Session of the Planning Commission and Land Use Planning Stakeholders Group, on Land Use Planning Issues and Options**

*October 24, 2005, Elizabeth B. Waters, facilitator*

#### ***Introduction***

A major goal in Accomack County's 3-Year Strategic Plan is to "revise the county's comprehensive plan and zoning ordinance to strengthen the county's ability to guide and manage growth and development". In September 2005, the Board of Supervisors appointed a Land Use Planning Stakeholders Group to assist the Planning Commission and the Board in their work to accomplish this goal, building on the work already underway by the Planning Commission. The Stakeholders Group includes representatives of a wide range of civic and business interests in the county and it will be an important sounding board for the Commission and the Board as they develop land use plan and zoning changes to take to the public at large.

An initial joint work session was held for members of the Planning Commission and the Stakeholders Group on October 24, 2005, in the Shore Bank Conference Room in Accomack County. The purpose of the session was to identify land use issues the county needs to address during the update of its land use plan and zoning ordinance and possible ways to accomplish this.

Participants said that some of the development problems the county is living with are the result of earlier plans and ordinances that have been changed, but there are a number of concerns that have not been addressed. These concerns need to be addressed to manage the increased growth pressures the county is experiencing. There was a general view expressed by the participants throughout the discussions that this planning process needs to focus on what is best for the county as a whole, not provide benefits to a few special interests. The following is a summary of issues and possible solutions identified during the session.

#### ***Issue Identification***

During the first portion of the discussion, participants identified assets, goals and problems that need to be taken into account as planning and zoning options are developed and considered.

##### ***Natural, Cultural and Economic Assets***

- Natural resources: groundwater, open space, wildlife, etc. need to be protected.
- Historic resources need to be identified, preserved and promoted.
- Agricultural land needs to be preserved.

- The Wallops facility needs to be protected from residential and commercial encroachment.
- Existing towns and communities need to be strengthened.

### ***Goals for Planning/Zoning Changes***

- Preserve the rural lifestyle, farming, seafood, and aquaculture activities, etc. that give the Shore its distinct identity.
- Encourage development that will provide jobs and housing for young people.
- Protect landowner's rights.
- Preserve the economic value of property.
- Ensure that the safety of Route 13 is preserved.
- Preserve and enhance agricultural profitability.
- Increase affordable and "starter" housing so local people can have adequate housing and begin to build equity.
- Preserve existing business and employers.

### ***Problems that Need to be Addressed***

- The county lacks appropriate, enforceable zoning regulations.
- Zoning around existing towns is not adequate and this pushes people out into agricultural areas.
- It's too easy for development to come into agricultural areas. These areas lack adequate roads for residential development and it often creates conflict among users.
- There is a countywide lack of affordable housing. Almost all of the new housing being built is out of reach for moderate income and first-time buyers. Most of it is second home development being marketed to people from outside the county and there is not enough decent housing for the local labor force.
- Increases in entrances and exists along Route 13 are threatening the safety of that corridor.
- Ways have to be found to balance preservation and growth in the county.
- The community needs to agree on the definitions of historic and natural resources in order to identify them and plan to protect them.
- The county needs to decide how much it wants to encourage and develop tourism. There may be conflicts between tourism-focused businesses and traditional agricultural and seafood activities. Too much tourism growth may tax the roadway system. On the other hand, many tourism focused activities like farmer's markets, pick your own farms and eco-tourism are good matches with the Shore's rural character.
- The best farmland is also the best land for development and something needs to be done to balance these competing demands.
- Expansion around existing towns is difficult because the soils are not suitable for septic systems and centralized wastewater treatment facilities are not available.
- There is competition for developable land, there isn't space for everything and the county has to set priorities.

- Residential development often costs more for services than it generates in taxes, although this depends on the size of the house and the type of services needed.

### ***Possible Approaches to Address Problems and Goals***

After identifying many of the major issues the county faces, participants identified a number of approaches that might help the county deal with these different problems, goals and concerns. They recognized there are limits on what counties are allowed to do in Virginia, but even within those restrictions there are many tools to manage growth that the county needs to consider.

At this early stage no attempt was made to reach agreement on specific approaches, but participants did suggest that this process should try to identify plans, ordinances and review processes that:

- enable long-time residents to continue to live and thrive in the county;
- welcome new residents and businesses in ways that protect the character and natural resources of the county while contributing to its vitality; and
- protect the rights of farmers and other landowners to use and benefit from their land.

Many options were identified that the county can consider during the update of its land use plan, zoning and development review processes. They have been divided into four major categories below. These ideas can serve as a starting point for further research and discussion.

### ***Development Patterns***

- Concentrate new development in and around existing towns and communities. They are well situated, have good access and this will help revitalize these communities.
- Identify ways for larger new developments to reproduce the attractive village concept that is already found throughout the county.
- Encourage more commercial development in existing villages to serve residents and attract tourists.
- Use Planned Unit Developments (PUDs) with their own sewage treatment plants so development can occur in areas with poor soils for septic systems.
- Review and update soil suitability maps, flood zone areas, etc. to determine the most appropriate locations for future development.
- Take account of the sole source aquifer in deciding where development should take place and how much. The cumulative water demand of all new developments needs to be tracked over time.
- Take account of the county's agricultural and forestal districts in deciding where to encourage future development.
- Make zoning changes recommended in the US Route 13 Corridor Plan to improve the safety and aesthetics of new development in the corridor.

### ***Affordable Housing***

- Adopt incentives to encourage developers to produce creative affordable housing options.
- Designate areas for well-designed trailer parks that include requirements for landscaping, maintenance, etc. This is often the only kind of housing local workers can afford.
- Develop PUD regulations that call for combining single family, duplex and triplex units that look similar but allow for a range of housing costs.
- Create a zoning ordinance that encourages affordable housing proffers.
- Consider adopting some property tax relief provisions for low-income homeowners.

### **Subdivision Regulations**

- Limit the amount of prime agricultural land that can be easily subdivided.
- Change some land from agricultural to rural residential category while keeping other land in agricultural designation.
- Require clustering in new subdivisions to protect open space.
- Protect groundwater quantity and quality by requiring “Best Management Practices” (BMPs) for all new developments. Some BMPs like stormwater retention ponds can be assets to new developments.
- Consider a special section of the subdivision ordinance that applies to mobile homes and establishes requirements for the design of these parks.

### ***Development Process***

- Create a clear, easily enforceable zoning ordinance.
- Revisit the current requirements to subdivide land to be sure the process is in the best interests of the county and landowners.
- Consider requiring re-zonings for all conversions of agricultural land into residential use.
- Make all revisions to the development process easy to understand and easy to execute.

### ***Next Steps***

The county is in the process of hiring a consultant to work with the Planning Commission, the Board and the public at large to identify various approaches and techniques available to manage growth and to update their land use plan and ordinances. In the months ahead, research will be done and additional public workshops will be held to help citizens and decision-makers gain a better understanding of the different approaches and techniques so they can reach consensus on which of these approaches and techniques are best for Accomack County. Throughout this process, the Land Use Planning Stakeholders group will play an important role in helping the Planning Commission and the Board identify the best solutions for the county.

## **Summary of Results of Public Forums for Updating the Accomack County Comprehensive Plan**

*Milton Herd, AICP, and Vlad Gavrilovic, AICP, Facilitators*

### ***First Forum on September 25, 2006 at Nandua High School Cafeteria***

#### **General Discussion**

##### **Are there any statistical forecasts of growth?**

Various growth projections have been compiled, including the Cooper Center (UVA) (official forecast). County staff can provide specific data files. [Official forecast is average 0.65% annual growth during next two decades; recent trend rate would be between 1% and 2% average annual].

##### **Would village residential category be on sewer or septic?**

Not determined – want to hear public comments. Mainly, village residential would be generally smaller lots/higher density than rural residential.

##### **What is status of Wallops sewer opportunity?**

County is currently negotiating – will probably be limited to industrial / commercial uses

##### **Concern that good soils are not an issue if you use central utilities.**

Wachapreague was considering expansion but they need sewer system in order for commercial to expand – but – hard to find environmentally appropriate location for it.

##### **How would central sewer be financed?**

- 1 – by users/future rate payers
- 2 – special service district (incremental tax on real estate within the district)
- 3 – general county funding assistance
- 4 – private central systems

##### **Would TDRs be appropriate? [transferable development rights program]**

Yes, it's an option to be considered [recent state legislation permit localities to do TDR, although the mechanics of successful implementation are complex]

##### **Concern over insurance for new homes on coastline – who pays?**

**Has anything been planned on alternative corridors for Rt. 13?**

- 2002 study recommends bypass from Route 175 to Temperanceville
- In 2006 General Assembly approved study for new interstate highway on Shore
- No funding has been available for major improvements to Rt. 13

**Is “central sewer” a mass drainfield or a central [discharge] plant?**

This is still and open question.

**Can we recommend that no discharge be put into streams when considering central sewer? Concern over impacts of discharge.**

**Would it be beneficial to have separate district to protect aquifer recharge spine?**

Yes, potentially – please note that in the small groups

**Results of Small Group Exercises**

**Group 1**

Circled around existing village to be future village residential (1/2 mile radius)  
Included existing towns as village residential  
Rural residential from Bloxom to Greenbackville – commercial should be included in village residential  
Industrial in existing industrial park  
Preserve “necks” on both coasts  
Green between concentrations of development along Rt 13 – protect groundwater

**Group 2**

Need EMS service for district 9  
Growth should be close to towns  
Need town sewer/water systems  
Large lots close to water  
Follow up 1997 plan and use it  
Interim ordinance to stay

**Group 3**

New growth should be on 316, not on 13 from Tasley to Bloxom  
Need growth around NASA  
Need nice park in mid-County with ballfields, skate park, picnic, lake  
Preserve cemeteries and historical sites  
Businesses on 13 clustered at traffic lights – no strip development  
Need master drainage plan for county – lost trees in Wachapreague

Group 4

Need to look at “what should be there” not “what is there now”  
Village residential could also mean mixed uses

Group 5

Keep Bayside/Seaside as Conservation  
Keep industrial off recharge spine  
Light Industrial and business around existing towns  
Some new development in larger Towns – Belle Haven, Accomac, Parksley  
AG land shouldn’t be fragmented  
Affordable Housing should be done by NGO’s (Habitat and VESHEEC) – not by county  
Sewer in waterfront towns but no discharge in creeks  
Developers should give proffers to offset costs

Group 6

Rt 13 should be commercial  
Industrial around Tysons and Peaker Plant and Perdue and Melfa Industrial Park  
Village Residential:

Oak Hall  
Temperanceville  
Mappsville  
Modest Town  
Nelsonia  
Parksley  
Greenbacksville  
Accomac  
Onancock  
Melfa  
Keller  
Pungoteague  
Belle Haven  
Craddockville  
Atlantic

Group 7

Should enact zoning similar to Worcester and Northampton (1 per 20 acres)  
Leave coastal edge with very little development  
Overlay to protect recharge spine  
Concentrate development along existing towns  
Locate commercial/industrial in industrial park  
Protect sensitive area between Chincoteague and Wallops

Group 8

Concentrate development around existing sewer in Onancock  
Need sewer around Wattsville and Atlantic to reduce septic tanks  
Need commercial/industrial around NASA  
Sewer will allow smaller lots and slow development in Ag areas with larger lots  
Need sewer around Wachapreague / Quinby / Parksley / Bloxom to protect surrounding farms and expand businesses.  
Consolidate commercial / industrial – don't spread it on Rt. 13.

Common Themes

Implementation is Key Issue  
Building on 1997 Plan  
Inherent conflicts on central sewer vs. environmental protection and market for waterfront uses vs. need to protect waterfront

Other Comments

Can't adequately locate new growth without showing existing subdivisions – recommend maps at a scale showing each election districts

Need to provide more boat access – especially if growth is to be pulled away from waterfront  
Rt 13 is a “death trap” – we can at least close the crossovers.

Recommend “land banking” – use transfer tax to purchase easements

Need to learn from planning efforts in Washington State.

Concern that population will double in 20-30 years.

Look at Outer Banks for example of what could happen Accomack.

Need to consider what kinds of new business will be attracted here – not conducive to large plants like Tysons/Perdue any more.

Recommend transfer tax to provide funds for affordable housing and open space

Look at home businesses or the “distributed work force” for future job growth.

***Second Forum on September 26, 2006 at Arcadia High School Cafeteria***

**Results of Small Group Exercises**

**Group 1 – Heinrich**

Focused on FLU areas that need enlargement  
Industrial at Peaker Plant, Melfa airport  
Commercial – 175 toward Chincoteague, areas to south  
Village Residential – county line road near Belle Haven/Exmore  
Behind Nandua HS to Onancock – rural res  
Parksley to North – village residential to Bloxom, add to the east  
Ches Bay Act needed on seaside  
Q – what about future sea level rise?

