



Virginia Coastal Resilience Master Plan

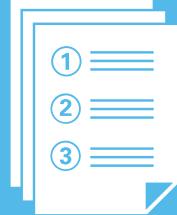
Technical Advisory Committee Meeting | 4/21/2021



Oral Presentation Agenda



1 Team Introduction



2 Approach



3 Question and Answer



Team Introduction



Lead Consultant



THE WATER INSTITUTE
OF THE GULF®

Project Advisor



Outreach Lead

TAC Support

VA SWaM



Technical Support

VA SWaM

U.S. SBA Mentor-
Protégé Program
with Dewberry



Outreach Support

VA SWaM

Today's Speakers



Brian Batten

Project Manager



Mat Mampara

Data Analytics Lead



Dale Morris

Project Advisor



Deepa Srinivasan

Outreach Lead



Caroline Whitehead

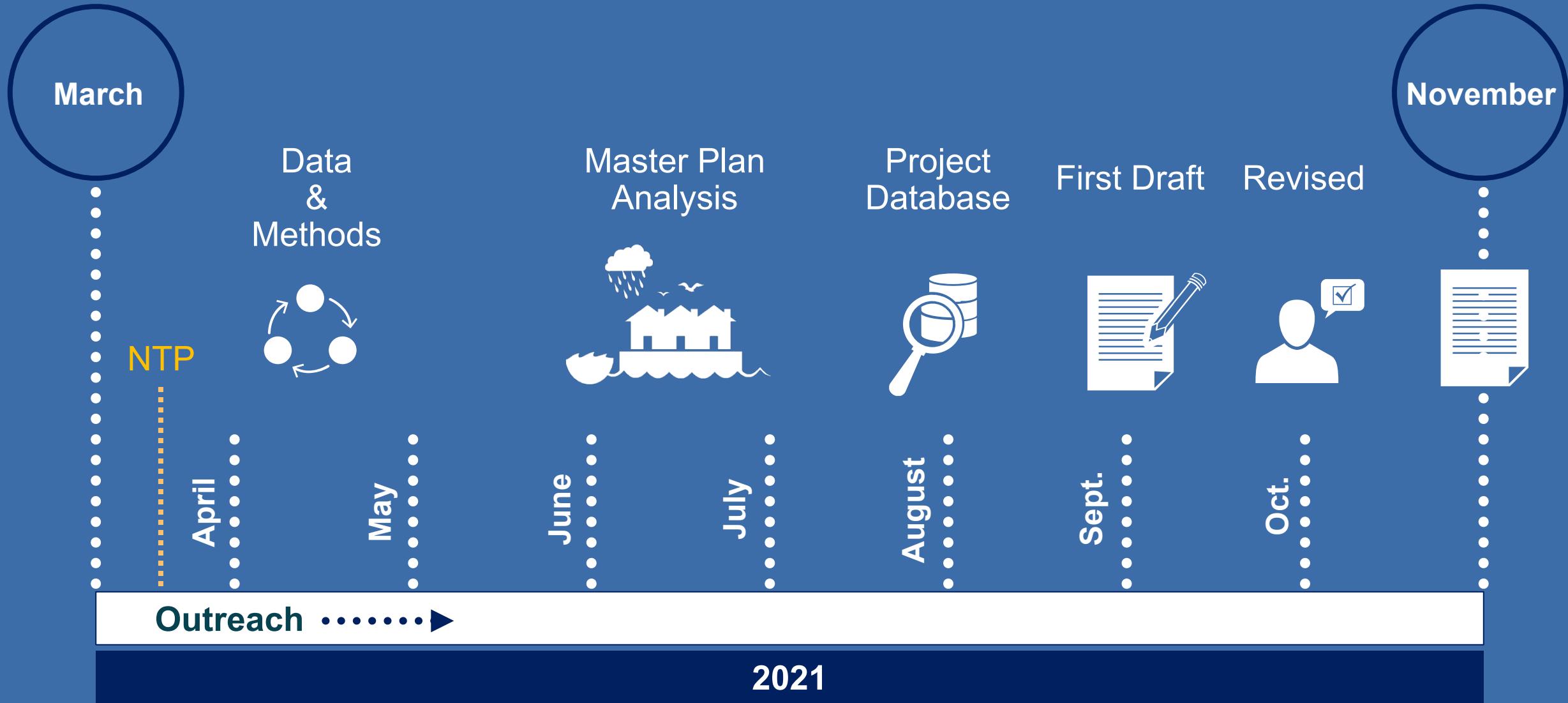
Finance Strategy



**Johanna
Greenspan-
Johnston**

Master Plan Lead

The Challenge:



Study Plan

Guiding Principles

- Acknowledge climate change and its consequences, and base decision-making on the best available science.
- Identify and address socioeconomic inequities and work to enhance equity through coastal adaptation and protection efforts.
- Recognize the importance of protecting and enhancing green infrastructure like natural coastal barriers and fish and wildlife habitat by prioritizing nature-based solutions.
- Utilize community and regional scale planning to the maximum extent possible, seeking region-specific approaches tailored to the needs of individual communities.
- Understand fiscal realities and focus on the most cost-effective solutions for protection and adaptation of our communities, businesses and critical infrastructure.

