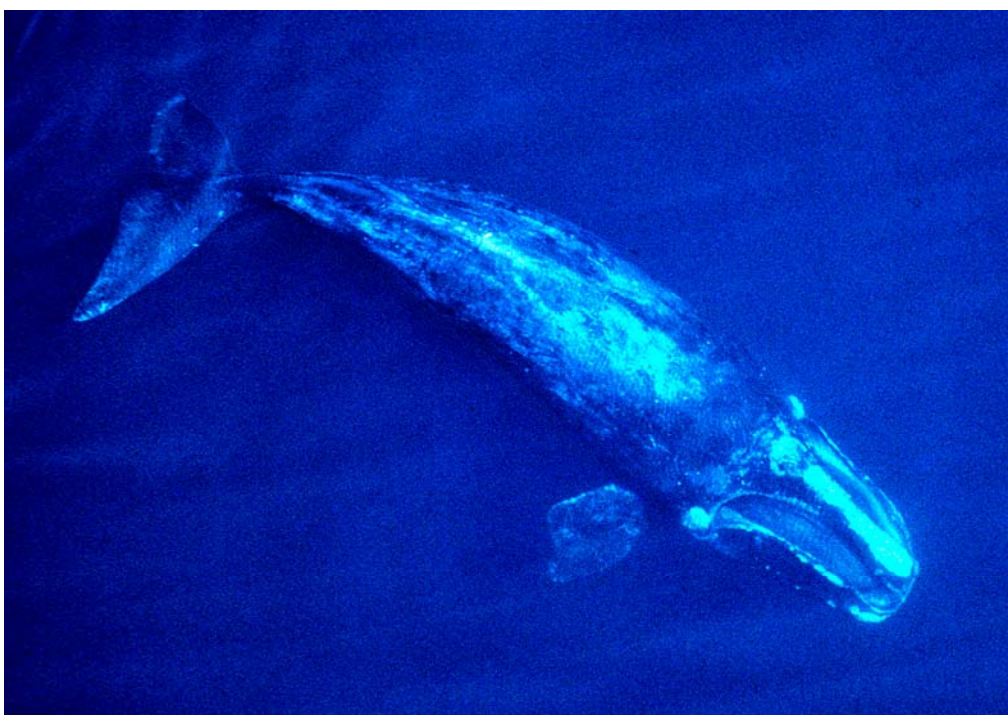


*FEIS Report*

# **Economic Analysis for the Final Environmental Impact Statement of the North Atlantic Right Whale Ship Strike Reduction Strategy**



**PREPARED FOR**

National Oceanic & Atmospheric Administration (NOAA)  
National Marine Fisheries (NMFS)  
Office of Protected Resources

**SUBMITTED TO**

Earth Tech Inc.  
Alexandria, VA

**PREPARED BY**

Nathan Associates Inc.  
Arlington, Virginia

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# 1. Introduction

The National Marine Fisheries Service (NMFS) of the National Oceanic and Atmospheric Administration (NOAA) is considering regulations to reduce mortalities to North Atlantic right whales as a result of vessel collisions. On June 22, 2005 NOAA issued a notice of intent (70 FR 3612) to prepare a Environmental Impact Statement (EIS) to analyze the potential impacts of implementing the operational measures in NOAA's North Atlantic Right Whale Ship Strike Reduction Strategy<sup>1</sup> and the proposed rule was issued on June 26, 2006 (71 FR 36299). Operational measures include seasonal speed restrictions for specific U.S. East Coast port areas during particularly sensitive periods when whales are typically present. The final rule proposes to include speed restrictions of 10 knots and would be in effect for a distance generally between 20-30 nautical miles from the shoreline.<sup>2</sup> During periods outside of the seasonal speed restrictions, all areas along the Atlantic seaboard within the U.S. Exclusive Economic Zone<sup>3</sup> (EEZ) would be subject to dynamic management area (DMA) measures if certain concentrations of right whales were sighted. The measures also allow for the establishment of recommended routes that provide the greatest possibility of reducing the risk of collisions between vessels and whales. If the routes are not used routinely, consideration will be given to making them mandatory through regulation. All of the proposed provisions would apply to non-sovereign vessels with a length of 65 feet and above.

Nathan Associates Inc. was retained by Earth Tech, a NMFS contractor, to conduct the economic analysis for the final EIS (FEIS) of the proposed North Atlantic right whale ship strike reduction operational measures. The FEIS updates and expands the economic analysis that Nathan Associates conducted in 2004-2005 for the draft Environmental Assessment<sup>4</sup> and in 2006 for the draft EIS (DEIS).<sup>5</sup> The FEIS will also evaluate a range of alternatives to reduce mortality to right whales due to ship strikes based on a suite of possible mitigation measures.

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<sup>1</sup> The advance notice of proposed rulemaking (ANPR) issued by NOAA on June 1, 2004 calls for the establishment of new operational measures for the shipping industry including consideration of routing and speed restrictions.

<sup>2</sup> Comments were also requested on alternative speed restrictions of 12 knots and 14 knots.

<sup>3</sup> The US EEZ extends to a distance 200 nautical miles from the baseline from which the breadth of the territorial sea is measured ([www.archives.gov/federal\\_register/codification/proclamations/05030.html](http://www.archives.gov/federal_register/codification/proclamations/05030.html)).

<sup>4</sup> Nathan Associates Inc., Economic Analysis for the Environmental Assessment of the North Atlantic Right Whale Ship Strike Reduction Strategy, April 14, 2005.

<sup>5</sup> Nathan Associates Inc., Economic Analysis for the Environmental Impact Statement of the North Atlantic Right Whale Ship Strike Reduction Strategy, May 23, 2006. The Notice of Availability (NOA) for the DEIS was published on July 7, 2006.

## Scope of Proposed Operational Measures

This Economic Impact Report analyzes the operational measures proposed in the final rule. The proactive operational measures are designed to reduce the likelihood and threat of collisions between vessels and endangered North Atlantic right whales. It also aims to minimize the geographical overlap of shipping lanes and whale habitat to reduce the likelihood of ship strikes in a manner that minimizes adverse effects on the shipping industry and maritime commerce. The operational measures are customized for each region to accommodate for differences in (1) oceanography, (2) commercial ship traffic patterns, (3) navigational concerns, and (4) right whale migration patterns and behavior.

The area covered by this study corresponds to the geographic regions delineated by NOAA in the final rule. The area covered range from the northernmost U.S. jurisdiction areas in the Gulf of Maine to an area just south of Port Canaveral Florida.<sup>6</sup> Proposed right whale ship strike reduction measures were specified for three broad regions of the U.S. East Coast (southeastern Atlantic Coast, the Mid-Atlantic, and the northeastern U.S) that contained 14 port regions (Figure 1-1).

- The southeastern US (SEUS) Atlantic Coast area, bounded to the north by latitude 31°27'N, to the south by latitude 29°45'N, to the east by longitude 80° 51.6'W, and the west by the US shoreline .
- The mid-Atlantic US (MAUS) region, extending from the northernmost boundary of the SEUS to the southernmost boundary of the third region, the northeastern US Atlantic Coast (NEUS).
- The northeastern US (NEUS) Atlantic Coast region, north and east of Block Island up to Canada.

The operational measures are intended to supplement existing conservation plans and include the following components:

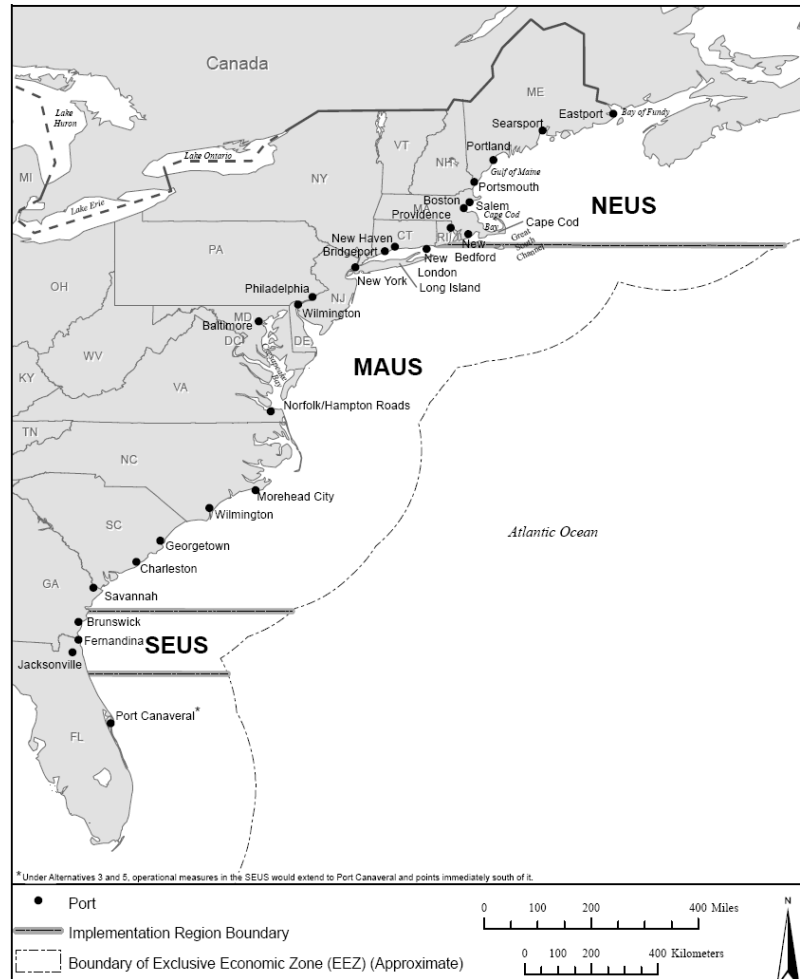
- Continue ongoing conservation and research activities to reduce the threat of ship strikes
- Develop and implement additional mariner education and outreach programs.
- Conduct ESA Section 7 consultations, as appropriate, with Federal agencies that operate or authorize the use of vessels in waters inhabited by right whales.
- Develop a Right Whale Conservation Agreement with the Government of Canada.
- Establish new operational measures for commercial and recreational mariners.

Only the last component (operational measures) is addressed in the EIS.

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<sup>6</sup> Accordingly, this study does not include U.S. East Coast ports south of Port Canaveral such as Miami, Palm Beach, Fort Lauderdale and other smaller ports.

**Figure 1-1. Port Areas for Proposed Operational Measures**



## Operational Measures

The proposed operational measures vary (mostly by specific times and affected areas) based on ship traffic patterns and locations of right whale habitat and migratory corridors in the three regions of implementation along the US East Coast. The proposed measures would include the following:

- **Dynamic Management Areas (DMAs).** DMAs would impose temporary restrictions on vessels in areas where right whales are detected and no specific measure(s) are in place or in force at this time.
- **Seasonal Management Areas (SMAs).** SMAs would create seasonal speed restrictions in (a) a 20 - 30 nm (37-56 km) radius around specified ports in the MAUS or a continuous 20 nm (area from the coast, except for the 25 to 30-nautical mile rectangular area off of Block Island (see Figure 1-1); (b) in specified areas in Cape Cod Bay, Off Race Point, and Great South Channel; and (c) in specified areas in the waters off the coasts of Georgia and Florida.

- **Vessel Routing Measures.** Routing measures include recommended shipping routes (also referred to as shipping lanes) that have been implemented by NMFS in the NEUS and SEUS. If the routes are not used routinely, consideration will be given to making them mandatory through regulation.

## Alternatives Considered

Each of the alternatives considered in the EIS implements a subset of the operational measures described above from none (Alternative 1) to all (Alternative 5). In some cases, the measures proposed for implementation under a given alternatives have been modified to ensure that the alternative is a reasonable and feasible option to meet NMFS' purpose and need. For all alternatives that include speed restrictions, the FEIS evaluates the impact for the proposed restricted speed of 10 knots (base case) and for alternative restricted speeds of 12 knots and 14 knots. Table 1-1 summarizes the alternatives considered in the FEIS.

*Table 1-1. Summary of Alternatives Considered in the FEIS*

Operational Measure	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Recommended Routes	No	No	No	Yes, in the SEUS and NEUS regions.	Yes, in SEUS and NEUS regions.	Yes, in SEUS and NEUS regions.
DMAs	No	Yes, in US Territorial waters and the EEZ.	No	No	Yes, in US Territorial waters and the EEZ.	Yes, in US Territorial waters and the EEZ.
SMAs	No	No	Yes	No	Yes	Yes, in SEUS, MAUS and NEUS regions
Speed restrictions	No	Yes, associated with DMAs.	Yes, within the SMAs: year- round in NEUS region, and seasonal in MAUS and SEUS regions.	No	Yes, associated with DMAs, and SMAs defined for Alternative 3.	Yes, associated with DMAs (voluntary), and all SMAs.

### ALTERNATIVE 1 – NO ACTION ALTERNATIVE

Under the No Action Alternative, none of the operational measures would be implemented. Mariners would not be subject to new regulations to reduce right whale ship strikes. NMFS would continue to implement existing measures and programs to reduce the likelihood of right whale mortalities from ship strikes. Research would continue and existing technologies would be used to determine whale locations and pass this information on to mariners. Other ongoing activities would include the use of aerial surveys to notify mariners of right whale sighting locations, the operation of the Mandatory Ship Reporting System (MSRS), support of Recovery Plan Implementation Teams, education and outreach programs for mariners, and ongoing research on technological solutions. Other components may be implemented, and existing conservation measures would remain active. Alternative 1 provides a baseline against which to assess the impacts of the action alternatives.

## **ALTERNATIVE 2 – DYNAMIC MANAGEMENT AREAS**

Alternative 2 would incorporate the elements of Alternative 1 plus the DMA component of the proposed operational measures. DMAs would be defined, as warranted by right whale sightings, in all areas within the Atlantic Ocean EEZ. Compliance with DMAs would be mandatory under Alternative 2. Successful implementation of this alternative would depend on maintaining survey efforts and ensuring that efforts are made to make, record, and make available the specific sighting locations. Therefore, it would require a commitment to continuing aircraft surveillance coverage and expanding coverage in the mid-Atlantic, as necessary.

## **ALTERNATIVE 3 – SPEED RESTRICTIONS IN DESIGNATED AREAS**

This alternative includes the elements of Alternative 1 plus certain speed restrictions in designated areas. Since speed restrictions would be the only measure implemented under this alternative, the areas and times applied to these restrictions would be different from the areas and times for similar restrictions proposed as part of the entire set of measures. Specifically, the proposed restrictions would apply as follows:

- In the NEUS region, year-round within all waters in the Seasonal Area Management (SAM) zones identified in the Atlantic Large Whale Take Reduction Plan (ALWTRP) and within the Cape Cod Bay critical habitat. There are currently two expanded SAM zones in the Northeast: “SAM West,” in effect from March 1 to April 30; and “SAM East,” in effect from May 1 to July 31. The adjoining line between SAM West and SAM East is 69°24’W longitude (NMFS, 2005a). Therefore, SAM West and SAM East essentially have the same boundaries as the Off Race Point and Great South Channel SMAs, the only difference being the overlap in the SAM areas.
- In the MAUS region, restrictions from October 1 to April 30. The restricted area would include all waters 25 nm out from the US coastline between Providence, RI and New London, CT (Block Island Sound), and Savannah, GA.
- In the SEUS region, restrictions from November 15 to April 15. The restricted area would include all waters within the MSRS WHALESSOUTH reporting area and the presently designated right whale critical habitat.

## **ALTERNATIVE 4 – RECOMMENDED SHIPPING ROUTES**

This alternative includes all the elements of Alternative 1 plus the recommended shipping routes component of the proposed operational measures for the SEUS region. These include use of the northeast and southeast port access routes to each of the port areas of Brunswick, Fernandina and Jacksonville. The port access routes will be in effect year-round. Alternative 4 does not propose speed restrictions in these shipping lanes. No measures would apply to the MAUS region. Recommended shipping lanes in Cape Cod Bay have been established year-round. NMFS will monitor use of the recommended routes, and if they are not used routinely, consideration will be given to making them mandatory through regulation.

## **ALTERNATIVE 5 – COMBINATION OF ALTERNATIVES**

This alternative would include all elements of Alternatives 1 to 4 as previously described. Therefore, it would implement all the proposed operational measures.

## **ALTERNATIVE 6 – PREFERRED ALTERNATIVE**

Alternative 6 of the FEIS has several changes from those analyzed in Alternative 6 of the DEIS. The revised alternative has the same revised trigger mentioned in Section 2.3.2 for DMAs; however, in Alternative 6, DMAs are voluntary. The recommended routes are in place year-round instead of seasonally. The MAUS ports of Wilmington, Georgetown, Charleston, and Savannah are now included in a continuous 20 (37 km) nm SMA. The SMAs for the ports of Block Island, New York/New Jersey, Delaware Bay, Chesapeake Bay, Morehead City, and Beaufort, North Carolina have been changed as described below. The operational measures for Alternative 6 are as follows:

- Seasonal speed restriction for the Southeast SMA will be implemented from November 15-April 15
- The shipping lanes into Brunswick, Fernandina, and Jacksonville extend out to longitude 80° 51.6 W (eastern boundary of the MSRS system).
- Monitoring of recommended routes as in Alternative 4 for the port areas of Brunswick, Fernandina and Jacksonville and Cape Cod Bay.
- SMAs for port areas in the mid-Atlantic US region will be implemented from November 1-April 30. Except for Block Island Sound, which will have a rectangular SMA of 30 nm, the port areas north of Wilmington, NC will have a radius of 20 nm. A continuous 20-nautical mile buffer will be implemented from Wilmington, NC through Savannah, GA to the northern boundary of the Southeastern SMA.
- Seasonal speed restrictions for Cape Cod Bay SMA will be implemented from January 1-May 15.
- An expanded Off Race Point Seasonal Management Area as proposed in the ALWTRP will be implemented from March 1-April 30.
- The Great South Channel Seasonal Management Area has also been expanded (west) and will be implemented from April 1-July 31.
- The trigger and duration for voluntary DMAs are those described under Alternative 2.

The operational measures proposed under Alternative 6 will expire five years after their date of effectiveness.

## 2. Existing U.S. East Coast Maritime Activity

In this section we will discuss existing maritime activity in the sections of the U.S. East Coast subject to the final rule. The discussion focuses on the identification of the number, type and size of vessels that call at U.S. East Coast ports and the value of U.S. imports and exports by port area. We also present estimates of the ocean freight component of the imported goods. All data sources and the methodology employed are described fully with further detail presented in the accompanying appendices.

While the final rule applies to vessels of 65 LOA or greater, we also analyzed vessel arrivals by deadweight tons (DWT) and/or gross registered tons (GRT) which are the customary units in the shipping industry for classifying vessels by size category to estimate vessel operating costs

### Vessel Arrivals at U.S. East Coast Ports

The principal data source used is the U.S. Coast Guard Vessel Arrival Database. This database includes all vessel arrivals at US ports of 150 GRT and above.<sup>7</sup> We obtained data for 2002, 2003, and 2004.<sup>8</sup> The database corresponding to the 2002 and 2003 data includes 48 fields of information, and the database corresponding to 2004 includes 38 fields. Key information relevant for this study includes date/time of arrival; port; vessel type, size and flag; product type; and cargo amount. (Appendix A, Attachment 1).

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<sup>7</sup> The USCG data includes 64 vessels (362 arrivals) with gross tonnage of less than 150 but greater than 65 feet in length; we have kept these in the dataset.

<sup>8</sup> Vessel arrival data for 2005 through 2007 only became available only after the preponderance of work on the economic analysis had been completed, and funding and time were not sufficient to conduct further updates for the EIS. Nonetheless, vessel arrivals for 2003 and 2004 provide a suitable basis for identifying the level of economic impacts for later years, as annual variations in the composition and volume of vessel traffic are relatively modest. For example, while new and larger vessels come into service each year, these new vessels would not significantly alter the average vessel operating costs used in this analysis by type and size of vessel. Similarly, the annual growth in overall traffic would affect all of the alternatives analyzed and pales in significance when compared to the large differences amongst the alternatives analyzed.

The 2002 and 2003 data was provided by the USCG in three data files<sup>9</sup> corresponding to:

- Vessel arrivals (245,910 records)
- Vessel characteristics and ownership (725,526 records)
- Arrival port codes (7,672 records)

The 2004 data was provided by the USCG in three data files corresponding to:

- Vessel arrivals (95,452 records)
- Vessel characteristics and ownership (798,611 records)
- Arrival port codes (7,672 records)

For purposes of analysis we have divided the port regions into defined 26 specific port areas<sup>10</sup> (Table 2-1).

***Table 2-1. U.S East Coast Regions and Port Areas Used in the Study***

Northeastern U.S.	Mid-Atlantic	Southeastern U.S.
Eastport, ME	New Bedford, MA	Brunswick, GA
Searsport, ME	Providence, RI	Fernandina, FL
Portland, ME	New London, CT	Jacksonville, FL
Portsmouth, NH	New Haven, CT	Port Canaveral, FL
Salem, MA	Bridgeport, CT	
Boston, MA	Long Island, NY	
Cape Cod	New York City, NY	
	Philadelphia, PA	
	Baltimore, MD	
	Hampton Roads, VA	
	Morehead City, NC	
	Wilmington, NC	
	Georgetown, SC	
	Charleston, SC	
	Savannah, GA	

Source: Prepared by Nathan Associates.

<sup>9</sup> This database also contains arrival records from January through October 2004, but all 2004 data was derived from the second database, which contains data for all 12 months for 2004.

<sup>10</sup> We use the term “port area” because they may include smaller ports within the general vicinity of a larger port but not formally included within the boundaries of a single port authority.



## USCG Vessel Arrival Data Reconciliation

Our initial review of the USCG vessel arrival data determined that while it appeared comprehensive and complete in terms of vessel arrivals; there were numerous inconsistencies and data entry errors, particularly concerning the port designation. However, it was possible to correct these inconsistencies and errors using information contained in other data fields. In all, Nathan Associates reconciled port codes for 43,782 records, (Appendix A, Attachment 2) and reconciled port code and state designations for 1,531 records. (Appendix A, Attachment 3).

In terms of geographic coverage, we first reduced the database of vessel arrivals to ports located in states along the U.S. East Coast based on the state designation included in the file. We then conducted a separate analysis to exclude ports located along the Gulf Coast of Florida, ports on the East Coast of Florida below Port Canaveral, and New York Great Lake ports. The result was 83,611 vessel arrival records for U.S. East Coast ports during 2002 through 2004 pertaining to 7,344 vessels. Vessel arrivals by USCG port codes were then matched with study port areas. (Appendix A, Attachment 4).

Information on the size of the vessel will be used later in the economic impact analysis to prepare estimates of the value of vessel time. However the USCG vessel characteristics and ownership database was missing the DWT for 1,100 vessels (15 percent of all vessels included in the U.S. East Coast arrivals), but did contain GRT. For these vessels we estimated DWT using regression analysis by 15 vessel type on the remaining 85 percent of vessels that reported both DWT and GRT. We modeled DWT as a function of the vessel type and gross tons including the interactive term “gross tons\*vessel type.” Regressions were based on 6,044 vessels with both DWT and GRT. The regression results included an R-squared of 93.4 percent; parameter estimates were statistically significant at the five percent level for 11 vessel types that account for 97.5 percent of total vessel arrivals (Appendix A, Attachment 5). This provided an estimated value of DWT for vessels records that lacked that information.

Conversations with USCG following the publication of our April 2005 report revealed that there are likely to be duplicate arrival records in the data. In this update we removed records if there were multiple arrivals by a vessel at the same port on the same day. Applying this filter resulted in the removal of 1,327 arrivals from the 2003 data. We also removed 24 arrivals made by vessels owned by the federal government. Additionally, certain arrival records to the ports of Boston, MA and Georgetown, SC contained the incorrect port code in the USCG data. These arrivals were incorrectly attributed to foreign ports with the same names. Correcting these errors resulted in the addition of 66 arrivals in 2003. A review of the USCG data with Massport officials identified 97 additional arrivals in Boston in 2003. Similarly, the USCG data for 2004 appeared to under represent a significant number of arrivals for Boston. For this report we have assumed that Boston 2004 arrivals were equal to those recorded by Massport in 2003. We found two additional instances where the USCG data contained the incorrect port code. Many vessel arrivals to the port of Portland, OR were being incorrectly attributed to the port of Portland, ME. As a result, we removed 821 arrivals from the 2003 Portland, ME data. We also found a number of arrivals attributed to the Portsmouth, NH port area that were actually arrivals made to the port of Portsmouth, VA. To correct this, we reallocated 61 arrivals from Portsmouth, NH port area

to the Hampton Roads, VA port area. Appendix A, Attachment 7 shows a comparison of the 2003 arrivals by port region and vessel classification in the April 2005 report and after making these corrections.

## **Vessel Arrivals by Port Area**

Based on the US Coast Guard data, there were 25,532 vessel arrivals at U.S. East Coast ports in 2003 (Table 2-2). For 2004, vessel arrivals increased by 7.3 percent to 27,385 vessel arrivals. For both years, the largest number of vessel arrivals was recorded in the port region of mid-Atlantic-Ports of New York/New Jersey with 5,426 vessel arrivals and 5,550 vessel arrivals in 2003 and 2004, respectively.

The mid-Atlantic-Chesapeake Bay is the next most important port region in terms of vessel arrivals with 4,486 and 4,875 in 2003 and 2004, respectively. The ports of Baltimore, Norfolk and Hampton Roads are included in this port region. Other significant port regions with more than 2,000 vessel arrivals in 2004 include Southeastern U.S. (4,315 vessel arrivals), mid-Atlantic Delaware Bay (2,661 vessel arrivals), mid-Atlantic Block Island Sound (2,563 vessel arrivals), mid-Atlantic Savannah GA (2,474 vessel arrivals), and mid-Atlantic-Charleston (2,473 vessel arrivals).

In terms of port areas, New York City had the most vessel arrivals (5,550 arrivals) in 2004, followed by Hampton Roads (2,834 arrivals), Philadelphia (2,661 arrivals), Jacksonville (2,517 arrivals), Savannah, GA (2,474 arrivals), Charleston (2,473 arrivals), Baltimore (2,041 arrivals) and Port Canaveral (1,062 arrivals).

**Table 2-2. Vessel Arrivals by Port Area, 2003 and 2004**

Port Area	2003	2004
<b>Northeastern US - Gulf of Maine</b>		
Eastport, ME	40	43
Searsport, ME	196	196
Portland, ME	620	641
Portsmouth, NH	199	173
<b>Northeastern US - Off Race Point</b>		
Salem, MA	9	15
Boston, MA	483	483
<b>Northeastern US - Cape Cod Bay</b>		
Cape Cod, MA	22	36
<b>Mid-Atlantic Block Island Sound</b>		
New Bedford, MA	110	99
Providence, RI	350	322
New London, CT	135	180
New Haven, CT	547	701
Bridgeport, CT	319	392
Long Island, NY	780	869
<b>Mid-Atlantic Ports of New York/New Jersey</b>		
New York City, NY	5,426	5,550
<b>Mid-Atlantic Delaware Bay</b>		
Philadelphia, PA	2,479	2,661
<b>Mid-Atlantic Chesapeake Bay</b>		
Baltimore, MD	1,820	2,041
Hampton Roads, VA	2,666	2,834
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>		
Morehead City, NC	123	151
<b>Mid-Atlantic Wilmington, NC</b>		
Wilmington, NC	628	667
<b>Mid-Atlantic Georgetown, SC</b>		
Georgetown, SC	63	69
<b>Mid-Atlantic Charleston, SC</b>		
Charleston, SC	2,277	2,473
<b>Mid-Atlantic Savannah, GA</b>		
Savannah, GA	2,398	2,474
<b>Southeastern US</b>		
Brunswick, GA	458	452
Fernandina, FL	255	284
Jacksonville, FL	2,240	2,517
Port Canaveral, FL	889	1,062
<b>All Port Areas</b>	<b>25,532</b>	<b>27,385</b>

Source: Prepared by Nathan Associates based on analysis of USCG data on vessel calls at U.S. ports, 2003-2004.

## U.S. East Coast Vessel Arrivals by Vessel Type

There is a great diversity in the type of vessels that call at U.S. East Coast ports. The USCG vessel characteristics file contains four fields that help identify vessel type: vessel class, vessel type, vessel subtype, vessel service. The USCG database includes 16 vessel classes, 48 vessel types, 35 vessel sub-types, and 21 vessel services. Table 2-3 presents the set of 12 summary vessel type categories that we defined for this study based on the information provided in the four USCG vessel description fields.

*Table 2-3. Vessel Types Used*

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Bulk Carriers
Combination Carriers
Containerships
Freight Barges
General Cargo Vessels
Passenger Vessels
Refrigerated Cargo Vessels
Ro-Ro Cargo Vessels
Tank Barges
Tank Ship
Towing Vessels
Other a/

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a/ Includes fishing vessels, industrial vessels, research vessels and school ships.

Source: Appendix A, Attachment 6.

Containerships accounted for the largest number of U.S. East Coast vessel arrivals with 8,623 arrivals in 2003 and 8,886 arrivals in 2004 (Tables 2-4 & 2-5). Tank ship was the next most frequent vessel type with 5,439 arrivals in 2003 and 5,513 in 2004. Other significant vessel types in 2004 include bulk carriers (3,149 arrivals), ro-ro cargo vessels (3,054 arrivals), and general cargo vessels (1,843 arrivals). These top 5 vessel types accounted for 82 percent of total vessel arrivals in 2004.

A detailed set of tables on vessel arrivals by type of vessel for each port area is presented in Appendix B.

**Table 2-4. U.S. East Coast Vessel Arrivals by Port Area and Vessel Type, 2003**

Port Area	Vessel Type												Other a/	Total
	Bulk Carrier	Combination Carrier	Container Ship	Freight Barge	General Dry Cargo Ship	Passenger Ship	Refrigerated Cargo Ship	Ro-Ro Cargo Ship	Tank Barge	Tanker	Towing Vessel			
Northeastern US - Gulf of Maine														
Eastport, ME	16	-	5	-	19	-	-	-	-	-	-	-	40	
Searsport, ME	14	1	-	-	-	66	-	1	23	89	2	-	196	
Portland, ME	66	14	9	1	38	19	-	58	6	396	11	2	620	
Portsmouth, NH	63	3	-	-	10	1	-	-	2	117	1	2	199	
Northeastern US - Off Race Point														
Salem, MA	7	-	-	-	-	1	-	-	-	1	-	-	9	
Boston, MA	34	1	77	2	8	94	4	33	-	225	1	4	483	
Northeastern US - Cape Cod Bay														
Cape Cod, MA	-	-	-	-	-	9	-	-	-	13	-	-	22	
Subtotal	0	0	0	0	0	9	0	0	0	13	0	0	22	
Mid-Atlantic Block Island Sound														
New Bedford, MA	58	-	1	-	25	0	11	-	4	11	-	-	110	
Providence, RI	77	2	2	-	24	35	4	77	3	122	3	1	350	
New London, CT	20	-	2	-	10	32	-	-	61	8	1	1	135	
New Haven, CT	54	2	1	5	33	5	-	-	236	195	15	1	547	
Bridgeport, CT	28	-	1	5	2	4	54	-	176	49	-	-	319	
Long Island, NY	-	2	-	2	-	32	-	-	521	218	3	2	780	
Mid-Atlantic Ports of New York/New Jersey														
New York City, NY	366	39	2,400	1	65	226	19	696	28	1,558	20	8	5,426	
Mid-Atlantic Delaware Bay														
Philadelphia, PA	312	19	467	16	195	26	401	148	12	864	17	2	2,479	
Mid-Atlantic Chesapeake Bay														
Baltimore, MD	304	8	368	-	204	40	6	653	6	192	16	23	1,820	
Hampton Roads, VA	320	30	1,748	1	138	31	1	174	2	202	6	13	2,666	
Mid-Atlantic Morehead City and Beaufort, NC														
Morehead City, NC	29	-	14	-	32	-	2	2	-	42	-	2	123	
Mid-Atlantic Wilmington, NC														
Wilmington, NC	111	7	92	-	118	-	1	23	17	257	1	1	628	
Mid-Atlantic Georgetown, SC														
Georgetown, SC	43	-	1	-	18	-	-	-	-	-	-	1	63	
Mid-Atlantic Charleston, SC														
Charleston, SC	162	2	1,503	-	92	40	7	223	14	214	15	5	2,277	
Mid-Atlantic Savannah, GA														
Savannah, GA	289	14	1,332	-	234	6	9	170	4	331	6	3	2,398	
Southeastern US														
Brunswick, GA	86	-	27	-	54	1	13	273	-	4	-	-	458	
Fernandina, FL	9	-	80	2	111	2	37	2	-	2	10	-	255	
Jacksonville, FL	166	4	476	195	245	12	11	537	9	302	274	9	2,240	
Port Canaveral, FL	109	2	17	13	77	547	41	37	3	27	14	2	889	
All Port Regions	2,743	150	8,623	243	1,752	1,229	621	3,107	1,127	5,439	416	82	25,532	

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

**Table 2-5. U.S. East Coast Vessel Arrivals by Port Area and Vessel Type, 2004**

Port Area	Vessel Type												Total
	Bulk Carrier	Combination Carrier	Container Ship	Freight Barge	General Dry Cargo Ship	Passenger Ship	Refrigerated Cargo Ship	Ro-Ro Cargo Ship	Tank Barge	Tanker	Towing Vessel	Other a/	
Northeastern US - Gulf of Maine													
Eastport, ME	22	-	4	-	17	-	-	-	-	-	-	-	43
Searsport, ME	10	-	2	2	3	81	-	1	11	78	8	-	196
Portland, ME	71	4	4	1	28	26	-	37	26	395	47	2	641
Portsmouth, NH	51	3	1	-	16	1	-	-	1	87	9	4	173
Northeastern US - Off Race Point													
Salem, MA	9	-	-	-	-	6	-	-	-	-	-	-	15
Boston, MA	34	1	77	2	8	94	4	33	-	225	1	4	483
Northeastern US - Cape Cod Bay													
Cape Cod, MA	-	-	-	-	-	13	-	-	1	21	1	-	36
Subtotal	0	0	0	0	0	13	0	0	1	21	1	0	36
Mid-Atlantic Block Island Sound													
New Bedford, MA	54	-	-	-	24	2	8	1	-	10	-	-	99
Providence, RI	86	2	-	-	21	43	-	62	5	94	6	3	322
New London, CT	17	-	8	-	26	57	-	-	58	11	3	-	180
New Haven, CT	41	-	6	5	34	-	-	-	442	151	22	-	701
Bridgeport, CT	69	-	-	1	2	4	24	-	258	33	-	1	392
Long Island, NY	-	-	-	8	-	38	-	-	597	225	-	1	869
Subtotal	267	2	14	14	107	144	32	63	1,360	524	31	5	2,563
Mid-Atlantic Ports of New York/New Jersey													
New York City, NY	380	27	2,499	-	68	307	26	683	23	1,485	47	5	5,550
Mid-Atlantic Delaware Bay													
Philadelphia, PA	360	8	450	24	270	33	364	147	3	944	54	4	2,661
Mid-Atlantic Chesapeake Bay													
Baltimore, MD	387	6	402	-	212	75	9	651	5	270	13	11	2,041
Hampton Roads, VA	439	25	1,725	5	147	64	10	152	7	222	22	16	2,834
Mid-Atlantic Morehead City and Beaufort, NC													
Morehead City, NC	49	1	14	-	22	7	-	-	-	56	-	2	151
Mid-Atlantic Wilmington, NC													
Wilmington, NC	135	4	84	1	123	6	1	29	9	266	6	3	667
Mid-Atlantic Georgetown, SC													
Georgetown, SC	45	3	4	-	16	1	-	-	-	-	-	-	69
Mid-Atlantic Charleston, SC													
Charleston, SC	145	3	1,649	6	123	64	5	211	11	210	39	7	2,473
Mid-Atlantic Savannah, GA													
Savannah, GA	302	12	1,317	1	200	49	18	186	3	376	8	2	2,474
Southeastern US													
Brunswick, GA	92	-	11	-	63	8	12	262	-	1	-	3	452
Fernandina, FL	28	-	75	2	117	19	18	1	-	-	24	-	284
Jacksonville, FL	187	7	541	183	220	89	13	547	17	307	369	37	2,517
Port Canaveral, FL	136	-	13	33	83	579	36	51	15	46	66	4	1,062
All Port Regions	3,149	106	8,886	274	1,843	1,666	548	3,054	1,492	5,513	745	109	27,385

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

## **U.S. East Coast Vessel Arrivals by Size of Vessel**

The size of vessels calling at U.S. East Coast ports can vary considerably depending on a number of factors including cargo and vessel type, length of ocean voyage, port and channel draft limitations at the loading or unloading port, customers preferred consignment size, and vessel routing considerations.

### **VESSEL SIZE BY PORT AREA**

Table 2-6 presents U.S. East Coast vessel arrivals by port region, port area and DWT size ranges for 2003 and 2004. For the U.S. East Coast as a whole, about 38 percent of the vessel arrivals are of vessels below 20,000 DWT, approximately 24 percent of vessel arrivals are between 20,000 and 40,000 DWT; 25 percent between 40,000 and 60,000 DWT; and 13 percent over 60,000 DWT.

**Table 2-6. Vessel Arrivals by Port Area and DWT, 2003-2004**

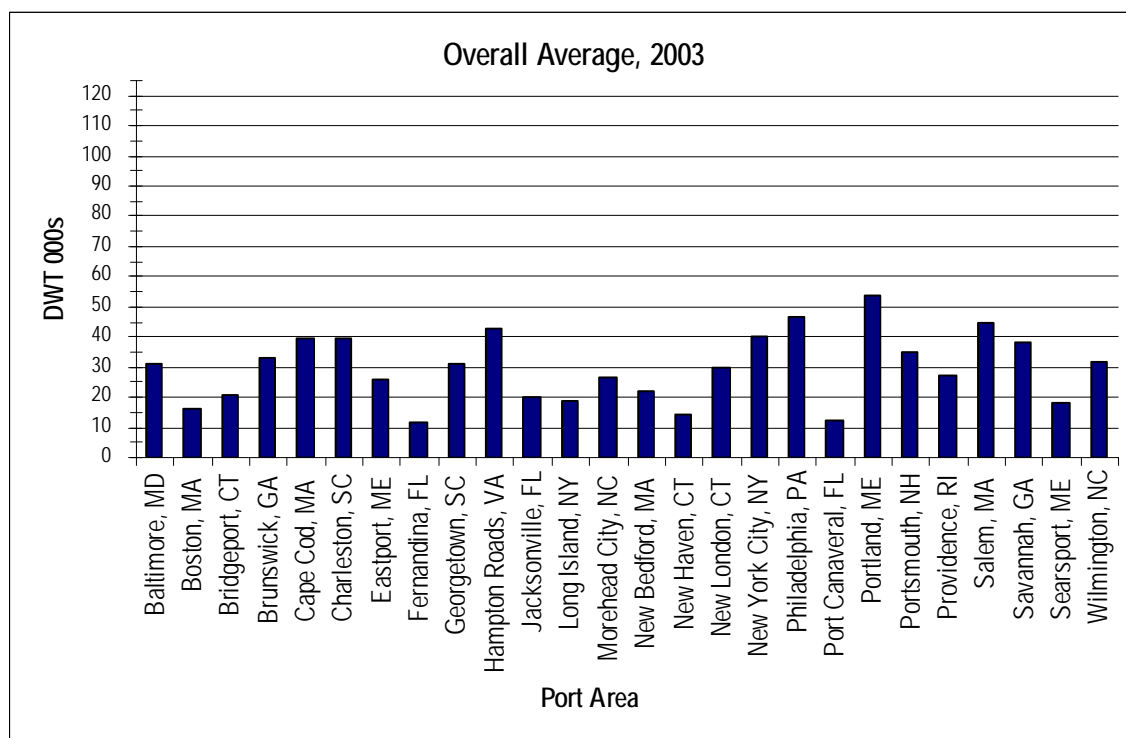
Port Area	2003					2004				
	DWT					DWT				
	0 - 19,999	20,000 - 39,999	40,000 - 59,999	60,000 and Greater	Total	0 - 19,999	20,000 - 39,999	40,000 - 59,999	60,000 and Greater	Total
<b>Northeastern US - Gulf of Maine</b>										
Eastport, ME	23	4	13	-	40	17	-	26	-	43
Searsport, ME	132	43	18	3	196	117	46	31	2	196
Portland, ME	209	111	83	217	620	201	103	104	233	641
Portsmouth, NH	32	91	74	2	199	33	48	91	1	173
<b>Northeastern US - Off Race Point</b>										
Salem, MA	1	1	5	2	9	6	6	-	3	15
Boston, MA	237	109	127	10	483	237	109	127	10	483
<b>Northeastern US - Cape Cod Bay</b>										
Cape Cod, MA	9	-	3	10	22	15	1	8	12	36
<b>Mid-Atlantic Block Island Sound</b>										
New Bedford, MA	46	33	12	19	110	41	28	8	22	99
Providence, RI	172	74	92	12	350	157	89	72	4	322
New London, CT	96	19	20		135	118	25	36	1	180
New Haven, CT	309	116	117	5	547	520	81	94	6	701
Bridgeport, CT	278	4	15	22	319	349	2	14	27	392
Long Island, NY	624	59	9	88	780	691	77	17	84	869
<b>Mid-Atlantic Ports of New York/New Jersey</b>										
New York City, NY	1,353	1,311	1,830	932	5,426	1,324	1,548	1,774	904	5,550
<b>Mid-Atlantic Delaware Bay</b>										
Philadelphia, PA	1,117	472	296	594	2,479	1,153	556	327	625	2,661
<b>Mid-Atlantic Chesapeake Bay</b>										
Baltimore, MD	754	483	415	168	1,820	759	588	443	251	2,041
Hampton Roads, VA	429	763	950	524	2,666	472	855	871	636	2,834
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>										
Morehead City, NC	30	74	15	4	123	37	77	33	4	151
<b>Mid-Atlantic Wilmington, NC</b>										
Wilmington, NC	196	168	238	26	628	221	176	240	30	667
<b>Mid-Atlantic Georgetown, SC</b>										
Georgetown, SC	19	18	26	-	63	27	28	14	-	69
<b>Mid-Atlantic Charleston, SC</b>										
Charleston, SC	371	692	986	228	2,277	406	817	1,045	205	2,473
<b>Mid-Atlantic Savannah, GA</b>										
Savannah, GA	507	667	908	316	2,398	496	739	823	416	2,474
<b>Southeastern US</b>										
Brunswick, GA	282	126	46	4	458	271	149	28	4	452
Fernandina, FL	225	4	26	-	255	247	2	35	-	284
Jacksonville, FL	1,376	457	358	49	2,240	1,562	514	389	52	2,517
Port Canaveral, FL	763	70	46	10	889	878	84	85	15	1,062
<b>All Port Areas</b>	<b>9,590</b>	<b>5,969</b>	<b>6,728</b>	<b>3,245</b>	<b>25,532</b>	<b>10,355</b>	<b>6,748</b>	<b>6,735</b>	<b>3,547</b>	<b>27,385</b>

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.



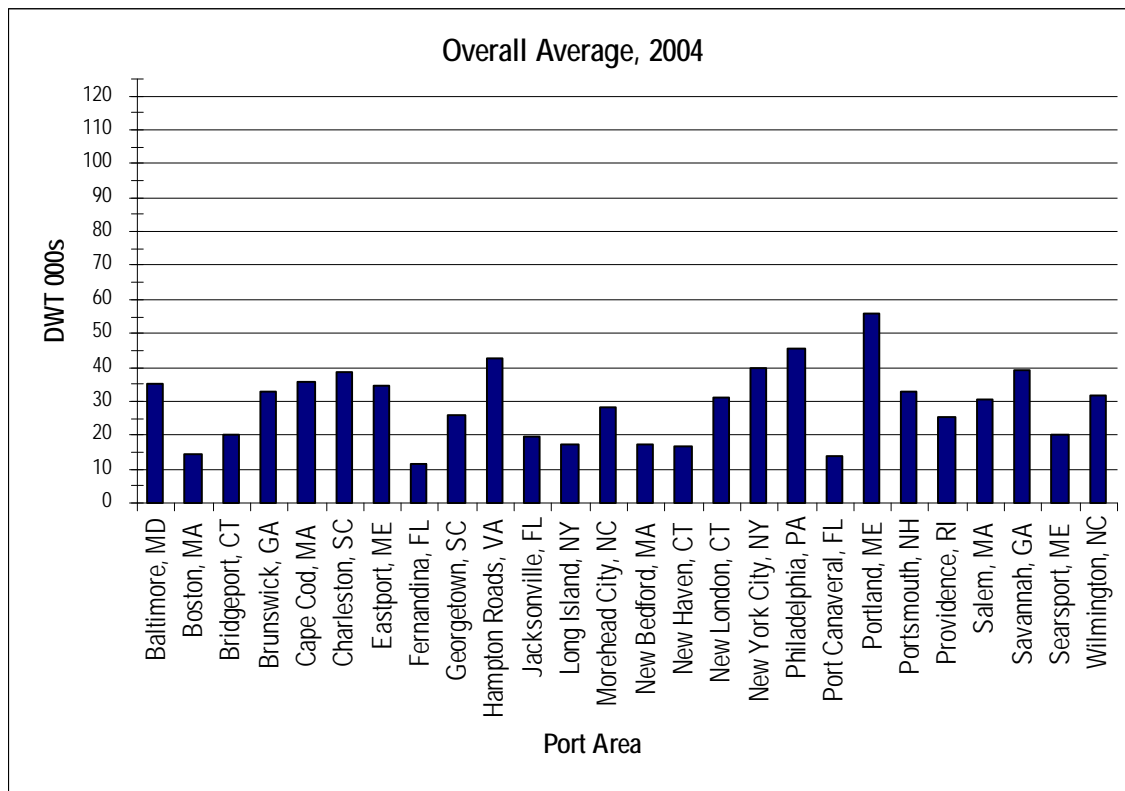
In 2003, the port area of Portland had the highest average vessel DWT on the U.S. East Coast with an average of 53,810 DWT (Figure 2-1). The port area of Philadelphia was second with an average of 46,371. Large tankers bringing principally fuel oil for local power plants account for more than 50 percent of the arrivals for both of these port areas. High average vessel DWT are also reported for the port area of Salem, MA (44,738 DWT in 2003) and Hampton Roads (42,749 DWT). The average vessel DWT by port area was similar for 2004 (Figure 2-2).

**Figure 2-1. Average Vessel DWT by Port Area, 2003**



Source: Prepared by Nathan Associates Inc. as described in text from USCG Vessel Arrival Database.

*Figure 2-2. Average Vessel DWT by Port Area, 2004*



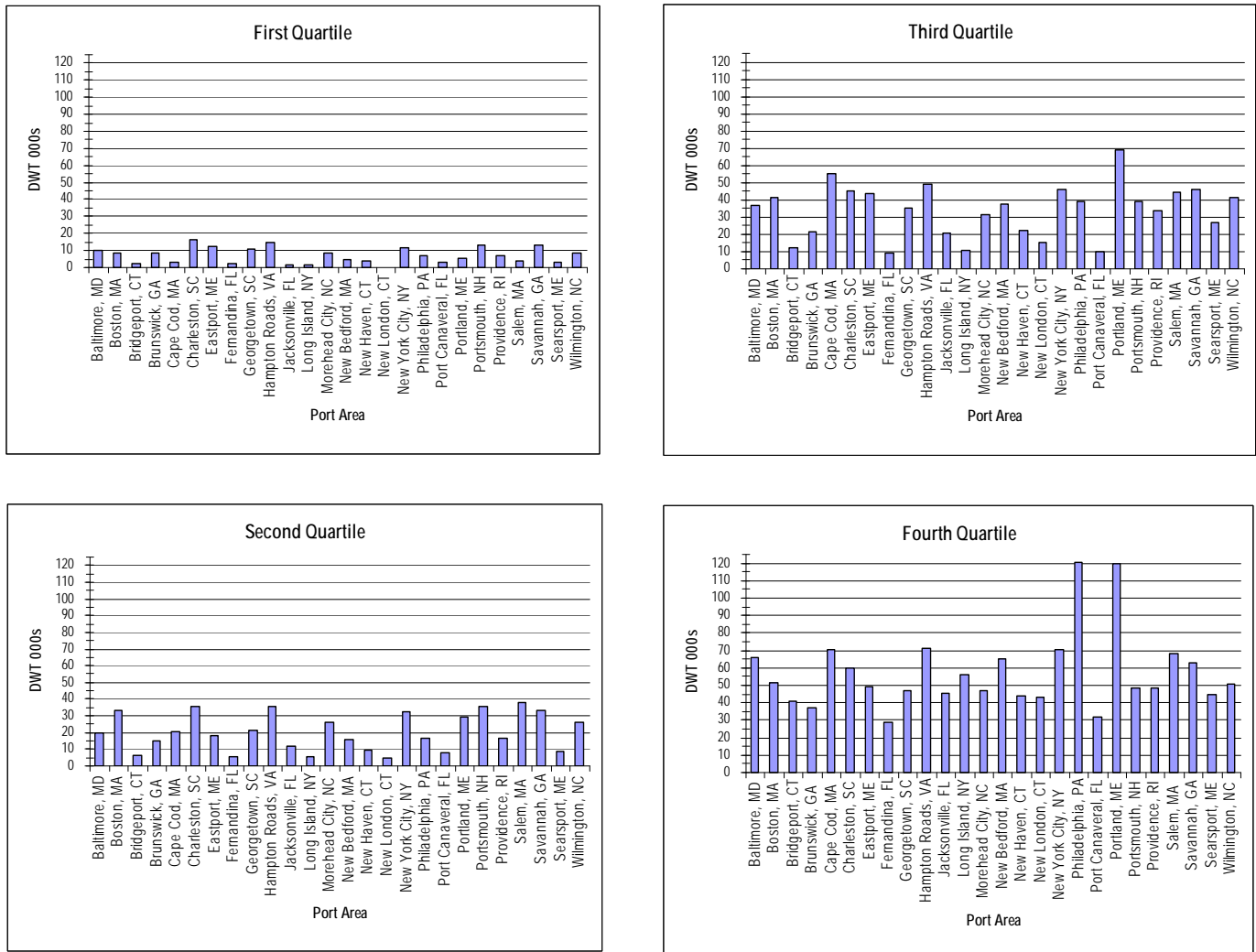
Source: Prepared by Nathan Associates Inc. as described in text from USCG Vessel Arrival Database.

The overall average vessel DWT by port area can sometimes mask a significant size difference of smaller and larger vessels calling at port. For this reason, we have analyzed average vessel size by DWT quartile for each of the port areas. Thus the average DWT for the smallest 25 percent of vessels calling at each port area in 2003-2004 is presented in Figure 2-3, quartile 1. The second smallest 25 percent of vessels is presented as quartile 2, etc.

For most port areas, there appears to be an orderly and graduated increase in the average vessel DWT by DWT quartile. In the second quartile, the port areas of Boston, Portland, Hampton Roads, Portsmouth and Salem exhibit large jumps in average vessel DWT. For Boston, this is due to the importance of containerships and tankers in the second quartile. In the case of Hampton Roads, it is an indication of the importance of bulk cargoes handled at the port and the predominance of large vessels even within the second DWT quartile. For Salem, it is the combination of a small number of overall vessel arrivals and the use of dry bulk vessels at the port.

In the fourth quartile, the port areas of Philadelphia, PA and Portland, ME demonstrate dramatic increases. For Philadelphia this is due to the very large liquid tank ships in excess of 160,000 DWT that call at the port area which includes Delaware Bay. For Portland this is due to the 120,000 DWT tankers that provide fuel oil to local power plants.

**Figure 2-3. Average Vessel DWT by Quartile and Port Area, 2003-2004**

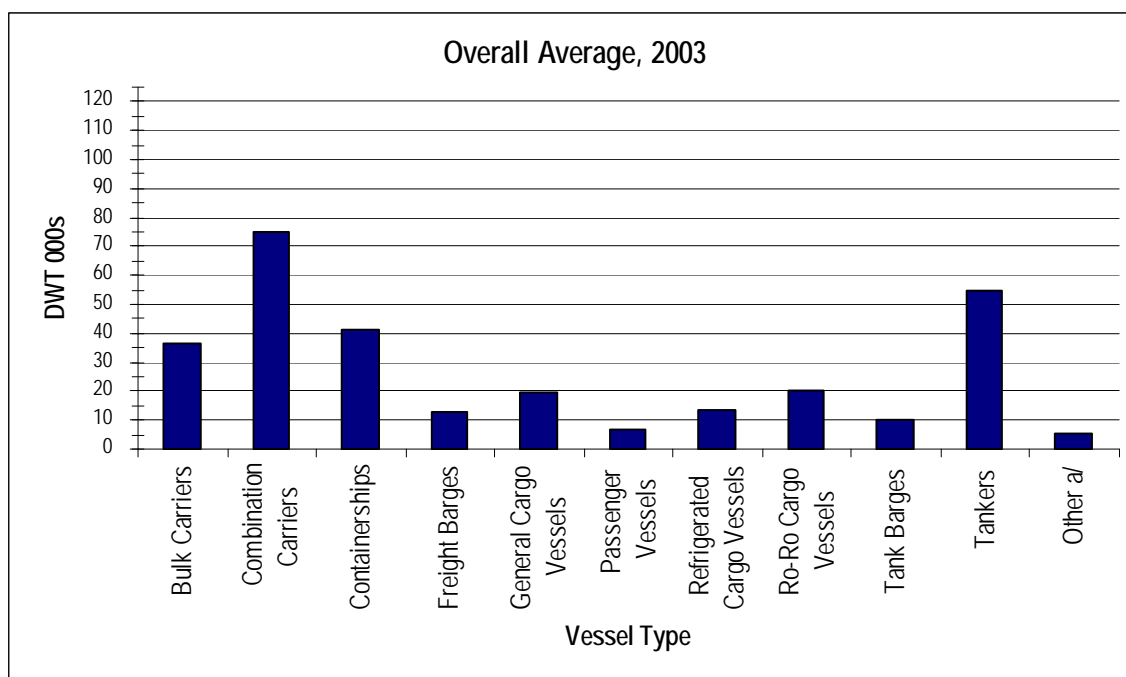


Source: Prepared by Nathan Associates Inc. as described in text from USCG Vessel Arrival Database

## VESSEL SIZE BY VESSEL TYPE

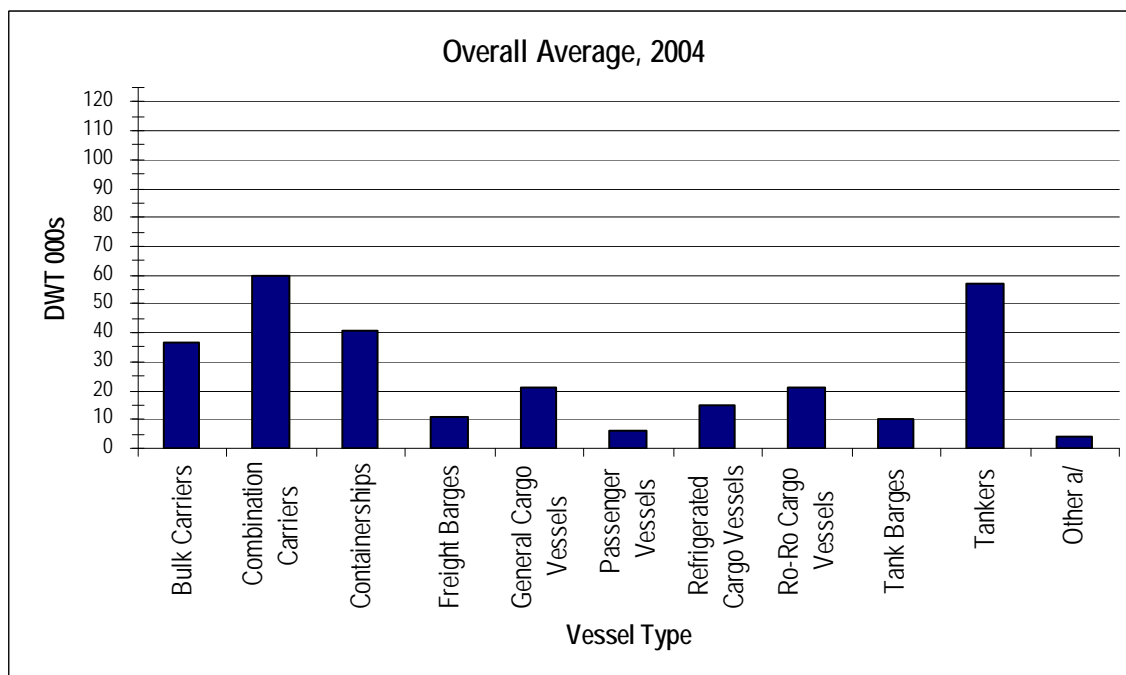
It is also interesting to review average vessel size by type of vessel. The overall average DWT by vessel type for U.S. East Coast ports for 2003 and 2004 are presented in Figure 2-4 and Figure 2-5, respectively. In terms of overall average size, combination carriers are the largest with an average of 74,697 DWT in 2003 and 59,777 DWT in 2004. Tank ships are next with an average of 54,513 DWT in 2003 and 57,060 DWT in 2004. The average containership was 40,895 DWT in 2003 and 40,760 DWT in 2004. Dry bulk carriers were the only other vessel type with an average DWT in excess of 30,000 DWT registering 36,193 DWT in 2003 and 36,620 DWT in 2004.

**Figure 2-4. U.S. East Coast Ports: Average Vessel DWT by Vessel Type, 2003**



Source: Prepared by Nathan Associates Inc. as described in text from USCG Vessel Arrival Database  
a/ Includes fishing vessels, industrial vessels, research vessels and school ships.

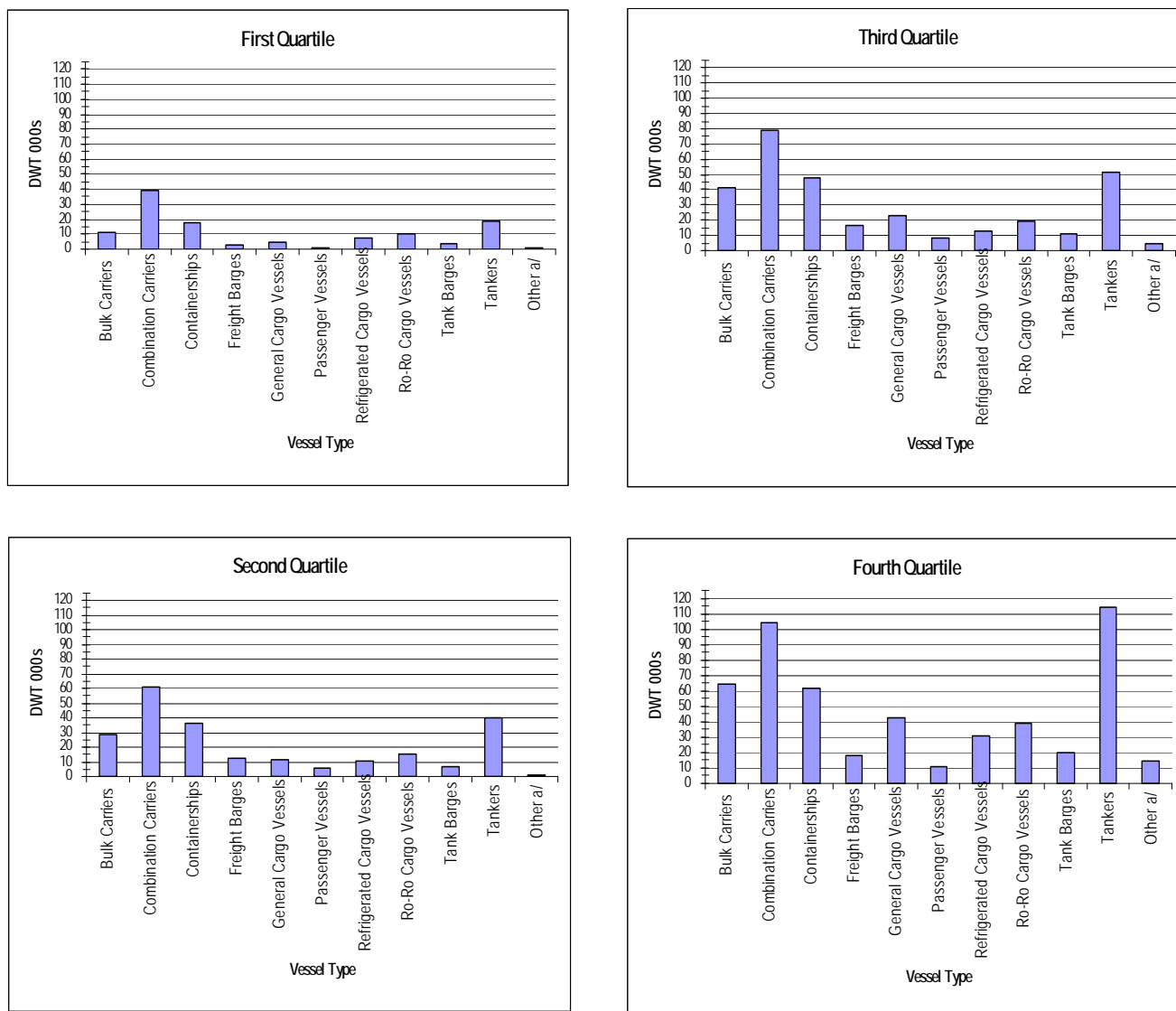
**Figure 2-5. U.S. East Coast Ports: Average Vessel DWT by Vessel Type, 2004**



Source: Prepared by Nathan Associates Inc. as described in text from USCG Vessel Arrival Database  
a/ Includes fishing vessels, industrial vessels, research vessels and school ships.

Figure 2-6 presents average vessel DWT by quartile for each vessel type during 2003-2004. Even in the first quartile, the average DWT for combination carriers is nearly 40,000 DWT; more than double that of any other vessel type. In the second quartile, the average DWT of tank ships, containerships and bulk carriers show significant increases. The increases in average vessel DWT by vessel type in the third quartile appear moderate and orderly. In the fourth quartile, the substantial jump in the average DWT of tank ships to over 110,000 DWT is noteworthy.

**Figure 2-6. U.S. East Coast: Average Vessel DWT by Quartiles and Vessel Type, 2003-2004**



Source: Prepared by Nathan Associates Inc. as described in text from USCG Vessel Arrival Database  
a/ Includes fishing vessels, industrial vessels, research vessels and school ships

## PASSENGER VESSELS

In 2003, there were 1,229 passenger vessel arrivals at U.S. East Coast ports and in 2004 there were 1,666 arrivals<sup>11</sup> (Table 2-7). Passenger vessels consist principally of cruise ships and ferries.

The Southeastern U.S. region with 562 arrivals accounted for 46 percent of U.S. East Coast passenger vessel arrivals in 2003; in 2004 the Southeastern U.S. region had 695 passenger vessel arrivals, 42 percent of the total U.S. East Coast. By far the most important port area for passenger vessel arrivals is Port Canaveral, FL with 547 passenger vessel arrivals in 2003 and 579 arrivals in 2004. In 2004, over 95 percent of the passenger vessel arrivals in Port Canaveral were of vessels greater than 60,000 GRT, an indication of the importance of the cruise industry in that port area. Disney Cruise Line uses Port Canaveral as the home port for its 83,000 GRT Disney Magic and Disney Wonder vessels.

New York City is the port area with the second most passenger vessel arrivals with 226 arrivals in 2003 and 307 arrivals in 2004. More than 50 percent of the passenger vessel arrivals are greater than 60,000 GRT.

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<sup>11</sup> These figures exclude the ports of Miami and Fort Lauderdale and other smaller ports south of Port Canaveral that are outside the scope of the proposed rulemaking.

**Table 2-7. Passenger Ship Arrivals by Port Region, Port Area and GRT, 2003-2004**

Port Area	2003					2004				
	Gross Registered Tonnage					Gross Registered Tonnage				
	0 - 19,999	20,000 - 39,999	40,000 - 59,999	60,000 and Greater	Total	0 - 19,999	20,000 - 39,999	40,000 - 59,999	60,000 and Greater	Total
<b>Northeastern US - Gulf of Maine</b>										
Eastport, ME	-	-	-	-	0	-	-	-	-	0
Searsport, ME	3	14	28	21	66	21	16	27	17	81
Portland, ME	-	2	6	11	19	5	3	10	8	26
Portsmouth, NH	1	-	-	-	1	1	-	-	-	1
<b>Northeastern US - Off Race Point</b>										
Salem, MA	-	1	-	-	1	3	-	3	-	6
Boston, MA	8	16	46	24	94	8	16	46	24	94
<b>Northeastern US - Cape Cod Bay</b>										
Cape Cod, MA	1	2	5	1	9	3	2	8	-	13
<b>Mid-Atlantic Block Island Sound</b>										
New Bedford, MA	-	-	-	-	0	2	-	-	-	2
Providence, RI	6	4	11	14	35	15	4	9	15	43
New London, CT	32	-	-	-	32	54	-	3	-	57
New Haven, CT	5	-	-	-	5	-	-	-	-	0
Bridgeport, CT	4	-	-	-	4	4	-	-	-	4
Long Island, NY	32	-	-	-	32	38	-	-	-	38
<b>Mid-Atlantic Ports of New York/New Jersey</b>										
New York City, NY	8	22	82	114	226	28	45	65	169	307
<b>Mid-Atlantic Delaware Bay</b>										
Philadelphia, PA	3	5	11	7	26	3	15	15	-	33
<b>Mid-Atlantic Chesapeake Bay</b>										
Baltimore, MD	3	7	1	29	40	9	16	3	47	75
Hampton Roads, VA	5	12	2	12	31	13	17	28	6	64
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>										
Morehead City, NC	-	-	-	-	0	7	-	-	-	7
<b>Mid-Atlantic Wilmington, NC</b>										
Wilmington, NC	-	-	-	-	0	4	2	-	-	6
<b>Mid-Atlantic Georgetown, SC</b>										
Georgetown, SC	-	-	-	-	0	1	-	-	-	1
<b>Mid-Atlantic Charleston, SC</b>										
Charleston, SC	6	5	10	19	40	17	11	25	11	64
<b>Mid-Atlantic Savannah, GA</b>										
Savannah, GA	4	1	-	1	6	45	4	-	-	49
<b>Southeastern US</b>										
Brunswick, GA	1	-	-	-	1	8	-	-	-	8
Fernandina, FL	1	1	-	-	2	17	2	-	-	19
Jacksonville, FL	7	-	5	-	12	19	1	56	13	89
Port Canaveral, FL	104	4	2	437	547	18	9	1	551	579
<b>All Port Regions</b>	<b>234</b>	<b>96</b>	<b>209</b>	<b>690</b>	<b>1,229</b>	<b>343</b>	<b>163</b>	<b>299</b>	<b>861</b>	<b>1,666</b>

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table 2-8 presents information on the number of cruise passenger embarkations at selected U.S. East Coast ports from 2000 through 2005. The North American cruise industry is defined as those cruise lines that primarily market their cruises in North America. Throughout this period, the Port of Miami was the leader in terms of embarkations with nearly 1.8 million passengers in 2005. However, strong growth at Port Everglades moved it from the third-ranked port with 0.8 million passengers in 2000 to the second-ranked port with 1.3 million passengers in 2005. Port Canaveral also grew from 0.9 million passengers in 2000 to 1.2 million passengers in 2005. It is important to note that the timing and duration of the proposed seasonal speed restrictions will be well-known and that vessel itineraries will be developed taking the speed restrictions into account.

*Table 2-8. Embarkations of the North American Cruise Industry for  
Selected U.S. East Coast Ports, 2000-2005 (passengers in 000s)*

Port	2000	2001	2002	2003	2004	2005
Miami	1,682	1,700	1,804	1,965	1,682	1,771
Port Everglades	798	1,046	1,202	1,213	1,324	1,283
Port Canaveral	941	870	1,028	1,089	1,220	1,234
New York	309	238	326	438	547	370
Jacksonville	n.a.	n.a.	n.a.	6	113	137
Norfolk	8.	27	39	48	47	45
Baltimore	n.a.	n.a.	57	57	105	67
Boston	n.a.	n.a.	69	69	100	80
Charleston	n.a.	n.a.	n.a.	31	39	41
Philadelphia	48	60	1.5	24	29	50

Source: Business Research & Economic Advisors, The Contribution of the North American Cruise Industry to the U.S. Economy in 2005, prepared for the International Council of Cruise Lines, August 2006. Jacksonville, Norfolk and Charleston data from U.S. Maritime Administration.

As mentioned earlier, the USCG vessel arrival data does not include information on vessels less than 150 GRT. As the majority of passenger and car ferries fall below this threshold, the USCG cannot be used as a reliable basis for analyzing movements of passenger and car ferry vessels at U.S. East Coast port areas.

We have obtained information on ferry vessels and ferry routes from the National Ferry Database published on-line by U.S. Department of Transportation, Bureau of Transportation Statistics. The National Ferry Database is a comprehensive inventory of existing ferry operations in the United States and its possessions. This data was collected as part of a survey conducted by the U.S. Department of Transportation, Federal Highway Administration (FHWA). The survey period extended from March 1, 2000 to September 30, 2000. The universe of 224 ferry operators provides ferry service on 487 nonstop ferry route segments, comprising 352 ferry routes, and serving 578 ferry terminal locations with 677 ferry vessels.

Using the National Ferry Database, we identified 261 ferry vessels operating on the U.S. East Coast in 2000 (Table 2-9). A complete inventory of ferry vessels operating in each state including the type of service



(passenger, ro-ro or rail), typical speed, vessel length and gross tonnage is presented in Appendix C. New York State had 65 ferry vessels in operation, followed by Massachusetts (36 ferry vessels), North Carolina (35 ferry vessels) and Maine (23 ferry vessels). More than 64 percent (168 ferry vessels) had an overall length of 65 feet or greater. Generally the ferry vessels are characterized as *conventional* with typical speeds of 8-16 knots, and *high speed* with typical speeds in excess of 25 knots.

**Table 2-9. Ferry Vessels Operating on the U.S. East Coast by State, 2000**

State	Number of Ferry Vessels	Ferry Vessels with LOA of 65 feet or greater	
		Number	Average speed (knots)
Maine	23	11	11.5
New Hampshire	2	2	n.a.
Massachusetts	36	37	16.5
Rhode Island	7	1	n.a.
Connecticut	17	14	19.3
New York	65	45	10.6
New Jersey	20	16	n.a.
Pennsylvania	3	1	n.a.
Delaware	10	7	16.4
Maryland	10	2	n.a.
Virginia	13	6	9.2
North Carolina	35	23	10.1
South Carolina	10	0	0.0
Georgia	4	1	10.0
Florida	6	2	6.0
Total	261	168	n.a.

Source: Prepared by Nathan Associates Inc. from U.S. Department of Transportation, Bureau of Transportation Statistics, National Ferry Database as presented in Appendix C.

The National Ferry Database contained information on 172 ferry routes operating on the U.S. East Coast in 2000 (Table 2-10). Once again New York State had the most ferry routes with 46 routes in service in 2000. Massachusetts was next with 36 ferry routes followed by Maine (23 routes) and North Carolina (16 routes). Most of the ferry routes involve crossing rivers, harbors, sounds or bays and only 10 routes of the 172 routes identified involved crossing segments of the Atlantic Ocean. Hence, most ferry operations on the U.S. East Coast will not be affected by the proposed regulations as they operate within the COLREGS lines.<sup>12</sup>

Further information on each of the ferry routes including the metro area served, water body crossed, type of service, number of passengers and vehicles served, and beginning and end of season service is presented in Appendix C.

<sup>12</sup> The COLREGS demarcation lines, which were developed by the Convention on International Regulations for Preventing Collisions at Sea 1972 (72 COLREGS), demarcate harbor entrances and provide the baseline for the 30 nm (56 km) zones around the ports in the MAUS. These lines have been established to delineate the waters where mariners must comply with the 72 COLREGS and the Inland Navigational Rules Act of 1980 (Inland Rules). The waters inside of the lines are Inland Rules Waters and the waters outside of these lines are COLREGS Waters. The proposed speed restrictions or other proposed operational measures would not apply to vessels transiting in waters inside these lines (Inland Rules Waters). Vessels transiting seaward of the COLREGS lines would be required to adhere to speed restrictions and other operational measures in the 30 nm (56 km) designated zones.

**Table 2-10. Ferry Routes Operating on the U.S. East Coast by State, 2000**

State	Number of Routes	Routes via Atlantic Ocean
Maine	23	5
New Hampshire	1	1
Massachusetts	36	4
Rhode Island	7	0
Connecticut	5	0
New York	46	0
Pennsylvania	1	0
Delaware	4	0
Maryland	7	0
Virginia	12	0
North Carolina	16	0
South Carolina	6	0
Georgia	4	0
Florida	4	0
Total	172	10

Source: Prepared by Nathan Associates Inc. from U.S. Department of Transportation, Bureau of Transportation Statistics, National Ferry Database as presented in Appendix C.

## COMMERCIAL FISHING

Commercial fishing is a multimillion dollar industry along the U.S. East Coast. In 2005, commercial fish landings at U.S. East Coast ports totaled \$801 million (Table 2-11). The port of New Bedford, MA is the leading U.S. port in terms of value of commercial fish landings with \$282.5 million in 2005.

**Table 2-11. U.S. East Coast Commercial Fishery Landings  
by Port, 2002 through 2005 (millions of dollars)**

Port	2002	2003	2004	2005
New Bedford, MA	168.6	176.2	206.5	282.5
Hampton Roads, VA	69.5	79.6	100.6	85.2
Cape May-Wildwood, NJ	35.3	42.8	68.1	68.4
Gloucetser, MA	41.2	37.8	42.7	45.9
Point Judith, RI	31.3	32.4	31.5	38.3
Portland, ME	40.4	28.7	24.2	34.6
Stonington, ME	21.7	20.5	7.5	32.3
Reedville, VA	24.2	24.2	26.1	27.1
Long Beach-Barnegat, NJ	14.6	16.4	20.6	26.7
Point Pleasant, NJ	19.7	22.8	19.2	21.6
Provincetown-Chatham, MA	15.2	13.5	14.1	19.8
Wanchese-Stumpy Point, NC	23.2	21.0	20.6	19.6
Atlantic City, NJ	22.4	20.8	17.7	18.5
Montauk, NY	11.1	11.0	13.0	16.5
Charleston -Mt. Pleasant, SC	9.3	13.0	8.5	12.2
Boston, MA	8.6	8.9	8.8	10.6
Beaufort- Morehead City, NC	19.1	15.0	16.9	9.7
Hampton Bay-Shinnecock, NY	8.3	6.5	6.6	8.1
Rockland, ME	4.3	4.1	2.7	7.4
Cape Canveral, FL	6.2	6.8	9.3	6.1
Engelhard-Swanquarter, NC	11.1	8.0	7.8	5.3
Oriental-Vandemere, NC	8.5	5.0	7.2	4.7
Beaufort, SC	n.a.	7.0	n.a.	n.a.
Ocean City, MD	8.1	6.6	n.a.	n.a.
Georgetown, SC	5.2	6.0	n.a.	n.a.
Belhaven- Washington, NC	6.2	5.0	3.7	n.a.
Sneads Ferry-Swansboro, NC	6.4	5.0	n.a.	n.a.
Darien-Belville, GA	6.9	6.0	5.0	n.a.
Total	646.6	650.6	688.9	801.1

Source: NOAA Fisheries.

The operational measures apply to vessels with a length of 65 feet and above. Our analysis of commercial fishing permits issued on the U.S. East Coast shows that the vast majority of commercial fishing vessels that are 65 feet and above have a GRT of less than 150 tons and hence are not captured in the U.S. Coast Guard vessel arrival database, which necessitated evaluating commercial fishing permits, rather than relying on just the USCG database. Table 2-12 shows that for the Southeast region approximately 84 percent of the fishing vessels over 65 feet are less than 150 tons. For the Northeast region, nearly 67 percent of the fishing vessels over 65 feet are less than 150 tons.

**Table 2-12. Fishing Vessel Permits Issued to Vessels 65 Feet and Above in LOA by Region, 2003**

Vessel gross registered tons	Southeast Region				Northeast Region	
	Fishing permits	%	Unique vessels	%	Fishing permits	%
All vessels	557	100.0%	347	100.0%	856	100.0%
Vessels less than 150 GRT	482	86.5%	290	83.6%	572	66.8%
Vessels 150 GRT and above	75	13.5%	57	16.4%	284	33.2%

Note: For the Northeast Region fishing permit data provided was for unique vessels only.