**Group 2 - Terry**

Didn't do maps  
Focused on principles  
Conservation/ag – more is better  
Tax incentives and aquaculture – focus conservation area to protect  
Rural residential – low density to protect aquifer – 1 unit per 10 acres  
Rural Village – one to four units per acre  
PUD – seaside  
Commercial – cluster. Limit ribbon (strip)  
Industrial – focus in existing areas

**Group 3**

Rural residential  
No industry in natural areas  
Need better commercial development on Rt 13 – aesthetics  
Melfa industrial park – need jobs for poverty areas in south Accomack  
Disagreement on lot sizes – land value [impacts]  
New development on spine and away from shores

**Group 4**

Put development where it already is, based on soils  
Onley – Onancock – Tasley – Accomac: development area to preserve rural character outside;  
May actually become a small city in the middle of the county

Group 5A – Ron Wolff

Protect groundwater  
Protect coastal bays  
Expand village residential around incorporated town – one-mile radius  
Rural residential – 1 to 3 miles beyond  
One mile buffer along seaside with large lots – 3 acre to 20 acre lots  
No overboard sewage discharge  
Use decentralized WWT & above ground systems in poor soils  
Need some small dots in outlying areas  
Sewer – Onancock, NASA Wallops \_\_\_\_ Park  
Disagreement on lot sizes close to water  
Need pre-treatment of septic within one mile of the water  
Debate on EMS vs. development on long necks – people's choice to live there

Group 5B – Stirling

Preserve white areas on map  
Look at existing developed areas and natural areas  
Peaker Plant – industrial  
Expand existing commercial areas  
Confine development to Onancock, Parksley  
Rural res around them  
Larger lots near water, bayside  
Rural residential on seaside  
Res and commercial development Onancock – Onley, Accomac – Parksley  
Density down on seaside  
Higher density in or near towns  
Lower density to preserve agriculture – ag is 50% of local economy  
Rt 13 – cluster and manage access  
Stricter septic requirements near shorelines to protect water and groundwater  
Map mostly green, but a lot of rural residential  
Encourage growth on seaside  
Residential between ESCC golf course and Onancock

Group 6 – Greg Lassiter

Small group / long conversation  
Threats to bayside – pollution \_\_\_\_; need BMPs for ag and commercial  
Rural res and Rural village on good soils

# Accomack County Comprehensive Plan Appendix B: JLUS EXECUTIVE SUMMARY

## *What is a joint land use study (JLUS)?*

There are many positive interactions between a military installation and the local jurisdiction. However, the activities of either can have unintended impacts on the other. Changes in military operations may increase noise, dust or safety concerns on the surrounding areas, while new residential or commercial development may restrict the military's ability to operate or train. Determining compatible development patterns on and around the installation is needed to protect the long-term, viable relationship between the installation and the local community.

A Joint Land Use Study (JLUS) is a project that brings local officials, military installation officials and the community together, in a collaborative effort, to discuss current and future needs, and to identify and promote compatible land use development patterns that are mutually beneficial to the military installation, the county and towns, and the citizens. Their findings, results, and recommendations are produced in a JLUS report.

## *Why was the Accomack County, VA JLUS initiated?*

In 2010, the Navy conducted an internal encroachment study for Navy missions and operations at NASA Wallops Flight Facility (WFF) in Accomack County, Virginia. The study was conducted to determine if any non-Navy activities were impeding the performance of Navy operations. The study recommended that a JLUS be undertaken to further explore existing and future land use compatibility issues associated with Navy missions at the WFF. As JLUS initiatives typically involve communities around military installations, this JLUS is unique, as it involves Navy and other Department of Defense (DOD) organizations that operate as tenants at WFF, a NASA (non-DOD) facility.

Funding for the JLUS was provided by the DOD Office of Economic Adjustment (OEA) with the purpose to engage NASA, the Navy and Accomack County in ongoing collaborative efforts to preserve the mission capabilities of the Surface Systems Combat Center (SCSC) in its current strategic location as a primary tenant onboard WFF. NASA, Navy, and other DOD and Federal agencies onboard or operating from WFF are valuable assets to Accomack County, just as there

is great value in the location and facilities of WFF for the federal agencies. The partnership between NASA and the Navy has a particularly long history, and it is the desire of NASA, the Navy, and Accomack County to continue and preserve this arrangement.

The encroachment study also noted the lack of an Air Installation Compatible Use Zone (AICUZ) study for the Navy's use of the WFF airfield. The AICUZ Program is a planning tool developed and used by DOD to assist in compatible development analysis with respect to potential impacts from noise and accident potential. While the AICUZ Program is not formally applicable to other federal agencies such as NASA and consequently Wallops Flight Facility, its applicable APZ layout and noise zones were among several factors considered for this study, since the majority of current flight operations at WFF are DOD.

## *What are the primary goals of this JLUS?*

The outcome of the collaborative efforts involved in development of this JLUS is to provide a planning tool for Accomack County. This planning tool includes recommended actions and strategies to inform future County policy-making decisions regarding compatible land use in order to accomplish the following primary goals:

- Protect the health, safety, and welfare of Accomack County residents living or working in potentially impacted areas surrounding the installation.
- Sustain the economic vitality of the Accomack County community.
- Promote a cooperative land use planning process where Accomack County collaborates with NASA, Navy and other DOD and Federal agencies onboard or operating from WFF to safeguard their mission capabilities, and in doing so, retain their critical economic value to the County.



# Accomack County Comprehensive Plan Appendix B: JLUS EXECUTIVE SUMMARY

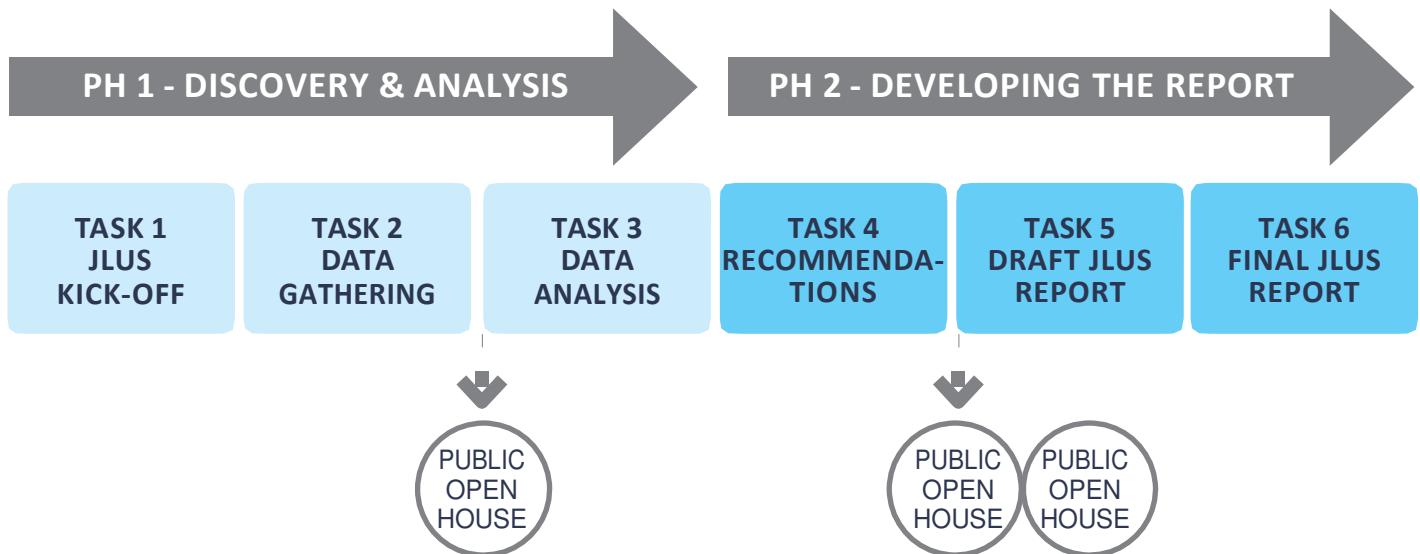


Figure. ES.1 - JLUS Development Process

- Ensure engagement of local private property owners in the land use planning process.

## *How was this JLUS conducted and who was involved?*

Figure ES.1 depicts the JLUS development process.

A wide range of participants represented various stakeholder organizations and agencies as follows:

- Elected officials, Planning Commissioners, and staff for Accomack County and the Town of Chincoteague
- The Navy/SCSC and other DOD officials (including OEA representatives) and military installation personnel
- NASA WFF officials
- Local, regional, and state planning regulatory agencies, as well as land and water management agencies
- Environmental advocacy organizations
- Non-governmental organizations (e.g., Eastern Shore Defense Alliance)

- Other special interest groups
- Public landowners and other interested persons

Guiding committees included the Policy Steering Committee (PSC) and the Technical Advisory Committee (TAC). The PSC, comprised of various executive-level personnel, provided overall direction for the development of the JLUS (including approval of recommendations and the Draft and Final JLUS Reports) and is ultimately responsible for the document. The TAC consisted of local subject matter experts in installation planning and operations, local planners, community staff, local business and professional representatives, town and neighborhood representatives and others. This committee worked closely with the consultant, providing expertise in the development of the JLUS documentation.

The Accomack County community was brought into the process by means of three public information meetings, the JLUS website, and three published brochures. Those brochures are:

- An Informational Brochure to engage the public early in the JLUS process
- A Findings Brochure, identifying the incompatible land use issue discovered of the project team's research and the analysis results

# Accomack County Comprehensive Plan Appendix B: JLUS EXECUTIVE SUMMARY

- A Recommendations Brochure, identifying proposed solutions and strategies to address existing and potential future incompatible land uses

## *What are the primary findings of this study?*

As joint land use studies have been conducted in recent years, approximately 24 potential impact factors/issues have been identified, not all of which apply to each specific study. Of the broad range of potential issues, the Accomack JLUS project team identified a total of five for exploration and analysis, plus general recommendations. These five issues, plus general recommendations, are depicted by the following icons:



Three of the analyzed issues helped shape the overall operational footprint, where the potential conflicts exist between WFF operations and the surrounding Accomack County communities. Figure ES.2 depicts this WFF overall operational footprint, reflecting the three predominant issues - Aircraft Accident Potential Zones, Aircraft Noise Zones, and Rocket Range Hazard Area.

### • Aircraft Accident Potential Zones

The Department of Defense (DOD) provides guidance for land use and population density at its air installations and in communities surrounding these installations. Considering public safety with respect to the potential for an accident, this guidance suggests land uses considered compatible with aircraft operations. Accident Potential Zones (APZs) are the areas where the greatest potential for aircraft accidents exists based on historical accident data, and the type and mission of the aircraft in use. See Figure ES.3, where the clear zones (shown in red), located immediately beyond the runways present the highest risk. Further from the end of the runway the risk diminishes in APZ 1 (orange) and diminishes further in APZ 2 (yellow). It is important to note that while APZ mapping is based on statistical evidence for the specific aircraft and mission,

accidents can occur outside the mapped APZs. The latest APZ mapping reflects changes since the publication of the 2008 Accomack County Comprehensive Plan. The clear zones have remained virtually unchanged; however the APZ1 & APZ2 zones have increased and cover just over 2,000 additional acres. This is due to the 2013 addition of Navy E2/C2 aircraft operations since the current APZ mapping is based on aircraft-specific data. Accomack County will ultimately determine if it wishes to adopt DOD APZ guidance.

Since the completion of the existing land use analysis phase of this study in May, 2014, site clearing and roadway construction at the WRP commenced and is nearing completion. This has the effect on the Existing Land Use mapping (*refer to Appendix "F"*) of changing some areas shown as "Forestry" to "Undeveloped". However, since no buildings or structures have been completed at this time, the effect on the analysis with respect to land use compatibility is negligible.

### • Aircraft Noise Zones

The DOD air installation guidance also covers aircraft noise. Noise is unwanted sound measured in decibels. Noise contours, or the areas of various noise levels are described in "decibels DNL." DNL is a term to represent the average sound level generated by all aviation-related operations during a 24-hour period. Below the threshold of 65 decibels DNL, noise is considered relatively low. For example residential uses are not suggested in areas where aircraft noise is expected to exceed 65 decibels DNL, while recreational activities are not discouraged unless the noise exceeds 75 decibels DNL. Warehousing, agriculture, forestry, and fishing are considered compatible. The mapping of expected noise levels shown in Figure ES.4 is based on acoustic modeling. However, given variables such as weather, actual flight paths, etc., actual noise levels/locations may vary. Accomack County will ultimately determine if it wishes to adopt DOD aircraft noise guidance.