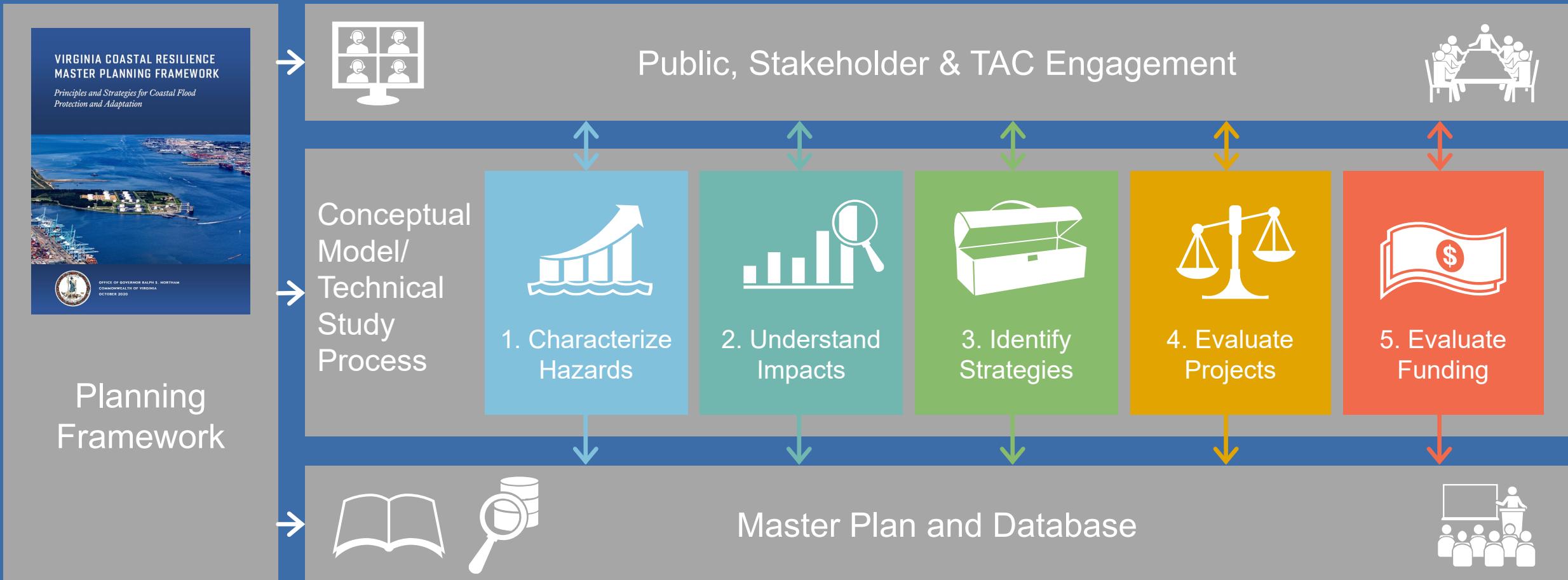
VIRGINIA COASTAL RESILIENCE MASTER PLANNING FRAMEWORK

*Principles and Strategies for Coastal Flood
Protection and Adaptation*

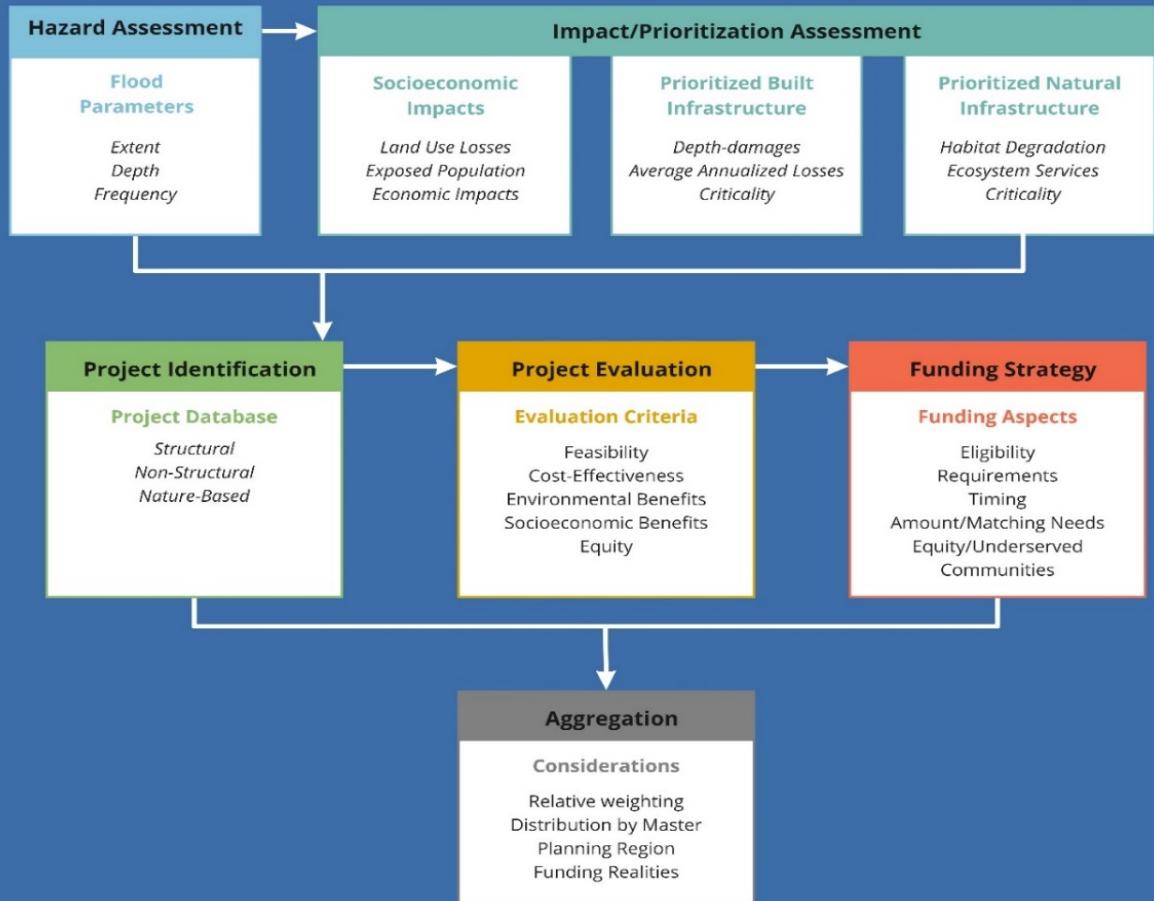


OFFICE OF GOVERNOR RALPH S. NORTHAM
COMMONWEALTH OF VIRGINIA
OCTOBER 2020

Our Approach:



Conceptual Model



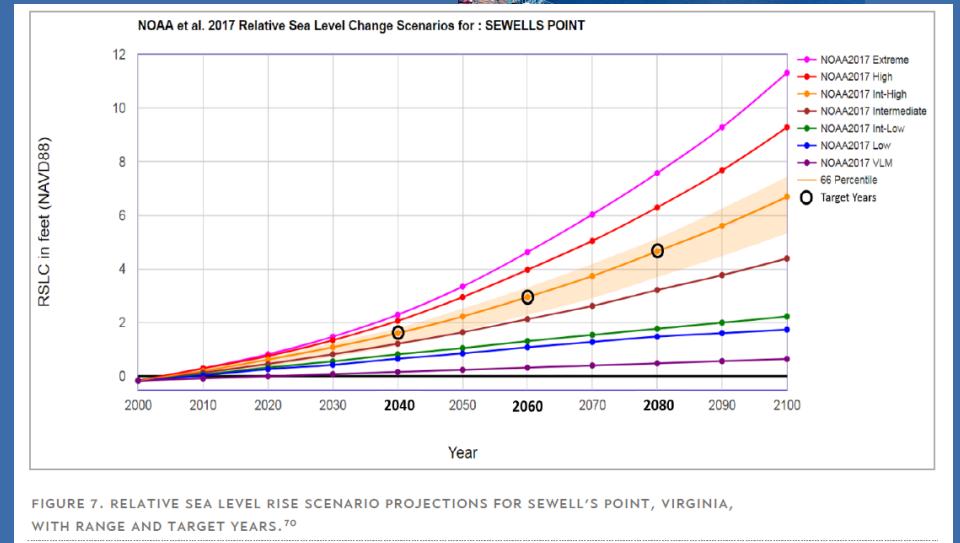