Source: Prepared by Nathan Associates Inc. from data provided by National Marine Fisheries Service, Sustainable Fisheries Division, Southeast Fisheries Science Center and NOAA Fisheries, Northeast Fisheries Science Center.

## WHALE WATCHING

In 2000, there were 36 whale watching operations permitted and registered in New England (Table 2-13).<sup>13</sup> It is estimated that more than 1.2 million passengers participated in whale-watching tours in 2000, generating more than \$30 million in revenues. Massachusetts accounted for nearly 80 percent of the New England totals for both passengers and revenues.

**Table 2-13. Characteristics of the New England Whale Watching Industry, 2000**

State	Number of Operations	Number of Vessels	Annual Ridership	Annual Revenue (\$ millions)
Massachusetts	17	30-35	1,000,000	\$24.0
New Hampshire	4	6-10	80,000	\$1.9
Maine	14	18-24	137,500	\$4.4
Rhode Island	1	1	12,500	\$0.3
Total	36	55-70	1,230,000	\$30.6

Source: Hoyt, Erich Whale Watching 2000: Worldwide Tourism Numbers, Expenditures and Expanding Socioeconomic Benefits, 2000.

## U.S. East Coast Trade

The volume and value of goods carried by vessels calling at U.S. East Coast ports are other indicators of the economic significance of maritime activity that may be affected by the final rule. We have analyzed the foreign trade statistics for 2003 and 2004 published by U.S. Census Bureau at a Custom District and port level. We have conducted further investigations to reconcile the reported volume and value of U.S. imports and exports by Customs District and port with USCG vessel arrivals by port region and port area (Table 2-14).

<sup>13</sup> Although whale watching operations exist in the mid and South Atlantic states, the degree of activity is smaller cannot be reliably distinguished from tours to view other species such as dolphins.

**Table 2-14. Reconciliation of U.S. Customs Districts and Ports  
with Port Region and Port Area**

U.S. Customs District and Port	Port Region	Port Area
01 Portland, ME		
0101 Portland, ME	Northeast- Gulf of Maine	Portland
0102 Bangor, ME	Northeast- Gulf of Maine	Searsport
0103 Eastport, ME	Northeast- Gulf of Maine	Eastport
0111 Bath, ME	Northeast- Gulf of Maine	Portland
0112 Bar Harbor, ME	Northeast- Gulf of Maine	Searsport
0121 Rockland, ME	Northeast- Gulf of Maine	Searsport
0122 Jonesport, ME	Northeast- Gulf of Maine	Searsport
0131 Portsmouth, NH	Northeast- Gulf of Maine	Portsmouth
0132 Belfast, ME	Northeast- Gulf of Maine	Searsport
0152 Searsport, ME	Northeast- Gulf of Maine	Searsport
04 Boston, MA		
0401 Boston, MA	Northeast- Off Race Point	Boston
0404 Gloucester, MA	Northeast- Off Race Point	Salem
0405 New Bedford, MA	Mid-Atlantic - Block Island Sound	New Bedford
0406 Plymouth, MA	Northeast- Off Race Point	Boston
0407 Fall River, MA	Mid-Atlantic - Block Island Sound	New Bedford
0408 Salem, MA	Northeast- Off Race Point	Salem
0409 Provincetown, MA	Northeast- Cape Cod	Cape Cod
0410 Bridgeport, CT	Mid-Atlantic - Block Island Sound	Bridgeport
0412 New Haven, CT	Mid-Atlantic - Block Island Sound	New Haven
0413 New London, CT	Mid-Atlantic - Block Island Sound	New London
05 Providence, RI		
0501 Newport, RI	Mid-Atlantic - Block Island Sound	Providence
0502 Providence, RI	Mid-Atlantic - Block Island Sound	Providence
0503 Melville, RI	Mid-Atlantic - Block Island Sound	Providence
10 New York City, NY		
1001 New York, NY	Mid-Atlantic - New York and New Jersey	New York City
1002 Albany, NY	Mid-Atlantic - New York and New Jersey	New York City
11 Philadelphia, PA		
1101 Philadelphia, PA	Mid-Atlantic Delaware Bay	Philadelphia
1102 Chester, PA	Mid-Atlantic Delaware Bay	Philadelphia
1103 Wilmington, DE	Mid-Atlantic Delaware Bay	Philadelphia
1105 PAulsboro, NJ	Mid-Atlantic Delaware Bay	Philadelphia
1107 Camden, NJ	Mid-Atlantic Delaware Bay	Philadelphia
1113 Gloucester City, NJ	Mid-Atlantic Delaware Bay	Philadelphia
1195 UPS, Philadelphia, PA	Mid-Atlantic Delaware Bay	Philadelphia
13 Baltimore, MD		
1301 Annapolis, MD	Mid-Atlantic - Chesapeake Bay	Baltimore
1302 Cambridge, MD	Mid-Atlantic - Chesapeake Bay	Baltimore
1303 Baltimore, MD	Mid-Atlantic - Chesapeake Bay	Baltimore
1304 Crisfield, MD	Mid-Atlantic - Chesapeake Bay	Baltimore
14 Norfolk, VA		
1401 Norfolk, VA	Mid-Atlantic - Chesapeake Bay	Hampton Roads
1402 Newport News, VA	Mid-Atlantic - Chesapeake Bay	Hampton Roads
1404 Richmond-Petersburg, VA	Mid-Atlantic - Chesapeake Bay	Hampton Roads
1408 Hopewell VA	Mid-Atlantic - Chesapeake Bay	Hampton Roads
15 Charlotte, NC		
1501 Wilmington, NC	Mid-Atlantic - Wilmington, NC	Wilmington
1511 Beaufort-Morehead City, NC	Mid-Atlantic - Morehead City	Morehead City
16 Charleston, SC		
1601 Charleston, SC	Mid-Atlantic - Charleston	Charleston
1602 Georgetown, SC	Mid-Atlantic - Georgetown	Georgetown
17 Savannah, GA		
1701 Brunswick, GA	Southeastern US	Brunswick
1703 Savannah, GA	Mid-Atlantic Savannah	Savannah
18 Tampa, FL		
1803 Jacksonville, FL	Southeastern US	Jacksonville
1805 Fernandina Beach, FL	Southeastern US	Fernandina Beach
1816 Port Canaveral, FL	Southeastern US	Port Canaveral

Source: Prepared by Nathan Associates Inc.

The U.S. Census Bureau data on U.S. imports of merchandise is compiled primarily from automated data submitted through the U.S. Customs' Automated Commercial System.<sup>14</sup> Data are compiled also from import entry summary forms, warehouse withdrawal forms and Foreign Trade Zone documents as required by law to be filed with the U.S. Customs Service. Information on U.S. exports of merchandise is compiled from copies of Shipper's Export Declarations (SEDs) and data from qualified exporters, forwarders or carriers. Copies of SEDs are required to be filed with Customs officials at the port of export.

For this study, the following data items have been used from the U.S. Census Bureau Foreign Trade Statistics:

- **Customs import value** – the value of imports appraised by the U.S. Customs Services in accordance with the legal requirements of the Tariff Act of 1930, as amended. This value is generally defined as the price actually paid or payable for merchandise when sold for exportation to the U.S. excluding U.S. import duties, freight, insurance and other charges incurred in bringing the merchandise to the U.S.
- **Import charges** – the aggregate cost of all freight, insurance and other charges (excluding U.S. import duties) incurred in bringing the merchandise from alongside the carrier at the port of exportation and placing it alongside the carrier at the first port of entry in the U.S.
- **F.A.S. export value** – the free alongside ship value of exports at the U.S. seaport based on the transaction price, including inland freight, insurance and other charges incurred in placing the merchandise alongside the carrier at the U.S. port of exportation. The value, as defined, excludes the cost of loading the merchandise aboard the exporting carrier and also excludes freight, insurance and any other charges or transportation costs beyond the port of exportation.
- **Shipping weight** – the gross weight in metric tons including the weight of moisture content, wrappings, crates, boxes and containers.
- **District of exportation** – the customs district in which the merchandise is loaded on the vessel which takes the merchandise out of the country.
- **Import district of unloading** – the district where merchandise is unloaded from the importing vessel.

Table 2-15 and Table 2-16 present U.S. East Coast maritime imports and exports by port region and port area for 2003 and 2004, respectively.<sup>15</sup>

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<sup>14</sup> The description and definition of information from the U.S Census Bureau Foreign Trade Statistics is based on the Guide to Foreign Trade Statistics: Description of the Foreign Trade Statistical Program available on the U.S. census Bureau website.

<sup>15</sup> Maritime trade refers to the method of transportation by which the merchandise arrived in or departed from the U.S.

**Table 2-15. U.S. East Coast Maritime Trade by Port Region and Port Area, 2003**

ANPR Port Region and Port Area	Imports		Exports		Total Trade	
	Custom import value (\$ millions)	Shipping Weight (m.t. 000s)	F.A.S. export value (\$ millions)	Shipping Weight (m.t. 000s)	Merchandise Value (\$ millions)	Shipping Weight (m.t. 000s)
<b>Gulf of Maine</b>						
Eastport, ME	0.0	0.0	133.3	309.7	133.3	309.7
Searsport, ME	295.4	1,342.7	5.6	2.0	301.0	1,344.7
Portland, ME	892.6	3,330.4	122.9	187.4	1,015.4	3,517.8
Portsmouth, NH	576.9	4,329.3	74.6	149.5	651.5	4,478.9
Subtotal	1,764.9	9,002.5	336.3	648.6	2,101.2	9,651.1
<b>Racepoint, MA</b>						
Salem, MA	29.4	790.9	9.4	4.2	38.8	795.1
Boston, MA	5,126.5	15,893.1	798.8	821.1	5,925.3	16,714.3
Subtotal	5,155.8	16,684.1	808.2	825.3	5,964.1	17,509.4
<b>Cape Cod, MA</b>						
Cape Cod, MA	0.0	0.0	0.1	0.0	0.1	0.0
Subtotal	0.0	0.0	0.1	0.0	0.1	0.0
<b>Block Island Sound</b>						
New Bedford, MA	135.9	2,087.1	7.9	5.2	143.8	2,092.3
Providence, RI	2,665.2	4,522.9	61.3	296.4	2,726.5	4,819.3
New London, CT	149.5	193.3	11.3	56.2	160.9	249.5
New Haven, CT	961.6	2,764.0	35.3	234.7	996.9	2,998.7
Bridgeport, CT	146.0	1,677.8	2.0	6.5	148.0	1,684.4
Subtotal	4,058.4	11,245.1	117.7	599.0	4,176.1	11,844.0
<b>New York</b>						
New York City, NY	78,601.0	68,879.8	21,760.0	9,585.8	100,361.0	78,465.5
Subtotal	78,601.0	68,879.8	21,760.0	9,585.8	100,361.0	78,465.5
<b>Delaware Bay</b>						
Philadelphia, PA	21,817.7	71,221.2	2,080.8	1,768.0	23,898.5	72,989.2
Subtotal	21,817.7	71,221.2	2,080.8	1,768.0	23,898.5	72,989.2
<b>Chesapeake Bay</b>						
Hampton Roads, VA	20,885.7	11,357.2	12,245.2	17,242.8	33,130.9	28,600.0
Baltimore, MD	20,412.1	17,726.0	5,753.1	4,708.8	26,165.2	22,434.8
Subtotal	41,297.8	29,083.2	17,998.3	21,951.7	59,296.1	51,034.8
<b>Morehead City, NC</b>						
Morehead City, NC	226.7	463.8	359.6	40.2	586.4	504.1
Subtotal	226.7	463.8	359.6	40.2	586.4	504.1
<b>Wilmington, NC</b>						
Wilmington, NC	1,250.7	3,337.1	953.2	730.1	2,203.9	4,067.2
Subtotal	1,250.7	3,337.1	953.2	730.1	2,203.9	4,067.2
<b>Georgetown, SC</b>						
Georgetown, SC	37.1	610.7	24.3	47.3	61.3	658.0
Subtotal	37.1	610.7	24.3	47.3	61.3	658.0
<b>Charleston, SC</b>						
Charleston, SC	26,063.4	11,886.0	13,483.2	5,399.4	39,546.7	17,285.3
Subtotal	26,063.4	11,886.0	13,483.2	5,399.4	39,546.7	17,285.3
<b>Savannah, GA</b>						
Savannah, GA	13,630.7	11,888.7	7,634.1	8,134.9	21,264.8	20,023.6
Subtotal	13,630.7	11,888.7	7,634.1	8,134.9	21,264.8	20,023.6
<b>Southeastern U.S.</b>						
Brunswick, GA	4,679.6	1,138.3	657.5	689.5	5,337.1	1,827.8
Fernandina, FL	79.4	92.8	194.6	239.7	274.0	332.5
Jacksonville, FL	8,884.0	8,826.5	3,475.7	942.9	12,359.7	9,769.5
Port Canaveral, FL	355.4	2,647.4	127.8	131.1	483.2	2,778.5
Subtotal	13,998.3	12,705.1	4,455.6	2,003.2	18,454.0	14,708.3
<b>All Port Areas</b>	<b>207,902.6</b>	<b>247,007.2</b>	<b>70,011.5</b>	<b>51,733.4</b>	<b>277,914.1</b>	<b>298,740.7</b>

Source: Prepared by Nathan Associates from U.S. Census Bureau Foreign Trade Statistics for 2003 as described in text.

**Table 2-16. U.S. East Coast Maritime Trade by Port Region and Port Area, 2004**

Port Region and Port Area	Imports		Exports		Total Trade	
	Custom import value (\$ millions)	Shipping Weight (m.t. 000s)	F.A.S. export value (\$ millions)	Shipping Weight (m.t. 000s)	Merchandise Value (\$ millions)	Shipping Weight (m.t. 000s)
<b>Gulf of Maine</b>						
Eastport, ME	0.0	0.0	115.7	260.9	115.7	260.9
Searsport, ME	394.4	1,554.0	1.6	0.8	396.0	1,554.8
Portland, ME	1,126.0	3,331.7	339.2	177.6	1,465.2	3,509.3
Portsmouth, NH	625.7	3,640.4	105.6	239.7	731.2	3,880.1
Subtotal	2,146.0	8,526.0	562.0	679.1	2,708.0	9,205.2
<b>Racepoint, MA</b>						
Salem, MA	23.5	543.6	10.2	3.1	33.7	546.7
Boston, MA	6,102.0	16,508.9	850.4	986.2	6,952.4	17,495.2
Subtotal	6,125.5	17,052.6	860.6	989.3	6,986.1	18,041.9
<b>Cape Cod, MA</b>						
Cape Cod, MA	0.4	0.0	0.0	0.0	0.4	0.0
Subtotal	0.4	0.0	0.0	0.0	0.4	0.0
<b>Block Island Sound</b>						
New Bedford, MA	128.7	2,114.7	9.4	12.2	138.0	2,126.9
Providence , RI	2,835.4	4,549.4	63.7	256.8	2,899.1	4,806.3
New London, CT	276.6	241.7	1.9	5.9	278.6	247.6
New Haven, CT	976.7	2,426.0	47.1	239.8	1,023.8	2,665.8
Bridgeport, CT	83.5	1,555.2	1.1	0.4	84.5	1,555.6
Subtotal	4,300.8	10,887.1	123.2	515.1	4,424.0	11,402.2
<b>New York</b>						
New York City, NY	90,968.3	70,340.7	23,567.1	10,303.3	114,535.4	80,644.0
Subtotal	90,968.3	70,340.7	23,567.1	10,303.3	114,535.4	80,644.0
<b>Delaware Bay</b>						
Philadelphia, PA	27,164.9	74,650.0	3,334.5	1,887.0	30,499.4	76,537.0
Subtotal	27,164.9	74,650.0	3,334.5	1,887.0	30,499.4	76,537.0
<b>Chesapeake Bay</b>						
Hampton Roads, VA	24,713.9	12,047.4	13,260.7	18,550.2	37,974.6	30,597.7
Baltimore, MD	24,410.9	22,589.5	6,905.5	6,273.8	31,316.5	28,863.3
Subtotal	49,124.8	34,636.9	20,166.3	24,824.0	69,291.1	59,461.0
<b>Morehead City, NC</b>						
Morehead City, NC	307.8	404.8	282.7	67.4	590.5	472.2
Subtotal	307.8	404.8	282.7	67.4	590.5	472.2
<b>Wilmington, NC</b>						
Wilmington, NC	1,516.1	4,206.4	1,109.9	856.4	2,626.1	5,062.8
Subtotal	1,516.1	4,206.4	1,109.9	856.4	2,626.1	5,062.8
<b>Georgetown, SC</b>						
Georgetown, SC	82.2	661.8	17.6	20.7	99.8	682.5
Subtotal	82.2	661.8	17.6	20.7	99.8	682.5
<b>Charleston, SC</b>						
Charleston, SC	31,103.0	12,823.8	15,341.5	5,778.6	46,444.5	18,602.3
Subtotal	31,103.0	12,823.8	15,341.5	5,778.6	46,444.5	18,602.3
<b>Savannah, GA</b>						
Savannah, GA	16,540.5	15,701.7	9,661.9	8,609.1	26,202.4	24,310.8
Subtotal	16,540.5	15,701.7	9,661.9	8,609.1	26,202.4	24,310.8
<b>Southeastern U.S.</b>						
Brunswick, GA	5,349.2	1,249.9	761.3	678.4	6,110.5	1,928.3
Fernandina, FL	92.9	116.7	199.9	239.7	292.7	356.4
Jacksonville, FL	9,165.5	9,490.9	4,541.1	1,168.2	13,706.6	10,659.1
Port Canaveral, FL	406.1	2,835.1	127.1	138.7	533.2	2,973.7
Subtotal	15,013.6	13,692.5	5,629.4	2,225.0	20,643.0	15,917.6
<b>All Port Areas</b>	<b>244,393.8</b>	<b>263,584.2</b>	<b>80,656.8</b>	<b>56,755.1</b>	<b>325,050.6</b>	<b>320,339.3</b>

Source: Prepared by Nathan Associates from U.S Census Bureau Foreign Trade Statistics for 2004 as described in text.



In 2003, the custom import value of merchandise imported by vessel on the U.S. East Coast was \$207.9 billion nearly triple the \$70 billion value of exports.<sup>16</sup> The total value of trade on the U.S. East Coast in 2003 was \$277.9 billion. The port area of New York City was the largest in terms of the value of imports (\$78.6 billion) and exports (\$21.8 billion). This port area accounted for 38 percent of the value of U.S. East Coast imports and 31 percent of exports.

The port areas of Charleston, Philadelphia, Hampton Roads and Baltimore constitute the next tier of port areas with value of imports ranging from \$20.4 billion and \$26.1 billion. For exports, the port area of Charleston recorded exports of \$13.5 billion in 2003, followed by the port areas of Hampton Roads and Savannah with exports of \$12.2 billion and \$7.6 billion, respectively.

For 2004, the value of imports on the U.S. East Coast increased by 17.6 percent to \$244.4 billion and the value of exports increased by 15.2 percent to \$80.7 billion. In 2004, the value of total trade increased by 17.0 percent to \$325.1 billion

The shipping weight of U.S maritime trade by port region and port area for 2003 and 2004 are also presented in Table 2-15 and Table 2-16. The total shipping weight of U.S East Coast imports was 247.0 million tons in 2003 with export shipments of 51.7 million tons. The port area of Philadelphia was the largest in terms of shipping weight of imports with 71.2 million tons in 2003 followed by New York City with 68.9 million tons. These two port areas account for 57 percent of the total U.S. East Coast import shipments by weight. For exports, Hampton Roads is first with 17.2 million tons followed by New York City with 9.6 million tons and Savannah with 8.1 million tons. The relative rankings by port area for 2004 are similar in terms of export tonnages.

The U.S. Census Bureau reports vessel import charges associated with import of merchandise by customs district.<sup>17</sup> Vessel import charges represent the aggregate cost of all freight, insurance and other charges (excluding U.S. import duties) incurred in bringing the merchandise from alongside the carrier at the port of exportation and placing it alongside the carrier at the first port of entry.

In 2003, vessel import charges at U.S. East Coast customs districts totaled \$11.1 billion or 5.3 percent of the vessel import value (Table 2-17).<sup>18</sup> In 2004, vessel import charges increased by 18.5 percent to \$13.2 billion, representing 5.3 percent of the vessel import value. In 2004, vessel import charges ranged from a high of 11.9 percent of vessel import value for the customs district of Charlotte, NC to a low of 2.8 percent for the customs district of Providence. Factors such as composition and volume of cargo, value of the merchandise per ton, distance of ocean voyage, size and type of vessel used, and port charges affect the relative importance of vessel import charges at a customs district level.

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<sup>16</sup> Please note that for purposes of this study, ports south of Port Canaveral, FL are excluded from the data presented.

<sup>17</sup> As vessel import charges are not reported by the U.S. Census Bureau at the port level, we have analyzed these charges only at the customs district level. The data presented does not precisely correspond to the vessel import values shown in Table 2-15 and Table 2-16 by port area as we had excluded in those tables ports included in custom district that are outside the scope of this study.

<sup>18</sup> Vessel import value is equivalent to custom import value for merchandise transported by vessels.

**Table 2-17. U.S. East Coast: Vessel Import Charges as a Percent of Vessel Import Value by Customs District of Unlading, 2003 and 2004**

Custom District of Unlading	2003			2004		
	Vessel Import Value (Millions of Dollars)	Vessel Import Charges (Millions of Dollars)	Percent of Vessel Import Value	Vessel Import Value (Millions of Dollars)	Vessel Import Charges (Millions of Dollars)	Percent of Vessel Import Value
1 Portland, ME	\$1,765	\$86	4.9%	\$2,146	\$103	4.8%
4 Boston, MA	\$6,549	\$341	5.2%	\$7,591	\$407	5.4%
5 Providence, RI	\$2,665	\$68	2.6%	\$2,835	\$78	2.8%
10 New York City, NY	\$78,601	\$4,046	5.1%	\$90,968	\$4,711	5.2%
11 Philadelphia, PA	\$21,818	\$1,507	6.9%	\$27,165	\$1,797	6.6%
13 Baltimore, MD	\$20,412	\$735	3.6%	\$24,411	\$944	3.9%
14 Norfolk, VA	\$20,886	\$1,143	5.5%	\$24,714	\$1,386	5.6%
15 Charlotte, NC	\$1,477	\$165	11.1%	\$1,824	\$217	11.9%
16 Charleston, SC	\$26,101	\$1,231	4.7%	\$31,185	\$1,483	4.8%
17 Savannah, GA	\$18,310	\$1,222	6.7%	\$21,890	\$1,433	6.5%
18 Tampa, FL	\$11,357	\$566	5.0%	\$12,197	\$612	5.0%
Total	\$209,941	\$11,112	5.3%	\$246,927	\$13,170	5.3%

Source: Prepared by Nathan Associates Inc. from U.S. Census Bureau, Foreign Trade Statistics for 2003 and 2004.

### 3. Socioeconomic Conditions

The National Environmental Policy Act (NEPA) is the primary legal authority necessitating development of a Social Impact Assessment for Federal management actions, including those of the proposed operational measures for Right Whale Ship Strike Reduction. According to Section 40 CFR 1508.14, “[if] economic or social and natural and physical environmental effects are interrelated, then the environmental impact statement will discuss all these effects on the human environment.” In addition, Executive Order 12898 requires that Federal agencies examine social and economic impacts when minority or low-income populations are likely to be affected by a policy measure.

In this chapter we present an overview of baseline demographic and socioeconomic data for the 26 U.S. East Coast port areas. A more comprehensive socioeconomic profile of each port area is provided in Appendix D.

We have used the U.S. Office of Management and Budget definitions for metropolitan and micropolitan statistical areas based on 2000 standards.<sup>19</sup> The general concept of a metropolitan or micropolitan statistical area is that of a core area containing a substantial population nucleus, together with adjacent communities having a high degree of economic and social integration with that core. Each metropolitan statistical area must have at least one urbanized area of 50,000 or more inhabitants. Each micropolitan statistical area must have at least one urban cluster of at least 10,000 but less than 50,000 population. Counties are used as the geographic “building blocks” for metropolitan and micropolitan statistical areas. The socioeconomic study areas included in this analysis are presented in Figure 3-1. The counties included in each metropolitan or micropolitan statistical area are listed in Table 3-1.

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<sup>19</sup> Further information on the metropolitan and micropolitan statistical areas can be found at <http://www.census.gov/population/www/estimates/aboutmetro.html>

Figure 3-1. Socioeconomic Study Areas



**Table 3-1. U.S. East Coast Port Areas: Counties included in Metropolitan or Micropolitan Statistical Areas**

Port Area	Classification	Counties
<b>Northeastern US- Gulf of Maine</b>		
Eastport, ME		Washington County, ME
Searsport, ME		Waldo County, ME
		Knox County, ME
		Hancock County, ME
Portland, ME	Portland-South Portland-Biddeford, ME Metr. MSA	Cumberland County, ME
		Sagadahoc County, ME
		York County, ME
Portsmouth, NH	Rockingham County-Strafford County, NH Metropolitan Division: <i>(Part of Boston-Cambridge-Quincy, MA-NH Met. SA)</i>	Rockingham County, NH
		Strafford County, NH
<b>Northeastern US- Off Race Point</b>		
Boston, MA	Boston-Cambridge-Quincy, MA-NH Metropolitan Statistical Area	Norfolk County, MA
		Plymouth County, MA
		Suffolk County, MA
		Middlesex County
Salem, MA	Essex County, MA Met Division : <i>(Boston-Cambridge-Quincy, MA-NH Metropolitan Statistical Area)</i>	Essex County
<b>Northeastern US- Cape Cod Bay</b>	Barnstable Town, MA Metropolitan Statistical Area	Barnstable County, MA
<b>Mid-Atlantic Block Island Sound</b>		
New Bedford, MA	Providence-New Bedford-Fall River, RI-MA Met SA, Part of	Bristol County, MA
Providence, RI	Providence-New Bedford-Fall River, RI-MA Met SA,	Bristol County, RI
		Kent County, RI
		Newport County, RI
		Providence County, RI
		Washington, RI
New London, CT	Norwich-New London CT Met SA	New London County
New Haven, CT	New Haven-Milford, CT Met SA	New Haven County
Bridgeport, CT	Bridgeport-Stamford-Norwalk, CT Met SA	Fairfield County
Long Island, NY	Nassau-Suffolk, NY Metropolitan Division <i>(Part of New York-Northern New Jersey-Long Island, NY-NJ-PA Met SA)</i>	Nassau County
		Suffolk County
<b>Mid-Atlantic Ports of New York/New Jersey</b>	New York-Northern New Jersey-Long Island, NY-NJ-PA Met SA	Middlesex County, NJ
		Monmouth County, NJ
		Ocean County, NJ
		Somerset County, NJ
		Bergen County, NJ
		Hudson County, NJ
		Passaic County, NJ
		Bronx County, NY
		Kings County, NY
		New York County, NY
		Putnam County, NY
		Queens County, NY
		Richmond County, NY
		Rockland County, NY
		Westchester County, NY
		Essex County, NJ
		Hunterdon County, NJ
		Morris County, NJ
		Sussex County, NJ
		Union County, NJ
		Pike County, PA

**Table 3-1. continued**

Port Area	Classification	Counties
Mid-Atlantic Delaware Bay	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metropolitan Statistical Area	Burlington County, NJ Camden County, NJ Gloucester County, NJ Bucks County, PA Chester County, PA Delaware County, PA Montgomery County, PA Philadelphia County, PA New Castle County, DE Cecil County, MD Salem County, NJ
Mid-Atlantic Chesapeake Bay Baltimore, MD	Baltimore-Towson, MD Met SA	Anne Arundel County, MD Baltimore County, MD Carroll County, MD Harford County, MD Howard County, MD Queen Anne's County, MD Baltimore City, MD
Hampton Roads, VA	Virginia Beach-Norfolk-Newport News, VA-NC Metropolitan Statistical Area	Currituck County, NC Gloucester County, VA Isle of Wight County, VA James City County, VA Mathews County, VA Surry County, VA York County, VA Chesapeake city, VA Hampton city, VA Newport News city, VA Norfolk city, VA Poquoson city, VA Portsmouth city, VA Suffolk city, VA Virginia Beach city, VA Williamsburg city, VA
Mid-Atlantic Morehead City and Beaufort, NC	Morehead City, NC Micropolitan Statistical Area	Carteret County, NC
	Washington, NC Micropolitan Statistical Area	Beaufort County, NC
Mid-Atlantic Wilmington, NC	Wilmington, NC Metropolitan Statistical Area	Brunswick County, NC New Hanover County, NC Pender County, NC
Mid-Atlantic Georgetown, SC	Georgetown, SC Micropolitan Statistical Area	Georgetown County, SC
Mid-Atlantic Charleston, SC	Charleston-North Charleston, SC Metropolitan Statistical Area	Berkeley County, SC Charleston County, SC Dorchester County, SC
Mid-Atlantic Savannah, GA	Savannah, GA Metropolitan Statistical Area	Bryan County, GA Chatham County, GA Effingham County, GA
Southeastern US Brunswick, GA	Brunswick, GA Metropolitan Statistical Area	Brantley County, GA Glynn County, GA McIntosh County, GA
Fernandina, FL	Jacksonville, FL Metropolitan Statistical Area, Part of	Nassau County
Jacksonville, FL	Jacksonville, FL Metropolitan Statistical Area	Baker County, FL Clay County, FL Duval County, FL St. Johns County, FL
Port Canaveral, FL	Palm Bay-Melbourne-Titusville, FL Metropolitan Statistical Area	Brevard County, FL

Source: U.S. Census Bureau, Population Division, Metropolitan and Micropolitan Statistical Areas and Components, November 2004.

## Demographic Characteristics

The most comprehensive and accurate source for demographic information on the U.S. East Coast port areas is the 2000 U.S. Census. Table 3-2 presents data on population, racial distribution and ethnicity structure for each of the 26 U.S. East Coast port areas. As expected, the New York City port area possesses the largest population with nearly 15.6 million inhabitants in 2000. Seven other U.S. East Coast port areas have more than one million inhabitants; namely, Philadelphia (5.7 million), Boston (3.3 million), Long Island (2.8 million), Baltimore (2.6 million), Hampton Roads (1.6 million), Jacksonville (1.1million) and Providence (1.0 million). Eastport, ME is the smallest port area in terms of population with 34 thousand inhabitants in 2000.

**Table 3-2. U.S. East Coast Port Areas: Demographic Characteristics, 2000**

Port Area	Population 2000	Racial Distribution (Percentage)				Percentage of Population that is Hispanic or Latino b/
		White alone	Black or African American alone	Asian alone	Other a/	
Eastport, ME	33,941	93.4	0.3	0.5	5.8	0.9
Searsport, ME	127,689	97.8	0.2	0.3	1.7	0.6
Portland, ME	487,568	96.6	0.7	0.9	1.7	0.9
Portsmouth, NH	389,592	96.7	0.6	1.1	1.6	1.2
Boston, MA	3,278,333	81.8	7.3	5.5	6.2	6.0
Salem, MA	723,419	86.4	2.5	2.4	8.8	11.0
Cape Cod, MA	222,230	94.3	1.5	0.6	3.5	1.3
New Bedford, MA	534,678	91.0	2.0	1.4	5.6	3.6
Providence, RI	1,048,319	85.0	4.3	2.3	8.4	8.6
New London, CT	259,088	86.9	5.1	1.9	6.2	5.2
New Haven, CT	824,008	79.3	11.2	2.4	7.1	5.0
Bridgeport, CT	882,567	79.2	10.0	3.2	7.6	11.8
Long Island, NY	2,753,913	82.0	8.4	3.5	6.1	10.3
New York, NY	15,569,089	58.0	19.7	8.1	14.2	21.1
Philadelphia, PA	5,687,147	72.6	19.7	3.3	4.5	5.0
Baltimore, MD	2,552,994	67.4	27.2	2.7	2.7	2.0
Hampton Roads, VA	1,576,370	62.4	30.9	2.7	4.0	3.1
Morehead City - Beaufort, NC	104,341	80.7	16.7	0.4	2.3	2.1
Wilmington, NC	274,532	79.5	17.0	0.6	2.8	2.5
Georgetown, SC	55,797	59.6	38.7	0.3	1.4	1.5
Charleston, SC	549,033	65.2	30.5	1.4	2.9	2.4
Savannah, GA	293,000	61.1	34.9	1.6	2.4	2.0
Brunswick, GA	93,044	73.4	23.7	0.7	2.2	2.4
Fernandina, FL	57,663	90.1	7.4	0.7	1.8	1.8
Jacksonville, FL	1,065,087	71.9	22.2	2.3	3.6	3.9
Port Canaveral, FL	476,230	86.7	8.1	1.5	3.7	4.6
Total	39,919,672	69.6	17.0	5.0	8.5	11.5

a/ Includes American Indian and Alaska Native alone, Native Hawaiian and Other Pacific Islander alone, some other race alone and two or more races.

b/ A self-designated classification for people whose origins are from Spain, the Spanish-speaking countries of Central or South America, the Caribbean, or those identifying themselves generally as Spanish, Spanish-American, etc. Origin can be viewed as ancestry, nationality, or country of birth of the person or person's parents or ancestors prior to their arrival in the United States. Spanish/Hispanic/Latino people may be of any race.

Source: US Census Data, Census 2000.

For all of the port areas in 2000, the majority of the population is white with the percentage white only ranging from a high of 97.8 percent in Searsport, ME to a low of 58.0 percent for New York City. Five other port areas where less than 70 percent of the population is white are Georgetown, SC (59.6 percent); Savannah (61.1 percent); Hampton Roads (62.4); Charleston (65.2 percent) and Baltimore (67.4 percent).

In four of the port areas, blacks or African American account for more than 30 percent of the population – Georgetown, SC (38.7 percent); Savannah (34.9 percent); Hampton Roads (30.9 percent) and Charleston (30.5 percent). New York City and Boston are the only port areas where a significant share of the population is Asian with 8.1 percent in New York City and 5.5 percent in Boston. No other port area has more than 3.5 percent of its population reported as Asian.

In terms of ethnicity structure, New York City has the highest percentage of population that is Hispanic or Latin (21.1 percent) followed by Bridgeport, CT (11.8 percent); Salem, MA (11.0 percent); Long Island (10.3 percent) and Providence (8.6 percent).

The socioeconomic profile for each U.S. East Coast port presented in Appendix D provides additional demographic information such as age distribution of the population, ability to speak English by age group, and educational attainment of population by sex.

## **Socioeconomic Characteristics**

Table 3-3 presents a summary of key socioeconomic characteristics for each of the 26 port areas in 2000 including

- Labor force participation rate
- Unemployment rate
- Median household income
- Per capita income
- Number of people occupied in rail, water and other transportation occupations
- Percentage of families below poverty line

The labor force participation rate represents the percentage of the civilian and military population that is employed or unemployed but looking for work. For 21 of the 26 port areas, the labor force participation rate in 2000 ranged between 60 and 69 percent (Figure 3-2). The port area of Portsmouth, NH with a labor force participation rate of 72.5 percent was the only U.S. East Coast port area where the rate exceeded 69 percent. Four port areas had labor force participation rates below 60 percent in 2000– Eastport, ME (57 percent); Port Canaveral, FL (57.4 percent); Morehead City-Beaufort, NC (58.7 percent) and Cape Cod (58.9 percent).



**Table 3-3. U.S. East Coast Ports: Socioeconomic Characteristics, 2000**

Port Area	Labor Force Participation Rate a/	Unemployment Rate b/	Median Household Income c/	Per Capita Income d/	Number of People Occupied in Rail, Water and Other Transportation Occupations e/	Percentage of People Below Poverty Line
Eastport, ME	57.0	8.5	25,869	14,119	23	19.0
Searsport, ME	63.9	4.8	35,606	19,189	308	11.3
Portland, ME	68.7	3.5	43,736	22,648	1,031	8.0
Portsmouth, NH	72.5	3.1	54,291	24,877	653	5.8
Boston, MA	67.3	4.2	55,882	28,755	4,289	8.8
Salem, MA	65.5	4.6	51,576	26,358	991	8.9
Cape Cod, MA	58.9	5.1	45,933	25,318	508	6.9
New Bedford, MA	65.8	5.8	43,496	20,978	806	10.0
Providence, RI	64.6	5.6	42,370	21,688	1,346	11.9
New London, CT	67.8	3.9	50,646	24,678	516	6.4
New Haven, CT	65.5	5.9	48,834	24,439	1,015	9.5
Bridgeport, CT	66.0	4.8	65,249	38,350	611	6.9
Long Island, NY	64.3	3.8	68,579	29,278	4,433	5.6
New York, NY	60.8	7.4	48,417	25,693	24,848	15.1
Philadelphia, PA	64.2	6.1	49,077	23,972	7,755	10.8
Baltimore, MD	66.4	4.9	50,572	24,398	3,261	9.8
Hampton Roads, VA	67.9	5.0	43,086	20,313	3,342	10.6
Morehead City - Beaufort, NC	58.7	5.5	35,284	19,305	444	14.5
Wilmington, NC	63.0	5.4	38,438	21,469	546	13.0
Georgetown, SC	58.2	6.2	35,312	19,805	70	17.1
Charleston, SC	64.5	5.3	39,232	19,772	942	14.0
Savannah, GA	63.6	5.4	39,558	20,752	758	14.5
Brunswick, GA	63.0	5.5	36,539	19,581	137	15.6
Fernandina, FL	63.9	4.7	46,022	22,836	75	9.1
Jacksonville, FL	66.8	4.6	42,825	21,567	2,016	10.8
Port Canaveral, FL	57.4	4.9	40,099	21,484	746	9.5

a/ The labor force includes all people classified in the civilian labor force, plus members of the U.S. Armed Forces (people on active duty with the United States Army, Air Force, Navy, Marine Corps, or Coast Guard). The Civilian Labor Force consists of people classified as employed or unemployed.

b/ All civilians 16 years old and over are classified as unemployed if they (1) were neither "at work" nor "with a job but not at work" during the reference week, and (2) were actively looking for work during the last 4 weeks, and (3) were available to accept a job. Also included as unemployed are civilians who did not work at all during the reference week, were waiting to be called back to a job from which they had been laid off, and were available for work except for temporary illness.

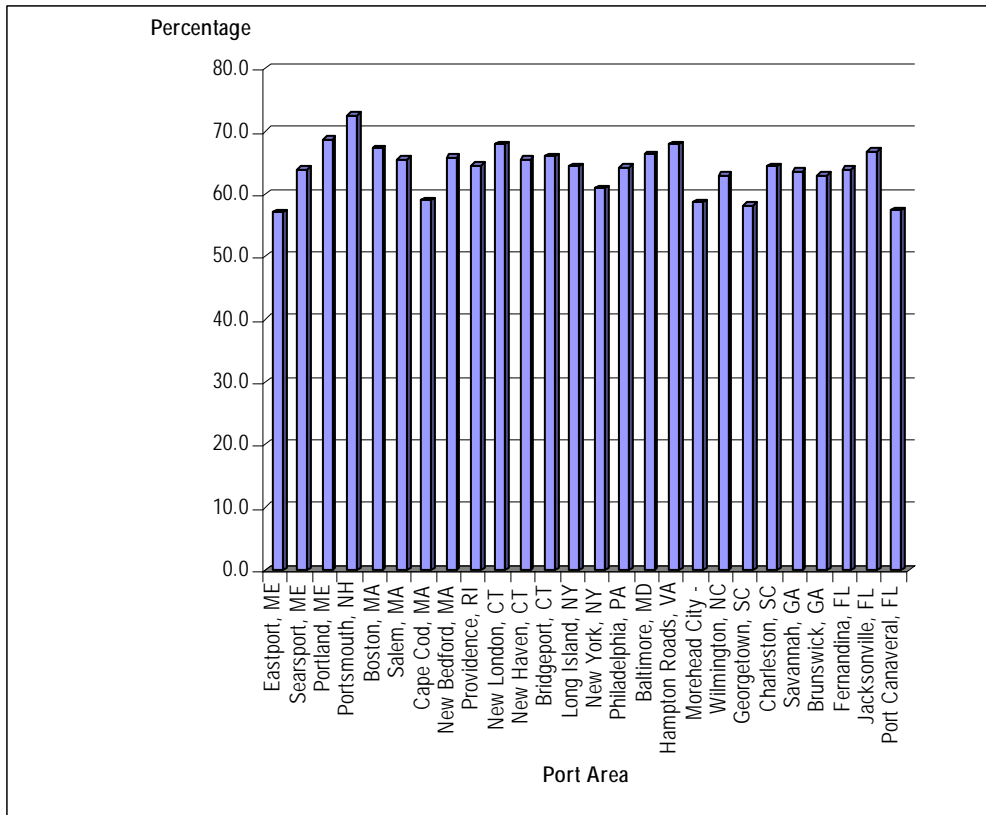
c/ In 1999.

d/ In 1999.

e/ From employed civilian population 16 years and over.

Source: US Census Data, Census 2000.

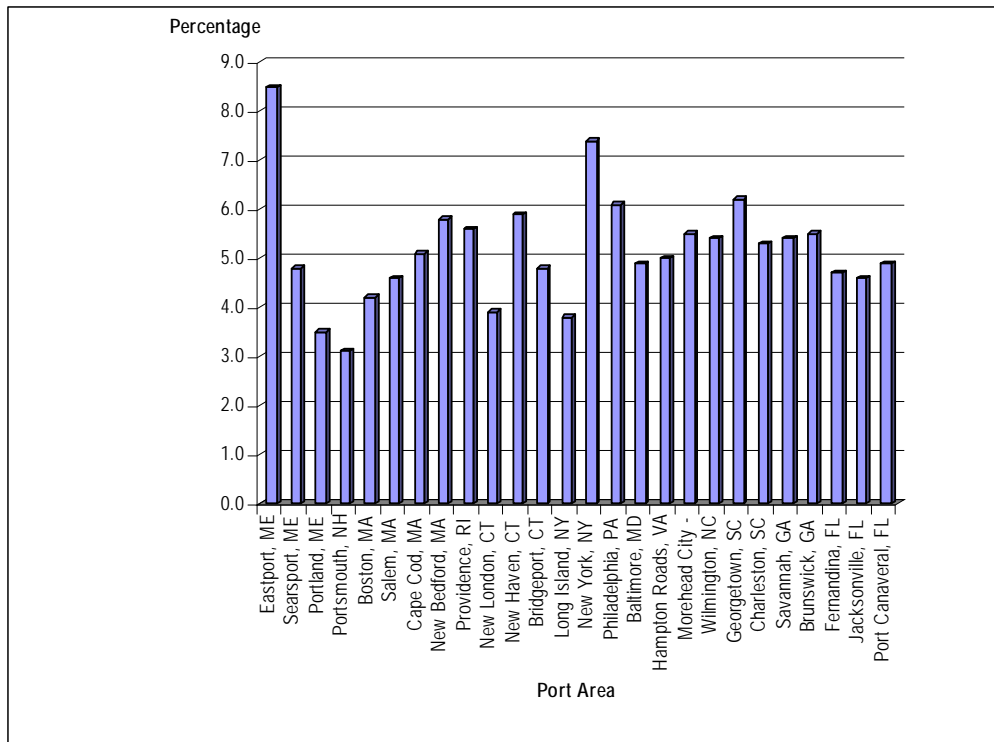
**Figure 3-2. U.S. East Coast Port Areas: Labor Force Participation Rate, 2000**



Source: Table 3-3.

As can be seen graphically in Figure 3-3, economic conditions in the port area of Portsmouth, NH resulted in the lowest rate of unemployment in 2000 at 3.1 percent followed by Portland, ME (3.5 percent); Long Island (3.8 percent) and New London, CT (3.9 percent). At the other end of the economic spectrum, Eastport, ME had an unemployment rate of 8.5 percent followed by New York City at 7.4 percent and Georgetown, SC at 6.2 percent and Philadelphia at 6.1 percent. All other U.S. East Coast port areas had unemployment rates ranging from 4.2 percent and 5.9 percent in 2000.

**Figure 3-3 U.S. East Coast Port Areas: Unemployment Rate, 2000**

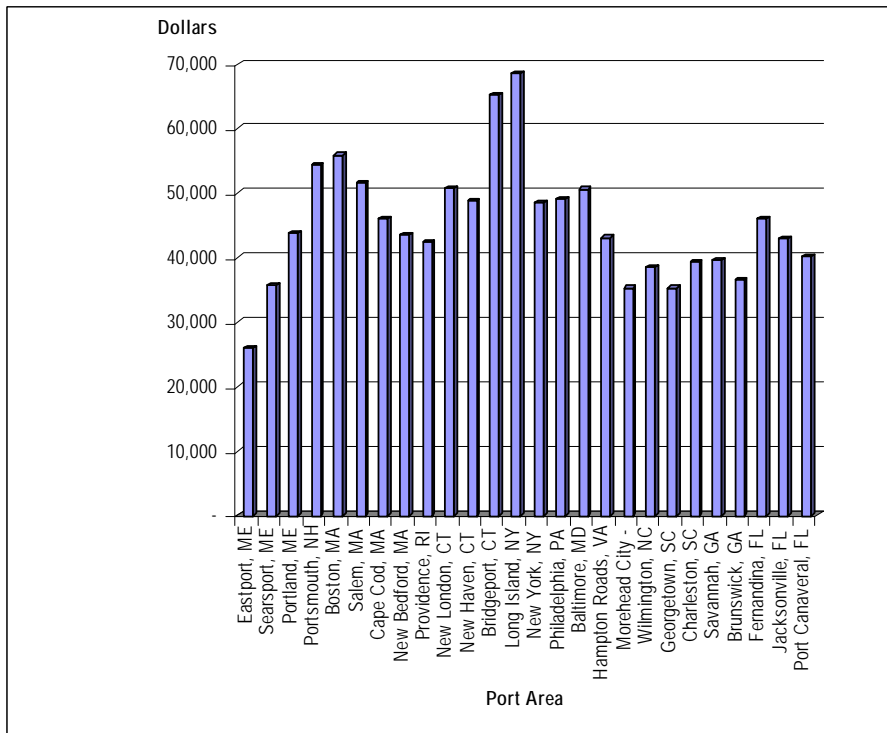


Source: Table 3-3.

The disparity in economic conditions in U.S. East Coast port areas is clearly displayed in Figure 3-4. The median household income in 1999 for the port areas of Long Island (\$68,579) and Bridgeport, CT (\$65,249) is more than 2.5 times the level of median household income reported for Eastport, ME (\$25,869). In general, median household incomes in the northern port areas of the U.S. East Coast are higher than those in the southern port areas. With the exception of Eastport, ME and Searsport, ME the median household income in all port areas from Hampton Roads to the north exceeded \$40,000 in 1999. With the exception of Fernandina, FL and Jacksonville, FL all port areas south of Hampton Roads had a median household income under \$40,000.

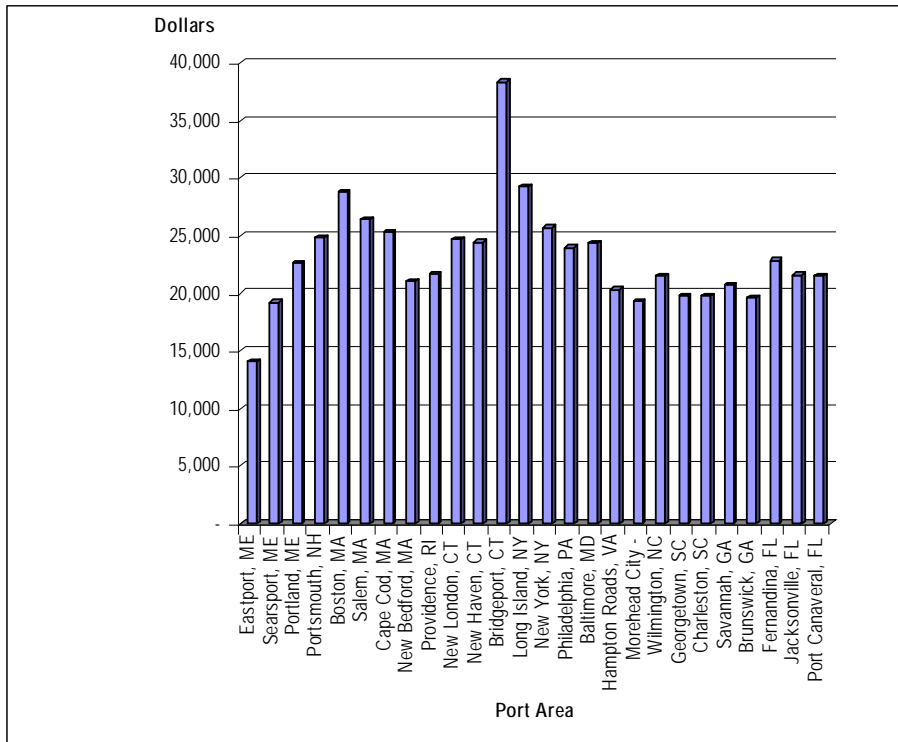
As would be expected, information on per capita income in 1999 by port area shown in Figure 3-5 displays a similar pattern to that of median household income discussed above. In general, the data on per capita income by port area is approximately half that of median household income. The port area of Bridgeport, CT is an exception as its per capita income in 1999 of \$38,350 is nearly 59 percent of the median household income of \$65,249. For this reason, the per capita income of the port area Bridgeport, CT is more than 30 percent higher than that of the second ranked port area of Long Island.

**Figure 3-4. U.S. East Coast Port Areas: Median Household Income, 1999**



Source: Table 3-3.

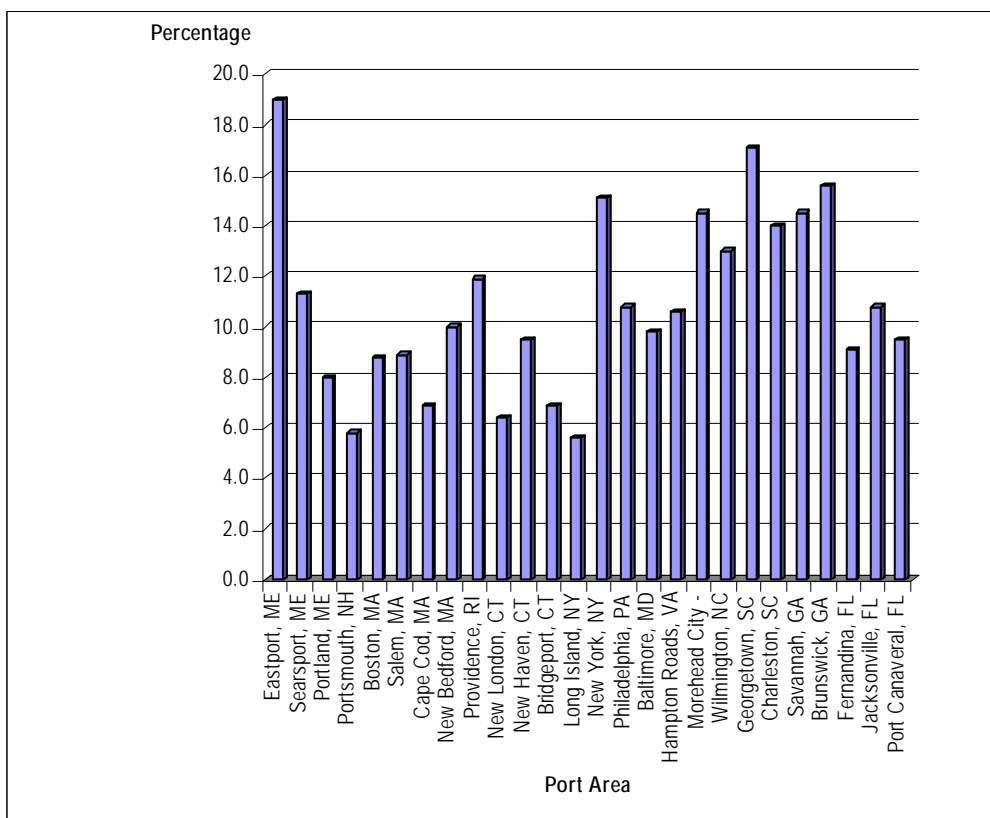
**Figure 3-5. U.S. East Coast Port Areas: Per-Capita Income, 1999**



Source: Table 3-3.

The percentage of people below the poverty line for each port area in 2000 is presented in Figure 3-6. The highest percentages are observed in the port areas of Eastport, ME (19.0 percent); Georgetown, SC (17.1 percent); Brunswick, GA (15.6 percent) and New York City (15.1 percent). The port areas with the lowest percentage of people below the poverty are Long Island (5.6 percent); Portsmouth, NH (5.8 percent); New London, CT (6.4 percent) and Bridgeport, CT (6.9 percent).

**Figure 3-6. U.S. East Coast Port Areas: Percentage of People Below Poverty Line, 2000**



Source: Table 3-3.

The socioeconomic profiles for each U.S. East Coast port presented in Appendix D provides additional information such as distribution of household income by household income level, employment by sex and industry, a general description of port facilities and the range of maritime activities conducted.

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## 4. Potential Economic Impacts

NMFS' preferred operational measures to reduce ship strikes to right whales and the alternative operational measures will directly affect maritime sector activity along the U.S. East Coast.<sup>20</sup> In this chapter we review prior economic studies of the impact of operational measure on the shipping industry, discuss the general approach employed to identify and estimate the potential economic impact, analyze affected vessel traffic, and present key features of our economic impact model. We also report the potential economic impact by alternative and describe the results within the economic context of U.S. East Coast maritime trade and shipping.

### Prior Economic Studies

Nathan Associates conducted a review of the following reports have been identified that address the key aspects of economic impact of proposed right whale ship strike protection measures:

- Kite-Powell and Hoagland, Economic Aspects of Right Whale Ship Strike Management Measures, April 2002
- IMO Sub-Committee on Safety of Navigation, Routing of Ships, Ship Reporting and Related Matters, April 2002
- Russell, Knowlton, and Beaudin Ring, Vessel Traffic-Management Scenarios Based on the National Marine Fisheries Service's Strategy to Reduce Ship Strikes of North Atlantic Right Whales, Initially published December 2003, revised May 2005
- Kite-Powell, Economic Implications of Possible Reductions in Boston Port Calls due to Ship Strike Management Measures, Report produced for NOAA National Marine Fisheries and Massport, March 2005

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<sup>20</sup> This analysis uses the same definition for U.S. East Coast ports as was presented in Chapter 2; that being from Port Canaveral, FL to the northernmost U.S. jurisdiction in the Gulf of Maine.

In the sections below we discuss the approach and methodology used in each of these reports.

### **KITE-POWELL AND HOAGLAND, ECONOMIC ASPECTS OF RIGHT WHALE SHIP STRIKE MANAGEMENT MEASURES, APRIL 2002**

This study was prepared prior to the development of the proposed rulemaking. It measured order of magnitude of economic effects for shipping of contemplated ship traffic management measures. The primary source of data on vessel traffic was the U.S. Army Corps of Engineers' Waterborne Commerce of the United States for 1999. For some ports (Boston, New York/New Jersey, Charleston and Jacksonville) more specific port call information was obtained from port authorities.

The authors stated approach was to adopt base case assumptions that will tend to overstate actual costs and to present cost estimates for a range of traffic management parameters (maximum speed, geographic extent of restriction, etc.). The report included the ports of Portland ME, Portsmouth NH, Boston MA, Providence RI, New York and New Jersey, Philadelphia PA, Baltimore, MD, Hampton Roads VA, Wilmington NC, Charleston SC, Savannah GA, Fernandina Beach, FL, Jacksonville FL and Cape Canaveral FL. Smaller US East Coast ports were omitted from the study.

According to observations by the authors, the study had the following limitations:

- Assumed larger, more expensive vessels than those actually operating along US East Coast.
- Assumed normal operating speed higher than actual.
- Vessel data was very aggregated by type and size; monthly variation not analyzed.
- Study did not model possible changes in number of port calls per year or the economic effects of such changes.
- Did not include fishing vessels, large recreational vessels or passenger ferries

The use of the US Army Corps of Engineers' as the principal data source also limited the authors' analysis to use 1999 data as there is a several year lag in the public dissemination of the USACE Waterborne Commerce reports.

### **IMO SUB-COMMITTEE ON SAFETY OF NAVIGATION, ROUTING OF SHIPS, SHIP REPORTING AND RELATED MATTERS, APRIL 2002**

This document submitted by Canada to the IMO discussed the impact of proposed amendment of traffic separation scheme (TSS) in the Bay of Fundy. The purpose for amending the TSS is to reduce ship strikes of the highly endangered North Atlantic Right Whale by shifting the traffic lanes of the TSS from an area with the highest density of Right Whales to an area where there is lower density. The TSS was originally adopted by



IMO in 1982 .The TSS is located entirely within Canada’s territorial waters and is mandatory for all vessels in accordance with the Collision Regulations.

The proposed amendment would add 5 miles for vessels calling at Saint John (affecting 600 vessels per year) and 11 miles for vessels calling at Bayside and Eastport (affecting 100 vessels per year). The estimated impact on shipping was not quantified but was described as “minimal”.

### **RUSSELL, KNOWLTON, AND BEAUDIN RING, VESSEL TRAFFIC-MANAGEMENT SCENARIOS BASED ON THE NATIONAL MARINE FISHERIES SERVICE’S STRATEGY TO REDUCE SHIP STRIKES OF NORTH ATLANTIC RIGHT WHALES, MAY 2005**

This study is an update of a November 2003 report. The study provides a detailed examination of the physical impact (time delays) on vessel operations along the U.S. East Coast of the proposed operational measures contained in the June 1, 2004 Advanced Notice of proposed rulemaking (ANPR). Both speed restrictions and DMAs are addressed. The study does not quantify the delays for vessels into economic impacts.

A detailed analysis is presented of the additional time required for vessels to decelerate from sea speed to the restricted speed as part of the impact of proposed speed restrictions. Some vessels were assumed to take as long as an hour to slow to the restricted speed. Shipping industry representatives claim that this time is an additional impact associated with the proposed speed restrictions. For most port areas we have not incorporated this slowing time in the calculation of delays for designated speed restricted areas. Even without the speed restrictions, most vessels will have to slow down for the pilot to board or as they approach the port. Even though the location at which the vessel commences to slow may be different with the proposed seasonal speed restrictions, there is no additional vessel time involved.<sup>21</sup>

### **KITE-POWELL, ECONOMIC IMPLICATIONS OF POSSIBLE REDUCTIONS IN BOSTON PORT CALLS DUE TO SHIP STRIKE MANAGEMENT MEASURES, MARCH 2005**

This study estimates illustrative direct and indirect economic impacts of the loss of vessel calls in the Port of Boston that may result from costs/delays imposed by right whale ship strike management measures. Estimates were prepared using a customized application of the MARAD Port Economic Impact Model. The model includes direct effects on port operations defined as the expenditures of businesses directly associated with the movement of waterborne cargo and passengers through the terminals; indirect effects of expenditures of the port industries buying goods and services from other industries in the region; and induced effects of spending by employees of the port industries and their suppliers. The results are shown for four scenarios that range from a loss of 27 cruise vessel port calls to a loss of 104 container ship calls. The study’s author, however, is

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<sup>21</sup> The issue of deceleration/ acceleration delay is more relevant for dynamic management areas measures implemented away from the shoreline when vessels could resume speed before approaching the port area.

careful to point out that they have not attempted to quantify the probability of the loss of vessel calls under any of the scenarios.

## General Approach

Our approach for the estimation of the potential economic impact of the proposed operational measures of each Alternative has been designed so that results can be identified and analyzed at a summary level or disaggregated by port area, vessel type, vessel size, and vessel flag. An ancillary benefit of this approach is that it also enhances the accuracy and rigor of the analysis. Key factors such as vessel operating speed vary significantly by vessel type and size; vessel operating costs vary by those vessel characteristics as well as flag of registry. For this study, we have used 10 knots as the base case. However in the sensitivity analysis we also identify the direct economic impact on the shipping industry of speed restrictions of 12 and 14 knots.

As depicted in Figure 4-1, our general approach is organized into the following four principal tasks:

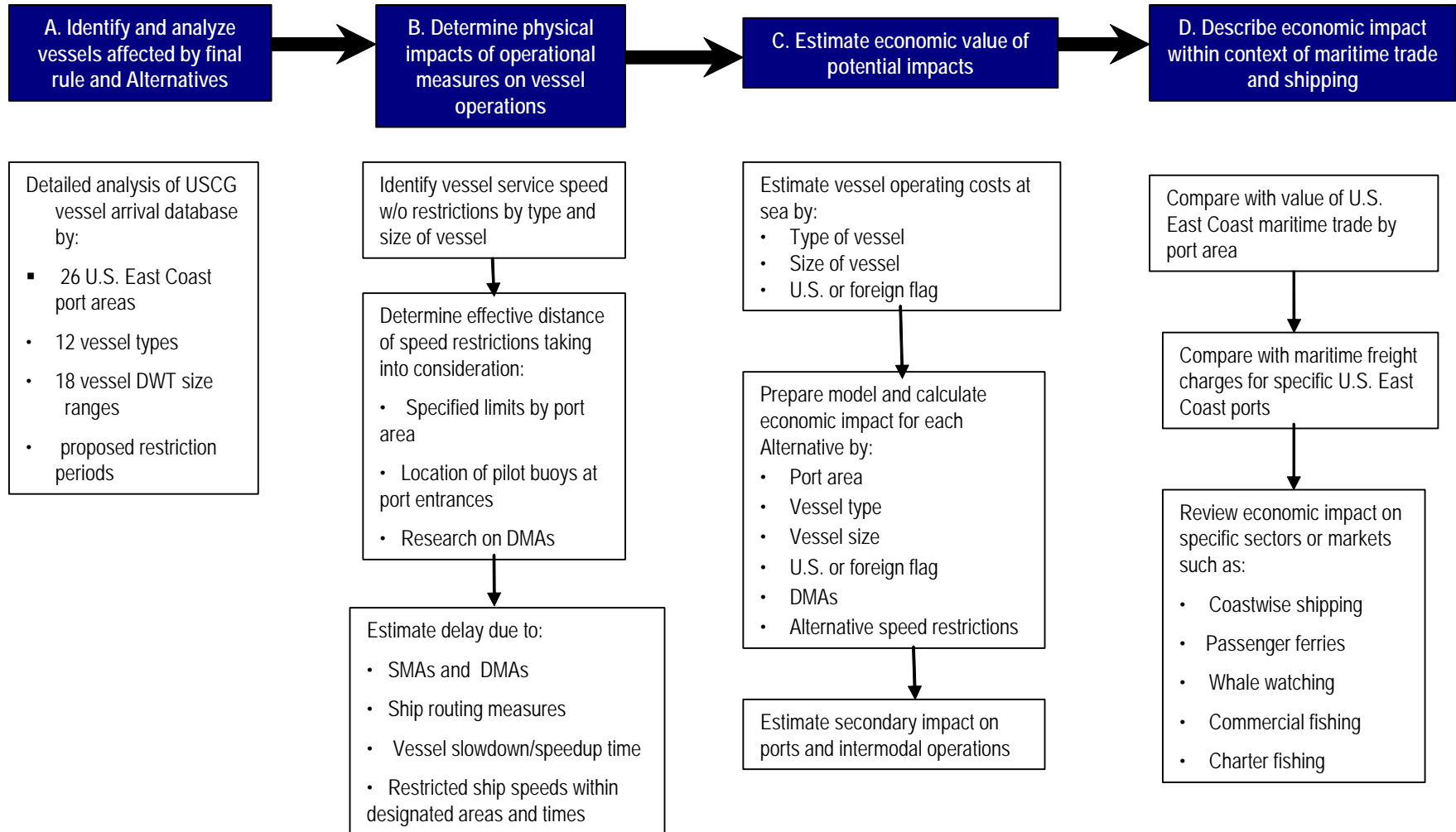
**Task A. Identify and analyze vessels affected by the final rule.** Detailed information regarding vessels 150 GRT or higher calling at U.S. East Coast ports during 2003 and 2004 was obtained from the U.S. Coast Guard vessel arrival database.<sup>22</sup> Vessel calls were analyzed for 26 port areas on the U.S. East Coast, 12 vessel types, 18 vessel DWT size ranges and U.S. and foreign flag registration.

**Task B. Determine physical impacts of operational measures on vessel operations.** Key information include vessel service speed by type and size of vessel and the effective distance of proposed seasonal speed restrictions by port area, including consideration of the location of pilot buoys. Also the effective distance and periods for proposed DMA measures were specified based on available research. Results of this task include estimate of minutes of delay per vessel arrival for seasonal speed restrictions.

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<sup>22</sup> A detailed description of the U.S. Coast guard vessel arrival database and the measures undertaken by Nathan Associates to reconcile the data with the port areas was described in Chapter 2, Existing U.S. East Coast Maritime Activity.

Figure 4-1. General Approach



**Task C. Estimate economic value of potential impacts.** Key data include vessel operating costs at sea by type and size of vessel and whether U.S. or foreign flag registry. Results include detailed estimates of potential economic impact of proposed speed restrictions by port area, vessel type, vessel DWT size range, flag of registration. Analyses of alternative assumptions regarding speed restrictions for speeds of 10, 12 and 14 knots were conducted.<sup>23</sup>

**Task D. Describe economic impact within context of U.S. East Coast maritime trade and shipping.** For each port area, the estimated potential economic impact is assessed relative to the value of maritime trade and relative to maritime freight charges during proposed seasonal and DMA speed restriction periods. We also conducted separate economic impact analyses for sectors not included in the US Coast Guard database such as whale watching vessels, passenger ferries, commercial fishing and charter fishing.

The analysis is conducted from the perspective of determining the potential economic impact if the proposed operational measures were in place during a recent period when data on maritime sector activity is available, in this case 2003 and 2004. The study however uses estimates of vessel operating costs in 2004 and updated for June 2008 bunker fuel prices to bring this data current.

The final rule calls for the establishment of new operational measures for the shipping industry including consideration of routing and speed restrictions. Operational measures include seasonal speed restrictions for specific U.S. East Coast port areas during particularly sensitive periods when whales are typically present.

NMFS is proposing in the final rule that the speed restrictions would be implemented at 10 knots and would be in effect for a distance generally between 20-30 nautical miles from the shoreline depending on the alternative. During periods outside of the seasonal speed restrictions, all areas along the Atlantic seaboard within the U.S. Exclusive Economic Zone would be subject to dynamic management area (DMA) measures if certain concentrations of right whales were sighted.<sup>24</sup> The final rule also allows for the establishment of recommended routes that provide the greatest possibility of reducing the risk of collisions between vessels and whales. All of the proposed provisions would apply to non-sovereign vessels with a length of 65 feet and above.

## Economic Impact Model

We developed an Excel-based spreadsheet model to calculate the potential direct<sup>25</sup> economic impact of the ship strike reduction operational measures. The model uses input worksheets that contain data on

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<sup>23</sup> The study uses a speed restriction of 10 knots as the base case.

<sup>24</sup> Possible triggers for implementation of DMA measures are discussed later in this chapter.

<sup>25</sup> The approach and methodology used to calculate in the indirect economic impact is described later in this chapter.

- U.S. East Coast total and restricted period vessel arrivals for 2003 and 2004 by type and size of vessel, port area, and flag of registry
- Vessel service speed by type and size of vessel
- Vessel operating costs at sea by type and size of vessel and flag of registry
- Distance by port area over which proposed seasonal management area speed restrictions would be in effect
- Distance and days per year by port area when proposed dynamic management area speed restrictions would be in effect
- Time for vessels to slow down to restricted speeds and to regain sea speed

A set of calculation worksheets are linked to these input worksheets to calculate the delay in minutes that would be encountered by vessels arriving at U.S. East Coast ports during seasonal speed restriction periods and DMA periods. The economic impact is calculated by multiplying the minutes of delay by vessel operating costs at sea. A set of output worksheets are used to report economic impact by various combinations of the following items:

- Year
- Port area
- Vessel type
- Vessel DWT size range
- U.S. or foreign flag of registry
- Seasonal speed restrictions
- DMA speed restrictions
- Alternative restricted speeds
- Alternative effective distance of speed restrictions by port area

In the sections below, we present the source and values for key input data used in the economic impact model.

## OPERATING SPEED

Accurate information on current vessel operating speeds is clearly an important element for the determination of the economic impact of the proposed speed restrictions. We have reviewed information on vessel operating speeds by type and size of vessel from three sources:

- Mandatory Ship Reporting System that provides actual operating speeds reported by ships captains
- U.S. Army Corps of Engineers estimates of vessel service speeds reported in guidance memorandum for use in official planning and economic studies
- Maritime industry comments presented during stakeholder meetings conducted in the fall of 2004.

The Mandatory Ship Reporting System (MSRS) was proposed by the U.S. and approved by the International Maritime Organization (IMO) in 1999. The MSRS requires all commercial ships 300 gross tons or greater to report information regarding entry location and time, route, destination and speed when entering either of two areas surrounding critical right whale habitats. The Northeast System encompasses right whale critical habitats in Cape Cod Bay and the Great South Channel and operates year-round. The Southeast System encompasses right whale critical habitat off the Coastline of Georgia and Florida and is in effect from November 15 to April 15 when right whales aggregate in these waters.

Nathan Associates analyzed the MSRS information reported for 2002, 2003, and 2004. During this 3-year period, there were 8,479 MSRS records reported by 1,557 vessels. Using the reported vessel call sign, vessels in the MSRS database were matched with the U.S. Coast Guard vessel characteristics database to identify type and size of vessel. After making corrections for obvious MSRS data entry errors, we were able to match call signs reported for 1,278 (82 percent) vessels that accounted for 7,779 MSRS records (92 percent). Of these, there were 6,942 MSRS records (89 percent) that contained usable information regarding vessel operating speed.

Table 4-1 presents the MSRS average operating speed by type and size of vessel for 2002 through 2004. The fastest average reported operating speeds were reported for containerships ranging from 14.6 knots for vessels less than 10,000 DWT to 20.4 knots for vessels between 50-70,000 DWT. Average reported operating speeds for bulk carriers range from 11.6 knots for vessels less than 10,000 DWT to 14.1 knots for vessels between 70-100,000 DWT.

**Table 4-1. MSRS Average Reported Speed by Vessel Type and DWT Size Range, 2002 -2004 (knots)**

Vessel type	DWT (000s)							
	0-10	10-20	20-30	30-40	40-50	50-70	70-100	100+
Bulk Carrier	11.6	12.6	12.7	13.1	13.5	14.2	14.1	-
Combination Carrier	-	-	-	9.3		14.8	13.4	-
Container Ship	14.6	17.8	17.6	18.2	18.5	20.4	-	-
Freight Barge	13.9	-	-	-	-	-	-	-
General Dry Cargo Ship	12.9	16.0	14.6	14.2	15.2	-	-	-
Passenger Ship	15.5	16.6	-	-	-	-	-	-
Refrigerated Cargo Ship	15.7	19.8	-	-	-	22.0	-	-
Ro-Ro Cargo Ship	13.5	16.9	17.6	20.0	17.7	14.3	-	-
Tank Barge	-	-	-	-	14.9	-	-	-
Tank Ship	11.8	13.3	13.0	13.8	13.7	13.9	15.0	15.2
Towing Vessel	10.0	-	-	-	-	-	-	-
Other a/	11.3	-	-	-	-	-	-	-

a/ Includes fishing vessels, industrial vessels, research vessels and school ships.

Source: Prepared by Nathan Associates based on analysis of MSRS data for 2002, 2003, and 2004.

A second source of vessel operating speed by vessel type and size is guidance memorandum published by the U.S. Army Corps of Engineers (USACE) to be used by planners in studies to determine the potential benefits of harbor improvement projects. Vessel service speeds are provided for four vessel types –containerships, general cargo ships, bulk carriers and tankers and for a range of vessel sizes relevant for U.S. maritime commerce.

Table 4-2 presents USACE estimates of vessel service speed for each of the four vessel types. For ease of comparison, we have included vessel DWT size ranges from the USACE similar to those used in the MSRS analysis above. In general, the estimated service speeds correspond closely to those reported in the MSRS. For example, MSRS reports average operating speeds of 14.6 knots and 18.0 knots for the first two DWT size ranges of containerships. The USACE estimates are 14.7 knots and 17.9 knots for these same size containerships. However, starting with containerships of 20,000 DWT and greater, the MSRS reports average operating speeds of 2-3 knots slower than the USACE estimates.

**Table 4-2. U.S. Army Corps of Engineers, Estimated Service Speed by Type and Size of Vessel, FY 2005 (knots)**

Vessel type	DWT							
	5,000	15,000	25,000	35,000	45,000	60,000	85,000	115,000
Container	14.7	17.9	19.7	20.9	21.9	23.1	-	-
General cargo	13.4	15.8	17.0	17.9	18.6	-	-	-
Bulk carrier	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Tankers	13.5	14.0	14.2	14.3	14.4	14.6	14.7	14.9

Source: U.S. Army Corps of Engineers, FY 2005 Deep Draft Vessel Operating Costs.

A similar pattern is observed for general cargo vessels where the MSRS data and USACE estimates match well for the smaller two DWT size categories, but where the MSRS average reported speeds are 2-3 knots slower than the USACE estimates for the larger vessel DWT size categories.

For bulk carriers, the MSRS reported average operating speed for bulk carriers greater than 50,000 DWT corresponds closely with the USACE estimate. However, the MSRS reported speed for bulk carriers less than 50,000 DWT are approximately 1-2 knots slower than the USACE estimates.

For tankers, the difference between the MSRS reported average speed and the USACE estimated service speed is usually less than 1 knot, except for the smallest tanker DWT size category where the MSRS speed is 1.6 knots below the USACE estimate.

There are several possible explanations for the apparent tendency for the MSRS reported speeds to be below the USACE estimated service speeds. It may be that vessels entering the MSRS reporting may voluntarily slow somewhat from normal operating speeds. Second, there may be a tendency to slightly underreport actual vessel operating speeds in order to appear to be complying. Third, the navigation characteristics of the two MSRS reporting areas may differ from conditions in open seas where vessel operating speeds are higher.

Limited information on vessel operating speeds was also provided by maritime industry comments provided during public stakeholder meetings conducted in the fall of 2004. In general, the anecdotal information was consistent with the general depiction of speeds by vessel type presented above.

Using primarily the USACE data, we have developed estimates of vessel operating speeds for the vessel type and DWT size categories corresponding to those used to report U.S. East Coast vessel arrivals. These estimates of average operating speeds are presented in Table 4-3.

**Table 4-3. Average Vessel Operating Speeds by Vessel Type Used in Economic Impact Analysis (knots)**

Vessel type	DWT (000s)																	
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+
Bulk Carriers	11.6	11.6	12.2	12.2	12.5	12.5	13.0	13.0	13.4	13.4	14.0	14.0	14.1	14.1	14.1	14.1	14.1	14.1
Combination Carriers	11.6	11.6	12.2	12.2	12.5	12.5	13.0	13.0	13.4	13.4	14.0	14.0	14.1	14.1	14.1	14.1	-	-
Containerships	13.0	15.8	17.4	18.5	19.3	20.0	20.7	21.2	21.7	22.1	22.7	23.4	24.1	24.6	-	-	-	-
Freight Barges	12.0	14.2	15.3	16.1	16.8	17.3	17.7	18.1	18.4	18.8	19.2	-	-	-	-	-	-	-
General Cargo Vessels	12.0	14.2	15.3	16.1	16.8	17.3	17.7	18.1	18.4	18.8	-	-	-	-	-	-	-	-
Passenger Vessels	16.0	18.0	20.0	22.0	24.0	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Vessels	13.0	15.8	17.4	18.5	19.3	20.0	20.7	21.2	21.7	22.1	22.7	-	-	-	-	-	-	-
Ro-Ro Cargo Vessels	13.0	15.8	17.4	18.5	19.3	20.0	20.7	21.2	21.7	22.1	22.7	23.4	24.1	-	-	-	-	-
Tank Barges	13.2	13.7	13.9	14.0	14.2	14.2	14.3	14.4	14.4	14.5	14.5	-	-	-	-	-	-	-
Tankers	13.2	13.7	13.9	14.0	14.2	14.2	14.3	14.4	14.4	14.5	14.5	14.6	14.7	14.7	14.8	14.8	14.9	15.0
Towing Vessels	12.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	12.0	12.0	12.0	12.0	12.0	12.0	12.0	-	-	-	-	-	-	-	-	-	-	-

a/ Includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates Inc. as described in text.