### • Rocket Range Hazard Area

The rocket launches at WFF Wallops Island are not only a major catalyst to bring Government, academia and industry business and economic development to the Wallops area, but are also an attraction for both tourists and residents alike. Yet, these types of operations are inherently hazardous. As such, NASA develops and implements

## Accomack County Comprehensive Plan Appendix B: JLUS EXECUTIVE SUMMARY



**Figure ES.2**  
**WFF Operational Footprint**

## Accomack County Comprehensive Plan Appendix B: JLUS EXECUTIVE SUMMARY



Figure. ES.3 - WFF Accident Potential Zones

## Accomack County Comprehensive Plan Appendix B: JLUS EXECUTIVE SUMMARY



## Accomack County Comprehensive Plan Appendix B: JLUS EXECUTIVE SUMMARY



Figure. ES.5 - WFF Rocket Range Hazard Area

# Accomack County Comprehensive Plan Appendix B: JLUS EXECUTIVE SUMMARY

mission-specific safety plans to ensure the protection of both members of the public and their property for all of its launches. As shown in Figure ES.5, the Rocket Range Hazard Areas consist of concentric rings (arcs) centered on the two current and one future planned orbital launch pads. The smaller arc, at 10,000 feet, is NASA's planning level estimate for the area potentially requiring the most stringent controls, including clearing the zone of all people prior to launch, to protect the safety of the public and for the ability to launch. The actual hazard area requiring clearance is defined for each launch based on the specific hazards of that launch and historically have not exceeded 9,000 feet for Antares and Minotaur launches. The larger arc, at 20,000 feet, depicts an area that may be susceptible to range hazards that are largely dictated by atmospheric conditions on launch day. In contrast to the 10,000 foot arc, the 20,000 foot arc would not likely require complete clearance, rather select areas within it could require special consideration, such as ensuring that large groups of people are not present or that building occupants are not in front of single-pane windows at launch. NASA coordinates all hazard area information with local law enforcement officials, and those officials are responsible for any notification and evacuations that may be necessary to protect the safety of the public. The 10,000 and 20,000 feet arcs depict NASA's best estimate of the extent of launch hazard areas required for current planned and future missions. Recently the validity of these areas and the hazards experienced have been verified by the actual events and lessons learned from the ORB-3 rocket mishap October 28, 2014.

## *What are the Recommendations deriving from this study?*

The following 15 recommendations and strategies were endorsed by the project leadership to address the five land use issues facing Accomack County, the Navy and NASA. They address both existing and future potential incompatible land uses.

### SHORT TERM RECOMMENDATIONS



Establish an Accomack-Wallops Working Group.



Amend/Update the Accomack County Comprehensive Plan to incorporate information contained in this study.



Pursue available grants and/or supplemental funding sources for JLUS recommendations implementation.



Establish a process for mitigating existing incompatibilities within the WFF aircraft clear zones.



Establish a collaborative review process for requests relating to development of commercial wind turbines, cell towers, radio frequency emitters or structures.



NASA and/or Navy notify Accomack County and Working Group of offshore energy development to identify potential operational interference.

### SHORT-TO-MID-TERM RECOMMENDATIONS



Establish a Rocket Range Hazard notification area and provide notifications of hazards associated with rocket launches.

### MID TERM RECOMMENDATIONS



Establish a WFF Aircraft Operations Overlay District and amend the Accomack County Zoning Ordinance and Subdivision Ordinance for compatible land use in Clear Zone, APZ 1, and APZ 2, and other affected areas.



Adopt measures for early and full real estate disclosure with respect to properties located within aircraft accident potential and noise zones.

# Accomack County Comprehensive Plan Appendix B: JLUS EXECUTIVE SUMMARY

Pursue Commonwealth of Virginia legislation to amend 55-517/55-519 (Required disclosures) to include military aircraft operations on non-military airfields.



Provide information regarding incentives for retrofits to windows on existing buildings within the Rocket Range Hazard Area.



Encourage the application of noise attenuation measures within the aircraft noise zones as part of the permitting process for new construction.

## LONG TERM RECOMMENDATIONS



Develop a plan for mitigating and/or accommodating the effects of recurrent flooding, storm surge events, and sea level rise for the Navy, NASA, and Mid-Atlantic Regional Spaceport (MARS)/VCSFA facilities on WFF Wallops Island.



Develop a plan for mitigating and/or accommodating the effects of recurrent flooding, storm surge events, and sea level rise for the coastal areas of Accomack County within the study area.



## ON-GOING RECOMMENDATIONS



Provide an annual update to the Accomack County Board of Supervisors regarding JLUS implementation progress.



Update the Accomack County GIS database with JLUS Report data following adoption by the County Board of Supervisors.



# Accomack County Comprehensive Plan Appendix C: JLUS RECOMMENDATIONS

## RECOMMENDATIONS & STRATEGIES

*This chapter of the Joint Land Use Study provides the project leadership's recommendations and strategies for addressing existing and potential future incompatible land uses between the WFF operations and the surrounding Accomack County community.*

*Recommendations and strategies are identified and discussed for each of the five major compatibility issues presented in Chapter 4. Additionally, recommendations and strategies of a general nature are provided. A total of fifteen recommendations are developed and identified with respect to category (communications, plans, regulations, legislation, etc.). The recommendations provided here include a range of options for the community to consider for implementation should it desire to do so.*

*Recommendations are discussed in order of anticipated time frame required for successful accomplishment.*



Aircraft Accident  
Potential Zones



EMI & Radar  
Interference



Range Hazard  
Area



Coastal  
Resiliency



Noise Zones



General  
Recommendations

### 5.1 SHORT - TERM RECOMMENDATIONS

#### 5.1.1 Establish an Accomack-Wallops Working Group (AWWG)

##### • Context

The intent is to provide an advisory body to support and track implementation of the JLUS recommendations and ongoing County-WFF-based agencies collaborative strategies and actions. Establishing this group highlights the need for ongoing collaborative efforts between the County, NASA, the Navy, other DOD and VCSFA officials, and the other agencies/organizations for the long term. The current collaborative relationship between WFF and the County will be enhanced by being given more structure. The new structure would be an effective forum for communication, development, and mitigation efforts for collaborative compatibility planning into the future. The AWWG would serve as a two-way communications forum, dealing with County Development and Wallops Operations matters. Development plans in areas surrounding WFF, WFF mission operations changes, and other related matters would be communicated and potential impacts addressed collaboratively. The AWWG would provide advisory level input and support to the County Planning Commission and Board of Supervisors.



##### • Action

Accomack County is to take the lead role in implementing this recommendation. In addition to the County, the AWWG would have resource partners including: NASA, DOD, the Navy, VCSFA, Town of Chincoteague, DOI/USFWS, and A-NPDC. Other entities or agencies could be brought into discussions as applicable (e.g., Chamber of Commerce, business groups, realtors, property owners, etc.). Because a working relationship already exists between the County and primary partners, establishing the AWWG to further cultivate the working relationships is considered easily attainable in the short term.

An example of AWWG usefulness in addressing compatibility issues would be coordinating a public forum to give local residents with properties in or close to APZs the opportunity to have the appropriate agencies provide responses to their specific questions.

This recommendation is timely, given the heightened interest at both the local and state level in retaining federal and military activities in an era of reduced federal spending. The economic impact, particularly in Coastal Virginia, is significant. This is evident at the state level, with the creation of the Commission on Military Installations and Defense Activities (CMIDA) in March, 2013. The Commission's 2013 Initial Report outlines 20 recommendations - two of which are "Encourage Joint Land Use Studies" and "Mitigate Effects of Encroachment". (CMIDA 2013).

# Accomack County Comprehensive Plan Appendix C: JLUS RECOMMENDATIONS

## **5.1.2 Amend/Update the Accomack County Comprehensive Plan to incorporate information in this study.**

- **Context**

This action captures pertinent information from the JLUS Report for incorporation in the Accomack County Comprehensive Plan update. The update would make use of such JLUS Report information as the updated aircraft APZ and noise contour data, updated rocket launch range hazard data, EMI and radar interference data, and associated mapping. The updated data would serve to enhance County planning efforts with respect to land use compatibility in areas surrounding WFF well into the future.



- **Action**

Accomack County would have the lead role, with the support of resource partners from the various groups represented in the AWWG. A critical resource document is the Commonwealth of Virginia Senate Bill 1029 (2013) that requires local planning commissions to consult with military installation officials when locality development plans may have adverse effect the installation. Much of the information in this study relates directly to information in the County's Comprehensive Plan. For instance, updating the WFF APZ information, including AICUZ noise zones, adding a discussion of EMI concerns, etc. could all be included in the Comprehensive Plan update.

## **5.1.3 Pursue available grants and/or supplemental funding sources for JLUS recommendations implementation**



- **Context**

The ability to obtain grants or other supplemental funding will greatly assist in implementing the JLUS recommendations. For implementation to be effective for many of these recommendations and strategies, this kind of assistance will be necessary. This is especially true given the limited resources and the realities of the County's available budget, programs and grants. Some valuable resources that can be considered are OEA Economic Adjustment, and the Catalog of Federal Domestic Assistance (CFDA).

- **Action**

This effort would be spearheaded by the AWWG, tapping the varied experience and contacts available from the agencies represented on this group. Assuming establishment of the AWWG takes place in the very near future, implementation of this recommendation is feasible in the short term.



## **5.1.4 Establish a process for identifying County strategies to address incompatibilities within the WFF aircraft clear zones**



- **Context**

In seeking to promote compatible land use in the areas surrounding the WFF, both existing and potential future land uses should be addressed. This recommendation addresses existing incompatibilities in the clear zones for which a structured process for mitigation is needed. The process would include developing a clear zone strategic action plan that identifies and prioritizes critical incompatible properties, on parcel-by-parcel basis; developing strategies to address the existing incompatibilities; and recommending appropriate actions to discourage operational encroachment. Examples of this strategic action plan include Encroachment Action Plans (EAPs), Clear Zone/APZ Master Plans, etc. There are approximately 75 acres located within the aircraft operational clear zones.

# Accomack County Comprehensive Plan Appendix C: JLUS RECOMMENDATIONS

- **Action**

NASA, DOD, and Accomack County are all critical resource partners for this effort. The lead role for implementing this recommendation will be determined by the AWWG. The DOD Instruction 4165.57 Air Installations Compatible Use Zones (AICUZ) and current NASA guidance will be used as technical resources for this initiative. Implementation of this recommendation involves establishment of a process for addressing incompatibilities, not the actual accomplishment of mitigation of existing incompatibilities. This will provide guidance and support for the potential mitigation to the appropriate partner organizations responsible for implementation. This is the basis of considering this to be a short term effort.

*For graphical depiction of the clear zones with reference to existing incompatible land use, see Figures 2.14 (p. 35), 4.6 (p. 67), and 4.7 (p. 69). See Appendix F for magnified depiction of impacted areas.*

## 5.1.5 Establish a collaborative review process for requests relating to development of wind turbines, cell towers, radio frequency emitters or structures

- **Context**

This recommendation is intended to discourage the permitting of structures that may cause electromagnetic or radar interference that would adversely impact DOD or NASA mission operations on or associated with the WFF. It is also intended to encourage compatible siting for such development by recommending alternative compatible sites. To effectively determine compatible sites, a collaborative effort between the County, NASA, the DOD, and the Town of Chincoteague will be needed. A change in forms/questionnaires for requestors represents a likely help to identify potential RF emitter sources. As these requests are received, three primary factors considered are power level, frequency and height. Airport overlay districts are typically used by the FAA for approval of requests for developments with potential impact on aircraft operations.

- **Action**

The anticipated lead role is the AWWG, with critical support from the following resource partners: DOD, NASA, Accomack County, and the Town of Chincoteague. The primary resources, however, for reviewing energy development requests will continue to be the established NASA processes for proposal reviews and the DOD Siting

Clearinghouse. This recommendation is intended to establish a process to enhance communications. Therefore, assuming near future establishment of the AWWG, implementation is anticipated in the near term.

## 5.1.6 NASA/Navy notify Accomack County and AWWG of offshore energy development to identify potential operational interference



- **Context**

The intent of this recommendation is to ensure Accomack County is kept apprised of offshore energy development requests as DOD and NASA seek and support useful opportunities for offshore energy developments, while discouraging initiatives that would adversely impact DOD and NASA mission operations at or associated with WFF.

- **Action**

The lead role for this coordinative effort would be the AWWG, with DOD, NASA, Accomack County, and the Town of Chincoteague as resource partners. The established NASA policy and the DOD Siting Clearinghouse are the primary resources for this recommendation as they are tasked to review alternative energy requests, each via their own independent formal processes for proposal reviews. The DOD process is delineated on the DOD Siting Clearinghouse website. Short term implementation is anticipated since the primary enabling action required is the establishment of the AWWG.

# Accomack County Comprehensive Plan Appendix C: JLUS RECOMMENDATIONS

## 5.2 SHORT- TO MID-TERM RECOMMENDATIONS

### 5.2.1 Establish a range hazard notification area and provide notifications of hazards associated with rocket launches

- **Context**

This recommendation aims at providing an effective tool for increasing awareness and for enhancing notifications of potential rocket launch hazards in the range hazard area. Rocket launches at WFF Wallops Island are inherently hazardous and to meet NASA's range safety criteria, the risk to persons and property must be within acceptable limits. Potential hazards include (1) Within the 10,000 feet arc, debris and direct blast in the event of rocket launch failure on the launch pads or immediately after launch and (2) within the 10,000 feet arc, but also the 20,000 feet arc, dissipated toxic propellant vapors and shattering of windows due to overpressure from a launch failure near the pad.