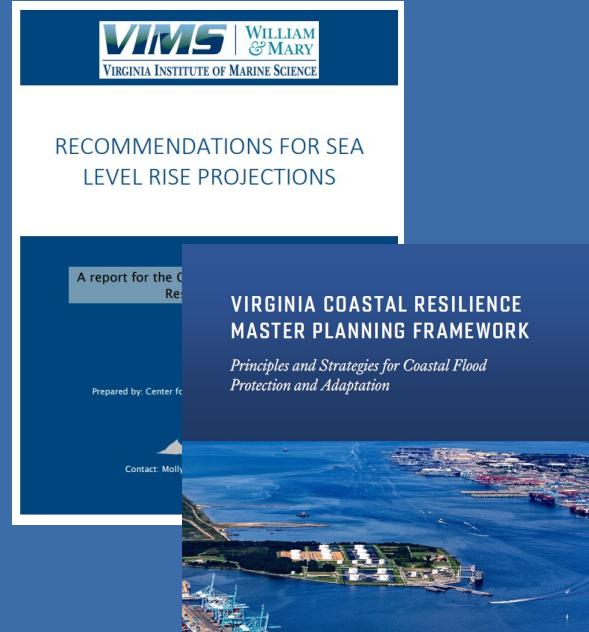
Hazard Assessment

Coastal Hazard Data

- Time horizons:
 - Current conditions (2020), 2040, 2060, 2080
- Range of Flood Conditions
 - Tidal, Nuisance, Storm Surge
- Key Data:
 - CCRFR/NOAA
 - FEMA Region 3 Storm Surge Study
 - USACE North Atlantic Coast Comprehensive Study (NACCS)