## VESSEL OPERATING COSTS AT SEA

The USACE also prepares estimates of vessel operating costs to be used by planners in studies to determine the potential benefits of harbor improvement projects. Vessel operating costs include annual capital costs as determined by the replacement cost of the vessels and application of capital recovery factors; estimates of fixed annual operating costs such as for crew, lubricating materials and stores (supplies), maintenance and repair, insurance and administration; the number of operational days per year; and fuel costs at sea and in port.

The type and DWT size of vessels for which operating costs are reported by the USACE is shown in Table 4-4 below.<sup>26</sup> Vessel operating costs are presented separately for U.S. flag and foreign flag vessels, for five vessel types, and up to 14 vessel DWT sizes within a vessel type.

*Table 4-4. Type and Size of Vessels for which USACE Reports Vessel Operating Costs (DWT)*

Foreign flag					U.S. flag				
General cargo vessel	Container ship	Bulk carrier	Tanker (double hull)	Tanker (single hull)	General cargo vessel	Container ship	Bulk carrier	Tanker (double hull)	Tanker (single hull)
11,000	9,000	15,000	20,000	20,000	11,000	9,000	15,000	20,000	20,000
14,000	14,000	25,000	25,000	25,000	14,000	14,000	25,000	25,000	25,000
16,000	17,000	35,000	35,000	35,000	16,000	17,000	35,000	35,000	35,000
20,000	20,000	40,000	50,000	50,000	20,000	20,000	40,000	50,000	50,000
24,000	23,000	50,000	60,000	60,000	24,000	23,000	50,000	60,000	60,000
30,000	28,000	60,000	70,000	70,000	30,000	28,000	60,000	70,000	70,000
	31,000	80,000	80,000	80,000		31,000	80,000	80,000	80,000
	35,000	100,000	90,000	90,000		35,000	100,000	90,000	90,000
	39,000	120,000	120,000	120,000		39,000	120,000	120,000	120,000
	42,000	150,000	150,000	150,000		42,000	130,000	150,000	150,000
	49,000	175,000	175,000	175,000		49,000		175,000	175,000
	55,000	200,000	200,000	200,000		55,000		200,000	200,000
	66,000		265,000	265,000		66,000		265,000	265,000
	82,000		325,000	325,000					

Source: U.S. Army Corps of Engineers, Economic Guidance Memorandum 02-06, Deep Draft Vessel Operating Costs

We applied regression techniques to the USACE vessel operating cost data in order to match exactly with the vessel size categories used in our analysis of U.S. East Coast vessel arrivals. A logarithmic equation was specified relating hourly operating costs at sea with vessel DWT for each of the five vessel type shown in Table 4-4 separately for foreign flag and U.S. flag vessels.

Comments from the shipping industry raised concerns that the USACE vessel operating costs for 2004 understate current conditions, especially due to the increased cost of bunker fuels. The USACE operating cost

<sup>26</sup> Up through 2002, the U.S. Army Corps of Engineers published every several years updated information on vessel operating costs at sea for U.S. and foreign flag vessels. However, starting with the Economic Guidance Memorandum 05-01, deep draft vessel operating costs will not be posted for public access as some or much of the information used to develop the cost estimates is considered proprietary by commercial sources and protected from open or public disclosure under Section 4 of the Federal Freedom of Information Act, as amended. For purposes of this study, we have obtained limited access to the deep draft vessel operating costs for 2004.

estimates provide the assumed fuel consumption per day at sea for the primary propulsion and auxiliary propulsion for each vessel type and DWT size. The primary propulsion is assumed to use heavy viscosity oil while the auxiliary propulsion is assumed to use marine diesel oil. We updated the USACE vessel operating costs to reflect the average bunker fuel prices per ton for New York for June 13, 2008 as reported by Bunkerworld. The price for heavy viscosity oil was \$631 per metric ton and marine diesel oil was \$1,245 per metric ton. These represent increases of approximately 360 percent over average bunker fuel prices for 2004. While consumption of fuel varies by vessel type and DWT size, the overall increase in vessel operating costs in 2008 due to bunker fuels is about 95-115 percent for foreign flag general cargo vessels and tankers, 130 percent for foreign dry bulk vessels and 150 to 170 percent for foreign containerships. The resulting estimates of vessel operating costs by type and size of vessel for June 2008 are presented in Table 4-5. As the U.S. Coast Guard vessel arrival database did not provide adequate information to distinguish single-hull and double-hull tankers, we used the vessel operating costs for double hull tankers in our analysis.<sup>27</sup>

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<sup>27</sup> Generally the additional vessel operating costs per hour for double hull tankers increases from one percent greater for the smaller tankers to seven percent greater for the largest tankers.

**Table 4-5. Hourly Vessel Operating Costs at Sea for Foreign Flag and U.S. Flag, Vessel Type and DWT Size Range, June 2008 (\$)**

Vessel type and flag	DWT (000s)																	
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+
Foreign Flag 2008 Hourly Operating Costs at Sea																		
Bulk Carrier	1,153	1,181	1,209	1,239	1,269	1,300	1,332	1,364	1,398	1,432	1,484	1,558	1,635	1,715	1,800	1,935	2,183	2,522
Combination Carrier (e.g. OBO)	1,210	1,240	1,270	1,301	1,333	1,365	1,398	1,433	1,467	1,503	1,559	1,636	1,716	1,801	1,890	2,032	2,292	2,648
Container Ship	1,137	1,291	1,466	1,664	1,890	2,145	2,436	2,766	3,140	3,565	4,313	5,560	7,167	9,239	11,911	17,433	-	-
Freight Barge	697	853	1,044	1,279	1,566	1,917	2,348	2,874	3,520	4,310	-	-	-	-	-	-	-	-
General Dry Cargo Ship	697	853	1,044	1,279	1,566	1,917	2,348	2,874	3,520	4,310	-	-	-	-	-	-	-	-
Passenger Ship a/	5,164	7,558	11,062	17,252	22,240	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	2,558	2,905	3,298	3,744	4,251	4,827	5,481	6,223	7,065	8,021	9,704	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	1,251	1,420	1,612	1,831	2,078	2,360	2,679	3,042	3,454	3,922	4,744	6,116	7,884	-	-	-	-	-
Tank Barge	1,323	1,349	1,375	1,401	1,428	1,456	1,484	1,512	1,541	1,571	1,617	-	-	-	-	-	-	-
Tank Ship	1,323	1,349	1,375	1,401	1,428	1,456	1,484	1,512	1,541	1,571	1,617	1,679	1,745	1,812	1,883	1,994	2,193	2,459
Towing Vessel	1,323	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other b/	697	853	1,044	1,279	1,566	1,917	2,348	-	-	-	-	-	-	-	-	-	-	-
US Flag 2008 Hourly Operating Costs at Sea																		
Bulk Carrier	1,672	1,720	1,768	1,819	1,870	1,923	1,977	2,033	2,091	2,150	2,242	2,371	2,507	2,651	2,803	3,048	3,504	4,143
Combination Carrier (e.g. OBO)	1,756	1,806	1,857	1,909	1,963	2,019	2,076	2,135	2,195	2,258	2,354	2,489	2,632	2,783	2,943	3,200	3,679	4,350
Container Ship	1,741	1,933	2,147	2,385	2,649	2,942	3,267	3,628	4,030	4,476	5,238	6,461	7,970	9,831	12,126	16,611	-	-
Freight Barge	1,143	1,372	1,647	1,977	2,374	2,850	3,421	4,107	4,931	5,920	7,787	-	-	-	-	-	-	-
General Dry Cargo Ship	1,143	1,372	1,647	1,977	2,374	2,850	3,421	4,107	4,931	5,920	7,787	-	-	-	-	-	-	-
Passenger Ship a/	7,734	10,595	14,514	20,953	25,845	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	3,917	4,350	4,831	5,366	5,959	6,619	7,351	8,164	9,067	10,070	11,786	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	1,915	2,127	2,362	2,623	2,914	3,236	3,594	3,991	4,433	4,923	5,762	7,107	8,767	-	-	-	-	-
Tank Barge	2,187	2,228	2,270	2,312	2,355	2,400	2,445	2,490	2,537	2,585	2,658	-	-	-	-	-	-	-
Tank Ship	2,187	2,228	2,270	2,312	2,355	2,400	2,445	2,490	2,537	2,585	2,658	2,758	2,862	2,971	3,083	3,260	3,577	3,998
Towing Vessel	2,187	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other b/	1,143	1,372	1,647	1,977	2,374	2,850	3,421	4,107	4,931	5,920	7,787	-	-	-	-	-	-	-

a/ Includes recreational vessels.

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. as described in text from data provided in U.S. Army Corps of Engineers, Economic Guidance Memorandum 05-01, Deep Draft Vessel Operating Costs and adjusted for bunker fuel prices reported by Bunkerworld for IFO380 and MDO for New York as of June 13, 2008.

We also used the USACE reported vessel operating costs to develop estimates of vessel operating costs for other vessel types making necessary adjustments for vessel capital cost and operating characteristics and flag of registry. For example, operating costs for U.S. flag ro-ro vessels were related to U.S. flag containerships and foreign flag combination carriers were related to foreign flag bulk carriers

Operating costs for US flag bulk carriers, combination carriers and tankers are generally double those of similar foreign flag vessels. Operating costs for U.S. flag containerships, ro-ro vessels and passenger vessels are about 1.5 times higher than comparable foreign flag vessels.

## **Estimated Direct Economic Impact on Shipping Industry**

In this section we estimate the direct economic impact of proposed operational measures of each alternative on the shipping industry by port area and type of vessel. The next section of this report considers other direct economic impacts to shipping such as multiple port calls and increased intermodal costs, and indirect impacts from economic impacts such as diversion of traffic to other port areas and the associated impact on employment and income.

### **ALTERNATIVE 1 – NO ACTION STATUS QUO**

Under this alternative, NMFS would continue to implement existing measures and programs, largely non-regulatory to reduce the likelihood of mortality from ship strikes. Alternative 1 does not include any new operational measures that would affect the shipping industry and hence there is no direct economic impact associated with this alternative.

### **ALTERNATIVE 2 – USE OF DMAS**

The final rule proposes that dynamic management areas would be implemented along the U.S. Exclusive Economic Zone when right whale sightings occur. Triggers for implementing a DMA are based on those specified for the Atlantic Large Whale Take Reduction Plan (ALWTRP) Dynamic Area Management fishing restrictions.<sup>28</sup> A DMA action would be triggered by a single reliable report from a qualified individual<sup>29</sup> of an aggregation of three or more right whales within 75 square nautical miles (nm<sup>2</sup>) (257 km<sup>2</sup>), such that right whale density is equal to or greater than 0.04 right whales per nm<sup>2</sup> (3.43 km<sup>2</sup>), equivalent to four right whales

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<sup>28</sup>See the January 9, 2002 Federal Register Proposed Rule (as amended by the October 28, 2002 technical amendment to the final rule) for the definition of Procedures and Criteria to Establish a DAM Zone, Criteria to Determine the Extent of the DAM Zone, and Duration of DAM Zones.

<sup>29</sup> A qualified individual is an individual ascertained by NMFS to be reasonably able, through training or experience, to identify a right whale. Such individuals include, but are not limited to, NMFS staff, USCG and Navy personnel trained in whale identification, scientific research survey personnel, whale watch operators, naturalists, and mariners trained in whale species identification through disentanglement training or some other training program deemed adequate by NMFS. A reliable report is a credible right whale sighting based upon which a DAM zone would be triggered.

per 100 nm<sup>2</sup> (343 km<sup>2</sup>). Once a DMA is triggered, NMFS would use the following procedures and criteria to establish a DMA:

- A circle with a radius of at least 2.8 nm (5.2 km) would be drawn around the location of each individual sighting. This radius would be adjusted for the number of observed whales, so as to size the DMA to maintain a density of four right whales per 100 nm<sup>2</sup> (343 km<sup>2</sup>). Information on how to calculate the length of the radius can be found in the Proposed Rule to amend the regulations that implement the ALWTRP (67 FR 1133). For a group of three whales the DMA would consist of a core area with a radius of 4.8 nm (8.9 km).
- If any circle or group of contiguous circles includes three or more right whales, this core area and its surrounding waters would be a candidate DMA zone.

Once NMFS identifies a core area containing three or more whales, the agency would expand this initial core area to provide a buffer in which the whales could move and still be protected. NMFS will determine the extent to the DMA zones as follows:

- A large circular zone would be drawn extending 15 nm (27.8 km) from the perimeter of a circle around each core area.
- The DMA would be a polygon drawn outside, but tangential to, the circular buffer zone(s), defined by the latitudinal and longitudinal coordinates of its corners.

Hence each DMA consists of the core area with a radius of 4.8 nm (for a group of three whales) plus the buffer with a radius of 15 nm for a total radius of 19.8 nm. The diameter of the DMA is thus 39.6 nm. The DMA zone would automatically expire after 15 days from the day of the original sighting, unless subsequent surveys within the 15-day period demonstrated (a) whales are present in the zone, or (b) the aggregation had persisted, in which case the period would be extended 15 days from the date of any subsequent sightings in the zone.

### *Impact on Vessel Operations*

For Alternative 2, DMA triggers could be implemented at any time of the year depending on whale sightings. We have reviewed research conducted on the frequency, timing and location of whale sightings to prepare assumptions regarding the expected number of days per year that DMAs would be effective in each port area. A report published by Russell, Knowlton and Beaudin Ring in May 2005 estimated the annual expected duration of DMAs in the Northeast Region and the Block Island Sound portions of the mid-Atlantic Region.<sup>30</sup> However, in calculating the incidence of DMAs, this report assumed that seasonal speed restrictions in designated areas would be in effect.<sup>31</sup> Hence the incidences of DMAs contained in the report are only those

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<sup>30</sup> Russell, Knowlton and Beaudin Ring, *Vessel-Traffic-Management Scenarios Based on the National Marine Fisheries Service's Strategy to Reduce Ship Strikes of [North Atlantic] Right Whales*, May 2005.

<sup>31</sup> The report assumed the following seasonal speed restriction periods: Great South Channel east of the shipping lanes leading to Boston, April 1-July 31; Cape Cod Bay critical habitat, January 1-April 30; portion of Boston shipping lanes near Race Point, April

that would occur outside of proposed speed restriction periods. For the southern Gulf of Maine, the report estimated an average of 2.3 DMAs per year. For our analysis we have rounded up to an expected incidence of 3 DMAs per year (45 effective days) outside of the assumed speed restriction periods.<sup>32</sup> We have assumed that DMAs would be implemented for 50 percent of the time that speed restrictions are proposed for the Boston shipping lanes near Race Point (April 1-May 15), or an additional 23 days.

One might assume that DMAs would be effective for 100 percent of the proposed seasonal speed restriction periods; however, the location specific nature of the DMAs means that some DMAs that would have been implemented during seasonal speed restriction periods would not fall within normal shipping lanes. Recent research on right whale sightings from 1978 through 2003 shows that many of the sightings after May appear to be more centrally located within the Great South Channel critical habitat and would be west of normal shipping lanes.<sup>33</sup> Hence as can be seen in Table 4-6, the economic impact analysis assumes 68 effective days per year for DMAs in the Northeast Region (excluding Cape Cod Bay).

**Table 4-6. Effective DMA Days by Port Area**

Port Area	Effective DMA Days
Northeast U.S.(except Cape Cod Bay)	68
Northeast U.S.- Cape Cod Bay	105
Mid-Atlantic (except Savannah, GA)	15
Southeastern U.S and Savannah GA	75

Source: Nathan Associates as described in text.

For Cape Cod Bay, the Russell Knowlton, Beaudin Ring report shows an average of 0.8 DMAs per year for Cape Cod Bay outside of the seasonal ATBA period of January 1-April 30. We have rounded this up to 1 per year (15 days). Due to the concentration of right whale sightings in the Cape Cod Bay, we have assumed that DMAs would have also been implemented for 75 percent of the seasonal ATBA that would affect shipping lanes, or an additional 90 days of effective DMAs. Hence we assume 105 effective DMA days for Cape Cod Bay.

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1-May 15; offshore approaches to Block Island Sound, September-October and February-April; approaches to the ports of NY/NJ, September-October and February-April.

<sup>32</sup> A review of DAM zones implemented under ALWTRP confirms the Russell, Knowlton and Beaudin Ring analysis. This shows that there were no more than 3 DAMs per year implemented outside of proposed speed restriction periods that would affect shipping routes in the Northeast U.S.

<sup>33</sup> A draft paper by Richard Merrick of NOAA Fisheries Service evaluates the spatial and temporal distribution of northern right whales within the Gulf of Maine. The analysis focused on sightings during March-July because this is the time period when whales move out of Cape Cod Bay. The analysis shows concentrations of right whale sightings near shipping lanes during the months of March-May when whales are migrating from Cape Cod Bay to the Great South Channel.

For the mid-Atlantic region, a report by Knowlton, Beaudin Ring and Russell prepared in July 2002 provides information on the spatial and temporal distribution of right whale sightings.<sup>34</sup> Data from 1970 through 2002 were used for this study. With the exception of Savannah, all port areas showed an average of less than one right whale sighting per year.<sup>35</sup> For the economic impact analysis we have assumed one DMA period per year (15 days) for each port in the mid-Atlantic region (except for Savannah). For Savannah we have assumed 75 days per year as specified below in the discussion of the Southeast region.

For the Southeast region, we have used a recent draft report by Lance Garrison to identify the incidence of DMAs in shipping lanes.<sup>36</sup> The report uses data on Right Whale sightings from 1992-2001. The concentration of Right Whale sightings appears consistent with the proposed seasonal speed restriction period of November 15-April 15. As discussed above for the Northeast region, not all DMAs implemented in the region will affect the shipping lanes into Southeast ports. For the Southeast region and Savannah we have assumed that DMAs would be implemented for 50 percent of proposed seasonal speed restriction period or 75 days per year.

### *Estimated Direct Economic Impact*

In all regions, mariners would have the option of either routing around the DMA or proceeding through it at a restricted speed. The direct impact of a DMA on vessel operations is the increased time required to transit through the DMA at the restricted speed. For a vessel normally traveling at an operating speed of 14 knots, it would normally be able to cover the 39.6 nautical miles of a DMA in 170 minutes (Table 4-7). With a speed restriction of 10 knots, covering the distance would take 238 minutes, an increase of 68 minutes. In addition, vessels will need time to slow to the restricted speed prior to entering the DMA and time to speed-up after leaving the DMA.<sup>37</sup> A vessel normally traveling at an average operating speed of 14 knots would take 18 additional minutes to slow down to 10 knots and then speed up again to 14 knots for a total delay of 86 minutes.

For the economic impact analysis we have conservatively assumed that vessels would opt to proceed through a DMA with a speed restriction of 10 knots rather than to route around the DMA. A vessel normally traveling at an average speed of 14 knots would incur a delay of 170 minutes to route the extra 39.6 nautical miles around two sides of the square that circumscribes a DMA,<sup>38</sup> as compared to the 86 minute delay to go through the 39.6 nautical miles of the DMA at the restricted speed.

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<sup>34</sup> Knowlton, Beaudin Ring and Russell, *Right Whale Sightings and Survey Effort in the Mid Atlantic Region: Migratory Corridor, Time Frame and Proximity to Port Entrances*, July 2002.

<sup>35</sup> The report shows that from November through March, right whale sightings at Savannah are three to ten times greater than those of other mid-Atlantic ports.

<sup>36</sup> Garrison, *Applying a spatial model to evaluate the risk of interactions between vessels and Right Whales in the southeast United States critical habitat*, October 14 2005.

<sup>37</sup> An excellent analysis of the time for vessels to slow down to restricted speeds and to speedup to sea speed is presented in the Russell, Knowlton, Beaudin Ring May 2005.

<sup>38</sup> While the two sides of the square that circumscribe a DMA are each 39.6 nautical miles, the extra distance is only equal to one side of 39.6 nautical miles as the vessel would normally have sailed the 39.6 nautical miles through the DMA at regular speed.

**Table 4-7. Minutes of Delay of Transiting DMA vs. Routing Around DMA**

Average operating speed	Minutes of delay for going through DMA					Minutes of delay for routing around DMA
	Normal transit time for 39.6 nm	Transit time with speed restriction	Additional transit time time	Slowdown/ speedup time	Total delay	
<b><u>Speed restriction of 10 knots</u></b>						
12	198.0	237.6	39.6	10	49.6	198.0
14	169.7	237.6	67.9	18	85.9	169.7
16	148.5	237.6	89.1	22	111.1	148.5
18	132.0	237.6	105.6	26	131.6	132.0
20	118.8	237.6	118.8	30	148.8	118.8
22	108.0	237.6	129.6	33	162.6	108.0
24	99.0	237.6	138.6	36	174.6	99.0
<b><u>Speed restriction of 12 knots</u></b>						
12	198.0	198.0	-	-	-	198.0
14	169.7	198.0	28.3	8	36.3	169.7
16	148.5	198.0	49.5	16	65.5	148.5
18	132.0	198.0	66.0	20	86.0	132.0
20	118.8	198.0	79.2	24	103.2	118.8
22	108.0	198.0	90.0	27	117.0	108.0
24	99.0	198.0	99.0	30	129.0	99.0
<b><u>Speed restriction of 14 knots</u></b>						
12	198.0	169.7	-	-	-	198.0
14	169.7	169.7	-	-	-	169.7
16	148.5	169.7	21.2	8	29.2	148.5
18	132.0	169.7	37.7	13	50.7	132.0
20	118.8	169.7	50.9	18	68.9	118.8
22	108.0	169.7	61.7	21	82.7	108.0
24	99.0	169.7	70.7	24	94.7	99.0

Source: Prepared by Nathan Associates as described in text.

With a speed restriction of 10 knots, vessels with an average operating speed in excess of 18 knots could benefit by routing around the DMA. Routing around the DMA would take an additional 132 minutes (39.6 nm divided by 18 knots). Going through the DMA at 10 knots would take an additional 106 minutes (238 minutes vs. the normal 132 minutes) plus 26 minutes for slowdown and speedup for a total delay of 132 minutes, the same as routing around.

Because NMFS will draw a square around each circular DMA buffer zone (so as to issue coordinates of the corners to mariners), the position of the DMA relative to the vessel routing alters the effective distance of the DMA. For example, a vessel that would route diagonally through the DMA square would have to traverse 56 nautical miles at the restricted speed rather than the 39.6 nautical miles for a vessel crossing the DMA at the mid-points of each side of the square. This phenomenon is perhaps offset by the fact that some vessel's routes will require them to pass only through a portion of a DMA. For the economic analysis, we have assumed that vessels would have to traverse an average of 39.6 nautical miles for each DMA.



Table 4-8 presents the direct economic impact of DMAs implemented under Alternative 2 on the shipping industry in 2003. The total direct economic impact is estimated at \$25.0 million with the port area of Savannah having the largest impact of \$6.9 million. The port area of Port Canaveral is second at \$3.9 million, followed by the port areas of New York/New Jersey and Jacksonville at \$2.9 million. The direct economic impact for these four port areas totals \$16.5 million or 65.8 percent of the total for this alternative.

In the Northeast region, the port area of Boston has the greatest direct economic impact estimated at \$0.8 million in 2003. The port area of Portland has an estimated impact of \$0.7 million.

Overall, containerships account for 47.0 percent of the total direct economic impact of Alternative 2 with an estimate of \$11.8 million. The vessel type with the next largest economic impact is passenger vessels at \$5.1 million followed by ro-ro cargo ships at \$2.8 million. Interestingly, the port area of Port Canaveral accounts for \$3.5 million or 69.2 percent of the economic impact incurred by passenger vessels.

Table 4-9 presents the direct economic impact of Alternative 2 in 2004. The total economic impact is \$27.6 million in 2004, roughly 10 percent higher than 2003. This is due to the overall increase in U.S. East Coast vessel arrivals of 7.3 percent in 2004 and particularly, the 12.3 percent growth in vessel arrivals in the Southeast region that is more affected by DMAs.<sup>39</sup> The rankings by port area and vessel type are the same as described for 2003 above, except that Jacksonville has moved slightly ahead of New York/New Jersey. Figure 4-2 presents graphically the direct economic impact by port area for 2003 and 2004.

Some industry representatives have commented that increased fuel consumption for vessels having to go faster to make up time should be included in the economic analysis. However, the economic analysis conservatively assumes that vessels will not speed up to make up time and hence includes the maximum estimate of delay that would be incurred. If vessels make up for the delay by speeding up then the estimated economic impact would need to be revised to reduce or exclude the cost applied for the time delayed. This assumption applies to all of the alternatives analyzed.

Another comment was that vessels may burn less fuel operating at slower speeds and that these savings may offset some of the cost of delays. However, for economic reasons, vessels operators already operate at close to the vessel's optimal fuel efficiency and any savings in fuel costs are assumed to be minimal.<sup>40</sup>

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<sup>39</sup> Vessel arrivals in 2003 and 2004 by port area are presented in Chapter 2.

<sup>40</sup> Some vessel operators have stated that at a restricted speed of 10 knots they will consume more fuel as their engines were designed for higher operating speeds.

**Table 4-8. Alternative 2: Direct Economic Impact on Shipping Industry by Port Area and Type of Vessel, 2003 (\$000s)**

Port Area	Bulk Carriers	Combination Carriers	Containerships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	Total
<b>Northeastern US - Gulf of Maine</b>													
Eastport, ME	7.7	-	13.4	-	30.4	-	-	-	-	-	-	-	51.6
Searsport, ME	6.0	0.8	-	-	-	371.8	-	0.5	16.0	71.4	0.8	-	467.4
Portland, ME	35.9	15.2	19.3	0.9	39.5	119.5	-	38.2	4.0	400.2	4.5	0.5	677.7
Portsmouth, NH	37.6	2.0	-	-	15.0	3.6	-	-	1.4	97.6	0.4	0.5	158.1
<b>Northeastern US - Off Race Point</b>													
Boston, MA	18.4	0.6	229.5	0.7	6.1	336.4	7.9	22.7	-	178.4	0.4	0.9	802.1
Salem, MA	4.8	-	-	-	-	3.6	-	-	-	1.0	-	-	9.3
<b>Northeastern US - Cape Cod Bay</b>	-	-	-	-	-	11.7	-	-	-	4.0	-	-	15.7
<b>Mid-Atlantic Block Island Sound</b>													
New Bedford, MA	8.7	-	0.1	-	3.1	-	4.8	-	0.5	1.8	-	-	18.9
Providence, RI	9.9	0.3	0.4	-	4.3	43.0	1.9	23.6	0.4	23.0	0.3	0.0	107.2
New London, CT	2.6	-	1.4	-	5.3	25.3	-	-	8.9	1.5	0.1	0.0	45.0
New Haven, CT	6.9	0.4	0.8	0.4	11.1	3.9	-	-	35.8	35.3	1.3	0.1	96.0
Bridgeport, CT	4.8	-	0.0	0.2	0.0	3.2	6.2	-	26.1	7.7	-	-	48.4
Long Island, NY	-	0.4	-	0.1	-	25.3	-	-	77.3	40.6	0.3	0.1	144.1
<b>Mid-Atlantic Ports of New York/New Jersey</b>	48.1	7.8	1,826.0	0.1	15.3	311.9	20.3	314.3	4.0	312.4	1.8	0.4	2,862.5
<b>Mid-Atlantic Delaware Bay</b>	37.4	3.8	200.7	2.8	37.9	29.8	261.1	45.0	1.9	210.3	1.5	0.1	832.3
<b>Mid-Atlantic Chesapeake Bay</b>													
Baltimore, MD	43.9	1.5	235.1	-	59.8	51.3	3.0	274.2	0.9	38.0	1.4	1.7	710.8
Hampton Roads, VA	46.3	6.2	1,340.4	0.1	34.8	38.8	0.6	113.2	0.3	42.4	0.5	0.9	1,624.4
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>	3.5	-	7.1	-	7.8	-	0.7	0.6	-	7.5	-	0.1	27.2
<b>Mid-Atlantic Wilmington, NC</b>	12.2	1.1	64.5	-	44.6	-	0.4	14.7	2.7	46.7	0.1	0.1	187.2
<b>Mid-Atlantic Georgetown, SC</b>	5.1	-	0.4	-	9.9	-	-	-	-	-	-	0.1	15.5
<b>Mid-Atlantic Charleston, SC</b>	20.3	0.3	1,180.9	-	39.8	47.3	3.2	89.6	2.4	41.4	1.3	0.3	1,426.8
<b>Mid-Atlantic Savannah, GA</b>	157.1	10.6	5,482.0	-	359.3	29.5	99.7	398.5	3.0	309.7	2.7	0.7	6,852.9
<b>Southeastern US</b>													
Brunswick, GA	41.2	-	81.8	-	100.9	3.9	37.0	484.5	-	3.8	-	-	753.1
Fernandina, FL	6.2	-	82.6	0.5	115.5	7.9	104.7	6.0	-	1.5	4.5	-	329.4
Jacksonville, FL	113.5	3.0	949.9	159.2	221.6	61.9	30.7	898.9	7.6	290.3	123.2	2.1	2,861.9
Port Canaveral, FL	56.3	1.3	39.0	3.1	89.1	3,529.6	94.0	52.0	2.6	27.2	6.3	0.5	3,901.1
<b>Total</b>	<b>734.4</b>	<b>55.4</b>	<b>11,755.4</b>	<b>168.1</b>	<b>1,251.0</b>	<b>5,059.2</b>	<b>676.2</b>	<b>2,776.7</b>	<b>196.1</b>	<b>2,193.5</b>	<b>151.5</b>	<b>8.9</b>	<b>25,026.5</b>

a/ Includes recreational vessels.

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

**Table 4-9. Alternative 2: Direct Economic Impact on Shipping Industry by Port Area and Type of Vessel, 2004 (\$000s)**

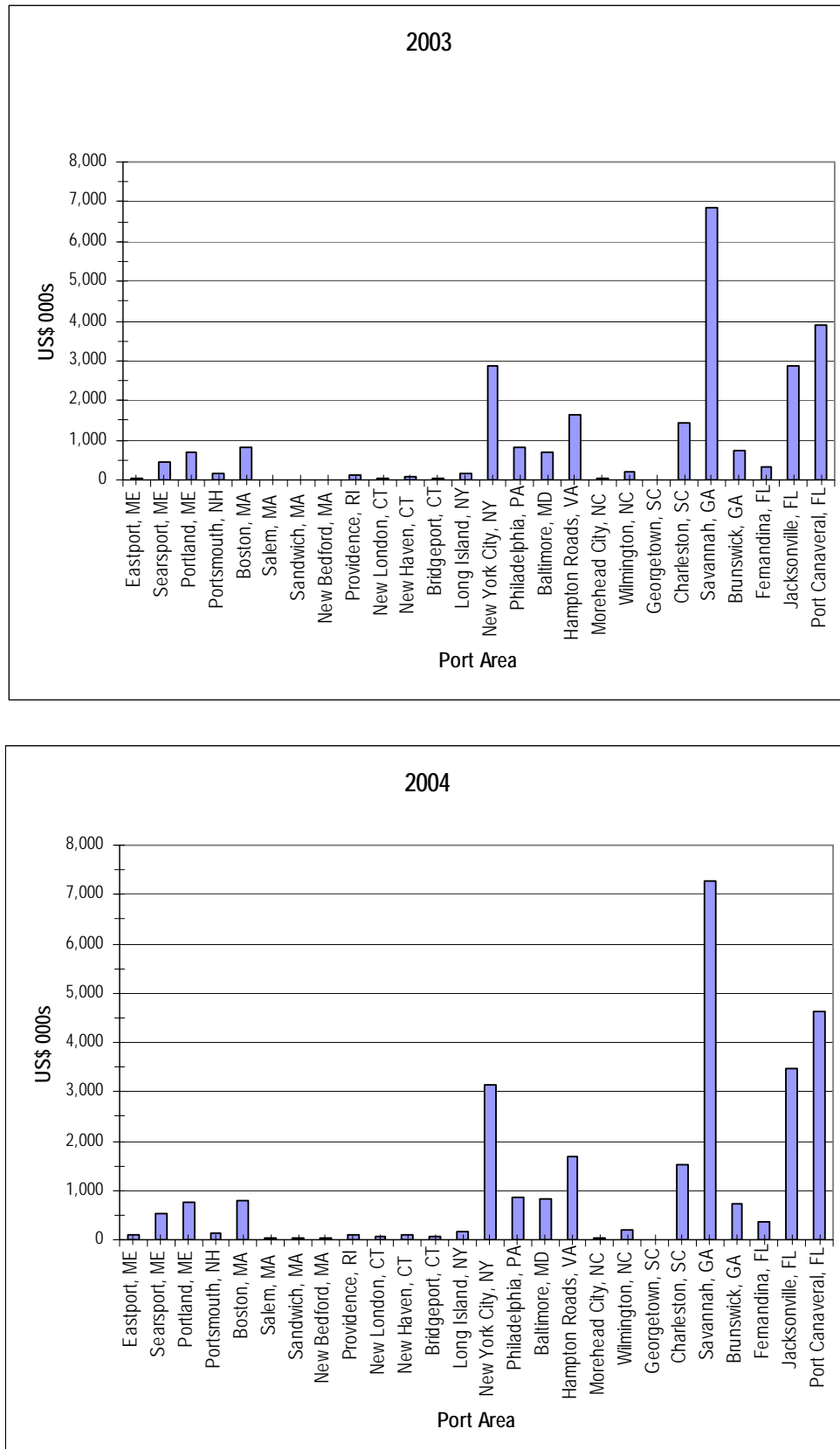
Port Area	Bulk Carriers	Combination Carriers	Containerships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	Total
<b>Northeastern US - Gulf of Maine</b>													
Eastport, ME	10.6	-	13.5	-	63.2	-	-	-	-	-	-	-	87.3
Searsport, ME	4.1	-	10.9	0.9	1.6	424.6	-	1.0	7.8	66.3	3.3	-	520.4
Portland, ME	38.5	4.4	10.7	0.9	40.5	167.6	-	26.2	18.3	417.5	19.2	0.4	744.3
Portsmouth, NH	30.3	1.8	0.5	-	24.0	3.6	-	-	0.7	72.8	3.7	1.1	138.4
<b>Northeastern US - Off Race Point</b>													
Boston, MA	18.4	0.6	229.5	0.7	6.1	336.4	7.9	22.7	-	178.4	0.4	0.9	802.1
Salem, MA	6.0	-	-	-	-	29.4	-	-	-	-	-	-	35.4
<b>Northeastern US - Cape Cod Bay</b>	-	-	-	-	-	22.7	-	-	0.2	6.2	0.1	-	29.3
<b>Mid-Atlantic Block Island Sound</b>													
New Bedford, MA	8.2	-	-	-	2.8	1.6	3.5	0.2	-	1.6	-	-	17.9
Providence, RI	10.2	0.3	-	-	4.5	56.5	-	19.3	0.8	17.7	0.5	0.3	110.0
New London, CT	2.2	-	5.5	-	15.3	46.7	-	-	8.8	2.0	0.3	-	80.9
New Haven, CT	5.4	-	2.4	0.2	10.1	-	-	-	67.2	27.2	2.0	-	114.5
Bridgeport, CT	9.6	-	-	0.0	0.1	3.2	2.5	-	37.7	4.6	-	0.0	57.8
Long Island, NY	-	-	-	0.4	-	30.0	-	-	89.1	41.7	-	0.0	161.3
<b>Mid-Atlantic Ports of New York/New Jersey</b>	46.9	4.8	1,899.1	-	23.5	503.5	21.5	320.4	3.4	301.7	4.2	0.2	3,129.3
<b>Mid-Atlantic Delaware Bay</b>	44.3	1.5	193.2	4.0	56.7	38.8	243.3	45.4	0.5	226.8	4.9	0.2	859.6
<b>Mid-Atlantic Chesapeake Bay</b>													
Baltimore, MD	56.4	1.1	261.7	-	63.1	94.0	5.4	281.0	0.8	58.4	1.2	0.7	823.9
Hampton Roads, VA	63.8	5.0	1,320.6	0.5	39.6	74.4	9.9	104.0	1.2	47.7	2.0	0.9	1,669.4
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>	5.9	0.1	7.8	-	5.2	5.5	-	-	-	10.0	-	0.1	34.7
<b>Mid-Atlantic Wilmington, NC</b>	15.4	0.5	59.5	0.4	48.8	4.7	0.4	17.3	1.4	48.3	0.5	0.4	197.7
<b>Mid-Atlantic Georgetown, SC</b>	4.9	0.3	1.4	-	7.2	0.8	-	-	-	-	-	-	14.7
<b>Mid-Atlantic Charleston, SC</b>	19.5	0.4	1,241.1	0.8	52.1	62.8	3.7	83.8	1.9	40.6	3.5	0.4	1,510.3
<b>Mid-Atlantic Savannah, GA</b>	165.9	8.5	5,581.4	1.0	357.6	196.3	141.3	443.4	2.5	361.5	3.6	0.5	7,263.4
<b>Southeastern US</b>													
Brunswick, GA	45.8	-	29.2	-	109.3	31.6	33.5	481.1	-	0.9	-	0.9	732.1
Fernandina, FL	14.3	-	89.9	1.0	129.7	75.0	45.9	5.4	-	-	10.8	-	372.1
Jacksonville, FL	130.8	5.4	976.6	140.9	248.5	502.1	34.4	931.0	14.7	297.2	165.9	8.8	3,456.3
Port Canaveral, FL	76.3	-	43.9	8.0	122.1	4,125.3	79.1	71.3	12.8	46.4	29.7	0.9	4,615.7
<b>Total</b>	<b>833.8</b>	<b>34.9</b>	<b>11,978.6</b>	<b>159.7</b>	<b>1,431.5</b>	<b>6,837.0</b>	<b>632.3</b>	<b>2,853.4</b>	<b>269.8</b>	<b>2,275.5</b>	<b>255.6</b>	<b>16.6</b>	<b>27,578.8</b>

a/ Includes recreational vessels

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

**Figure 4-2 Alternative 2: Direct Economic Impact on Shipping Industry by Port Area, 2003 and 2004 (\$000s)**



### **ALTERNATIVE 3 – SPEED RESTRICTIONS IN DESIGNATED AREAS**

Under Alternative 3, speed restrictions would be implemented along the U.S. East Coast during periods when whales are known to be present. The alternative specifies differing spatial scope and timing of the speed restrictions for the Northeast, mid-Atlantic and Southeast regions of the U.S.

In the Northeast region, speed restrictions would be effective year-round and would cover the Cape Cod Bay critical habitat and all waters used by Seasonal Area Management (SAM) zones designated in the Atlantic Large Whale Take Reduction Plan (ALWTRP).<sup>41</sup> The combined area would consist of the Cape Cod Bay critical habitat and cover an extensive continuous polygon extending eastward from Massachusetts Bay (70.5° W) to the Hague Convention Line and southward from 42.5° N to the Cape Cod Bay critical habitat and the southern edge of the Great South Channel critical habitat area.

In the mid-Atlantic region, speed restrictions would be implemented from October 1 through April 30 and would extend 25 nautical miles from the U.S. coastline starting from Block Island Sound to Savannah, GA.

In the Southeast region, speed restrictions would be implemented from November 15 through April 15 and would include all waters within the Mandatory Ship Reporting system (MSRS) referred to as MSRS WHALESSOUTH plus the presently designated right whale critical habitat. MSRS WHALESSOUTH is a polygon off the coast of Brunswick, Fernandina and Jacksonville that extends from the shoreline to 80°51.6'W with the southern and northern boundaries at 30° 00'N and 31° 27' N. The northern portion of the right whale critical habitat is encompassed by the MSRS WHALESSOUTH area; however, the southern portion extends 4 to 5 nautical miles from the shoreline from the southern boundary of MSRS WHALESSOUTH past Port Canaveral to 28 ° 00'N.

The effective period of proposed speed restriction for each port area is depicted in Figure 4-3. For all port areas in the Northeast region, the restrictions would be effective year-round (365 days). Speed restrictions would be in place for 212 days per year along the mid-Atlantic region and 151 days per year for port areas in the Southeast region.

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<sup>41</sup> The definition of the expanded SAM is specified in the ALWTRP Broad-based gear modification final rule (72 FR 57104), October 5, 2007.

**Figure 4-3. Alternative 3: Proposed Speed Restrictions by Port Area**

Port Region and Port Area	Jan	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Days
<b>Northeastern US - Gulf of Maine</b>													
Eastport, ME													365
Searsport, ME													365
Portland, ME													365
Portsmouth, NH													365
<b>Northeastern US - Off Race Point</b>													
Boston, MA													365
Salem, MA													365
<b>Northeastern US - Cape Cod Bay</b>													365
<b>Mid-Atlantic Block Island Sound</b>													
New Bedford, MA													212
Providence, RI													212
New London, CT													212
New Haven, CT													212
Bridgeport, CT													212
Long Island, NY													212
<b>Mid-Atlantic Ports of New York/New Jersey</b>													212
<b>Mid-Atlantic Delaware Bay</b>													212
<b>Mid-Atlantic Chesapeake Bay</b>													
Baltimore, MD													212
Hampton Roads, VA													212
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>													212
<b>Mid-Atlantic Wilmington, NC</b>													212
<b>Mid-Atlantic Georgetown, SC</b>													212
<b>Mid-Atlantic Charleston, SC</b>													212
<b>Mid-Atlantic Savannah, GA</b>													212
<b>Southeastern US</b>													
Brunswick, GA													151
Fernandina, FL													151
Jacksonville, FL													151
Port Canaveral, FL													151

Source: NOAA.

### *Impact on Vessel Operations*

As described in Chapter 2, the U.S. Coast Guard Vessel Arrival database and ancillary data sets provide information on all vessel arrivals of 150 GRT or greater at U.S. ports. Information in the database regarding the date of vessel arrival was used to determine the number of vessel arrivals in 2003 and 2004 that would have occurred during the proposed seasonal speed restriction periods for each port area.

Table 4-10 presents U.S. East Coast arrivals of vessels for 2003 during the periods when speed restrictions are proposed for each port area. In 2003 there were 14,935 vessel arrivals during speed restricted periods approximately 58 percent of the total of 25,532 arrivals for 2003 presented in Chapter 2. While there is some seasonality in U.S. East Coast vessel arrivals, the proposed periods of speed restrictions include both peak periods and non-peak periods and hence the percentage of restricted arrivals correspond closely to the percentage of speed restricted days per year.

The port area of New York/New Jersey has the most vessel arrivals during speed restricted periods with 3,103 arrivals in 2003 followed by the port areas of Hampton Roads (1,529 arrivals), Philadelphia (1,521 arrivals), Savannah (1,368 arrivals), Charleston (1,343 arrivals) and Baltimore (1,085 arrivals).<sup>42</sup> These six port areas accounted for 66.6 percent of the total U.S. vessel arrivals during speed restricted periods.

In terms of vessel type, containerships recorded the most vessel arrivals during proposed speed restricted periods with 4,937 arrivals in 2003. Tankers were the next most frequent with 3,483 arrivals followed by ro-ro cargo ships with 1,713 arrivals and bulk carriers with 1,660 arrivals.

In 2004, there were 15,815 vessel arrivals at U.S. East Coast ports during the periods when speed restrictions are proposed for each port area, an increase of 5.9 percent over 2003 (Table 4-11). The increase is lower than the 7.3 percent shown for total U.S. East Coast vessel arrivals in Chapter 2 for several reasons. First, the Southeast region which recorded an increase of 12.3 percent in total vessel arrivals in 2004 is the region with the fewest speed restricted days. Second, the port area of New York/New Jersey with the largest number of annual vessel arrivals recorded a growth of less than 0.4 percent in vessel arrivals during proposed speed restricted periods.

Detailed statistics on restricted period U.S. and foreign flag vessel arrivals by port area, vessel type, and vessel DWT size category are presented in Appendix E for 2003 and 2004.

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<sup>42</sup> The port areas of Philadelphia, PA and Wilmington, DE are included in the data presented for the port region of mid-Atlantic Delaware Bay in tables in this chapter. A complete definition of port areas included in each port region is presented in Appendix A, Attachment 4.

**Table 4-10. Alternative 3: U.S. East Coast Restricted Vessel Arrivals by, Port Area and Vessel Type, 2003**

Port Area	Vessel Type												Total
	Bulk Carrier	Combination Carrier	Container Ship	Freight Barge	General Dry Cargo Ship	Passenger Ship	Refrigerated Cargo Ship	Ro-Ro Cargo Ship	Tank Barge	Tanker	Towing Vessel	Other a/	
Northeastern US - Gulf of Maine													
Eastport, ME	16	-	5	-	19	-	-	-	-	-	-	-	40
Searsport, ME	14	1	-	-	-	66	-	1	23	89	2	-	196
Portland, ME	66	14	9	1	38	19	-	58	6	396	11	2	620
Portsmouth, NH	63	3	-	-	10	1	-	-	2	117	1	2	199
Northeastern US - Off Race Point													
Salem, MA	7	-	-	-	-	1	-	-	-	1	-	-	9
Boston, MA	34	1	77	2	8	94	4	33	-	225	1	4	483
Northeastern US - Cape Cod Bay													
Cape Cod, MA	-	-	-	-	-	9	-	-	-	13	-	-	22
Mid-Atlantic Block Island Sound													
New Bedford, MA	36	-	1	-	16	-	5	-	4	7			69
Providence, RI	49	1		-	13	14	3	45	1	74	1	1	202
New London, CT	12	-	2	-	4	20	-	-	47	5	1	-	91
New Haven, CT	38	-	1	1	17	2	-	-	152	110	10	-	331
Bridgeport, CT	17	-	-	2	2	1	32	-	108	30	-	-	192
Long Island, NY	-	1	-	2	-	19	-	-	318	144	2	1	487
Mid-Atlantic Ports of New York/New Jersey													
New York City, NY	209	19	1,381	1	31	53	14	405	25	950	11	4	3,103
Mid-Atlantic Delaware Bay													
Philadelphia, PA	206	7	287	6	131	16	266	85	11	493	12	1	1,521
Mid-Atlantic Chesapeake Bay													
Baltimore, MD	188	6	217	-	107	22	3	401	2	122	5	12	1,085
Hampton Roads, VA	193	14	1,006	1	76	14	1	92	1	122	2	7	1,529
Mid-Atlantic Morehead City and Beaufort, NC													
Morehead City, NC	15	-	9	-	20	-	1	2	-	22	-	2	71
Mid-Atlantic Wilmington, NC													
Wilmington, NC	66	4	54	-	76	-	1	12	13	142	1	-	369
Mid-Atlantic Georgetown, SC													
Georgetown, SC	26	-	1	-	6	-	-	-	-	-	-	1	34
Mid-Atlantic Charleston, SC													
Charleston, SC	100	-	873	-	58	28	3	136	13	118	12	2	1,343
Mid-Atlantic Savannah, GA													
Savannah, GA	166	7	769	-	137	4	5	94	4	177	3	2	1,368
Southeastern US													
Brunswick, GA	33	-	11	-	14	1	5	112	-	2	-	-	178
Fernandina, FL	4	-	43	1	42	1	13	-	-	-	7	-	111
Jacksonville, FL	62	1	185	80	102	8	2	222	7	114	117	5	905
Port Canaveral, FL	40	-	6	8	37	223	26	15	3	10	8	1	377
All Port Regions	1,660	79	4,937	105	964	616	384	1,713	740	3,483	207	47	14,935

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.



**Table 4-11. Alternative 3: U.S. East Coast Restricted Vessel Arrivals by, Port Area and Vessel Type, 2004**

Port Area	Vessel Type												Total
	Bulk Carrier	Combina-tion Carrier	Container Ship	Freight Barge	Dry Cargo Ship	Passeng-er Ship	Refrigerat-ed Cargo Ship	Ro-Ro Cargo Ship	Tank Barge	Tanker	Towing Vessel	Other a/	
Northeastern US - Gulf of Maine													
Eastport, ME	22	-	4	-	17	-	-	-	-	-	-	-	43
Searsport, ME	10	-	2	2	3	81	-	1	11	78	8	-	196
Portland, ME	71	4	4	1	28	26	-	37	26	395	47	2	641
Portsmouth, NH	51	3	1	-	16	1	-	-	1	87	9	4	173
Northeastern US - Off Race Point													
Salem, MA	9	-	-	-	-	6	-	-	-	-	-	-	15
Boston, MA	34	1	77	2	8	94	4	33	-	225	1	4	483
Northeastern US - Cape Cod Bay													
Cape Cod, MA	-	-	-	-	-	13	-	-	1	21	1	-	36
Mid-Atlantic Block Island Sound													
New Bedford, MA	31	-	-	-	14	-	4	1	-	6	-	-	56
Providence, RI	45	1	-	-	14	25	-	42	1	68	5	2	203
New London, CT	8	-	5	-	14	17	-	-	39	7	1	-	91
New Haven, CT	21	-	3	-	19	-	-	-	286	94	17	-	440
Bridgeport, CT	35	-	-	1	2	-	17	-	178	28	-	1	262
Long Island, NY	-	-	-	5	-	23	-	-	379	157	-	1	565
Mid-Atlantic Ports of New York/New Jersey													
New York City, NY	199	14	1,436	-	49	95	16	404	9	868	20	4	3,114
Mid-Atlantic Delaware Bay													
Philadelphia, PA	200	2	261	13	171	12	242	86	3	547	35	2	1,574
Mid-Atlantic Chesapeake Bay													
Baltimore, MD	223	5	229	-	121	38	4	386	2	160	10	7	1,185
Hampton Roads, VA	254	13	986	3	93	37	5	90	1	133	12	11	1,638
Mid-Atlantic Morehead City and Beaufort, NC													
Morehead City, NC	23	1	9	-	13	4	-	-	-	32	-	1	83
Mid-Atlantic Wilmington, NC													
Wilmington, NC	67	3	48	-	73	4	-	17	9	152	2	2	377
Mid-Atlantic Georgetown, SC													
Georgetown, SC	26	2	2	-	12	1	-	-	-	-	-	-	43
Mid-Atlantic Charleston, SC													
Charleston, SC	84	1	949	2	66	51	3	128	4	117	19	6	1,430
Mid-Atlantic Savannah, GA													
Savannah, GA	174	8	760	-	124	35	10	107	1	206	5	1	1,431
Southeastern US													
Brunswick, GA	33	-	7	-	23	4	5	113	-	-	-	3	188
Fernandina, FL	12	-	30	2	50	6	6	1	-	-	11	-	118
Jacksonville, FL	66	2	204	74	91	43	2	231	9	120	154	14	1,010
Port Canaveral, FL	54		7	10	46	224	17	21	2	14	23	2	420
All Port Regions	1,752	60	5,024	115	1,067	840	335	1,698	962	3,515	380	67	15,815

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table 4-12 presents the basis for determining the effective distance that speed restrictions would apply for each port area. We begin with a discussion of the effective distance for port areas in the mid-Atlantic region and then address port areas in the Northeast and Southeast regions.

For port areas in the mid-Atlantic region, Alternative 3 proposes speed restrictions would extend 25 nautical miles from the coastline. However, independent researchers and stakeholders have pointed out that due to vessel operating practices, the effective distance of the proposed seasonal speed restrictions may be less than distances specified. This is because at most port areas, vessels already slow down to 8-10 knots at the pilot buoy for the pilot to board the vessel. In most instances the proximity of the pilot buoys to the shore makes it impractical for the vessel to resume normal operating speed. Thus the effective distance over which the proposed seasonal speed restrictions would apply is lessened by the distance of the pilot buoy from the shore. The location of the pilot buoy relative to the harbor baseline or closing line is shown in Table 4-12. For example, the pilot buoy for the port area of New York/New Jersey is 6.8 nautical miles from the harbor baseline. Thus the distance from the edge of the speed restricted area to the pilot buoy is only 18.2 nautical miles.

It should be noted, however, that for the port area of New York/New Jersey and most other U.S. East Coast port areas, vessels do not approach the port directly perpendicular to the coastline. Rather, mariners approaching from the north or south would approach the port more at on a diagonal routing. For purposes of the economic impact analysis we have assumed that vessels would travel through the speed restricted areas on a 45° routing until they reach the pilot buoy. Thus, for the port area of New York/New Jersey it is assumed that vessel would traverse 25.7 nautical miles through the speed restricted area. This concept was applied to all port areas in the mid-Atlantic region.

Table 4-12 indicates an additional effective distance of 54.9 nautical miles for the port area of New York/New Jersey. This is due to the year-round large speed restricted area established in the Northeast region that some vessels will have to traverse either coming to the port area of New York/New Jersey from the north or departing to the north (Figure 4-4). We have estimated that vessels affected will need to traverse 54.9 nautical miles of speed restricted areas in the Northeast. This factor, though, only affects vessel arrivals into the port area of New York/ New Jersey from the north or departures to north.

Data on the number of vessels arrivals at the port area of New York, New Jersey by direction of approach and departure was not available for this study. However, we have prepared an estimate of the number of arrivals and departures from / to the north based on our general knowledge of shipping patterns in the area and of movements along the US. East Coast. For example, on some liner container trades, the port area of New York/ New Jersey is the end of a northern string for routes that serves the Far East and the US East Coast via the Panama Canal. Once these vessel unload/ load at the port area of New York/ New jersey, they depart to the south for the return trip. On the other hand, most liner vessels that call at the port area of New York/New Jersey from Europe arrive from the north and depart to the south for calls at other US East Cast ports before

heading back. Based on these type of routing considerations, we have assumed that it would affect 30 percent of vessel arrivals in the port area of New York/New Jersey. <sup>43</sup>

**Table 4-12. Alternative 3: Effective Distance of Speed Restrictions in Designated Areas**

Port Area	Location of pilot buoy relative to harbor baseline or closing line	Distance Stated in NOI	Distance to pilot buoy	Diagonal of distance to pilot buoy	Additional effective distance a/	Slow down/speed up time
<b>Northeastern US - Gulf of Maine</b>						
Eastport, ME	n.a.	n.a.	n.a.	n.a.	54.9	Included
Searsport, ME	n.a.	n.a.	n.a.	n.a.	54.9	Included
Portland, ME	n.a.	n.a.	n.a.	n.a.	54.9	Included
Portsmouth, NH	n.a.	n.a.	n.a.	n.a.	54.9	Included
<b>Northeastern US - Off Race Point</b>						
Boston, MA	n.a.	n.a.	n.a.	n.a.	72.4	n.a.
Salem, MA	n.a.	n.a.	n.a.	n.a.	72.4	n.a.
<b>Northeastern US - Cape Cod Bay</b>						
	5.0	n.a.	n.a.	n.a.	59.2	n.a.
<b>Mid-Atlantic Block Island Sound</b>						
New Bedford, MA	n.a.	25	25	35.4	54.9	Included
Providence, RI	n.a.	25	25	35.4	54.9	Included
New London, CT	n.a.	25	25	35.4	54.9	Included
New Haven, CT	n.a.	25	25	35.4	54.9	Included
Bridgeport, CT	n.a.	25	25	35.4	54.9	Included
Long Island, NY	n.a.	25	25	35.4	54.9	Included
<b>Mid-Atlantic Ports of New York/New Jersey</b>						
	6.8	25	18.2	25.7	54.9	Included
<b>Mid-Atlantic Delaware Bay</b>						
	2.5	25	22.5	31.8	54.9	Included
<b>Mid-Atlantic Chesapeake Bay</b>						
Baltimore, MD	2.8	25	22.2	31.3	54.9	Included
Hampton Roads, VA	2.8	25	22.2	31.3	54.9	Included
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>						
	6.7	25	18.3	25.9	n.a.	n.a.
<b>Mid-Atlantic Wilmington, NC</b>						
	4.1	25	20.9	29.6	n.a.	n.a.
<b>Mid-Atlantic Georgetown, SC</b>						
	5.6	25	19.4	27.4	n.a.	n.a.
<b>Mid-Atlantic Charleston, SC</b>						
	12.5	25	12.5	17.7	6.3	n.a.
<b>Mid-Atlantic Savannah, GA</b>						
	9.7	25	15.3	21.6	4.9	n.a.
<b>Southeastern US</b>						
Brunswick, GA	6.7	n.a.	n.a.	26.4	3.4	n.a.
Fernandina, FL	10.9	n.a.	n.a.	32.9	5.5	n.a.
Jacksonville, FL	4.2	n.a.	n.a.	30.9	n.a.	n.a.
Port Canaveral, FL	n.a.	n.a.	n.a.	4.5	n.a.	n.a.

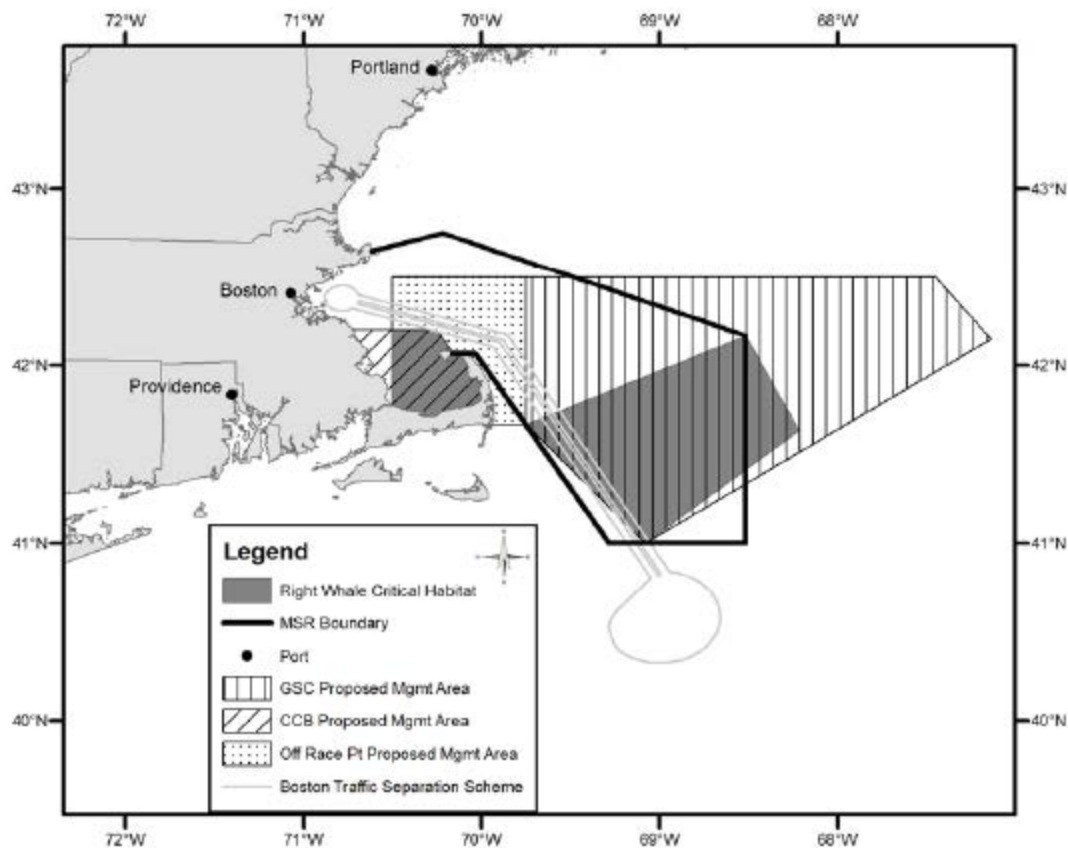
a/ Defined and described in text for each port area.

Source: Nathan Associates as described in text.

<sup>43</sup> The determination of 30 percent is based on the following assumptions: 45 percent arrive from the south and depart to the south (0 trips through the northeast speed restricted area); 40 percent arrive from the north and depart to the south (1 trip through the northeast speed restricted area), 10 percent of vessel arrive from the south and depart to the north south (1 trip through the northeast speed restricted area), 5 percent arrive from the north and depart to the north south (2 trips through the northeast speed restricted area). This results in a total factor of 60 percent which is cut in half to apply to vessel arrivals only. Later in the economic impact analysis we double the estimated impact on vessel arrivals to account for the impact on vessel departures.

The mid-Atlantic port areas of Philadelphia, Baltimore and Hampton Roads have been assumed to be equally affected by the year-round large speed restricted area established in the Northeast region. Port areas south of Hampton Roads are assumed not to be affected as vessels normally travel to the east of the Northeast region restricted area.

*Figure 4-4 Northeastern U.S. Proposed Regulatory Measures*



Source: DEIS, Right Whale Ship Strike Reduction, Figure 1-3.

Port areas in Block Island Sound are assumed to have 40 percent of their vessel arrivals affected by the large speed restricted area in the Northeast region.<sup>44</sup>

As discussed under Alternative 2, another element of the impact on vessel operations is the time for vessels to slow down from sea speed to restricted speed and later to speed back up to sea speed. This will affect vessel

<sup>44</sup> This assumption is premised on consideration of maritime shipping patterns similar to the discussion above for the port area of New York/ New Jersey. The determination of 40 percent is based on the following assumptions: 45 percent arrive from the north and depart to the south (1 trip through the northeast speed restricted area); 30 percent arrive from the south and depart to the south (0 trips through the northeast speed restricted area), 15 percent arrive from the north and depart to the north south (1 trips through the northeast speed restricted area) and 10 percent of vessel arrive from the north and depart to the north (2 trips through the northeast speed restricted area). This results in a total factor of 80 percent which is cut in half to apply to vessel arrivals only

arrivals at the port area of New York/New Jersey mentioned that will traverse the year-round speed restricted areas in the Northeast region. We have included the extra time for these vessels to slow down to restricted speed and to resume sea speed in the economic impact analysis.

The additional distance shown in Table 4-12 for the mid-Atlantic port areas of Charleston and Savannah is calculated as half of the distance of the pilot buoy to the harbor baseline. Pilots at these ports have indicated that without speed restrictions vessel would regain some speed (not sea speed) prior to the entering the harbor baseline. Applying the speed restriction over half of this distance should approximate the extra delay incurred from the pilot buoy to the harbor baseline at these port areas.

For port areas in the Northeast region, Alternative 3 does not specify a specific distance over which speed restrictions would be implemented. Rather, broad geographic areas were delineated as described earlier in this section. With the exception of Cape Cod Bay, vessels arriving in port areas in the Northeast region from the north will not be affected by proposed speed restricted areas. Vessels arriving from the south will be affected primarily by the portion of the restricted area referred to as expanded SAM West. It is assumed that vessels arriving from the south and destined for Northeast port areas will attempt to minimize the impact of the speed restrictions by entering the existing Boston TSS at a point east of the southern tip of Cape Cod. From there vessels will route at restricted speeds through the TSS (65 nautical miles). Vessels destined for Boston may regain some speed (but not sea speed) from the western end of the restricted area to the Boston pilot buoy (15 nautical miles). Similar to the treatment of Charleston and Savannah above we have assumed that applying speed restrictions to half of this distance should approximate the extra delay incurred by the vessel.

Vessels arriving from the south and destined for Gulf of Maine ports will need to route 54.9 nautical miles through the expanded Off Race Point area. These vessels will also be affected by the time to slow down prior to entering and upon leaving the expanded Off Race Point area.

For Alternative 3, the effective distance of speed restrictions for port areas in the Southeast was determined by identifying typical access routes for each port and the distance from the intersection of those routes with the eastern edge of the MSRS WHALESSOUTH area to each port's pilot buoy. For the port area of Brunswick, two routes were considered typical, one to the northeast of 21.8 nautical miles and one to the southeast of 28.4 nautical miles. The southeast route was assumed to account for 70 percent of vessel traffic resulting in a weighted average distance of 26.4 nautical miles. An additional effective distance of 3.4 nautical miles was assumed to account for vessels not being able to regain speed over the 6.7 nautical miles from the pilot buoy to the coastline.

Two typical routes were used for the port area of Fernandina – a northeast route of 39.5 nautical miles and a southeast route of 26.3 nautical miles. Traffic was assumed to be equally divided among the two routes for an average distance of 32.9 nautical miles. An additional effective distance of 5.5 nautical miles was assumed to account for vessels not being able to regain speed over the 10.9 nautical miles from the pilot buoy to the coastline.

Three typical routes were used for the port area of Jacksonville- a northeast route of 39.4 nautical miles (10 percent of vessels), an easterly route of 26.3 nautical miles (30 percent) and a southeast route of 31.7 nautical miles (60 percent). The weighted average distance is 30.9 nautical miles.

For the port area of Port Canaveral, a single route of 4.5 nautical miles was used through the right whale critical habitat area.

Using the economic impact model, we have identified the minutes of delay that will be incurred in each port area, taking into account the distribution of vessel arrivals, normal vessel operating speeds, and the effective distance over which the restriction will apply. Table 4-13 presents the average minutes of delay for a speed restriction of 10 knots per vessel arrival for each affected port area and vessel type in 2003.<sup>45</sup> The overall weighted average delay for all vessels in 2003 is 91 minutes per arrival.<sup>46</sup>

The longest average delay is experienced at the port area of Hampton Roads with an average delay of 132 minutes per arrival. This is due to the predominance of large and fast containerships at the port area coupled with the relatively few arrivals of smaller and slower vessel types. The port areas of Baltimore (116 minutes), Providence (113 minutes), New York/New Jersey (107 minutes), Delaware Bay (103) and New London (103 minutes) are the other port areas with average delays in excess of 100 minutes. The port area of Port Canaveral at 10 minutes has the least average minutes of delay per vessel arrival as the speed restriction is only effective for 4.5 nautical miles from the eastern edge of the right whale critical habitat to the pilot buoy.

Containerships incur the longest average delay with an average of 118 minutes per vessel arrival followed by ro-ro cargo ships (108 minutes), and refrigerated cargo vessels (102 minutes).

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<sup>45</sup> The average delay includes slowdown/speedup time for port areas in the Gulf of Maine divided by the number of vessel arrivals by type of vessel for each port area during proposed speed restriction periods. It does not include slow down speedup time for port areas in the mid-Atlantic as those delays would need to be divided annual vessel arrivals at each port.

<sup>46</sup> As will be discussed later, vessels are assumed to incur similar delays when leaving each port area.

**Table 4-13. Alternative 3: Average Minutes of Delay per Vessel Arrival by Port Area and Type of Vessel, 2003**

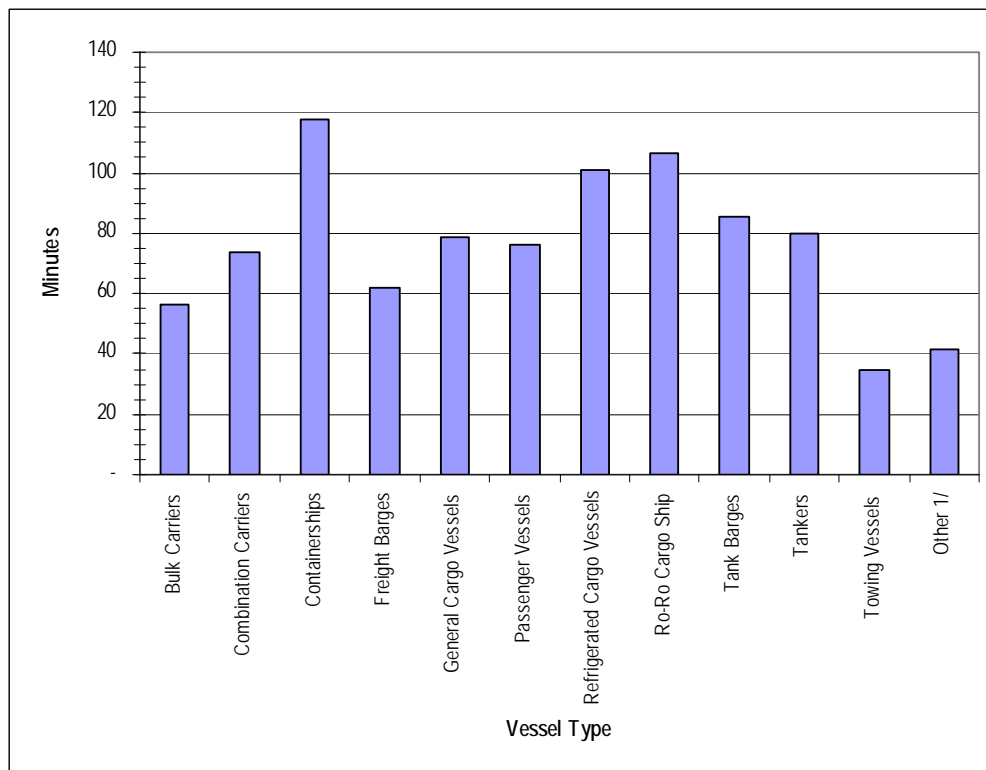
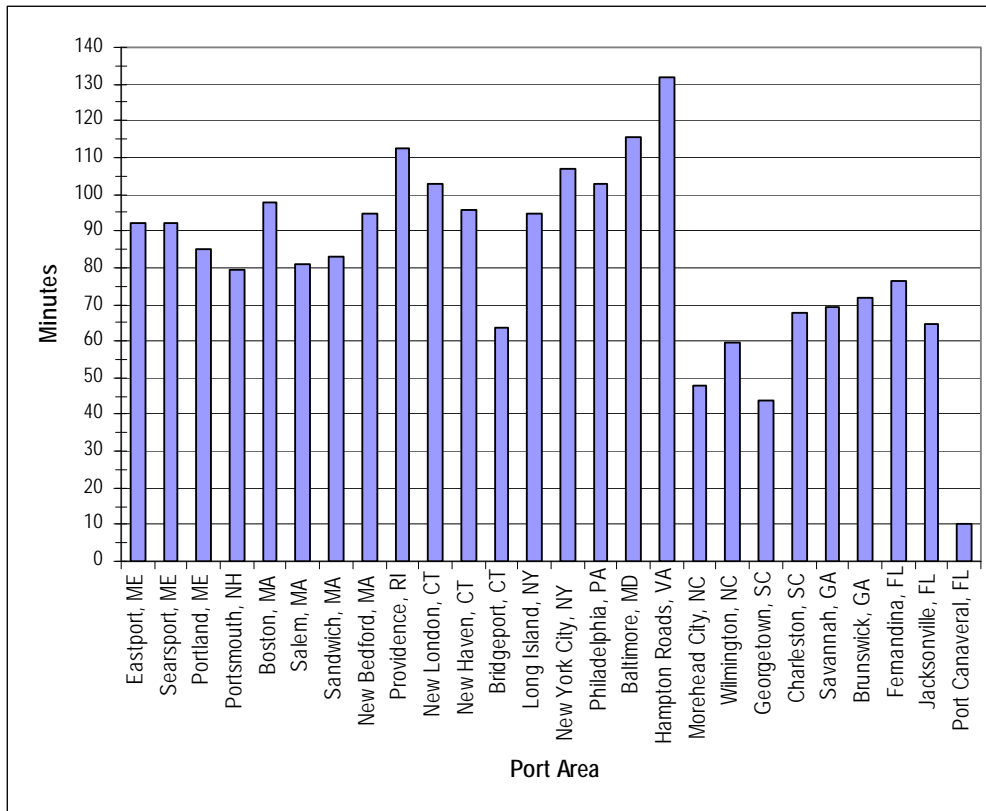
Port Area	Bulk Carriers	Combination Carriers	Containerships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	Weighted Average
<b>Northeastern US - Gulf of Maine</b>													
Eastport, ME	44.9	-	112.0	-	85.2	-	-	-	-	-	-	-	72.4
Searsport, ME	40.3	63.4	-	-	-	94.8	-	50.6	61.1	65.5	37.0	-	72.7
Portland, ME	48.7	64.6	110.2	84.5	78.2	97.4	-	57.3	59.8	68.9	37.0	37.0	66.8
Portsmouth, NH	52.2	55.3	-	-	85.8	83.3	-	-	62.3	66.5	37.0	37.0	62.4
<b>Northeastern US - Off Race Point</b>													
Boston, MA	63.6	67.7	149.0	68.4	85.1	110.0	107.9	78.2	-	85.0	48.9	48.9	97.8
Salem, MA	75.0	-	-	-	-	110.0	-	-	-	92.6	-	-	80.9
<b>Northeastern US - Cape Cod Bay</b>	-	-	-	-	-	93.5	-	-	-	75.4	-	-	82.8
<b>Mid-Atlantic Block Island Sound</b>													
New Bedford, MA	85.4	-	78.4	-	107.9	-	126.6	-	86.4	98.0	-	-	94.8
Providence, RI	79.9	100.1	-	-	122.5	149.2	133.0	150.6	84.3	103.4	57.4	57.4	112.5
New London, CT	79.7	-	185.3	-	146.1	129.0	-	-	91.4	102.2	57.4	-	102.8
New Haven, CT	78.5	-	188.7	58.5	136.3	129.0	-	-	93.8	100.8	57.4	-	95.8
Bridgeport, CT	92.4	-	-	43.1	-	108.7	-	-	75.9	75.4	-	-	63.7
Long Island, NY	-	100.1	-	58.5	-	129.0	-	-	91.7	98.3	57.4	57.4	94.7
<b>Mid-Atlantic Ports of New York/New Jersey</b>	59.1	71.8	134.1	75.1	80.5	111.5	118.0	116.4	66.9	77.1	42.2	42.2	106.9
<b>Mid-Atlantic Delaware Bay</b>	62.8	84.3	129.3	102.2	100.0	120.8	122.2	124.5	79.9	92.1	48.3	48.3	102.7
<b>Mid-Atlantic Chesapeake Bay</b>													
Baltimore, MD	69.0	77.7	149.0	-	107.8	124.8	116.3	132.9	78.9	87.4	47.8	47.8	115.5
Hampton Roads, VA	69.3	83.4	152.1	85.0	103.2	127.5	121.7	144.6	80.5	88.0	47.8	47.8	132.1
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>	32.5	-	73.7	-	49.2	-	35.4	68.5	-	46.5	-	25.9	47.7
<b>Mid-Atlantic Wilmington, NC</b>	37.2	46.6	92.1	-	66.1	-	65.2	90.1	49.9	52.5	29.6	-	59.4
<b>Mid-Atlantic Georgetown, SC</b>	36.1	-	82.5	-	74.8	-	-	-	-	-	-	27.4	44.0
<b>Mid-Atlantic Charleston, SC</b>	32.1	-	77.2	-	58.0	59.4	55.5	66.8	41.9	43.9	23.9	23.9	67.7
<b>Mid-Atlantic Savannah, GA</b>	32.5	39.3	84.6	-	55.6	62.4	89.0	73.8	43.6	47.9	26.5	26.5	69.3
<b>Southeastern US</b>													
Brunswick, GA	33.9	-	94.2	-	67.6	66.9	73.7	81.3	-	53.7	-	-	71.6
Fernandina, FL	62.6	-	84.5	39.1	69.2	86.3	97.6	-	-	-	38.4	-	76.2
Jacksonville, FL	43.9	47.0	82.6	64.6	54.2	74.4	73.4	82.9	54.5	56.5	30.9	30.9	64.6
Port Canaveral, FL	4.8	-	14.3	4.6	9.0	11.8	10.1	10.8	7.9	8.3	4.5	4.5	10.2
<b>Total</b>	55.0	69.6	117.4	61.9	77.3	72.5	101.2	106.2	84.8	76.5	34.1	40.9	91.1

a/ Includes recreational vessels

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

*Figure 4-5. Alternative 3: Average Minutes of Delay per Vessel Arrival by Port Area and Type of Vessel, 2003*





### *Estimated Direct Economic Impact*

Table 4-14 presents the direct economic impact of speed restrictions in designated areas implemented under Alternative 3 on the shipping industry in 2003. The total direct economic impact is estimated at \$133.0 million with the port area of New York/New Jersey having the largest impact of \$36.6 million. The port area of Hampton Roads is second at \$24.5 million, followed by the port areas of Philadelphia at \$13.5 million, Baltimore at \$11.0 million, Savannah at \$10.2 million, Charleston at \$9.9 million, Boston at \$4.2 million, Jacksonville at \$3.6 million and Portland at \$3.4 million. The direct economic impact for these nine port areas totals \$117.0 million or 87.9 percent of the total for this alternative.

Containerships account for 54.1 percent of the total direct economic impact of Alternative 3 with an estimate of \$71.9 million. The vessel type with the next largest economic impact is tankers at \$16.4 million followed by ro-ro cargo ships at \$14.7 million and passenger vessels at \$10.9 million.

Table 4-15 presents the direct economic impact of Alternative 3 in 2004. The total economic impact is \$142.5 million in 2004, roughly 7.1 percent higher than 2003 which reflects the overall increase in U.S. East Coast vessel arrivals. The rankings for the major vessel types are similar to 2003.