Safety notifications are a key strategy to mitigating these potential hazards. NASA's existing, robust notification process would be enhanced and would involve three components as follows:

1. Real Estate Disclosure: Involves notification when real estate transactions occur for properties located within the range hazard area. These notifications would be provided by the County and would address the potential hazards and impacts associated with rocket launch events. As there are no known precedents to date with respect to rocket launch facilities, Virginia enabling legislation requiring full real estate disclosure may be pursued by NASA and the County as a next step.
2. Building Permits/Future Construction: Involves notification of potential hazards within the range hazard area and suggests recommended construction materials and methods to help mitigate those hazards. This notification would occur when applications are submitted for building permits.
3. Launch Emergency Notification System (ENS): Involves pre-launch notifications to people within the range hazard area. NASA would work with the County to coordinate and utilize the County's Code Red notification system, and work with them to take advantage of future notification technologies.

An additional (or next) step for mitigating the impact of rocket launch hazards would be to amend the existing



County Zoning Ordinance and Subdivision Ordinance. This option encourages compatible land use within the rocket launch hazard area, using the County's zoning and subdivision ordinances. This step would also require enabling legislation, as there are no known precedents around other NASA launch facilities where compatible land uses are defined and/or regulated within the range hazard area.

- **Action**

Accomack County would assume the lead role for implementation, with NASA as a critical resource partner. Several resources (documents, agencies, systems, etc.) needed for implementation are as follows: NASA Range Safety Manual; Accomack County Comprehensive Plan; the potential to integrate with County Code Red Notification System; and the Virginia Commercial Space Flight Authority (VCSFA). Because the resources required to implement are available, efforts to utilize them effectively to accomplish the intended notifications are expected to make implementation possible for the mid-term, and possibly in the short-term.

*For magnified graphical depictions of the range hazard area and the land uses within it, see Appendix G map series.*

## 5.3 MID-TERM RECOMMENDATIONS

### 5.3.1 Establish a WFF Aircraft Operations Overlay District and amend the Accomack County Zoning Ordinance and Subdivision Ordinance for compatible land use in Clear Zone, APZ 1, APZ 2, and other affected areas.

- **Context**

This recommendation serves to establish an effective tool for managing development in areas surrounding WFF with respect to public safety and population density issues. It would enhance the ability to provide specific compatibility guidance for land development within the overlay district and implement other JLUS recommendations. This district would be comprised of all areas within the County's jurisdiction that lie within the WFF Main Base airfield operational footprint, including clear zones, APZ 1 and APZ 2; and potentially areas outside the currently mapped accident potential zones if sufficient rationale exists to warrant inclusion. This district would be distinct from the existing Airport Overlay District in that it relates



# Accomack County Comprehensive Plan Appendix C: JLUS RECOMMENDATIONS

specifically to safety and population density as well as WFF aircraft operations encroachment issues. Establishing this overlay district would encourage compatible land uses by utilizing both DOD AICUZ guidance (as shown in Table 5.1) and NASA guidance as resources.

- **Action**

Accomack County would take the lead role in implementing this recommendation, with DOD and NASA as primary resource partners whose subject matter expertise is invaluable. The primary technical source documents that would inform/guide this effort are the DOD Instruction 4165.57 Air Installations Compatible Use Zones (AICUZ) and current NASA safety guidance. Additionally, implementation of this recommendation would provide a valuable tool for pursuing compatible land use in the future, providing an incentive for accomplishment. These two factors support an anticipated mid-term time frame for accomplishment.

*For graphical depictions of APZs with reference to existing zoning and future land use, see Figures 4.8 (p. 71), 4.9 (p. 75), and Appendices E and F.*

Table 5.1 provides a general reference summary of compatible land uses in APZs.

**Table 5.1 DOD-Recommended Land Uses for APZ**

**DOD Recommended Land Uses for APZ:**

CLEAR ZONE	APZ 1	APZ 2
Agricultural (non-livestock)	Agricultural	Agricultural
	Heavy Industrial	Heavy Industrial
	Recreational/Parks	Recreational/Parks
	Forestry	Forestry
		Commercial
		Personal Services
		Residential (Single Units, detached)

Note: Public gathering places are discouraged in APZs.

**5.3.2 Adopt measures for early and full real estate disclosure with respect to properties located within aircraft accident potential and noise zones. Pursue Commonwealth of Virginia legislation to amend 55-517/55-519 (Required disclosures) to include WFF aircraft operations on the WFF Main Base airfield**



- **Context**

Currently state legislation addressing military air installations is not applicable to WFF since it is not a military installation. The intent of this recommendation is to enable the applicability of AICUZ data as guidance for the WFF Main Base Airfield in order to facilitate appropriate requirements for real estate disclosure. The guidance would be based on both NASA and DOD/Navy AICUZ guidance for these zones as presented in the JLUS Report and consistent with the proposed WFF Aircraft Operations Overlay District.

This recommendation specifically includes action to pursue special legislative enablement for the applicability to WFF Main Base of military notification requirements per Virginia Statutes 15.2-2200, 15.2-2201, 15.2-2204, and 15.2-2211, revised 2013 (3,000-foot boundary notification). This could be accomplished by redefining “military air installations.” The critical issue is notification with respect to the WFF airfield for which the preponderance of operations involves military operations, although it is classified as a non-military airfield.

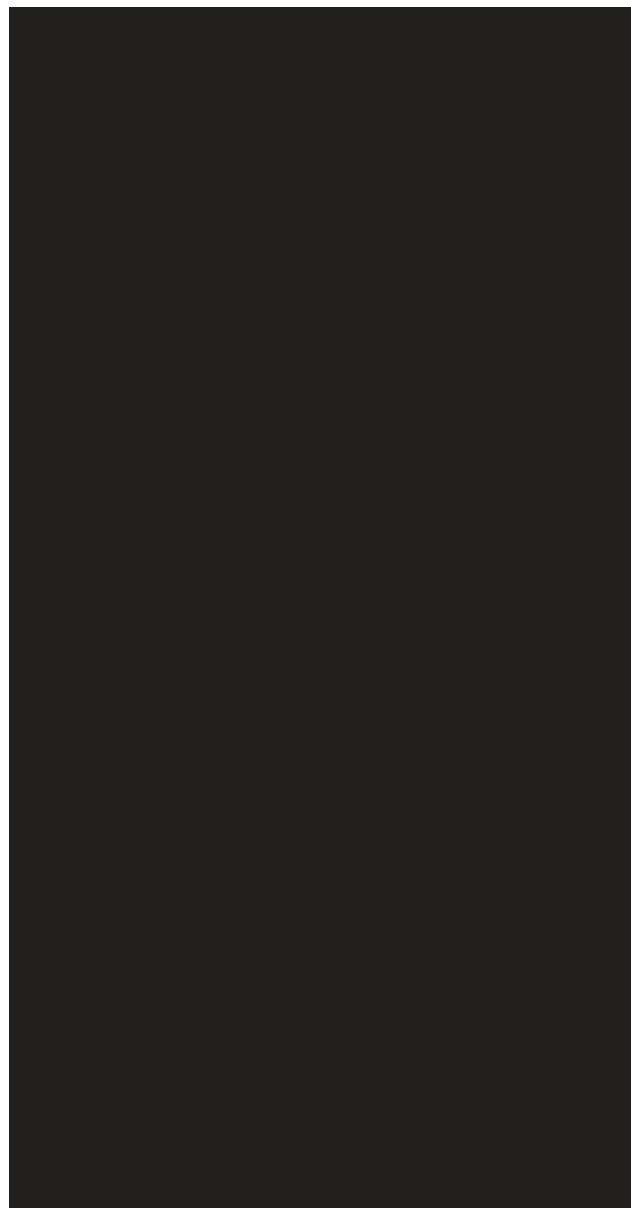
- **Action**

Accomack County and NASA would share the lead role for implementation, with the DOD as a resource partner. The following Virginia legislation applies:

Because implementation of this recommendation requires state-level legislative action to enable its enforceability, a short-term attainment is not possible. Mid-term accomplishment is, however, a possibility only because this is not just a local issue, but much broader, and could receive supportive attention.

*For graphical depiction of APZs and noise zones, see the following: Figures 2:14 (p. 35), 2:15 (p. 37), 4.8 (71), 4.9 (75), 4.14 (p. 93), and Appendix F.*

# Accomack County Comprehensive Plan Appendix C: JLUS RECOMMENDATIONS



## 5.3.3 Provide information regarding incentives for retrofits to windows on existing buildings within the range hazard area

### • Context

Incentives for property owners to install replacement windows capable of withstanding the effects of rocket launches would be a valuable resource. Currently there are no known incentives. This recommendation involves research of viable solutions and incentive sources. Findings would be communicated to property owners within the rocket launch range hazard area. Ultimately this supports land use compatibility within the range hazard area and simplifies NASA's pre-launch notification efforts.



### • Action

Accomack County would take the lead role, with NASA as primary technical resource partner. Resource documents include the Accomack County Comprehensive Plan and NASA's Range Safety Manual. A further resource agency is the VCSFA. A mid-term accomplishment is viewed as possible since the recommendation involves research and communication of findings, not actual installation of potential retrofits.

*For magnified graphical depictions of the range hazard area and properties located under the arcs, see the Appendix G map series.*

## 5.3.4 Encourage the application of noise attenuation measures within the aircraft noise zones as part of the permitting process for new construction



### • Context

This recommendation supports the promotion of compatible land use in the areas surrounding the WFF with respect to noise. The means of doing so is via the permitting process by notifying requestors of potential noise impacts for properties within the 65 decibels DNL or greater noise contours.

### • Action

Accomack County would assume the lead role, with support from DOD and NASA as technical resource partners. The technical information resources that would be communicated to requestors are the DOD Instruction 4165.57 Air Installations Compatible Use Zones (AICUZ) and NASA guidance. Mid-term accomplishment is viewed

Table 5.2 DOD-Recommended Land Uses for Noise

75-79 db DNL	70-74 db DNL	65-69 db DNL
Agricultural	Agricultural	Agricultural
Industrial	Industrial	Industrial
Commercial	Commercial	Commercial
	Recreational/ Parks	Recreational/ Parks
Schools	Schools	
Hospitals	Hospitals	
		Forestry

Note: Residential is discouraged for noise zones 65 db DNL or greater

# Accomack County Comprehensive Plan Appendix C: JLUS RECOMMENDATIONS

as probable, since it depends primarily on technical data support from DOD and NASA involving precedent noise attenuation measures used in similar JLUS locations nationwide.

*For graphical depiction of the noise contours associated with WFF Main Base airfield operations, see Figure 4.13 (p. 91) and Figure 4.14 (p. 93).*

Table 5.2 provides a general reference summary of compatible land uses in aircraft noise zones. Detailed guidance is provided in Appendix E

## 5.4 LONG TERM RECOMMENDATIONS

Although the two recommendations included in this time frame are expected to experience full implementation in the long term, it is vital to their realization that communications and collaborative planning for their future implementation begins now, with ongoing efforts, until sufficient information is provided to serve as the basis of their formulation.

### **5.4.1 Develop a plan for mitigating and/or accommodating the effects of recurrent flooding, storm surge events, and sea level rise for the Navy, NASA, and MARS/VCSFA facilities on WFF Wallops Island**

#### • Context



Numerous groups/initiatives are aggressively exploring the impacts of recurrent flooding, storm surge events and sea level rise on coastal areas. The findings to date indicate serious challenges to the resiliency of these coastal areas. This recommendation encourages the use of the findings, conclusions and recommendations of the various pertinent studies to formulate a coordinated mitigation plan. This plan is vital to ensure integration of County, NAVY/SCSC, NASA, USFWS, and NOAA mitigation planning initiatives. The mitigation plan would take into account the latest data available (flood maps, sea level rise, etc.). The plan will incorporate concrete mitigation actions and even potential contingency actions, such as relocation plans for the Navy, NASA, MARS/VCSFA and other agency facilities located on WFF Wallops Island. The mitigation plan will also incorporate planning actions for transportation and other critical infrastructure critical to WFF operations.

#### • Action

NASA, Accomack County and the A-NPDC would coordinate the implementation of this recommendation. Critical partners in the effort are the Navy, the DOD, MARS/VCSFA, and MACRI. Resource studies, legislation or agencies/groups such as the following would be valuable:

- Virginia Subpanel on Recurrent Coastal Flooding MACRI / Climate Adaptation Science Investigation Update
- Virginia Senate Bill 964
- Executive Order 11988 (Federal)
- Executive Order 13690 (Federal)
- The Navy's Task Force Climate Change
- Recurrent Flooding Study for Tidewater, Virginia, Center for Coastal Resources Management, VIMS
- Eastern Shore of Virginia Climate Adaptation Working Group
- Recurrent Flooding Study for Tidewater, Virginia, Center for Coastal Resources Management, VIMS

Implementation is expected to be attainable in the long term for the reasons provided in the previous recommendation.