Incorporation of Sea Level Rise

- Align with existing state guidance
- Coordinating Approach:
 - VIMS
 - NOAA



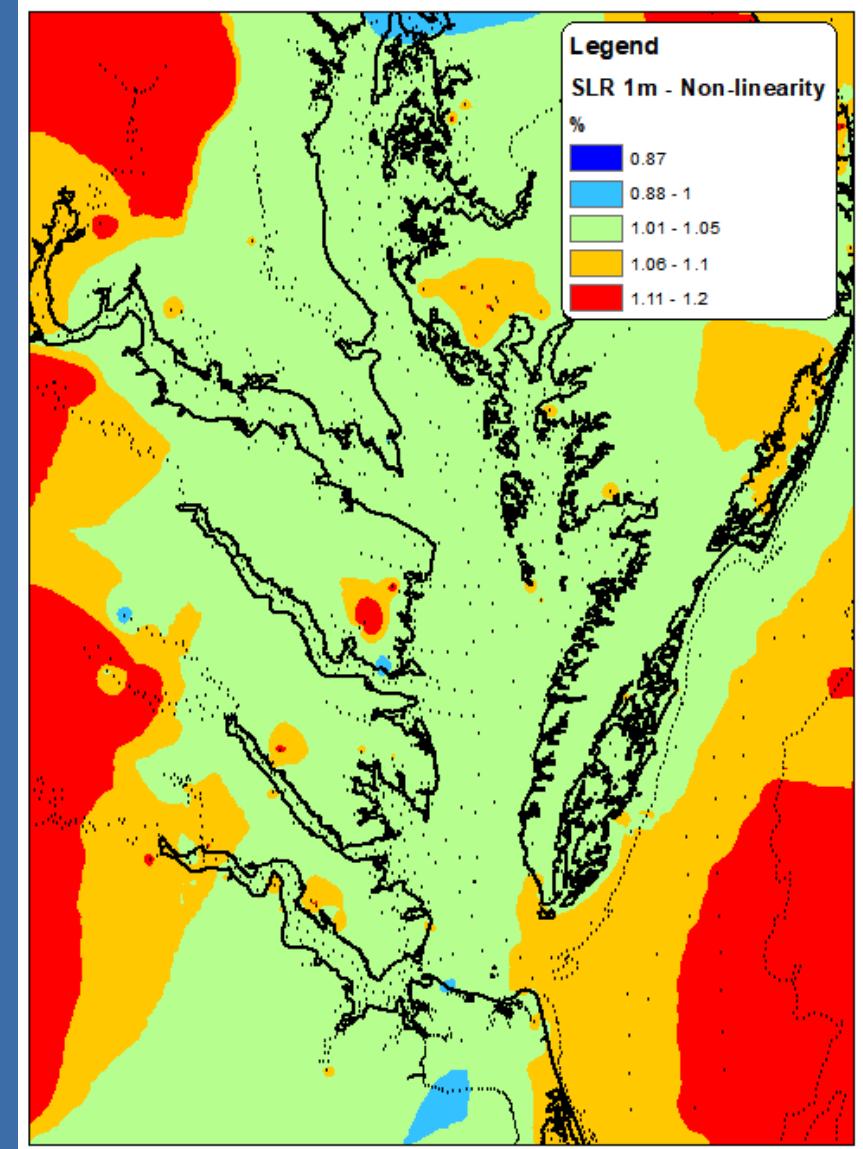
Flood Amplification due to SLR

For 2040:

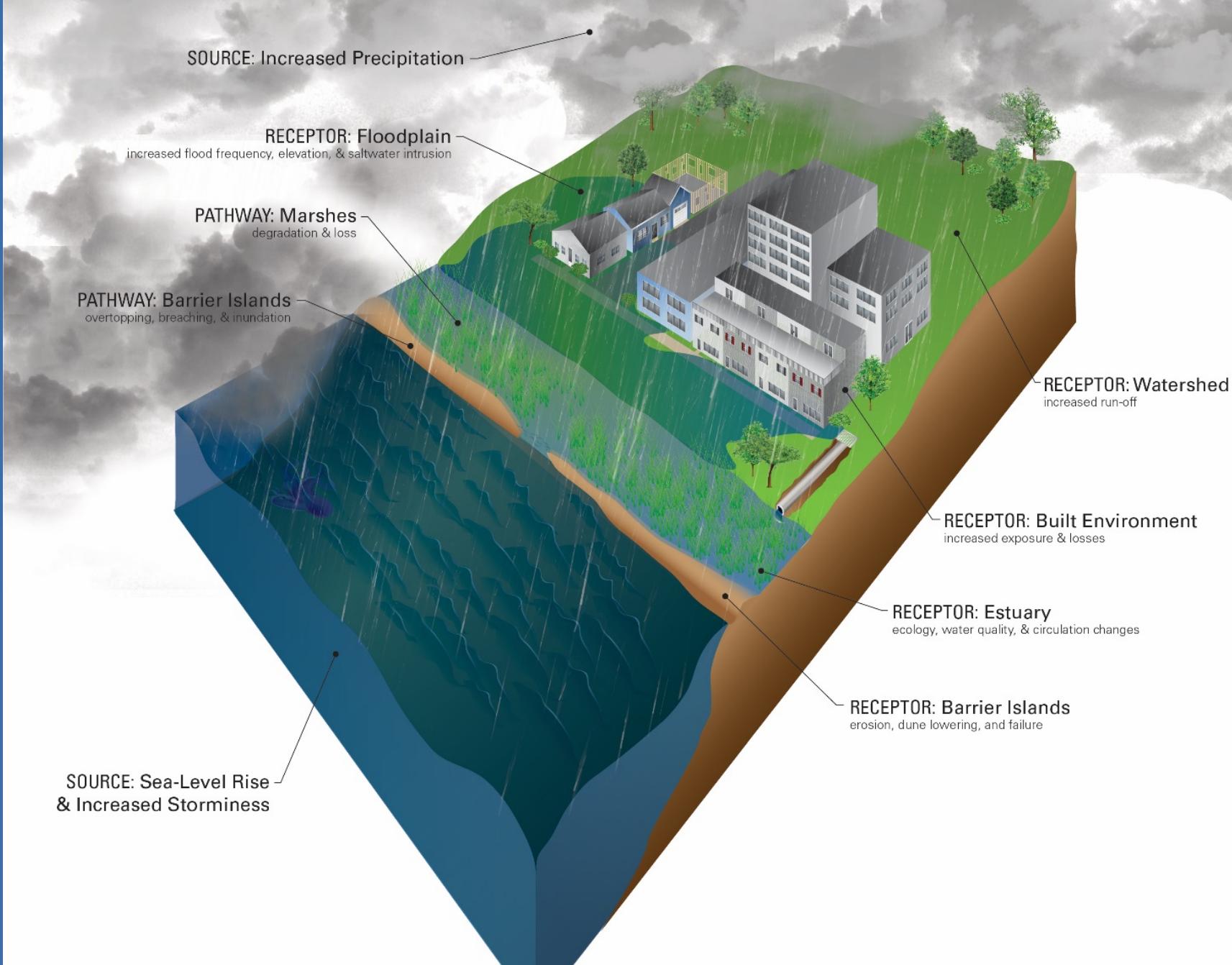
- All changes are linear
- Wave effects – will scale with depth