Figure 4-6 presents graphically the direct economic impact by port area for 2003 and 2004. The rankings for the leading port areas are similar to those described for 2003 above except that Jacksonville has moved ahead of Boston.

**Table 4-14. Alternative 3: Direct Economic Impact on Shipping Industry by Port Area and Type of Vessel, 2003 (\$000s)**

Port Area	Bulk Carriers	Combination Carriers	Containerships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	Total
<b>Northeastern US - Gulf of Maine</b>													
Eastport, ME	39.3	-	68.4	-	154.6	-	-	-	-	-	-	-	262.3
Searsport, ME	30.7	4.2	-	-	-	1,891.2	-	2.7	81.2	363.4	4.1	-	2,377.5
Portland, ME	182.6	77.4	98.3	4.6	201.1	607.7	-	194.5	20.6	2,035.3	22.8	2.4	3,447.2
Portsmouth, NH	191.3	10.4	-	-	76.1	18.2	-	-	7.3	496.3	2.1	2.4	804.1
<b>Northeastern US - Off Race Point</b>													
Boston, MA	97.6	3.2	1,214.7	3.6	32.5	1,780.2	41.8	119.9	-	944.1	2.2	4.5	4,244.4
Salem, MA	25.2	-	-	-	-	18.9	-	-	-	5.2	-	-	49.4
<b>Northeastern US - Cape Cod Bay</b>	-	-	-	-	-	161.8	-	-	-	54.7	-	-	216.5
<b>Mid-Atlantic Block Island Sound</b>													
New Bedford, MA	166.5	-	3.4	-	74.7	-	69.1	-	17.3	36.0	-	-	366.9
Providence, RI	202.2	6.5	-	-	77.5	581.1	45.7	434.0	4.2	439.6	2.9	1.5	1,795.2
New London, CT	49.3	-	44.2	-	60.6	500.9	-	-	218.9	28.8	2.9	-	905.4
New Haven, CT	152.7	-	25.3	1.5	189.2	50.1	-	-	731.3	623.0	28.5	-	1,801.7
Bridgeport, CT	90.2	-	-	2.3	-	20.9	-	-	413.3	120.7	-	-	647.4
Long Island, NY	-	6.5	-	3.1	-	475.8	-	-	1,485.2	872.6	5.7	1.8	2,850.6
<b>Mid-Atlantic Ports of New York/New Jersey</b>	646.2	89.2	24,866.6	2.4	138.4	1,775.4	303.5	4,221.3	85.1	4,441.1	23.2	4.4	36,596.9
<b>Mid-Atlantic Delaware Bay</b>	649.8	41.5	3,257.1	26.4	651.4	503.6	4,450.6	692.5	44.9	3,200.2	28.5	1.3	13,547.8
<b>Mid-Atlantic Chesapeake Bay</b>													
Baltimore, MD	705.8	28.7	3,648.1	-	768.5	743.9	41.3	4,413.0	8.0	641.9	11.8	23.9	11,034.9
Hampton Roads, VA	743.4	77.9	20,353.1	2.7	476.4	557.6	14.9	1,588.6	4.1	662.0	4.7	14.6	24,500.1
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>	21.6	-	57.9	-	51.1	-	3.0	7.9	-	50.5	-	1.2	193.2
<b>Mid-Atlantic Wilmington, NC</b>	109.5	9.7	550.9	-	386.6	-	6.3	111.7	29.9	372.3	1.3	-	1,578.3
<b>Mid-Atlantic Georgetown, SC</b>	42.0	-	5.9	-	49.5	-	-	-	-	-	-	0.8	98.2
<b>Mid-Atlantic Charleston, SC</b>	147.3	-	8,095.7	-	288.0	375.6	16.9	641.2	25.8	268.3	12.7	1.1	9,872.6
<b>Mid-Atlantic Savannah, GA</b>	235.5	13.6	8,190.7	-	513.5	48.6	144.0	564.2	7.9	428.6	3.5	1.2	10,151.3
<b>Southeastern US</b>													
Brunswick, GA	48.6	-	98.3	-	68.1	11.5	39.6	576.8	-	5.3	-	-	848.3
Fernandina, FL	12.2	-	165.5	0.9	186.2	14.9	139.4	-	-	-	11.8	-	530.9
Jacksonville, FL	127.8	2.4	1,141.6	193.1	320.4	122.1	15.2	1,124.4	18.3	332.4	159.5	3.6	3,560.7
Port Canaveral, FL	8.2	-	8.4	0.9	18.5	650.1	25.9	9.0	1.1	4.4	1.6	0.1	728.0
<b>Total</b>	<b>4,725.6</b>	<b>371.0</b>	<b>71,894.0</b>	<b>241.5</b>	<b>4,783.0</b>	<b>10,910.1</b>	<b>5,357.4</b>	<b>14,701.5</b>	<b>3,204.3</b>	<b>16,426.8</b>	<b>329.7</b>	<b>64.9</b>	<b>133,009.9</b>

a/ Includes recreational vessels.

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

**Table 4-15. Alternative 3: Direct Economic Impact on Shipping Industry by Port Area and Type of Vessel, 2004 (\$000s)**

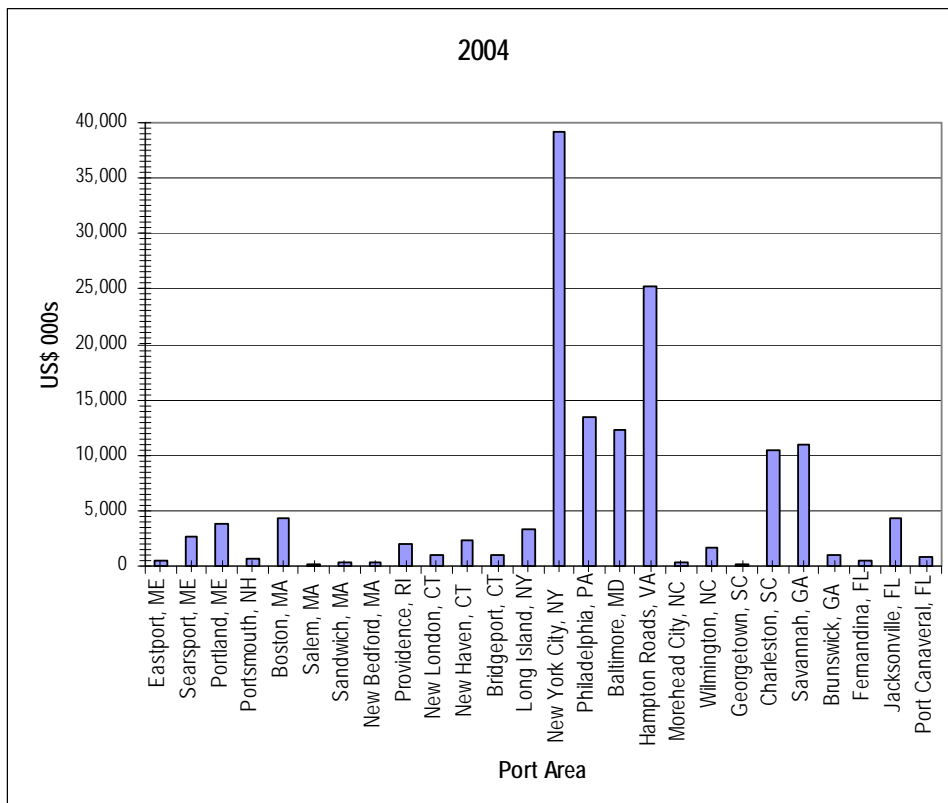
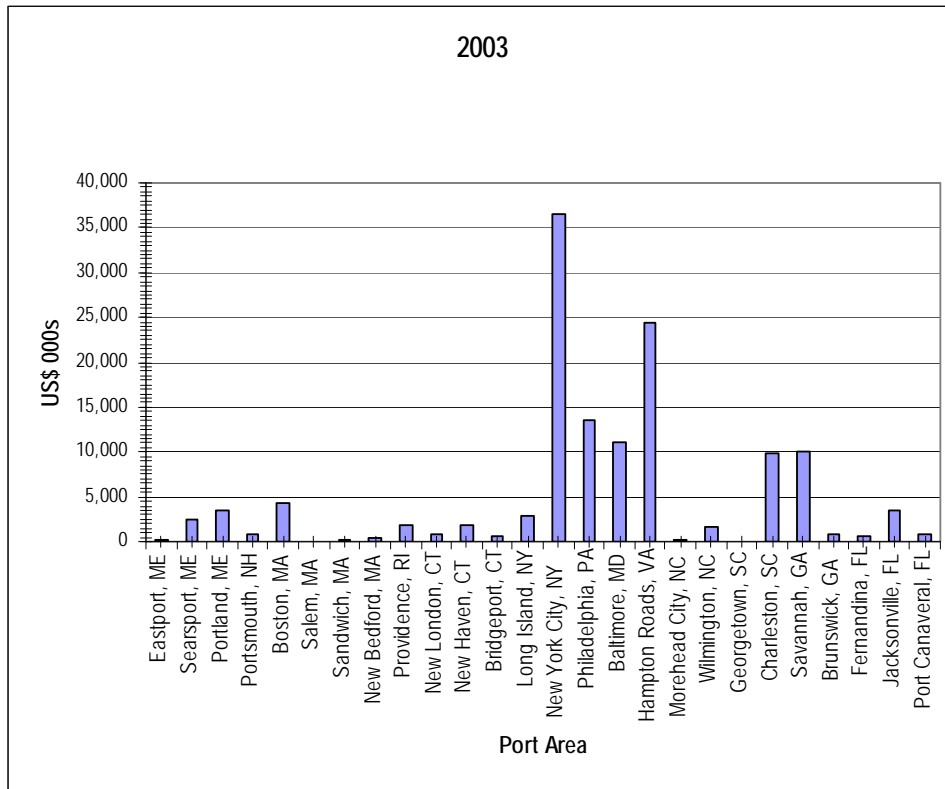
Port Area	Bulk Carriers	Combination Carriers	Containerships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	Total
<b>Northeastern US - Gulf of Maine</b>													
Eastport, ME	54.0	-	68.6	-	321.4	-	-	-	-	-	-	-	444.0
Searsport, ME	20.8	-	55.3	4.5	8.2	2,159.9	-	4.9	39.6	337.3	16.6	-	2,647.1
Portland, ME	196.1	22.2	54.3	4.6	206.1	852.5	-	133.4	93.2	2,123.5	97.4	2.2	3,785.5
Portsmouth, NH	153.9	9.3	2.4	-	122.1	18.2	-	-	3.6	370.1	18.7	5.3	703.7
<b>Northeastern US - Off Race Point</b>													
Boston, MA	97.6	3.2	1,214.7	3.6	32.5	1,780.2	41.8	119.9	-	944.1	2.2	4.5	4,244.4
Salem, MA	31.8	-	-	-	-	155.4	-	-	-	-	-	-	187.2
<b>Northeastern US - Cape Cod Bay</b>	-	-	-	-	-	314.4	-	-	3.1	86.2	1.8	-	405.5
<b>Mid-Atlantic Block Island Sound</b>													
New Bedford, MA	145.1	-	-	-	46.3	-	55.3	6.8	-	31.3	-	-	284.7
Providence, RI	170.7	6.8	-	-	103.3	939.9	-	410.0	5.0	407.3	14.3	5.5	2,062.8
New London, CT	32.2	-	109.8	-	235.0	444.2	-	-	186.4	39.7	2.9	-	1,050.2
New Haven, CT	86.9	-	49.7	-	155.4	-	-	-	1,381.0	537.6	48.5	-	2,259.1
Bridgeport, CT	157.2	-	-	1.1	-	-	-	-	668.4	100.2	-	0.6	927.5
Long Island, NY	-	-	-	7.7	-	576.0	-	-	1,791.1	886.8	-	1.5	3,263.1
<b>Mid-Atlantic Ports of New York/New Jersey</b>	579.5	60.2	25,641.7	-	399.4	3,501.7	301.8	4,439.0	31.2	4,138.4	42.2	4.4	39,139.5
<b>Mid-Atlantic Delaware Bay</b>	642.0	9.9	3,006.5	60.4	940.7	296.6	4,216.7	702.1	13.5	3,495.3	83.2	2.8	13,469.7
<b>Mid-Atlantic Chesapeake Bay</b>													
Baltimore, MD	844.1	24.8	3,883.8	-	974.0	1,196.5	78.0	4,384.6	8.2	893.0	23.6	11.3	12,321.9
Hampton Roads, VA	971.0	64.6	19,812.9	9.3	675.4	1,222.2	129.2	1,591.5	4.1	735.4	28.3	14.8	25,258.7
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>	39.3	1.7	61.8	-	41.5	40.1	-	-	-	72.4	-	0.6	257.4
<b>Mid-Atlantic Wilmington, NC</b>	108.0	5.5	487.1	-	413.3	45.8	-	150.9	20.2	402.8	2.6	3.0	1,639.1
<b>Mid-Atlantic Georgetown, SC</b>	39.1	2.8	5.2	-	75.0	10.6	-	-	-	-	-	-	132.7
<b>Mid-Atlantic Charleston, SC</b>	138.8	0.8	8,469.2	4.7	330.1	554.7	29.8	592.6	8.0	266.6	20.1	3.6	10,418.9
<b>Mid-Atlantic Savannah, GA</b>	248.7	15.1	8,388.1	-	578.0	366.6	216.9	665.5	2.6	516.3	5.8	0.6	11,004.1
<b>Southeastern US</b>													
Brunswick, GA	48.0	-	50.3	-	120.8	46.1	41.5	606.6	-	-	-	2.5	915.9
Fernandina, FL	22.9	-	132.8	3.9	186.0	89.1	59.3	20.4	-	-	18.6	-	533.0
Jacksonville, FL	140.9	4.7	1,197.6	166.2	311.8	708.0	17.3	1,173.3	23.6	354.4	209.9	10.0	4,317.9
Port Canaveral, FL	13.1	-	10.7	1.1	27.5	708.0	16.3	14.5	0.8	6.4	4.6	0.2	803.2
<b>Total</b>	<b>4,981.8</b>	<b>231.6</b>	<b>72,702.5</b>	<b>267.0</b>	<b>6,303.9</b>	<b>16,026.7</b>	<b>5,204.0</b>	<b>15,016.0</b>	<b>4,283.6</b>	<b>16,745.2</b>	<b>641.0</b>	<b>73.6</b>	<b>142,476.8</b>

a/ Includes recreational vessels

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

**Figure 4-6. Alternative 3: Direct Economic Impact on Shipping Industry by Port Area, 2003 and 2004 (\$000s)**



## ALTERNATIVE 4 – USE OF RECOMMENDED ROUTES

Alternative 4 relies on recently altered vessel routing patterns that moved vessels away from areas where whales are known to aggregate in order to reduce the likelihood of mortality due to a ship strike. Vessels 65 ft and greater would be expected to use these routes year round. The following route changes were established in 2006:

- Northeast and southeast port access routes to each of the port areas of Brunswick, Fernandina and Jacksonville. (Figure 4-7).
- Recommended shipping lanes in Cape Cod Bay. (Figure 4-8).

### *Impact on Vessel Operations*

Under Alternative 3, we identified the existing pattern of vessel approaches to each port area. As vessel arriving at these ports generally approach from the south or north, the current pattern of approaches to the pilot buoys are approximately 40-65 degrees and 135-160 degrees from a parallel line to the coastline. Under Alternative 4, the preferred northeast and southeast access routes to each port are flatter. Vessels are assumed to have to route parallel to the eastern boundary of the MSRS WHALESSOUTH until they meet the intersection of the recommended route. The difference in the total distance between current route and the use of the recommended route is then divided by the average operating speed of each type and size of vessel to determine the additional time associated with the use of the recommended route. The economic impact is estimated by multiplying the additional time by the hourly operating cost for each type and size of vessel.

Figure 4-7. Port Access Routes for Brunswick, Fernandina and Jacksonville

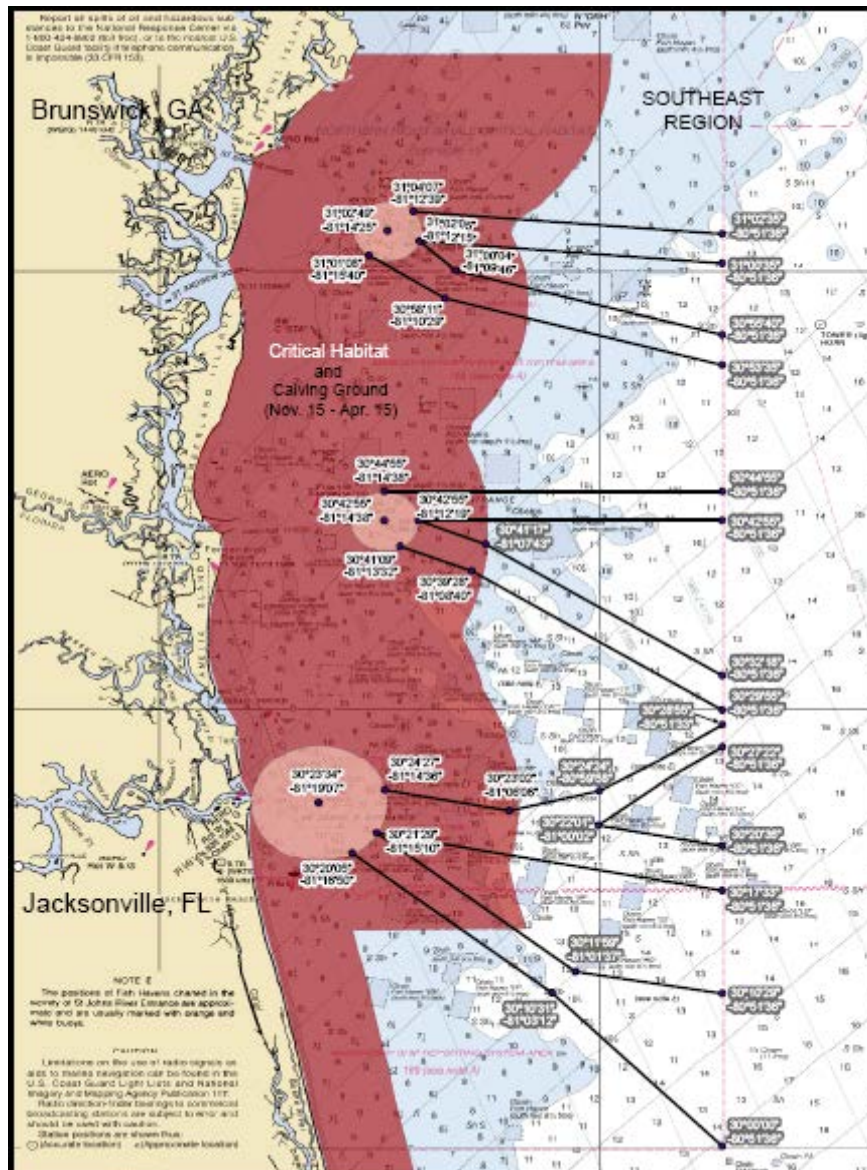
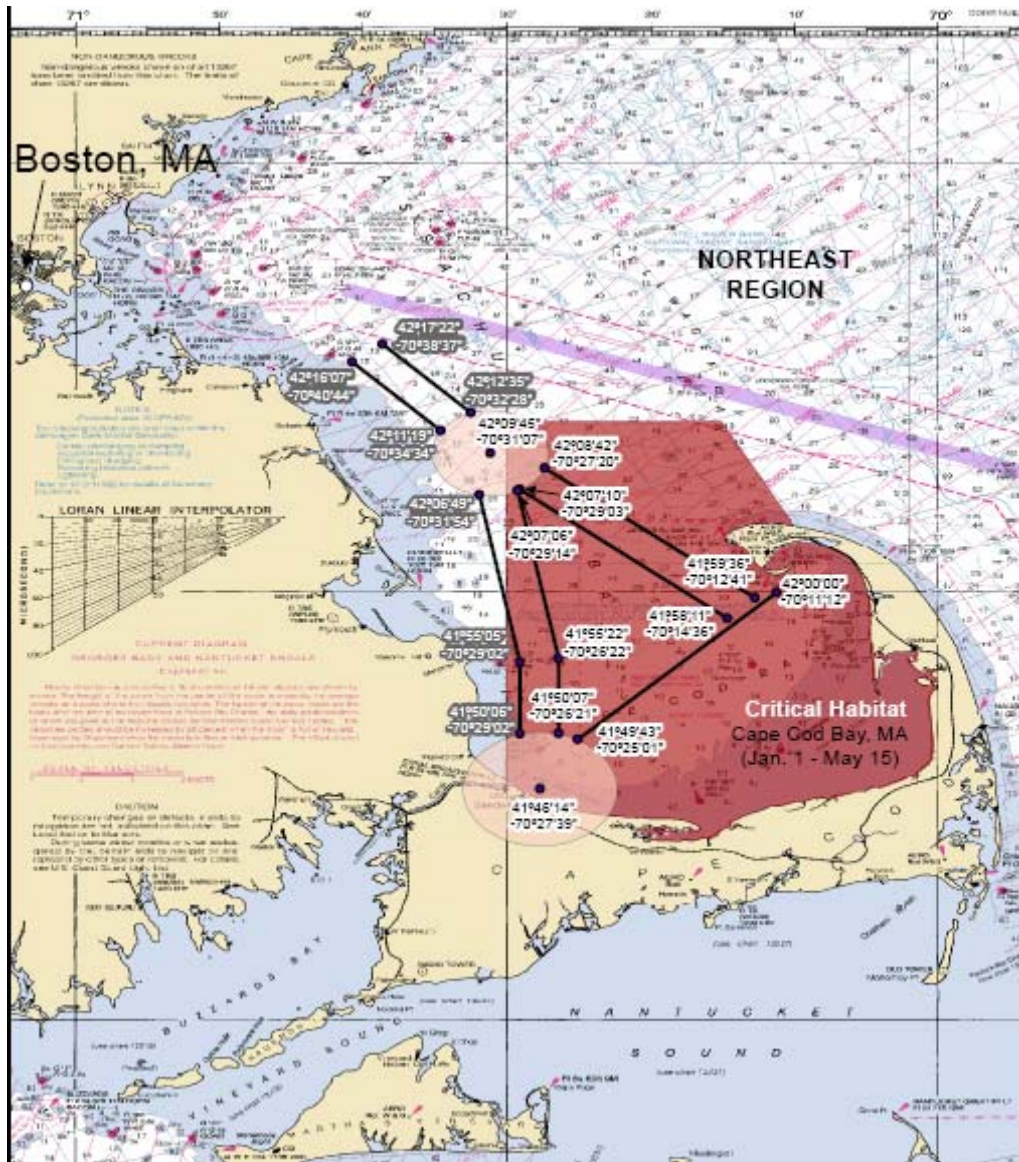


Figure 4-8. Recommended Shipping Lanes for Cape Cod Bay



For the port area of Brunswick, the weighted average incremental distance of using the recommended access route is 6.0 nautical miles, for the port area of Fernandina it is 10.5 nautical miles, and for the port area of Jacksonville it is 10.0 nautical miles.

The recommended shipping lanes for Cape Cod Bay would not measurably impact shipping industry vessel operations as the recommended lanes are not different from existing north-south shipping routes via the Cape Cod Canal to Boston. The economic impact of the recommended shipping lanes for Cape Cod Bay on passenger and other vessels particularly to Provincetown is addressed in a later section of this report.



### *Estimated Direct Economic Impact*

Table 4-16 presents the direct economic impact of use of recommended routes implemented under Alternative 4 on the shipping industry in 2003. For the Southeast port areas of Brunswick, Fernandina and Jacksonville, the economic analysis assumes that all vessels will use the recommended routes during the period of November 15-April 15 when right whales are known to be present. During other periods, the economic analysis assumes that vessel operators will choose to sail via the most direct and economical access route to each port.

The total direct economic impact is estimated at \$2.3 million with the port area of Jacksonville having the largest impact of \$1.9 million. The other port areas impacted under this alternative-Brunswick and Fernandina each had an economic impact of under \$250 thousand.

Ro-ro cargo ships and containerships have the highest direct economic impact at \$0.6 million and \$0.5 million, respectively, followed by towing vessels, general cargo vessels and tankers at roughly \$0.3 million each.

Table 4-17 presents the direct economic impact of Alternative 4 in 2004. The total economic impact is \$2.8 million in 2004, representing a 20 percent increase over 2003. This is due to the overall increase in vessel arrivals in the Southeast region and particularly passenger vessels at Jacksonville. The ranking by port area is the same as described for 2003 above. Figure 4-9 presents graphically the direct economic impact by port area for 2003 and 2004.



**Table 4-16. Alternative 4: Direct Economic Impact on Shipping Industry by Port Area and Type of Vessel, 2003 (\$000s)**

Port Area	Bulk Carriers	Combination Carriers	Containerships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	Total
<b>Northeastern US - Gulf of Maine</b>													
Eastport, ME	-	-	-	-	-	-	-	-	-	-	-	-	-
Searsport, ME	-	-	-	-	-	-	-	-	-	-	-	-	-
Portland, ME	-	-	-	-	-	-	-	-	-	-	-	-	-
Portsmouth, NH	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Northeastern US - Off Race Point</b>													
Boston, MA	-	-	-	-	-	-	-	-	-	-	-	-	-
Salem, MA	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Northeastern US - Cape Cod Bay</b>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Block Island Sound</b>													
New Bedford, MA	-	-	-	-	-	-	-	-	-	-	-	-	-
Providence, RI	-	-	-	-	-	-	-	-	-	-	-	-	-
New London, CT	-	-	-	-	-	-	-	-	-	-	-	-	-
New Haven, CT	-	-	-	-	-	-	-	-	-	-	-	-	-
Bridgeport, CT	-	-	-	-	-	-	-	-	-	-	-	-	-
Long Island, NY	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Ports of New York/New Jersey</b>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Delaware Bay</b>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Chesapeake Bay</b>													
Baltimore, MD	-	-	-	-	-	-	-	-	-	-	-	-	-
Hampton Roads, VA	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Wilmington, NC</b>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Georgetown, SC</b>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Charleston, SC</b>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Savannah, GA</b>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Southeastern US</b>													
Brunswick, GA	40.6	-	17.6	-	19.3	3.9	11.3	136.3	-	2.5	-	-	231.4
Fernandina, FL	8.9	-	75.6	1.2	83.6	6.8	51.9	-	-	-	16.2	-	244.2
Jacksonville, FL	130.9	2.2	401.5	114.0	180.0	57.5	7.5	441.5	14.2	244.8	258.0	5.8	1,857.8
Port Canaveral, FL	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total</b>	180.3	2.2	494.7	115.2	282.8	68.1	70.7	577.8	14.2	247.3	274.2	5.8	2,333.4

a/ Includes recreational vessels.

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

**Table 4-17. Alternative 4: Direct Economic Impact on Shipping Industry by Port Area and Type of Vessel, 2004 (\$000s)**

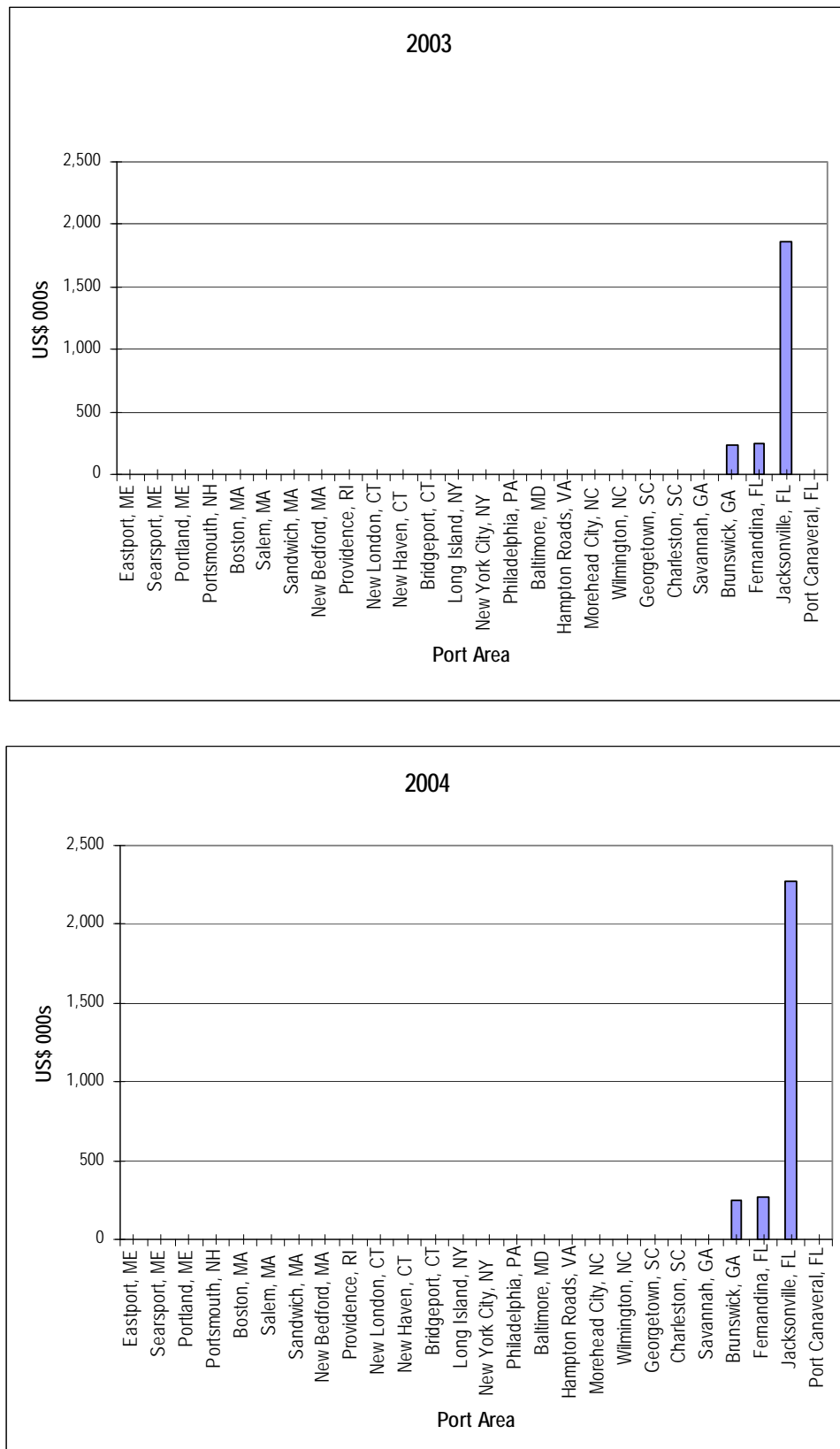
Port Area	Bulk Carriers	Combination Carriers	Containerships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	Total
<b>Northeastern US - Gulf of Maine</b>													
Eastport, ME	-	-	-	-	-	-	-	-	-	-	-	-	-
Searsport, ME	-	-	-	-	-	-	-	-	-	-	-	-	-
Portland, ME	-	-	-	-	-	-	-	-	-	-	-	-	-
Portsmouth, NH	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Northeastern US - Off Race Point</b>													
Boston, MA	-	-	-	-	-	-	-	-	-	-	-	-	-
Salem, MA	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Northeastern US - Cape Cod Bay</b>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Block Island Sound</b>													
New Bedford, MA	-	-	-	-	-	-	-	-	-	-	-	-	-
Providence, RI	-	-	-	-	-	-	-	-	-	-	-	-	-
New London, CT	-	-	-	-	-	-	-	-	-	-	-	-	-
New Haven, CT	-	-	-	-	-	-	-	-	-	-	-	-	-
Bridgeport, CT	-	-	-	-	-	-	-	-	-	-	-	-	-
Long Island, NY	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Ports of New York/New Jersey</b>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Delaware Bay</b>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Chesapeake Bay</b>													
Baltimore, MD	-	-	-	-	-	-	-	-	-	-	-	-	-
Hampton Roads, VA	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Wilmington, NC</b>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Georgetown, SC</b>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Charleston, SC</b>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Savannah, GA</b>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Southeastern US</b>													
Brunswick, GA	40.5	-	9.8	-	33.2	15.5	11.5	139.9	-	-	-	2.6	253.0
Fernandina, FL	25.3	-	54.8	2.5	89.5	40.7	23.7	4.4	-	-	25.5	-	266.3
Jacksonville, FL	139.6	4.5	437.4	102.8	167.4	320.3	7.6	458.7	18.3	258.9	339.6	16.3	2,271.3
Port Canaveral, FL	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total</b>	<b>205.3</b>	<b>4.5</b>	<b>502.0</b>	<b>105.3</b>	<b>290.1</b>	<b>376.5</b>	<b>42.7</b>	<b>603.1</b>	<b>18.3</b>	<b>258.9</b>	<b>365.1</b>	<b>18.8</b>	<b>2,790.6</b>

a/ Includes recreational vessels

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

**Figure 4-9. Alternative 4: Direct Economic Impact on Shipping Industry by Port Area, 2003 and 2004 (\$000s)**



## ALTERNATIVE 5 – COMBINATION OF ALTERNATIVES

Alternative 5 includes all elements of Alternatives 1 through 4. Thus it includes DMAs proposed in Alternative 2, speed restrictions in designated areas from Alternative 3, and use of recommended routes from Alternative 4. In analyzing the economic impact of Alternative 5, we have made efforts to avoid double-counting of economic impacts. For example, we have adjusted the assumed incidence of DMAs from Alternative 2 to include only those DMAs that would fall outside of the periods when speed restrictions for designated areas are implemented.

### *Impact on Vessel Operations*

Table 4-18 presents the key assumptions that are used to analyze the impact of Alternative 5 operational measures on vessel operations. The table presents the basis for determining the effective distance that speed restrictions would apply for each port area similar to that previously shown in Table 4-12 for Alternative 3. Note that the diagonal distances to the buoy for the port areas of Brunswick, Fernandina and Jacksonville differ from those of Alternative 3. This is due to the inclusion from Alternative 4 of the recommended port access routes for these ports that reduces the distance traveled through the speed-restricted MSRS WHALESSOUTH area. For those distances we apply the speed restrictions to determine the additional time incurred by vessels.

The other new element for these three Southeast port areas is the additional distance that is traveled parallel to the eastern boundary of the MSRS WHALESSOUTH until the intersection of the recommended port access route. These distances are shown in Table 4-18 as “extra PARS distance”. Speed restrictions do not apply to these distances and the additional time incurred is calculated using the averaging operating speed for each type and size of vessel.

The DMA effective days assumed for each port area under Alternative 5 is presented in the last column of Table 4-18. We have assumed the implementation of one DMA per port area for the Northeast Region taking into consideration the sighting of right whales in the Gulf of Maine outside of the speed restricted Off Race Point area. In the Southeast region, we also assume the implementation of one DMA per port area taking into consideration the sighting of whales outside of the time periods established for speed restricted designated areas. No DMAs for port areas in the mid-Atlantic period have been assumed outside of the periods established for speed restricted designated areas. The slow down speed up time for each port is as specified for Alternative 3. While not shown separately in Table 4-18, each DMA also includes slowdown/speedup time as described in Alternative 2.

**Table 4-18. Alternative 5: Effective Distance of Speed Restrictions in Designated Areas, Duration of DMAs and Extra PARS Distances by Port Area**

Port Area	Location of pilot buoy relative to harbor baseline or closing line	Distance stated in NOI	Distance to pilot buoy	Diagonal distance to pilot buoy	Additional effective distance a/	Extra PARS	PARS Effective Days b/	Slow down/speed up time	DMA effective days
<b>Northeastern US - Gulf of Maine</b>									
Eastport, ME	n.a.	n.a.	n.a.	n.a.	54.9	0	0	Included	15
Searsport, ME	n.a.	n.a.	n.a.	n.a.	54.9	0	0	Included	15
Portland, ME	n.a.	n.a.	n.a.	n.a.	54.9	0	0	Included	15
Portsmouth, NH	n.a.	n.a.	n.a.	n.a.	54.9	0	0	Included	15
<b>Northeastern US - Off Race Point</b>									
Boston, MA	n.a.	n.a.	n.a.	n.a.	72.4	0	0	n.a.	15
Salem, MA	n.a.	n.a.	n.a.	n.a.	72.4	0	0	n.a.	15
<b>Northeastern US - Cape Cod Bay</b>									
	5.0	n.a.	n.a.	n.a.	59.2	0	365	n.a.	15
<b>Mid-Atlantic Block Island Sound</b>									
New Bedford, MA	n.a.	25	25	35.4	54.9	0	0	Included	0
Providence, RI	n.a.	25	25	35.4	54.9	0	0	Included	0
New London, CT	n.a.	25	25	35.4	54.9	0	0	Included	0
New Haven, CT	n.a.	25	25	35.4	54.9	0	0	Included	0
Bridgeport, CT	n.a.	25	25	35.4	54.9	0	0	Included	0
Long Island, NY	n.a.	25	25	35.4	54.9	0	0	Included	0
<b>Mid-Atlantic Ports of New York/New Jersey</b>									
	6.8	25	18.2	25.7	54.9	0	0	Included	0
<b>Mid-Atlantic Delaware Bay</b>									
	2.5	25	22.5	31.8	54.9	0	0	Included	0
<b>Mid-Atlantic Chesapeake Bay</b>									
Baltimore, MD	2.8	25	22.2	31.3	54.9	0	0	Included	0
Hampton Roads, VA	2.8	25	22.2	31.3	54.9	0	0	Included	0
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>									
	6.7	25	18.3	25.9	n.a.	0	0	n.a.	0
<b>Mid-Atlantic Wilmington, NC</b>									
	4.1	25	20.9	29.6	n.a.	0	0	n.a.	0
<b>Mid-Atlantic Georgetown, SC</b>									
	5.6	25	19.4	27.4	n.a.	0	0	n.a.	0
<b>Mid-Atlantic Charleston, SC</b>									
	12.5	25	12.5	17.7	6.3	0	0	n.a.	0
<b>Mid-Atlantic Savannah, GA</b>									
	9.7	25	15.3	21.6	4.9	0	0	n.a.	0
<b>Southeastern US</b>									
Brunswick, GA	6.7	n.a.	n.a.	23.5	3.4	6.0	151	n.a.	15
Fernandina, FL	10.9	n.a.	n.a.	26.0	5.5	10.5	151	n.a.	15
Jacksonville, FL	4.2	n.a.	n.a.	27.0	n.a.	10.0	151	n.a.	15
Port Canaveral, FL	n.a.	n.a.	n.a.	4.5	n.a.	0	0	n.a.	15

a/ Defined and described in text for each port area.

b/ PARS effective days as described in the text for Alternative 4.

Source: Nathan Associates as described in text.

### *Estimated Direct Economic Impact*

Table 4-19 presents the direct economic impact of the combination of 10-knot speed restrictions in designated areas, DMAs, and use of recommended routes implemented under Alternative 5 on the shipping industry in 2003. The total direct economic impact is estimated at \$137.0 million with the port area of New York/ New Jersey having the largest impact of \$36.6 million. The port area of Hampton Roads is second at \$24.5 million, followed by the port areas of Philadelphia at \$13.5 million, Baltimore at \$11.0 million, Savannah at \$10.2 million and Charleston at \$9.9 million. The direct economic impact for these six port areas totals \$105.7 million or 77.2 percent of the total for this alternative.

Containerships account for 53.0 percent of the total direct economic impact of Alternative 5 with an estimate of \$72.6 million. The vessel type with the next largest economic impact is tankers at \$16.9 million followed by ro-ro cargo ships at \$15.5 million and passenger vessels at \$11.9 million.

Table 4-20 presents the direct economic impact of Alternative 5 in 2004. The total direct economic impact is \$147.2 million in 2004, about 7.4 percent higher than 2003 which reflects the overall increase in U.S. East Coast vessel arrivals. The rankings for the major vessel types are similar to 2003.

Figure 4-10 presents graphically the direct economic impact by port area for 2003 and 2004. The rankings for the leading port areas are the same as described for 2003 above.

**Table 4-19. Alternative 5: Direct Economic Impact on Shipping Industry by Port Area and Type of Vessel, 2003 (\$000s)**

Port Area	Bulk Carriers	Combination Carriers	Containerships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	Total
<b>Northeastern US - Gulf of Maine</b>													
Eastport, ME	41.0	-	71.4	-	161.3	-	-	-	-	-	-	-	273.7
Searsport, ME	32.1	4.4	-	-	-	1,973.2	-	2.8	84.8	379.1	4.3	-	2,480.6
Portland, ME	190.5	80.7	102.6	4.8	209.8	634.1	-	202.9	21.4	2,123.6	23.8	2.5	3,596.7
Portsmouth, NH	199.6	10.9	-	-	79.4	19.0	-	-	7.6	517.8	2.2	2.5	838.9
<b>Northeastern US - Off Race Point</b>													
Boston, MA	101.7	3.4	1,265.3	3.8	33.8	1,854.4	43.5	124.9	-	983.5	2.2	4.7	4,421.4
Salem, MA	26.3	-	-	-	-	19.7	-	-	-	5.4	-	-	51.4
<b>Northeastern US - Cape Cod Bay</b>	-	-	-	-	-	163.5	-	-	-	55.2	-	-	218.7
<b>Mid-Atlantic Block Island Sound</b>													
New Bedford, MA	166.5	-	3.4	-	74.7	-	69.1	-	17.3	36.0	-	-	366.9
Providence, RI	202.2	6.5	-	-	77.5	581.1	45.7	434.0	4.2	439.6	2.9	1.5	1,795.2
New London, CT	49.3	-	44.2	-	60.6	500.9	-	-	218.9	28.8	2.9	-	905.4
New Haven, CT	152.7	-	25.3	1.5	189.2	50.1	-	-	731.3	623.0	28.5	-	1,801.7
Bridgeport, CT	90.2	-	-	2.3	-	20.9	-	-	413.3	120.7	-	-	647.4
Long Island, NY	-	6.5	-	3.1	-	475.8	-	-	1,485.2	872.6	5.7	1.8	2,850.6
<b>Mid-Atlantic Ports of New York/New Jersey</b>	646.2	89.2	24,866.6	2.4	138.4	1,775.4	303.5	4,221.3	85.1	4,441.1	23.2	4.4	36,596.9
<b>Mid-Atlantic Delaware Bay</b>	649.8	41.5	3,257.1	26.4	651.4	503.6	4,450.6	692.5	44.9	3,200.2	28.5	1.3	13,547.8
<b>Mid-Atlantic Chesapeake Bay</b>													
Baltimore, MD	705.8	28.7	3,648.1	-	768.5	743.9	41.3	4,413.0	8.0	641.9	11.8	23.9	11,034.9
Hampton Roads, VA	743.4	77.9	20,353.1	2.7	476.4	557.6	14.9	1,588.6	4.1	662.0	4.7	14.6	24,500.1
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>	21.6	-	57.9	-	51.1	-	3.0	7.9	-	50.5	-	1.2	193.2
<b>Mid-Atlantic Wilmington, NC</b>	109.5	9.7	550.9	-	386.6	-	6.3	111.7	29.9	372.3	1.3	-	1,578.3
<b>Mid-Atlantic Georgetown, SC</b>	42.0	-	5.9	-	49.5	-	-	-	-	-	-	0.8	98.2
<b>Mid-Atlantic Charleston, SC</b>	147.3	-	8,095.7	-	288.0	375.6	16.9	641.2	25.8	268.3	12.7	1.1	9,872.6
<b>Mid-Atlantic Savannah, GA</b>	235.5	13.6	8,190.7	-	513.5	48.6	144.0	564.2	7.9	428.6	3.5	1.2	10,151.3
<b>Southeastern US</b>													
Brunswick, GA	93.7	-	124.6	-	102.3	15.3	55.3	765.4	-	8.2	-	-	1,164.8
Fernandina, FL	20.4	-	231.3	2.1	263.3	20.8	190.0	1.2	-	0.3	27.1	-	756.6
Jacksonville, FL	272.7	5.0	1,655.5	325.8	522.9	183.7	27.8	1,669.2	32.8	612.7	431.3	9.6	5,748.9
Port Canaveral, FL	19.4	0.3	16.2	1.5	36.3	1,356.0	44.7	19.4	1.7	9.8	2.8	0.2	1,508.2
<b>Total</b>	4,959.3	378.1	72,565.7	376.3	5,134.7	11,873.2	5,456.8	15,460.1	3,224.0	16,881.4	619.4	71.4	137,000.4

a/ Includes recreational vessels.

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

**Table 4-20. Alternative 5: Direct Economic Impact on Shipping Industry by Port Area and Type of Vessel, 2004 (\$000s)**

Port Area	Bulk Carriers	Combination Carriers	Containerships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	Total
<b>Northeastern US - Gulf of Maine</b>													
Eastport, ME	56.4	-	71.5	-	335.4	-	-	-	-	-	-	-	463.3
Searsport, ME	21.7	-	57.7	4.7	8.5	2,253.5	-	5.1	41.4	352.0	17.3	-	2,761.9
Portland, ME	204.6	23.2	56.7	4.8	215.1	889.5	-	139.2	97.2	2,215.6	101.7	2.3	3,949.7
Portsmouth, NH	160.6	9.7	2.5	-	127.4	19.0	-	-	3.8	386.1	19.5	5.6	734.2
<b>Northeastern US - Off Race Point</b>													
Boston, MA	101.7	3.4	1,265.3	3.8	33.8	1,854.4	43.5	124.9	-	983.5	2.2	4.7	4,421.4
Salem, MA	33.2	-	-	-	-	161.9	-	-	-	-	-	-	195.0
<b>Northeastern US - Cape Cod Bay</b>	-	-	-	-	-	317.7	-	-	3.1	87.1	1.8	-	409.7
<b>Mid-Atlantic Block Island Sound</b>													
New Bedford, MA	145.1	-	-	-	46.3	-	55.3	6.8	-	31.3	-	-	284.7
Providence, RI	170.7	6.8	-	-	103.3	939.9	-	410.0	5.0	407.3	14.3	5.5	2,062.8
New London, CT	32.2	-	109.8	-	235.0	444.2	-	-	186.4	39.7	2.9	-	1,050.2
New Haven, CT	86.9	-	49.7	-	155.4	-	-	-	1,381.0	537.6	48.5	-	2,259.1
Bridgeport, CT	157.2	-	-	1.1	-	-	-	-	668.4	100.2	-	0.6	927.5
Long Island, NY	-	-	-	7.7	-	576.0	-	-	1,791.1	886.8	-	1.5	3,263.1
<b>Mid-Atlantic Ports of New York/New Jersey</b>	579.5	60.2	25,641.7	-	399.4	3,501.7	301.8	4,439.0	31.2	4,138.4	42.2	4.4	39,139.5
<b>Mid-Atlantic Delaware Bay</b>	642.0	9.9	3,006.5	60.4	940.7	296.6	4,216.7	702.1	13.5	3,495.3	83.2	2.8	13,469.7
<b>Mid-Atlantic Chesapeake Bay</b>													
Baltimore, MD	844.1	24.8	3,883.8	-	974.0	1,196.5	78.0	4,384.6	8.2	893.0	23.6	11.3	12,321.9
Hampton Roads, VA	971.0	64.6	19,812.9	9.3	675.4	1,222.2	129.2	1,591.5	4.1	735.4	28.3	14.8	25,258.7
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>	39.3	1.7	61.8	-	41.5	40.1	-	-	-	72.4	-	0.6	257.4
<b>Mid-Atlantic Wilmington, NC</b>	108.0	5.5	487.1	-	413.3	45.8	-	150.9	20.2	402.8	2.6	3.0	1,639.1
<b>Mid-Atlantic Georgetown, SC</b>	39.1	2.8	5.2	-	75.0	10.6	-	-	-	-	-	-	132.7
<b>Mid-Atlantic Charleston, SC</b>	138.8	0.8	8,469.2	4.7	330.1	554.7	29.8	592.6	8.0	266.6	20.1	3.6	10,418.9
<b>Mid-Atlantic Savannah, GA</b>	248.7	15.1	8,388.1	-	578.0	366.6	216.9	665.5	2.6	516.3	5.8	0.6	11,004.1
<b>Southeastern US</b>													
Brunswick, GA	94.0	-	62.1	-	166.5	64.3	56.5	795.9	-	0.2	-	5.1	1,244.5
Fernandina, FL	47.3	-	184.4	6.0	271.9	130.6	82.7	22.6	-	-	43.3	-	788.9
Jacksonville, FL	297.0	10.0	1,748.9	285.9	507.7	1,080.6	30.6	1,738.5	43.3	648.7	568.5	27.4	6,987.0
Port Canaveral, FL	28.4	-	19.4	2.7	51.9	1,533.1	32.2	28.8	3.4	15.7	10.5	0.4	1,726.3
<b>Total</b>	<b>5,247.5</b>	<b>238.4</b>	<b>73,384.5</b>	<b>390.9</b>	<b>6,685.6</b>	<b>17,499.4</b>	<b>5,273.2</b>	<b>15,797.9</b>	<b>4,311.8</b>	<b>17,211.9</b>	<b>1,036.1</b>	<b>94.1</b>	<b>147,171.3</b>

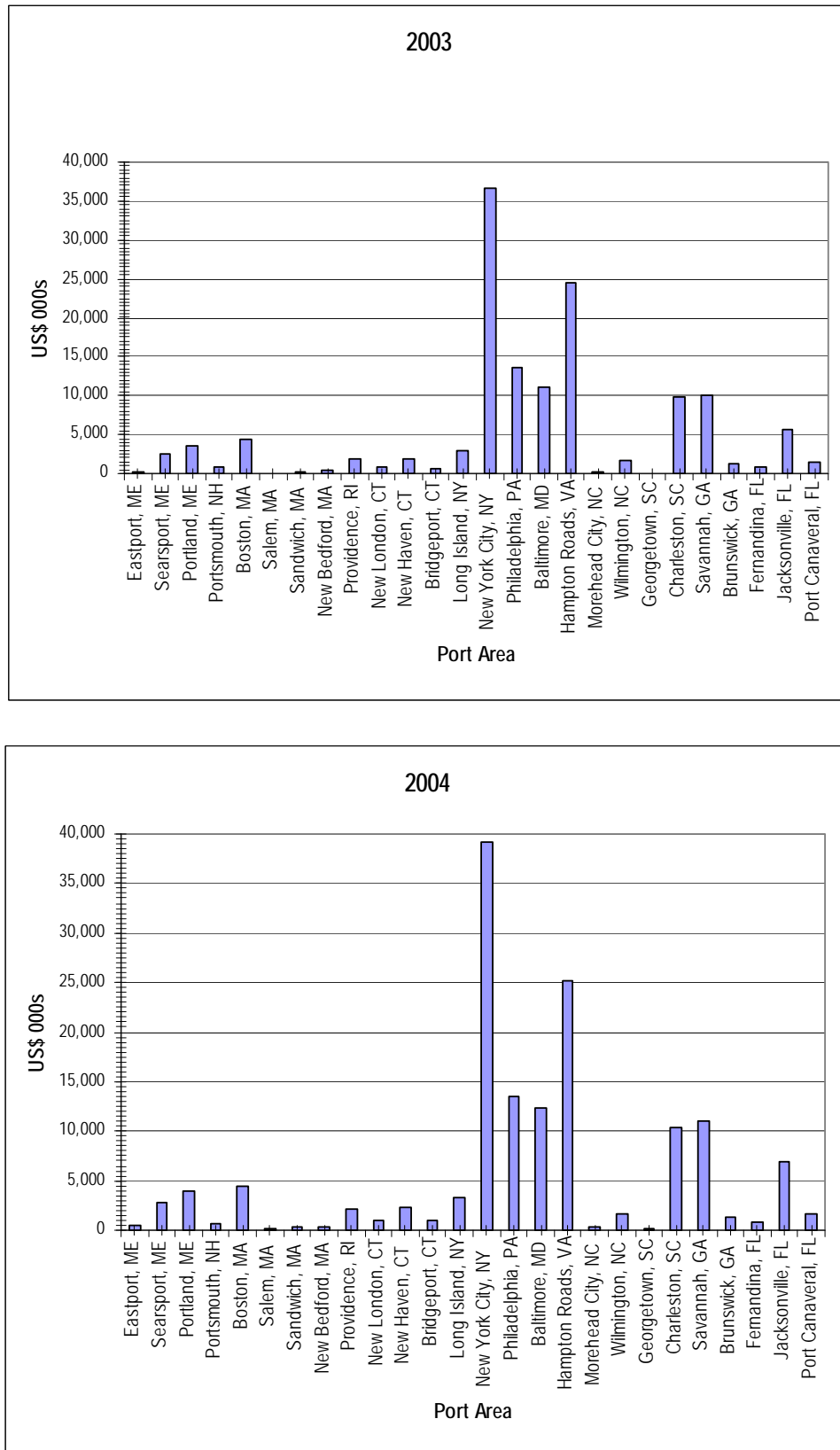
a/ Includes recreational vessels

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.



**Figure 4-10. Alternative 5: Direct Economic Impact on Shipping Industry by Port Area, 2003 and 2004 (\$000s)**



## ALTERNATIVE 6 – PREFERRED ALTERNATIVE

This alternative includes NMFS' preferred operational measures to reduce ship strikes to right whales. This economic impact analysis is based on those operational measures except as modified by the following revisions that are under consideration by NMFS.<sup>47</sup>

- Seasonal speed restriction periods for the Southeast SMA will be implemented from November 15-April 15.
- The shipping lanes into Brunswick, Fernandina, and Jacksonville extend out to longitude 80° 51.6 W (eastern boundary of the MSRS system).
- PARS routings as discussed for Alternative 4 for the port areas of Brunswick, Fernandina, Jacksonville, and Cape Cod Bay.
- SMAs for port areas in the mid-Atlantic US region will be implemented from November 1-April 30 and the port areas north of Wilmington, NC will have a radius of 20 nautical miles.<sup>48</sup> A continuous 20-mile buffer will be implemented from Wilmington, NC through Savannah, GA to the northern boundary of the Southeastern SMA.
- Seasonal speed restrictions for Cape Cod Bay SMA will be implemented from January 1-May 15.
- An expanded Off Race Point Seasonal Management Area as proposed in the ALWTRP will be implemented from March 1-April 30.
- The Great South Channel Seasonal Management Area has also been expanded (west) and will be implemented from April 1-July 31.
- The trigger and duration for DMAs are those described under Alternative 2, except that they are voluntary for Alternative 6.

The operational measures proposed under Alternative 6 will expire five years after their date of effectiveness. In this section we analyze the economic impacts that would likely occur each year that the rule is in effect.

### *Impact on Vessel Operations*

Figure 4-11 presents the periods for proposed seasonal speed restrictions by port area. SMAs have not been proposed for specific port areas in the Northeast region. However, we have assumed that speed restrictions for the expanded Off Race Point Management Area would affect vessel arrivals at the port areas in the Northeast

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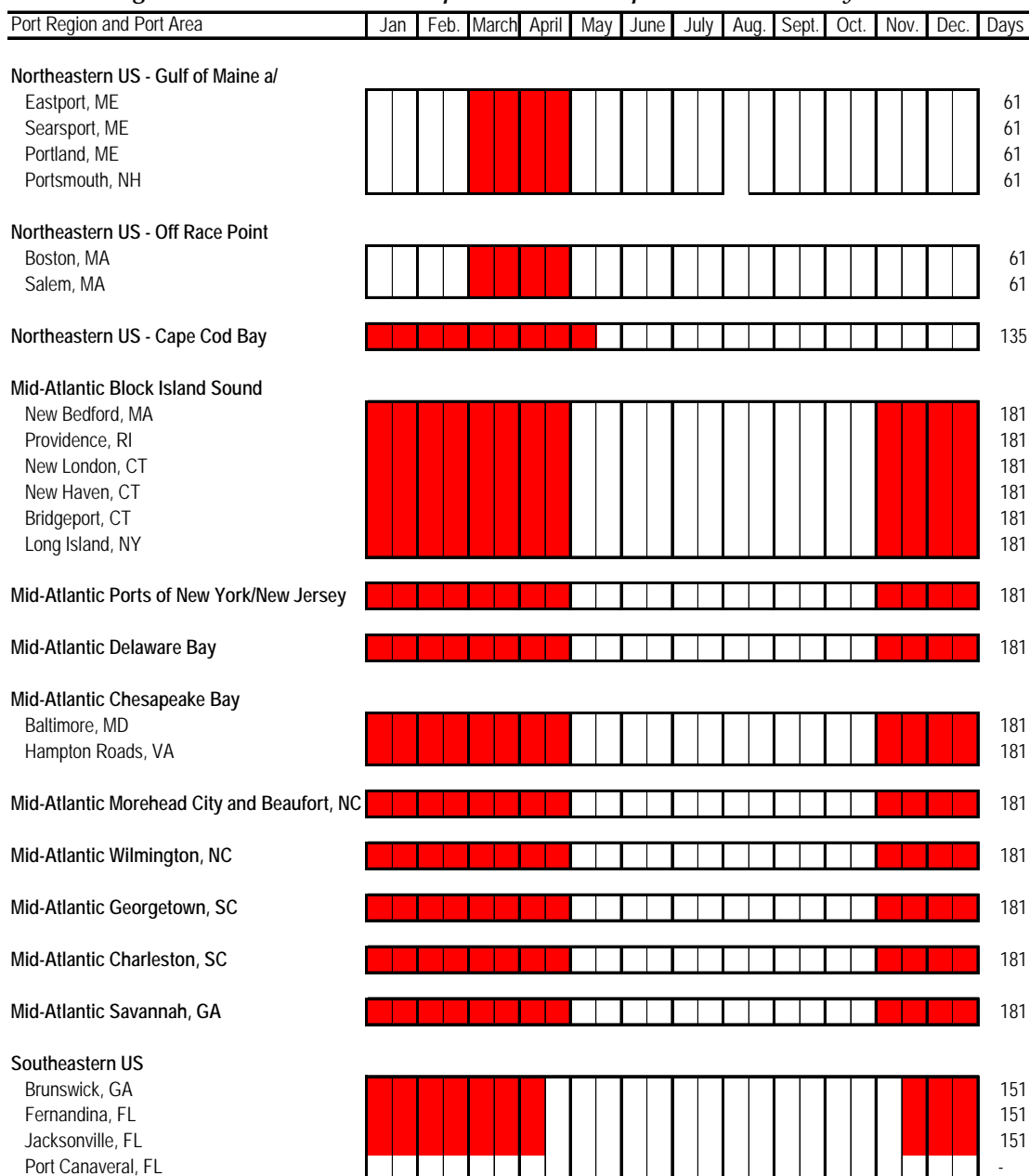
<sup>47</sup> The ATBA for the Great South Channel and Boston TSS are no longer included in this alternative but are considered in the cumulative impacts section of the EIS. An economic analysis of these measures is presented in Section 4.7.1.3 of the EIS.

<sup>48</sup> Except for Block Island sounds, this is a rectangle with a 30-nm width.

region. Note that this alternative does not include speed restrictions for the port area of Port Canaveral. DMAs will be implemented in all areas outside of the proposed seasonal speed restricted periods.

For all Northeast region port areas (excluding Cape Cod Bay), the seasonal speed restrictions would be effective 61 days per year. For Cape Cod Bay, the seasonal speed restrictions would be effective 135 days. Speed restrictions would be in place for 181 days per year for port areas in the mid-Atlantic region and 151 days per year for the three affected port areas in the Southeast region.

**Figure 4-11. Alternative 6: Proposed Seasonal Speed Restrictions by Port Area**



a/ While seasonal speed restrictions are not proposed for the Northeastern US- Gulf of Maine, vessel approaching or departing these port areas are assumed to be affected by the seasonal speed restrictions proposed for the Northeastern US- Off Race Point.

Source: NOAA.

Table 4-21 presents U.S. East Coast arrivals of vessels for 2003 during the periods when speed restrictions are proposed for Seasonal Management Areas established at each port area. In 2003 there were 11,498 vessel arrivals during speed restricted periods representing approximately 45 percent of the total of 25,532 arrivals for 2003 presented in Chapter 2. While there is some seasonality in U.S. East Coast vessel arrivals, the proposed periods of speed restrictions include both peak periods and non-peak periods and hence the percentage of restricted arrivals correspond closely to the percentage of speed restricted days per year.

The port area of New York/New Jersey has the most vessel arrivals during speed restricted periods with 2,618 arrivals in 2003 followed by the port areas of Philadelphia (1,315 arrivals), Hampton Roads (1,298 arrivals), Savannah (1,157 arrivals), Charleston (1,140 arrivals), Baltimore (913 arrivals) and Jacksonville (905 arrivals). These seven port areas accounted for 81.3 percent of the total U.S. vessel arrivals during speed restricted periods.

In terms of vessel type, containerships recorded the most vessel arrivals during proposed speed restricted periods with 4,165 arrivals in 2003. Tankers were the next most frequent with 2,473 arrivals followed by ro-ro cargo ships with 1,444 arrivals and bulk carriers with 1,243 arrivals.

In 2004, there were 12,189 vessel arrivals at U.S. East Coast ports during the periods when speed restrictions are proposed for each port area (Table 4-22), an increase of 6.0 percent over 2003. The increase is lower than the 7.3 percent shown for total U.S. East Coast vessel arrivals in Chapter 2 for several reasons. First, the Southeast region which recorded an increase of 12.3 percent in total vessel arrivals in 2004 is the region with the fewest speed restricted days. Second, the port area of New York/New Jersey with the largest number of annual vessel arrivals recorded no increase in vessel arrivals during proposed speed restricted periods.

**Table 4-21. Alternative 6: U.S. East Coast Restricted Vessel Arrivals by Port Area and Vessel Type, 2003**

Port Area	Vessel Type												Total
	Bulk Carrier	Combination Carrier	Container Ship	Freight Barge	General Dry Cargo Ship	Passenger Ship	Refrigerated Cargo Ship	Ro-Ro Cargo Ship	Tank Barge	Tanker	Towing Vessel	Other a/	
Northeastern US - Gulf of Maine													
Eastport, ME	3	-	1	-	3	-	-	-	-	-	-	-	7
Searsport, ME	2	-	-	-	-	-	-	-	-	18	-	-	20
Portland, ME	14	1	1	-	2	-	-	10	1	78	-	-	107
Portsmouth, NH	9	-	-	-	2	-	-	-	1	25	-	-	37
Northeastern US - Off Race Point													
Salem, MA	3	-	-	-	-	-	-	-	-	-	-	-	3
Boston, MA	7	-	20	-	2	-	-	10	-	72	-	1	112
Subtotal	10	0	20	0	2	0	0	10	0	72	0	1	115
Northeastern US - Cape Cod Bay													
Cape Cod, MA	-	-	-	-	-	3	-	-	-	6	-	-	9
Mid-Atlantic Block Island Sound													
New Bedford, MA	29	-	1	-	14	-	3	-	4	6	-	-	57
Providence, RI	41	1	-	-	11	-	3	38	1	62	1	-	158
New London, CT	9	-	2	-	4	17	-	-	41	4	1	-	78
New Haven, CT	31	-	1	1	14	1	-	-	136	96	8	-	288
Bridgeport, CT	13	-	-	-	1	1	29	-	94	25	-	-	163
Long Island, NY	-	1	-	-	-	15	-	-	281	122	2	1	422
Mid-Atlantic Ports of New York/New Jersey													
New York City, NY	172	17	1,172	1	28	14	10	347	25	820	9	3	2,618
Mid-Atlantic Delaware Bay													
Philadelphia, PA	179	7	246	5	116	1	246	72	11	420	12	-	1,315
Mid-Atlantic Chesapeake Bay													
Baltimore, MD	153	4	183	-	95	12	3	347	2	101	4	9	913
Hampton Roads, VA	161	11	857	1	66	4	1	79	1	112	1	4	1,298
Mid-Atlantic Morehead City and Beaufort, NC													
Morehead City, NC	11	-	7	-	17	-	1	1	-	19	-	2	58
Mid-Atlantic Wilmington, NC													
Wilmington, NC	59	4	44	-	63	-	1	11	11	120	1	-	314
Mid-Atlantic Georgetown, SC													
Georgetown, SC	23	-	1	-	5	-	-	-	-	-	-	1	30
Mid-Atlantic Charleston, SC													
Charleston, SC	85	-	735	-	49	21	3	117	13	103	12	2	1,140
Mid-Atlantic Savannah, GA													
Savannah, GA	140	7	655	-	113	3	5	78	4	148	2	2	1,157
Southeastern US													
Brunswick, GA	33	-	11	-	14	1	5	112	-	2	-	-	178
Fernandina, FL	4	-	43	1	42	1	13	-	-	-	7	-	111
Jacksonville, FL	62	1	185	80	102	8	2	222	7	114	117	5	905
Port Canaveral, FL	-	-	-	-	-	-	-	-	-	-	-	-	0
All Port Regions	1,243	54	4,165	89	763	102	325	1,444	633	2,473	177	30	11,498

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

**Table 4-22. Alternative 6: U.S. East Coast Restricted Vessel Arrivals by, Port Area and Vessel Type, 2004**

Port Area	Vessel Type												Total
	Bulk Carrier	Combination Carrier	Container Ship	Freight Barge	General Dry Cargo Ship	Passenger Ship	Refrigerated Cargo Ship	Ro-Ro Cargo Ship	Tank Barge	Tanker	Towing Vessel	Other a/	
Northeastern US - Gulf of Maine													
Eastport, ME	5	-	2	-	1	-	-	-	-	-	-	-	8
Searsport, ME	1	-	-	-	-	-	-	-	4	14	-	-	19
Portland, ME	13	-	-	-	2	1	-	11	10	69	5	-	111
Portsmouth, NH	8	1	-	-	3	-	-	-	-	11	1	2	26
Northeastern US - Off Race Point													
Salem, MA	-	-	-	-	-	-	-	-	-	-	-	-	0
Boston, MA	7	-	20	-	2	-	-	10	-	72	-	1	112
Northeastern US - Cape Cod Bay													
Cape Cod, MA	-	-	-	-	-	1	-	-	-	10	-	-	11
Mid-Atlantic Block Island Sound													
New Bedford, MA	26	-	-	-	11	-	4	1	-	5	-	-	47
Providence, RI	33	1	-	-	12	7	-	34	1	57	2	2	149
New London, CT	8	-	4	-	13	10	-	-	36	6	1	-	78
New Haven, CT	14	-	3	-	17	-	-	-	257	83	13	-	387
Bridgeport, CT	34	-	-	1	2	-	13	-	163	21	-	1	235
Long Island, NY	-	-	-	4	-	20	-	-	339	143	-	1	507
Mid-Atlantic Ports of New York/New Jersey													
New York City, NY	163	14	1,226	-	43	41	14	345	8	738	20	2	2,614
Mid-Atlantic Delaware Bay													
Philadelphia, PA	163	2	225	13	142	6	223	71	3	470	27	2	1,347
Mid-Atlantic Chesapeake Bay													
Baltimore, MD	190	4	194	-	104	16	3	323	1	140	7	6	988
Hampton Roads, VA	219	13	840	2	81	24	5	76	1	116	11	9	1,397
Mid-Atlantic Morehead City and Beaufort, NC													
Morehead City, NC	18	1	8	-	13	4	-	-	-	28	-	-	72
Mid-Atlantic Wilmington, NC													
Wilmington, NC	53	3	42	-	66	3	-	14	9	129	1	-	320
Mid-Atlantic Georgetown, SC													
Georgetown, SC	22	1	2	-	11	1	-	-	-	-	-	-	37
Mid-Atlantic Charleston, SC													
Charleston, SC	67	1	798	-	56	42	3	108	4	101	16	5	1,201
Mid-Atlantic Savannah, GA													
Savannah, GA	136	7	648	-	99	33	10	93	1	176	3	1	1,207
Southeastern US													
Brunswick, GA	33	-	7	-	23	4	5	113	-	-	-	3	188
Fernandina, FL	12	-	30	2	50	6	6	1	-	-	11	-	118
Jacksonville, FL	66	2	204	74	91	43	2	231	9	120	154	14	1,010
Port Canaveral, FL	-	-	-	-	-	-	-	-	-	-	-	-	0
All Port Regions	1,291	50	4,253	96	842	262	288	1,431	846	2,509	272	49	12,189

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table 4-23 presents the key assumptions that are used to analyze the impact of Alternative 6 operational measures on vessel operations. The table presents the basis for determining the effective distance that speed restrictions would apply for each port area similar to that previously shown in Table 4-18 for Alternative 5. However, for Alternative 6, port area buffers will have a radius of 20 nautical miles (except for Block Island Sound), and except for the Wilmington, NC to Savannah segment will not be parallel to the coastline as in Alternatives 3 and 5. Hence there is no need to determine the diagonal distance of port access route as was calculated for Alternatives 3 and 5.

The effective distance and period of seasonal speed restrictions and the extra PARS distance shown in Table 4-23 for the port areas of Brunswick, Fernandina and Jacksonville are the same as described for Alternative 5.

The additional effective distance shown for port areas in the northeast and for some port areas in the mid-Atlantic is based on the assumption that vessel arrivals at these port areas will have to traverse 54.9 nautical miles through the large speed restricted area of a combined expanded Off Race Point Management Area and the Great South Channel Management Area that will be implemented during the April 1-30. Under Alternatives 3 and 5 this element was effective year-round, whereas under Alternative 6 this element is only effective for 30 days and only applies to vessel arrivals that would need to pass through the area.<sup>49</sup>

For the port areas of Providence and New Bedford we have assumed an additional effective distance of 13.8 nautical miles from the northern boundary of the Block Island speed restriction area to the pilot buoy for Narragansett Bay as vessels would not be able to regain sea speed after passing through the speed restricted area. Combined with the 54.9 nautical miles for the Off Race Point and Great South Channel Management Area, this results in a total additional effective distance of 68.7 nautical miles as shown in Table 4-23.

For the Northeast region, the additional effective distance shown in Table 4-23 is based on an average of the effective distance during March 1-30 (when only the Off Race Point Management Area is implemented) and the effective distance during April 1-30 (when both expanded Off Race Point Management Area and the Great South Channel Management Area are implemented). For the Gulf of Maine port areas, the effective distance during March is estimated at 36.9 nautical miles and for April at 60.5 nautical miles, resulting in the average effective distance of 48.7 nautical miles listed in Table 4-23. For the port areas of Boston and Salem, the effective distance for March is estimated at 52.4 nautical miles and for April at 72.4 nautical miles, which yields the average effective distance of 62.4 nautical miles listed in Table 4-23.

The DMA effective days assumed for each port area under Alternative 6 is presented in the last column of Table 4-23. We have assumed the implementation of three DMAs per port area for the Northeast Region taking into consideration the sighting of right whales in the Gulf of Maine and for time periods outside of those specified for speed restrictions in the Off Race Point Management Area. In the Southeast region, we also assume the implementation of one DMA per port area taking into consideration the sighting of whales outside

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<sup>49</sup> See the discussion under Alternative 3 regarding assumptions as to the percentage of vessel arrivals at mid-Atlantic port areas that would be affected.

of the time periods established for speed restricted designated areas. No DMAs for port areas in the mid-Atlantic period have been assumed outside of the periods established for speed restricted designated areas. While not shown separately in Table 4-23, each DMA includes slowdown/speedup time as described in Alternative 2.

**Table 4-23. Alternative 6: Effective Distance of Seasonal Speed Restrictions and Duration of DMAs**

Port Area	Location of pilot buoy relative to harbor	Distance Stated in Rule	Effective distance to pilot buoy	Diagonal of effective distance	Additional effective distance a/	Extra PARS Distance	PARS Effective Days b/	Slow down/speed up time	DMA effective days
<b>Northeastern US - Gulf of Maine</b>									
Eastport, ME	n.a.	n.a.	n.a.	n.a.	48.7	0	0	Included	45
Searsport, ME	n.a.	n.a.	n.a.	n.a.	48.7	0	0	Included	45
Portland, ME	n.a.	n.a.	n.a.	n.a.	48.7	0	0	Included	45
Portsmouth, NH	n.a.	n.a.	n.a.	n.a.	48.7	0	0	Included	45
<b>Northeastern US - Off Race Point</b>									
Boston, MA	n.a.	n.a.	n.a.	n.a.	62.4	0	0	n.a.	45
Salem, MA	n.a.	n.a.	n.a.	n.a.	62.4	0	0	n.a.	45
<b>Northeastern US - Cape Cod Bay</b>	5.0	n.a.	n.a.	n.a.	39.9	0	0	n.a.	45
<b>Mid-Atlantic Block Island Sound</b>									
New Bedford, MA	n.a.	30	30	n.a.	68.7	0	0	Included	0
Providence, RI	n.a.	30	30	n.a.	68.7	0	0	Included	0
New London, CT	n.a.	30	30	n.a.	54.9	0	0	Included	0
New Haven, CT	n.a.	30	30	n.a.	54.9	0	0	Included	0
Bridgeport, CT	n.a.	30	30	n.a.	54.9	0	0	Included	0
Long Island, NY	n.a.	30	30	n.a.	54.9	0	0	Included	0
<b>Mid-Atlantic Ports of New York/New Jersey</b>	6.8	20	13.2	n.a.	54.9	0	0	Included	0
<b>Mid-Atlantic Delaware Bay</b>	2.5	20	17.5	n.a.	54.9	0	0	Included	0
<b>Mid-Atlantic Chesapeake Bay</b>									
Baltimore, MD	2.8	20	17.15	n.a.	54.9	0	0	Included	0
Hampton Roads, VA	2.8	20	17.15	n.a.	54.9	0	0	Included	0
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>	6.7	20	13.3	n.a.	n.a.	0	0	n.a.	0
<b>Mid-Atlantic Wilmington, NC</b>	4.1	20	15.9	n.a.	n.a.	0	0	n.a.	0
<b>Mid-Atlantic Georgetown, SC</b>	5.6	20	14.4	n.a.	n.a.	0	0	n.a.	0
<b>Mid-Atlantic Charleston, SC</b>	12.5	20	7.5	n.a.	6.3	0	0	n.a.	0
<b>Mid-Atlantic Savannah, GA</b>	9.7	20	10.3	n.a.	4.9	0	0	n.a.	0
<b>Southeastern US</b>									
Brunswick, GA	6.7	n.a.	n.a.	23.5	3.4	6.0	151	n.a.	15
Fernandina, FL	10.9	n.a.	n.a.	26.0	5.5	10.5	151	n.a.	15
Jacksonville, FL	4.2	n.a.	n.a.	27.0	n.a.	10.0	151	n.a.	15
Port Canaveral, FL	n.a.	n.a.	n.a.	n.a.	n.a.	0	0	n.a.	15

a/ Defined and described in text for each port area.

b/ PARS effective days as described in the text for Alternative 4.

Source: Nathan Associates as described in text.



Table 4-24 presents the average minutes of delay for speed restrictions of 10 knots per vessel arrival for each affected port area and vessel type in 2003.<sup>50</sup> The overall weighted average delay for all vessels in 2003 is 53 minutes per arrival.

The longest average delay is experienced at the Southeast port areas of Fernandina (105 minutes) Jacksonville (96 minutes) and Brunswick (86 minutes) due to the combination of speed restrictions and the delays caused by the PARS recommended routings. The port areas of Providence (93 minutes) and other port areas in Block Island Sound have above average delays due to the 30-nautical mile rectangular area proposed for that region. Boston (82 minutes) and other port areas in the Northeast also have above average delays due to the longer time period that the additional effective distance is applied (two months in the Northeast as compared to one month for the mid-Atlantic port areas).

Freight barges incur the longest average delay with an average of 91 minutes per vessel arrival (Figure 4-12). This is due the specialized higher-speed freight barge service from Jacksonville to Puerto Rico. Other vessel types with above average delays are ro-ro cargo ships (66 minutes), passenger vessels (62 minutes) towing vessels (61 minutes), containerhips (59 minutes) and general cargo ships and refrigerated cargo vessels (each at 54 minutes).

It is important to note that the timing and duration of the proposed seasonal speed restrictions will be well-known and that vessel itineraries for containerhips and cruise vessels will be developed taking them into account. For example, shipping lines providing liner service to several U.S. East Coast ports would likely adjust their rotation of port calls and number of vessels deployed on that service to optimize vessel utilization while maintaining a weekly service.

Cruise vessels would also adjust vessel itineraries as necessary to optimize vessel utilization. This could involve reducing the duration of port calls at off-shore destinations or the elimination of an off-shore port of call. For example, a 7-day cruise from Norfolk to Bermuda could easily adjust the scheduled time spent at port of calls in Bermuda such as Hamilton, Saint George or King's Wharf. Similarly, 4-day cruises from Jacksonville to the Bahamas or 5-day cruises to the Western Caribbean could make minor adjustments to the duration of stays at the corresponding port of calls.