### **5.4.2 Develop a plan for mitigating and/or accommodating the effects of recurrent flooding, storm surge events, and sea level rise for the coastal areas of Accomack County within the study area**

#### • Context



The previous recommendation focused on federal facilities located on WFF Wallops Island. This recommendation has the same intent with respect to Accomack County coastal areas within the study area. As with the previous recommendation, this recommendation uses the results of the ongoing studies in forging a well-coordinated plan for addressing the impacts of recurrent flooding, storm surge events, and sea level rise on coastal Accomack County. This plan is vital to ensure mitigation planning initiatives cover Accomack County coastal areas within the study area.

As with the previous recommendation, the mitigation plan will take into account the latest data available (flood maps, sea level rise, etc.). The plan will incorporate concrete mitigation actions for affected coastal areas in the study area. The planning actions should also incorporate mitigation plans for transportation infrastructure critical to local residential and business accessibilities.

# Accomack County Comprehensive Plan Appendix C: JLUS RECOMMENDATIONS

- **Action**

The coordinative role for implementation would belong to Accomack County and A-NPDC, with support from the following partners: The Town of Chincoteague, MACRI, USFWS/DOI, TNC and NOAA. Resource studies, legislation or agencies/groups such as the following will be valuable:

- MACRI/Climate Adaptation Science Investigation Update
- Accomack-Northampton Planning District Commission
- Virginia Subpanel on Recurrent Coastal Flooding
- Virginia Senate Bill 964
- Recurrent Flooding Study for Tidewater, Virginia, Center for Coastal resources Management, VIMS
- Eastern Shore of Virginia Climate Adaptation working Group

Implementation is expected to be attainable in the long term for the reasons provided in the previous recommendation.

## 5.5 ON-GOING RECOMMENDATIONS

### 5.5.1 *Provide an annual update to the Accomack County Board of Supervisors regarding JLUS implementation progress*

- **Context**

In order to continue to engage the public in efforts to maintain land use compatibility in areas surrounding WFF following completion of this JLUS, the intent of this recommendation is to provide (at a minimum) annual JLUS implementation status via the public forum of the Accomack County Board of Supervisors meetings.

As an extension of the JLUS public participation plan, this effort represents an attempt to enhance continued connectivity with the community for implementation actions for JLUS recommendations. As JLUS implementation issues come before the Board of Supervisors, the information would be accessible to the public, since these meetings are open to the public.

- **Action**

Implementation would be an ongoing effort led by the Accomack County Planning Department. Resource partners in this effort would include Navy/SCSC, DOD, NASA, VCSFA & other agencies participating with the AWWG. Additionally, the Accomack County official website is an available communication medium for JLUS implementation status. Implementation is intended to take place regularly as an ongoing versus one-time effort.

### 5.5.2 *Update the Accomack County GIS database with JLUS Report data following adoption by the County Board of Supervisors*

- **Context**

The intent of this recommendation is to enhance the County's tools for monitoring land use changes in the WFF operational footprint. Spatial data developed for the JLUS Report is valuable for foreseeable future land management in the WFF operational footprint. Updating the Accomack County GIS database with the JLUS Report land use data set and APZ and noise zone updates is a useful start. Further, maintaining this database for the region into the future will provide an ongoing resource for data collection and updating of GIS data, enabling accurate analysis for the County, WFF activities, and the AWWG. Most importantly, continued sharing of GIS data between the JLUS partners will assist in monitoring future land use changes, their impacts on compatibility, and the consistent communication of this information.

- **Action**

Accomack County has the lead role in implementation, with DOD and NASA as resource partners. Though near-term implementation actions are feasible, the intent of this recommendation is to provide a continual sharing and updating of data.

## **APPENDIX C**

### **Five Year Update Amendment**

**The Following Sections were Updated or Added thru this Amendment:**

<b><u>SECTION</u></b>	<b><u>STATUS</u></b>	<b><u>PAGE</u></b>
Executive Summary – Vision for the Future	Updated	C-2
Chapter 6 – Demographics	Updated	C-2
NEW SECTION – Education	Added	C-3
NEW SECTION – Trends in Agriculture/Rural Counties	Added	C-8
NEW SECTION – Economic Development	Added	C-11
Chapter 6 – Coastal Resiliency	Updated	C-17
Chapter 6 – Review of Future Land Use Map (FLUM)	Added	C-20

**Adopted by the Board of Supervisors**

**On October 17, 2018**

## Vision for the Future (Executive Summary)

*Accomack County is a rural place, consisting of a mixture of agricultural, forestal, coastal, commercial, residential and industrial land uses. We desire economic development that is compatible with and adds value to our rural economy. Economic growth is market appropriate for the Eastern Shore and is located along Lankford Highway (Route 13) and Chincoteague Road (Route 175) so that the undeveloped agricultural, forestal and coastal areas of Accomack County are preserved. The areas surrounding existing towns and villages are appropriate locations for a traditional development pattern of residential and light commercial growth in a manner consistent with the existing character of each town or village.*

*Our history, culture, geography, location, and people define who we are and what we value.*

## Demographics (Chapter 6)

The 2010 census data revealed a population of 33,164 people in Accomack County, which is lower compared to the population of 38,305 people recorded in the 2000 census data. **The U.S. Census QuickFacts for Accomack County, which contains updated estimates through July 2017, can be viewed at the following link:**

<https://www.census.gov/quickfacts/fact/dashboard/accomackcountylvirginia,US/PST045217>

In July 2017, the Weldon Cooper Center (WCC) released population projections for the Commonwealth of Virginia and information specific to Accomack County was provided, which are shown below. The WCC data shows the population remaining relatively static except in the year 2040, where it projected a decline of over 20% from its prior projections in November 2012.

2010 Census	2020 (WCC)	2030 (WCC)	2040 (WCC)
33,164	33,775	30,369	26,615

The following is a comparison between the 2030 population projections in the 2008 Comprehensive Plan, the Weldon Cooper projections that were released in November 2012 and were adopted as part of the 2014 Amendment to the Comp Plan, and the Weldon Cooper projections that were released in July 2017.

2030 Population Projections (2008 Comprehensive Plan)	2030 Population Projections (Weldon Cooper Center – November 2012)	2030 Population Projections (Weldon Cooper Center – July 2017)
46,500	33,568	30,369

Other noteworthy information from the 2010 census and 2012 and 2017 Weldon Cooper population projections are as follows:

- A percentage increase of residents age 55 or over and a slightly declining birth rate in the coming decades indicates that Accomack County has an aging population.
- The Hispanic population in Accomack County is increasing.
- On a percentage basis, the White and Black populations in Accomack County are decreasing while other race populations are increasing.

The Weldon Cooper Center population projection data can be viewed at the following link:  
<http://www.coopercenter.org/demographics/virginia-population-projections>

Based on the 2010 Census and the 2012 and 2017 Weldon Cooper Center population projections indicating a consistent projection for the next 20 plus years, no adjustments to the Future Land Use Plan Map are necessary.

## **EDUCATION**

### **Accomack County Public Schools**

**Our Mission:** The Mission of Accomack County Public Schools is to provide a safe, engaging student-centered environment where all learners are challenged, encouraged, and supported to maximize growth and be prepared for further education, citizenship and work.

**Our Vision:** Accomack County Public Schools will be a community of diverse learners where all members are valued, challenged, and expected to grow.

### **Our Goals**

**Goal 1:** Ensure students graduate with the knowledge and skills to be successful in further education and the workforce.

#### **Key Strategies:**

Engage all students in authentic, rigorous work.

Expand opportunities for students to explore and pursue career opportunities.

Ensure students enter the 9<sup>th</sup> grade with the knowledge, skills, necessary support, guidance, and a plan to succeed in a course of study leading to further education and entry into the workforce.

Ensure students connect what they have learned with new learning by aligning the curriculum vertically.

**Goal 2:** Close gaps in achievement.

#### **Key Strategies:**

Use observational and student growth data to improve teaching and learning for all membership groups.

Implement a learning community model to improve collaboration, effectiveness, and student outcomes.

Ensure inclusion model and English-language learner support structures are effectively implemented.

Respond to instructional audit recommendations, ensuring identified practices are in place.

**Goal 3:** Recruit, develop, and retain high quality teachers, administrators, and support staff.

**Key Strategies:**

- Expand and enhance recruiting efforts.
- Develop, implement and refine a three-year induction program for novice teachers.
- Identify professional development priorities, aligning processes and resources.
- Research, identify, and implement additional strategies to improve retention in critical need areas.
- Implement performance-based evaluation systems for all employees.

**Goal 4:** Institute a continuous improvement process to ensure effectiveness and competitive performance.

**Key Strategies:**

- Establish and implement a well-defined process for universal strategic planning at the division, department and school levels, including performance measures.
- Conduct program and department audits.

**Goal 5:** Establish efficient, transparent systems for the allocation and alignment of resources to support the division's vision, mission, and goals.

**Key Strategies:**

- Develop and implement division-wide staffing formulas for all departments.
- Benchmark, analyze, develop, and implement revised compensation model.
- Plan use and allocation of operational and grant funds in an integrated manner.

**Eastern Shore Community College**

Eastern Shore Community College (ESCC) is a member of the Virginia Community College System (VCCS) and serves the residents of Accomack and Northampton Counties as a two-year institution of higher education. Originally a branch of the University of Virginia, the institution joined the Virginia Community College System in 1971. The college was accredited and granted membership in the Southern Association of College Schools Commission on Colleges (SACSCOC) in 1973 and moved to its current location in Melfa on approximately 115 acres in 1974.

The current academic and administration building includes classrooms, laboratories, a bookstore, a lecture hall, administrative offices, a student lounge, and a Learning Resources Center/Library. However, space is limited and the ability to expand course offerings is restricted; therefore, ESCC broke ground on a new \$20 million academic and administration building in fall 2017. This project will allow the ESCC to expand its program offerings and provide for a Technical Programs Innovation Lab to better meet the changing demands of local business needs for training and certifying individuals in technical fields.

The Business Development and Workforce Training Center opened in January, 2009 and houses Workforce Development Services including: occupational trade areas, allied health programs, industrial technology programs and employer training programs. The Workforce Development Program is able to develop customized contracted training for an organization or business; offers classes in general business basics (computer program usage, bookkeeping), and provides classes

or on-line access to classes that are required to obtain state certifications in the building trades which otherwise would require travel to the Hampton Roads region over multiple weeks for this certification.

Eastern Shore Community College offers associate degree programs, certificate programs and career study certificate programs. Currently, there are (5) associate of applied science degrees (AAS), (5) associate of arts and sciences degrees (AA&S), these degrees are commonly referred to as the “transfer degree” programs, (5) certificate programs and (9) career studies certificate programs (CSC) from which to choose a field of study.

Below is the enrollment for 2010 – 2016 by program and indicating participation by each academic year by Full Time Participants (FTE) as well as all part-time or casual participants (HC). This information supports the need for maintaining the ESCC as an option for continuing education for our residents and provides the ability for our residents to pursue certification and employment goals in fields that require supplemental training and certification, particularly in the building and trades industry and the medical support industry.

#### ENROLLMENT BY PROGRAM TYPE: CURRICULUM ENROLLMENT

CURRICULUM	FALL 2016		FALL 2015		FALL 2014		FALL 2013		FALL 2012		FALL 2011		FALL 2010	
AA & S	HC	FTE												
Business Admin	28	17	33	23	44	31	43	29	40	28	60	38	45	35
Education	24	16	21	14	32	21	29	18	40	25	40	28	36	27
General Studies	70	43	67	46	84	52	99	60	118	72	132	82	154	104
Liberal Arts	65	45	74	53	69	45	71	49	85	62	100	77	66	53
Science	82	47	93	52	108	69	131	79	110	66	126	77	139	83
<b>Sub Total</b>	<b>269</b>	<b>168</b>	<b>288</b>	<b>188</b>	<b>337</b>	<b>218</b>	<b>373</b>	<b>235</b>	<b>393</b>	<b>254</b>	<b>458</b>	<b>304</b>	<b>440</b>	<b>302</b>
AAS	HC	FTE												
Info. Systems Tech.	2	1	2	1	6	2	6	3	4	2	7	5	3	1
Management	26	13	29	15	32	18	40	25	33	21	34	22	42	29
Management-IST	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Early Childhood Ed	27	16	29	17	37	19	55	32	65	37	57	35	44	31
Electronics Tech	20	14	23	15	21	14	18	12	33	20	26	18	22	17
<b>Sub Total</b>	<b>75</b>	<b>44</b>	<b>83</b>	<b>48</b>	<b>96</b>	<b>53</b>	<b>119</b>	<b>72</b>	<b>147</b>	<b>89</b>	<b>137</b>	<b>89</b>	<b>128</b>	<b>92</b>
CERTIFICATES	HC	FTE												
Electronics	1	0	2	1	5	4	4	3	2	1	1	0	3	2
Industrial Main.Tech	11	7	12	7	16	11	16	12	16	11	10	8	8	5
Medical Assisting	33	24	34	26	30	18	34	18	51	32	45	31	61	42
Practical Nursing	30	16	38	22	58	31	58	29	47	30	69	44	60	35
Welding	9	5	9	5	16	8	18	12	11	6	11	7	15	8
<b>Sub Total</b>	<b>84</b>	<b>52</b>	<b>95</b>	<b>61</b>	<b>122</b>	<b>72</b>	<b>130</b>	<b>74</b>	<b>135</b>	<b>86</b>	<b>155</b>	<b>103</b>	<b>167</b>	<b>159</b>

CAREER STUDIES CERTIFICATES (CSC)	HC	FTE	HC	FTE												
Early Childhood Dev.	-	-	-	-	2	1	-	-	1	0	7	2	3	1		
Electricity (new 2014)	3	2	-	-	3	2	-	-	-	-	-	-	-	-	-	-
HVAC	4	2	3	1	9	5	7	3	8	3	18	7	16	6		
Long-Term Care Assistant	7	4	11	5	16	7	13	4	12	5	15	6	10	4		
Med. Admin. Office Specialist	1	0	-	-	-	-	2	1	5	3	4	2	-	-		
Med. Code.& Bill Specialist	3	1	14	6	2	0	5	2	1	0	3	1	2	1		
Small Business Manage.	1	0	1	0	1	0	1	1	1	1	1	1	1	1		
Welding	3	1	4	2	4	2	10	6	8	4	4	3	3	1		
<b>Sub Total</b>	<b>23</b>	<b>10</b>	<b>33</b>	<b>14</b>	<b>37</b>	<b>18</b>	<b>39</b>	<b>18</b>	<b>40</b>	<b>19</b>	<b>54</b>	<b>24</b>	<b>38</b>	<b>15</b>		

ESCC also partners with the local secondary school systems on the Eastern Shore to offer high school students who are college-bound to enroll in selected courses for college credit; this category is known as dual enrollment and the participation rate is provided below for 2010-2016. The level of students accessing this program has remained relatively consistent and is funded as part of the operating costs of the local school system.