For 2060, 2080

- Assume tidal, nuisance flooding linear
- Storm surge – capture from NACCS
- Wave effects – will scale with depth



Dynamic Future Conditions Modeling Concept



Understand Impacts

Impact Assessment

Multiple Flood Hazard Types



Tidal/Nuisance

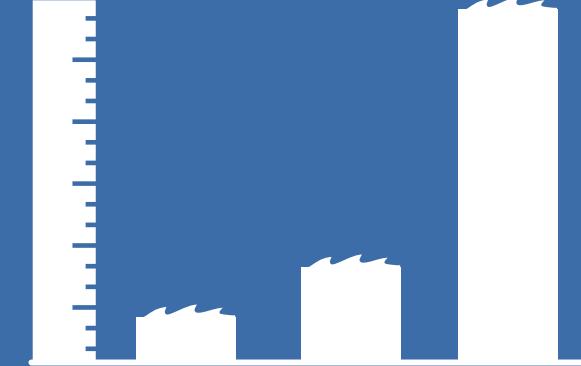


Storm Surge



Precipitation

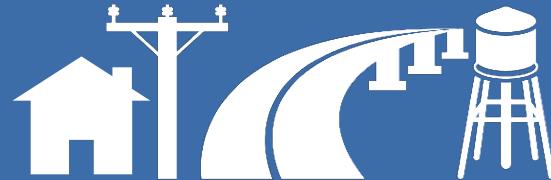
Range of Conditions



Impact Types



People
(Social Environment)



Structures
(Built Infrastructure)



Ecological Systems
(Natural Infrastructure)

Overview

- Data Gathering
- Impact Assessment (CISA)
- Risk Summarization

Data Gathering

- Enshrine FAIR Principles
 - Findable
 - Accessible
 - Interoperable
 - Reusable

Service	Title	Collection	Owner	Description
	Waterlevel_Active_Stations	CO_OPS_Stations	noaa	<p>Layer represents the geographic locations at which water level observations are presently being collected. "Water level" is defined as the height of the water surface relative to a specific datum (base elevation). Most stations with water level observations provide readings every 6 minutes. CO-OPS measures water levels at over 200 tidal and non-tidal stations along the coast of the United States and its territories and around the Great Lakes. "Tide" is defined as the periodic rise and fall of a body of water resulting from gravitational interactions between Sun, Moon, and Earth. The time series on the CO-OPS website that are associated with these point locations contain both verified and unverified data. Unverified, or raw, data have not been subjected to the National Ocean Service's quality control or quality assurance procedures and do not meet the criteria and standards of official National Ocean Service data. They are released for limited public use as preliminary data to be used only with appropriate caution. This file also contains air gap stations which measure clearance between a bridge and the water surface. Air gap measurements are updated every 6 minutes to account for changes in water level and bridge height, due to bridge traffic, air temperature, and other factors. Data from air gap sensors along with real-time data on water conditions like tides, currents, and winds, help ships safely navigate U.S. ports. More information can be found at http://tidesandcurrents.noaa.gov/stations.html?type=Water+Levels</p>
	Currents_Prediction_Stations	CO_OPS_Products	noaa	<p>Layer represents the geographic location of stations at which tidal current predictions can be generated from historic and active stations. Tidal current predictions are a calculation of what the current direction and speed will be based on the analysis of data collected at these locations. Harmonic stations generate predictions from harmonic constituents from the data analysis. Subordinate stations generate predictions using time and speed adjustment applied to the predictions for a specific harmonic station. CO-OPS offers predicted time and speed of maximum flood/ebb and timing of slack water (no current) and at regular intervals for all stations in NOAA's annually published tidal current tables and in NOAA Current Predictions service of the CO-OPS Tides & Currents website. The CO-OPS site is updated every quarter, during the first two weeks of January, April, July and October. The quarterly updates may include the addition of new stations, updating subordinate and harmonic stations, and removal of superseded stations. More information can be found at http://tidesandcurrents.noaa.gov/noaacurrents/Help</p>
Service				
	CCAP_national_riparian_final	Riparian_Land_Cover	noaa	
	CCAP_national_riparian_final	Riparian_Land_Cover	noaa	

Jupyter Notebook Documenting Authoritative Data Sources

Critical Infrastructure (Built Infrastructure)

Impact Assessment



Ecological Systems (Natural Infrastructure)