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<sup>50</sup> The average delay is based on the total minutes of delays for speed restrictions, extra PARS distance and slowdown/speedup time divided by the number of vessel arrivals by type of vessel for each port area during proposed seasonal speed restriction periods. It does not include delays for DMAs as those delays would need to be divided by vessels affected by DMAs.

**Table 4-24. Alternative 6: Average Minutes of Delay for Speed Restrictions per Vessel Arrival by Port Area and Type of Vessel, 2003**

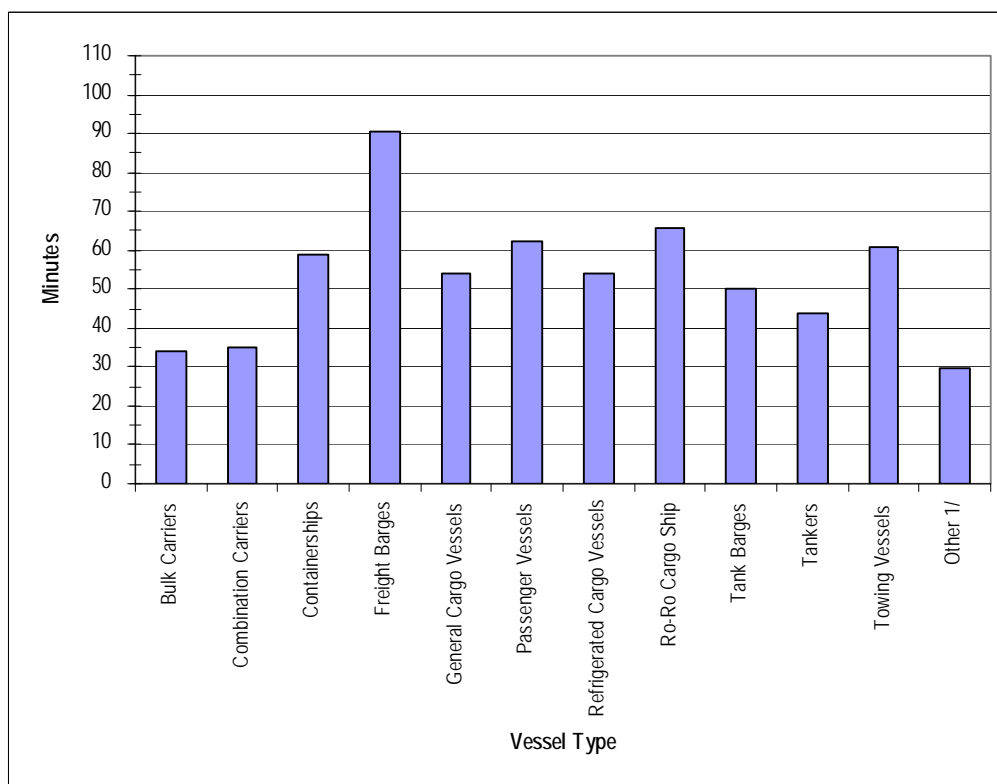
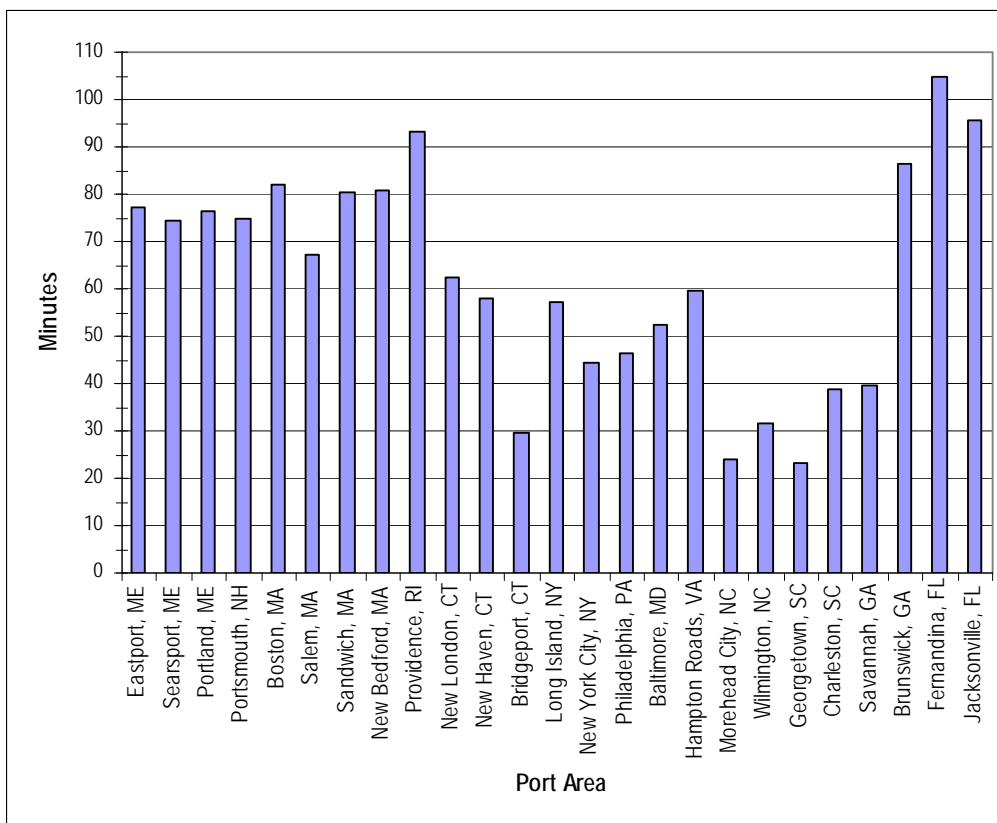
Port Area	Bulk Carriers	Combination Carriers	Containerships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	Weighted Average
<b>Northeastern US - Gulf of Maine</b>													
Eastport, ME	52.7	-	138.7	-	80.7	-	-	-	-	-	-	-	77.0
Searsport, ME	51.5	-	-	-	-	-	-	-	-	77.1	-	-	74.5
Portland, ME	58.2	74.8	94.7	-	95.7	-	-	68.8	69.4	79.8	-	-	76.3
Portsmouth, NH	61.8	-	-	-	106.1	-	-	-	72.3	77.1	-	-	74.8
<b>Northeastern US - Off Race Point</b>													
Boston, MA	52.8	-	129.4	-	65.6	-	-	62.7	-	75.3	-	42.2	81.9
Salem, MA	67.4	-	-	-	-	-	-	-	-	-	-	-	67.4
<b>Northeastern US - Cape Cod Bay</b>	-	-	-	-	-	89.8	-	-	-	75.5	-	-	80.3
<b>Mid-Atlantic Block Island Sound</b>													
New Bedford, MA	73.0	-	66.1	-	94.3	-	106.8	-	72.9	82.8	-	-	80.9
Providence, RI	68.4	84.4	-	-	102.5	-	112.2	127.5	71.1	86.9	48.4	-	93.1
New London, CT	48.2	-	111.6	-	88.0	77.8	-	-	55.0	61.0	34.6	-	62.4
New Haven, CT	47.6	-	113.7	35.3	83.5	77.8	-	-	56.6	60.9	34.6	-	57.9
Bridgeport, CT	55.4	-	-	-	-	49.3	-	-	34.1	33.8	-	-	29.6
Long Island, NY	-	60.3	-	-	-	77.8	-	-	55.2	59.1	34.6	34.6	57.0
<b>Mid-Atlantic Ports of New York/New Jersey</b>	24.5	29.8	55.9	31.3	33.8	47.7	50.1	48.3	27.9	32.1	17.6	17.6	44.5
<b>Mid-Atlantic Delaware Bay</b>	28.6	38.2	58.3	45.6	45.2	58.4	55.2	56.8	36.2	41.7	21.9	-	46.5
<b>Mid-Atlantic Chesapeake Bay</b>													
Baltimore, MD	31.3	33.7	67.3	-	48.3	57.5	52.4	59.8	35.6	39.3	21.6	21.6	52.3
Hampton Roads, VA	31.1	37.6	68.5	38.3	46.5	57.0	54.8	65.2	36.3	39.6	21.6	21.6	59.5
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>	16.3	-	36.4	-	25.0	-	18.2	36.6	-	23.8	-	13.3	24.0
<b>Mid-Atlantic Wilmington, NC</b>	20.2	25.1	49.3	-	35.0	-	35.1	48.2	26.9	28.3	15.9	-	31.7
<b>Mid-Atlantic Georgetown, SC</b>	19.2	-	43.3	-	39.4	-	-	-	-	-	-	14.4	23.2
<b>Mid-Atlantic Charleston, SC</b>	18.4	-	44.4	-	33.1	33.4	31.9	38.4	24.1	25.2	13.8	13.8	38.8
<b>Mid-Atlantic Savannah, GA</b>	18.5	22.5	48.3	-	31.6	34.1	50.9	42.2	24.9	27.4	15.2	15.2	39.6
<b>Southeastern US</b>													
Brunswick, GA	59.8	-	102.0	-	83.4	82.9	87.6	93.0	-	73.7	-	-	86.2
Fernandina, FL	97.2	-	109.2	84.4	100.8	110.1	116.3	-	-	-	84.0	-	104.6
Jacksonville, FL	84.2	85.9	105.4	95.5	89.8	100.9	100.4	105.6	90.0	91.1	77.0	77.0	95.6
Port Canaveral, FL	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total</b>	34.1	34.9	59.1	90.5	54.0	62.1	53.9	65.9	50.1	44.0	60.8	29.8	53.1

a/ Includes recreational vessels

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

**Figure 4-12. Alternative 6: Average Minutes of Delay for Speed Restriction per Vessel Arrival by Port Area and Type of Vessel, 2003**



### *Estimated Direct Economic Impact*

Table 4-25 presents the direct economic impact of combination of 10-knot speed restrictions and DMAs under Alternative 6 on the shipping industry in 2003. The total direct economic impact is estimated at \$53.2 million with the port area of New York/New Jersey having the largest impact of \$11.1 million. The port area of Hampton Roads is second at \$8.3 million, followed by the port areas of Jacksonville at \$5.5 million, Savannah at \$4.9 million, Charleston at \$4.8 million, Philadelphia at \$4.7 million, and Baltimore at \$3.7 million. The direct economic impact for these seven port areas totals \$43.1 million or 81.0 percent of the total for this alternative. No other port area had a direct economic impact over \$1.3 million.

Containerships account for 52.4 percent of the total direct economic impact of Alternative 6 with an estimate of \$27.9 million. The vessel type with the next largest economic impact is ro-ro cargo ships at \$7.0 million followed by tankers at \$6.5 million, passenger vessels at \$2.6 million, general cargo vessels at \$2.5 million, and refrigerated cargo vessels at \$2.2 million.

Table 4-26 presents the direct economic impact of Alternative 6 in 2004. The total direct economic impact is \$57.6 million in 2004, roughly 8.3 percent higher than 2003 which reflects the overall increase in U.S. East Coast vessel arrivals. The rankings for the major vessel types are similar to 2003 except for bulk carriers moving ahead of refrigerated cargo vessels.

Figure 4-13 presents graphically the direct economic impact by port area for 2003 and 2004. The rankings for the leading port areas are the same as described for 2003.

**Table 4-25. Alternative 6: Direct Economic Impact on Shipping Industry by Port Area and Type of Vessel, 2003 (\$000s)**

Port Area	Bulk Carriers	Combination Carriers	Containerships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	Total
<b>Northeastern US - Gulf of Maine</b>													
Eastport, ME	11.9	-	23.4	-	27.6	-	-	-	-	-	-	-	62.9
Searsport, ME	8.4	0.5	-	-	-	246.1	-	0.3	10.6	117.1	0.5	-	383.5
Portland, ME	60.7	15.1	16.9	0.6	39.4	79.1	-	56.6	5.8	632.0	3.0	0.3	909.5
Portsmouth, NH	50.8	1.4	-	-	22.2	2.4	-	-	4.3	161.1	0.3	0.3	242.7
<b>Northeastern US - Off Race Point</b>													
Boston, MA	28.4	0.4	431.7	0.5	8.1	222.6	5.2	42.4	-	389.6	0.3	1.5	1,130.8
Salem, MA	13.2	-	-	-	-	2.4	-	-	-	0.6	-	-	16.2
<b>Northeastern US - Cape Cod Bay</b>	-	-	-	-	-	51.4	-	-	-	27.1	-	-	78.4
<b>Mid-Atlantic Block Island Sound</b>													
New Bedford, MA	102.3	-	2.5	-	52.3	-	31.0	-	12.9	23.2	-	-	224.2
Providence, RI	129.0	4.8	-	-	43.1	-	34.2	276.8	3.1	274.5	2.1	-	767.6
New London, CT	19.8	-	23.6	-	32.4	227.6	-	-	101.8	12.0	1.5	-	418.7
New Haven, CT	67.2	-	13.5	0.8	91.7	13.4	-	-	349.8	291.9	12.2	-	840.5
Bridgeport, CT	36.6	-	-	-	-	8.5	-	-	144.6	40.4	-	-	230.2
Long Island, NY	-	3.5	-	-	-	200.8	-	-	701.1	389.9	3.0	1.0	1,299.3
<b>Mid-Atlantic Ports of New York/New Jersey</b>	194.7	29.2	7,780.0	0.9	48.3	183.5	88.4	1,310.0	31.3	1,406.2	7.0	1.2	11,080.7
<b>Mid-Atlantic Delaware Bay</b>	230.9	16.9	1,117.6	8.6	232.0	14.7	1,665.6	239.7	18.2	1,107.9	11.6	-	4,663.8
<b>Mid-Atlantic Chesapeake Bay</b>													
Baltimore, MD	233.8	7.2	1,259.8	-	271.2	173.7	16.7	1,530.8	3.2	212.9	3.8	6.7	3,719.8
Hampton Roads, VA	249.4	24.4	7,015.0	1.1	170.0	61.1	6.0	544.0	1.7	244.3	1.0	3.2	8,321.1
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>	7.9	-	20.7	-	21.7	-	1.6	2.2	-	22.2	-	0.6	76.9
<b>Mid-Atlantic Wilmington, NC</b>	53.4	5.2	241.8	-	166.3	-	3.4	54.2	13.7	169.1	0.7	-	707.7
<b>Mid-Atlantic Georgetown, SC</b>	19.9	-	3.1	-	22.3	-	-	-	-	-	-	0.4	45.7
<b>Mid-Atlantic Charleston, SC</b>	71.5	-	3,963.2	-	132.6	147.0	9.7	316.2	14.8	134.7	7.3	0.6	4,797.6
<b>Mid-Atlantic Savannah, GA</b>	113.0	7.8	3,991.4	-	235.3	17.6	82.4	266.1	4.5	205.4	1.3	0.7	4,925.5
<b>Southeastern US</b>													
Brunswick, GA	92.7	-	122.7	-	100.9	15.1	54.5	753.8	-	8.0	-	-	1,147.7
Fernandina, FL	20.1	-	227.9	2.1	259.4	20.5	187.1	1.2	-	0.3	26.8	-	745.5
Jacksonville, FL	265.2	4.9	1,589.0	314.5	504.3	176.5	26.9	1,603.7	31.7	593.3	422.0	9.4	5,541.5
Port Canaveral, FL	11.3	0.3	7.8	0.6	17.8	705.9	18.8	10.4	0.5	5.4	1.3	0.1	780.2
<b>Total</b>	2,092.2	121.5	27,851.6	329.7	2,498.8	2,569.9	2,231.6	7,008.5	1,453.6	6,469.2	505.7	26.1	53,158.3

a/ Includes recreational vessels.

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

**Table 4-26. Alternative 6: Direct Economic Impact on Shipping Industry by Port Area and Type of Vessel, 2004 (\$000s)**

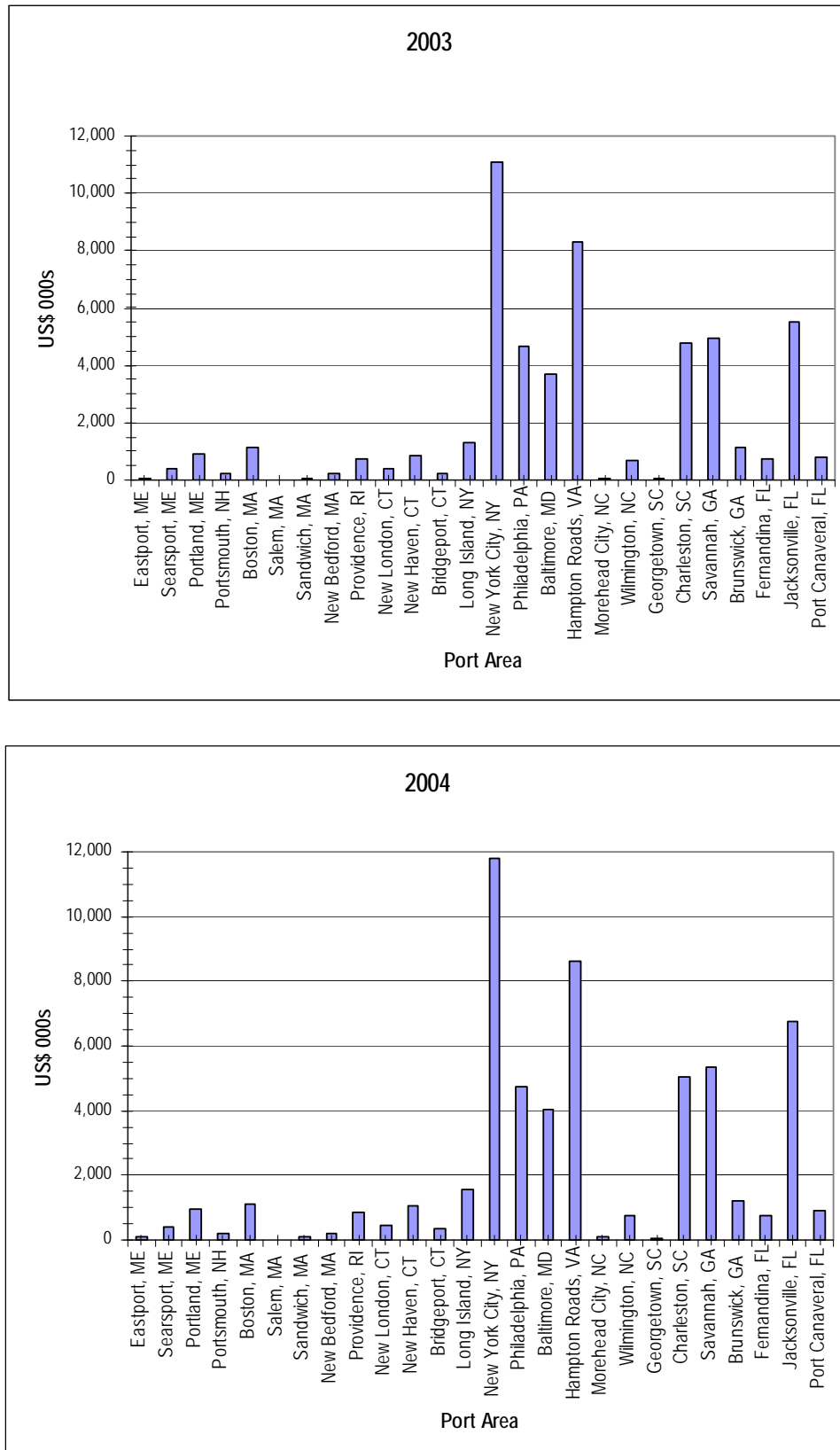
Port Area	Bulk Carriers	Combination Carriers	Containerships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	Total
<b>Northeastern US - Gulf of Maine</b>													
Eastport, ME	19.5	-	40.2	-	59.1	-	-	-	-	-	-	-	118.8
Searsport, ME	5.8	-	7.2	0.6	1.1	281.0	-	0.6	18.2	99.6	2.2	-	416.2
Portland, ME	56.1	2.9	7.1	0.6	33.1	127.5	-	53.8	44.0	608.0	22.1	0.3	955.4
Portsmouth, NH	43.3	4.0	0.3	-	34.9	2.4	-	-	0.5	89.7	4.3	3.1	182.5
<b>Northeastern US - Off Race Point</b>													
Boston, MA	28.4	0.4	431.7	0.5	8.1	222.6	5.2	42.4	-	389.6	0.3	1.5	1,130.8
Salem, MA	4.0	-	-	-	-	19.4	-	-	-	-	-	-	23.4
<b>Northeastern US - Cape Cod Bay</b>	-	-	-	-	-	36.5	-	-	0.1	43.5	0.1	-	80.2
<b>Mid-Atlantic Block Island Sound</b>													
New Bedford, MA	88.8	-	-	-	27.5	-	41.3	5.1	-	19.7	-	-	182.4
Providence, RI	92.1	5.1	-	-	70.2	172.4	-	247.8	3.7	254.6	4.3	4.1	854.3
New London, CT	17.2	-	48.6	-	121.3	133.9	-	-	91.9	18.4	1.5	-	432.9
New Haven, CT	32.3	-	26.6	-	71.9	-	-	-	664.7	252.6	19.8	-	1,067.9
Bridgeport, CT	81.0	-	-	0.4	-	-	-	-	246.1	30.6	-	0.3	358.4
Long Island, NY	-	-	-	3.3	-	267.8	-	-	856.6	432.9	-	0.8	1,561.3
<b>Mid-Atlantic Ports of New York/New Jersey</b>	175.6	22.2	8,051.6	-	127.1	605.5	101.2	1,394.5	9.8	1,296.4	15.5	0.8	11,800.3
<b>Mid-Atlantic Delaware Bay</b>	211.1	4.0	1,051.6	24.5	315.5	69.6	1,573.4	236.5	5.5	1,219.8	26.1	1.1	4,738.8
<b>Mid-Atlantic Chesapeake Bay</b>													
Baltimore, MD	289.1	8.0	1,338.3	-	357.7	213.3	26.9	1,477.6	1.7	315.6	6.7	4.0	4,038.7
Hampton Roads, VA	337.4	26.1	6,835.1	2.2	232.0	316.8	52.1	545.6	1.7	257.2	10.5	4.8	8,621.5
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>	16.3	0.9	27.3	-	21.3	20.6	-	-	-	32.5	-	-	118.8
<b>Mid-Atlantic Wilmington, NC</b>	44.8	3.0	230.1	-	206.5	18.5	-	66.7	10.9	182.9	0.7	-	763.9
<b>Mid-Atlantic Georgetown, SC</b>	17.4	0.5	2.7	-	34.7	5.6	-	-	-	-	-	-	61.0
<b>Mid-Atlantic Charleston, SC</b>	63.3	0.5	4,118.8	-	162.1	247.1	17.1	285.4	4.6	132.4	9.7	1.7	5,042.7
<b>Mid-Atlantic Savannah, GA</b>	110.3	7.6	4,063.3	-	269.0	197.9	124.0	329.8	1.5	250.6	2.0	0.4	5,356.5
<b>Southeastern US</b>													
Brunswick, GA	93.0	-	61.1	-	164.0	63.4	55.7	783.6	-	0.2	-	5.0	1,226.0
Fernandina, FL	46.9	-	181.7	5.9	268.0	128.7	81.5	22.2	-	-	42.9	-	777.8
Jacksonville, FL	288.8	9.7	1,679.2	276.2	489.5	1,039.4	29.6	1,670.2	41.9	628.0	556.2	26.8	6,735.5
Port Canaveral, FL	15.3	-	8.8	1.6	24.4	825.1	15.8	14.3	2.6	9.3	5.9	0.2	923.1
<b>Total</b>	<b>2,177.9</b>	<b>94.8</b>	<b>28,211.2</b>	<b>315.7</b>	<b>3,099.0</b>	<b>5,015.1</b>	<b>2,123.9</b>	<b>7,176.1</b>	<b>2,005.8</b>	<b>6,563.9</b>	<b>730.7</b>	<b>55.0</b>	<b>57,569.2</b>

a/ Includes recreational vessels

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

**Figure 4-13. Alternative 6: Direct Economic Impact on Shipping Industry by Port Area, 2003 and 2004 (\$000s)**



## SUMMARY

In this section we compare the direct economic impact on the shipping industry of operational measures proposed for Alternatives 2 through Alternative 6 by port area for 2003 and 2004. We also present the estimated direct economic impact for U.S.-flag and foreign-flag vessels. The alternatives are discussed in descending order in terms of highest direct economic impact in 2003.

- **Alternative 5 - Combination of Alternatives** has the highest direct economic impact on the shipping industry at \$137.0 million in 2003 (Table 4-27). This alternative also has the highest direct economic impact on U.S.-flag vessels at \$14.9 million and foreign-flag vessels at \$122.1 million in 2003. With the exception of the port area of Port Canaveral,<sup>51</sup> this alternative results in the highest direct economic impact on the shipping industry for each port area.
- **Alternative 3- Speed Restrictions in Designated Areas** has the second highest direct economic impact on the shipping industry at \$133.0 million in 2003. This alternative also has the second highest direct economic impact on U.S.-flag vessels at \$14.0 million and foreign-flag vessels at \$119.0 million in 2003. With the exception of the four port areas of the Southeastern U.S., this alternative results in the second highest direct economic impact on the shipping industry for each port area.
- **Alternative 6- Preferred Alternative** has the third highest direct economic impact on the shipping industry at \$53.2 million in 2003. This is 38.9 percent of the direct economic impact estimated for Alternative 5. Alternative 6 also has the third highest direct economic impact on U.S.-flag vessels at \$7.2 million and foreign-flag vessels at \$46.0 million in 2003. This alternative has the second highest direct economic impact of the alternatives proposed for the Southeast port areas of Brunswick, Fernandina and Jacksonville. For all other port areas, Alternative 6 ranks third in terms of highest direct economic impact.
- **Alternative 2- Use of DMAs** ranks fourth in terms of highest direct economic impact on the shipping industry at \$25.0 million in 2003. This alternative also has the fourth highest direct economic impact on U.S.-flag vessels at \$2.2 million and foreign-flag vessels at \$22.9 million in 2003. For the port area of Port Canaveral, Alternative 2 results in the highest direct economic impact of the alternatives proposed at \$3.9 million. For all other port areas it ranks fourth.

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<sup>51</sup> Alternative 2 shows the highest direct economic impact for the port area of Port Canaveral as the effective distance for the DMAs is 39.6 nautical miles for an assumed 75 days per year. Under Alternative 5, the effective distance for the seasonal speed restriction is limited to 4.5 nautical miles through the right whale critical habitat area and the DMAs are assumed to occur for only 15 days per year outside the seasonal speed restriction period.



- **Alternative 4 - Use of Recommended Routes** has the lowest direct economic impact of the proposed alternatives at \$2.3 million in 2003. This alternative also has the lowest direct economic impact on U.S.-flag vessels at \$0.7 million and foreign-flag vessels at \$1.6 million in 2003.

Table 4-28 presents a comparison of the direct economic impact of the operational measures proposed for each alternative for 2004.

**Table 4-27. Direct Economic Impact on Shipping Industry for U.S. and Foreign Flag Vessels by Port Area and Alternative, 2003 (\$000s)**

Port Area	Alternative 2			Alternative 3			Alternative 4			Alternative 5			Alternative 6		
	US	Foreign	Total	US	Foreign	Total	US	Foreign	Total	US	Foreign	Total	US	Foreign	Total
<b>Northeastern US - Gulf of Maine</b>															
Eastport, ME	-	51.6	51.6	-	262.3	262.3	-	-	-	-	273.7	273.7	-	62.9	62.9
Searsport, ME	24.1	443.3	467.4	122.7	2,254.8	2,377.5	-	-	-	128.0	2,352.6	2,480.6	24.1	359.5	383.5
Portland, ME	29.2	648.5	677.7	148.6	3,298.5	3,447.2	-	-	-	155.1	3,441.6	3,596.7	51.0	858.5	909.5
Portsmouth, NH	9.3	148.8	158.1	47.3	756.8	804.1	-	-	-	49.3	789.6	838.9	15.0	227.7	242.7
<b>Northeastern US - Off Race Point</b>															
Boston, MA	6.8	795.3	802.1	35.8	4,208.7	4,244.4	-	-	-	37.3	4,384.1	4,421.4	9.3	1,121.4	1,130.8
Salem, MA	0.6	8.7	9.3	3.1	46.3	49.4	-	-	-	3.2	48.2	51.4	0.4	15.9	16.2
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Northeastern US - Cape Cod Bay</b>	-	15.7	15.7	-	216.5	216.5	-	-	-	-	218.7	218.7	-	78.4	78.4
<b>Mid-Atlantic Block Island Sound</b>															
New Bedford, MA	2.8	16.1	18.9	72.5	294.3	366.9	-	-	-	72.5	294.3	366.9	48.1	176.1	224.2
Providence, RI	3.3	103.9	107.2	70.9	1,724.3	1,795.2	-	-	-	70.9	1,724.3	1,795.2	47.6	720.0	767.6
New London, CT	34.7	10.3	45.0	727.8	177.5	905.4	-	-	-	727.8	177.5	905.4	333.7	85.0	418.7
New Haven, CT	48.4	47.6	96.0	956.0	845.7	1,801.7	-	-	-	956.0	845.7	1,801.7	444.5	396.0	840.5
Bridgeport, CT	34.2	14.2	48.4	512.6	134.8	647.4	-	-	-	512.6	134.8	647.4	179.6	50.5	230.2
Long Island, NY	118.8	25.4	144.1	2,292.4	558.2	2,850.6	-	-	-	2,292.4	558.2	2,850.6	1,055.0	244.3	1,299.3
<b>Mid-Atlantic Ports of New York/New Jersey</b>	177.4	2,685.1	2,862.5	2,423.2	34,173.7	36,596.9	-	-	-	2,423.2	34,173.7	36,596.9	749.1	10,331.7	11,080.7
<b>Mid-Atlantic Delaware Bay</b>	17.1	815.2	832.3	242.5	13,305.4	13,547.8	-	-	-	242.5	13,305.4	13,547.8	86.3	4,577.5	4,663.8
<b>Mid-Atlantic Chesapeake Bay</b>															
Baltimore, MD	25.8	684.9	710.8	409.4	10,625.5	11,034.9	-	-	-	409.4	10,625.5	11,034.9	138.6	3,581.2	3,719.8
Hampton Roads, VA	159.4	1,465.0	1,624.4	2,412.3	22,087.8	24,500.1	-	-	-	2,412.3	22,087.8	24,500.1	835.3	7,485.8	8,321.1
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>	2.5	24.7	27.2	12.7	180.6	193.2	-	-	-	12.7	180.6	193.2	4.7	72.2	76.9
<b>Mid-Atlantic Wilmington, NC</b>	17.1	170.0	187.2	130.9	1,447.4	1,578.3	-	-	-	130.9	1,447.4	1,578.3	57.4	650.4	707.7
<b>Mid-Atlantic Georgetown, SC</b>	0.1	15.4	15.5	0.8	97.4	98.2	-	-	-	0.8	97.4	98.2	0.4	45.3	45.7
<b>Mid-Atlantic Charleston, SC</b>	276.2	1,150.5	1,426.8	1,943.8	7,928.8	9,872.6	-	-	-	1,943.8	7,928.8	9,872.6	961.5	3,836.1	4,797.6
<b>Mid-Atlantic Savannah, GA</b>	171.3	6,681.6	6,852.9	260.1	9,891.2	10,151.3	-	-	-	260.1	9,891.2	10,151.3	142.6	4,782.9	4,925.5
<b>Southeastern US</b>															
Brunswick, GA	64.1	689.1	753.1	94.4	754.0	848.3	22.6	208.8	231.4	122.5	1,042.3	1,164.8	120.6	1,027.1	1,147.7
Fernandina, FL	9.5	319.9	329.4	27.6	503.3	530.9	24.2	220.0	244.2	49.3	707.3	756.6	48.7	696.8	745.5
Jacksonville, FL	878.3	1,983.5	2,861.9	1,082.9	2,477.9	3,560.7	691.6	1,166.2	1,857.8	1,876.6	3,872.3	5,748.9	1,813.5	3,728.0	5,541.5
Port Canaveral, FL	42.3	3,858.8	3,901.1	11.0	717.0	728.0	-	-	-	19.5	1,488.8	1,508.2	8.5	771.8	780.2
<b>Total</b>	2,153.4	22,873.1	25,026.5	14,041.2	118,968.7	133,009.9	738.4	1,595.0	2,333.4	14,908.6	122,091.8	137,000.4	7,175.4	45,982.9	53,158.3

Source: Nathan Associates Inc.

**Table 4-28. Direct Economic Impact on Shipping Industry for U.S. and Foreign Flag Vessels by Port Area and Alternative, 2004 (\$000s)**

Port Area	Alternative 2			Alternative 3			Alternative 4			Alternative 5			Alternative 6		
	US	Foreign	Total	US	Foreign	Total	US	Foreign	Total	US	Foreign	Total	US	Foreign	Total
<b>Northeastern US - Gulf of Maine</b>															
Eastport, ME	-	87.3	87.3	-	444.0	444.0	-	-	-	-	463.3	463.3	-	118.8	118.8
Searsport, ME	65.4	455.1	520.4	332.5	2,314.6	2,647.1	-	-	-	346.9	2,415.0	2,761.9	53.0	363.2	416.2
Portland, ME	70.0	674.3	744.3	355.9	3,429.6	3,785.5	-	-	-	371.3	3,578.4	3,949.7	93.6	861.8	955.4
Portsmouth, NH	5.8	132.5	138.4	29.6	674.1	703.7	-	-	-	30.9	703.4	734.2	3.8	178.6	182.5
<b>Northeastern US - Off Race Point</b>															
Boston, MA	6.8	795.3	802.1	35.8	4,208.7	4,244.4	-	-	-	37.3	4,384.1	4,421.4	9.3	1,121.4	1,130.8
Salem, MA	7.1	28.3	35.4	37.4	149.8	187.2	-	-	-	39.0	156.0	195.0	4.7	18.7	23.4
<b>Northeastern US - Cape Cod Bay</b>	2.2	27.1	29.3	30.9	374.6	405.5	-	-	-	31.2	378.4	409.7	1.0	79.2	80.2
<b>Mid-Atlantic Block Island Sound</b>															
New Bedford, MA	3.4	14.5	17.9	32.6	252.2	284.7	-	-	-	32.6	252.2	284.7	21.3	161.1	182.4
Providence, RI	10.2	99.9	110.0	141.7	1,921.1	2,062.8	-	-	-	141.7	1,921.1	2,062.8	68.7	785.7	854.3
New London, CT	51.6	29.2	80.9	612.4	437.8	1,050.2	-	-	-	612.4	437.8	1,050.2	236.5	196.4	432.9
New Haven, CT	74.6	39.9	114.5	1,538.1	721.0	2,259.1	-	-	-	1,538.1	721.0	2,259.1	737.1	330.8	1,067.9
Bridgeport, CT	45.1	12.6	57.8	765.1	162.4	927.5	-	-	-	765.1	162.4	927.5	275.4	83.1	358.4
Long Island, NY	136.0	25.3	161.3	2,781.7	481.4	3,263.1	-	-	-	2,781.7	481.4	3,263.1	1,328.5	232.8	1,561.3
<b>Mid-Atlantic Ports of New York/New Jersey</b>	179.0	2,950.3	3,129.3	2,414.6	36,724.9	39,139.5	-	-	-	2,414.6	36,724.9	39,139.5	721.9	11,078.4	11,800.3
<b>Mid-Atlantic Delaware Bay</b>	25.9	833.7	859.6	413.8	13,055.8	13,469.7	-	-	-	413.8	13,055.8	13,469.7	133.2	4,605.6	4,738.8
<b>Mid-Atlantic Chesapeake Bay</b>															
Baltimore, MD	35.3	788.6	823.9	493.4	11,828.5	12,321.9	-	-	-	493.4	11,828.5	12,321.9	157.8	3,880.9	4,038.7
Hampton Roads, VA	166.6	1,502.8	1,669.4	2,529.4	22,729.3	25,258.7	-	-	-	2,529.4	22,729.3	25,258.7	880.8	7,740.8	8,621.5
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>	7.1	27.6	34.7	54.0	203.4	257.4	-	-	-	54.0	203.4	257.4	26.5	92.4	118.8
<b>Mid-Atlantic Wilmington, NC</b>	18.1	179.6	197.7	175.2	1,463.9	1,639.1	-	-	-	175.2	1,463.9	1,639.1	83.4	680.5	763.9
<b>Mid-Atlantic Georgetown, SC</b>	0.9	13.8	14.7	10.6	122.1	132.7	-	-	-	10.6	122.1	132.7	5.6	55.4	61.0
<b>Mid-Atlantic Charleston, SC</b>	317.2	1,193.1	1,510.3	2,191.7	8,227.3	10,418.9	-	-	-	2,191.7	8,227.3	10,418.9	1,076.7	3,966.1	5,042.7
<b>Mid-Atlantic Savannah, GA</b>	219.5	7,043.9	7,263.4	369.5	10,634.6	11,004.1	-	-	-	369.5	10,634.6	11,004.1	206.4	5,150.0	5,356.5
<b>Southeastern US</b>															
Brunswick, GA	109.8	622.3	732.1	155.5	760.3	915.9	42.0	211.0	253.0	207.4	1,037.1	1,244.5	204.3	1,021.7	1,226.0
Fernandina, FL	75.0	297.1	372.1	111.6	421.4	533.0	68.7	197.6	266.3	177.5	611.4	788.9	175.2	602.6	777.8
Jacksonville, FL	953.1	2,503.2	3,456.3	1,193.4	3,124.5	4,317.9	793.4	1,477.9	2,271.3	2,096.4	4,890.6	6,987.0	2,026.8	4,708.6	6,735.5
Port Canaveral, FL	92.7	4,523.0	4,615.7	13.1	790.1	803.2	-	-	-	31.6	1,694.7	1,726.3	18.5	904.6	923.1
<b>Total</b>	2,678.4	24,900.4	27,578.8	16,819.3	125,657.5	142,476.8	904.0	1,886.5	2,790.6	17,893.1	129,278.2	147,171.3	8,550.0	49,019.2	57,569.2

Source: Nathan Associates Inc.

## SENSITIVITY ANALYSIS

NMFS is proposing in the final rule that speed restrictions will be implemented at 10 knots and in this study, we have used 10 knots as the base case assumption. However in this sensitivity analysis we identify the direct economic impact on the shipping industry of speed restrictions of 12 and 14 knots.

Table 4-29 presents the results of the sensitivity analysis by port area for 2004. The ranking of the alternatives in terms of economic impact does not change with restricted speeds of 12 knots or 14 knots. A change of the speed restriction from 10 knots to 12 knots would generally reduce the direct economic impact of each alternative by 37 percent, whereas a change in the restricted speed to from 10 knots to 14 knots would generally lower the direct economic impact of each alternative by more than 60 percent.<sup>52</sup>

The results of the sensitivity analysis show that alternative restricted speed levels dramatically alter the direct economic impact. For example under Alternative 5, the direct economic impact ranges from \$147.2 million with a restricted speed of 10 knots to \$55.2 million at 14 knots. For Alternative 6, the range is from \$57.6 million to \$21.5 million.

At a restricted speed of 12 knots, the direct economic impact on the shipping industry is \$92.8million for Alternative 5; \$89.2 million for Alternative 3; \$36.0 million dollars for Alternative 6; \$17.7 million for Alternative 2; and \$2.8 million for Alternative 4.

At a restricted speed of 14 knots, the direct economic impact on the shipping industry is \$55.2 million for Alternative 5; \$52.5 million for Alternative 3; \$21.5 million dollars for Alternative 6; \$10.8 million dollars for Alternative 2; and \$2.8 million for Alternative 4.

Table 4-30 displays the sensitivity analysis results for each alternative using the economic impact of the 10-knot speed restriction as an index. Thus this table shows the percentage of the direct economic impact of a 12-knot speed or 14-knot speed restriction relative to the impact presented for a 10-knot speed restriction. It is evident that changes in economic impacts due to alternative speed restrictions are not uniformly incurred by all port areas. Port areas that are characterized by arrivals of slower vessels show a disproportionate decrease in economic impact when the restricted speed is changed from 10 knots to 12 knots, as fewer vessels are affected at the higher limit. The port areas within Block Island Sound demonstrate this phenomenon. Other port areas such as Charleston and Hampton Roads, whose arrivals consist more of faster vessels, do not show as dramatic a decrease in direct economic impacts at alternative restricted speeds of 12 knots. This is because the economic

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<sup>52</sup> The exception is Alternative 4 that does not change with restricted speeds as this alternative uses the time to cover the increased distance of recommended routes at normal vessel operating speed.

impact at 12 knots is not more significant for these port areas than those with arrivals of slower vessels and in relative terms do not have many slower vessels that are only affected at the slower restricted speed.

**Table 4-29. Direct Economic Impact on Shipping Industry at Restricted Speeds of 10, 12 and 14 knots, 2004 (\$000s)**

Port Area	Alternative 2			Alternative 3			Alternative 4			Alternative 5			Alternative 6		
	Restriction speed in knots			Restriction speed in knots			Restriction speed in knots			Restriction speed in knots			Restriction speed in knots		
	10	12	14	10	12	14	10	12	14	10	12	14	10	12	14
<b>Northeastern US - Gulf of Maine</b>															
Eastport, ME	87.3	54.0	33.4	444.0	275.5	170.6	-	-	-	463.3	287.4	178.0	118.8	73.2	45.7
Searsport, ME	520.4	313.2	161.3	2,647.1	1,596.6	823.7	-	-	-	2,761.9	1,665.7	859.3	416.2	240.3	110.5
Portland, ME	744.3	380.4	136.3	3,785.5	1,938.7	696.4	-	-	-	3,949.7	2,022.6	726.4	955.4	464.6	138.0
Portsmouth, NH	138.4	60.9	13.9	703.7	310.5	70.9	-	-	-	734.2	323.9	74.0	182.5	79.6	18.2
<b>Northeastern US - Off Race Point</b>															
Boston, MA	802.1	460.0	217.7	4,244.4	2,339.7	1,065.9	-	-	-	4,421.4	2,441.2	1,113.9	1,130.8	630.8	291.6
Salem, MA	35.4	20.4	10.0	187.2	103.9	48.8	-	-	-	195.0	108.4	51.0	23.4	13.5	6.6
<b>Northeastern US - Cape Cod Bay</b>															
	29.3	20.4	11.6	405.5	234.9	114.3	-	-	-	409.7	237.8	116.0	80.2	44.5	18.0
<b>Mid-Atlantic Block Island Sound</b>															
New Bedford, MA	17.9	8.0	1.8	284.7	118.8	19.8	-	-	-	284.7	118.8	19.8	182.4	75.1	13.5
Providence, RI	110.0	63.0	31.4	2,062.8	1,144.2	534.5	-	-	-	2,062.8	1,144.2	534.5	854.3	438.8	176.4
New London, CT	80.9	46.5	21.6	1,050.2	585.3	261.6	-	-	-	1,050.2	585.3	261.6	432.9	234.1	101.3
New Haven, CT	114.5	49.2	6.3	2,259.1	944.3	106.2	-	-	-	2,259.1	944.3	106.2	1,067.9	441.4	48.9
Bridgeport, CT	57.8	23.0	2.1	927.5	332.1	3.1	-	-	-	927.5	332.1	3.1	358.4	125.1	1.3
Long Island, NY	161.3	71.0	11.2	3,263.1	1,397.3	208.0	-	-	-	3,263.1	1,397.3	208.0	1,561.3	655.4	94.9
<b>Mid-Atlantic Ports of New York/New Jersey</b>															
	3,129.3	2,118.0	1,375.0	39,139.5	26,088.1	16,704.8	-	-	-	39,139.5	26,088.1	16,704.8	11,800.3	7,743.8	4,891.4
<b>Mid-Atlantic Delaware Bay</b>															
	859.6	504.4	253.3	13,469.7	7,766.7	3,842.3	-	-	-	13,469.7	7,766.7	3,842.3	4,738.8	2,700.3	1,322.3
<b>Mid-Atlantic Chesapeake Bay</b>															
Baltimore, MD	823.9	530.3	319.5	12,321.9	7,773.2	4,601.6	-	-	-	12,321.9	7,773.2	4,601.6	4,038.7	2,511.4	1,469.6
Hampton Roads, VA	1,669.4	1,153.5	779.2	25,258.7	17,123.4	11,360.5	-	-	-	25,258.7	17,123.4	11,360.5	8,621.5	5,755.6	3,765.1
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>															
	34.7	18.1	7.4	257.4	132.2	52.8	-	-	-	257.4	132.2	52.8	118.8	61.8	24.8
<b>Mid-Atlantic Wilmington, NC</b>															
	197.7	115.7	61.1	1,639.1	926.5	472.1	-	-	-	1,639.1	926.5	472.1	763.9	435.1	223.8
<b>Mid-Atlantic Georgetown, SC</b>															
	14.7	7.2	3.5	132.7	64.6	30.1	-	-	-	132.7	64.6	30.1	61.0	30.1	14.1
<b>Mid-Atlantic Charleston, SC</b>															
	1,510.3	1,053.2	717.3	10,418.9	6,979.3	4,566.4	-	-	-	10,418.9	6,979.3	4,566.4	5,042.7	3,379.2	2,212.4
<b>Mid-Atlantic Savannah, GA</b>															
	7,263.4	5,008.1	3,384.6	11,004.1	7,292.1	4,742.0	-	-	-	11,004.1	7,292.1	4,742.0	5,356.5	3,552.0	2,309.0
<b>Southeastern US</b>															
Brunswick, GA	732.1	459.4	273.7	915.9	556.9	321.2	253.0	253.0	253.0	1,244.5	839.4	560.3	1,226.0	828.2	553.8
Fernandina, FL	372.1	207.6	104.8	533.0	282.0	136.5	266.3	266.3	266.3	788.9	519.5	330.1	777.8	513.6	327.2
Jacksonville, FL	3,456.3	2,011.4	1,106.7	4,317.9	2,429.2	1,294.9	2,271.3	2,271.3	2,271.3	6,987.0	4,575.6	3,094.2	6,735.5	4,434.1	3,018.8
Port Canaveral, FL	4,615.7	2,943.9	1,737.1	803.2	493.5	281.2	-	-	-	1,726.3	1,082.3	628.6	923.1	588.8	347.4
<b>Total</b>	<b>27,578.8</b>	<b>17,700.7</b>	<b>10,781.8</b>	<b>142,476.8</b>	<b>89,229.6</b>	<b>52,530.3</b>	<b>2,790.6</b>	<b>2,790.6</b>	<b>2,790.6</b>	<b>147,171.3</b>	<b>92,772.0</b>	<b>55,237.8</b>	<b>57,569.2</b>	<b>36,050.4</b>	<b>21,544.6</b>

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

**Table 4-30. Direct Economic Impact on Shipping Industry at Restricted Speeds of 10, 12 and 14 knots, 2004 (Indexed 10 knots = 100)**

Port Area	Alternative 2			Alternative 3			Alternative 4			Alternative 5			Alternative 6		
	Restriction speed in knots			Restriction speed in knots			Restriction speed in knots			Restriction speed in knots			Restriction speed in knots		
	10	12	14	10	12	14	10	12	14	10	12	14	10	12	14
<b>Northeastern US - Gulf of Maine</b>															
Eastport, ME	100.0	61.9	38.3	100.0	62.0	38.4	-	-	-	100.0	62.0	38.4	100.0	61.7	38.4
Searsport, ME	100.0	60.2	31.0	100.0	60.3	31.1	-	-	-	100.0	60.3	31.1	100.0	57.7	26.6
Portland, ME	100.0	51.1	18.3	100.0	51.2	18.4	-	-	-	100.0	51.2	18.4	100.0	48.6	14.4
Portsmouth, NH	100.0	44.0	10.0	100.0	44.1	10.1	-	-	-	100.0	44.1	10.1	100.0	43.6	10.0
<b>Northeastern US - Off Race Point</b>															
Boston, MA	100.0	57.3	27.1	100.0	55.1	25.1	-	-	-	100.0	55.2	25.2	100.0	55.8	25.8
Salem, MA	100.0	57.7	28.2	100.0	55.5	26.1	-	-	-	100.0	55.6	26.2	100.0	57.7	28.2
<b>Northeastern US - Cape Cod Bay</b>	100.0	69.5	39.4	100.0	57.9	28.2	-	-	-	100.0	58.0	28.3	100.0	55.5	22.5
<b>Mid-Atlantic Block Island Sound</b>															
New Bedford, MA	100.0	44.8	10.0	100.0	41.7	7.0	-	-	-	100.0	41.7	7.0	100.0	41.2	7.4
Providence, RI	100.0	57.3	28.6	100.0	55.5	25.9	-	-	-	100.0	55.5	25.9	100.0	51.4	20.7
New London, CT	100.0	57.5	26.8	100.0	55.7	24.9	-	-	-	100.0	55.7	24.9	100.0	54.1	23.4
New Haven, CT	100.0	42.9	5.5	100.0	41.8	4.7	-	-	-	100.0	41.8	4.7	100.0	41.3	4.6
Bridgeport, CT	100.0	39.8	3.6	100.0	35.8	0.3	-	-	-	100.0	35.8	0.3	100.0	34.9	0.4
Long Island, NY	100.0	44.0	7.0	100.0	42.8	6.4	-	-	-	100.0	42.8	6.4	100.0	42.0	6.1
<b>Mid-Atlantic Ports of New York/New Jersey</b>	100.0	67.7	43.9	100.0	66.7	42.7	-	-	-	100.0	66.7	42.7	100.0	65.6	41.5
<b>Mid-Atlantic Delaware Bay</b>	100.0	58.7	29.5	100.0	57.7	28.5	-	-	-	100.0	57.7	28.5	100.0	57.0	27.9
<b>Mid-Atlantic Chesapeake Bay</b>															
Baltimore, MD	100.0	64.4	38.8	100.0	63.1	37.3	-	-	-	100.0	63.1	37.3	100.0	62.2	36.4
Hampton Roads, VA	100.0	69.1	46.7	100.0	67.8	45.0	-	-	-	100.0	67.8	45.0	100.0	66.8	43.7
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>	100.0	52.0	21.2	100.0	51.4	20.5	-	-	-	100.0	51.4	20.5	100.0	52.0	20.9
<b>Mid-Atlantic Wilmington, NC</b>	100.0	58.5	30.9	100.0	56.5	28.8	-	-	-	100.0	56.5	28.8	100.0	57.0	29.3
<b>Mid-Atlantic Georgetown, SC</b>	100.0	49.0	24.1	100.0	48.7	22.7	-	-	-	100.0	48.7	22.7	100.0	49.4	23.1
<b>Mid-Atlantic Charleston, SC</b>	100.0	69.7	47.5	100.0	67.0	43.8	-	-	-	100.0	67.0	43.8	100.0	67.0	43.9
<b>Mid-Atlantic Savannah, GA</b>	100.0	68.9	46.6	100.0	66.3	43.1	-	-	-	100.0	66.3	43.1	100.0	66.3	43.1
<b>Southeastern US</b>															
Brunswick, GA	100.0	62.7	37.4	100.0	60.8	35.1	100.0	100.0	100.0	100.0	67.4	45.0	100.0	67.5	45.2
Fernandina, FL	100.0	55.8	28.2	100.0	52.9	25.6	100.0	100.0	100.0	100.0	65.9	41.8	100.0	66.0	42.1
Jacksonville, FL	100.0	58.2	32.0	100.0	56.3	30.0	100.0	100.0	100.0	100.0	65.5	44.3	100.0	65.8	44.8
Port Canaveral, FL	100.0	63.8	37.6	100.0	61.4	35.0	-	-	-	100.0	62.7	36.4	100.0	63.8	37.6
<b>Total</b>	100.0	64.2	39.1	100.0	62.6	36.9	100.0	100.0	100.0	100.0	63.0	37.5	100.0	62.6	37.4

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

## **ADDITIONAL DIRECT ECONOMIC IMPACT ON THE SHIPPING INDUSTRY DUE TO MULTIPLE PORT CALLS DURING RESTRICTED PERIODS**

Many of the vessels arrivals at U.S. East Coast ports occur as part of a “string” of port calls by the vessel. For containerships, ro-ro cargo ships and some specialty tankers these multi-port calls constitute a scheduled cargo service offered by the shipping lines. Other types of vessels may have multiple U.S. East Coast port calls as part of a coastwise cabotage service, for delivery of specialty chemicals or other products, or to lighten or top off in order to maximize vessel utilization.

Shipping industry representatives and port officials raised concerns during the stakeholder meetings regarding the cumulative effect of NOAA’s preferred operational measures for Right Whale Ship Strike Reduction and alternatives on vessels calling at multiple U.S. East Coast ports during speed-restricted periods. In this section we identify the number of vessel arrivals at each port area that are part of multi-port string during proposed restriction periods and estimate the additional direct economic impact on the shipping industry.

We used U.S. Coast Guard Vessel Arrival Database described in Chapter 2 to determine which vessels made multiple port calls along the U.S. East Coast in 2003 and 2004. For purposes of this analysis, if a vessel arrived at another U.S. East Coast port area within two days after its arrival at the preceding U.S. East Coast port, that arrival was considered to be part of a multi-port string.<sup>53</sup>

Table 4-31 lists sets of multi-port strings that occurred at least 20 times in 2003. Of the total 4,278 occurrences of multi-port strings in 2003, those strings with at least 20 occurrences totaled 2,760 or 65 percent of the total observed. The multi-port string of New York/New Jersey–Hampton Roads–Charleston was the most frequent with 293 occurrences in 2003 followed by the string of New York/New Jersey–Hampton Roads–Savannah with 194 occurrences. The string of New York/New Jersey–Hampton Roads was third with 151 occurrences in 2003.

Table 4-32 presents a similar listing of U.S. East Coast multi-port strings in 2004. Those strings with 20 or more occurrences accounted for 63 percent of the 4,461 total occurrences of multi-port strings that year. While some of the rankings change slightly, it is interesting to note that the port areas of New York/New Jersey or Hampton Roads are part of each of the top ten multi-port strings in 2003 and 2004.

Other port areas with significant participation in multi-port strings each year include Charleston, Savannah, Baltimore, and Philadelphia.

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<sup>53</sup> Vessels making multiple port calls within the same port area were not considered as part of a multi-port string as they would not be passing through a speed restricted area for the second port call.



**Table 4-31. U.S. East Coast: Most Frequent Multi-Port Strings, 2003**

Port Area 1	Port Area 2	Port Area 3	Port Area 4	Occurrences
New York City, NY	Hampton Roads, VA	Charleston, SC		293
New York City, NY	Hampton Roads, VA	Savannah, GA		194
New York City, NY	Hampton Roads, VA			151
Hampton Roads, VA	New York City, NY			143
New York City, NY	Baltimore, MD			139
New York City, NY	Philadelphia, PA			104
Charleston, SC	Hampton Roads, VA	New York City, NY		93
Baltimore, MD	New York City, NY			92
Savannah, GA	Hampton Roads, VA	New York City, NY		84
Savannah, GA	Hampton Roads, VA			76
Charleston, SC	Hampton Roads, VA			69
Charleston, SC	Jacksonville, FL			67
Savannah, GA	New York City, NY			65
Savannah, GA	Charleston, SC			58
Baltimore, MD	Hampton Roads, VA			54
Philadelphia, PA	Hampton Roads, VA			54
Charleston, SC	Wilmington, NC			53
Brunswick, GA	Charleston, SC			46
New York City, NY	Savannah, GA			46
Charleston, SC	New York City, NY			45
New York City, NY	Charleston, SC			43
Charleston, SC	Savannah, GA			41
Philadelphia, PA	New York City, NY			38
Hampton Roads, VA	Savannah, GA			38
Savannah, GA	Charleston, SC	Hampton Roads, VA	New York City, NY	37
Hampton Roads, VA	Charleston, SC			36
Jacksonville, FL	New York City, NY			36
Jacksonville, FL	Charleston, SC			35
Wilmington, NC	Savannah, GA			35
New York City, NY	Hampton Roads, VA	Charleston, SC	New York City, NY	33
Long Island, NY	New York City, NY			33
Philadelphia, PA	Baltimore, MD			28
Savannah, GA	Philadelphia, PA			28
New York City, NY	Baltimore, MD	Hampton Roads, VA		27
Jacksonville, FL	Baltimore, MD	New York City, NY		27
New York City, NY	Baltimore, MD	Savannah, GA		26
Hampton Roads, VA	Philadelphia, PA			26
Jacksonville, FL	Savannah, GA			26
New York City, NY	Baltimore, MD	Hampton Roads, VA	Charleston, SC	25
Hampton Roads, VA	Baltimore, MD			24
Portland, ME	Searsport, ME			24
New York City, NY	Savannah, GA	Hampton Roads, VA	New York City, NY	23
Jacksonville, FL	New York City, NY	Baltimore, MD		22
New York City, NY	Port Canaveral, FL			22
Savannah, GA	Jacksonville, FL			21
New York City, NY	Baltimore, MD	Charleston, SC		20
Hampton Roads, VA	Baltimore, MD	New York City, NY		20
Portland, ME	Boston, MA			20
New Haven, CT	New York City, NY			20
Subtotal				2,760
Other Strings				1,518
<b>Total</b>				<b>4,278</b>

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in the text.

**Table 4-32. U.S. East Coast: Most Frequent Multi-Port Strings, 2004**

Port Area 1	Port Area 2	Port Area 3	Port Area 4	Occurrences
New York City, NY	Hampton Roads, VA	Charleston, SC		279
New York City, NY	Hampton Roads, VA	Savannah, GA		223
New York City, NY	Hampton Roads, VA			187
Charleston, SC	Hampton Roads, VA	New York City, NY		183
New York City, NY	Baltimore, MD			162
Baltimore, MD	New York City, NY			119
Charleston, SC	Hampton Roads, VA			100
New York City, NY	Philadelphia, PA			99
Hampton Roads, VA	New York City, NY			86
Savannah, GA	New York City, NY			83
Philadelphia, PA	Hampton Roads, VA			69
Savannah, GA	Charleston, SC			65
Charleston, SC	Jacksonville, FL			64
Savannah, GA	Hampton Roads, VA	New York City, NY		58
Jacksonville, FL	New York City, NY			51
Wilmington, NC	Savannah, GA			49
Charleston, SC	Savannah, GA			47
Savannah, GA	Charleston, SC	New York City, NY		45
New York City, NY	Charleston, SC			42
New York City, NY	Hampton Roads, VA	Charleston, SC	New York City, NY	42
New York City, NY	Savannah, GA			40
Hampton Roads, VA	Charleston, SC			39
Charleston, SC	Wilmington, NC			39
New York City, NY	Baltimore, MD	Hampton Roads, VA	Charleston, SC	38
Baltimore, MD	Hampton Roads, VA			38
Philadelphia, PA	New York City, NY			38
New York City, NY	Baltimore, MD	Hampton Roads, VA	New York City, NY	37
Savannah, GA	Philadelphia, PA			37
Hampton Roads, VA	Baltimore, MD			35
Hampton Roads, VA	Savannah, GA			35
Jacksonville, FL	Baltimore, MD	New York City, NY		31
Charleston, SC	Brunswick, GA			31
New York City, NY	Port Canaveral, FL			31
Savannah, GA	Hampton Roads, VA			30
Jacksonville, FL	Savannah, GA			29
New York City, NY	Baltimore, MD	Hampton Roads, VA		28
New York City, NY	Savannah, GA	Hampton Roads, VA	New York City, NY	28
Hampton Roads, VA	Baltimore, MD	New York City, NY		25
Brunswick, GA	Charleston, SC			23
Hampton Roads, VA	Philadelphia, PA			22
Portland, ME	Searspoint, ME			22
New York City, NY	Wilmington, NC	Savannah, GA		22
Baltimore, MD	Philadelphia, PA			21
Long Island, NY	New York City, NY			20
Subtotal				2,792
Other Strings				1,669
<b>Total</b>				<b>4,461</b>

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in the text.

The occurrences of multi-port strings presented above were based on total U.S. East Coast vessel movements in 2003 and 2004. In the following sections, we examine the impacts for each alternative.<sup>54</sup>

### *Alternatives 3 and 5*

Seasonal speed restrictions by port area under Alternative 3 were presented earlier in Figure 4-3. They include speed restrictions which are in place year-round in the Northeastern U.S., from October 1 through April 30 for the mid-Atlantic region, and from November 15 through April 15 for the Southeastern U.S. The same seasonal speed restrictions apply for Alternative 5 along with other operational measures.<sup>55</sup>

Table 4-33 presents vessel arrivals in 2003 for port areas that are part of multi-port strings when at least two port areas in the string would contain speed restrictions. In 2003, 6,080 vessel arrivals fell into this category, with the 3,337 containerships arrivals accounting for 55 percent of the total multi-port vessel arrivals during speed restricted periods. Ro-ro cargo ships with 1,052 arrivals (17 percent) and tankers with 921 arrivals (15 percent) were the other vessel types with the most port calls as part of multi-port strings during restricted periods.

The 6,080 multi-port string restricted arrivals in 2003 shown in Table 4-33 represent roughly 41 percent of total U.S. East Coast Alternative 3 restricted vessel arrivals (which were shown in Table 4-10). For containerships, the multi-port string restricted arrivals represents 68 percent of the total containership restricted period arrivals. For ro-ro cargo ships, the multi-port string restricted arrivals represents 61 percent of those vessels total restricted arrivals in 2003.

The port area of New York/New Jersey had the most multi-port string restricted arrivals with 1,489 arrivals in 2003. The port area of Hampton Roads was second with 1,083 arrivals, followed by the port areas of Charleston (737 arrivals), Savannah (631 arrivals), Baltimore (575 arrivals) and Philadelphia (345 arrivals).

Table 4-34 presents similar information for 2004. The total number of multi-port string restricted arrivals increased by 5.5 percent to 6,412 arrivals. The ranking by vessel type remained unchanged from 2003 with the exception of general cargo vessels moving ahead of bulk carriers for fifth place. In terms of vessel arrivals by port area, the rankings for the top eight port areas remained unchanged from 2003.

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<sup>54</sup> Due to their more limited geographic scope at any single point in time, Alternative 2: Use of DMAS and Alternative 4: Use of Recommended Routes would not generate an additional direct economic impact due to the cumulative effect of vessels making multiple U.S. East Coast port calls.

<sup>55</sup> For simplicity, in this section we will refer to Alternative 3; however, the comments apply equally to Alternative 5.

**Table 4-33. Alternatives 3 and 5: U.S. East Coast Restricted Vessel Arrivals that are part of Multi-Port String, by Port Area and Vessel Type, 2003**

Port Area	Vessel Type												Total
	Bulk Carriers	Combination Carriers	Container ships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	
Northeastern US - Gulf of Maine													
Eastport, ME	5	-	-	-	6	-	-	-	-	-	-	-	11
Searsport, ME	-	1	-	-	-	56	-	1	-	32	-	-	90
Portland, ME	6	-	-	-	6	12	-	19	-	65	1	-	109
Portsmouth, NH	2	1	-	-	-	1	-	-	-	35	1	-	40
Northeastern US - Off Race Point													
Boston, MA	1	-	21	-	1	57	-	21	-	50	-	-	151
Salem, MA	1	-	-	-	-	1	-	-	-	1	-	-	3
Northeastern US - Cape Cod Bay													
Cape Cod, MA	-	-	-	-	-	8	-	-	-	5	-	-	13
Mid-Atlantic Block Island Sound													
New Bedford, MA	5	-	-	-	4	-	-	-	-	6	-	-	15
Providence, RI	3	1	-	-	3	14	2	25	-	25	-	-	73
New London, CT	5	-	2	-	2	1	-	-	1	3	-	-	14
New Haven, CT	10	-	1	-	6	-	-	-	11	36	2	-	66
Bridgeport, CT	3	-	-	-	-	-	7	-	9	13	-	-	32
Long Island, NY	-	1	-	-	-	1	-	-	8	51	-	-	61
Mid-Atlantic Ports of New York/New Jersey													
New York City, NY	14	5	965	-	5	25	8	263	6	194	4	-	1,489
Mid-Atlantic Delaware Bay													
Philadelphia, PA	32	-	122	1	21	7	7	48	2	99	6	-	345
Mid-Atlantic Chesapeake Bay													
Baltimore, MD	24	-	195	-	14	14	-	271	-	53	2	2	575
Hampton Roads, VA	24	2	898	-	25	8	-	82	-	42	-	2	1,083
Mid-Atlantic Morehead City and Beaufort, NC													
Morehead City, NC	2	-	5	-	5	-	-	1	-	6	-	1	20
Mid-Atlantic Wilmington, NC													
Wilmington, NC	19	4	41	-	19	-	1	6	6	55	1	-	152
Mid-Atlantic Georgetown, SC													
Georgetown, SC	4	-	1	-	3	-	-	-	-	-	-	-	8
Mid-Atlantic Charleston, SC													
Charleston, SC	12	-	554	-	13	10	-	77	3	66	2	-	737
Mid-Atlantic Savannah, GA													
Savannah, GA	22	5	464	-	37	4	5	45	2	46	-	1	631
Southeastern US													
Brunswick, GA	7	-	6	-	3	1	-	70	-	-	-	-	87
Fernandina, FL	1	-	6	-	10	1	-	-	-	-	-	-	18
Jacksonville, FL	7	-	53	1	6	2	-	115	4	37	3	-	228
Port Canaveral, FL	3	-	3	-	7	5	-	8	1	1	1	-	29
All Port Regions	212	20	3,337	2	196	228	30	1,052	53	921	23	6	6,080

a/ Includes recreational vessels.

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

**Table 4-34 Alternatives 3 and 5: U.S. East Coast Restricted Vessel Arrivals that are part of Multi-Port String, by Port Area and Vessel Type, 2004**

Port Area	Vessel Type												Total
	Bulk Carriers	Combination Carriers	Container ships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	
Northeastern US - Gulf of Maine													
Eastport, ME	9	-	-	-	4	-	-	-	-	-	-	-	13
Searsport, ME	-	-	-	-	1	35	-	-	1	41	3	-	81
Portland, ME	13	-	-	-	7	16	-	14	2	59	6	-	117
Portsmouth, NH	4	2	-	-	2	1	-	-	-	24	1	-	34
Northeastern US - Off Race Point													
Boston, MA	1	-	6	-	-	19	-	15	-	29	-	-	70
Salem, MA	6	-	-	-	-	5	-	-	-	-	-	-	11
Northeastern US - Cape Cod Bay													
Cape Cod, MA	-	-	-	-	-	11	-	-	-	5	-	-	16
Mid-Atlantic Block Island Sound													
New Bedford, MA	10	-	-	-	3	-	-	-	-	6	-	-	19
Providence, RI	8	-	-	-	1	22	-	27	-	19	1	-	78
New London, CT	1	-	3	-	3	1	-	-	2	3	-	-	13
New Haven, CT	2	-	3	-	2	-	-	-	45	36	-	-	88
Bridgeport, CT	4	-	-	-	-	-	7	-	43	17	-	-	71
Long Island, NY	-	-	-	-	-	-	-	-	29	52	-	-	81
Mid-Atlantic Ports of New York/New Jersey													
New York City, NY	14	5	1,003	-	20	40	8	264	1	189	2	1	1,547
Mid-Atlantic Delaware Bay													
Philadelphia, PA	13	1	113	2	27	10	7	51	-	99	5	-	328
Mid-Atlantic Chesapeake Bay													
Baltimore, MD	15	-	216	-	24	18	2	281	-	60	4	1	621
Hampton Roads, VA	24	3	921	-	33	14	4	82	-	48	2	2	1,133
Mid-Atlantic Morehead City and Beaufort, NC													
Morehead City, NC	3	1	3	-	3	4	-	-	-	12	-	1	27
Mid-Atlantic Wilmington, NC													
Wilmington, NC	16	2	40	-	31	4	-	12	-	66	1	1	173
Mid-Atlantic Georgetown, SC													
Georgetown, SC	7	-	-	-	2	1	-	-	-	-	-	-	10
Mid-Atlantic Charleston, SC													
Charleston, SC	4	-	616	-	23	23	2	76	-	70	1	1	816
Mid-Atlantic Savannah, GA													
Savannah, GA	11	4	463	-	30	18	8	50	-	58	1	1	644
Southeastern US													
Brunswick, GA	6	-	6	-	11	4	-	80	-	-	-	-	107
Fernandina, FL	1	-	15	-	9	5	1	1	-	-	-	-	32
Jacksonville, FL	5	-	54	2	10	6	-	110	-	56	2	-	245
Port Canaveral, FL	2	-	5	-	7	9	-	9	-	4	1	-	37
All Port Regions	179	18	3,467	4	253	266	39	1,072	123	953	30	8	6,412

a/ Includes recreational vessels.

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

There are several reasons why the cumulative effect of multiple port calls at restricted ports could impact a vessel more than the sum of the individual direct impacts presented in the prior sections. First, the delays incurred from speed restrictions at one port when combined with speed restrictions at a subsequent port may diminish the ability of the vessel to maintain its schedule and could result in missed tidal windows. Second, even brief delays at arrival at the second port could result in increased costs for scheduled, but unused, port labor. Third, some shipping lines felt that the cumulative impact of three or four port calls at port areas with restrictions could cause them to rework vessel itineraries and could result in dropping of one of the port calls in order to maintain a weekly service without having to add an additional vessel to the service.

However, these cumulative factors will not affect every vessel making multiple port calls at restricted ports. Also the impact may vary from an 8-hour delay due to a missed tidal window to incurring charges for unused labor if a vessel is late arriving at the port.<sup>56</sup> It is realistic to assume that the shipping industry will revise their itineraries to account for the delays imposed by the speed restrictions and that occurrences of missed tidal windows will be rare. We have used an average additional delay of 36 minutes for each vessel arrival that is part of a multi-port string to account for this cumulative impact.<sup>57</sup> The economic value of this additional time has been calculated for each port area based on the June 2008 vessel operating costs by type and size of vessel. The results by port area and type of vessel at a restricted speed of 10 knots are presented in Table 4-35 for 2003 and Table 4-36 for 2004.<sup>58</sup>

The additional direct economic impact of multi-port strings on the shipping industry in 2003 is estimated at \$11.3 million. The port area of New York/New Jersey has the largest additional economic impact at \$2.9 million followed by Hampton Roads at \$2.2 million, Charleston at \$1.5 million, Savannah at \$1.3 million and Baltimore at \$0.9 million. Containerships accounted for 65 percent of the additional economic impact of multi-port strings in 2003.

The additional direct economic impact of multi-port strings in 2004 is estimated at \$11.9 million. The ranking of the top six port areas in terms of largest impact remains unchanged from 2003.

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<sup>56</sup> While tides occur on 12-hour cycle, it is assumed that a tidal window is open for 2 hours before and after high tide. This results in an 8-hour waiting period between tidal windows.

<sup>57</sup> Only a small portion of vessel arrivals should be affected by this additional delay. It is assumed that 7.5 percent of vessels could be affected by as much as an additional 8-hour delay due to missing the tidal window. This results in an average additional delay per vessel of 36 minutes.

<sup>58</sup> The estimated impact at alternative restricted speeds of 12 and 14 knots are presented in Table 4-51. The impact at a restricted speed of 12 knots was assumed to be 17 percent lower than the estimate at 10 knots. The impact at a restricted speed of 14 knots was assumed to be 30 percent lower than the estimate at 10 knots. As explained above, it is realistic to assume that the shipping industry will revise their itineraries to account for the (known) delays due to the speed restriction in place. The additional impact for multi-port vessel calls applies more to unknown delays that may occur. At a restriction speed of 12 or 14 knots, the overall known delays are shorter, thereby creating less opportunity for the unknown delays to occur. This factor was judged to be proportionate to the change in the restricted speed.

**Table 4-35. Alternatives 3 and 5: Additional Direct Economic Impact of Multi-Port Strings on Shipping Industry by Port Area and Vessel Type, 2003 (\$000s)**

Port Area	Vessel Type												Total
	Bulk Carriers	Combination Carriers	Container ships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	
Northeastern US - Gulf of Maine													
Eastport, ME	3.9	-	-	-	7.0	-	-	-	-	-	-	-	10.9
Searsport, ME	-	0.9	-	-	-	241.7	-	0.8	-	30.7	-	-	274.1
Portland, ME	4.5	-	-	-	4.9	53.0	-	14.3	-	62.0	1.3	-	140.0
Portsmouth, NH	1.5	0.9	-	-	-	4.6	-	-	-	32.8	1.3	-	41.2
Northeastern US - Off Race Point													
Boston, MA	0.8	-	46.5	-	0.6	176.6	-	16.7	-	47.3	-	-	288.5
Salem, MA	1.0	-	-	-	-	3.1	-	-	-	1.0	-	-	5.1
Northeastern US - Cape Cod Bay													
Cape Cod, MA	-	-	-	-	-	26.2	-	-	-	5.0	-	-	31.3
Mid-Atlantic Block Island Sound													
New Bedford, MA	6.1	-	-	-	2.5	-	-	-	-	5.6	-	-	14.2
Providence, RI	2.4	1.0	-	-	1.9	61.3	3.7	26.4	-	25.2	-	-	121.8
New London, CT	4.1	-	3.8	-	3.2	4.6	-	-	1.3	3.3	-	-	20.4
New Haven, CT	8.2	-	2.1	-	9.6	-	-	-	14.8	39.9	2.6	-	77.3
Bridgeport, CT	2.6	-	-	-	-	-	13.9	-	12.1	16.3	-	-	44.8
Long Island, NY	-	1.0	-	-	-	4.6	-	-	10.7	61.0	-	-	77.4
Mid-Atlantic Ports of New York/New Jersey													
New York City, NY	11.4	4.9	2,142.3	-	4.1	108.9	23.5	377.8	8.1	207.4	5.2	-	2,893.7
Mid-Atlantic Delaware Bay													
Philadelphia, PA	25.3	-	211.4	1.2	21.0	28.1	32.6	51.2	2.7	103.3	7.9	-	484.6
Mid-Atlantic Chesapeake Bay													
Baltimore, MD	19.3	-	358.4	-	12.8	59.2	-	371.4	-	51.3	2.6	2.8	877.8
Hampton Roads, VA	21.8	2.1	1,956.4	-	23.0	37.6	-	157.4	-	41.5	-	2.8	2,242.6
Mid-Atlantic Morehead City and Beaufort, NC													
Morehead City, NC	2.1	-	8.8	-	4.5	-	-	1.6	-	6.0	-	0.7	23.7
Mid-Atlantic Wilmington, NC													
Wilmington, NC	15.6	3.7	86.7	-	30.9	-	1.7	12.4	8.3	54.9	1.3	-	215.7
Mid-Atlantic Georgetown, SC													
Georgetown, SC	3.2	-	1.3	-	5.9	-	-	-	-	-	-	-	10.4
Mid-Atlantic Charleston, SC													
Charleston, SC	9.6	-	1,289.7	-	19.9	43.1	-	100.2	4.2	68.7	2.6	-	1,538.0
Mid-Atlantic Savannah, GA													
Savannah, GA	17.6	4.5	1,105.0	-	53.1	15.4	29.1	64.2	2.7	47.8	-	0.7	1,340.1
Southeastern US													
Brunswick, GA	5.5	-	10.9	-	5.2	4.6	-	88.4	-	-	-	-	114.5
Fernandina, FL	0.9	-	5.8	-	16.3	4.6	-	-	-	-	-	-	27.6
Jacksonville, FL	5.4	-	100.1	1.2	9.6	9.3	-	127.2	5.6	36.8	3.9	-	299.0
Port Canaveral, FL	2.3	-	5.7	-	8.4	22.9	-	7.7	1.4	0.9	1.3	-	50.6
All Port Regions	175.0	19.2	7,334.6	2.4	244.3	909.5	104.5	1,417.6	72.0	948.7	30.2	7.0	11,265.1

a/ Includes recreational vessels.