#### UNDUPLICATED DUAL ENROLLMENT BY HIGH SCHOOL: ANNUAL

HIGH SCHOOL	2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	2010-11	2009-010
Arcadia HS	78	89	105	54	77	127	100	71
Chincoteague HS	29	11	18	5	23	5	42	3
Nandua HS	99	108	92	74	75	78	65	77
Tangier Combined	3	6	-	3	-	8	0	4
<b>Sub Total: ACCOMACK County</b>	<b>209</b>	<b>214</b>	<b>215</b>	<b>136</b>	<b>175</b>	<b>218</b>	<b>207</b>	<b>152</b>
Northampton HS	20	12	38	34	36	41	42	38
Broadwater Academy (private)	30	30	39	37	42	80	82	76
<b>GRAND TOTAL</b>	<b>259</b>	<b>256</b>	<b>292</b>	<b>207</b>	<b>253</b>	<b>339</b>	<b>331</b>	<b>266</b>

For 2016/2017, there were 929 students enrolled at ESCC. Of that total, 325 were enrolled in transfer programs (AA&S), 269 were enrolled in Career and Technical programs (AAS) or the certificate programs and the career studies certificate programs (CSC), and 334 students were enrolled as unclassified. Additionally, there were 259 high school students (unduplicated) enrolled in the dual enrollment program. Below is the enrollment for the last ten years between those seeking an associate's degree (Annual FTES) versus all other part-time or casual participants. There has been some decline of participants in both categories, which may be reflective of the

declining population of the Eastern Shore or could be attributable to other causes such as cost or interest. The county will need to work closely with the ESCC to monitor and understand the participation rates and ensure that the ESCC remains viable to the community.

Academic Year	Unduplicated Headcount	Annual FTES
2016-2017	929	382
2015-2016	987	417
2014-2015	1,131	489
2013-2014	1,142	511
2012-2013	1,338	591
2011-2012	1,381	640
2010-2011	1,461	688
2009-2010	1,446	662
2008-2009	1,332	577
2007-2008	1,215	542
2006-2007	1,106	486
2005-2006	1,103	444

The breakdown of the type of student is useful in examining how best to approach and ensure the ESCC is meeting the needs of our community. The table below shows an increasing participation from individuals with military service and a consistent option for first time college participants.

#### STUDENT TYPE

TYPE	Fall 2016	Fall 2015	Fall 2014	Fall 2013	Fall 2012	Fall 2011	Fall 2010
Returning	443	542	562	626	681	721	705
New	243	186	248	192	265	250	300
Transfer	19	17	29	39	44	51	47
First Time in College	136	131	146	157	167	205	195
Military	50	68	79	77	84	25	29

ESCC is an essential component of the county's educational system, providing first-time entry into college for some as well as increasing preparedness for those looking at a four-year degree program. It also develops workforce training, dependent upon the needs of the business community and employment needs of our residents. The county needs to continue working with the ESCC to determine the effectiveness of its program offerings and assist as a conduit to its business community to determine what skills, certification or training are needed to ensure the employee base is available for growth and expansion of our businesses.

## **TRENDS IN AGRICULTURE/RURAL COUNTIES**

We have looked nationally and statewide and are not seeing any obvious trends that have not already been identified by the County and considered as part of the County's future development. There are several areas that the County has been actively engaged in the planning, development, and execution of either directly by a government entity or through approval of a third party proposal; these areas are still growing and reacting to the needs of the community.

### **Broadband Service:**

In terms of future trends, the expansion of high-speed broadband services is essential to every community in the United States in order to remain competitive economically and provide the quality of life services that is becoming the expected norm in terms of high-capacity, 24/7 availability to the internet for shopping and entertainment purposes as well as for business purposes which include entrepreneur and home-based businesses.

The role of technology and its deployment throughout the county should be detailed further since it will play a role in the economic development, education, health care and housing issues of the county.

### **Health Care Services:**

The expansion of broadband services to all areas of the county will also be critical in meeting the health care needs of its community since the future and face of health care delivery is in rapid flux due to the restructuring of the health care system at the federal level. Many rural localities have been faced with the closure of their local hospital due to ever-increasing operational costs against a declining population service area. While a new hospital has relocated to Accomack County, the challenges facing the continuation of that service are still the same challenges facing all rural hospitals – declining population base, loss of funding from federal and state government thru the health care system, and increased costs in providing more technologically driven health-care.

The County's demographic projections for the 50 and older population segment remains consistent at about 15,700 people for the next thirty years; however, this age group becomes a larger percentage of the total population during this same projection time frame, projected at 31.7% of the total population in 2020, 47% of the total population in 2030, and at 46.9% of the total population in 2040. There is currently one private assisted living facility, the Hermitage on the Eastern Shore in Onancock with 35 beds, and one publicly-assisted facility, Shore Health & Rehab Center in Parksley with 136 beds. However, in 2017, the Arcadia Nursing Home & Rehab Center closed, thereby removing 60 beds that had previously served this market. The county may be adequately served by the medical facilities currently available but it will require monitoring by the County and its health care professionals to continue to assess the demand and need for assisted living care facilities.

One area that has not been fully tapped is residential development and services targeted at the 50 and older age bracket. The establishment of Riverside Shore Memorial Hospital in Accomack County provides an opportunity to ensure the Comp Plan supports the growth of medical industries that complement the operations of the hospital and also encourages housing development and associated amenities that meets the need of this type of consumer who is physically active but may have need for access to medical services in the near future.

Alternative Energy Sectors:

There are growth opportunities in certain sectors; however, they may conflict with other values and community priorities. These areas are in the green energy sectors for wind and solar farms.

The County has approved two solar farm projects: Eastern Shore Solar (shown to the right), a 2,859 acre property comprised of 44 parcels on Withams Road in Oak Hall with the developed project acre of 965 of an 80 megawatt solar farm; and Sun Tech, a 600 acre property near Tasley for a 20 megawatt solar farm. These large utility scale solar farms are allowed by special use permit by the County, are governed by Permit by Rule by the Virginia Department of Environmental Quality, and are desirable by the traditional energy sector companies to assist in diversification of their energy portfolio. The County will need to evaluate the dedication of formerly active agricultural land to a 30 year lease for solar farm development against other community priorities to determine its position on additional utility scale solar projects.



On January 5, 2017, Accomack County removed utility scale solar and wind projects from consideration in the Agricultural Zoning District. There were several reasons for this action; however, one of the primary reasons was the local tax revenue implications caused by Virginia Code §58.1-3660 which has exempted 80% of the assessed value of utility scale “certified pollution control equipment facilities” greater than 20 megawatts ; solar energy equipment and facilities are included in the definition of “certified pollution control equipment facilities”. This law does have a sunset clause for the 20 megawatt or greater projects with the exemption ending for projects that have not begun construction as of 1/1/2024.

Agriculture

Accomack County has an extensive history with agriculture including the large-scale production of poultry and crops.

The 2018 Annual Poultry report contains information concerning the number of poultry houses, the economic contributions of the poultry industry to the general economy of the County and addresses the environmental components of the poultry industry to the County. Said report can be viewed at: <https://www.co.accomack.va.us/home/showdocument?id=9090>.

Large scale crop industries farmed in Accomack County include tomato production, soybean production, and corn as feeder crop. According to Agriculture Census Data 2012, the Crops Sale in Accomack County totaled \$59,778,000 or 35% of all agricultural sales with livestock sales making up the rest at \$112,419,000.

The Poultry Industry has transitioned from smaller grower operations to larger-scale, high density growing operations and this was experienced in Accomack County starting in July 2014

through December 31, 2017 where 240 new larger poultry houses were approved. This information is detailed in the Annual Poultry Report, referenced above. Most of the broiler chickens produced in Accomack County are processed in the Perdue and Tyson processing plants located in the county.

Smaller, family farms are declining and their land and operations are being absorbed by larger, national farming corporations. The 2012 Agriculture Census Data shows that the number of farms declined from 248 farms in 2007 to 226 farms in 2012, a decline of 9% which is greater than the national average which saw a decline of only 4% during this same time frame.

## ECONOMIC DEVELOPMENT

### **Economy & Economic Growth**

The Top 10 employers for Accomack County as of the Quarterly Census of Employment and Wages (QCEW) for the third quarter (July, August, September) 2017 are the following:

1. Perdue Products
2. Tyson Farms
3. Accomack County School Board
4. Riverside Regional Medical Center
5. County of Accomack
6. National Aeronautics & Space Administration
7. LJT Associates, Inc.
8. Wal Mart
9. Eastern Shore Community Services
10. Eastern Shore Rural Health System

### **Wallop's Governmental Complex & Wallop's Related Private Sector Businesses:**

The Wallop's Governmental Complex: includes NASA Wallop's (including contractors), National Oceanic and Atmospheric Administration ("NOAA"), NAVY Surface Combat Systems Center ("NAVY SCSC"), Coast Guard, Virginia Commercial Space Flight Authority ("Virginia Space") and Wallop's Research Park – The Wallop's Governmental Complex is a major employer in Accomack County with an estimated 1,725 employees. NASA Wallop's, NAVY SCSC, NOAA, and the Coast Guard are US Government entities with facilities on the NASA Main Base and Wallop's Island. Their websites are listed below.

NASA Wallop's: <https://www.nasa.gov/centers/wallops/home>

NAVY SCSC: <http://www.navsea.navy.mil/Home/SCSC.aspx>

NOAA: <https://www.wcd.a.noaa.gov/>

Coast Guard: <https://www.atlanticarea.uscg.mil/Our-Organization/District-5/District-Units/>

As part of the \$4.094 Trillion 2018 Federal Budget, military spending is increasing by 9%, with some of that increased military spending coming to Accomack County through NAVY SCSC who is adding over 60 new personnel.

Virginia Space is located near the NASA Main Base gate on Atlantic Road. Locally, Virginia Space manages and operates the Mid-Atlantic Regional Spaceport (MARS) on the southern portion of Wallop's Island and the UAS runway and facilities located on the north end of Wallop's Island.

After many years of planning and discussion, the Wallop's Research Park construction began in 2014 and was completed in 2016. The park is open for business. For more information about the Wallop's Research Park, visit

<https://www.co.accomack.va.us/businesses/wallops-research-park-information>.

**Wallops Related Private Sector Businesses:** Over the past 10 years or so, there has been an ebb and flow with the number of business that have located in the County with ties and/or support for the Wallops Governmental Complex or that locate in the County due to the proximity and opportunity of the Wallops Governmental Complex. Companies like Orbital, SRS and others have located in Northern Accomack County due the Wallops Complex.

There has been significant Federal, State, and Local government investment in the Wallops Complex over the past 10 years. It is anticipated that the government investment will create Wallops' related, private sector investment and job creation.

**4 - Corners Area – Hospital/Retail & Commercial center** – expect growth here, especially for national names.

Within a part of the Town of Onley and the County is an area locally referred to as the “4-Corners” area. The traffic signal on Rte. 13 and Market and Main St is the center of the 4-Corners area. The 4-Corners area is the largest retail and commercial hub in the County. Riverside Shore Memorial Hospital and its 300 employees relocated to this area and the hospital opened in February 2017. Numerous local businesses and nationally recognized chain stores and restaurants are located along Rte. 13 here.