- | | |
|---|--|
| <p>Chemical Sector
The Department of Homeland Security is designated as the Sector-Specific Agency for the Chemical Sector.</p> | <p>Commercial Facilities Sector
The Department of Homeland Security is designated as the Sector-Specific Agency for the Commercial Facilities Sector, which includes a diverse range of sites that draw large crowds of people for shopping, business, entertainment, or lodging.</p> |
| <p>Communications Sector
The Communications Sector is an integral component of the U.S. economy, underlying the operations of all businesses, public safety organizations, and government. The Department of Homeland Security is the Sector-Specific Agency for the Communications Sector.</p> | <p>Critical Manufacturing Sector
The Department of Homeland Security is designated as the Sector-Specific Agency for the Critical Manufacturing Sector.</p> |
| <p>Dams Sector
The Department of Homeland Security is designated as the Sector-Specific Agency for the Dams Sector. The Dams Sector comprises dam projects, navigation locks, levees, hurricane barriers, mine tailings impoundments, and other similar water retention and/or control facilities.</p> | <p>Defense Industrial Base Sector
The U.S. Department of Defense is the Sector-Specific Agency for the Defense Industrial Base Sector. The Defense Industrial Base Sector enables research, development, design, production, delivery, and maintenance of military weapons systems, subsystems, and components or parts to meet U.S. military requirements.</p> |
| <p>Emergency Services Sector
The Department of Homeland Security is designated as the Sector-Specific Agency for the Emergency Services Sector. The sector provides a wide range of prevention, preparedness, response, and recovery services during both day-to-day operations and incident response.</p> | <p>Energy Sector
The U.S. energy infrastructure fuels the economy of the 21st century. The Department of Energy is the Sector-Specific Agency for the Energy Sector.</p> |
| <p>Financial Services Sector
The Department of the Treasury is designated as the Sector-Specific Agency for the Financial Services Sector.</p> | <p>Food and Agriculture Sector
The Department of Agriculture and the Department of Health and Human Services are designated as the co-Sector-Specific Agencies for the Food and Agriculture Sector.</p> |
| <p>Government Facilities Sector
The Department of Homeland Security and the General Services Administration are designated as the Co-Sector-Specific Agencies for the Government Facilities Sector.</p> | <p>Healthcare and Public Health Sector
The Department of Health and Human Services is designated as the Sector-Specific Agency for the Healthcare and Public Health Sector.</p> |
| <p>Information Technology Sector
The Department of Homeland Security is designated as the Sector-Specific Agency for the Information Technology Sector.</p> | <p>Nuclear Reactors, Materials, and Waste Sector
The Department of Homeland Security is designated as the Sector-Specific Agency for the Nuclear Reactors, Materials, and Waste Sector.</p> |
| <p>Transportation Systems Sector
The Department of Homeland Security and the Department of Transportation are designated as the Co-Sector-Specific Agencies for the Transportation Sector.</p> | <p>Water and Wastewater Systems Sector
The Environmental Protection Agency is designated as the Sector-Specific Agency for the Water and Wastewater Systems Sector.</p> |

Risk Summarization

- Nested Geographic Aggregation



Identify Strategies

Project Identification

- Project Definition:
 - Define: “project”, needed attributes
 - Populate: Leverage existing databases of projects
- Initial Screening:
 - Filter: duplicative projects, outside of CRMP scope, data availability, project status
- Alignment of projects:
 - Align: filter projects not meeting criteria
 - Improve: key project characteristics sufficient to describe project

Evaluate Projects

Prioritization Process

Guiding CRMP principles

Acknowledge
climate
change

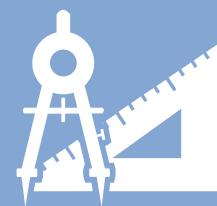
Reduce
socioeconomic
inequities

Prioritize
natural
infrastructure

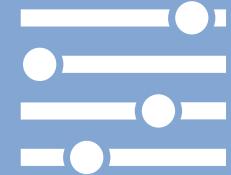
Maximize
regional-scale
planning

Prioritize
cost-effective
projects

Approaches:



Quantitative
Assessment



Qualitative
Assessment



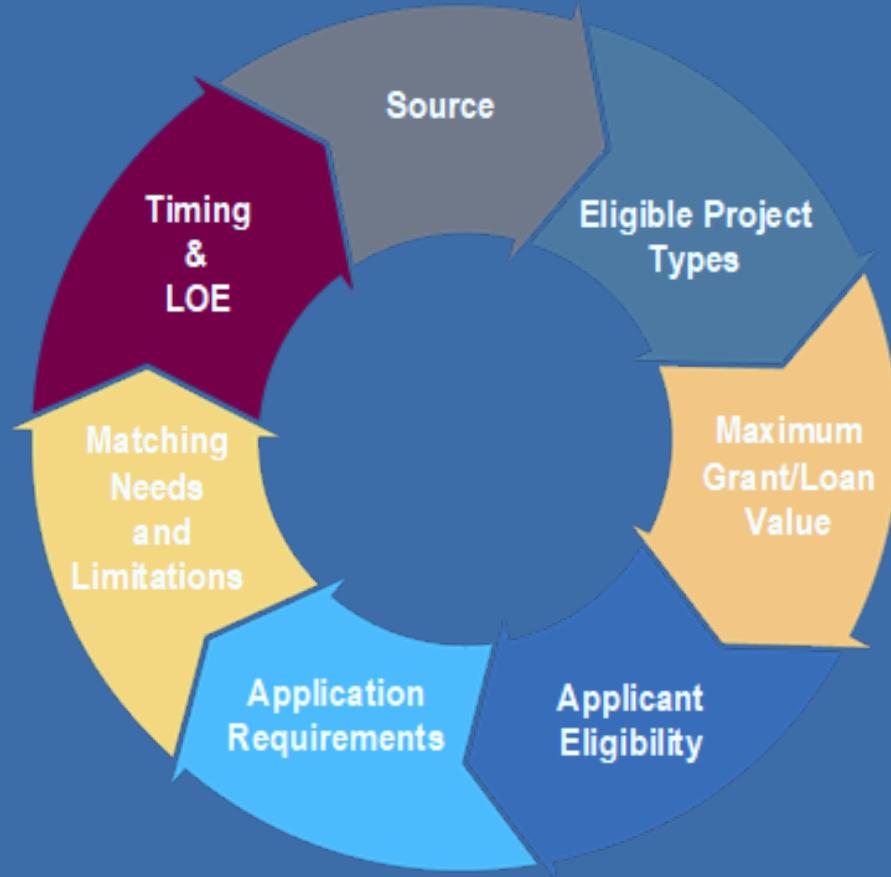
Expert
Evaluation



Participatory
Scoring

Evaluate Funding

Funding Analyses



Gap Analysis

Enhance Database

Equity Considerations

Projects Funding and Financing Alignment

Finance Mechanisms

TAC and Subcommittee Engagement

Funding Database

Grid view ... Hide fields Filter Group Sort

	Name	Funding Source	Projects Funded	RFPs & Fact Sheets	Implementation Phase	Funding Maximum (per ...	Non-Federal Cost S...	Pre-Pr...	Full Proposal Dea...	Contact	Funding Type
1	Restoration Fund Grants	Chesapeake Bay Restoration Fund	Habitat Restoration/Enhancement Environmental Education Water Quality Improvements		Project Implementation				9/25/2021	gfoley@dls.virginia.gov	State/Federal
2	Green Streets, Green Towns, Green Jobs	Chesapeake Bay Trust	Green Infrastructure Stormwater Management		Project Implementation Preliminary Design and Sit... Research	\$100,000	Preferred		3/4/2021	jpopp@cbtrust.org	Private Foundation
3	Middle Peninsula Nearshore Habitat Restoration Design	Chesapeake Research Consortium	Habitat Restoration/Enhancement		Preliminary Design and Sit...	\$40,000	N/A		1/31/2020	trommatterm@chesapeake.o rg	State/Federal
4	Coordination and Collaboration in the Resilience Ecosystem	Climate Resilience Fund	Climate Resilience Community Engagement		Planning	\$50,000	None		7/17/2020	info@climateresiliencefund.o rg	Private Foundation
5	Virginia Coastal & Estuarine Land Conservation Program	CZM	Land Acquisition		Final Design and Permitting Project Implementation	Currently Unfunded				Laura.McKay@deq.virginia.gov	State/Federal
6	Dam Safety and Floodplain Management Grants	DCR	Flood Mitigation Dam Safety		Planning Preliminary Design and Sit... Project Implementation	Varies	50%		2/26/2021	dam@dcr.virginia.gov	State/Federal
7	Land & Water Conservation Fund	DCR	Land Acquisition Habitat Restoration/Enhancement		Project Implementation	\$500,000	50%		12/15/2020	kristal.mckelvey@dcr.virginia.gov	State/Federal
8	Stormwater Local Assistance Fund	DEQ	Stormwater Management Habitat Restoration/Enhancement		Planning Preliminary Design and Sit... Final Design and Permitting	\$5,000,000	50%			kelly.ward@deq.virginia.gov	State/Federal
9	Clean Water Revolving Loan	DEQ	Stormwater Management		Final Design and Permitting	No maximum	N/A		7/10/2021	Karen.Doran@deq.virginia.gov	State/Federal