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

**Table 4-36. Alternatives 3 and 5: Additional Direct Economic Impact of Multi-Port Strings on Shipping Industry by Port Area and Type of Vessel, 2004 (\$000s)**

Port Area	Vessel Type												Total
	Bulk Carriers	Combination Carriers	Containerships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	
Northeastern US - Gulf of Maine													
Eastport, ME	6.8	-	-	-	10.3	-	-	-	-	-	-	-	17.1
Searsport, ME	-	-	-	-	0.5	143.3	-	-	1.3	39.0	2.9	-	187.1
Portland, ME	10.0	-	-	-	10.9	79.4	-	10.5	2.6	56.5	5.3	-	175.3
Portsmouth, NH	3.3	1.7	-	-	2.8	4.6	-	-	-	21.6	0.8	-	34.8
Northeastern US - Off Race Point													
Boston, MA	0.7	-	13.9	-	-	58.9	-	11.3	-	25.9	-	-	110.7
Salem, MA	6.7	-	-	-	-	19.8	-	-	-	-	-	-	26.6
Northeastern US - Cape Cod Bay													
Cape Cod, MA	-	-	-	-	-	48.4	-	-	-	4.8	-	-	53.3
Mid-Atlantic Block Island Sound													
New Bedford, MA	11.3	-	-	-	1.9	-	-	-	-	5.1	-	-	18.2
Providence, RI	7.3	-	-	-	0.6	94.0	-	29.1	-	17.6	0.8	-	149.6
New London, CT	0.8	-	5.9	-	7.8	4.5	-	-	2.6	3.3	-	-	25.0
New Haven, CT	1.6	-	4.5	-	1.8	-	-	-	60.4	40.0	-	-	108.3
Bridgeport, CT	3.4	-	-	-	-	-	13.6	-	57.3	22.1	-	-	96.4
Long Island, NY	-	-	-	-	-	-	-	-	38.6	63.3	-	-	101.9
Mid-Atlantic Ports of New York/New Jersey													
New York City, NY	10.8	4.4	2,191.0	-	24.0	182.0	18.6	408.1	1.3	199.6	2.6	0.7	3,043.1
Mid-Atlantic Delaware Bay													
Philadelphia, PA	10.1	0.9	188.1	2.0	24.1	32.4	36.7	55.8	-	108.2	6.6	-	464.9
Mid-Atlantic Chesapeake Bay													
Baltimore, MD	14.4	-	390.4	-	27.2	71.6	5.8	386.2	-	62.5	4.2	0.5	962.9
Hampton Roads, VA	22.4	2.6	1,985.6	-	33.5	60.7	11.6	163.3	-	46.2	2.6	1.2	2,329.7
Mid-Atlantic Morehead City and Beaufort, NC													
Morehead City, NC	2.8	0.8	5.7	-	3.9	18.6	-	-	-	10.9	-	0.7	43.4
Mid-Atlantic Wilmington, NC													
Wilmington, NC	13.3	1.8	79.8	-	50.3	17.0	-	23.9	-	66.3	1.3	0.7	254.4
Mid-Atlantic Georgetown, SC													
Georgetown, SC	5.6	-	-	-	2.3	4.6	-	-	-	-	-	-	12.6
Mid-Atlantic Charleston, SC													
Charleston, SC	3.1	-	1,371.1	-	31.7	90.6	5.8	98.5	-	69.8	0.8	0.7	1,672.0
Mid-Atlantic Savannah, GA													
Savannah, GA	8.9	3.6	1,116.0	-	54.5	77.3	40.7	72.4	-	58.1	1.3	0.7	1,433.4
Southeastern US													
Brunswick, GA	4.6	-	9.2	-	19.2	18.6	-	104.0	-	-	-	-	155.5
Fernandina, FL	0.8	-	14.4	-	17.7	23.2	2.0	2.8	-	-	-	-	61.0
Jacksonville, FL	3.9	-	95.0	2.0	10.8	26.3	-	122.8	-	56.0	2.6	-	319.4
Port Canaveral, FL	1.7	-	9.4	-	9.7	39.4	-	11.0	-	3.6	1.3	-	76.1
All Port Regions	154.4	15.8	7,480.1	4.0	345.5	1,115.2	134.8	1,499.8	164.3	980.4	33.1	5.1	11,932.6

a/ Includes recreational vessels.

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.



## *Alternative 6*

Seasonal speed restrictions by port area under Alternative 6 were presented earlier in Figure 4-11. They include speed restrictions during March and April for most of the Northeastern U.S., except Cape Cod Bay (January 1 through May 15) and Great South Channel (April 1-July 31), as well as speed restriction from November 1 through April 30 for the mid-Atlantic region, and from November 15 through April 15 for the Southeastern U.S.

Table 4-37 presents vessel arrivals in 2003 for port areas with speed restrictions that are part of multi-port strings when at least two port areas in the string would contain speed restrictions. In 2003, there were 4,829 such total vessel arrivals with the 2,870 containerships arrivals accounting for 59 percent of the total multi-port vessel arrivals during speed restricted periods. Ro-ro cargo ships with 1,075 arrivals (22 percent) and tankers with 722 arrivals (15 percent) were the other vessel types with the most port calls as part of multi-port strings during restricted periods.

The total of 4,829 multi-port string restricted arrivals in 2003 represents roughly 41 percent of total U.S. East Coast Alternative 6 restricted vessel arrivals (see Table 4-21). For containerships, the multi-port string restricted arrivals represents 69 percent of the total containership restricted period arrivals. For ro-ro cargo ships the multi-port string restricted arrivals represents 73 percent of those vessels total restricted arrivals in 2003.

The port area of New York/New Jersey had the most multi-port string restricted arrivals with 1,236 arrivals in 2003. The port area of Hampton Roads was second with 912 arrivals followed by the port areas of Charleston (620 arrivals), Savannah (523 arrivals), Baltimore (481 arrivals) and Philadelphia (289 arrivals).

Table 4-38 presents similar information for 2004. The total number of multi-port string restricted arrivals increased by 6.6 percent to 5,147 arrivals. The ranking by type of vessel remained unchanged from 2003 with the exception of general cargo vessels moving ahead of bulk carriers for fourth place. In terms of vessel arrivals by port area, the rankings for the top 8 port areas remained unchanged from 2003.

The additional direct economic impact of multi-port strings on the shipping industry in 2003 is estimated at \$8.7 million (Table 4-39). The port area of New York/New Jersey has the largest additional economic impact at \$2.4 million followed by Hampton Roads at \$1.9 million, Charleston at \$1.3 million, Savannah at \$1.1 million and Baltimore at \$0.7 million. Containerships accounted for 71 percent of the additional economic impact of multi-port strings in 2003.

The additional direct economic impact of multi-port strings in 2004 is estimated at \$9.4 million (Table 4-40). The ranking of the top six port areas in terms of largest impact remains unchanged from 2003.

**Table 4-37. Alternative 6: U.S. East Coast Restricted Vessel Arrivals that are part of Multi-Port String, by Port Area and Vessel Type, 2003**

Port Area	Vessel Type												Total
	Bulk Carriers	Combination Carriers	Container ships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	
Northeastern US - Gulf of Maine													
Eastport, ME	1	-	-	-	-	-	-	-	-	-	-	-	1
Searsport, ME	-	-	-	-	-	-	-	-	-	9	-	-	9
Portland, ME	1	-	-	-	-	-	-	5	-	20	-	-	26
Portsmouth, NH	-	-	-	-	-	-	-	-	-	15	-	-	15
Northeastern US - Off Race Point													
Boston, MA	1	-	9	-	1	-	-	7	-	26	-	-	44
Salem, MA	1	-	-	-	-	-	-	-	-	-	-	-	1
Northeastern US - Cape Cod Bay													
Cape Cod, MA	-	-	-	-	-	-	-	-	-	4	-	-	4
Mid-Atlantic Block Island Sound													
New Bedford, MA	3	-	-	-	4	-	-	-	-	5	-	-	12
Providence, RI	3	1	-	-	3	-	2	20	-	17	-	-	46
New London, CT	3	-	2	-	2	1	-	-	1	2	-	-	11
New Haven, CT	7	-	1	-	5	-	-	-	11	30	1	-	55
Bridgeport, CT	2	-	-	-	-	-	6	-	9	10	-	-	27
Long Island, NY	-	1	-	-	-	1	-	-	8	42	-	-	52
Mid-Atlantic Ports of New York/New Jersey													
New York City, NY	11	5	814	-	5	1	7	226	6	159	2	-	1,236
Mid-Atlantic Delaware Bay													
Philadelphia, PA	25	-	103	1	19	1	7	40	2	86	5	-	289
Mid-Atlantic Chesapeake Bay													
Baltimore, MD	17	-	164	-	14	4	-	236	-	44	1	1	481
Hampton Roads, VA	18	2	764	-	22	1	-	69	-	35	-	1	912
Mid-Atlantic Morehead City and Beaufort, NC													
Morehead City, NC	2	-	3	-	3	-	-	1	-	4	-	1	14
Mid-Atlantic Wilmington, NC													
Wilmington, NC	18	4	33	-	12	-	1	5	6	46	1	-	126
Mid-Atlantic Georgetown, SC													
Georgetown, SC	4	-	1	-	2	-	-	-	-	-	-	-	7
Mid-Atlantic Charleston, SC													
Charleston, SC	10	-	459	-	10	4	-	75	3	57	2	-	620
Mid-Atlantic Savannah, GA													
Savannah, GA	16	5	387	-	29	2	5	37	2	39	-	1	523
Southeastern US													
Brunswick, GA	7	-	6	-	3	1	-	70	-	-	-	-	87
Fernandina, FL	1	-	6	-	10	1	-	-	-	-	-	-	18
Jacksonville, FL	5	-	53	1	6	-	-	107	3	36	2	-	213
Port Canaveral, FL	-	-	-	-	-	-	-	-	-	-	-	-	0
All Port Regions	169	18	2,870	3	169	19	28	1,075	54	722	16	4	4,829

a/ Includes recreational vessels.

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

**Table 4-38. Alternative 6: U.S. East Coast Restricted Vessel Arrivals that are part of Multi-Port String, by Port Area and Vessel Type, 2004**

Port Area	Vessel Type												Total
	Bulk Carriers	Combination Carriers	Container ships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	
Northeastern US - Gulf of Maine													
Eastport, ME	3	-	-	-	-	-	-	-	-	-	-	-	3
Searsport, ME	-	-	-	-	-	-	-	-	1	10	-	-	11
Portland, ME	3	-	-	-	1	-	-	5	2	19	-	-	30
Portsmouth, NH	-	1	-	-	-	-	-	-	-	6	-	-	7
Northeastern US - Off Race Point													
Boston, MA	-	-	3	-	-	-	-	5	-	11	-	-	19
Salem, MA	-	-	-	-	-	-	-	-	-	-	-	-	-
Northeastern US - Cape Cod Bay													
Cape Cod, MA	-	-	-	-	-	1	-	-	-	3	-	-	4
Mid-Atlantic Block Island Sound													
New Bedford, MA	8	-	-	-	2	-	-	-	-	5	-	-	15
Providence, RI	5	-	-	-	-	5	-	22	-	15	-	-	47
New London, CT	1	-	3	-	3	-	-	-	2	3	-	-	12
New Haven, CT	2	-	3	-	2	-	-	-	39	33	-	-	79
Bridgeport, CT	3	-	-	-	-	-	6	-	42	12	-	-	63
Long Island, NY	-	-	-	-	-	-	-	-	24	46	-	-	70
Mid-Atlantic Ports of New York/New Jersey													
New York City, NY	9	4	843	-	16	5	7	224	1	151	2	-	1,262
Mid-Atlantic Delaware Bay													
Philadelphia, PA	8	1	100	2	22	4	7	41	-	88	5	-	278
Mid-Atlantic Chesapeake Bay													
Baltimore, MD	10	-	182	-	23	6	2	240	-	49	2	-	514
Hampton Roads, VA	19	3	779	-	28	8	4	69	-	40	2	-	952
Mid-Atlantic Morehead City and Beaufort, NC													
Morehead City, NC	3	1	3	-	3	4	-	-	-	10	-	-	24
Mid-Atlantic Wilmington, NC													
Wilmington, NC	13	2	33	-	23	3	-	10	-	58	1	-	143
Mid-Atlantic Georgetown, SC													
Georgetown, SC	6	-	-	-	2	1	-	-	-	-	-	-	9
Mid-Atlantic Charleston, SC													
Charleston, SC	4	-	519	-	20	14	2	69	-	60	-	1	689
Mid-Atlantic Savannah, GA													
Savannah, GA	8	4	390	-	23	15	8	42	-	52	1	1	544
Southeastern US													
Brunswick, GA	6	-	6	-	11	4	-	80	-	-	-	-	107
Fernandina, FL	-	-	15	-	9	5	1	1	-	-	-	-	31
Jacksonville, FL	5	-	54	2	10	6	-	103	-	53	1	-	234
Port Canaveral, FL	-	-	-	-	-	-	-	-	-	-	-	-	-
All Port Regions	127	16	3,008	6	228	96	38	1,095	111	777	15	2	5,147

a/ Includes recreational vessels.

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

**Table 4-39. Alternative 6: Additional Direct Economic Impact on Shipping Industry by Port Area and Vessel Type, 2003 (\$000s)**

Port Area	Vessel Type												Total
	Bulk Carriers	Combination Carriers	Container ships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	
Northeastern US - Gulf of Maine													
Eastport, ME	0.7	-	-	-	-	-	-	-	-	-	-	-	0.7
Searsport, ME	-	-	-	-	-	-	-	-	-	8.9	-	-	8.9
Portland, ME	0.7	-	-	-	-	-	-	3.8	-	19.9	-	-	24.4
Portsmouth, NH	-	-	-	-	-	-	-	-	-	13.8	-	-	13.8
Northeastern US - Off Race Point													
Boston, MA	0.8	-	19.1	-	0.6	-	-	5.5	-	24.2	-	-	50.2
Salem, MA	1.0	-	-	-	-	-	-	-	-	-	-	-	1.0
Northeastern US - Cape Cod Bay													
Cape Cod, MA	-	-	-	-	-	-	-	-	-	4.0	-	-	4.0
Mid-Atlantic Block Island Sound													
New Bedford, MA	3.7	-	-	-	2.5	-	-	-	-	4.7	-	-	10.9
Providence, RI	2.4	1.0	-	-	1.9	-	3.7	21.3	-	17.7	-	-	48.0
New London, CT	2.4	-	3.8	-	3.2	4.6	-	-	1.3	2.3	-	-	17.7
New Haven, CT	5.8	-	2.1	-	7.1	-	-	-	14.8	33.0	1.3	-	64.1
Bridgeport, CT	1.7	-	-	-	-	-	11.9	-	12.1	13.1	-	-	38.8
Long Island, NY	-	1.0	-	-	-	4.6	-	-	10.7	49.7	-	-	66.1
Mid-Atlantic Ports of New York/New Jersey													
New York City, NY	8.9	4.9	1,813.1	-	4.1	4.5	21.5	317.1	8.1	168.7	2.6	-	2,353.7
Mid-Atlantic Delaware Bay													
Philadelphia, PA	20.0	-	177.8	1.2	18.6	4.5	32.6	42.5	2.7	87.8	6.6	-	394.4
Mid-Atlantic Chesapeake Bay													
Baltimore, MD	13.7	-	305.4	-	12.8	18.1	-	321.4	-	41.7	1.3	1.4	715.8
Hampton Roads, VA	16.1	2.1	1,667.9	-	20.4	4.5	-	131.9	-	34.2	-	1.4	1,878.5
Mid-Atlantic Morehead City and Beaufort, NC													
Morehead City, NC	2.1	-	5.1	-	3.6	-	-	1.6	-	4.2	-	0.7	17.2
Mid-Atlantic Wilmington, NC													
Wilmington, NC	14.9	3.7	69.9	-	20.5	-	1.7	10.4	8.3	45.6	1.3	-	176.4
Mid-Atlantic Georgetown, SC													
Georgetown, SC	3.2	-	1.3	-	4.2	-	-	-	-	-	-	-	8.7
Mid-Atlantic Charleston, SC													
Charleston, SC	8.0	-	1,080.0	-	15.0	16.7	-	97.5	4.2	59.2	2.6	-	1,283.2
Mid-Atlantic Savannah, GA													
Savannah, GA	12.8	4.5	930.8	-	41.2	7.7	29.1	52.7	2.7	40.9	-	0.7	1,123.2
Southeastern US													
Brunswick, GA	5.5	-	10.9	-	5.2	4.6	-	88.4	-	-	-	-	114.5
Fernandina, FL	0.9	-	5.8	-	16.3	4.6	-	-	-	-	-	-	27.6
Jacksonville, FL	3.9	-	100.1	1.2	9.6	-	-	119.4	4.2	35.8	2.6	-	276.8
Port Canaveral, FL	-	-	-	-	-	-	-	-	-	-	-	-	-
All Port Regions	129.1	17.4	6,193.0	2.4	186.9	74.7	100.6	1,213.3	69.2	709.5	18.4	4.2	8,718.7

a/ Includes recreational vessels.

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

**Table 4-40. Alternative 6: Additional Direct Economic Impact on Shipping Industry by Port Area and Vessel Type, 2004 (\$000s)**

Port Area	Vessel Type												Total
	Bulk Carriers	Combination Carriers	Container ships	Freight Barges	General Cargo Vessels	Passenger Vessels a/	Refrigerated Cargo Vessels	Ro-Ro Cargo Ship	Tank Barges	Tankers	Towing Vessels	Other b/	
Northeastern US - Gulf of Maine													
Eastport, ME	2.2	-	-	-	-	-	-	-	-	-	-	-	2.2
Searsport, ME	-	-	-	-	-	-	-	-	1.3	9.1	-	-	10.5
Portland, ME	2.2	-	-	-	0.6	-	-	3.8	2.6	19.1	-	-	28.3
Portsmouth, NH	-	0.9	-	-	-	-	-	-	-	5.4	-	-	6.2
Northeastern US - Off Race Point													
Boston, MA	-	-	6.9	-	-	-	-	3.8	-	10.0	-	-	20.6
Salem, MA	-	-	-	-	-	-	-	-	-	-	-	-	-
Northeastern US - Cape Cod Bay													
Cape Cod, MA	-	-	-	-	-	4.5	-	-	-	2.8	-	-	7.4
Mid-Atlantic Block Island Sound													
New Bedford, MA	9.1	-	-	-	1.3	-	-	-	-	4.2	-	-	14.6
Providence, RI	4.4	-	-	-	-	19.8	-	24.0	-	13.9	-	-	62.2
New London, CT	0.8	-	5.9	-	7.8	-	-	-	2.6	3.3	-	-	20.4
New Haven, CT	1.6	-	4.5	-	1.8	-	-	-	52.5	37.3	-	-	97.7
Bridgeport, CT	2.4	-	-	-	-	-	11.6	-	56.0	15.6	-	-	85.6
Long Island, NY	-	-	-	-	-	-	-	-	32.0	56.5	-	-	88.6
Mid-Atlantic Ports of New York/New Jersey													
New York City, NY	7.0	3.5	1,843.2	-	18.1	19.8	16.6	343.3	1.3	162.1	2.6	-	2,417.5
Mid-Atlantic Delaware Bay													
Philadelphia, PA	6.2	0.9	165.4	2.0	19.3	13.8	36.7	45.4	-	96.7	6.6	-	392.8
Mid-Atlantic Chesapeake Bay													
Baltimore, MD	9.6	-	330.6	-	26.6	25.8	5.8	326.9	-	50.6	2.6	-	778.4
Hampton Roads, VA	18.3	2.6	1,686.8	-	26.7	33.6	11.6	137.6	-	38.2	2.6	-	1,958.1
Mid-Atlantic Morehead City and Beaufort, NC													
Morehead City, NC	2.8	0.8	5.7	-	3.9	18.6	-	-	-	9.1	-	-	40.9
Mid-Atlantic Wilmington, NC													
Wilmington, NC	10.8	1.8	66.3	-	41.0	13.9	-	19.7	-	58.9	1.3	-	213.8
Mid-Atlantic Georgetown, SC													
Georgetown, SC	4.8	-	-	-	2.3	4.6	-	-	-	-	-	-	11.8
Mid-Atlantic Charleston, SC													
Charleston, SC	3.1	-	1,165.4	-	28.7	61.2	5.8	90.4	-	59.8	-	0.7	1,415.0
Mid-Atlantic Savannah, GA													
Savannah, GA	6.4	3.6	936.7	-	43.7	68.0	40.7	61.6	-	51.9	1.3	0.7	1,214.8
Southeastern US													
Brunswick, GA	4.6	-	9.2	-	19.2	18.6	-	104.0	-	-	-	-	155.5
Fernandina, FL	-	-	14.4	-	17.7	23.2	2.0	2.8	-	-	-	-	60.1
Jacksonville, FL	3.9	-	95.0	2.0	10.8	26.3	-	116.0	-	53.2	1.3	-	308.5
Port Canaveral, FL	-	-	-	-	-	-	-	-	-	-	-	-	-
All Port Regions	100.3	14.1	6,335.9	4.0	269.4	351.7	130.8	1,279.3	148.4	757.9	18.4	1.4	9,411.5

a/ Includes recreational vessels.

b/ Includes fishing vessels, industrial vessels, research vessels, and school ships.

Source: Prepared by Nathan Associates Inc. based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.

## RE-ROUTING OF SOUTHBOUND COASTWISE SHIPPING

Coastwise shipping or cabotage trade along the U.S. East Coast has always been an important segment of our nation's maritime heritage. In recent years, attention has been focused on the further development of coastwise shipping (also referred to as short-sea shipping) as a means of reducing highway congestion on the Eastern Seaboard. Benefits of coastwise shipping also include lowering transport and environmental costs and reducing our demand for imported fuel. For these reasons, it is important that the speed restrictions not unduly affect the development of increased coastwise shipping.

However, for commercial and navigation purposes, it appears unlikely that the speed restriction would significantly affect coastwise shipping. Northbound vessels prefer to use Gulf Stream further offshore and benefit from the enhanced operating speed and fuel efficiency. Southbound traffic routes closer to the U.S. East Coast; generally within 7-10 nautical miles of the shoreline. However, during the proposed seasonal management periods, masters of southbound vessels would likely route outside of seasonal speed restricted areas incurring an overall increase in distance. This affects southbound vessels between the entrance to the Chesapeake Bay and Port Canaveral.

For Alternative 3 the proposed speed restrictions would be in effect for a distance of 25 nautical miles from the entire mid-Atlantic coastline. Containerships and ro-ro cargo ships are the vessel types that would be most affected by speed restrictions at intermediate seasonal speed restricted areas.<sup>59</sup> In 2003, there were 4,142 restricted period arrivals at U.S. east coast port areas from Baltimore through Port Canaveral of containership and ro-ro cargo ships providing coastal liner service in international trade and cabotage routes. Assuming half of these calls were in the southbound direction and that the typical vessel made calls at three U.S. East Coast ports per service, there would be about 690 southbound vessels that would need to route outside of the seasonal speed restricted areas. Based on an increase in routing of 108 nautical miles<sup>60</sup> and an average operating speed of 20 knots, the containership would have increased sailing time of 5.4 hours. Using an approximate average hourly operating cost at sea of \$2,000, the estimated economic impact for each southbound vessel would be \$10,800. For 2003, the additional economic impact for containerships for coastwise shipping under Alternative 3 is estimated at \$7.5 million. In 2004, the same assumptions result in an estimated economic impact of \$7.6 million.<sup>61</sup>

For Alternative 6, the proposed speed restrictions in the mid-Atlantic region would be implemented for a radius of 20 nautical mile buffer around each port area for port areas north of Wilmington, NC.<sup>62</sup> A

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<sup>59</sup> Again this analysis pertains equally to Alternative 5.

<sup>60</sup> The vessels are assumed to sail at a distance of 25 nautical miles offshore instead of 8 nautical miles. Based on a diagonal routing to the pilot's buoy, the 25 nautical miles becomes an effective 37 nautical miles. However, the diagonal access for a routing 8 nautical miles off-shore is 10 nautical miles. The difference of 27 nautical miles is thus the additional distance incurred resulting from having to sail further offshore per arrival and departure at the intermediate port calls.

<sup>61</sup> Comments on the DEIS stated that restrictions are proposed during the winter months when speed and schedules are already adversely affected by the weather and hence the economic impact will be greater. To the degree that vessels are operating at slower speeds during the winter months when speed restrictions are proposed, this would result in a lower estimate of economic impact of the proposed speed restriction.

<sup>62</sup> The exception is the Block Island Sound speed restriction area that is configured as a rectangle with a width of 30 nautical miles.

continuous 20-mile buffer will be implemented from Wilmington, NC through Savannah to the northern boundary of the Southeastern SMA. The additional distance incurred by southbound vessels would be 56 nautical miles.<sup>63</sup> In 2003, there were 3,688 containership and ro-ro cargo ship restricted period arrivals at U.S. east coast port areas from Baltimore thorough Port Canaveral. Assuming half of these calls were in the southbound direction and that the typical vessel made calls at three U.S. East Coast ports per service, there would be about 615 southbound vessels that would need to route outside of the seasonal speed restricted areas. Based on an increase in routing of 56 nautical miles and an average operating speed of 20 knots, the containership would have increased sailing time of 2.8 hours. Using an average hourly operating cost at sea of \$2,000, the estimated economic impact for each southbound vessel would be \$5,600. For 2003 and 2004, the additional economic impact for containerships for coastwise shipping under Alternative 6 is estimated at \$3.4 million.

## **DIRECT ECONOMIC IMPACT ON SHIPPING INDUSTRY RELATIVE TO VALUE OF U.S. EAST COAST TRADE AND OCEAN FREIGHT COSTS**

In Chapter 2, we presented data collected by the U.S. Census Bureau on volume and value of goods carried by vessels calling at U.S. East Coast ports. We also presented information on vessel import charges that represent the aggregate cost of all freight, insurance and other charges (excluding U.S. import duties) incurred in bringing the merchandise from alongside the carrier at the port of exportation and placing it alongside the carrier at the first port of entry. In this section we will compare the estimates of the direct economic impact on the shipping industry to these indicators of the economic significance of U.S. East Coast maritime activity.

Table 4-41 presents for each port area, the significance of the estimated economic impact of the operational measures relative to the value of U.S. East Coast trade in 2003 and 2004. This comparison is useful to determine whether increased shipping costs associated with the proposed operational measures would significantly affect the price and volume of traded goods via U.S. East Coast ports. The direct economic impact on the shipping industry for each alternative is based on the base case analyses presented in this chapter including a speed restriction of 10 knots. The value of trade merchandise is the same as reported in Chapter 2 for U.S. East Coast imports and exports by Customs District and Port. In 2003, the total annual direct economic impact on the shipping industry of Alternative 5 is \$155.8 million while the value of U.S. East Coast trade is \$298.7 billion. Thus the direct economic impact represents five hundredths of one percent of the value of traded merchandise in 2003. For other alternatives the direct economic impact is even smaller. These results indicate that

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<sup>63</sup> Vessels calling at port areas with circular buffers will have to travel 20 nautical miles for a diagonal access to the port as compared to a normal distance of 10 nautical miles for the diagonal access. The extra distance of 10 nautical miles applies to each arrival and departure for a total additional distance of 20 nautical miles. Vessels calling at port areas with a continuous buffer from the shoreline are assumed to have an additional distance of 18 nautical miles each way for a total of 36 nautical miles for an arrival and departure as described under Alternative 3. As there are an average of three port calls and hence two intermediate port calls per service, we have assumed one intermediate call per string at a port area with a circular buffer in the northern portion of the MAUS (for example at Hampton Roads) and one intermediate call per string at a southern port area with a continuous buffer (for example at Savannah) for a total additional distance of 56 nautical miles.

implementation of the proposed operational measures will not have any measurable impact on the volume of merchandise traded through U.S. East Coast ports.

To measure the significance of the operational measures on the shipping industry, it is interesting to compare the estimated direct economic impact with ocean freight costs associated with U.S. East Coast trade. Ocean freight costs are considered as a conservative proxy for shipping industry revenues. In Chapter 2 we determined that ocean freight charges averaged 5.3 percent of the value of imports. Given the composition of our trade, it is reasonable to assume that ocean freight charges would represent no less than the same percentage of the value of our exports. Based on these factors, we estimate that the direct economic impact on the shipping industry for Alternative 5 represents less than one percent of the ocean freight costs for U.S. East Coast trade. For other alternatives the relative economic impact is even smaller. For Alternative 6, the direct economic impact represents only four tenths of one percent of the ocean freight costs. These results indicate that the implementation of the proposed operational measures would have a minimal impact on the financial revenues and hence the financial performance of the vessel operators calling at U.S. East Coast ports.

**Table 4-41. Economic Impact as a Percent of Value of U.S. East Coast Maritime Trade and Ocean Freight Costs, 2003 and 2004 (\$ millions unless otherwise specified)**

Item	Alternative				
	2	3	4	5	6
<b>2003</b>					
Direct economic impact	25.0	133.0	2.3	137.0	53.2
Additional direct economic impact due to cumulative effect of multit-port strings	-	11.3	-	11.3	8.7
Direct economic impact of re-routing of southbound coastwise shipping	-	7.5	-	7.5	3.4
Total direct economic impact on shipping industry	25.0	151.8	2.3	155.8	65.3
Trade Merchandise Value	298,741	298,741	298,741	298,741	298,741
Total direct economic impact as a percent of trade value (%)	0.008%	0.051%	0.001%	0.052%	0.022%
Ocean Freight Costs	15,833	15,833	15,833	15,833	15,833
Total direct economic impact as a percent of ocean freight cost (%)	0.158%	0.959%	0.015%	0.984%	0.412%
<b>2004</b>					
Direct economic impact	27.6	142.5	2.8	147.2	57.6
Additional direct economic impact due to cumulative effect of multit-port strings	-	11.9	-	11.9	9.4
Direct economic impact of re-routing of southbound coastwise shipping	-	7.6	-	7.6	3.4
Total direct economic impact on shipping industry	27.6	162.0	2.8	166.7	70.4
Trade Merchandise Value	325,051	325,051	325,051	325,051	325,051
Total direct economic impact as a percent of trade value (%)	0.008%	0.050%	0.001%	0.051%	0.022%
Ocean Freight Costs	17,228	17,228	17,228	17,228	17,228
Total direct economic impact as a percent of ocean freight cost (%)	0.160%	0.940%	0.016%	0.968%	0.409%

Source: Prepared by Nathan Associates from U.S. Census Bureau Foreign Trade Statistics for 2003 and 2004 and analysis of U.S. Coast Guard data on vessel calls at U.S. ports as described in text.



## Estimated Indirect Economic Impact

Depending on the nature and significance of the direct economic impact, it is possible that implementation of the proposed operational measures could have indirect economic impacts. Potential indirect economic impacts were raised by port authorities, shipping industry representatives, and community leaders during the public stakeholder meetings. Potential indirect economic impacts include:

- Increased intermodal costs due to missed rail and truck connections
- Diversion of traffic to other ports
- Impact on local economies of decreased income from jobs lost to due traffic diversions

It is important to note that the timing and duration of the proposed seasonal speed restrictions will be well-known and that vessel itineraries will be developed taking them into account. Hence except for DMAs, unexpected disruptions to the manufacturing and transport logistics systems should not occur as a result of the proposed seasonal speed restrictions.

There are many factors that influence a shipping line's decision to call at specific ports. These include the adequacy and suitability of port facilities and equipment, the ability of the terminal operator to quickly turnaround the vessel, overall cargo demand, efficiency of intermodal transportation, port charges, and the port location relative to other ports and cargo markets. At the stakeholders meeting in Boston, there was particular concern raised over the possibility of traffic diverting to other ports such as Halifax.

In the prior sections, we have estimated the cost of the increased vessel time due to delays caused by the operational measures. If cargo is to divert to other ports this would be because the total additional costs associated with those routes are less than the cost of vessel time due to delays at the current port. Hence it would be double-counting to also include any additional overland transport costs to the estimated impact already presented.

As described earlier in this Chapter, under Alternative 3 there would be year-round speed restrictions established for a large area eastward of Massachusetts Bay which would extend through the Great South Channel critical habitat area. This speed restricted area would significantly affect vessel traffic in the Northeast region and port areas from Hampton Roads northward in the mid-Atlantic region. As shown in Table 4-13, the average minutes of delay for a containership in Boston would be 149 minutes per arrival and another 149 minutes per departure. A permanent delay of nearly 5 hours per call year-round would be sufficient for shippers and vessel operators to look at alternative ports such as Halifax that would not be affected by the proposed regulations.

A good portion of a port's traffic is often considered captive to that port. For cargoes that are destined for the port's immediate hinterland, it does not make economic sense to call at a distant port and then to ship back to the port via expensive land transport. However, most ports also accommodate traffic that is not destined for its

immediate hinterland but is through traffic that may have economically attractive routing alternatives. Port areas in the Northeast and northern parts of the mid-Atlantic region serves as gateways to the inland population centers and industrial areas such as western New York, western Pennsylvania, Ohio, Indiana, Illinois and Michigan. These areas may be served via the Canadian ports of Halifax and Montreal without incurring delays caused by the right whale ship strike reduction measures.<sup>64</sup> These Canadian ports currently compete with Northeast U.S. ports for cargo destined for the mid-eastern U.S. and the speed restrictions implemented in the U.S. and not in Canada could shift the current competitive balance to the advantage of Canadian ports.

For Alternative 3, we have assumed that with a speed restriction of 10 knots, 25 percent of the containership and ro-ro cargo ship calls at Northeast ports would divert to Canadian ports.<sup>65</sup> This rate of diversion is considered as a mid-point of a range of possible diversion rates from a high of 35 percent to a low of 15 percent. This relatively high rate of diversion is due to the permanent, year-round speed restrictions that will be in effect under Alternative 3 and considering the portion of cargo at Northeast ports that is destined for inland areas that could realistically be served via Canadian ports.

Port areas in the Block Island are assumed to lose 15 percent of their vessel calls during restricted periods. More of the cargo at these smaller ports is for the local market and they are not considered as gateway ports to further inland areas. The port areas of New York/ New Jersey, Philadelphia, Baltimore and Hampton roads are assumed to lose 3 percent of their containership and ro-ro cargo ship vessel calls during restricted periods. The diversion rate for these port areas is lower for several reasons. First, the speed restrictions will not be in effect year-round in the MAUS; second, due to the size of the local market, most vessels must call at the port area of New York/ New Jersey; and third, due to the distances involved, the Canadian ports are a less viable alternative for most of the cargo handled at MAUS ports.

We have also assumed that a 10-knot speed restriction under Alternative 3 would lead to the diversion of 5 percent of the containership and ro-ro cargo ship calls from the port areas of Savannah during restricted periods. The speed restrictions will be in effect in Savannah for 212 days as compared to 151 days for the nearby Southeastern port areas of Brunswick, Fernandina and Jacksonville. As Jacksonville is by far the largest and more important of these three alternative ports, we have assumed that 50 percent of the diverted Savannah calls would be handled at Jacksonville. Brunswick and Fernandina which are smaller ports but closer to the Savannah hinterland, are assumed to each capture 25 percent of the diverted calls from Savannah.

On the other hand, we have assumed that 15 percent of the restricted period cruise vessel calls at Jacksonville would divert to the nearby port area of Port Canaveral under Alternative 3. The effective distance of speed restriction in Port Canaveral is only 4.5 nautical miles compared to the 30.9 nautical miles at Jacksonville.

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<sup>64</sup> Comments on the DEIS suggested that vessels may divert to other U.S. ports in addition to those diverting to Canada. While this is possible, for the total economic impact analysis only diversions to non-U.S. ports are included. For diversion to ports within the U.S. the negative economic impact for one U.S. port are offset by gains in another U.S. port.

<sup>65</sup> Other types of vessels are less likely to divert as their cargo are more likely to be for the port's immediate hinterland.

Table 4-42 presents the assumed diversion rates for Alternative 3 with restricted speeds of 10, 12 knots and 14 knots.

**Table 4-42. Percent of Restricted Period Vessel Calls Assumed to be Diverted by Alternative and Port Area, 2003 and 2004**

Port Area	Alternative 3			Alternative 4			Alternative 5			Alternative 6		
	Restricted	speed in knots		Restricted	speed in knots		Restricted	speed in knots		Restricted	speed in knots	
	10	12	14	10	12	14	10	12	14	10	12	14
Northeastern US	25.0%	20.0%	15.0%	-	-	-	27.0%	22.0%	17.0%	15.0%	10.0%	7.0%
Mid-Atlantic Block Island Sound	15.0%	10.0%	5.0%	-	-	-	16.0%	11.0%	6.0%	3.0%	2.0%	1.0%
Selected Mid-Atlantic Ports a/	3.0%	1.5%	0.5%	-	-	-	3.5%	1.7%	0.7%	1.5%	0.5%	0.1%
Savannah, GA	5.0%	3.0%	1.0%	-	-	-	-	-	-	-	-	-
Brunswick, GA	-	-	-	5.0%	3.0%	1.5%	-	-	-	3.0%	2.0%	1.0%
Fernandina, FL	-	-	-	5.0%	3.0%	1.5%	-	-	-	3.0%	2.0%	1.0%
Jacksonville, FL	15.0%	10.0%	5.0%	15.0%	10.0%	5.0%	40.0%	30.0%	20.0%	40.0%	30.0%	20.0%

a/ Includes port areas of New York/New Jersey, Philadelphia, Baltimore and Hampton Roads.

Source: Prepared by Nathan Associates as described in text.

Under Alternative 4, the port areas of Brunswick and Fernandina will have modest delays due to the increased distance associated with the use of recommended routes. Because of these delays, it is assumed that 5 percent of the containership and ro-ro cargo ship calls at these two port areas would divert to the port area of Savannah that has no operational measures proposed. The reason for the relatively small rate of diversion are is that much of the cargo handled at these two ports is considered for the local market and not easily diverted to other ports. Under Alternative 4, cruise vessels are assumed to divert again to Port Canaveral where no operational measures have been proposed.

Under Alternative 5, the rates of diversion for the affected port areas in the Northeast and mid-Atlantic regions are similar to Alternative 3, except that the additional impact of DMAs and use of recommended routes are assumed to increase the rate of diversion slightly. The port area of Savannah is assumed not to incur any diversions under Alternative 5 as the delays associated with the increased recommended routes for the Southeast port areas are offset by the longer duration of speed restrictions at Savannah. The port area of Jacksonville is doubly disadvantaged under Alternative 5 relative to Port Canaveral. First, Jacksonville is subject to the increased distance associated with the use of recommended routes, and second the speed restrictions are in effect for 30.9 nautical miles as compared to the 4.5 nautical miles at Port Canaveral. For these reasons we have assumed that as much as 40 percent of the restricted period cruise vessel calls will divert from Jacksonville to Port Canaveral.

Under Alternative 6, the effective speed restrictions for the large area in the Northeast will be implemented during April.<sup>66</sup> Hence, shipping lines will not be as likely to alter their regular service pattern for delays that are only incurred for one month per year. Thus while under Alternative 3 we had assumed a diversion rate of

<sup>66</sup> Speed restrictions will be in effect for other months in the Northeast region but not the large combined area encompassing Massachusetts Bay and the Great South Channel critical habitat area.

25 percent, for Alternative 6 we assume a lower diversion rate of 15 percent for containerships and ro-ro cargo ships during the restricted period.<sup>67</sup> For the port areas in Block Island Sound, we have assumed a diversion rate of only 3 percent for containerships and ro-ro cargo ships due to the limited duration of the large speed restriction area. For the affected mid-Atlantic ports, we have assumed a diversion of 1.5 percent of restricted period containership and ro-ro cargo ship vessel calls.

An additional diversion was assumed to occur under Alternative 6 for the port area of Providence. This port area has speed restrictions in effect for 181 days as compared to 61 days for the port area of Boston. Hence we have assumed that 20 percent of the containership and ro-ro cargo ship restricted period calls at Providence would divert to the nearby port area of Boston.

The Southeastern region ports of Brunswick and Fernandina are assumed to have 3 percent of their restricted period arrivals of containerships and ro-ro cargo ships diverted to Savannah as the effect of the use of recommended routes creates additional delays relative to Savannah. Finally, 40 percent of the restricted period cruise vessel calls at Jacksonville are assumed to divert to Port Canaveral as that port is not affected by speed restrictions or the use of recommended routes.

The Maritime Administration (MARAD), an agency of the U.S. Department of Transportation has developed a Port Economic Impact Kit that allows users to assess the economic impact of port activity on a region's economy. The MARAD Port Economic Impact Kit uses an adaptation of input-output analysis that is a widely established tool for undertaking economic impact assessments. The model calculates the total economic impacts or multiplier effect of deep-draft port industry and includes an indirect effect that reflects expenditures made by the supplying firms to meet the requirements of the deep-draft port industry as well as expenditures by firms stocking the supplying firms.

The model also includes an induced effect that corresponds to the change in consumer spending that is generated by changes in labor income accruing to the workers in the deep-draft port industry as well as employment in the supplying businesses.

The MARAD Port Economic Impact Kit was applied in two recent studies of the economic implications of port calls in Boston.<sup>68</sup> These studies estimate that an average containership port call in Boston results in a positive economic impact for the region of approximately \$900 thousand. We have used this estimate for the port area of Boston and other major ports and to estimate the impact of port calls diverted to Canadian ports.<sup>69</sup> For other

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<sup>67</sup> For Alternative 6, speed restrictions are only in place for the months of March and April thus the 15 percent diversion only applies to vessel calls during those months.

<sup>68</sup> Haute Kite-Powell, Economic Implications of Possible Reductions in Boston Port Calls due to Ship Strike Management Measures, a report produced for NOAA National Marines Fisheries and MASSPORT, March 2005.; and Leigh Fisher Associates, Economic Impact Study of Massachusetts Port Authority and Port of Boston facilities, prepared for MASSPORT and the Greater Boston Chamber of Commerce, Draft Technical Report June 30, 2005.Draft

<sup>69</sup> For purposes of this section, other major port areas are New York/New Jersey, Philadelphia, Baltimore, Hampton Roads, Charleston, Savannah, Jacksonville and Port Canaveral.

port areas such as Portland and Providence that would generally have smaller vessels calling at the port, we have used an estimate of \$500 thousand of total economic impact per port call.<sup>70</sup>

The indirect economic impact of port diversions in 2003 by alternative, port area and restricted speed is presented in Table 4-43. There are no significant indirect economic impacts associated with the use of DMAs in Alternative 2. For Alternative 3, the net indirect economic impact is estimated at a total of \$141.1 million in 2003 at a speed restriction of 10 knots. The port areas of New York/New Jersey (\$48.2 million), Savannah (\$38.8 million), Boston (\$24.8 million) and Hampton Roads (\$29.6 million) have the largest indirect economic impacts. Note that the port areas of Jacksonville, Brunswick, Fernandina, and Port Canaveral show a positive net economic impact (in parentheses) as they gain vessel calls diverted from Savannah.

From the perspective of the national economy, there are no net indirect economic impacts under Alternative 4. The diverted vessel calls at the southeastern port areas of Brunswick, Fernandina and Jacksonville are offset by the gains in vessels calling at the port areas of Savannah and Port Canaveral.

For Alternative 5, the net indirect economic impact at a restricted speed of 10 knots is estimated at \$162.5 million based on 2003 vessel traffic data. This estimated impact is about 15 percent higher than the estimated impact under Alternative 3. The ranking of results is similar to Alternative 3 with the exception that the port of Savannah is not assumed to have vessel calls diverted to the Southeastern ports as those ports incur delays due to the inclusion of recommended routes in Alternative 5.

For Alternative 6, the net indirect economic impact at a restricted speed of 10 knots is estimated at \$49.6 million using the 2003 traffic vessel data (Table 4-43). The largest indirect economic losses are generated in the port areas of New York/New Jersey (\$20.5 million), Hampton Roads (\$12.6 million), Providence (\$4.8 million), Baltimore (\$7.2 million), Philadelphia (\$4.3 million), Jacksonville (\$2.9 million), and Brunswick (\$1.8 million). The following port areas experience a net indirect economic impact gain: Port Canaveral (\$2.9 million), Savannah (\$2.5 million), and Boston (\$0.7 million).

Table 4-44 presents the indirect economic impact for 2004. In general, the estimated indirect economic impacts match closely with those described for 2003. The slight decline in impact for 2004 for some port areas reflects the slight decline in containership and ro-ro vessel restricted period arrivals in 2004. It is interesting to note the large increase in indirect economic impact in Jacksonville under Alternative 6 in 2004 as cruise vessel arrivals increased substantially.

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<sup>70</sup> The indirect economic impact is relative to the volume of cargo diverted and hence we use the size of containerships and ro-ro vessels calling at the major and other ports as an indicator of the indirect economic impact per vessel.

**Table 4-43. Indirect Economic Impact of Port Diversions by Alternative, Restricted Speed and Port Area, 2003 (\$000s)**

Port Area	Alternative 2			Alternative 3			Alternative 4			Alternative 5			Alternative 6		
	Restricted speed in knots			Restricted speed in knots			Restricted speed in knots			Restricted speed in knots			Restricted speed in knots		
	10	12	14	10	12	14	10	12	14	10	12	14	10	12	14
<b>Northeastern US - Gulf of Maine</b>															
Eastport, ME	-	-	-	625	500	375	-	-	-	675	550	425	75	50	35
Searsport, ME	-	-	-	125	100	75	-	-	-	135	110	85	-	-	-
Portland, ME	-	-	-	8,375	6,700	5,025	-	-	-	9,045	7,370	5,695	825	550	385
Portsmouth, NH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Northeastern US - Off Race Point</b>															
Boston, MA	-	-	-	24,750	19,800	14,850	-	-	-	26,730	21,780	16,830	(700)	(150)	(10)
Salem, MA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Northeastern US - Cape Cod Bay</b>															
Cape Cod, MA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Block Island Sound</b>															
New Bedford, MA	-	-	-	75	50	25	-	-	-	80	55	30	15	10	5
Providence, RI	-	-	-	3,375	2,250	1,125	-	-	-	3,600	2,475	1,350	4,750	2,850	1,900
New London, CT	-	-	-	150	100	50	-	-	-	160	110	60	30	20	10
New Haven, CT	-	-	-	75	50	25	-	-	-	80	55	30	15	10	5
Bridgeport, CT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Long Island, NY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Ports of New York/New Jersey</b>															
New York City, NY	-	-	-	48,222	24,111	8,037	-	-	-	56,259	27,326	11,252	20,507	6,836	1,367
<b>Mid-Atlantic Delaware Bay</b>															
Philadelphia, PA	-	-	-	10,044	5,022	1,674	-	-	-	11,718	5,692	2,344	4,293	1,431	286
<b>Mid-Atlantic Chesapeake Bay</b>															
Baltimore, MD	-	-	-	16,686	8,343	2,781	-	-	-	19,467	9,455	3,893	7,155	2,385	477
Hampton Roads, VA	-	-	-	29,646	14,823	4,941	-	-	-	34,587	16,799	6,917	12,636	4,212	842
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>															
Morehead City, NC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Wilmington, NC</b>															
Wilmington, NC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Georgetown, SC</b>															
Georgetown, SC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Charleston, SC</b>															
Charleston, SC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Savannah, GA</b>															
Savannah, GA	-	-	-	38,835	23,301	7,767	(4,150)	(2,490)	(1,245)	-	-	-	(2,490)	(1,660)	(830)
<b>Southeastern US</b>															
Brunswick, GA	-	-	-	(9,709)	(5,825)	(1,942)	3,075	1,845	923	-	-	-	1,845	1,230	615
Fernandina, FL	-	-	-	(9,709)	(5,825)	(1,942)	1,075	645	323	-	-	-	645	430	215
Jacksonville, FL	-	-	-	(19,418)	(11,651)	(3,884)	1,080	720	360	2,880	2,160	1,440	2,880	2,160	1,440
Port Canaveral, FL	-	-	-	(1,080)	(720)	(360)	(1,080)	(720)	(360)	(2,880)	(2,160)	(1,440)	(2,880)	(2,160)	(1,440)
<b>All Port Areas</b>	-	-	-	141,068	81,129	38,623	-	-	-	162,536	91,777	48,911	49,601	18,204	5,303

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004 as described in text.

**Table 4-44. Indirect Economic Impact of Port Diversions by Alternative, Restricted Speed and Port Area, 2004 (\$000s)**

Port Area	Alternative 2			Alternative 3			Alternative 4			Alternative 5			Alternative 6		
	Restricted	speed in knots		Restricted	speed in knots		Restricted	speed in knots		Restricted	speed in knots		Restricted	speed in knots	
	10	12	14	10	12	14	10	12	14	10	12	14	10	12	14
<b>Northeastern US - Gulf of Maine</b>															
Eastport, ME	-	-	-	500	400	300	-	-	-	540	440	340	150	100	70
Searsport, ME	-	-	-	375	300	225	-	-	-	405	330	255	-	-	-
Portland, ME	-	-	-	5,125	4,100	3,075	-	-	-	5,535	4,510	3,485	825	550	385
Portsmouth, NH	-	-	-	125	100	75	-	-	-	135	110	85	-	-	-
<b>Northeastern US - Off Race Point</b>															
Boston, MA	-	-	-	24,750	19,800	14,850	-	-	-	26,730	21,780	16,830	(200)	150	190
Salem, MA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Northeastern US - Cape Cod Bay</b>															
Cape Cod, MA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Block Island Sound</b>															
New Bedford, MA	-	-	-	75	50	25	-	-	-	80	55	30	15	10	5
Providence, RI	-	-	-	3,150	2,100	1,050	-	-	-	3,360	2,310	1,260	4,250	2,550	1,700
New London, CT	-	-	-	375	250	125	-	-	-	400	275	150	60	40	20
New Haven, CT	-	-	-	225	150	75	-	-	-	240	165	90	45	30	15
Bridgeport, CT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Long Island, NY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Ports of New York/New Jersey</b>															
New York City, NY	-	-	-	49,680	24,840	8,280	-	-	-	57,960	28,152	11,592	21,209	7,070	1,414
<b>Mid-Atlantic Delaware Bay</b>															
Philadelphia, PA	-	-	-	9,369	4,685	1,562	-	-	-	10,931	5,309	2,186	3,996	1,332	266
<b>Mid-Atlantic Chesapeake Bay</b>															
Baltimore, MD	-	-	-	16,605	8,303	2,768	-	-	-	19,373	9,410	3,875	6,980	2,327	465
Hampton Roads, VA	-	-	-	29,052	14,526	4,842	-	-	-	33,894	16,463	6,779	12,366	4,122	824
<b>Mid-Atlantic Morehead City and Beaufort, NC</b>															
Morehead City, NC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Wilmington, NC</b>															
Wilmington, NC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Georgetown, SC</b>															
Georgetown, SC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Charleston, SC</b>															
Charleston, SC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mid-Atlantic Savannah, GA</b>															
Savannah, GA	-	-	-	39,015	23,409	7,803	(3,775)	(2,265)	(1,133)	-	-	-	(2,265)	(1,510)	(755)
<b>Southeastern US</b>															
Brunswick, GA	-	-	-	(9,754)	(5,852)	(1,951)	3,000	1,800	900	-	-	-	1,800	1,200	600
Fernandina, FL	-	-	-	(9,754)	(5,852)	(1,951)	775	465	233	-	-	-	465	310	155
Jacksonville, FL	-	-	-	(13,703)	(7,835)	(1,967)	5,805	3,870	1,935	15,480	11,610	7,740	15,480	11,610	7,740
Port Canaveral, FL	-	-	-	(5,805)	(3,870)	(1,935)	(5,805)	(3,870)	(1,935)	(15,480)	(11,610)	(7,740)	(15,480)	(11,610)	(7,740)
<b>All Port Areas</b>	-	-	-	139,406	79,603	37,251	-	-	-	159,582	89,308	46,956	49,695	18,280	5,355

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004 as described in text.

## Estimated Economic Impact on Other Market Segments

As described earlier, the estimates of economic impact by port area and vessel type are based on U.S. Coast Guard data on the arrival of vessel 150 GRT or greater at U.S. East Coast ports. The USCG data captures the vast preponderance of commercial maritime activity that would be subject to the speed restrictions and other operational measures. However, there are some market segments that may be impacted by the speed

restrictions and other operational measures whose maritime activities are not adequately captured in the USCG data. In this section, we identify the most relevant of these market segments and discuss the potential economic impact. Vessel operating costs in this section have been updated to include fuel costs of June 2008.

## COMMERCIAL FISHING

Commercial fishing is a multimillion dollar industry along the U.S. East Coast. In 2005, commercial fish landings at U.S. East Coast ports totaled \$801 million (Table 2-11). The port of New Bedford, MA is the leading U.S. port in terms of value of commercial fish landings with \$282.5 million in 2005.

The right whale ship strike reduction operational measures and alternatives apply to vessels with a length of 65 feet and above. Because the USCG data excludes data on commercial fishing vessels that are less than 150 GRT, we also evaluated data which included fishing vessels which are over 65 feet in length and weigh less than 150 tons, using information provided by NMFS' database of commercial fishing permits. In Chapter 2, we identified that for the Southeast region approximately 84 percent of the fishing vessels over 65 feet weigh less than 150 tons. For the Northeast region, nearly 67 percent of the fishing vessels over 65 feet weigh less than 150 tons.

The estimated economic impact of the operational measures on commercial fishing vessels in 2003 is presented in Table 4-45. The analysis is based on the fishing permits issued in the Northeast and Southeast regions to vessels over 65 feet of LOA and under 150 GRT. The analysis assumes that the commercial fishing vessels are affected for an effective distance of 25 nautical miles under Alternatives 3 and 5 and 20 nautical miles under Alternative 6 each way as they steam to and from fishing areas.<sup>71</sup>

Many commercial fishing vessels steam at 10 knots or below and will not be affected by the operational measures if they were implemented at the 10-knot speed restriction. The typical steaming speed for other commercial fishing vessels is assumed at 12 knots. Based on these assumptions, these commercial fishing vessels will be impacted by the proposed alternative speed restrictions of 10 knots but will not be affected by alternative speed restrictions of 12 knots or higher. Average operating costs per hour of \$300 includes fuel costs of June 2008.

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<sup>71</sup> The proposed routing measures of Alternative 4 do not affect typical sailing routes of commercial fishing vessels. For DMAs proposed under Alternative 2, it is assumed that similar restrictions on commercial fishing activities would have been triggered by operational measures under the existing ALWTRP and hence no additional impact on commercial fishing due to the Ship Strike operational measures.



**Table 4-45. Estimated Economic Impact of Proposed Operational Measures on Commercial Fishing Vessels by Region, 2003**

Item	Alternatives 3 and 5		Alternative 6	
	Northeast Region	Southeast Region	Northeast Region	Southeast Region
Commercial fishing permits for vessels over 65 ft LOA and under 150 GRT	572	290	572	290
Percent with steaming speed over 10 knots	40%	40%	40%	40%
Vessels potentially affected by speed restrictions	229	116	229	116
Typical steaming speed of affected vessels (knots)	12	12	12	12
Number of trips per year per vessel	20	20	20	20
Minutes of delay per trip with restricted speed of				
12 knots	-	-	-	-
10 knots	50.0	50.0	38.0	38.0
Operating cost per hour of steaming (dollars)	300	300	300	300
Estimated impact per year with restricted speed (dollars)				
12 knots	-	-	-	-
10 knots	1,144,000	580,000	869,440	440,800

Source: Prepared by Nathan Associates Inc.

With a speed restriction of 10 knots, the estimated impact in 2003 on commercial fishing vessels under Alternatives 3 and 5 is estimated at \$1.1 million for the Northeast Region and \$0.6 million for the Southeast Region. Under Alternative 6, the estimated impact in 2003 on commercial fishing vessels is estimated at \$0.9 million for the Northeast Region and \$0.4 million for the Southeast Region. The combined Northeast and Southeast regional economic impact of \$1.3 to \$1.7 million is less than two-tenth of one percent of the U.S. East Coast commercial fishery landings of \$801 million in 2005.

These results indicate that the implementation of the operational measures will not have an undue adverse impact on the commercial fishing industry along the U.S. East Coast.

## CHARTER FISHING

During the stakeholder meetings, concerns were raised by representatives of the charter fishing industry regarding the negative effects of the speed restrictions on the industry. In some areas, charter vessels travel up to 50 nautical miles offshore to reach prime fishing areas. At vessel speeds of up to 17 knots they can reach their fishing areas in less than 3 hours. Under Alternative 6, a speed restriction of 10 knots for 20 nautical miles would add about 100 minutes to the roundtrip steaming time, and could severely affect client demand.

The charter fishing industry is active along the U.S. East Coast with concentration in the Carolinas, Virginia, Florida, New Jersey and Massachusetts. The industry consists of half-day charters of about 6 hours that typically go up to 20 nautical miles offshore; full-day charters of 11-12 hours that can go up to 40 nautical miles

offshore; and extended full day charters that can be from 18-24 hours and go up to 50 miles offshore. The vast majority of the charter fishing industry consists of modern and well-equipped fishing boats of less than 65 feet LOA and thus would not be subject to the speed restrictions and other operational measures.

A small segment of the industry referred to as head boats often uses vessels of 80 feet LOA and above that can accommodate 60 to 100 passengers. These vessels go up to 50 miles offshore stop and anchor over wreck and rock formations for fishing species as red snapper, grouper, trigger fish, amberjack. The charter fee for a head boat is typically \$50- \$80 per person.

As described above an increase of 100 minutes roundtrip steaming time would reduce the competitiveness of the larger head boats (more than 65 foot LOA) particularly for the half-day and full-day charters. It is likely that vessels of less than 65 foot LOA would increase their share of those market segments, partially offsetting the economic impact incurred by the larger head boats. For extended full-day charters, head boats of LOA in excess of 65 feet would incur additional costs associated with the 100 minutes increase in roundtrip steaming time. It is estimated that annual economic impact of a speed restriction of 10 knots for these vessels over 20 nautical miles for Alternative 6 would be approximately \$796 thousand.<sup>72</sup> For Alternatives 3 and 5 with a speed restriction over 25 nautical miles, the annual economic impact is estimated at \$1.0 million.<sup>73</sup>

## **PASSENGER FERRIES**

As described in Chapter 2, the vast majority of passenger vessels operating along the U.S. East Coast sail within the COLREGS line and as such will not be affected by the preferred operational measures for Right Whale Ship Strike Reduction and alternatives. However, in the southern New England area, there is a well-developed passenger ferry sector that operates beyond the COLREGS line and hence is subject to the proposed operational measures. A list of major southern New England passenger ferry operators, routes served and service characteristics are presented in Table 4-46.

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<sup>72</sup> This calculation assumes 40 headboat vessels with 30 roundtrips during the off-season months of November through April and an hourly steaming operating cost of \$400. For alternative speed restrictions of 12 and 14 knots, the estimated impact would be \$480 thousand and \$ 240 thousand, respectively. These calculations do not include any offsetting impact of revenue gains by operators of smaller charter fishing vessels.

<sup>73</sup> The proposed routing measures of Alternative 4 do not affect typical sailing routes of charter fishing vessels. Also due to their flexibility in sailing routes, DMAs proposed under Alternative 2 would not significantly affect charter fishing vessels.

**Table 4-46. Southern New England Ferry Operators, 2005**

Operator	Route	Vessel Speed (knots)	Distance (nm)	Summer Schedule	Average Adult Fare (\$)
<b>Fast Ferries</b>					
Bay State Cruises	Boston-Provincetown	30	50	6 trips daily	32
Boston Harbor Cruises	Boston-Provincetown	39	50	4 trips daily	30
Cross Sound Ferry Service	New London-Block Island	35	30	10 trips daily	15
Cross Sound Ferry Service	New London-Orient Point LI	30	16	12 trips daily	15
Freedom Cruise Line	Harwich-Nantucket	24	30	6 trips daily	26
Hy-Line Cruises	Hyannis- Nantucket	30	27	10 trips daily	31
Hy-Line Cruises	Hyannis-Martha's Vineyard	24	20	8 trips daily	14
Island High Speed Ferry	Point Judith-Block Island	33	11	12 trips daily	15
New England Fast Ferry	New Bedford- Martha's Vineyard	30	30	10 trips daily	25
Steamship Authority	Hyannis- Nantucket	30	27	10 trips daily	28
Vineyard Fast Ferry	Quonset Point-Martha's Vineyard	33	50	4 trips daily	30
<b>Regular Ferries</b>					
Bay State Cruises	Boston-Provincetown	16	50	2 trips Sat and Sun	15
Capt. John Boats	Plymouth-Provincetown	14	25	2 trips daily	18
Cross Sound Ferry Service	New London-Orient Point LI	13	16	30 trips daily	10
Hy-Line Cruises	Hyannis- Nantucket	15	27	6 trips daily	16
Hy-Line Cruises	Hyannis-Martha's Vineyard	12	20	6 trips daily	16
Hy-Line Cruises	Nantucket-Martha's Vineyard	16	20	6 trips daily	16
Interstate Navigation Company	Point Judith-Block Island	12	11	8 trips daily	10
Interstate Navigation Company	Newport-Block Island	12	22	2 trips daily	12
Patriot Party Boats	Falmouth- Martha's Vineyard	15	5	8 trips daily	7
Pied Piper	Falmouth-Edgartown	12	9	6 trips daily	15
Steamship Authority	Woods Hole-Martha's Vineyard	12	7	32 trips daily	6
Steamship Authority	Hyannis- Nantucket	12	27	12 trips daily	14

Source: Prepared by Nathan Associates from data on operator websites and selected interviews.

Passenger ferry operations in southern New England generally fall into two categories– fast ferry service with vessel speeds ranging from 24-39 knots and regular ferry service with vessel speeds from 12-16 knots. As shown in Table 4-46 there are nine operators providing fast ferry service on eight routes utilizing eleven vessels. Key destinations include Provincetown, Block Island, Nantucket, and Martha's Vineyard, while important origins include Boston, New London, Hyannis, Harwich, Point Judith and Quonset Point.

Regular ferry service is provided by eight operators on eleven routes utilizing 16 vessels. Vessel speeds range from 12-16 knots and serve many of the same origins and destinations as the fast ferry service. Additional origins served by regular ferries include Plymouth, Falmouth and Woods Hole.

### *Impact on Ferry Operators*

Passenger ferry service will be impacted by operational measures proposed under Alternatives 2, 3, 5, and 6. The proposed routing measures of Alternative 4 do not affect typical sailing routes of passenger ferry service vessels. Under Alternative 2, a DMA will be established over a 39.6 nautical mile buffer square based on the trigger conditions described earlier in this chapter. Interviews with passenger ferry operators identified their particular concern of the situation where a DMA were to be implemented during the peak summer season. For

fast ferry operator, a DMA implemented directly along their route would result in the suspension of service for the entire period that the DMA is in effect. There are several reasons for this conclusion. First, the demand for fast ferries that normally operate between 24-39 knots would virtually disappear if the ferries were restricted to a speed of 10 knots. Second, any remaining demand would not be sufficient to cover vessel operating costs, and third, many of the handling and comfort characteristics of fast ferries would suffer at these reduced speeds.

We have estimated the net economic loss of the implementation of a single DMA for these eleven fast ferry operators at \$2.2 million (Table 4-47).<sup>74</sup> This analysis assumes 100 percent compliance with the voluntary DMAs. This is based on a daily operating cost of a fast ferry vessel of \$13,320 excluding fuel costs. Some operators state that the loss of income and profits from a single 15-day DMA during peak season would cause them to go out of business. However, we assume that many of the fast ferry operators who also operate regular ferries would be able to remain in business as they would generate some incremental profits from passengers that would have otherwise used the fast ferry service.<sup>75</sup>

**Table 4-47. Estimated Economic Impact of Proposed Operational Measures on Southern New England Ferry Operators, 2005 (\$)**

Type of vessel and alternative	Restricted speed in knots		
	10	12	14
<b><u>Fast Ferries</u></b>			
Alternative 2	2,178,000	2,178,000	2,178,000
Alternative 3	7,128,000	7,128,000	7,128,000
Alternative 6	2,577,600	2,577,600	2,577,600
<b><u>Regular Ferries</u></b>			
Alternative 2	5,900,000	3,933,333	1,966,667
Alternative 3	5,900,000	3,933,333	1,180,000
Alternative 6	6,031,250	3,989,583	1,985,417
<b><u>Total</u></b>			
Alternative 2	8,078,000	6,111,333	4,144,667
Alternative 3	13,028,000	11,061,333	8,308,000
Alternative 6	8,608,850	6,567,183	4,563,017

Source: Prepared by Nathan Associates from data on operator websites and selected interviews.

Operators of regular ferry services would also be adversely affected by the DMAs. For these operators it is assumed that a speed restriction of 10 knots would cause an average delay of 30 minutes for each ferry trip.<sup>76</sup>

<sup>74</sup> This same estimate applies to alternative restricted speeds of 10, 12 and 14 knots as it is assumed that the fast ferry service would be temporarily suspended under any of those speeds.

<sup>75</sup> It is very difficult to estimate the portion of passenger demand that would cancel their travel by ferry entirely during a DMA. Relevant factors include the purpose of the trip, the availability of alternative ferry origins that may not be affected by the DMA, availability of other economically viable transport modes and competing entertainment options.

<sup>76</sup> This analysis assumes that, on average, only half of a DMA area would affect the ferry vessel's route, hence the effective distance of the DMA would be approximately 20 nautical miles.

The 118 daily trips of regular ferry services would incur additional costs of \$5.9 million for the implementation of a single DMA. With a restricted speed of 12 knots the average delay decreases to 20 minutes and the estimated economic impact to regular-speed ferries is \$3.9 million. With a restricted speed of 14 knots, the average delay is 6 minutes and the estimated economic impact is \$2.0 million.

Under Alternative 3, speed restrictions would be in place year round in Cape Cod Bay and for the months of October –April for Block Island Sound.<sup>77</sup> The two fast ferry operations from Boston to Provincetown would cease and be replaced by regular ferry service. However, overall ferry demand would diminish as passengers curtail day trips or seek alternative transport modes. It is assumed that the fast ferry operators would either sell their vessels or deploy them in other routes. While a loss for the distressed sale of the vessels may be incurred, this would not represent a recurring annual economic impact and is not included in this assessment.

Fortunately, the proposed speed restrictions for Block Island Sound are outside the peak summer season. Hence, it is assumed that the nine fast ferry operators in this area would lose an average of 30 business days per year<sup>78</sup>. The economic impact of suspending operations for these 30 days for these nine operators is calculated as double the impact of the DMA described above. The resulting estimate is \$7.1 million annually.

Regular ferries will incur average delays of approximately 30 minutes per trip with a speed restriction of 10 knots. As the restrictions are during the off-peak season for Block Island Sound, these delays can be absorbed in the more open ferry schedule without losing any round-trip daily service. The estimated incremental cost of the delay is estimated at \$5.9 million annually at 10 knots, \$3.9 million at 10 knots and \$1.2 million at 14 knots.

Under Alternative 6, speed restrictions for Cape Cod Bay are implemented from January 1 through May 15. As such the fast ferry service from Boston to Provincetown would remain in operation. Speed restrictions for Block Island Sound would be from November 1 through April 30. However, the speed restricted area for Block Island Sound under Alternative 6 would not extend to the shoreline and hence would not impact fast ferry operations.<sup>79</sup> DMAs would also be implemented under Alternative 6 and the economic impact of those is estimated to be the same as under Alternative 2 above.<sup>80</sup> The estimated economic impact for fast ferry service under Alternative 6 is thus similar to Alternative 2 with an increment for speed restrictions on the Boston-Provincetown route during January through May 15. The resulting estimated economic impact is \$2.6 million annually.

For regular ferries, the economic impact for Alternative 6 is again similar to Alternative 2 with an increment for speed restrictions on the Boston-Provincetown route during January through May 15. The estimated economic impact is \$6.0 million at 10 knots, \$4.0 million at 12 knots and \$2.0 million at 14 knots.

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<sup>77</sup> The analysis in this section for Alternative 3 also applies to Alternative 5.

<sup>78</sup> While regular ferry service is year-round, the high-speed Block Island ferry only operates from mid-April through mid-October. Thus the 30 days of lost business consists of 15 days from October 1- 15 and 15 days from April 16-30.

<sup>79</sup> The rectangular area proposed has its northern limits running approximately in a line from Montauk to the southwestern coast of Block Island.

<sup>80</sup> Even though compliance by ferry operators with the proposed speed restrictions of DMAs under Alternative 6 is voluntary, we have assumed 100 percent compliance for the economic impact analysis. Lesser levels of compliance would result in proportionately lower levels of economic impact.

## *Impact on Ferry Passengers*

The proposed operational measures will have a direct economic impact on ferry passengers whose travel time will be increased due to the speed restrictions. As recognized by the U.S. Department of Transportation, time saved from travel may be devoted to other activities, such as remunerative work or recreation.<sup>81</sup> The USDOT guidelines recommend hourly values of travel-time savings to be used in all economic analysis of transportation regulatory actions. Specific values of travel time are recommended for local travel and intercity travel and whether the travel is for business or personal purposes.

The USDOT guidelines recommend using the median household income (divided by 2000 hours) as the basis for valuation of intercity business travel time, and 70 percent of that value for intercity personal travel time. Hence, based on the 2000 Census data, they recommend hourly values of \$21.20 for intercity business travel and \$14.80 for intercity personal travel. We have updated the USDOT recommended values using 2005 data for median household income reported by the U.S. Census Bureau.<sup>82</sup> Based on that data, the hourly value of intercity business travel time is \$23.16 and intercity personal travel time is \$16.21.<sup>83</sup>

The estimated economic impact of proposed operational measures on Southern New England ferry passengers is presented in Table 4-48. The estimates use the same assumptions regarding timing and scope of operational impacts as described in the section above on impacts on ferry operators. However, for the alternatives where we anticipate that fast ferries would cease operations, we assume that fast ferry passengers would divert to regular ferries. In this case, the delay in travel time for former fast ferry passengers consists of two components (1) the extra time due to the slower average speed of regular ferries for the portion of the transit not affected by speed restrictions and (2) the extra time due to the restricted speed over the effective distance of the speed restriction. As an illustration, the average fast ferry trip that previously took 1 hour to transit 30 nm at 30 knots is now estimated to take 2.6 hours. This consists of 2 hours to transit the average effective distance of a DMA of 20 nautical miles at 10 knots plus 0.6 hours to transit the remaining 10 nautical miles at an average speed of 15 knots.

For Alternative 2, the estimated economic impact on fast ferry passengers of a speed restriction at 10 knots is estimated at \$3.2 million. This is based on an assumed average of 90 passengers per trip incurring a delay of 1.6 hours for 92 fast ferry trips per day over 15 days and an hourly value of passenger time of \$16.21. With a speed restriction of 12 knots, the estimated delay is 1.25 hours and the estimated economic impact decreases to \$2.5

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<sup>81</sup> U.S. Department of Transportation, Office of the Secretary of transportation, The Value of Travel Time: Departmental Guidance for Conducting Economic Evaluations, April 9, 1997 <http://ostpxweb.dot.gov/policy/Data/VOT97guid.pdf> and Revised Departmental Guidance, Valuation of Travel Time in Economic Analysis, February 11, 2003 [http://ostpxweb.dot.gov/policy/Data/VOTrevision1\\_2-11-03.pdf](http://ostpxweb.dot.gov/policy/Data/VOTrevision1_2-11-03.pdf).

<sup>82</sup> U.S. Census Bureau, Income, Poverty and Health Insurance Coverage in the United States: 2005, issued August 2006. <http://www.census.gov/prod/2006pubs/p60-231.pdf>

<sup>83</sup> In this analysis, we have applied the valuation recommended the USDOT guidelines; however, the use of median household income may overstate the value of time as it does not account for the average number of wage earners per household. The U.S. Census Bureau reports median per capita income in 2005 at \$25,036. This would result in a hourly valuation of business time at \$12.52 and for personal travel time at \$8.76. Use of these values would reduce the estimated impact on ferry passenger time by 46 percent.

million. With a speed restriction of 14 knots, the estimated delay is 1 hour and the estimated economic impact is \$2.0 million.

For regular ferries, the estimated economic impact for Alternative 2 at 10 knots is \$1.3 million consisting of a delay of 30 minutes for 90 passengers on 118 daily trips over 15 days. At 12 knots the estimated delay is 20 minutes and estimated economic impact is \$0.9 million; at 14 knots, the estimated delay is 6 minutes and the estimated economic impact is \$0.3 million.

**Table 4-48. Estimated Economic Impact of Proposed Operational Measures on Southern New England Ferry Passengers, 2005 (\$)**

Type of vessel and alternative	Restricted speed in knots		
	10	12	14
<b><u>Fast Ferries</u></b>			
Alternative 2	3,221,251	2,516,603	2,013,282
Alternative 3	6,862,666	5,453,368	4,446,727
Alternative 6	3,571,387	2,790,146	2,232,117
<b><u>Regular Ferries</u></b>			
Alternative 2	1,291,127	859,890	258,225
Alternative 3	5,164,506	3,439,561	1,032,901
Alternative 6	1,619,379	1,078,506	323,876
<b><u>Total</u></b>			
Alternative 2	4,512,378	3,376,493	2,271,507
Alternative 3	12,027,172	8,892,929	5,479,628
Alternative 6	5,190,766	3,868,653	2,555,993

Source: Prepared by Nathan Associates as described in text.

For Alternative 3, it is assumed that the nine fast ferry operators in the Block Island Sound area would suspend operations for 30 days per year and their passengers would divert to regular ferries. The two fast ferry operations from Boston to Provincetown would cease and be replaced by regular ferry service. For purposes of calculating the economic impact, we have used 120 days per year of peak operation for the Boston-Provincetown services. The resulting economic impact on fast ferry passengers is estimated at \$6.9 million at 10 knots, \$5.5 million at 12 knots and \$4.4 million at 14 knots.

For regular ferries, the impact is similar to that described for Alternative 2 above, except that regular ferry operations are assumed to be affected for 60 days per year. The resulting economic impact on regular ferry passengers is estimated at \$5.2 million at 10 knots, \$3.4 million at 12 knots and \$1.0 million at 14 knots.

Under Alternative 6, the impact is the same as under Alternative 2 for fast ferry passengers affected by the DMAs. However, there is an additional impact of 15 days during early-May for the two fast ferries operating from Boston to Provincetown that together have 10 trips daily. The estimated economic impact on fast ferry passengers is estimated at \$3.6million at 10 knots, \$2.8 million at 12 knots and \$2.2 million at 14 knots.

For regular ferries, the economic impact for Alternative 6 is again similar to Alternative 2 with an increment for speed restrictions for 30 daily trips on the Boston-Provincetown route over 15 days. The estimated economic impact on regular ferry passengers is \$1.6 million at 10 knots, \$1.1 million at 12 knots and \$0.3 million at 14 knots.

## WHALE WATCHING INDUSTRY

The whale watching industry also can be categorized into operations that deploy high-speed vessels with speeds ranging from 25-38 knots; and operations that deploy regular speed vessels with speeds from 16-20 knots. Table 4-49 presents information for the major whale watching operators in Massachusetts Bay. There are four operators of high-speed vessels; two are based in Boston, one in Barnstable and one in Provincetown (2 vessels). There are five operators of regular speed vessels that have operations based in Newburyport, Boston, Gloucester, Plymouth (6 vessels) and Provincetown (4 vessels).

Under Alternative 2, the high-speed vessels are assumed to suspend operations during periods when DMAs are implemented along their route.<sup>84</sup> The estimated economic impact of the suspension of the five high-speed vessels for a single 15-day DMA is \$0.4 million.<sup>85</sup> This analysis assumes 100 percent compliance with the voluntary DMAs. The estimated economic impact at 10 knots is \$0.9 million for the 13 regular-speed vessels, which incur a 54-minute delay each way for two trips per day. At 12 knots, the estimated economic impact to regular-speed whale watching vessels is \$0.5 million and at 14 knots, \$0.3 million.

*Table 4-49. Massachusetts Bay Whale Watching Operators, 2005*

Operator	Location	Vessel Speed	Vessels
<b><u>High-Speed Vessels</u></b>			
Boston Harbor Cruises	Boston, MA	37	1
Hyannis Whale Watcher Cruises	Barnstable, MA	38	1
New England Aquarium	Boston, MA	25	1
Portuguese Princess Excursions	Provincetown, MA	25	2
<b><u>Regular Speed Vessel</u></b>			
Massachusetts Bay Lines	Boston, MA	18	1
Capt. John Boats	Plymouth, MA	17	6
Newburyport Whale Watch	Newburyport, MA	20	1
Yankee Whale Watching	Gloucester, MA	20	1
Dolphin Fleet of Provincetown	Provincetown, MA	16	4

Source: Prepared by Nathan Associates from data on operator websites and selected interviews.

Under Alternative 3, the year-round speed restrictions in the Northeast region and Cape Cod Bay would render the high-speed whale watching vessels unprofitable and they would be sold or diverted into other

<sup>84</sup> This analysis assumes that, on average, only half of a DMA area would affect the whale watching vessel's route, hence the effective distance of the DMA would be approximately 20 nautical miles.