Municipal sewer and limited water service is available in this area. A planned ‘northern spur’ will serve the Chesapeake Square shopping center and nearby properties. Discussion about expanded water service is currently underway.

It is anticipated that this area of the County will continue to grow and expand incrementally over time.

**Tourism:**

Tourism has played a significant role in the County’s economy for decades, especially in the northern end of the County. The county, by its geographic location, has been able to lay claim to several assets that tourism benefits from: beach access, water access, fishing access, and wildlife access. Due to the limited transportation access to the Eastern Shore, development has not been rampant similar to other coastal locations. In particular, Chincoteague Island and Assateague Island have a naturalized coastal location which has developed a localized economy geared toward servicing a tourism clientele. There is a strong partnership with the U.S. National Park Service, U.S. Fish & Wildlife Service and the Department of Natural Resources who oversee Assateague Island which offers visitors to the region access to an expansive beach, wildlife, dunes, and wetlands for public outdoor recreational use and enjoyment. Chincoteague is home to many campgrounds, rental properties, several hotels, restaurants and shops that cater to the seasonal visitor.

The growth of Wallops/NASA has led to an ancillary branch of tourism – those interested in learning about and observing rocket launches – and is allowing growth of the tourism season beyond the naturally warmer spring, summer and fall months to fall throughout the year.

The County is a member of the Eastern Shore of Virginia Tourism Commission which is focused on developing, promoting and marketing the tourism resources and advantages of the two counties (Accomack and Northampton). This authority provides several regional marketing resources and guides and is gaining strength in providing a social media presence.

Traveler spending as reported by the Virginia Tourism Corporation continues to increase for Accomack County. From 2012 to 2016, the number of individuals employed in a tourism related position increased by 17% with a greater increase on actual payroll expenditures by almost 28% during that same time frame.

Travel Economic Impacts	2012	2013	2014	2015	2016
<b>Employment<sup>(1)</sup></b>	1,892	1,968	2,043	2,103	2,214
<b>Expenditures<sup>(2)</sup></b>	\$163,393,774	\$169,903,203	\$180,681,609	\$185,206,622	\$196,143,807
<b>Payroll<sup>(3)</sup></b>	\$33,302,816	\$35,458,230	\$37,480,566	\$39,355,082	\$42,552,965

Source: Virginia Tourism Corporation

NOTES:

<sup>(1)</sup>Employment represents the estimates of direct travel-related employment in the locality.

<sup>(2)</sup>Expenditures represents the direct spending by domestic travelers including food, accommodations, auto transportation, public transportation, incidental purchases, entertainment/recreation and travel generated tax receipts.

<sup>(3)</sup> Payroll represents the direct wages, salaries and tips corresponding to the direct travel-related employment.

Continued efforts need to be made to ensure sufficient guest services are provided to meet the demand and growth of the tourism industry for Accomack County, include lodging, dining, and entertainment opportunities. Chincoteague Island is home to the area's first water park which is opening June 2018 and will be monitored to determine if this type of manufactured entertainment venue achieves support from the seasonal as well as the year-round residential marketplace.

**Agriculture** – Agriculture has a major presence in Accomack County. According to the 2012 Census of Agriculture, approximately 77,389 acres of land, which is 26.57% of the total land in the County, is actively farmed. The County's major crops produced are Corn and Soybeans. For 2017, the County is the top producer in the state for crop for grain, soybeans, and winter wheat, according to the 2017 Virginia Agricultural Statistics Annual Bulletin. The value of each crop, based upon the cost per bushel at time of harvest is shown below:

TYPE	# of Bushels	Cost Per Bushel	TOTAL VALUE
Crop for grain	2,803,000	\$4.00	\$11,212,000
Soybeans	1,205,000	\$9.40	\$11,327,000
Winter Wheat	772,000	\$4.75	\$ 3,667,000

As reported in the 2012 Census of Agriculture, the number of farms in the County is 226, a decrease of 9% from the 2007 Census of Agriculture and the average farm size in the County is 342 acres, a decrease of 10%. However, the total market value of products sold, as reported in

the 2012 Census of Agriculture, is \$172,197,000 which is split between crop sales constituting 35% of sales and livestock sales constituting 65% of sales. The market value of products sold increased by 13%, or \$19,157,000, from the 2007 Census of Agriculture. The number of people employed as seasonal farm workers for 2012 is 791.

Large scale agriculture, especially given its symbiotic relationship with the poultry industry in the County, looks to continue to be a primary economic driver for the County for the future.

Significant portions of the County are forested, with many areas managed for pine production. Local demand for forest products is not strong at the present time. A custom sawmill is operating outside Wachapreague, and efforts to attract additional sawmills are underway. It is hoped that a sizable sawmill in the County will better utilize the forest resource and benefit forest landowners.

It is possible that forest land assessment values may start to decline if market demand for local forest products does not increase.

#### **Aquaculture:**

The marine industry has always had a strong role in the economy and life of Accomack County. However, it is a transitioning industry with the expansion of aquaculture. Aquaculture is the farming of aquatic organisms such as fish, crustaceans, and mollusks through the cultivation of freshwater and saltwater populations under controlled conditions.

Although a respectively smaller group of the employed population work in fishing and aquaculture, it is a culturally invaluable trade. In the year 2000, there were 599 commercial licenses and zero aquaculture permits issued by the Virginia Marine Resources Commission (VMRC). In 2010 VMRC issued 475 commercial licenses, but also 153 oyster aquaculture permits and 116 clam aquaculture permits, revealing an increase in the number of individuals who make their living working on the waterways of the Eastern Shore.

#### **Poultry:**

Poultry is a major industry in Accomack County. The Perdue Processing plant in Accomac and employs approximately 1,850 people. The Tyson Complex in Temperanceville employs approximately 1,430 people. Valley Proteins is located at the Perdue plant. The combined direct employment at the processing plants creates the employment sector on the Eastern Shore of Virginia. There are numerous other indirect jobs such as, truck drivers, contractors, and others that are supported by the poultry processing plants.

The County saw a surge in the number of poultry houses between 2014 to the present time (2018). County Planning staff estimates that there were 284 poultry houses in Accomack County prior to 2014. As of January 1, 2018, 194 new Poultry Houses had been constructed since 2014 and there are 28 poultry houses still under construction.

County Planning Staff has been developing Annual Poultry Reports since 2016. The 2018 report is the most comprehensive yet and covers a wide variety of topics and can be found at the following link: <https://www.co.accomack.va.us/home/showdocument?id=9090> or by visiting the County website (Planning Department page) at [www.co.accomack.va.us](http://www.co.accomack.va.us).

**Airport & Industrial Park:**

In Melfa, the County owns and operates a municipal airport and an industrial park.

The Accomack County Airport covers an area of 100 acres which contains one runway designated 3/21 with a 5,000 x 100 ft. (1,524 x 30 m) asphalt surface. For the 12-month period ending September 30, 2009, the airport had 14,056 aircraft operations, an average of 38 per day: 84% general aviation and 8% air taxi and 9% military. At that time, there were 23 aircraft based at this airport: 22 single-engine and 1 multi-engine. According to the 2011 Virginia Airport System Economic Impact Study, the Accomack County Airport generated \$2.3 million in aviation-generated economic spending impact in the county along with 32 aviation-related jobs.

The adjacent 360 acre industrial park has over 120 acres that have been improved with streets, centralized water and sewer and is currently home to the following companies: Truss-Tech, Inc., Blue Crab Bay Company, Shore Ice, Luminary Air Group, Lucas Underground, and the Eastern Shore Chamber of Commerce. Adjacent to the park at the northern end of the airport runway is the Eastern Shore Farmer's Market and the Robert S. Bloxom Eastern Shore Agricultural Complex. The park is continuing to seek additional tenants and recently connected the Industrial Park with a new road connection from within the park to the adjacent Eastern Shore Community College and the Workforce Development Center.

**Other Areas in County Where Growth is Anticipated:**

In the New Church area, two companies have located: KmX Chemical Corporation and Coastline Chemicals. KmX recently invested \$2.075 million to expand its solvent reclamation facility. Coastline Chemicals blends and packages antifreeze and recently completed the expansion of a rail spur to the site as well as the installation of a distillation tower & equipment and additional storage tanks.

With the addition of this rail spur to the area and easy access to Route 13, this area is positioned to offer ancillary services to complement these recent industry expansions.

**Rte. 13 & Natural Gas**

The Delmarva Pipeline Company reiterated its intent to construct a natural gas pipeline that would serve parts of Maryland and Accomack County. As currently proposed the natural gas pipeline would extend south from the Maryland/Virginia State line to the Perdue plant on Rte.13 in Accomac.

The availability of natural gas via pipeline provides a reliable and affordable energy source for large industrial type users of energy such as the Commonwealth Chesapeake energy facility, Tyson Processing plant and Perdue & Valley Protein plants.

In the event that the gas pipeline is constructed and operational along Rte. 13, it is anticipated that new processing/manufacturing facilities will locate in this area as there is ample developable land and good transportation access for truck traffic.

Once the pipeline timetable and construction become certain, the Planning Commission should review the Future Land Use Plan to ensure that it recognizes the potential economic growth that could occur once the natural gas pipeline becomes a reality.

**T's Corner:**

The area of Accomack County located at the juncture of Route 13 and Route 175 (Chincoteague Road), known as T's Corner, is a commercial growth center for the County in providing services for the traveling public, seasonal visitors and year-round residents. There are currently the following businesses: grocery store, several fast-food restaurants including chain brands, gas station/convenience store, banks, laundromat, and storage units. The area is zoned as General Business which stretches as far north as Oak Hall and as far south just before Temperanceville.

T's Corner has several vacant parcels that could be developed for commercial interests based upon market demand of the varied nature of the clientele of this region.

**Growth in Exmore along Rte. 13/Belle Haven**

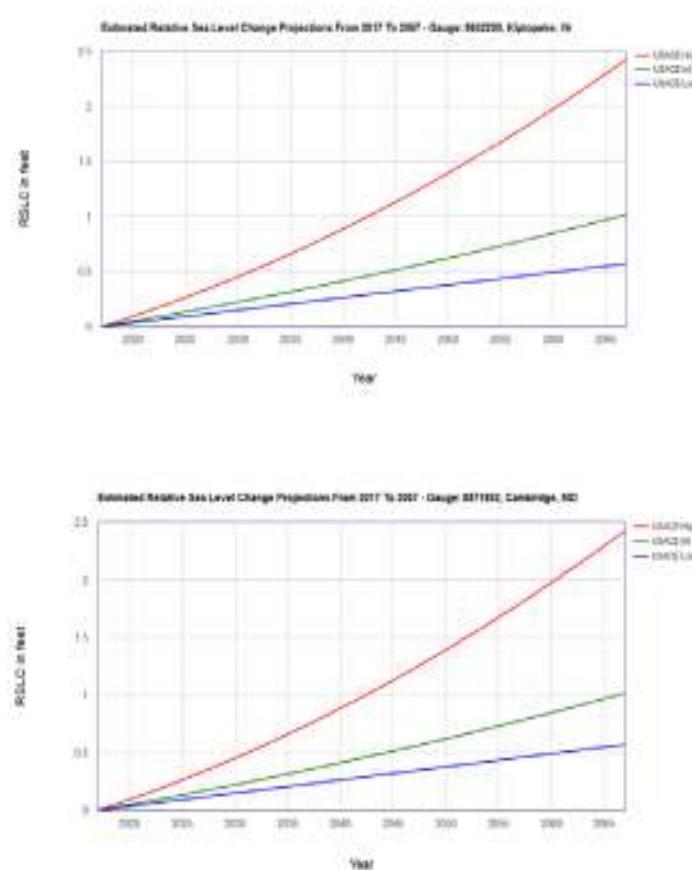
Commercial growth along Rte. 13 has occurred in the Town of Exmore within Northampton County, notably Family Dollar and Dollar General in the past few years. The Accomack County line and that portion of the Town of Belle Haven in the County have land available that is suited for additional commercial growth. Lack of municipal sewer and market support for additional commercial growth in this part of Accomack County are key factors regarding growth along Rte. 13 in this area.

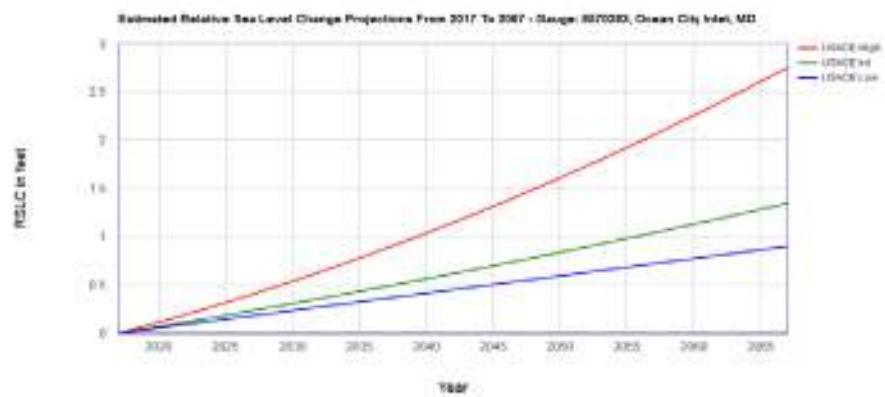
## COASTAL RESILIENCY

As a locality that is adjacent to both the Atlantic Ocean and the Chesapeake Bay, examination of the impact of sea level rise to our locality and the implementation of various waterfront management land tools is essential to developing a proactive position to help reduce any coastal erosion/loss of land/loss of marshland/loss of wetlands.