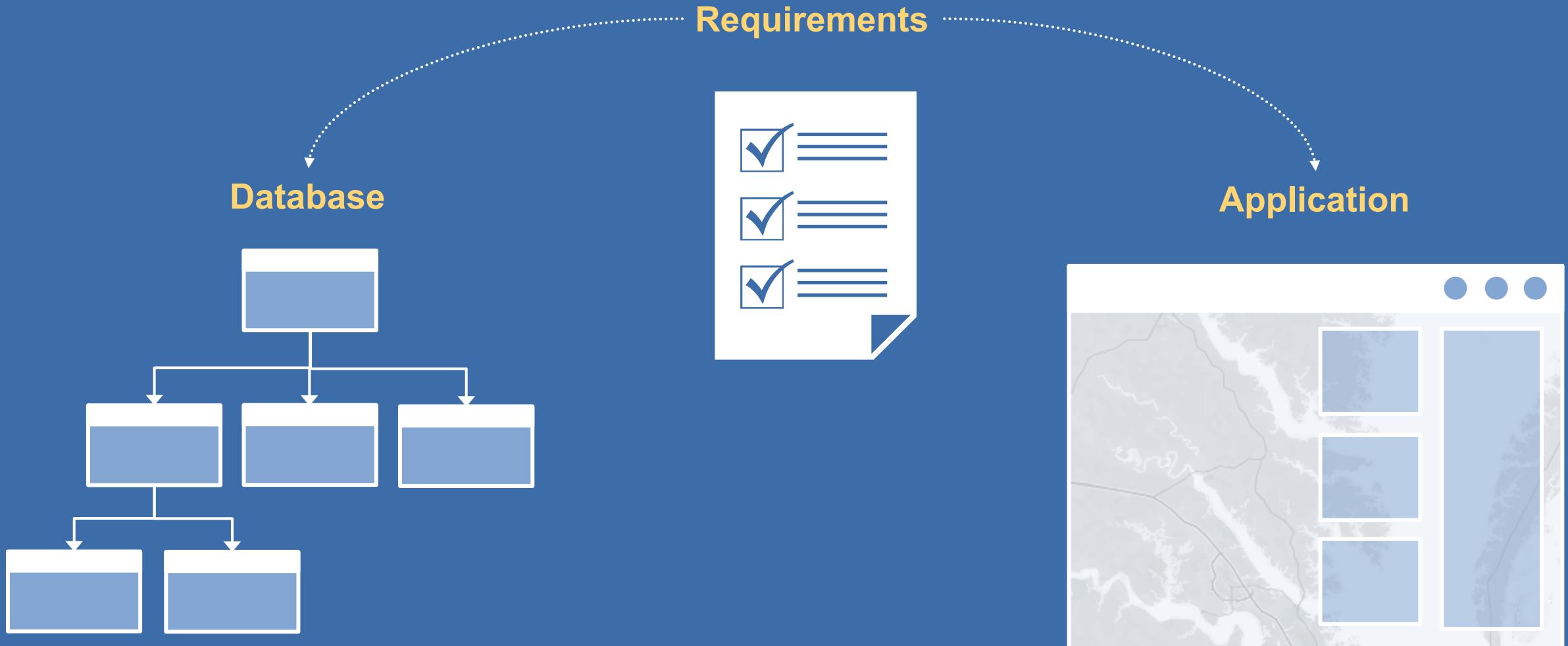
Master Plan

Master Plan and Outputs

- Anticipated Outputs:
 - Plan Document
 - Technical Appendices
 - Database/Web Application



Database and Application



Outreach Plan

Outreach and Engagement Processes/Tools



Target Audiences

- CRO, TAC, and SACAP
- Coastal Planning Districts
- Coastal Planning Regions - local governments
- Local businesses/industries
- Universities/Schools
- Underserved Populations
- General Public (residents seasonal/tourist populations)
- Military Stakeholders



Outreach Goals

- Provide an education component incorporated into all outreach.
- Introduce the Commonwealth's efforts regarding sea level rise and climate change
- Identify Stakeholder's biggest hurdles and most pressing needs

Outreach and Engagement Processes/Tools



Available / Preferred Outlets

- Traditional Media (Newspapers, Websites, etc.)
- Social Media (Facebook, Twitter)
- Virtual or In-Person Events (meetings, open houses)
- Information Gathering Tools (Surveys)



Frequency of Engagement

- Monthly (Twitter, Facebook)
- Bi-Monthly (Newsletters, Blogs, etc.)
- Quarterly (Press Releases)
- Ad Hoc (Meetings, Surveys)

TAC Support/Engagement

TAC Engagement

- Refine approach elements
- Data access/understanding
- Project identification
- Prioritization factors
- Iterative review of products/plan



Progress and Activities



- Completed:
 - Introductions to TA subcommittees
 - Draft conceptual model
 - Initial master plan outline
 - Data gathering, inventory, additional needs assessment
 - Draft outreach strategy
- In progress:
 - Coastal hazard framework
 - Draft prioritization approach
 - Project identification criteria
 - Database requirements
 - Stakeholder points of contact
 - TAC integration

Questions?

Subcommittee Report

Studies, Research and Best Practices

- Working Groups:

- Relocation Handbook, Natural and Nature-based Solutions, and Socioeconomic Equity.
- Most of the interactions among working group will be through FOIA-compliant email interaction.
- Public meetings of all working groups are scheduled for the end of April/beginning of May.
- Thanks to the academic institutions and other entities, there is a group of 3-5 students/interns (lead by Shurui Zhang) to do research-related legwork for the working group.

- Expert and Advisor Database:

- Help us to identify the folks with the right expertise and interest to help answer questions from the contractor.
- Advisors will provide key support and input to working groups.
- Started out with the membership of the SRBP Subcommittee, but need to go beyond.
- Please email Robert Weiss (weisrz@vt.edu) if you want self-nominate or nominate someone you know!!

- Subcommittee Meetings:

- Last meeting: April 12 from 11:00 am - 12:30 PM with talk by Dr. Anamaria Bukvic (Virginia Tech) about her research on relocation.
- Monthly meetings (next on May 10, 11:00 - 12:30 PM)

Federal Installations Partnerships

Purpose Statement

Build an understanding of federal coastal resilience needs, find common ground and leverage expertise, human capital, and financial assets across local, tribal, state, private, and federal stakeholders to establish a repeatable governance model that achieves shared goals.

Lines of Effort

- Awareness
- Alignment
- Action

Lines of Effort *Awareness*

- Identify and engage all federal partners
- Understand federal adaptation strategies
- Understand federal priority projects
- Understand Federal investment strategies
- Understand Federal tools used to inform adaptation and feasibility strategies (e.g. CUP, REPI, RAFT, etc)
- Understand federal storm water management programs
- Conduct federal resilience round tables

Lines of Effort *Alignment*

- Identify existing local and federal coordination models
- Identify local and federal shared studies and plans
- Identify existing state and federal coordination
- Identify existing state and federal shared studies and plans
- Identify state governance role
- Identify investment sources
- Identify existing federal/local projects; determine gaps
- Identify existing authorities and gaps that facilitate or limit coordination

Lines of Effort

Action

- Recommend state governance role
- Deliver a prioritized list of existing shared projects
- Target a pilot project
- Develop a model that delivers collective local, tribal, state, private, and federal strategy and investment to execute a pilot project