<sup>85</sup> Calculated at \$13,320 daily operating costs excluding fuel times 15 days for 5 vessels.



service.<sup>86</sup> As this would not be a recurring economic cost, any loss associated with the sale of the vessel is not included in this economic assessment. It is also assumed that regular-speed whale watching vessels would be put into service in their place. However, demand for whale watching from locations such as Boston would diminish as the additional time required to reach whale feeding areas will discourage passengers. It is possible some of this demand would divert to other whale watching operations located closer to the feeding areas.

Regular-speed whale watching vessels would be subject to the year-round speed restrictions extending 25 nautical miles from the Northeast region coastline and in Cape Cod Bay. It is assumed that at 10 knots, the 13 regular-speed vessels would incur a 54-minute delay each way for two round-trips daily during a 90-day summer whale-watching period. The estimated economic impact is \$5.6 million for a speed restriction of 10 knots, \$3.1 million at 12 knots and \$1.9 million at 14 knots (Table 4-50).

Under Alternative 6, speed restrictions for Cape Cod Bay are implemented from January 1 through May 15. Hence, the peak summer whale watching season would not be affected for high-speed or regular speed vessels. Similarly, the proposed speed restrictions for an extended Off Race Point are proposed for March through April would not impact the whale watching season. Accordingly, the economic impact of Alternative 6 is assumed to be the same as Alternative 2 due to the implementation of DMAs.<sup>87</sup>

**Table 4-50. Estimated Economic Impact of Proposed Operational Measures on Massachusetts Bay Whale Watching Operators, 2005**

Type of vessel and alternative	Restricted speed in knots		
	10	12	14
<b><u>High-Speed Vessels</u></b>			
Alternative 2	399,600	399,600	399,600
Alternative 3	-	-	-
Alternative 6	399,600	399,600	399,600
<b><u>Regular Speed Vessel</u></b>			
Alternative 2	936,000	520,000	312,000
Alternative 3	5,616,000	3,120,000	1,872,000
Alternative 6	936,000	520,000	312,000
<b><u>Total</u></b>			
Alternative 2	1,335,600	919,600	711,600
Alternative 3	5,616,000	3,120,000	1,872,000
Alternative 6	1,335,600	919,600	711,600

Source: Prepared by Nathan Associates from data on operator websites and selected interviews.

<sup>86</sup> This analysis also applies to Alternative 5.

<sup>87</sup> Even though compliance by whale watch operators with the proposed speed restrictions of DMAs under Alternative 6 is voluntary, we have assumed 100 percent compliance for the economic impact analysis. Lesser levels of compliance would result in proportionately lower levels of economic impact.

## INDIRECT ECONOMIC IMPACT

Industry representatives and other parties expressed concern that implementation of the proposed operational measures on passenger ferries, whale-watching vessels and charter fishing vessels would also have an indirect economic impact on local communities. For example, operators of fast ferries between Boston and Provincetown stated that suspension of their services due to the implementation of a DMA during peak season would affect tourism-related businesses in Provincetown. However, members of the passenger ferry industry have also expressed concerns about their ability to compete with car travel, suggesting it is likely that in the absence of convenient ferry service, passengers would select a different mode of transportation to travel to Provincetown. If that is the case, any indirect economic impacts on the local economy can be expected to be limited. These indirect impacts may increase slightly if the high price of gas makes car travel less desirable; however, high energy prices would also affect the cost of traveling by ferry.

Similarly, whale watching operators and tourism officials in the Greater Boston area expressed concerns that visitors would cut short their trip or cancel their visit to the region entirely with the implementation of a DMA. However, unlike the passenger ferry operators that have to operate on a fixed route, whale watching operators under most circumstances could alter their route to avoid a DMA implemented offshore. Thus they would select routings to areas outside the DMA where they could observe whale species other than the right whale. Also operators of vessels less than 65 feet in length would likely serve some additional customers desiring to observe right whales within the DMA area, even though the vessels would still be required to comply with the 500 yard approach regulation. In this case, the implementation of a DMA might generate additional business for these whale watching operators. As such, tourists would have sufficient attractive alternatives and would not be expected to cut short or cancel their visit to the region due to the proposed operational measures.

The proposed operational measures for the mid-Atlantic region will be effective from November through April and as such do not fall within the peak months for charter fishing. In addition, it is expected that customers lost to the larger head boats will be served by charter fishing operators with vessels under 65 LOA. For these reasons, the indirect economic impact on the local communities is expected to be minimal.

## Summary

In this section we summarize the findings regarding the economic impact of the proposed operational measures for right whale ship strike reduction and alternatives on U.S. East Coast maritime activity.

Table 4-51 presents the direct and indirect economic impacts by alternative and restriction speed for 2003 and 2004. The direct economic impact is shown for each sector or element analyzed.

- Alternative 5 has the largest estimated economic impact in terms of direct economic impact, indirect economic impact and total economic impact. In 2004, the estimated total economic impact of Alternative 5 at a speed restriction of 10 knots is \$359.7 million annually. The operational measure of speed restrictions year-round under Alternative 5 (and Alternative 3) will have

substantial repercussions through the Northeast region port areas and the northern mid-Atlantic port areas. The combination of DMA, recommended route designations and speed restrictions also contributes to substantial total economic impact for Alternative 5. The brunt of the direct economic impact is borne by the commercial shipping industry with a combined direct economic impact of \$166.7 million. This represents 83 percent of the total direct economic impact for a speed restriction of 10 knots. The total annual economic impact with a speed restriction of 12 knots is estimated at \$223.3 million and with a speed restriction of 14 knots at \$134.1 million.

- Alternative 3 has the second largest annual economic impact of \$334.8million with a speed restriction of 10 knots. The direct economic impact is estimated at \$195.4 million while the indirect economic impact is estimated at \$139.4 million. The total economic impact at 12 knots is estimated to be \$210.0 million, while at 14 knots, it is estimated to be \$121.7 million.
- Alternative 6, which is the preferred alternative, has the third largest total economic impact of \$137.3 million with a speed restriction of 10 knots. This is comprised of \$87.6 million in direct economic impact and \$49.7 million in indirect economic impact. The total economic impact with a speed restriction of 12 knots is \$77.4 million and with a speed restriction of 14 knots the total economic impact is \$45.0 million.
- Alternative 2 ranks fourth in terms of the largest total economic impact with an annual impact of \$41.5 million for a speed restriction of 10 knots. This alternative did not have any estimated indirect economic impact as vessel calls were assumed not to be diverted to Canadian ports. The total economic impact at 12 knots is estimated to \$28.1 million and at 14 knots, it is estimated to be \$17.9 million.
- Alternative 4 has the lowest total economic impact at \$2.8 million annually. This alternative consists only of use of recommended routes and port areas that may incur negative indirect economic impacts were offset by port areas with gains. The change in speed restriction is not relevant for this alternative.

**Table 4-51. Total Direct and Indirect Economic Impact by Alternative and Restriction Speed, 2003 and 2004 (\$000s)**

Item	Alternative 2			Alternative 3			Alternative 4			Alternative 5			Alternative 6		
	Restriction speed in knots			Restriction speed in knots			Restriction speed in knots			Restriction speed in knots			Restriction speed in knots		
	10	12	14	10	12	14	10	12	14	10	12	14	10	12	14
<b>2003</b>															
Direct economic impact															
Shipping industry vessels	25,026.5	16,119.0	9,829.8	133,009.9	83,641.1	49,461.4	2,333.4	2,333.4	2,333.4	137,000.4	86,678.1	51,755.2	53,158.3	33,423.8	20,007.9
Cumulative effect of multi-port strings	-	-	-	11,265.1	9,350.0	7,885.6	-	-	-	11,265.1	9,350.0	7,885.6	8,718.7	7,236.5	6,103.1
Re-routing of southbound coastwise shipping	-	-	-	7,500.0	7,500.0	7,500.0	-	-	-	7,500.0	7,500.0	7,500.0	3,400.0	3,400.0	3,400.0
Commercial fishing vessels	-	-	-	1,724.0	-	-	-	-	-	1,724.0	-	-	1,310.2	-	-
Charter fishing vessels	-	-	-	1,000.0	597.6	298.8	-	-	-	1,000.0	597.6	298.8	796.0	480.0	240.0
Passenger ferries	8,078.0	6,111.3	4,144.7	13,028.0	11,061.3	8,308.0	-	-	-	13,028.0	11,061.3	8,308.0	8,608.9	6,567.2	4,563.0
Passengers' time on passenger ferries	4,512.4	3,376.5	2,271.5	12,027.2	8,892.9	5,479.6	-	-	-	12,027.2	8,892.9	5,479.6	5,190.8	3,868.7	2,556.0
Whale watching vessels	1,335.6	919.6	711.6	5,616.0	3,120.0	1,872.0	-	-	-	5,616.0	3,120.0	1,872.0	1,335.6	919.6	711.6
Subtotal direct economic impact	38,952.5	26,526.4	16,957.6	185,170.2	124,162.9	80,805.4	2,333.4	2,333.4	2,333.4	189,160.7	127,199.9	83,099.1	82,518.5	55,895.8	37,581.6
Indirect economic impact of port diversions	-	-	-	141,608.0	81,489.0	38,803.0	-	-	-	162,536.0	91,777.2	48,911.2	49,600.5	18,203.5	5,302.7
Total economic impact	38,952.5	26,526.4	16,957.6	326,778.2	205,651.9	119,608.4	2,333.4	2,333.4	2,333.4	351,696.7	218,977.1	132,010.3	132,119.0	74,099.3	42,884.3
<b>2004</b>															
Direct economic impact															
Shipping industry vessels	27,578.8	17,700.7	10,781.8	142,476.8	89,229.6	52,530.3	2,790.6	2,790.6	2,790.6	147,171.3	92,772.0	55,237.8	57,569.2	36,050.4	21,544.6
Cumulative effect of multi-port strings	-	-	-	11,932.6	9,904.1	8,352.8	-	-	-	11,932.6	9,904.1	8,352.8	9,411.5	7,811.5	6,588.1
Re-routing of southbound coastwise shipping	-	-	-	7,600.0	7,600.0	7,600.0	-	-	-	7,600.0	7,600.0	7,600.0	3,400.0	3,400.0	3,400.0
Commercial fishing vessels	-	-	-	1,724.0	-	-	-	-	-	1,724.0	-	-	1,310.2	-	-
Charter fishing vessels	-	-	-	1,000.0	597.6	298.8	-	-	-	1,000.0	597.6	298.8	796.0	480.0	240.0
Passenger ferries	8,078.0	6,111.3	4,144.7	13,028.0	11,061.3	8,308.0	-	-	-	13,028.0	11,061.3	8,308.0	8,608.9	6,567.2	4,563.0
Passengers' time on passenger ferries	4,512.4	3,376.5	2,271.5	12,027.2	8,892.9	5,479.6	-	-	-	12,027.2	8,892.9	5,479.6	5,190.8	3,868.7	2,556.0
Whale watching vessels	1,335.6	919.6	711.6	5,616.0	3,120.0	1,872.0	-	-	-	5,616.0	3,120.0	1,872.0	1,335.6	919.6	711.6
Subtotal direct economic impact	41,504.8	28,108.1	17,909.6	195,404.6	130,405.4	84,441.6	2,790.6	2,790.6	2,790.6	200,099.1	133,947.9	87,149.0	87,622.2	59,097.4	39,603.2
Indirect economic impact of port diversions	-	-	-	139,406.0	79,603.0	37,251.0	-	-	-	159,582.0	89,308.4	46,956.4	49,695.0	18,280.0	5,355.0
Total economic impact	41,504.8	28,108.1	17,909.6	334,810.6	210,008.4	121,692.6	2,790.6	2,790.6	2,790.6	359,681.1	223,256.3	134,105.4	137,317.2	77,377.4	44,958.2

Source: Prepared by Nathan Associates as described in text.

## 5. Economic Analysis for a Regulatory Flexibility Act Determination

This section presents the economic analysis for a Regulatory Flexibility Act (RFA) threshold assessment of whether the operational measures of the final rule will have a significant economic impact on a substantial number of small entities. The analysis includes an identification of the number of small entities affected using size standards issued by the U.S. Small Business Administration, Office of Advocacy; an estimate of the economic impact on small entities based on the approach and methodology presented in Section 4; and an assessment of the significance of the economic impact within the context of the RFA standards.

### Size Standards for Small Entities

According to the U.S. Small Business Administration<sup>88</sup>, a small business is a concern that is organized for profit, with a place of business in the United States, and which operates primarily within the United States or makes a significant contribution to the U.S. economy through payment of taxes or use of American products, materials or labor. Further, the concern cannot be dominant in its field, on a national basis. Finally, the concern must meet the numerical small business size standard for its industry. SBA has established a size standard for most industries in the U.S. economy.

Size standards for the industries potentially affected by the final rule are presented in Table 5-1. For international and domestic commercial shipping operators, the SBA size standard for a small business is 500 employees or less. The same threshold applies for international cruise operators and domestic ferry service operators. For whale watching operators and charter fishing operators the SBA threshold is \$6.5 million of average annual receipts. For commercial fishing operators, the SBA threshold is \$4.0 million of average annual receipts.

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<sup>88</sup> United States Small Business Administration, Frequently Asked Questions About Small Business Size Standards, [www.sba.gov/size/indexfaqs.html](http://www.sba.gov/size/indexfaqs.html)

**Table 5-1. Small Business Size Standards and Firms by Employment Size and NAICS Code, 2002**

Type of entity	NAICS Code	NAICS U.S. Industry Title	Size Standard		Firms			
			(\$ millions)	Employees	Total	< 20	< 500	500+
International commercial shipping operator	483111	Deep Sea Freight Transportation	n.a.	500	229	156	206	23
International cruise operator	483112	Deep Sea Passenger Transportation	n.a.	500	94	71	85	9
Domestic commercial shipping operator	483113	Coastal and Great Lakes Freight Transportation	n.a.	500	377	242	349	28
Domestic ferry service operator	483114	Coastal and Great Lakes Passenger Transportation	n.a.	500	124	97	123	1
Whale watching operators	487210	Scenic & sightseeing transportation, water	6.5	n.a.	1,756	1,632	1,748	8
Charter fishing operators	487210	Scenic & sightseeing transportation, water	6.5	n.a.	1,756	1,632	1,748	8
Commerical fishing	114111	Finfish Fishing	4	n.a.	1,100	1,058	1,093	7
	114112	Shellfish Fishing	4	n.a.	791	774	791	-
	114119	Other Marine Fishing	4	n.a.	10	9	10	-

Source: U.S. Small Business Administration, Table of Small Business Size Standards matched to North American Industry Classification System Codes, July 31, 2006 and SBA Office of Advocacy, Firm Size Data provided by U.S. Census Bureau on Employer Firms and Employment by Employment Size of Firm by NAICS Codes, 2002.

Table 5-1 also presents information on the total number of firms in the U.S. in 2002 by employment size ranges for these industries. The preponderance of firms involved in these industries is considered as small entities by the SBA size standards. In 2002, there were 229 firms involved in deep sea freight transportation industry of which 206 firms had 500 employees or less. In the deep sea passenger transport industry, 85 firms of the total 94 firms had 500 or fewer employees. In the Coastal and Great Lakes freight transportation industry, 349 firms of the total 377 firms had 500 or fewer employees. In the Coastal and Great Lakes passenger transportation industry, all but one firm of the 124 total firms had 500 or fewer employees.

There were 1,756 firms providing scenic and sightseeing water transportation in 2002 of which 1,748 firms had 500 or fewer employees. For the finfish fishing industry 1,093 firms of the total 1,100 firms had 500 or fewer employees; while all 791 firms involved in shellfish fishing had 500 or fewer employees.

## Number of Small Entities Potentially Affected

We first present estimates for the number of small entities involved in commercial shipping along the U.S. East Coast that are potentially affected by the operational measures of the final rule followed by estimates for other maritime industries.

### COMMERCIAL SHIPPING

Many of the firms operating within the international commercial shipping industry and international cruise industry have foreign ownership and have their primary place of business outside the U.S. and hence would not qualify as a U.S. small entity.

To identify vessel owned by U.S. entities, we analyzed information provided by the U.S. Coast Guard regarding parties owning vessels that had arrivals at the U.S. East Coast in 2004. We were able to identify the vessel owner and/or managing owner for 99.6 percent of the vessels that had U.S. East Coast vessel arrivals in 2004.<sup>89</sup> The USCG data provides information on the address of the vessel owner and/or managing owner in terms of zip code, state and country. Using that information we identified vessels with U.S. East Coast arrivals in 2004 that were owned by U.S. entities or foreign entities.

Of the 27,385 U.S. East Coast vessel arrivals in 2004, 6,540 arrivals or 23.9 percent were recorded by vessels owned by parties with U.S. address (Table 5-2). The U.S. East Coast arrivals were made by 4,114 vessels of which 620 or 15.1 percent were by vessels owned by parties with a U.S. address. In terms of number of parties, the 2004 vessel arrivals were made by 3,505 parties of which 432 or 12.3 percent had a U.S. address.

**Table 5-2. U.S. East Coast Vessel Arrivals by Vessels with U.S. or Foreign Parties, 2004**

Item	Party address		Total
	U.S.	Foreign	
Number of vessel arrivals	6,540	20,845	27,385
Percent	23.9%	76.1%	100.0%
Number of vessels	620	3,494	4,114
Percent	15.1%	84.9%	100.0%
Number of parties	432	3,073	3,505
Percent	12.3%	87.7%	100.0%

Source: Prepared by Nathan Associates Inc. from analysis of U.S. Coast Guard as described in text.

We then conducted an analysis of the entire U.S. Coast Guard vessel characteristics database to identify the number and type of vessels owned by the U.S. parties with U.S. East Coast arrivals in 2004.<sup>90</sup> Approximately 71 percent of the U.S.-based parties owned only one vessel and 90.7 percent owned 4 or less vessels (Table 5-3).

<sup>89</sup> We were not able to match party information for 198 vessels of the 4,114 vessels that had U.S. East Coast arrivals in 2004. These vessels accounted for 3.8 percent of 2004 U.S. East Coast arrivals (1,004 of the 27,385 arrivals). However using information on U.S. or foreign flag of registry, we assigned these vessels by country of ownership.

<sup>90</sup> For this analysis, we included all vessels owned by the party, not just those with vessel arrivals at U.S. East Coast ports in 2004.

**Table 5-3. U.S.-Based Parties with U.S. East Coast Arrivals  
by Number of Vessels Owned, 2004**

Number of Vessels Owned	Number of Parties	Percentage of Parties	Number of Vessels	Percentage of Vessels
1	306	70.8	306	30.6
2	49	11.3	98	9.8
3	24	5.6	72	7.2
4	13	3.0	52	5.2
5	6	1.4	30	3.0
6	7	1.6	42	4.2
7	6	1.4	42	4.2
8	3	0.7	24	2.4
9	4	0.9	36	3.6
10	1	0.2	10	1.0
11	3	0.7	33	3.3
12	1	0.2	12	1.2
15	1	0.2	15	1.5
16	1	0.2	16	1.6
17	2	0.5	34	3.4
20	1	0.2	20	2.0
24	1	0.2	24	2.4
35	1	0.2	35	3.5
38	1	0.2	38	3.8
61	1	0.2	61	6.1
Total:	432	100	1,000	100

Source: Prepared by Nathan Associates inc. from U.S. Coast

Guard data as described in text.

The next step was to determine which of these U.S. based parties should be considered a small-business for the RFA analysis. Information on the number of employees is not readily available for U.S.-based parties that own vessels with arrivals at the U.S. East Coast. However, we reviewed the list of U.S.-based parties and removed the 53 parties that obviously do not qualify as a small business such as Carnival Cruise Lines, Chevron, Maersk, Holland America Line, BP Oil Shipping, etc. A further classification was made to exclude an additional 17 parties that own 5 or more vessels from the set of small businesses on the assumption that a business with 5 or more capital intensive commercial cargo vessels would employ at least 500 employees throughout its organization. We assume that the remaining set of 362 US-based parties that own vessels that had U.S. East Coast arrivals in 2004 be assumed to be small businesses for the purposes of the RFA analysis. Table 5-4 presents information on vessels and vessel arrivals for this set of vessels assumed to be operated by U.S.-based small entities.



**Table 5-4. U.S. East Coast Vessel Arrivals by U.S.-Based Small Entities, 2004**

Vessel Type	Number of 2004 Vessel Arrivals	Number of vessels	Number of parties
Bulk Carrier	142	25	24
Container Ship	502	30	28
Freight Barge	77	13	12
General Dry Cargo Ship	99	24	22
Multiple	435	49	31
Passenger Ship	463	33	31
Refrigerated Cargo Ship	51	6	6
Ro-Ro Cargo Ship	433	25	22
Tank Barge	702	61	51
Tank Ship	784	83	79
Towing Vessel	209	44	43
Other a/	65	14	13
Total:	3,962	407	362

a/ Other includes fishing vessels, industrial vessels, and research vessels.

Source: Prepared by Nathan Associates Inc. from U.S. Coast Guard data as described in text.

The 362 parties assumed to be small businesses operated 407 vessels that had 3,962 vessel arrivals at U.S. East Coast ports in 2004. Tank ships and tank barges are the vessel types with the most parties, vessels and vessel arrivals for the set of vessels assumed to be owned by U.S. based small businesses.

## OTHER INDUSTRIES

In Section 4, we presented information on entities involved in other maritime industries that would potentially be affected by the operational measures of the final rule. For purposes of this RFA analysis we have assumed that all U.S. East Coast entities involved in commercial fishing industry, domestic ferry service industry, and charting fishing industry are considered as small entities. In the whale watching industry all entities (except the New England Aquarium) are considered as small entities.

Thus as shown in Table 5-5, we estimate that there are 406 small entities potentially affected by the final rule. Of these, 229 entities are involved in commercial fishing in the Northeast Region and 116 entities in the Southeast region. There are 13 entities identified involved in Southern New England passenger ferry service<sup>91</sup>, 8 entities providing whale watching services in Massachusetts Bay and 40 entities providing charter fishing service along the U.S. East Coast. Note that only the subset of charter fishing entities operating larger head boats that accommodate 60 to 100 passengers is included in this analysis. The majority of charter fishing

<sup>91</sup> In Table 4-46, nine entities are listed as operating fast ferries in Southern New England and eight entities that operate regular ferries. However, four of the entities operate both fast ferries and regular ferries and hence, there are only 13 entities involved in Southern New England passenger ferry service.

entities operates fishing boats of less than 65 LOA and thus would not be subject to the operational measures of the final rule.

**Table 5-5. Number of Small Entities in Other Industries  
Potentially Affected by Proposed Rule, 2005**

Industry	Number of Small Entities Potentially Affected
Commercial Fishing	
Northeast Region	229
Southeast Region	116
Southern New England Passenger Ferries	13
Massachusetts Bay Whale Watching	8
Charter Fishing	40
Total	406

Source: Prepared by Nathan Associates Inc. as described in Section 4,  
and presented in Table 4-45, Table 4-46 and Table 4-49.

## Economic Impact on Small Entities

The economic impact of the operational measures of the final rule on small entities was estimated using the same approach and methodology for all entities described in Section 4. Below, we first present the economic impact on the small entities involved in the commercial shipping industry<sup>92</sup> followed the estimated impact on small entities in other maritime industries. Vessel operating costs in this section have been updated to include fuel costs of June 2008.

### COMMERCIAL SHIPPING

All of the operational measures of the final rule described in Section 4 for Alternative 6 are assumed to apply to commercial shipping vessel operated by small entities. Table 5-6 presents the number of vessel arrivals by type of vessel and flag of registry that occurred in 2004 during proposed seasonal speed restriction periods. In total there were 1,745 such vessel arrivals consisting of 1,369 arrivals by U.S.-flagged vessels and 376 arrivals by foreign-flagged vessels. Tank barges and tankers each had 433 vessel arrivals during proposed seasonal speed restriction periods. Containerships were next with 260 vessel arrivals followed by ro-ro cargo ships with 244 vessel arrivals.

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<sup>92</sup> Passenger cruise vessels are included in this section as the data sources, approach and methodology applied for this market segment is same as those of the commercial shipping industry.

**Table 5-6. U.S. East Coast Restricted Period Vessel Arrivals Operated by Small Entities and Economic Impact of Final Rule by Vessel Type, 2004**

Vessel type	2004 Restricted Period Vessel Arrivals			Economic Impact (\$000s)	Economic Impact as a % of Annual Revenues
	U.S.Flag	Foreign	Total		
Bulk Carrier	47	25	72	107.3	0.05%
Combination Carrier (e.g. OBO)	-	-	-	-	-
Container Ship	225	35	260	1,760.2	0.24%
Freight Barge	16	-	16	19.6	0.06%
General Dry Cargo Ship	8	42	50	107.2	0.06%
Passenger Ship	89	9	98	1,346.9	0.19%
Refrigerated Cargo Ship	-	27	27	130.7	0.13%
Ro-Ro Cargo Ship	129	115	244	1,707.6	0.29%
Tank Barge	433	-	433	1,072.9	0.11%
Tanker	325	108	433	1,048.5	0.11%
Towing Vessel	86	-	86	116.6	0.02%
Other a/	11	15	26	19.6	0.03%
Total	1,369	376	1,745	7,437.1	0.15%

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Note: Annual revenue estimated as average of daily operating cost at sea and daily operating cost in port by vessel type and size presented in Section 4 for 365 days for vessels accounting for 2004 restricted period arrivals.

Daily operating cost in port was assumed at 60 percent of daily operating cost at sea. Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

With a speed restriction of 10 knots proposed by NMFS in the final rule, the economic impact of the operational measures on small entities in the commercial shipping industry is estimated at \$7.4 million in 2004. This estimate includes the direct economic impact of speed restrictions during seasonal management periods and dynamic management periods plus the cumulative effect of multi-port strings and the re-routing of southbound coastwise shipping. Containerships (\$1.8 million) ro-ro cargo ships (\$1.7 million) and passenger ships (\$1.3 million) together account for 65 percent of the economic impact on small entities in the commercial shipping industry.

Table 5-6 also presents the economic impact on small entities as a percent of annual revenues for alternative speed restrictions by vessel type. Annual revenues for U.S.-flag and foreign-flag vessels were estimated from the 2008 vessel operating costs presented in Section 4, Table 4-5 by size and type of vessel. For vessels operated by small entities it was assumed that they spend equal amounts of days at sea and in port.

Overall, the economic impact of a speed restriction of 10 knots represents less than two-tenths of one percent of the annual revenues of vessels operated on the U.S. East Coast by small entities. For small entities operating ro-ro cargo ships and containerships, the economic impact increases to up to three-tenths of one percent.

Based on these findings, we conclude that the operational measures of the final rule would not have a significant economic impact on a substantial number of small entities involved in commercial shipping along the U.S. East Coast.

## OTHER INDUSTRIES

The estimated economic impact of the final rule on small entities in other maritime industries is presented in Table 5-7. The economic impact is the same as presented in Section 4 for these industries with the exception of the high-speed vessel segment of the whale watching industry that excludes the economic impact associated with the New England Aquarium operations that is not considered a small entity<sup>93</sup>. For purposes of the RFA determination we have segmented the passenger ferry and whale watching industries by high-speed vessel operators and regular-speed vessel operators.

With a speed restriction of 10 knots proposed by NMFS in the final rule, the economic impact on small entities operating high-speed passenger ferries is estimated at \$2.6 million in 2004. For small entities operating regular speed passenger ferries, the annual estimated impact is \$6.0 million. In the whale watching industry, the estimated impact on operators of high-speed vessels and regular vessels is approximately \$1.3 million. The impact on small entities in the charter fishing industry is estimated at \$0.8 million. The estimated economic impact on small entities in the commercial fishing industry is \$1.3 million.

**Table 5-7. Estimated Economic Impact of Final Rule on Small Entities in Other Industries 2004 (\$000s unless otherwise specified)**

Industry	Estimated Economic Impact (\$000s)	No. of Small Entities	Average Economic Impact per Small Entity (\$000s)	Economic Impact as a % of Annual Revenues
Passenger ferries				
High-speed vessels	2,577.6	9	286.4	4.9%
Regular-speed vessels	6,031.3	8	753.9	7.9%
Whale watching				
High-speed vessels	319.7	3	106.6	4.2%
Regular-speed vessels	936.0	5	187.2	3.8%
Commercial fishing	1,310.2	345	3.8	0.5%
Charter fishing	796.0	40	19.9	3.9%

Source: Prepared by Nathan Associates Inc. as described in text.

Based on information provided by industry members, annual revenues for passenger ferries have been estimated using an average of \$40,000 per vessel per day during a peak season of 120 days. For whale watching vessels, an average of \$16,000 per vessel per day was assumed for a peak season of 120 days. Average annual revenue per small entity also takes into account the average number of vessels operated by small entities in each industry segment. The average economic impact per small entity is calculated by dividing the estimated economic impact by the number of small entities<sup>94</sup>.

For small entities operating high-speed passenger ferries, the economic impact of the operational measures of the final rule will represent nearly 5 percent of their annual revenue. This is primarily due to the effects of a 15-

<sup>93</sup> See Table 4-45 for estimation of economic impact on commercial fishing; Table 4-47, for ferry operators; Table 4-50, for whale watching operators; and the discussion on pp. 145-146 for the economic impact estimation for charter fishing operators.

<sup>94</sup> As mentioned earlier, the economic impact on high-speed ferries and regular ferries was calculated separately; however, as shown in Table 4-46, four entities operate both high-speed and regular ferries.

day DMA assumed to be implemented on their routes during the peak season. Note that 100 percent compliance with the voluntary DMA is assumed. For regular-speed ferries, a speed restriction of 10 knots would result in an economic impact of 7.9 percent of annual revenues of the small entities affected. These economic impacts on small entities operating high-speed ferries and regular-speed are considered significant and if the costs were not passed on to passengers would substantially affect the profitability and viability of these small entities. Even if the increased costs could be transferred to passengers, overall demand could be affected as the ferry industry competes with other transportation modes.

The estimated direct economic impacts presented in Table 5-7 assume 100 percent compliance with the voluntary speed restrictions proposed for DMAs. If ferry operators choose not to comply with the speed restrictions during DMA periods, then the estimated economic impact on high-speed ferries would be \$400,000 per year or about \$45,000 per entity. This corresponds to less than one percent of estimated annual revenues. For regular speed ferries, the economic impact excluding voluntary DMA speed restrictions would be only \$132 thousand per year, and would represent about two-tenths of one percent of annual revenues.

Small entities operating high-speed whale watching vessels would also be affected significantly by DMAs during their peak season with the estimated economic impact representing 4.2 percent of their annual revenues, again assuming 100 percent compliance with voluntary DMAs. The economic impacts on small entities operating high-speed whale watching vessels are considered significant and if the costs were not passed on to passengers would substantially affect the profitability and viability of these small entities. The impact on operators of regular-speed whale watching vessel is somewhat less at 3.8 percent of annual revenues. Even if the increased costs could be transferred to passengers, overall demand could be affected as the whale-watching industry competes with other entertainment options. If whale watching vessel operators choose not to comply with the voluntary DMA speed restrictions, there would not be any economic impact on the whale watching industry.

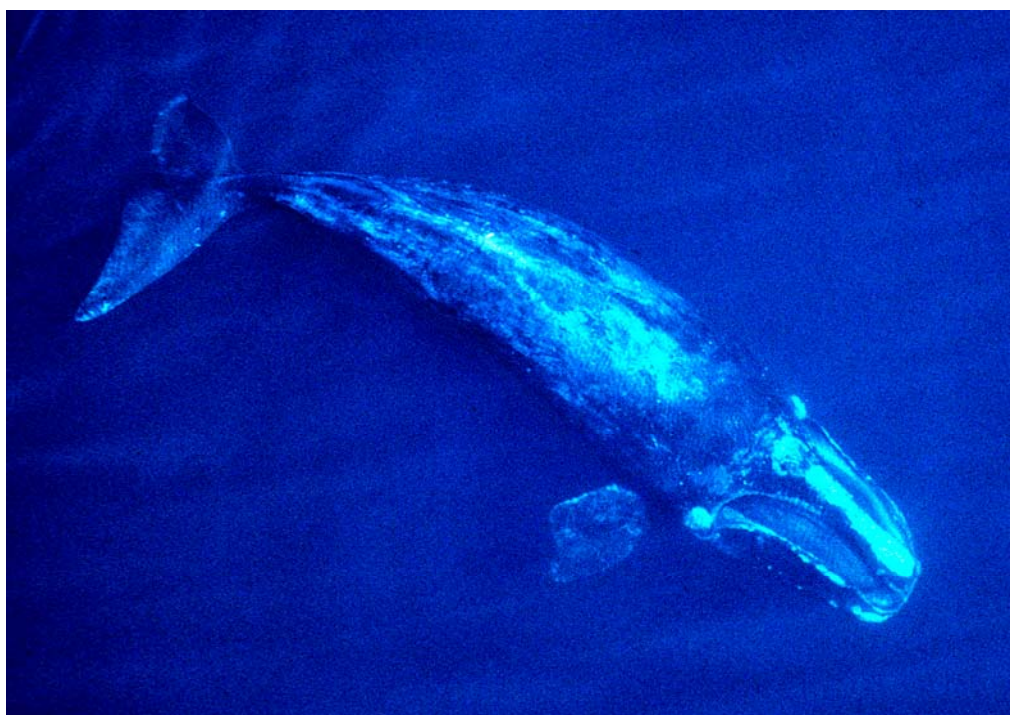
The economic impact on commercial fishing vessels is estimated at \$3,800 per vessel per year and constitutes about one-half of one percent of their annual revenues. This is not considered to be a significant economic impact.

The annual revenue of a small entity operating a charter fishing headboat is estimated at \$504 thousand based on an average of 80 passenger paying \$70 for 90 charters. The estimated economic impact of the final rule at is 3.9 percent of their estimated annual revenue and for purposes of the FRFA determination is not considered to be a significant economic impact.

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*FEIS Report - Appendix Volume*

# **Economic Analysis for the Final Environmental Impact Statement of the North Atlantic Right Whale Ship Strike Reduction Strategy**



**PREPARED FOR**  
National Oceanic & Atmospheric Administration (NOAA)  
National Marine Fisheries (NMFS)  
Office of Protected Resources

**SUBMITTED TO**  
Earth Tech Inc.  
Alexandria, VA

**PREPARED BY**  
Nathan Associates Inc.  
Arlington, Virginia

August 2008

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*Appendix A*

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DESCRIPTION AND REVIEW  
OF U.S. COAST GUARD  
VESSEL ARRIVAL DATA

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**Appendix A, Attachment 1. U.S. Coast Guard Data Fields on Vessel Arrivals, Vessel Characteristics and Ports**

VESSEL ARRIVALS		2002-2003	2004 Data	2002-2003	2004	
Column No.	Type	Column Name	Data	Length	Length	
1	char	Arrival-Id	Yes	Yes	10	4
2	char	Vessel Id	Yes	Yes	10	4
3	char	Arrival_DtTm	Yes	Yes	10	10
4	char	Departure DtTm	Yes	Yes	10	10
5	char	Arrival Status Type	Yes	Yes	5	30
6	char	AOR_Id	Yes	Yes	10	4
7	varchar	Port Abrv	Yes	Yes	50	50
8	char	Last AOR Id	Yes	Yes	10	4
9	varchar	Last_ Port Abrv	Yes	Yes	20	250
10	char	Next AOR Id	Yes	Yes	10	4
11	varchar	Next_ Port Abrv	Yes	Yes	20	20
12	char	Product Type Id	Yes	Yes	3	1
13	char	Cargo Amount	Yes	Yes	10	4
14	char	Cargo Unit Type Id	Yes	Yes	3	1
15	char	Low_ Value_ Bulk_Ind	Yes	Yes	1	1
16	varchar	Location_Desc	Yes	Yes	150	150
17	char	Contact_ Party_Id	Yes	Yes	10	4
18	varchar	Contact_ Name	Yes	No	30	
19	char	Contact_ Phone Num	Yes	No	12	
20	char	Class Soc_ Party_Id	Yes	Yes	10	4
21	char	Targeted Party_Id	Yes	Yes	10	4
22	char	Targeting Matrix Pts	Yes	Yes	10	4
23	char	Calc_Priority_Lvl	Yes	Yes	5	2
24	bit	Preliminary_Priority_Ind	Yes	Yes	1	1
25	char	Assigned Priority_Lvl	Yes	Yes	5	2
26	varchar	Assigned Priorit	Yes	Yes	255	255
27	varchar	Comments	Yes	Yes	255	255
28	char	Inspection Activity_Id	Yes	Yes	10	4
29	char	Last-Mod DtTm	Yes	No	10	
30	char	Last Mod Activity_Id	Yes	No	10	
31	char	Last-Mod-Unit-Id	Yes	No	10	
32	text	General Cargo Desc	Yes	Yes	16	16
33	varchar	Anchorage	Yes	Yes	150	150
34	varchar	Place.Of.Docking	Yes	Yes	150	150
35	varchar	Other_Port_Desc	Yes	Yes	150	150
36	char	SANS_ Id	Yes	Yes	10	4
37	char	AMVER_Id	Yes	Yes	10	4
38	char	Ext_Last_Mod_DtTm	Yes	No	10	
39	varchar	Docking Desc	Yes	Yes	100	150
40	varchar	Anchorage Desc	Yes	Yes	100	150
41	char	Voy_Num	Yes	Yes	10	4
42	varchar	Sans Comments	Yes	No	250	
43	varchar	Sans Discrepancies	Yes	No	250	
44	varchar	Sans_Cargo Desc	Yes	No	250	
45	char	Sans-Port-Id	Yes	No	10	

46 varchar	Charterer	Yes	Yes	100	100
47 char	Boarding Activity_Id	Yes	Yes	10	4
48 varchar	sp - filler	Yes	Yes	1	1

#### ARRIVAL PORTS

Column No.	Type	Column Name	Length
1	char	Port-Id	10
2	varchar	Port_Abbr	20
3	varchar	Port Desc	200
4	char	Country_Code_Id	5
5	char	State_Abbr	2
6	varchar	City_Name	50
7	char	Location-Id	10
8	char	AMVER_Port_Ind	1
9	char	Active-Ind	1
10	char	Last_Mod_DtTm	10
11	char	Last-Mod-Unit-Id	10
12	varchar	Last.Mod.User	30
13	varchar	sp - filler	1

Table Name: MisleVessel

Column No.	Type	Column Name	Length
1	char	gk d vessel	28
2	char	vessel_ id	15
3	varchar	vessel.name	33
4	char	managing_owner_id	28
5	varchar	managing_ owner	120
6	varchar	gross ton	8
7	varchar	net_ ton	8
8	varchar	length	7
9	varchar	breadth	7
10	varchar	depth	7
11	varchar	itc breadth	7
12	varchar	itc depth	7
13	varchar	itc gross ton	8
14	varchar	itc length	7
15	varchar	itc net.ton	8
16	varchar	draft design	8
17	char	draft_ design_ units	2
18	char	dead.Weight ton	8
19	char	-	2
20	char	flag abbr	2
21	varchar	hailing.port	50
22	varchar	hailing_ state	2
23	varchar	hailing port port-province	50
24	varchar	route type	50
25	varchar	classification society	80
26	varchar	cargo authorization type	30
27	char	documented ind	1
28	varchar	documented status.type	30
29	char	inspected ind	1
30	varchar	inspected desc	30
31	char	state_ vessel ind	1

32	varchar	state_ vessel desc	30
33	char	lloyds ind	1
34	varchar	lloyds desc	30
35	char	solas_ind	1
36	varchar	solas_desc	30
37	varchar	insp.subchapter.type	255
38	varchar	vessel_ class	50
39	varchar	vessel_ type	50
40	varchar	vessel_ subtype	50
41	varchar	vessel_ service	30
42	varchar	max passengers allowed	6
43	varchar	max_crew	6
44	varchar	self propelled ind	1
45	varchar	propulsion type	30
46	varchar	hull_ material	30
47	varchar	hull_ design_ type	30
48	varchar	hull_ double_ bottom_ type	30
49	varchar	hull.double.side.type	30
50	varchar	call_ sign	8
51	varchar	official_ number	10
52	varchar	hull number	30
53	varchar	rbs hull number	30
54	varchar	imo number	30
55	varchar	vessel_ age	4
56	varchar	build_ shipyard	50
57	char	build_ year	4
58	varchar	hull build.party.name	80
59	varchar	-	80
60	varchar	horsepower_ ahead	5
61	varchar	horsepower_ astern	5
62	varchar	forebody_type_desc	30
63	varchar	hull_ configuration	30
64	varchar	hull_ shape	30
65	char	filler	1

**Appendix A, Attachment 2. Reconciliation of Port Codes in USCG Vessel Arrival File and Port Description File**

Port Code from Arrival File	Keep or drop	Port Code	Comment
7 AGRUM 0	Drop	SCRMT0	Fresno, CA Nr Sacramento
16 ALEXANDRIA B 0	Drop		Alexandria Bay on the St. Lawrence
21 ALLIANCE 0	Drop		5 arrivals
34 ANGOON 0	Drop		Canadian icebreaker
38 ANTIOCH 0	Keep	SCRMT0	Antioch, CA nr Sacramento
41 APRA HARBOR 0	drop		Guam could combine with apra
42 ARABI 0	drop		St. Bernard port, Louisiana
66 BANGOR/BREWE 0	Keep	BANGME	Bangor ME
69 BARBOURS C 0	Keep	GALV	Barbours Cut Container terminal in Glaveston,TX
70 BARBOURS CUT 0	Keep	GALV	Barbours Cut Container terminal in Glaveston,TX
73 BATON ROUG 0	Keep	NRLNSSW	Baton Rouge
76 BAYONNE 0	Keep	BAYONN	Bayonne NJ
77 BAYOU COSOTT 0	Drop		Off-shore drilling rig
78 BAYPORT 0	Keep	PASAD	Bayport nr Pasadena TX
87 BELLINGHAM 0	Keep	BELHAM	Bellingham, WA
91 BERWICK 0	Drop		Berwick LA
94 BIENVILLE 0	Drop		Port Bienville, MS
95 BIGISL 0	Drop		Big Island HI
100 BLOUNT ISL 0	Keep	JAX	Blount Island Terminal, Jacksonville, FL
101 BLOUNT ISLAN 0	Keep	JAX	Blount Island Terminal, Jacksonville, FL
104 BOLIVAR RO 0	Drop		Port Bolivar,TX
109 BRAINTREE 0	Keep	WEYMTH	weymouth, Fore River, Braintree, MA
116 BREVORT 0	drop		Brevort, MI on Great Lakes
117 BRIDGEPORT 0	Keep	BRIDPT	Bridgeport, CT
118 BRIDGEPORT A 0	Keep	BRIDPT	Bridgeport, CT
131 BURNS HARB 0	Drop		Burns Harbor ,IN on Lake Michigan
136 CALCITE 0	Drop		Calcite, MI on Lake
138 CAMERON 0	Drop		Cameron ,TX
141 CAPE CANAV 0	Keep	PCANAV	Port Canaveral, FL
146 CAPE HENRY P 0	Keep	VIRN A	Virginia Beach, VA
150 CARYLSS 0	Drop		Lake Charles ,LA
157 CEDARVILLE 0	Drop		Cedarville, MI
160 CHANNEL VIEW 0	Keep	PTARAS	Port Arkansas, TX
164 CHARLEVOIX 0	Drop		Charlevoix, MI
166 CHEBOYGAN 0	Keep	CHBYGN	Cheboygan, MI on Lake
172 CHERRY POI 0	Keep	CHERPT	Cherry Point, WA
175 CHESAPEAKE 0	Keep	CHESLV	Cheasapeake, VA
176 CHESAPEAKE C 0	Keep	CHESLV	Cheasapeake, VA
182 CHIGNIK 0	Keep	SEA	Seattle, WA fishing vessels
183 CHOCOLATE BA 0	Drop		Chocolate Bay, TX
184 CHRISTIANS 0	Keep	LIMETREE BA	LimetreeBay, St. Croix
204 COON COVE 0	Drop		Coon Cove, Alaska
209 CORPUS CHR 0	Keep	CORPUS	Corpus Christi, TX
222 DAMES POINT 0	Keep	JAX	Jacksonville, FL
223 DANIA 0	Keep	FTLAUD	Fort lauderdale, FL
230 DEER PARK 0	Keep	PASAD	Deer Park nr Pasadena TX
231 DESTREHAN 0	Keep	DESTHN	Destrahan, LA
233 DETOUR 0	Drop		DeTour, MI Lake Huron
237 DODGE ISLAND 0	Keep	MIAMI	Dodge Island nr Miami, FL
242 DRUMMOND ISL 0	Drop		Drummond Island, MI
246 DUTCH HARBOR 0	Keep	DUTCHH	Dutch Harbour, AK
248 EAST BOSTON 0	Keep	BOSTON	Boston, MA
254 EMPIRE 0	Drop		Empire, LA
268 FERNANDINA 0	Keep	FERNNA	Fernandina, FL
277 FOURCHON 0	Drop		Port Fourchon, LA
280 FREDERIKST 0	Keep	FRDSTD	Fredericsted, St. Croix
285 FRIDAY HARBO 0	Drop		Friday Harbor, WA
291 GALES FERRY 0	Keep	NLON	Near New London, CT
305 GATEWAY TERM 0	Keep	NHAV	New Haven, CT

Port Code from Arrival File	Keep or drop	Port Code	Comment
309 GETTY PETROL 0	drop		two barges
311 GLADSTONE 0	drop		Gladstone, MI
313 GLOUCESTER 0	Keep	GLOUST	Glocester, MA
318 GRAMERCY 0	Keep	GRAMCY	Gramercy, LA
321 GREEN COVE 0	Keep	JAX	nr Jacksonville, FL
322 GREEN COVER 0	Keep	JAX	nr Jacksonville, FL
323 GREENPORT 0	Keep	OYBAY	nr Oyster Bay, NY
324 GREENS BAYOU 0	Keep	HOU	Houston, TX
329 GROTON/NEW L 0	Keep	NLON	Near New London, CT
337 GULFMEX 2 0	drop		Offshore termial
338 GULFPORT 0	Keep	GULFPT	Gulfport. MS
344 HAWK INLET 0	Keep	JUNEAU	Juneau, AK
346 HAY 0	Keep	ISLPK	Island Park, NY
359 HOUMA 0	Drop	NRLNSSW	nr New Orleans, LA
363 HOVENSA 0	Drop		Hovensa, St Croix
376 INDIANA HARB 0	Keep	CHIC	East Chicago, IL
381 JACINTOPORT 0	Keep	HOU	Houston, TX
382 JACKSONVIL 0	Keep	JAX	Jacksonville, FL
393 KAWAIIHAE HAR 0	Drop		Kawaihae, HI
399 KEYSpan NORT 0	Keep	ISLPK	Island Park, NY
400 KEYSpan PORT 0	Keep	ISLPK	Island Park, NY
402 KINGS BAY 0	Keep	KINGBY	Kings Bay, FL nr jacksonville
404 KIVILINA 0	Keep	KIVLNA	Kivalina, AK
417 LA PLACE 0	Drop		La Place, LA
421 LACKAWANA 0	Drop		Lackawana, NY
424 LAKE CHARL 0	Keep	LCHAR	Lake Charles, LA
438 LOCUS POINT 0	Keep	BALTO	Baltimore, MD
439 LOGISTICS TE 0	Drop		2 records
443 LOS ANGELE 0	Keep	LA/LB	Los Angeles
446 LUMMUS ISLAN 0	Keep	MIAMI	Miami, FL
448 MACKINAC 0	Keep	MACN	Mackinac, Island, MI
449 MACKINAW CIT 0	Keep	MACN	Mackinaw City, MI
450 MANCHESTER 0	Keep	HOU	Houston, TX
451 MANITOWOC 0	Keep	MANTWC	Manitowoc, WI
462 MATTITUCK 0	Keep	ISLPK	MATTITUCK, NY
475 MIAMI RIVER 0	Keep	MIAMI	Miami, FL
489 MORGAN'S POI 0	Keep	GALV	Barbours Cut Container terminal in Glaveston,TX
492 MOTIVA BRIDG 0	Keep	WILMDL	Wilmington, DE
493 MOTIVA NEW H 0	Keep	WILMDL	Wilmington, DE
497 MSD SITKA 0	Keep	MSD SITKA	Sitka, AK
498 MSO PORT ART 0	Keep	MSOPort Ar	MSO Port Arthur, TX
503 MYRTLE GRO 0	Keep	MYRE	Myrtle Grove, LA
504 MYRTLE GROVE 0	Keep	MYRE	Myrtle Grove, LA
507 NASHVILLE 0	Keep	NRLNSSW	New Orleans, LA
508 NASHVILLE AV 0	Keep	NRLNSSW	New Orleans, LA
518 NEW HAVEN AN 0	Keep	NHAV	New Haven, CT
521 NEW LONDON S 0	Keep	NLON	New London, CT
522 NEW ORLEAN 0	Keep	NRLNSSW	New Orleans, LA
523 NEW ORLEANS 0	Keep	NRLNSSW	New Orleans, LA
525 NEW YORK CIT 0	Keep	NYC	New York City
528 NEWBURYPORT 0	Keep	SALEM	nr Salem, MA
529 NEWIBERIA 0	Keep	NRLNSSW	nr New Orleans, LA
532 NEWPORT 0	Keep	NEWPT	Newport, RI
537 NIKISHKA 0	DROP		Nikishka, AK
546 NORTHPORT AN 0	Keep	ISLPK	North Long Island nr Huntington
564 OFFSHORE LIG 0	Keep	MTKPS	offshore Montauk
571 OSTRICA 0	Keep	OSTRCA	Ostricala, LA
580 PANAMA CIT 0	Keep	PANAMA	Panama City, FL
588 PATMS-ALL PO 0	Keep	PATMS-All P	MSO Port Arthur, TX
590 PAULINA 0	Keep	NRLNSSW	nr New Orleans, LA
606 PHILLIPS 0	Keep	ANCRGE	Nikiski, AK nr Anchorage
607 PHILLIPS DOC 0	Keep	ANCRGE	Nikiski, AK nr Anchorage
624 POINT COMF 0	DROP		9 Records

Port Code from Arrival File	Keep or drop	Port Code	Comment
635 PORT ARTHU 0	Keep	PATMS-All P	MSO Port Arthur, TX
639 PORT CANAV 0	Keep	PCANAV	Port Canaveral, FL
643 PORT COVINGT 0	Keep	BALTO	Baltimore, MD
644 PORT DOLOMIT 0	Drop		Port Dolomite, MI near Cedarville
645 PORT EVERG 0	Keep	PTGLDS	Port Everglades, FL
647 PORT FOURCHO 0	Drop		Port Fourchon, LA
648 PORT HADLOCK 0	Keep	PUGET	Port Hadlock, WA
649 PORT HUENE 0	Keep	PORHUE	Port Hueneme, CA
652 PORT INLAND 0	Drop		Port Inland, MI
653 PORT JEFFE 0	Keep	PTJFSN	Port Jefferson, NY
657 PORT MANAT 0	Keep	TAMPA	Port Manatee, FL nr Tampa
658 PORT MANATEE 0	Keep	TAMPA	Port Manatee, FL nr Tampa
660 PORT NECHE 0	Keep	PTNECH	Port Neches, TX nr Por Arthur
663 PORT OF NEW 0	Drop		1 record
665 PORT SUTTO 0	Keep	TAMPA	Port Sutton, FL nr Tampa
666 PORT SUTTON 0	Keep	TAMPA	Port Sutton, FL nr Tampa
673 PRESQUE ISLE 0	Drop		PresqueIsland, MI
674 PRIBILOF ISL 0	Drop		Pribilof Islands,AK
694 PUGET SOUN 0	Keep	PUGET	Puget Sound, WA
697 RATTLESNAKE 0	Keep	TAMPA	Rattlesnake Point,FL nr Tampa
700 REDWOOD CI 0	Keep	REDWOD	Redwood City, CA nr SF
703 RESERVE 0	Keep	NRLNSSW	Reserve, LA nr New Orleans
710 RIVERHEAD AN 0	Keep	ISLPK	Riverhead, NY
712 ROCHESTER 0	Drop		Rochester, NY
715 ROCKPORT 0	Keep	TAMPA	Rockport, FL nr Tampa
716 RODEO 0	Keep	SFRAN	Rodeo, CA nr SF
719 ROSEY ROADS 0	Drop		Rosey Roads, Puerto Rico
725 SABINE LIG 0	Keep	SAB LGT	Sabine, TX
728 SABINE RIVER 0	Keep	SAB LGT	Sabine, TX
729 SACRAMENTO 0	Keep	SCRMT0	Sacramento, CA
732 SAN FRANCI 0	Keep	SFRAN	San Francisco, CA
736 SAN JUAN 0	Keep	SJUAN	San Juan, Puerto Rico
738 SAN PEDRO 0	Keep	SPEDRO	San Pedro, CA
739 SAN PEDRO HA 0	Keep	SPEDRO	San Pedro, CA
741 SANDFILL 0	Keep	SNDFIL	nr San Juan, Puerto Rico
744 SAULT STE. M 0	Drop		Sault Ste. Marie Michigan
745 SAV 0	Keep	SAVGA	Savannah, GA
753 SEABROOK 0	Keep	GALV	Seabrook, TX nr Galveston
758 SEATTLE 0	Keep	SEA	Seattle, WA
768 SHEMA ISLAN 0	Drop		Shemya Island. AK
770 SILVER BAY 0	Drop		Silver bay, MN near Duluth
780 SOUTH BOSTON 0	Keep	BSN	Boston, MA
781 SOUTH LOCUST 0	Keep	BALTO	Baltimore, MD
782 SOUTH LOUISI 0	Keep	NRLNSSW	New Orleans, LA
784 SOUTHWEST 0	Keep	NRLNSSW	Baton Rouge, LA
785 SOUTHWEST HA 0	drop		1 record
794 ST, MICHAEL 0	drop		St. Michael. AK
795 ST. AUGUSTIN 0	Keep	STAUG	Saint Augustine, FL
796 ST. CHARLES 0	drop		Port St. Charles, Barbados
797 ST. CROIX 0	Keep	STCROX	Saint Croix, VI
798 ST. ELMO 0	drop		1 record; looks west coast
799 ST. GEORGE 0	drop		2 records
800 ST. JAMES 0	Keep	SJAMES	St. James, LA
801 ST. JOHN 0	Keep	ST JOHN	St. John, VI
802 ST. JOHNS 0	Keep	STJOAC	St. Johns, Antigua
804 ST. PAUL 0	Keep	SPIH	Saint Paul Island, AK
805 ST. PAUL ISL 0	Keep	SPIH	Saint Paul Island, AK
807 ST. ROSE 0	Keep	NRLNSSW	New Orleans, LA
808 ST. THOMAS 0	Keep	STTHOM	St Thomas, VI
813 STAR LAKE 0	drop		3 records
819 STONEPORT 0	drop		Stoneport, MI
820 STONEY POINT 0	Keep	STO I	Stony Point, CT
823 STURGEON BAY 0	Keep	STURBY	Sturgeon Bay, WI



Port Code from Arrival File	Keep or drop	Port Code	Comment
830 SWP LIGHTER I 0	Keep	SWP	Southwest Pass Lightering, LA
832 SWPASS LIGHT 0	Keep	SWP	Southwest Pass Lightering, LA
835 TACONITE HAR 0	Drop		Taconite Harbor, MN near Duluth
836 TAFT 0	Keep	NRLNSSW	New Orleans, LA
837 TALLABOA 0	Keep	TALLBY	Tallaboa, Puerto Rico
845 TINIAN 0	Drop		Tinian, Northern Marrianas
848 TOKSOOK 0	Drop		Toksook Bay, AK
851 TOLSTOI 0	Drop		5 records
853 TOSCO PORT J 0	Keep	NYC	Tosco Bay, NJ
854 TOSCO RIVERH 0	Keep	NYC	Tosco Bay, NJ
856 TRAVERSE CIT 0	Drop		Traverse City, MI
864 VANCOUVER 0	Keep	VANCOV	Vancouver
872 WAGGAMAN 0	Keep	NRLNSSW	Waggaman, LA
875 WASHINGTON 0	Keep	WASHDC	Washington, DC
876 WEEDON ISLAN 0	Keep	TAMPA	Weedon Island, FL nr Tampa
882 WHITING 0	Drop		Whiting, IN
884 WILLIAMS PIN 0	Drop		Williams Point, FL nr Indian River
885 WILLIAMS T-D 0	Keep	NHAV	William Terminal, New Haven, CT
886 WILMINGTON 0	Keep	WILMDL	Wilmington, DE
AMERICAN SAM	drop		
AMERICAN SAM	drop		
AMERICAN SAM	drop		
FOX RIVER	drop		MI
GUSTAVUS	drop		AK
HUNMS	drop		MS
JAMESTOWN	keep	HAMPTONRDS	
JAMESTOWN	keep	HAMPTONRDS	
JAMESTOWN	keep	HAMPTONRDS	
JAMESTOWN	keep	HAMPTONRDS	
LYNNHAVEN AN	keep	HAMPTONRDS	
PELICAN	drop		AK
ST JOHNS BAR	drop		FL
TENAKEE SPRI	drop		AK

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**Appendix A, Attachment 3. Reconciliation of Port /State Designations for Port Codes in USCG Port Description File without State Designations**

Port_Abbreviation	State	Port_ Description
ALSEN	Drop	ALSEN
BALTPS	MD	BALTIMORE PILOT STA
DARRO	LA	DARROW
FJORD	AK	COLLEGE FJORD
GEISMAR	LA	GEISMAR
HOONAH	AK	HOONAH
LOOP	LA	LOOP
OFFSHORE	NY	LIGHTERING-OFFSHORE
PORT AL	LA	PORT ALLEN
PROVIDENCE	RI	PROVIDENCE
BOSTON	MA	BOSTON, MA
GEOTN	SC	GEORGETOWN, SC

Note: There was only one vessel arrival from 2002-2004 to the port with port abbreviation ALSEN. This record did not have any other data entered in the vessel arrival fields. The state for this port was not able to be determined.

## Appendix A, Attachment 4. Match of USCG Port Codes with ANPR Port Regions and Port

State_Abbreviation	Port_Abbreviation	Port_Description	Port area	Port Region
CT	BRIDPT	BRIDGEPORT, CONNECTICUT	BRIDPT	MID-ATL BIS
CT	GLSFRRY	DOW CHEMICAL, ALLYNS POINT	NLON	MID-ATL BIS
CT	GROTON	GROTON	NLON	MID-ATL BIS
CT	HRTFD	HARTFORD	NLON	MID-ATL BIS
CT	MFORD	MILFORD	NHAV	MID-ATL BIS
CT	MIDTOWN	MIDDLETOWN	NLON	MID-ATL BIS
CT	MTKPS	MONTAUK PILOT STATION	LONI U	MID-ATL BIS
CT	MTVILLE	MONTVILLE	NLON	MID-ATL BIS
CT	NHAV	NEW HAVEN	NHAV	MID-ATL BIS
CT	NHT	NEW HAVEN TERMINAL	NHAV	MID-ATL BIS
CT	NLON	NEW LONDON	NLON	MID-ATL BIS
CT	NRWLK	NORWALK	BRIDPT	MID-ATL BIS
CT	PTLANDCT	PORTLAND	NLON	MID-ATL BIS
CT	STAM	STAMFORD	BRIDPT	MID-ATL BIS
CT	STAO	STAMFORD	BRIDPT	MID-ATL BIS
CT	STO I	STONY POINT, NEW YORK	NYC	MID-ATL BIS
CT	WETHFLD	WEATHERSFIELD	NLON	MID-ATL BIS
DE	WILMDL	WILMINGTON, DELAWARE	PHIL	MID-ATL DEL
FL	C CNVL	CAPE CANAVERAL	PCANAV	SE
FL	FERNANDINA	MSO JACKSONVILLE	FERNANDINA	SE
FL	FERNNA	FERNANDINA BEACH	FERNANDINA	SE
FL	FNADNA	FERNADINA	FERNANDINA	SE
FL	JACKSONVILL	JACKSONVILLE	JAX	SE
FL	JAX	JACKSONVILLE	JAX	SE
FL	KINGBY	KINGSBAY	JAX	SE
FL	MAYPT	MAYPORT	JAX	SE
FL	PCANAV	PORT CANAVERAL	PCANAV	SE
FL	PTCD	PORT CANAVERAL	PCANAV	SE
FL	STAUG	SAINT AUGUSTINE	JAX	SE
GA	BRUNSWICK	BRUNSWICK	BRUNSWICK	MID-ATL SAV
GA	BRUNWK	BRUNSWICK	BRUNSWICK	MID-ATL SAV
GA	SAV	SAVANNAH	SAVGA	MID-ATL SAV
GA	SAVANNAH		SAVGA	MID-ATL SAV
GA	SAVGA	SAVANNAH	SAVGA	MID-ATL SAV
GA	SAVMS	MSO SAVANNAH	SAVGA	MID-ATL SAV
MA	BEVL	BEVERLY	SALEM	NE RACE PT
MA	BRAOPN	BRAYTON POINT	NWBDFD	MID-ATL BIS
MA	BSN	BOSTON	BSN	NE RACE PT
MA	CCOD	MSFO CAPE COD	CCOD	NE CCOD

State_Abbreviation	Port_Abbreviation	Port_Description	Port area	Port_Region
MA	CHELSEA	CHELSEA	BSN	NE RACE PT
MA	EVRET	EVERETT	BSN	NE RACE PT
MA	FALL RIVER	FALL RIVER LINE PIER	NWBDFD	MID-ATL BIS
MA	GLOUST	GLOUCESTER, MASSACHUSETTS	SALEM	NE RACE PT
MA	NEWBED	MSFO NEW BEDFORD	NWBDFD	MID-ATL BIS
MA	NWBDFD	NEW BEDFORD	NWBDFD	MID-ATL BIS
MA	NWYMTH	NORTH WEYMOUTH	BSN	NE RACE PT
MA	QUINCY	QUINCY	BSN	NE RACE PT
MA	REVERE	REVERE	BSN	NE RACE PT
MA	SALEM	SALEM	SALEM	NE RACE PT
MA	SNDWCH	SANDWICH	CCOD	NE CCOD
MA	SOMSET	SOMERSET	NWBDFD	MID-ATL BIS
MA	WEYMTH	WEYMOUTH, MASSACHUSETTS	BSN	NE RACE PT
MD	ANNOS	ANNAPOLIS	BALTO	MID-ATL CHES BAY
MD	ANNOS ANCH	ANNAPOLIS ANCHORAGE	BALTO	MID-ATL CHES BAY
MD	BALMS	HAWKINS POINT	BALTO	MID-ATL CHES BAY
MD	BALTO	BALTIMORE	BALTO	MID-ATL CHES BAY
MD	BALTO ANCH	BALTIMORE ANCHORAGE	BALTO	MID-ATL CHES BAY
MD	BALTPS	BALTIMORE PILOT STATION	BALTO	MID-ATL CHES BAY
MD	COVPN	COVE POINT	BALTO	MID-ATL CHES BAY
MD	CURSA	CURTIS BAY	BALTO	MID-ATL CHES BAY
MD	SPRWPT	SPARROWS POINT	BALTO	MID-ATL CHES BAY
MD	STMICHAELS	ST. MICHAELS	BALTO	MID-ATL CHES BAY
ME	BANGME	BANGOR, MAINE	SEARPT	NE GOM
ME	BARHBR	BAR HARBOR	SEARPT	NE GOM
ME	BUCKSPORT	COTP	SEARPT	NE GOM
ME	BUCPT	BUCKSPORT	SEARPT	NE GOM
ME	CASTIN	CASTINE	SEARPT	NE GOM
ME	EASTPT	EASTPORT	EASTPT	NE GOM
ME	PORTLAND	COTP	PORTLAND	NE GOM
ME	PORTLD	PORTLAND, MAINE	PORTLAND	NE GOM
ME	ROCKLD	ROCKLAND	SEARPT	NE GOM
ME	SEARPT	SEARSPORT	SEARPT	NE GOM
ME	WINRR	WINTERPORT	SEARPT	NE GOM
NC	BEAUNC	BEAUFORT	MORCTY	MID-ATL MORCTY
NC	MORCTY	MOREHEAD CITY	MORCTY	MID-ATL MORCTY
NC	SUNYPT	SUNNY POINT	WILMNC	MID-ATL WILMNC
NC	WILMNC	WILMINGTON (N. CAROLINA)	WILMNC	MID-ATL WILMNC
NH	NEWING	NEWINGTON	PORTSMOUTH	NE GOM
NH	PORD	NH-MA BORDER TO KENNEBUNKPORT, ME	PORTSMOUTH	NE GOM
NH	PORTSMOUTH	COTP	PORTSMOUTH	NE GOM
NJ	BAYONN	BAYONNE, NEW JERSEY	NYC	MID-ATL NY

State_Abbreviation	Port_Abbreviation	Port_Description	Port area	Port Region
NJ	ELIZNJ	ELIZABETH	NYC	MID-ATL NY
NJ	NEWARK	NEWARK	NYC	MID-ATL NY
NJ	PAMBOY	PERTH AMBOY	NYC	MID-ATL NY
NJ	PTNWRK	PORT NEWARK	NYC	MID-ATL NY
NY	AMBROS	AMBROSE LV	NYC	MID-ATL NY
NY	CDSPNGHAR	COLD SPRING HARBOR	LONI U	MID-ATL BIS
NY	ISLPK	ISLAND PARK	LONI U	MID-ATL BIS
NY	LONI U	LONG ISL SOUND	LONI U	MID-ATL BIS
NY	MNTKPT	MONTAUK POINT	LONI U	MID-ATL BIS
NY	NORPT	NORTHPORT	LONI U	MID-ATL BIS
NY	NYC	NEW YORK	NYC	MID-ATL NY
NY	NYCMI	NEW YORK CITY	NYC	MID-ATL NY
NY	NYK	NEW YORK	NYC	MID-ATL NY
NY	OCNSDE	OCEANSIDE	NYC	MID-ATL NY
NY	OFFSHORE	LIGHTERING-OFFSHORE	LONI U	MID-ATL BIS
NY	OYBAY	OYSTER BAY	LONI U	MID-ATL BIS
NY	PMISLND	PLUM ISLAND	LONI U	MID-ATL BIS
NY	PTCHEST	PORT CHESTER	LONI U	MID-ATL BIS
NY	PTJFSN	PORT JEFFERSON	LONI U	MID-ATL BIS
NY	RIVRHD	RIVERHEAD	LONI U	MID-ATL BIS
NY	SINY	STATEN ISLAND	NYC	MID-ATL NY
NY	STPLTN	STAPLETON	NYC	MID-ATL NY
PA	CHESTR	CHESTER, PENNSYLVANIA	PHIL	MID-ATL DEL
PA	MARHK	MARCUS HOOK	PHIL	MID-ATL DEL
PA	MORSVL	MORRISVILLE	PHIL	MID-ATL DEL
PA	PHILA	PHILADELPHIA	PHIL	MID-ATL DEL
PA	PHILPS	PHILADELPHIA - DEL BAY ENT	PHIL	MID-ATL DEL
PA	PHIMS	PHILADELPHIA, DELAWARE, SOUTH JERSEY	PHIL	MID-ATL DEL
RI	BLOCKI	BLOCK ISLAND	PROV	MID-ATL BIS
RI	BRENRF	BRENTON REEF	PROV	MID-ATL BIS
RI	BRSTOL	BRISTOL, RHODE ISLAND	PROV	MID-ATL BIS
RI	DAVSVL	DAVISVILLE	PROV	MID-ATL BIS
RI	MELVIL	MELVILLE	PROV	MID-ATL BIS
RI	NARBAY	NARRAGANSETT BAY	PROV	MID-ATL BIS
RI	NEWPT	NEWPORT, RHODE ISLAND	PROV	MID-ATL BIS
RI	PROV	PROVIDENCE, RHODE ISLAND	PROV	MID-ATL BIS
RI	PROVIDENCE		PROV	MID-ATL BIS
RI	PTSMRI	PORTSMOUTH, RHODE ISLAND	PROV	MID-ATL BIS
RI	TIVRTN	TIVERTON	PROV	MID-ATL BIS
SC	BUFTSC	BEAUFORT	SAVGA	MID-ATL SAV
SC	CHARLESTON		CHARLESTON	MID-ATL-CHARL
SC	CHASN	CHARLESTON	CHARLESTON	MID-ATL-CHARL

State_Abbreviation	Port_Abbreviation	Port_Description	Port area	Port_Region
SC	GEOTN	GEORGETOWN, S. CAROLINA	GEOTN	MID-ATL GEOTN
SC	PORT ROYAL	PORT ROYAL	SAVGA	MID-ATL SAV
SC	WANDO	WANDO	CHARLESTON	MID-ATL-CHARL
VA	ALEXVA	ALEXANDRIA	BALTO	MID-ATL CHES BAY
VA	CAPCHAZ	CAPE CHARLES	HAMPTONRDS	MID-ATL CHES BAY
VA	CHEH N	CHEATHAM ANNEX	HAMPTONRDS	MID-ATL CHES BAY
VA	CHENRY	CAPE HENRY	HAMPTONRDS	MID-ATL CHES BAY
VA	CHESLV	CHESAPEAKE LV	HAMPTONRDS	MID-ATL CHES BAY
VA	HAMPRD	HAMPTON ROADS	HAMPTONRDS	MID-ATL CHES BAY
VA	HAMPTONRDS	HAMPTON ROADS	HAMPTONRDS	MID-ATL CHES BAY
VA	HOPE	HOPEWELL	HAMPTONRDS	MID-ATL CHES BAY
VA	JAMSTN	JAMESTOWN, VIRGINIA	HAMPTONRDS	MID-ATL CHES BAY
VA	LCREEK	LITTLE CREEK	HAMPTONRDS	MID-ATL CHES BAY
VA	LYNANN	LYNNHAVEN ANCHORAG	HAMPTONRDS	MID-ATL CHES BAY
VA	NORFOLK	NORFOLK INTERNATIONAL	HAMPTONRDS	MID-ATL CHES BAY
VA	NORVA	NORFOLK	HAMPTONRDS	MID-ATL CHES BAY
VA	NPTNWS	NEWPORT NEWS	HAMPTONRDS	MID-ATL CHES BAY
VA	PINYPT	PINEY POINT	HAMPTONRDS	MID-ATL CHES BAY
VA	PTSMVA	PORTSMOUTH, VIRGINIA	HAMPTONRDS	MID-ATL CHES BAY
VA	RICHMD	RICHMOND	HAMPTONRDS	MID-ATL CHES BAY
VA	VIRN A	VIRGINIA BEACH	HAMPTONRDS	MID-ATL CHES BAY
VA	YORKTN	YORKTOWN	HAMPTONRDS	MID-ATL CHES BAY

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*The GLM Procedure*

Class Level Information		
Class	Levels	Values
<b>nathan_vessel_classification</b>	15	Bulk Carrier Combination Carrier (e.g. OBO) Container Ship Fishing Vessel Freight Barge General Dry Cargo Ship Industrial Vessel Passenger Ship Refrigerated Cargo Ship Research Vessel Ro-Ro Cargo Ship School Ship Tank Barge Tank Ship Towing Vessel

<b>Number of Observations Read</b>	6044
<b>Number of Observations Used</b>	6044

*The GLM Procedure**Dependent Variable: dead\_Weight\_ton Dead Weight Ton*

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	1.5432356E13	1.0288237E12	14861.0	<.0001
Error	6029	417385991862	69229721.656		
Uncorrected Total	6044	1.5849742E13			

R-Square	Coeff Var	Root MSE	dead_Weight_ton Mean
0.934126	20.97180	8320.440	39674.42

Source	DF	Type I SS	Mean Square	F Value	Pr > F
gross_ton*nathan_ves	15	1.5432356E13	1.0288237E12	14861.0	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
gross_ton*nathan_ves	15	1.5432356E13	1.0288237E12	14861.0	<.0001

Parameter	Estimate	Standard Error	t Value	Pr >  t
gross_ton*nathan_ves Bulk Carrier	1.771673315	0.00687489	257.70	<.0001
gross_ton*nathan_ves Combination Carrier (e.g. OBO)	1.705058159	0.02797845	60.94	<.0001
gross_ton*nathan_ves Container Ship	1.157478039	0.00832494	139.04	<.0001
gross_ton*nathan_ves Fishing Vessel	0.565705107	0.74522650	0.76	0.4478
gross_ton*nathan_ves Freight Barge	1.676291420	0.31260983	5.36	<.0001
gross_ton*nathan_ves General Dry Cargo Ship	1.251286201	0.01510447	82.84	<.0001
gross_ton*nathan_ves Industrial Vessel	0.919024058	0.14352300	6.40	<.0001
gross_ton*nathan_ves Passenger Ship	0.109716432	0.01609201	6.82	<.0001
gross_ton*nathan_ves Refrigerated Cargo Ship	1.082925402	0.05196361	20.84	<.0001

*The GLM Procedure**Dependent Variable: dead\_Weight\_ton Dead Weight Ton*

Parameter	Estimate	Standard Error	t Value	Pr >  t
gross_ton*nathan_ves Research Vessel	0.431074591	1.69074763	0.25	0.7988
gross_ton*nathan_ves Ro-Ro Cargo Ship	0.447431311	0.01027650	43.54	<.0001
gross_ton*nathan_ves School Ship	0.523009686	0.43331290	1.21	0.2275
gross_ton*nathan_ves Tank Barge	2.058201277	0.09863496	20.87	<.0001
gross_ton*nathan_ves Tank Ship	1.718735517	0.00488654	351.73	<.0001
gross_ton*nathan_ves Towing Vessel	0.753318686	1.74255941	0.43	0.6655