There are numerous agencies that are studying this issue and developing projections for coastal communities. While there may not be a direct reporting site in Accomack County, there are several nearby reporting sites that examination of their data will allow the county to extrapolate certain projected conclusions to assist in determining how the County should proceed.

From National Oceanic and Atmospheric Administration (NOAA), the three data sets to examine are: For Kiptopeke State Park (located at the southern end of Northampton County near the beginning of the Chesapeake Bay), Cambridge, Maryland (located to the north of the county on the inner reaches of the Chesapeake Bay) and Ocean City Inlet (located to the north of the county in Maryland on the Atlantic Ocean). These three data sets with a projected impact from current year of 2017 to 2067 and using both the low, intermediate and high projection estimates, show a consistent estimated relative sea level rise (RSLC) in the low level of .5 feet to a high level of 2.5 feet on the Chesapeake Bay side to a slightly higher projection of .9 feet up to 2.75 feet for the Atlantic Ocean side.





Beyond the sheer consideration of sea-level rise to Accomack County, it is also relevant to look at wave attenuation and its impact on marshland which may have a greater impact to our coastline preservation.

The County needs to be mindful of the impact of sea level rise on various facets of the county, including loss of developed land, loss of environmentally buffering land, loss of revenue from a tax base perspective as well as from an economy perspective. Based upon the above projections from NOAA using a low to high range of estimated relative sea level change, several other agencies have done projections on tax base and economy.

For Accomack County, NOAA offers the following flood exposure snapshots based upon the listed data sources.

### Flood Exposure Snapshot

COASTAL COUNTY SNAPSHOTS  
[coast.noaa.gov/snapshots/](http://coast.noaa.gov/snapshots/)

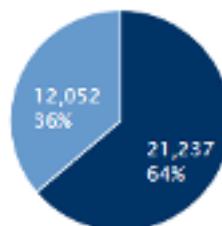
## Accomack County, Virginia

**People + Floodplains = Not Good**

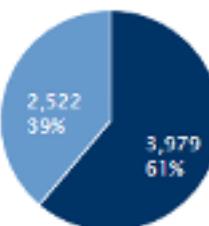
**High-Risk Populations + Floodplains = Even Worse**

The more homes and people located in a floodplain, the greater the potential for harm from flooding. Impacts are likely to be even greater when additional risk factors (age, income, capabilities) are involved, since people at greatest flood risk may have difficulty evacuating or taking action to reduce potential damage.

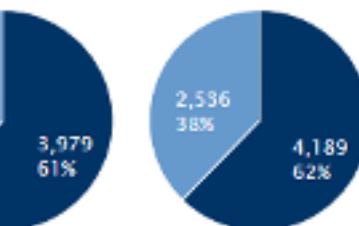
Population  
Total: 33,289



Population over 65  
Total: 6,501



Population in Poverty  
Total: 6,725



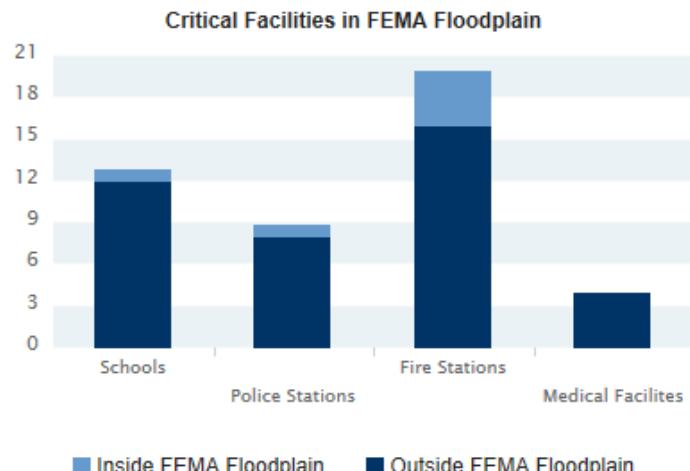
Based on [2009-2013 American Community Survey 5-year Summary File data](#).

**Community Infrastructure + Floodplains = Bad News**

13% of critical facilities in Accomack County, Virginia, are within the floodplain.

Hospitals. Roads. Schools. Shelters. These facilities play a central role in disaster response and recovery. Understanding which facilities are exposed, and the degree of that exposure, can help reduce or eliminate service interruptions and costly redevelopment. Incorporating this information into development planning helps communities get back on their feet faster.

Based on [USGS Structures Database](#).



The Virginia Institute of Marine Sciences (VIMS) has developed several tools for use to determine site specific solutions and are to be utilized by the County in analyzing a specific area of the County and implementing best management practices to address shoreline conditions. These are listed in the box below as a hyperlink.

**Undefended Shorelines & Failed Defense Structures**

- [Undefended Shoreline Decision Tool User Manual – 2010](#)
- [Undefended Shoreline Decision Tool Diagram](#)

**Currently Defended Shorelines**

- [Currently Defended Shoreline Definitions](#)
- [Structural Integrity Guidance](#)



**Existing Bulkheads**



**Existing Marsh Sills**



**Existing Revetments**



**Existing Offshore Breakwaters**



**Existing Groins**

For shorelines with multiple structure types – refer to each structure type decision tool, consider the shoreline condition, structural integrity and remaining life expectancy, and the level of protection provided by each type.

VIMS has also completed the [\*\*Accomack County Shoreline Situation Report\*\*](#) which is intended to be utilized as an element of our GIS program and intended to be the interactive mapping tool to be used in conjunction with the tool box above to develop the best management practices on a site specific basis for our locality.

### **Coastal Resiliency Planning & Next Steps**

It is now generally accepted that water levels are increasing relative to ground level on the Eastern Shore. Given the sizeable land mass of the County, particularly on the Bayside of Accomack County that is less than 10 feet above sea level, additional review and analysis of data is warranted. Staff has data based on modeling that shows recurrent flooding due to water level rise, under a number of scenarios.

The recommended next step is to review the modeled data and identify the number of structures and properties affected. After appropriate review, action items are a likely outcome. Examples of such action items are advisory statements for new construction and planning for voluntary relocation of residents.

### **Review of Future Land Use Map (FLUM)**

There are no proposed alterations to the Future Land Use Map as part of this review & update of the Comprehensive Plan. There have been areas identified that shall be examined and considered for the next update in five years. The Planning Commission and staff will develop a workplan, including a timeframe, for the following areas:

- Wattsville Village Development
- Route 13 Corridor Overlay District
- Mappsville
- Tasley
- Captain's Cove
- Trail's End
- Land Use designation changes under the APZs and clear zones identified in the Joint Land Use Study
- Examination of Current Public Water & Sewer Systems: areas served and possible expansions of said systems.

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*Adopted May 14, 2008*

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## **Appendix A: Application Form for Grant and Loan Requests for All Categories**

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Virginia Department of Conservation and Recreation  
Virginia Community Flood Preparedness Fund Grant Program

**Name of Local Government:**

**Category Being Applied for (check one):**

Capacity Building/Planning

Project

Study

**NFIP/DCR Community Identification Number (CID)** 510001

**Name of Authorized Official and Title:** Mike Mason, CPA Accomack County Administrator

**Signature of Authorized Official:**

LEANDER N PAMBID

Leander N Pambid FOR THE COUNTY ADMINISTRATOR  
DEPUTY COUNTY ADMINISTRATOR FOR  
COMMUNITY & ECONOMIC DEVELOPMENT

**Mailing Address (1):** P.O. Box 388

**Mailing Address (2):** \_\_\_\_\_

**City:** Accomac      **State:** VA      **Zip:** 23301

**Telephone Number:** (757) 787-5700      **Cell Phone Number:** (757) 710-3242

**Email Address:** mmason@co.accomack.va.us

**Contact and Title (If different from authorized official):** Tom Brockenbrough, Floodplain Administrator

Mailing Address (1): P.O. Bo 93 \_\_\_\_\_

Mailing Address (2): \_\_\_\_\_

City: Accomac State: VA Zip: 23301

Telephone Number: (757) 787-5797 Cell Phone Number: (\_\_\_\_) \_\_\_\_\_

Email Address: tbrockenbrough@co.accomack.va.us

Is the proposal in this application intended to benefit a low-income geographic area as defined in the Part 1 Definitions? Yes  No \_\_\_\_\_

**Categories (select applicable activities that will be included in the project and used for scoring criterion):**

**Capacity Building and Planning Grants**

- Floodplain Staff Capacity.
- Resilience Plan Development
  - Revisions to existing resilience plans and integration of comprehensive and hazard mitigation plans.
  - Resource assessments, planning, strategies, and development.
    - Policy management and/or development.
    - Stakeholder engagement and strategies.
- Other: \_\_\_\_\_

**Study Grants (Check All that Apply)**

- Revising other land use ordinances to incorporate flood protection and mitigation goals, standards, and practices.

- Conducting hydrologic and hydraulic (H&H) studies of floodplains. *Changes to the base flood, as demonstrated by the H&H must be submitted to FEMA within 6 months of the data becoming available.*
  
- Studies and Data Collection of Statewide and Regional Significance.
- Revisions to existing resilience plans and modifications to existing comprehensive and hazard.
- Other relevant flood prevention and protection project or study.
- Pluvial studies.
- Studies to aid in updating floodplain ordinances to maintain compliance with the NFIP, or to incorporate higher standards that may reduce the risk of flood damage. This must include establishing processes for implementing the ordinance, including but not limited to, permitting, record retention, violations, and variances. This may include revising a floodplain ordinance when the community is getting new Flood Insurance Rate Maps (FIRMs), updating a floodplain ordinance to include floodplain setbacks, freeboard, or other higher standards, RiskMAP public noticing requirements, or correcting issues identified in a Corrective Action Plan.

**Project Grants and Loans (Check All that Apply – Hybrid Solutions will include items from both the “Nature-Based” and “Other” categories)**

**Nature-based solutions**

- Acquisition of property (or interests therein) and/or structures for purposes of allowing floodwater inundation, strategic retreat of existing land uses from areas vulnerable to flooding; the conservation or enhancement of natural flood resilience resources; or acquisition of structures, provided the acquired property will be protected in perpetuity from further development, and where the flood mitigation benefits will be achieved as a part of the same project as the property acquisition.
  
- Wetland restoration.
- Floodplain restoration.
- Construction of swales and settling ponds.

- Living shorelines and vegetated buffers.
- Permanent conservation of undeveloped lands identified as having flood resilience value by *ConserveVirginia* Floodplain and Flooding Resilience layer or a similar data driven analytic tool, or the acquisition of developed land for future conservation.
- Dam removal.
- Stream bank restoration or stabilization.
- Restoration of floodplains to natural and beneficial function.

#### **Other Projects**

- Developing flood warning and response systems, which may include gauge installation, to notify residents of potential emergency flooding events.
- Dam restoration.
- Beneficial reuse of dredge materials for flood mitigation purposes
- Removal or relocation of structures from flood-prone areas where the land will not be returned to open space.
- Structural floodwalls, levees, berms, flood gates, structural conveyances.
- Storm water system upgrades.
- Medium and large-scale Low Impact Development (LID) in urban areas.
- Acquisition of property (or interests therein) and/or structures for purposes of allowing floodwater inundation, strategic retreat of existing land uses from areas vulnerable to flooding; the conservation or enhancement of natural flood resilience resources; or acquisition of structures, provided the acquired property will be protected in perpetuity from further development, and where the flood mitigation benefits will not be achieved as a part of the same project as the property acquisition.
- Other project identified in a DCR-approved Resilience Plan.

**Location of Project or Activity (Include Maps):** Accomack County, Virginia

**NFIP Community Identification Number (CID#):** 510001

**Is Project Located in an NFIP Participating Community?**  Yes  No

**Is Project Located in a Special Flood Hazard Area?**  Yes  No

**Flood Zone(s) (If Applicable):** \_\_\_\_\_

**Flood Insurance Rate Map Number(s) (If Applicable):** \_\_\_\_\_

**Total Cost of Project:** \$50,000

**Total Amount Requested** \$50,000

**Amount Requested as Grant** \$50,000

**Amount Requested as Project Loan (Long-Term, not including short-term loans for up-front costs)**  
\$0

**RVRF Loan Amount Requested as Project Match (Not including short-term loans for up-front costs)**

\$0

**Amount Requested as Short-Term loan for Up-Front Costs (not to exceed 20% of amount requested as Grant)** \$0

**For projects, planning, capacity building, and studies in low-income geographic areas: Are you requesting that match be waived?**  Yes  No