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## Appendix A, Attachment 6. Summary Vessel Type from Four USCG Vessel Description Fields

vessel_class	vessel_type	vessel_subtype	vessel_service	Nathan_Vessel_Classification
Barge	Bulk Liquid Cargo (Tank) Barge		Tank Barge	Tank Barge
Barge	Bulk Liquid Cargo (Tank) Barge	General	Tank Barge	Tank Barge
Barge	Bulk Liquid Cargo (Tank) Barge	Liquid Chemical Cargo Barge	Tank Barge	Tank Barge
Barge	Bulk Liquid Cargo (Tank) Barge	Non-Flammable Liquid Cargo Barge	Tank Barge	Tank Barge
Barge	Bulk Liquid Cargo (Tank) Barge	Oil Cargo Barge	Tank Barge	Tank Barge
Barge	Bulk Liquid Cargo (Tank) Barge	UNSPECIFIED	Tank Barge	Tank Barge
Barge	Container Barge		Freight Barge	Freight Barge
Barge	Container Barge	UNSPECIFIED	Freight Barge	Freight Barge
Barge	Deck Barge	General	Freight Barge	Freight Barge
Barge	Deck Barge	Roll-on Roll-off	Freight Barge	Freight Barge
Barge	Dry Cargo Barge	General	Freight Barge	Freight Barge
Barge	Dry Cargo Barge	Open General Cargo	Freight Barge	Freight Barge
Barge	General		Freight Barge	Freight Barge
Barge	General	UNSPECIFIED	Freight Barge	Freight Barge
Barge	Industrial Barge	Derrick/Crane Barge	Industrial Vessel	Freight Barge
Barge	Industrial Barge	General	Industrial Vessel	Freight Barge
Barge	Industrial Barge	Pipe laying Barge	Industrial Vessel	Freight Barge
Barge	Integrated Tug and Barge (Barge)	Bulk Liquid	Tank Barge	Tank Barge
Barge	UNSPECIFIED	UNSPECIFIED	UNSPECIFIED	Freight Barge
Bulk Carrier	Cement Carrier		Freight Ship	Bulk Carrier
Bulk Carrier	Cement Carrier	UNSPECIFIED	Freight Ship	Bulk Carrier
Bulk Carrier	Cement Carrier	UNSPECIFIED	UNSPECIFIED	Bulk Carrier
Bulk Carrier	Combination Carrier (e.g. OBO)	Bulk/Oil	Freight Ship	Combination Carrier (e.g. OBO)
Bulk Carrier	Combination Carrier (e.g. OBO)	General	Freight Ship	Combination Carrier (e.g. OBO)
Bulk Carrier	Combination Carrier (e.g. OBO)	Ore/Bulk/Oil	Freight Ship	Combination Carrier (e.g. OBO)
Bulk Carrier	Combination Carrier (e.g. OBO)	UNSPECIFIED	Freight Ship	Combination Carrier (e.g. OBO)
Bulk Carrier	General		Freight Ship	Bulk Carrier
Bulk Carrier	General	General	Freight Ship	Bulk Carrier
Bulk Carrier	General	Self-Discharging	Freight Ship	Bulk Carrier
Bulk Carrier	General	UNSPECIFIED	Freight Ship	Bulk Carrier
Bulk Carrier	General	UNSPECIFIED	UNSPECIFIED	Bulk Carrier
Bulk Carrier	Ore Carrier	General	Freight Ship	Bulk Carrier
Bulk Carrier	Ore Carrier	Self-Discharging	Freight Ship	Bulk Carrier
Bulk Carrier	Ore Carrier	UNSPECIFIED	Freight Ship	Bulk Carrier
Bulk Carrier	UNSPECIFIED	UNSPECIFIED	UNSPECIFIED	Bulk Carrier
Bulk Carrier	Woodchips Carrier	General	Freight Ship	Bulk Carrier
Bulk Carrier	Woodchips Carrier	Self-Discharging	Freight Ship	Bulk Carrier
Fishing Vessel	Fish Catching Vessel	General	Commercial Fishing Vessel	Fishing Vessel
Fishing Vessel	Fish Catching Vessel	Pot/Trap	Commercial Fishing Vessel	Fishing Vessel
Fishing Vessel	Fish Catching Vessel	Trawler, Stern	Commercial Fishing Vessel	Fishing Vessel
Fishing Vessel	Fishing Catching/Processing Vessel	General	Commercial Fishing Vessel	Fishing Vessel
Fishing Vessel	Fishing Catching/Processing Vessel	General Catcher/Processor	Commercial Fishing Vessel	Fishing Vessel
General Dry Cargo Ship	Barge Carrier (e.g. LASH)	LASH Carrier	Freight Ship	General Dry Cargo Ship
General Dry Cargo Ship	Container Ship		Freight Ship	Container Ship
General Dry Cargo Ship	Container Ship	Bulk/Container Carrier	Freight Ship	Container Ship
General Dry Cargo Ship	Container Ship	General	Freight Ship	Container Ship
General Dry Cargo Ship	Container Ship	General Cargo/Container	Freight Ship	Container Ship
General Dry Cargo Ship	Container Ship	UNSPECIFIED	Freight Ship	Container Ship
General Dry Cargo Ship	Container Ship	UNSPECIFIED	UNSPECIFIED	Container Ship
General Dry Cargo Ship	General		Freight Ship	General Dry Cargo Ship
General Dry Cargo Ship	General	UNSPECIFIED	Freight Ship	General Dry Cargo Ship
General Dry Cargo Ship	General	UNSPECIFIED	UNSPECIFIED	General Dry Cargo Ship
General Dry Cargo Ship	Heavy Load Carrier		Freight Ship	General Dry Cargo Ship

vessel_class	vessel_type	vessel_subtype	vessel_service	Nathan_Vessel_Classification
General Dry Cargo Ship	Heavy Load Carrier	UNSPECIFIED	Freight Ship	General Dry Cargo Ship
General Dry Cargo Ship	Pallets Carrier		Freight Ship	General Dry Cargo Ship
General Dry Cargo Ship	UNSPECIFIED	UNSPECIFIED	Freight Ship	General Dry Cargo Ship
Miscellaneous Vessel	Cable laying Vessel		Industrial Vessel	Industrial Vessel
Miscellaneous Vessel	Cable laying Vessel	UNSPECIFIED	Industrial Vessel	Industrial Vessel
Miscellaneous Vessel	Cutter/Dredger	General	Industrial Vessel	Industrial Vessel
Miscellaneous Vessel	Cutter/Dredger	Hopper	Industrial Vessel	Industrial Vessel
Miscellaneous Vessel	Cutter/Dredger	Suction/Hopper	Industrial Vessel	Industrial Vessel
Miscellaneous Vessel	Drydock, Floating		Industrial Vessel	Industrial Vessel
Miscellaneous Vessel	General		Unclassified	Industrial Vessel
Miscellaneous Vessel	General	UNSPECIFIED	Unclassified	General Dry Cargo Ship
Miscellaneous Vessel	Ice Breaker		Public Vessel, Unclassified	Industrial Vessel
Miscellaneous Vessel	Oil Recovery Vessel	General	Oil Recovery	Industrial Vessel
Miscellaneous Vessel	Pipe laying		Industrial Vessel	Industrial Vessel
Miscellaneous Vessel	Repair Vessel		Industrial Vessel	Industrial Vessel
Miscellaneous Vessel	Supply Vessel (not OSV)		Industrial Vessel	Industrial Vessel
Miscellaneous Vessel	UNSPECIFIED		UNSPECIFIED	General Dry Cargo Ship
Miscellaneous Vessel	UNSPECIFIED	UNSPECIFIED	UNSPECIFIED	General Dry Cargo Ship
Offshore	Offshore Supply Vessel	General	Offshore Supply Vessel	General Dry Cargo Ship
Offshore	Offshore Supply Vessel	General	Towing Vessel	Towing Vessel
Passenger Ship	Attraction Vessel	General (6 or Fewer)	Passenger (6 or Fewer)	Passenger Ship
Passenger Ship	Cruise Ship Launch/Tender	UNSPECIFIED	Passenger (More Than 6)	Passenger Ship
Passenger Ship	Excursion/Tour Vessel	General (More Than 6)	Passenger (More Than 6)	Passenger Ship
Passenger Ship	Ferry	General (More Than 6)	Passenger (More Than 6)	Passenger Ship
Passenger Ship	Ferry	General (More Than 6)	Public Freight	Passenger Ship
Passenger Ship	Ferry	Non Ro-Ro Ferry (More Than 6)	Passenger (More Than 6)	Passenger Ship
Passenger Ship	Ferry	Ro-Ro Ferry (More Than 6)	Passenger (More Than 6)	Passenger Ship
Passenger Ship	Gaming Vessel	General (More Than 6)	Passenger (More Than 6)	Passenger Ship
Passenger Ship	General	General (More Than 6)	Passenger (More Than 6)	Passenger Ship
Passenger Ship	General	General (More Than 6)	Passenger Barge (More Than 6)	Passenger Ship
Passenger Ship	Harbor Cruise Vessel	General (More Than 6)	Passenger (More Than 6)	Passenger Ship
Passenger Ship	Ocean Cruise Vessel	General (6 or Fewer)	Passenger (6 or Fewer)	Passenger Ship
Passenger Ship	Ocean Cruise Vessel	General (More Than 6)	Passenger (More Than 6)	Passenger Ship
Passenger Ship	Ocean Cruise Vessel	UNSPECIFIED	Passenger (More Than 6)	Passenger Ship
Passenger Ship	UNSPECIFIED	UNSPECIFIED	UNSPECIFIED	Passenger Ship
Recreational	Motor Propelled Vessels	General	Recreational	Recreational
Recreational	Motor Propelled Vessels	UNSPECIFIED	Recreational	Recreational
Recreational	Motor Propelled Vessels	Yacht, Luxury	Recreational	Recreational
Recreational	Sailing Vessels	General	Recreational	Recreational
Recreational	Sailing Vessels	Motor sailer	Recreational	Recreational
Recreational	UNSPECIFIED	UNSPECIFIED	Recreational	Recreational
Refrigerated Cargo Ship	Container Ship		Freight Ship	Refrigerated Cargo Ship
Refrigerated Cargo Ship	Container Ship	UNSPECIFIED	UNSPECIFIED	Refrigerated Cargo Ship
Refrigerated Cargo Ship	General		Freight Ship	Refrigerated Cargo Ship
Refrigerated Cargo Ship	General	UNSPECIFIED	Freight Ship	Refrigerated Cargo Ship
Research Ship	General		Research Vessel	Research Vessel
Research Ship	General	UNSPECIFIED	Research Vessel	Research Vessel
Research Ship	Oceanographic		Research Vessel	Research Vessel
Ro-Ro Cargo Ship	General		Freight Ship	Ro-Ro Cargo Ship
Ro-Ro Cargo Ship	General	UNSPECIFIED	Freight Ship	Ro-Ro Cargo Ship
Ro-Ro Cargo Ship	General	UNSPECIFIED	UNSPECIFIED	Ro-Ro Cargo Ship
Ro-Ro Cargo Ship	Ro-Ro/Container		Freight Ship	Ro-Ro Cargo Ship
Ro-Ro Cargo Ship	Ro-Ro/Container	UNSPECIFIED	Freight Ship	Ro-Ro Cargo Ship
Ro-Ro Cargo Ship	Ro-Ro/Container	UNSPECIFIED	UNSPECIFIED	Ro-Ro Cargo Ship
Ro-Ro Cargo Ship	Vehicle Carrier		Freight Ship	Ro-Ro Cargo Ship
Ro-Ro Cargo Ship	Vehicle Carrier	UNSPECIFIED	Freight Ship	Ro-Ro Cargo Ship

vessel_class	vessel_type	vessel_subtype	vessel_service	Nathan_Vessel_Classification
Ro-Ro Cargo Ship	Vehicle Carrier	UNSPECIFIED	UNSPECIFIED	Ro-Ro Cargo Ship
School Ship	General		School Ship	School Ship
School Ship	General	UNSPECIFIED	School Ship	School Ship
School Ship	Sailing School	UNSPECIFIED	School Ship	School Ship
School Ship	Training		School Ship	School Ship
Tank Ship	Chemical Tank Ship	Chemical Tank Ship	Tank Ship	Tank Ship
Tank Ship	Chemical Tank Ship	General	Tank Ship	Tank Ship
Tank Ship	Chemical Tank Ship	Oil & Chemical Tank Ship	Tank Ship	Tank Ship
Tank Ship	Chemical Tank Ship	UNSPECIFIED	Tank Ship	Tank Ship
Tank Ship	Chemical Tank Ship	UNSPECIFIED	UNSPECIFIED	Tank Ship
Tank Ship	Gas Carrier	Anhydrous Ammonia	Tank Ship	Tank Ship
Tank Ship	Gas Carrier	General	Tank Ship	Tank Ship
Tank Ship	Gas Carrier	LNG	Tank Ship	Tank Ship
Tank Ship	Gas Carrier	LPG	Tank Ship	Tank Ship
Tank Ship	General		Tank Ship	Tank Ship
Tank Ship	General	UNSPECIFIED	Tank Ship	Tank Ship
Tank Ship	Petroleum Oil Tank Ship	Asphalt, Bitumen Tank Ship	Tank Ship	Tank Ship
Tank Ship	Petroleum Oil Tank Ship	Crude & Products Tank Ship	Tank Ship	Tank Ship
Tank Ship	Petroleum Oil Tank Ship	Crude & Products Tank Ship	UNSPECIFIED	Tank Ship
Tank Ship	Petroleum Oil Tank Ship	Crude Oil Tank Ship	Tank Ship	Tank Ship
Tank Ship	Petroleum Oil Tank Ship	General	Tank Ship	Tank Ship
Tank Ship	Petroleum Oil Tank Ship	Oil Products Tank Ship	Tank Ship	Tank Ship
Tank Ship	Petroleum Oil Tank Ship	UNSPECIFIED	Tank Ship	Tank Ship
Tank Ship	Petroleum Oil Tank Ship	UNSPECIFIED	UNSPECIFIED	Tank Ship
Tank Ship	UNSPECIFIED	UNSPECIFIED	Tank Ship	Tank Ship
Tank Ship	Vegetable Oil Tank Ship		Tank Ship	Tank Ship
Towing Vessel	General		Towing Vessel	Towing Vessel
Towing Vessel	General	UNSPECIFIED	Towing Vessel	Towing Vessel
Towing Vessel	General	UNSPECIFIED	UNSPECIFIED	Towing Vessel
Towing Vessel	Integrated Tug and Barge (Tug)		Towing Vessel	Towing Vessel
Towing Vessel	Integrated Tug and Barge (Tug)	UNSPECIFIED	Towing Vessel	Towing Vessel
Towing Vessel	Integrated Tug and Barge (Tug)	UNSPECIFIED	UNSPECIFIED	Towing Vessel
Towing Vessel	Pushing Ahead (Towboat)		Towing Vessel	Towing Vessel
Towing Vessel	Pushing Ahead (Towboat)	UNSPECIFIED	Towing Vessel	Towing Vessel
Towing Vessel	Ship Assist Tug		Towing Vessel	Towing Vessel
Towing Vessel	Towing Behind (Tug)		Towing Vessel	Towing Vessel
Towing Vessel	Towing Behind (Tug)	UNSPECIFIED	Towing Vessel	Towing Vessel
Towing Vessel	Towing Behind (Tug)	UNSPECIFIED	UNSPECIFIED	Towing Vessel
UNSPECIFIED	General	UNSPECIFIED	Freight Ship	General Dry Cargo Ship
UNSPECIFIED	UNSPECIFIED		UNSPECIFIED	General Dry Cargo Ship
UNSPECIFIED	UNSPECIFIED	UNSPECIFIED	Freight Barge	Freight Barge
UNSPECIFIED	UNSPECIFIED	UNSPECIFIED	Freight Ship	General Dry Cargo Ship
UNSPECIFIED	UNSPECIFIED	UNSPECIFIED	Industrial Vessel	Industrial Vessel
UNSPECIFIED	UNSPECIFIED	UNSPECIFIED	Offshore Supply Vessel	Industrial Vessel
UNSPECIFIED	UNSPECIFIED	UNSPECIFIED	Public Freight	General Dry Cargo Ship
UNSPECIFIED	UNSPECIFIED	UNSPECIFIED	Public Tankship/Barge	Tank Barge
UNSPECIFIED	UNSPECIFIED	UNSPECIFIED	Public Vessel, Unclassified	General Dry Cargo Ship
UNSPECIFIED	UNSPECIFIED	UNSPECIFIED	Tank Barge	Tank Barge
UNSPECIFIED	UNSPECIFIED	UNSPECIFIED	Tank Ship	Tank Ship
UNSPECIFIED	UNSPECIFIED	UNSPECIFIED	Towing Vessel	Towing Vessel
UNSPECIFIED	UNSPECIFIED	UNSPECIFIED	UNSPECIFIED	Drop
UNSPECIFIED	UNSPECIFIED	UNSPECIFIED	Unclassified	Drop

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**Appendix A, Attachment 7 Comparison of 2003 Arrivals  
by Port Region and Vessel Classification**

Port Region	2003 Arrivals Reported in April 2005	
	Report	Revised 2003 Arrivals
MID-ATL BIS	2,462	2,241
MID-ATL CHES BAY	4,571	4,486
MID-ATL DEL	2,530	2,479
MID-ATL GEOTN	3	63
MID-ATL MORCTY	126	123
MID-ATL NY	5,676	5,426
MID-ATL SAV	2,618	2,398
MID-ATL WILMNC	646	628
MID-ATL-CHARL	2,361	2,277
NE CCOD	22	22
NE GOM	2,013	1,055
NE RACE PT	399	492
SE	4,114	3,842
Total:	27,541	25,532

Vessel Classification	2003 Arrivals Reported in April 2005	
	Report	Revised 2003 Arrivals
Bulk Carrier	3,114	2,743
Combination Carrier (e.g. OBO)	167	150
Container Ship	9,215	8,623
Fishing Vessel	4	3
Freight Barge	252	243
General Dry Cargo Ship	1,883	1,752
Industrial Vessel	72	65
Passenger Ship	1,197	1,229
Refrigerated Cargo Ship	650	621
Research Vessel	11	11
Ro-Ro Cargo Ship	3,504	3,107
School Ship	4	3
Tank Barge	1,251	1,127
Tank Ship	5,755	5,439
Towing Vessel	462	416
Total	27,541	25,532

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*Appendix B*

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**VESSEL ARRIVALS BY PORT  
AREA AND VESSEL DWT**

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Table B-1. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

## Port Area: Total East Coast

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	76	197	177	249	109	317	193	334	324	262	136	123	215	14	-	2	11	4	2,743
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	16	-	27	9	-	36	17	25	18	-	2	150
Container Ship	184	382	323	359	434	254	1,118	679	1,108	794	1,844	1,135	-	8	-	1	-	-	8,623
Freight Barge	33	16	107	85	1	-	1	-	-	-	-	-	-	-	-	-	-	-	243
General Dry Cargo Ship	257	376	263	159	145	114	72	108	145	113	-	-	-	-	-	-	-	-	1,752
Passenger Ship	455	684	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,229
Refrigerated Cargo Ship	4	197	281	56	7	7	47	-	-	-	22	-	-	-	-	-	-	-	621
Ro-Ro Cargo Ship	156	66	913	986	324	199	31	55	169	16	191	-	1	-	-	-	-	-	3,107
Tank Barge	282	437	141	176	84	3	4	-	-	-	-	-	-	-	-	-	-	-	1,127
Tanker	368	93	275	194	103	185	299	721	604	827	137	405	142	47	389	279	210	161	5,439
Towing Vessel	416	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	416
Other a/	47	23	7	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	82
Total	2,278	2,471	2,577	2,264	1,207	1,079	1,770	1,913	2,350	2,039	2,339	1,663	394	86	414	300	221	167	25,532
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	62	261	237	238	139	366	191	410	288	281	182	171	304	9	-	-	3	7	3,149
Combination Carrier (e.g. OBO)	2	2	-	-	-	-	3	31	-	16	3	4	20	12	1	12	-	-	106
Container Ship	204	352	324	261	502	306	1,184	957	1,069	810	1,682	1,234	1	-	-	-	-	-	8,886
Freight Barge	73	39	73	79	7	-	3	-	-	-	-	-	-	-	-	-	-	-	274
General Dry Cargo Ship	200	378	300	150	156	137	48	117	182	175	-	-	-	-	-	-	-	-	1,843
Passenger Ship	598	922	100	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,666
Refrigerated Cargo Ship	-	215	168	55	1	39	49	-	2	-	19	-	-	-	-	-	-	-	548
Ro-Ro Cargo Ship	135	88	808	977	274	258	79	54	153	25	202	-	1	-	-	-	-	-	3,054
Tank Barge	346	530	265	217	114	7	8	2	-	3	-	-	-	-	-	-	-	-	1,492
Tanker	344	72	197	186	110	160	343	750	473	989	121	411	182	38	348	364	196	229	5,513
Towing Vessel	745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	745
Other a/	78	20	5	3	-	-	3	-	-	-	-	-	-	-	-	-	-	-	109
Total	2,787	2,879	2,477	2,212	1,303	1,273	1,911	2,321	2,167	2,299	2,209	1,820	508	59	349	376	199	236	27,385

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-2. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Eastport, ME

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	-	1	6	3	-	-	2	-	3	1	-	-	-	-	-	-	-	-	16
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	1	-	-	-	-	-	1	2	1	-	-	-	-	-	-	-	-	5
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	4	5	3	-	-	-	1	3	3	-	-	-	-	-	-	-	-	19
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	6	11	6	-	-	2	2	8	5	-	-	-	-	-	-	-	-	40
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	-	-	9	8	-	-	-	-	-	2	3	-	-	-	-	-	-	-	22
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	4
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	17	-	-	-	-	-	-	-	-	17
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	9	8	-	-	-	-	2	21	3	-	-	-	-	-	-	-	43

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-3. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Searsport, ME

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	-	6	-	-	1	5	-	1	-	-	1	-	-	-	-	-	-	-	14
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	19	44	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tank Barge	1	10	10	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	23
Tanker	-	2	33	-	-	4	18	13	7	6	3	2	-	-	-	1	-	-	89
Towing Vessel	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	23	62	46	1	2	9	18	14	7	6	5	2	-	-	-	1	-	-	196
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	-	6	-	-	1	-	1	1	-	1	-	-	-	-	-	-	-	-	10
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	2
Freight Barge	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
General Dry Cargo Ship	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Passenger Ship	34	46	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	81
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tank Barge	-	2	8	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Tanker	3	-	2	-	-	3	14	26	4	21	4	1	-	-	-	-	-	-	78
Towing Vessel	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	46	57	12	2	1	3	15	27	5	22	4	1	1	-	-	-	-	-	196

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-4. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Portland, ME

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<u>2003 Total arrivals</u>																			
Bulk Carrier	-	3	6	10	2	5	14	8	5	9	3	1	-	-	-	-	-	-	66
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	13	-	-	14
Container Ship	-	1	-	-	1	2	3	1	1	-	-	-	-	-	-	-	-	-	9
Freight Barge	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	1	10	17	3	-	-	-	3	2	2	-	-	-	-	-	-	-	-	38
Passenger Ship	4	12	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	50	-	4	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	58
Tank Barge	1	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Tanker	18	4	39	1	1	8	35	27	31	26	4	1	1	-	57	112	16	15	396
Towing Vessel	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Other a/	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	86	34	71	18	4	16	52	39	39	37	7	2	1	-	58	125	16	15	620
<u>2004 Total arrivals</u>																			
Bulk Carrier	-	6	6	11	4	4	18	3	5	4	6	3	1	-	-	-	-	-	71
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	4
Container Ship	-	2	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	4
Freight Barge	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	-	3	14	1	-	2	1	1	1	5	-	-	-	-	-	-	-	-	28
Passenger Ship	8	13	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	29	2	1	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
Tank Barge	1	10	10	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Tanker	19	-	5	-	1	5	26	34	35	44	1	4	2	1	51	123	15	29	395
Towing Vessel	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47
Other a/	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	106	36	40	19	10	11	45	38	41	53	9	7	3	1	51	127	15	29	641

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.



Table B-5. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Portsmouth, NH

Year and period	DWT (000s)																	Total	
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150		150+
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	-	-	2	-	1	8	2	26	16	5	2	1	-	-	-	-	-	-	63
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	3
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	1	1	-	1	1	3	-	2	1	-	-	-	-	-	-	-	-	-	10
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Tanker	3	9	5	4	3	8	2	33	21	19	9	1	-	-	-	-	-	-	117
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	7	11	9	5	5	19	4	63	38	24	12	2	-	-	-	-	-	-	199
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	-	-	-	1	3	4	1	26	9	5	2	-	-	-	-	-	-	-	51
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	3
Container Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	3	-	-	-	3	4	2	3	1	-	-	-	-	-	-	-	-	-	16
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	7	4	2	3	1	15	23	13	13	5	1	-	-	-	-	-	-	87
Towing Vessel	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Other a/	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Total	14	11	5	3	9	9	18	55	23	18	7	1	-	-	-	-	-	-	173

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-6. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Salem, MA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	1	3	2	-	-	1	-	-	-	-	-	7
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1	-	-	-	-	-	-	1	3	2	-	1	1	-	-	-	-	-	9
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	6	-	-	-	2	1	-	-	-	-	-	9
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	3	3	-	-	-	-	-	6	-	-	-	2	1	-	-	-	-	-	15

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-7. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Boston, MA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	-	-	2	11	2	5	1	2	5	2	-	2	2	-	-	-	-	-	34
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Container Ship	-	15	-	1	3	2	1	2	23	9	21	-	-	-	-	-	-	-	77
Freight Barge	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
General Dry Cargo Ship	3	2	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	8
Passenger Ship	94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	94
Refrigerated Cargo Ship	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Ro-Ro Cargo Ship	27	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	55	-	8	1	1	9	11	67	47	19	1	4	2	-	-	-	-	-	225
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Total	185	22	14	16	6	17	13	73	75	30	22	6	4	-	-	-	-	-	483
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	-	-	2	11	2	5	1	2	5	2	-	2	2	-	-	-	-	-	34
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Container Ship	-	15	-	1	3	2	1	2	23	9	21	-	-	-	-	-	-	-	77
Freight Barge	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
General Dry Cargo Ship	3	2	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	8
Passenger Ship	94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	94
Refrigerated Cargo Ship	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Ro-Ro Cargo Ship	27	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	55	-	8	1	1	9	11	67	47	19	1	4	2	-	-	-	-	-	225
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Total	185	22	14	16	6	17	13	73	75	30	22	6	4	-	-	-	-	-	483

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-8. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Cape Cod, MA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<u>2003 Total arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	7	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	2	1	7	3	-	-	-	-	-	13
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	7	2	-	-	-	-	-	-	-	2	1	7	3	-	-	-	-	-	22
<u>2004 Total arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	3	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	-	-	-	-	-	1	-	1	7	-	7	5	-	-	-	-	-	21
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	4	10	1	-	-	-	1	-	1	7	-	7	5	-	-	-	-	-	36

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-9. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: New Bedford, MA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	-	-	-	-	7	-	2	18	4	5	3	12	7	-	-	-	-	-	58
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	8	8	5	-	3	1	-	-	-	-	-	-	-	-	-	-	-	-	25
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Tanker	-	2	4	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	12	22	9	3	12	1	2	18	4	5	3	12	7	-	-	-	-	-	110
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	-	-	-	-	4	4	1	15	5	2	1	14	8	-	-	-	-	-	54
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	7	9	6	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	24
Passenger Ship	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Refrigerated Cargo Ship	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Ro-Ro Cargo Ship	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	6	2	1	-	-	1	-	-	-	-	-	-	-	-	-	-	10
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	9	18	12	2	6	4	2	16	5	2	1	14	8	-	-	-	-	-	99

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-10. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Providence, RI

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	-	1	-	13	2	3	17	11	13	12	2	2	1	-	-	-	-	-	77
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	2
Container Ship	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	6	14	1	-	1	-	2	-	-	-	-	-	-	-	-	-	-	24
Passenger Ship	13	19	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
Refrigerated Cargo Ship	-	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Ro-Ro Cargo Ship	-	1	43	32	-	1	-	-	-	-	-	-	-	-	-	-	-	-	77
Tank Barge	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Tanker	5	3	4	1	1	5	7	23	38	23	4	4	3	-	1	-	-	-	122
Towing Vessel	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	24	35	66	47	3	10	24	37	51	35	6	6	5	-	1	-	-	-	350
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	-	-	-	21	5	17	11	12	11	3	4	2	-	-	-	-	-	-	86
Combination Carrier (e.g. OBO)	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	2
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	2	8	1	7	2	1	-	-	-	-	-	-	-	-	-	-	-	21
Passenger Ship	20	18	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	36	23	1	2	-	-	-	-	-	-	-	-	-	-	-	-	62
Tank Barge	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Tanker	4	3	-	1	-	7	7	17	13	37	4	-	-	1	-	-	-	-	94
Towing Vessel	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Other a/	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Total	31	23	51	52	13	28	19	29	24	40	8	2	-	2	-	-	-	-	322

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-11. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: New London, CT

Year and period	DWT (000s)																	Total	
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150		150+
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	-	-	-	5	-	1	-	3	5	6	-	-	-	-	-	-	-	-	20
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	2
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	1	-	-	2	1	3	-	3	-	-	-	-	-	-	-	-	10
Passenger Ship	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	20	27	7	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	61
Tanker	-	1	-	1	-	-	1	-	-	5	-	-	-	-	-	-	-	-	8
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	54	28	8	6	7	3	2	7	5	15	-	-	-	-	-	-	-	-	135
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	-	2	-	-	3	1	-	2	4	2	2	1	-	-	-	-	-	-	17
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	1	6	1	-	-	-	-	-	-	-	-	8
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	1	-	-	-	6	-	-	3	6	10	-	-	-	-	-	-	-	-	26
Passenger Ship	54	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	57
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	10	17	22	1	8	-	-	-	-	-	-	-	-	-	-	-	-	-	58
Tanker	1	-	-	4	-	-	-	1	-	5	-	-	-	-	-	-	-	-	11
Towing Vessel	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	69	22	22	5	17	1	-	7	16	18	2	1	-	-	-	-	-	-	180

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-12. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: New Haven, CT

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	-	-	1	1	6	16	8	4	5	6	5	2	-	-	-	-	-	-	54
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	2
Container Ship	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Freight Barge	4	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
General Dry Cargo Ship	-	-	11	3	8	3	1	1	-	6	-	-	-	-	-	-	-	-	33
Passenger Ship	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	36	99	39	57	5	-	-	-	-	-	-	-	-	-	-	-	-	-	236
Tanker	35	-	1	-	-	5	6	53	52	38	3	1	-	-	1	-	-	-	195
Towing Vessel	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
Other <i>a/</i>	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	95	100	52	62	19	24	15	58	57	52	8	3	-	1	1	-	-	-	547
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	-	1	-	-	1	8	6	9	3	7	6	-	-	-	-	-	-	-	41
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	2	-	-	-	3	-	-	1	-	-	-	-	-	-	-	-	-	6
Freight Barge	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
General Dry Cargo Ship	-	7	8	5	2	4	1	2	1	4	-	-	-	-	-	-	-	-	34
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	56	205	61	112	8	-	-	-	-	-	-	-	-	-	-	-	-	-	442
Tanker	31	1	2	2	1	-	7	29	39	31	2	3	3	-	-	-	-	-	151
Towing Vessel	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	114	216	71	119	12	15	14	40	44	42	8	3	3	-	-	-	-	-	701

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.



Table B-13. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Bridgeport, CT

Year and period	DWT (000s)																	Total	
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150		150+
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	-	-	1	-	-	-	-	-	-	11	-	2	14	-	-	-	-	-	28
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Freight Barge	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
General Dry Cargo Ship	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Passenger Ship	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Refrigerated Cargo Ship	-	7	39	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	60	44	22	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	176
Tanker	35	-	-	-	-	-	-	4	1	2	1	2	-	-	2	-	1	1	49
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	104	54	62	58	-	-	-	4	1	13	1	4	14	-	2	-	1	1	319
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	-	-	30	-	-	-	-	-	-	12	-	4	23	-	-	-	-	-	69
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Passenger Ship	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Refrigerated Cargo Ship	-	8	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	114	44	50	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	258
Tanker	29	-	-	-	-	-	-	2	-	2	-	-	-	-	-	-	-	-	33
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	149	52	98	50	-	-	-	2	-	14	-	4	23	-	-	-	-	-	392

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-14. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Long Island, NY

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	2
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	146	224	49	45	57	-	-	-	-	-	-	-	-	-	-	-	-	-	521
Tanker	104	-	2	15	-	-	1	1	2	5	2	25	5	1	23	8	18	6	218
Towing Vessel	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Other a/	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	287	226	51	60	57	-	1	1	2	5	2	25	6	1	24	8	18	6	780
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	154	238	94	46	65	-	-	-	-	-	-	-	-	-	-	-	-	-	597
Tanker	112	-	-	-	-	-	-	12	-	13	4	35	9	-	14	3	7	16	225
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	313	238	94	46	65	-	-	12	-	13	4	35	9	-	14	3	7	16	869

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-15. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: New York City, NY

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	1	9	20	43	6	34	25	49	68	55	32	8	14	2	-	-	-	-	366
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	1	-	5	4	-	14	8	7	-	-	-	39
Container Ship	2	20	187	105	84	78	322	201	243	231	523	404	-	-	-	-	-	-	2,400
Freight Barge	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	8	17	8	3	8	11	4	2	2	2	-	-	-	-	-	-	-	-	65
Passenger Ship	66	114	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	226
Refrigerated Cargo Ship	-	-	8	-	-	7	-	-	-	-	4	-	-	-	-	-	-	-	19
Ro-Ro Cargo Ship	25	44	181	201	48	45	5	10	49	2	86	-	-	-	-	-	-	-	696
Tank Barge	10	15	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	28
Tanker	78	22	41	48	32	58	75	205	195	278	51	160	71	21	140	51	24	8	1,558
Towing Vessel	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
Other a/	7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Total	217	243	492	401	179	233	431	468	557	573	700	572	99	31	147	51	24	8	5,426
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	1	29	23	45	12	45	21	56	39	72	28	3	4	1	-	-	-	1	380
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	9	-	2	2	-	9	3	1	1	-	-	27
Container Ship	1	25	174	80	92	94	347	289	260	214	475	448	-	-	-	-	-	-	2,499
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	7	10	5	7	5	6	6	9	7	6	-	-	-	-	-	-	-	-	68
Passenger Ship	80	154	32	41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	307
Refrigerated Cargo Ship	-	-	10	-	-	16	-	-	-	-	-	-	-	-	-	-	-	-	26
Ro-Ro Cargo Ship	20	50	156	181	57	57	10	9	45	3	95	-	-	-	-	-	-	-	683
Tank Barge	10	4	6	-	-	-	-	1	-	2	-	-	-	-	-	-	-	-	23
Tanker	33	14	45	29	31	28	107	241	169	315	40	119	70	25	115	73	10	21	1,485
Towing Vessel	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47
Other a/	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Total	204	286	451	383	197	246	491	614	520	614	640	570	83	29	116	74	10	22	5,550

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-16. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Philadelphia, PA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	-	30	21	31	15	51	16	48	36	34	15	9	6	-	-	-	-	-	312
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	1	-	-	-	-	14	2	-	2	19
Container Ship	49	106	15	75	69	5	32	9	13	19	74	1	-	-	-	-	-	-	467
Freight Barge	-	4	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
General Dry Cargo Ship	11	62	44	38	8	11	10	5	3	3	-	-	-	-	-	-	-	-	195
Passenger Ship	13	11	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Refrigerated Cargo Ship	3	113	183	42	4	-	47	-	-	-	9	-	-	-	-	-	-	-	401
Ro-Ro Cargo Ship	11	3	56	67	10	1	-	-	-	-	-	-	-	-	-	-	-	-	148
Tank Barge	2	2	2	5	-	1	-	-	-	-	-	-	-	-	-	-	-	-	12
Tanker	4	17	25	39	18	11	37	64	27	54	8	39	5	15	152	95	139	115	864
Towing Vessel	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17
Other a/	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	112	348	348	309	124	80	142	126	79	111	106	49	11	15	166	97	139	117	2,479
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	2	36	19	24	23	57	15	58	40	34	23	20	9	-	-	-	-	-	360
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	2	-	-	1	2	1	-	-	2	-	-	8
Container Ship	52	91	12	68	75	13	33	7	9	19	71	-	-	-	-	-	-	-	450
Freight Barge	-	1	14	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
General Dry Cargo Ship	6	93	74	35	7	23	9	5	10	8	-	-	-	-	-	-	-	-	270
Passenger Ship	11	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33
Refrigerated Cargo Ship	-	139	109	53	1	1	49	-	2	-	10	-	-	-	-	-	-	-	364
Ro-Ro Cargo Ship	9	13	50	58	13	3	-	-	-	-	1	-	-	-	-	-	-	-	147
Tank Barge	-	-	1	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	3
Tanker	11	9	20	53	28	15	36	82	23	67	9	38	8	3	155	143	142	102	944
Towing Vessel	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54
Other a/	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Total	148	405	299	301	147	112	142	155	84	128	115	60	18	3	155	145	142	102	2,661

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-17. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Baltimore, MD

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<u>2003 Total arrivals</u>																			
Bulk Carrier	1	22	28	16	10	25	13	26	12	19	19	29	74	6	-	-	2	2	304
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	2	-	-	1	-	4	1	-	-	-	-	8
Container Ship	6	11	1	10	12	26	100	26	72	32	71	1	-	-	-	-	-	-	368
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	8	33	24	35	57	5	2	8	13	19	-	-	-	-	-	-	-	-	204
Passenger Ship	6	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40
Refrigerated Cargo Ship	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Ro-Ro Cargo Ship	9	-	216	199	80	44	9	15	32	6	43	-	-	-	-	-	-	-	653
Tank Barge	1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Tanker	1	12	19	15	3	3	10	4	12	57	7	15	21	-	3	2	-	8	192
Towing Vessel	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
Other a/	2	14	4	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	23
Total	50	130	299	275	162	103	137	81	141	133	141	45	99	7	3	2	2	10	1,820
<u>2004 Total arrivals</u>																			
Bulk Carrier	-	25	31	18	10	22	12	51	28	22	24	48	92	3	-	-	-	1	387
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	1	-	-	-	1	3	1	-	-	-	-	6
Container Ship	-	4	1	4	13	28	118	54	74	32	73	1	-	-	-	-	-	-	402
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	2	38	34	32	50	8	4	12	12	20	-	-	-	-	-	-	-	-	212
Passenger Ship	15	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75
Refrigerated Cargo Ship	-	4	3	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	9
Ro-Ro Cargo Ship	15	3	186	199	55	69	23	18	31	8	44	-	-	-	-	-	-	-	651
Tank Barge	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Tanker	10	12	14	20	7	6	13	12	4	60	11	21	25	2	1	-	7	45	270
Towing Vessel	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
Other a/	1	5	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Total	56	151	279	273	135	135	170	148	149	142	152	71	120	6	1	-	7	46	2,041

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-18. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Hampton Roads, VA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	15	20	16	12	15	19	15	44	27	12	6	29	71	6	-	2	9	2	320
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	1	-	-	2	-	15	7	2	3	-	-	30
Container Ship	18	34	46	56	97	39	252	141	259	143	374	289	-	-	-	-	-	-	1,748
Freight Barge	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	8	28	30	12	10	20	15	7	6	2	-	-	-	-	-	-	-	-	138
Passenger Ship	17	7	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31
Refrigerated Cargo Ship	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ro-Ro Cargo Ship	4	3	17	27	26	8	5	8	22	2	51	-	1	-	-	-	-	-	174
Tank Barge	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Tanker	2	12	12	5	7	7	20	5	9	28	7	27	18	6	9	8	12	8	202
Towing Vessel	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Other a/	9	1	1	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	13
Total	79	107	131	112	155	93	309	206	323	187	440	345	105	19	11	13	21	10	2,666
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	17	38	24	17	17	39	8	44	20	11	14	48	129	5	-	-	3	5	439
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	2	3	-	-	-	1	7	7	-	5	-	-	25
Container Ship	13	23	45	26	115	50	263	197	247	140	289	317	-	-	-	-	-	-	1,725
Freight Barge	1	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
General Dry Cargo Ship	5	40	31	8	12	18	9	7	8	9	-	-	-	-	-	-	-	-	147
Passenger Ship	29	31	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	64
Refrigerated Cargo Ship	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	10
Ro-Ro Cargo Ship	14	1	9	21	11	3	5	9	24	4	50	-	1	-	-	-	-	-	152
Tank Barge	-	1	1	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Tanker	4	8	9	11	6	8	17	12	6	23	10	27	25	4	9	19	14	10	222
Towing Vessel	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
Other a/	10	5	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	16
Total	115	150	124	83	166	128	305	272	305	187	363	393	162	16	9	24	17	15	2,834

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-19. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Morehead City, NC

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	-	3	1	-	3	8	6	-	-	3	2	2	1	-	-	-	-	-	29
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	1	1	-	-	4	1	-	-	7	-	-	-	-	-	-	-	-	-	14
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	7	3	-	2	5	13	-	1	1	-	-	-	-	-	-	-	-	-	32
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Ro-Ro Cargo Ship	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	3	3	2	22	7	2	-	2	-	1	-	-	-	-	-	-	42
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	11	8	5	6	14	44	13	3	8	5	2	3	1	-	-	-	-	-	123
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	1	7	1	2	3	9	4	2	7	8	1	2	2	-	-	-	-	-	49
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Container Ship	1	-	-	-	-	5	-	-	8	-	-	-	-	-	-	-	-	-	14
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	5	3	-	1	3	8	1	-	1	-	-	-	-	-	-	-	-	-	22
Passenger Ship	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	5	2	2	30	5	4	-	8	-	-	-	-	-	-	-	-	56
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	16	10	6	5	8	52	11	6	16	16	1	2	2	-	-	-	-	-	151

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-20. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Wilmington, NC

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<u>2003 Total arrivals</u>																			
Bulk Carrier	12	12	7	10	2	20	7	13	14	8	5	-	1	-	-	-	-	-	111
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	6	-	-	1	-	-	-	-	-	7
Container Ship	3	2	3	5	1	2	5	6	21	25	16	3	-	-	-	-	-	-	92
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	16	13	6	14	8	5	6	15	24	11	-	-	-	-	-	-	-	-	118
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ro-Ro Cargo Ship	1	1	-	2	3	-	-	-	15	-	1	-	-	-	-	-	-	-	23
Tank Barge	-	6	-	9	2	-	-	-	-	-	-	-	-	-	-	-	-	-	17
Tanker	19	-	38	14	12	12	21	28	32	53	7	20	-	1	-	-	-	-	257
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	52	35	55	54	28	39	39	62	106	103	29	23	2	1	-	-	-	-	628
<u>2004 Total arrivals</u>																			
Bulk Carrier	6	8	17	18	6	23	13	14	10	7	6	3	4	-	-	-	-	-	135
Combination Carrier (e.g. OBO)	1	-	-	-	-	-	-	1	-	2	-	-	-	-	-	-	-	-	4
Container Ship	2	2	3	1	-	1	1	10	12	47	4	1	-	-	-	-	-	-	84
Freight Barge	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	25	8	13	6	4	6	1	15	28	17	-	-	-	-	-	-	-	-	123
Passenger Ship	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Refrigerated Cargo Ship	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ro-Ro Cargo Ship	-	1	3	4	3	-	-	-	18	-	-	-	-	-	-	-	-	-	29
Tank Barge	-	6	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Tanker	15	6	40	21	3	3	36	31	20	64	5	22	-	-	-	-	-	-	266
Towing Vessel	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Other a/	1	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	3
Total	62	32	76	51	18	33	54	71	88	137	15	26	4	-	-	-	-	-	667

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.



Table B-21. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Georgetown, SC

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	-	-	11	5	4	6	2	-	4	6	5	-	-	-	-	-	-	-	43
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	2	-	-	-	2	-	-	3	8	3	-	-	-	-	-	-	-	-	18
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	2	1	11	5	6	7	2	3	12	9	5	-	-	-	-	-	-	-	63
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	-	4	4	11	4	4	8	5	3	-	2	-	-	-	-	-	-	-	45
Combination Carrier (e.g. OBO)	-	1	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	3
Container Ship	-	2	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	4
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	2	-	2	1	2	1	-	8	-	-	-	-	-	-	-	-	-	16
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1	9	4	13	6	6	9	7	12	-	2	-	-	-	-	-	-	-	69

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-22. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Charleston, SC

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<u>2003 Total arrivals</u>																			
Bulk Carrier	1	12	3	30	5	10	11	27	32	9	4	7	11	-	-	-	-	-	162
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2
Container Ship	3	9	42	18	22	30	248	173	249	111	413	181	-	4	-	-	-	-	1,503
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	4	15	2	4	6	7	8	18	16	12	-	-	-	-	-	-	-	-	92
Passenger Ship	19	17	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40
Refrigerated Cargo Ship	-	6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Ro-Ro Cargo Ship	3	3	49	88	26	32	1	3	10	-	8	-	-	-	-	-	-	-	223
Tank Barge	-	-	1	3	9	-	1	-	-	-	-	-	-	-	-	-	-	-	14
Tanker	1	1	11	1	-	7	12	34	43	68	11	24	-	1	-	-	-	-	214
Towing Vessel	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
Other a/	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Total	49	64	114	144	68	86	281	257	350	200	436	212	11	5	-	-	-	-	2,277
<u>2004 Total arrivals</u>																			
Bulk Carrier	-	9	5	6	6	10	14	34	19	12	11	3	16	-	-	-	-	-	145
Combination Carrier (e.g. OBO)	-	1	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	3
Container Ship	2	11	43	6	40	35	273	250	317	119	398	155	-	-	-	-	-	-	1,649
Freight Barge	-	4	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
General Dry Cargo Ship	9	20	5	9	5	6	3	26	24	16	-	-	-	-	-	-	-	-	123
Passenger Ship	49	11	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	64
Refrigerated Cargo Ship	-	-	3	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	5
Ro-Ro Cargo Ship	1	4	49	84	20	33	9	-	2	-	9	-	-	-	-	-	-	-	211
Tank Barge	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Tanker	2	2	10	9	3	4	9	23	23	85	9	29	1	1	-	-	-	-	210
Towing Vessel	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39
Other a/	5	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Total	107	64	119	116	85	90	308	334	385	233	427	187	17	1	-	-	-	-	2,473

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-23. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Savannah, GA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	6	38	39	26	19	47	32	26	30	18	8	-	-	-	-	-	-	-	289
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	3	-	11	-	-	-	-	-	-	-	-	14
Container Ship	20	16	17	54	51	28	105	104	158	204	316	255	-	4	-	-	-	-	1,332
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	26	54	33	22	11	13	15	8	27	25	-	-	-	-	-	-	-	-	234
Passenger Ship	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-	9
Ro-Ro Cargo Ship	14	6	22	26	30	9	8	18	32	4	1	-	-	-	-	-	-	-	170
Tank Barge	-	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Tanker	-	5	26	38	15	19	20	86	38	21	6	44	12	-	1	-	-	-	331
Towing Vessel	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Other a/	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Total	79	124	137	167	126	116	180	245	285	283	340	299	12	4	1	-	-	-	2,398
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	7	42	27	21	26	61	27	35	23	20	9	2	2	-	-	-	-	-	302
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	8	-	4	-	-	-	-	-	-	-	-	12
Container Ship	-	27	22	46	60	26	104	129	72	207	312	312	-	-	-	-	-	-	1,317
Freight Barge	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	15	29	36	20	13	18	3	7	25	34	-	-	-	-	-	-	-	-	200
Passenger Ship	48	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49
Refrigerated Cargo Ship	-	1	-	-	-	8	-	-	-	-	9	-	-	-	-	-	-	-	18
Ro-Ro Cargo Ship	11	4	45	15	17	14	24	18	31	6	1	-	-	-	-	-	-	-	186
Tank Barge	-	2	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	3
Tanker	10	7	23	26	18	23	17	83	28	36	5	64	29	-	-	-	1	6	376
Towing Vessel	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Other a/	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	101	113	153	129	134	150	175	280	179	308	336	378	31	-	-	-	1	6	2,474

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-24. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Brunswick, GA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	34	5	1	11	1	12	1	3	10	5	1	2	-	-	-	-	-	-	86
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	3	-	-	-	1	1	-	6	15	-	-	1	-	-	-	-	-	-	27
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	2	5	6	8	1	4	2	18	8	-	-	-	-	-	-	-	-	-	54
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	2	9	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
Ro-Ro Cargo Ship	-	-	110	83	37	35	1	-	7	-	-	-	-	-	-	-	-	-	273
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	1	2	-	-	-	-	1	-	-	-	-	-	-	4
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	40	12	126	104	40	53	6	27	40	5	1	4	-	-	-	-	-	-	458
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	28	8	4	11	2	8	5	11	7	3	1	4	-	-	-	-	-	-	92
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	1	-	1	1	-	-	6	2	-	-	-	-	-	-	-	-	-	11
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	4	7	10	6	7	2	1	14	11	1	-	-	-	-	-	-	-	-	63
Passenger Ship	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Refrigerated Cargo Ship	-	3	7	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Ro-Ro Cargo Ship	-	-	71	97	43	46	2	-	2	1	-	-	-	-	-	-	-	-	262
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Total	40	22	92	117	53	56	9	31	22	5	1	4	-	-	-	-	-	-	452

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-25. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Fernandina, FL

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	-	1	1	-	-	-	1	1	1	-	4	-	-	-	-	-	-	-	9
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	5	65	8	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	80
Freight Barge	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
General Dry Cargo Ship	37	25	27	2	-	-	-	2	9	9	-	-	-	-	-	-	-	-	111
Passenger Ship	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Refrigerated Cargo Ship	-	5	28	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
Ro-Ro Cargo Ship	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	2
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Towing Vessel	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	57	98	64	6	-	-	1	3	12	9	5	-	-	-	-	-	-	-	255
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	-	-	22	-	-	-	1	-	3	-	2	-	-	-	-	-	-	-	28
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	3	57	9	-	-	-	-	-	4	2	-	-	-	-	-	-	-	-	75
Freight Barge	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
General Dry Cargo Ship	39	34	20	-	-	-	-	1	11	12	-	-	-	-	-	-	-	-	117
Passenger Ship	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19
Refrigerated Cargo Ship	-	8	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	85	101	61	-	-	-	1	1	18	14	3	-	-	-	-	-	-	-	284

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-26. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Jacksonville, FL

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Total arrivals</u></b>																			
Bulk Carrier	2	4	7	11	2	25	13	9	24	29	15	13	12	-	-	-	-	-	166
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	1	-	3	-	-	-	-	-	-	-	-	4
Container Ship	70	97	3	35	89	39	48	6	36	17	36	-	-	-	-	-	-	-	476
Freight Barge	6	9	107	71	1	-	1	-	-	-	-	-	-	-	-	-	-	-	195
General Dry Cargo Ship	102	71	7	2	17	13	4	4	14	11	-	-	-	-	-	-	-	-	245
Passenger Ship	7	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Refrigerated Cargo Ship	-	5	4	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Ro-Ro Cargo Ship	6	3	185	253	64	19	2	1	2	2	-	-	-	-	-	-	-	-	537
Tank Barge	-	1	-	3	1	2	2	-	-	-	-	-	-	-	-	-	-	-	9
Tanker	8	1	3	5	6	6	10	70	47	114	8	21	1	1	-	1	-	-	302
Towing Vessel	274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	274
Other a/	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Total	484	196	316	380	182	104	80	91	123	176	59	34	13	1	-	1	-	-	2,240
<b><u>2004 Total arrivals</u></b>																			
Bulk Carrier	-	6	9	3	7	26	16	8	21	37	33	10	11	-	-	-	-	-	187
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	7
Container Ship	129	90	15	28	102	49	44	10	19	18	37	-	-	-	-	-	-	-	541
Freight Barge	23	28	57	66	7	-	2	-	-	-	-	-	-	-	-	-	-	-	183
General Dry Cargo Ship	60	50	9	12	29	24	4	7	20	5	-	-	-	-	-	-	-	-	220
Passenger Ship	37	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	89
Refrigerated Cargo Ship	-	4	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
Ro-Ro Cargo Ship	3	5	160	287	54	29	6	-	-	3	-	-	-	-	-	-	-	-	547
Tank Barge	-	1	-	-	9	4	3	-	-	-	-	-	-	-	-	-	-	-	17
Tanker	5	2	3	3	5	16	9	44	44	136	9	30	1	-	-	-	-	-	307
Towing Vessel	369	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	369
Other a/	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
Total	663	238	262	399	213	148	84	69	104	206	79	40	12	-	-	-	-	-	2,517

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table B-27. Arrivals of Vessels 150 GRT and Above by Port Area and Vessel DWT, 2003 and 2004

Port Area: Port Canaveral, FL

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<u>2003 Total arrivals</u>																			
Bulk Carrier	4	30	4	11	6	17	5	14	7	5	4	2	-	-	-	-	-	-	109
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2
Container Ship	3	1	1	-	-	-	2	2	7	-	-	-	-	-	-	1	-	-	17
Freight Barge	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
General Dry Cargo Ship	13	17	22	6	-	1	4	4	8	2	-	-	-	-	-	-	-	-	77
Passenger Ship	108	417	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	547
Refrigerated Cargo Ship	-	36	4	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	41
Ro-Ro Cargo Ship	4	2	26	1	-	4	-	-	-	-	-	-	-	-	-	-	-	-	37
Tank Barge	-	-	-	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	3
Tanker	-	-	1	-	-	-	4	2	2	7	4	5	-	1	-	1	-	-	27
Towing Vessel	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Other a/	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	161	503	80	19	8	22	16	24	24	14	8	7	-	1	-	2	-	-	889
<u>2004 Total arrivals</u>																			
Bulk Carrier	-	34	4	10	-	19	8	16	26	15	4	-	-	-	-	-	-	-	136
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	2	11	-	-	-	-	-	-	-	-	-	13
Freight Barge	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33
General Dry Cargo Ship	9	19	23	5	1	3	-	4	8	11	-	-	-	-	-	-	-	-	83
Passenger Ship	27	498	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	579
Refrigerated Cargo Ship	-	35	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36
Ro-Ro Cargo Ship	6	3	39	-	-	2	-	-	-	-	1	-	-	-	-	-	-	-	51
Tank Barge	1	-	-	5	1	3	5	-	-	-	-	-	-	-	-	-	-	-	15
Tanker	-	1	1	-	-	2	12	6	4	3	2	6	2	1	3	3	-	-	46
Towing Vessel	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66
Other a/	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Total	146	590	122	20	2	29	25	28	49	29	7	6	2	1	3	3	-	-	1,062

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

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*Appendix C*

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U.S. EAST  
COAST FERRY  
VESSELS AND  
ROUTES

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Table C-1. Ferry Vessels Operating on U.S. East Coast, 2000

State and Vessel Name	City	State	Type	Typical Speed (Knots)	Length (ft)	Gross Tons
<b>Maine</b>						
Scotia Prince	Portland	ME	RoRo	18	469	11,968
Margaret Chase Smith	Rockland	ME	RoRo	14	152.8	99
Captain Charles Phillbrook	Rockland	ME	RoRo	12	127	288
Captain Neal Burgess	Rockland	ME	RoRo	12	127	288
Captain Henry Lee	Rockland	ME	RoRo	12	127	288
Governor Curtis	Rockland	ME	RoRo	12	123.2	303
Machigonne II	Portland	ME	RoRo	9	116.4	88
Everett Libby	Rockland	ME	RoRo	10	104.8	198
North Haven	Rockland	ME	RoRo	10	84.8	143
Bay Mist	Portland	ME	Passenger	9	83.9	95
Maquoit II	Portland	ME	RoRo	9	77.9	97
Balmy Days II	Boothbay Harbor	ME	Passenger	12	64.9	97
Island Romance	Portland	ME	Passenger	9	64.7	78
Elizabeth Ann	Port Clyde	ME	Passenger	10.5	64	48
Island Holiday	Portland	ME	Passenger	9	59.9	84
Laura B.	Port Clyde	ME	Passenger	9	58.1	46
Hardy III	New Harbor	ME	Passenger	11	56	66
Islander	Chebeague Island	ME	Passenger	7.5	52	46
Miss Lizzie	Stonington	ME	Passenger	n.a.	49	20
Novelty	Boothbay Harbor	ME	Passenger	9	46.7	38
Big Squaw	Chebeague Island	ME	Passenger	7.5	46	33
Sea Queen	Cranberry Isles	ME	Passenger	9	44	26
Mink	Stonington	ME	Passenger	n.a.	41.7	34
<b>New Hampshire</b>						
M.V. Thomas Loughton	Portsmouth	NH	Passenger	n.a.	83.4	59
M.V. Oceanic	Portsmouth	NH	Passenger	n.a.	70.59	95
<b>Massachusetts</b>						
Governor	Woods Hole	MA	RoRo	12	242	678
Martha's Vineyard	Woods Hole	MA	RoRo	13	224.1	1,297
Eagle	Woods Hole	MA	RoRo	12	219.5	276
Nantucket	Woods Hole	MA	RoRo	12	219.5	1,152
Gay Head	Woods Hole	MA	RoRo	13	218.3	99
Katama	Woods Hole	MA	RoRo	13	215.8	99
Islander	Woods Hole	MA	RoRo	10.5	191.7	855
Sankaty	Woods Hole	MA	RoRo	13	180.3	351
Provincetown II	Boston	MA	Passenger	16	176.8	96
Great Point	Hyannis	MA	Passenger	16	169.5	71
Flying Cloud	Woods Hole	MA	Passenger	36	134.5	99
Schamouchi	New Bedford	MA	Passenger	14	129.8	91
Brant Point	Hyannis	MA	Passenger	12	112.4	97
Grey Lady II	Hyannis	MA	Passenger	30	106	74
Eugina Louise	Boston	MA	Passenger	18	105.8	97
Cross Rip	Hyannis	MA	Passenger	11	103.8	97
Point Gammon	Hyannis	MA	Passenger	11	103	99
Island Queen	Falmouth	MA	Passenger	14	101.3	99
James J. Doherty	Boston	MA	Passenger	18	100.7	98
Laura	Boston	MA	Passenger	18	100.7	98
Lulu E	Boston	MA	Passenger	18	100.7	98
Matthew J. Hughes	Boston	MA	Passenger	18	100.7	98
Chimera	Plymouth	MA	Passenger	19	100	97
Bay State	Boston	MA	Passenger	11	97.8	98
Fort Independence	Boston	MA	Passenger	10	89.9	98
Capt. Red	Newburyport	MA	Passenger	25	88.8	94
Massachusetts	Boston	MA	Passenger	20	87.6	99
Capt. John & Son IV	Plymouth	MA	Passenger	19	85.9	96
Frederick L. Nolan, Jr.	Boston	MA	Passenger	10	82.9	98

State and Vessel Name	City	State	Type	Typical Speed (Knots)	Length (ft)	Gross Tons
East Chop	Hyannis	MA	Passenger	10	79.9	99
Capt. John & Son	Plymouth	MA	Passenger	17	76.9	79
Capt. John & Son II	Plymouth	MA	Passenger	17	76.59	76
Capt. John & Son III	Plymouth	MA	Passenger	17	76.59	78
Flying Cloud	Quincy	MA	Passenger	30	75.8	45
Lightning	Quincy	MA	Passenger	30	75.8	45
Yankee Freedom	Gloucester	MA	Passenger	18	72.2	94
Native Son	Boston	MA	Passenger	10	65	93
Freedom	Harwich Port	MA	Passenger	20	62.4	67
Alert II	New Bedford	MA	Passenger	n.a.	61.6	66
Anna	Boston	MA	Passenger	20	61.3	56
On Time III	Edgartown	MA	RoRo	4	60.2	26
Edward Rowe Snow	Boston	MA	Passenger	10	58.6	59
Bostonian II	Boston	MA	Passenger	10	56.6	49
On Time II	Edgartown	MA	RoRo	4	52.5	28
Patriot Too	Falmouth	MA	Passenger	9	47	35
Betty Joe Tyler	Boston	MA	Passenger	10	46.1	33
Quickwater	Falmouth	MA	Passenger	15	45	28
Breeds Hill	Boston	MA	Passenger	10	40.9	22
Bunker Hill	Boston	MA	Passenger	10	40.9	22
Minuteman	Falmouth	MA	Passenger	14	40	19
Alison	Boston	MA	Passenger	10	39.29	32

#### **Rhode Island**

Prudence Ferry	Bristol	RI	Passenger	n.a.	91.9	78
Prudence Ferry	Bristol	RI	RoRo	n.a.	61.5	94

#### **Connecticut**

Cape Henlopen	New London	CT	RoRo	11	307.6	1,492
Susan Anne	New London	CT	RoRo	15	237.6	1,348
John H.	New London	CT	RoRo	13	229.7	96
New London	New London	CT	RoRo	13	198.9	94
Block Island	New London	CT	RoRo	12.5	187.3	98
Carol Jean	New London	CT	RoRo	12.5	167.4	88
North Star	New London	CT	RoRo	10	157.9	238
Sassacus	New London	CT	Passenger	45	137.8	95
Tatobam	New London	CT	Passenger	45	137.8	318
Nelseco	New London	CT	RoRo	12.5	124.5	89
Caribbean	New London	CT	RoRo	10	116	94
Sea Jet I	New London	CT	Passenger	28	109.6	99
Shuttle VI	New London	CT	Passenger	15	99.3	98
Zelinsky	Danbury	CT	Passenger	28	84.6	96
Selden III	Newington	CT	RoRo	6	64.8	87
Hollister III	Newington	CT	RoRo	4	64	29
Cumberland	Newington	CT	RoRo	4	28.4	10

#### **New York**

Railcar Float #29	Brooklyn	NY	Rail	4	360	n.a.
Railcar Float #30	Brooklyn	NY	Rail	4	360	n.a.
Samuel I. Newhouse	Staten Island	NY	Passenger	16	310	3,335
Andrew J. Barberi	Staten Island	NY	Passenger	16	310	3,335
P.T. Barnum	Port Jefferson	NY	RoRo	18	290.3	1,595
Railcar Float #16	Brooklyn	NY	Rail	4	290	n.a.
Railcar Float #17	Brooklyn	NY	Rail	4	290	n.a.
The Gov. Herbert H. Lehman	Staten Island	NY	RoRo	16	277	2,109
American Legion	Staten Island	NY	RoRo	16	277	2,109
John F. Kennedy	Staten Island	NY	RoRo	16	277	2,109
Park City	Port Jefferson	NY	RoRo	15	261.2	1,129
Grand Republic	Port Jefferson	NY	RoRo	14.5	260.7	1,237
John A. Noble	Staten Island	NY	Passenger	16	207	499
Alice Austen	Staten Island	NY	Passenger	16	207	499
Anna C.	Orient Point	NY	RoRo	15	179.7	98

State and Vessel Name	City	State	Type	Typical Speed (Knots)	Length (ft)	Gross Tons
Race Point	Fishers Island	NY	RoRo	11	162	87
Miss Circle Line	New York	NY	Passenger	n.a.	139.69	369
Circle Line XIV	New York	NY	Passenger	n.a.	123.2	580
Miss Ellis Island	New York	NY	Passenger	n.a.	122.9	93
Miss New Jersey	New York	NY	Passenger	n.a.	122.9	93
Miss New York	New York	NY	Passenger	n.a.	122.9	94
Miss Freedom	New York	NY	Passenger	n.a.	121.6	98
Miss Liberty	New York	NY	Passenger	n.a.	121.5	98
Miss Gateway	New York	NY	Passenger	n.a.	120.9	95
Viking Starship	Montauk	NY	Passenger	12	117.4	98
Munnatawket	Fishers Island	NY	RoRo	10.5	115.5	95
Viking Starliner	Montauk	NY	Passenger	11	97.8	99
Southern Cross	Shelter Island	NY	RoRo	8	90.4	72
Viking Star	Montauk	NY	Passenger	11	88.2	87
Greenport	Shelter Island Heights	NY	RoRo	7	84.7	95
New Prospect	Shelter Island Heights	NY	RoRo	7	84.7	95
Firebird	Bay Shore	NY	Passenger	19	81.8	72
Shelter Island	Shelter Island Heights	NY	RoRo	7	81.3	90
Islander	Shelter Island Heights	NY	RoRo	7	81.2	90
Voyager	Bay Shore	NY	Passenger	19	79.09	62
Explorer	Bay Shore	NY	Passenger	19	79.09	62
South Bay Clipper	Sayville	NY	Passenger	20	76.8	63
Kiki	Patchogue	NY	Passenger	18	75	68
Fire Island Clipper	Sayville	NY	Passenger	20	73.4	71
Vagabond	Bay Shore	NY	Passenger	9	71.59	73
Capt. Patterson	Bay Shore	NY	Passenger	18	70.7	58
Fire Island Miss	Bay Shore	NY	Passenger	18	70.7	58
Traveler	Bay Shore	NY	Passenger	18	70.7	58
Fireball	Bay Shore	NY	Passenger	18	70.59	56
Pathfinder II	Patchogue	NY	Passenger	18	65.3	99
Quaiapen	Patchogue	NY	Passenger	16	63.7	87
Fire Island Belle	Bay Shore	NY	Passenger	17	62.4	59
Fire Island Duchess	Sayville	NY	Passenger	15	62.3	77
Zee Whiz	Bay Shore	NY	Passenger	18	62.3	73
Zee Lion	Bay Shore	NY	Passenger	17	62	79
Beach Comber IV	Sayville	NY	Passenger	1	61.3	9
Fire Island Empress	Sayville	NY	Passenger	15	61.2	63
Fire Island Trader	Bay Shore	NY	Passenger	9	60.8	33
Michael Cosgrove	Staten Island	NY	Passenger	8	60.75	139
Point O'Woods VI	Long Island	NY	Passenger	n.a.	60.4	70
Stranger	Bay Shore	NY	Passenger	17	60.1	65
Highlander	Patchogue	NY	Passenger	18	58.3	13
North Haven	Shelter Island	NY	RoRo	6	58.2	97
South Ferry II	Shelter Island	NY	RoRo	8	57.5	95
Capt. Ed Cartwright	Shelter Island	NY	RoRo	7	54.2	99
Roamer II	Sayville	NY	Passenger	15	51.5	14
Merrimac II	Sayville	NY	Passenger	15	51.2	38
Monitor II	Sayville	NY	Passenger	15	49	38
Mehsamac	Patchogue	NY	Passenger	18	40.79	35
Bemus Point - Stow Ferry	Mayville	NY	RoRo	n.a.	n.a.	n.a.
<b><u>New Jersey</u></b>						
currently unnamed	Highlands	NJ	Passenger	42	125	90
Bravest	Highlands	NJ	Passenger	34	114.1	93
City Express	Little Falls	NJ	Passenger	20	100	98
Port Imperial New Jersey	Weehawken	NJ	Passenger	n.a.	94.6	96
Empire State	Weehawken	NJ	Passenger	n.a.	92	95
Garden State	Weehawken	NJ	Passenger	n.a.	92	95
Henry Hudson	Weehawken	NJ	Passenger	n.a.	92	95
Robert Fulton	Weehawken	NJ	Passenger	n.a.	92	95
Abraham Lincoln	Weehawken	NJ	Passenger	n.a.	87.3	95
Alexander Hamilton	Weehawken	NJ	Passenger	n.a.	87.3	95

State and Vessel Name	City	State	Type	Typical Speed (Knots)	Length (ft)	Gross Tons
George Washington	Weehawken	NJ	Passenger	n.a.	87.3	95
Thomas Jefferson	Weehawken	NJ	Passenger	n.a.	87.3	95
Port Imperial Manhattan	Weehawken	NJ	Passenger	n.a.	87.2	94
Express I	Little Falls	NJ	Passenger	30	77.7	90
Express II	Little Falls	NJ	Passenger	30	77.7	90
Port Imperial	Weehawken	NJ	Passenger	n.a.	76.8	69
Yogi Berra	Weehawken	NJ	Passenger	n.a.	n.a.	n.a.
LaGuardia	Weehawken	NJ	Passenger	n.a.	n.a.	n.a.
Christopher Columbus	Weehawken	NJ	Passenger	n.a.	n.a.	n.a.
Frank Sinatra	Weehawken	NJ	Passenger	n.a.	n.a.	n.a.
<b><u>Pennsylvania</u></b>						
Riverlink	Philadelphia	PA	Passenger	n.a.	90.8	98
Frederick	Uniontown	PA	RoRo	n.a.	64	35
Roaring Bull V	Millersburg	PA	RoRo	n.a.	n.a.	n.a.
<b><u>Delaware</u></b>						
Twin Capes	Wilmington	DE	RoRo	12.5	301.2	2,262
Cape May	Wilmington	DE	RoRo	12.5	299.2	2,165
Cape Henlopen	Wilmington	DE	RoRo	12.5	284.89	2,120
Delaware	Wilmington	DE	RoRo	12.5	284	2,108
New Jersey	Wilmington	DE	RoRo	12.5	284	2,108
Whale Watcher	Wilmington	DE	Passenger	31	106.4	99
American River	Wilmington	DE	Passenger	21	95.9	96
Virginia C	Georgetown	DE	RoRo	3	64.9	35
Delafort	Wilmington	DE	Passenger	10	55	39
Lady Christina	Wilmington	DE	Passenger	8	47	5
<b><u>Maryland</u></b>						
General Jubal A. Early	Dickerson	MD	RoRo	n.a.	84	68
Steven Thomas	Crisfield	MD	Passenger	9	78.3	99
Talbot	Royal Oak	MD	RoRo	7.5	64.5	43
Capt. Tyler	Ewell	MD	Passenger	12	64	84
Whitehaven Ferry	Salisbury	MD	RoRo	4	60	21
Chelsea Lane Tyler	Ewell	MD	Passenger	14	60	42
Upper Ferry	Salisbury	MD	RoRo	4	50	n.a.
Island Belle II	Ewell	MD	Passenger	n.a.	38.1	21
Capt. Jason	Tylerton	MD	Passenger	n.a.	38.1	19
Capt. Jason II	Tylerton	MD	Passenger	n.a.	38.1	23
<b><u>Virginia</u></b>						
Nandua	Cape Charles	VA	Rail	6	407.6	2,105
Pocahontas	Surry	VA	RoRo	8.5	263.3	1,197
Williamsburg	Surry	VA	RoRo	8.5	200	837
Surry	Surry	VA	RoRo	8.5	189.9	825
Virginia	Surry	VA	RoRo	8.5	152	327
Chesapeake Breeze	Reedville	VA	Passenger	15	95.7	97
Captain Evans	Reedville	VA	Passenger	9	64.7	60
James C. Echols (Elizabeth Ferry I)	Hampton	VA	Passenger	4	60	60
Elizabeth River Ferry II	Hampton	VA	Passenger	4	60	60
Elizabeth River Ferry III	Hampton	VA	Passenger	4	60	60
The Lancaster	Lancaster	VA	RoRo	12	44.25	30
Northumberland	Lottsburg	VA	RoRo	12	44.25	30
Hatton Ferry	Charlottesville	VA	RoRo	0.5	40	20
<b><u>North Carolina</u></b>						
Silver Lake	Morehead City	NC	RoRo	10	210.2	736
Pamlico	Morehead City	NC	RoRo	10	210	735
Cedar Island	Morehead City	NC	RoRo	10	207.8	648
Carteret	Morehead City	NC	RoRo	10	207.5	687
Governor Daniel Russell	Morehead City	NC	RoRo	10	172.8	469
Southport	Morehead	NC	RoRo	10	167.7	374

State and Vessel Name	City	State	Type	Typical Speed (Knots)	Length (ft)	Gross Tons
Neuse	Morehead City	NC	RoRo	10	167.7	380
Floyd J. Lupton	Morehead City	NC	RoRo	10	167.7	374
Fort Fisher	Morehead City	NC	RoRo	10	167.7	374
Governor Hyde	Morehead City	NC	RoRo	9	161	574
Baum	Morehead City	NC	RoRo	10	143.6	283
Lupton	Morehead City	NC	RoRo	10	143.6	248
Cape Point	Morehead City	NC	RoRo	10	140.3	276
Chicamacomico	Morehead City	NC	RoRo	10	140.3	276
Frisco	Morehead City	NC	RoRo	10	140.3	275
Kinnakeet	Morehead City	NC	RoRo	10	140.3	280
Ocracoke	Morehead City	NC	RoRo	10	140.1	276
Governor James B. Hunt, Jr.	Morehead City	NC	RoRo	10	125.1	323
Beaufort	Morehead City	NC	RoRo	9	124.1	287
Alpheus W. Drinkwater	Morehead City	NC	RoRo	9	122.4	199
Conrad Wirth	Morehead City	NC	RoRo	9	112.4	199
Herbert C. Bonner	Morehead City	NC	RoRo	9	112.4	199
Sans Souci	Bald Head Island	NC	Passenger	18	72	93
Adventure	Bald Head Island	NC	Passenger	18	64.8	76
Revenge	Bald Head Island	NC	Passenger	18	62.2	67
Capt. Alger	Davis	NC	RoRo	5	51	35
Capt Alex	Bald Head Island	NC	RoRo	6	50	47
Green Grass	Atlantic	NC	RoRo	n.a.	47.8	34
Elwell	Raleigh	NC	RoRo	5	46.9	22
San Souci	Raleigh	NC	RoRo	5	46.2	22
Parker	Raleigh	NC	RoRo	5	46.2	22
Catherine T.	Davis	NC	RoRo	5	40	n.a.
Miss Anne	Davis	NC	RoRo	7	32.2	9
H.I.F.C. I	Harkers Island	NC	Passenger	20	24	2
Last Cast	Harkers Island	NC	Passenger	25	20	1

#### South Carolina

Daufuskie Clipper I	Hilton Head Island	SC	Passenger	n.a.	58	48
Haig Point I	Hilton Head Island	SC	Passenger	19	55.25	40
Haig Point II	Hilton Head Island	SC	Passenger	19	55.2	39
Daufuskie Clipper IV	Hilton Head Island	SC	Passenger	n.a.	54	20
Daufuskie Clipper II	Hilton Head Island	SC	Passenger	n.a.	48.9	38
Daufuskie Clipper III	Hilton Head Island	SC	Passenger	n.a.	48.9	38
South Island	Columbia	SC	RoRo	2	46	23
Haig Point Pelican	Hilton Head Island	SC	Passenger	22	46	28
Haig Point Osprey	Hilton Head Island	SC	Passenger	22	45	28
Haig Point III	Hilton Head Island	SC	Passenger	16	35.79	22

#### Georgia

Cumberland Princess	St. Marys	GA	Passenger	10	65	50
Annemarie	Sapelo Island	GA	Passenger	12	64.8	61
Cumberland Queen	St. Marys	GA	Passenger	10	64.3	55
Sapelo Queen	Sapelo	GA	Passenger	12	60	82

#### Florida

Blackbeard	Jacksonville	FL	RoRo	6	170.3	537
Jean Ribault	Jacksonville	FL	RoRo	6	153.6	497
Drayton Island Ferry	Palatka	FL	RoRo	n.a.	48	n.a.
Ruby B.	Carrabelle	FL	Passenger	7	38	14
Fort Gates Ferry	Crescent City	FL	RoRo	3	36	n.a.
Fort Gates Ferry	Crescent City	FL	RoRo	3	n.a.	n.a.

Source: U.S. Department of Transportation, Bureau of Transportation Statistics, National Ferry Database

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Table C-2. Ferry Routes Operating on U.S. East Coast, 2000

Sate and Route	Metro Area	Waterbody Crossed	Type	Data Year	Passengers	Vehicles	Season	
							Start	End
<b>Maine</b>								
Yarmouth (NS) - Bar Harbor (ME)	Bar Harbor	Gulf of Maine	Passenger	1998	223,000	61,000	6/1/2000	10/22/2000
Yarmouth (NS) - Portland (ME)	Portland	Bay of Fundy	Passenger	1999	160,000	30,000	5/1/2000	10/26/2000
Bass Harbor (ME) - Frenchboro (ME)	Bangor	Blue Hill Bay	Passenger	1999	3,539	1,514	Year-round	
Bass Harbor (ME) - Swans Island (ME)	Bangor	Blue Hill Bay	Passenger	1999	68,849	32,112	Year-round	
Boothbay Harbor (ME) - Monhegan Island (ME)	Portland	Coastal Atlantic Ocean	RoRo	1999	10,810	n.a.	5/27/2000	10/9/2000
Boothbay Harbor (ME) - Squirrel Island (ME)	Portland	Boothbay Harbor	RoRo	1999	17,193	n.a.	3/1/2000	11/30/2000
Lincolnvill (ME) - Islesboro (ME)	Bangor	Penobscot Bay	Passenger	1999	191,360	91,954	Year-round	
Northeast Harbor (ME) - Islesford, Little Cranberry Island (ME)	Bangor	Coastal Atlantic Ocean	RoRo	1999	29,011	n.a.	Year-round	
Cousins Island (ME) - Chebeague Island, Stone Wharf (ME)	Portland	Casco Bay	Passenger	1999	118,000	n.a.	Year-round	
Portland, Casco Bay Ferry Terminal (ME) - Bailey Island (ME)	Portland	Casco Bay	RoRo	1999	8,664	n.a.	6/30/2000	9/4/2000
Portland, Casco Bay Ferry Terminal (ME) - Chebeague Island, Chandler Cove Landing (ME)	Portland	Casco Bay	RoRo	1999	11,546	n.a.	Year-round	
Portland, Casco Bay Ferry Terminal (ME) - Cliff Island (ME)	Portland	Casco Bay	RoRo	1999	27,764	n.a.	Year-round	
Portland, Casco Bay Ferry Terminal (ME) - Diamond Cove, Great Diamond Island (ME)	Portland	Casco Bay	RoRo	1999	64,596	n.a.	Year-round	
Portland, Casco Bay Ferry Terminal (ME) - Little Diamond Island (ME)	Portland	Casco Bay	RoRo	1999	16,590	n.a.	Year-round	
Portland, Casco Bay Ferry Terminal (ME) - Great Diamond Island (ME)	Portland	Casco Bay	RoRo	1999	35,941	n.a.	Year-round	
Portland, Casco Bay Ferry Terminal (ME) - Long Island (ME)	Portland	Casco Bay	RoRo	1999	103,794	n.a.	Year-round	
Portland, Casco Bay Ferry Terminal (ME) - Peaks Island (ME)	Portland	Casco Bay	Passenger	1999	659,699	17,000	Year-round	
Stonington (ME) - Duck Harbor, Isle Au Haut (ME)	Stonington	Isle Au Haut Bay	RoRo	n.a.	n.a.	n.a.	6/12/2000	9/9/2000
Stonington (ME) - Isle Au Haut (ME)	Stonington	East Penobscot Bay	RoRo	n.a.	n.a.	n.a.	4/3/2000	10/14/2000
Port Clyde (ME) - Monhegan Island (ME)	Portland	Coastal Atlantic Ocean	RoRo	1999	15,000	n.a.	Year-round	
New Harbor (ME) - Monhegan Island (ME)	Portland	Muscongus Bay	RoRo	n.a.	n.a.	n.a.	5/15/2000	10/15/2000
Rockland (ME) - Matinicus Island (ME)	Portland	Penobscot Bay	Passenger	1999	653	221	Year-round	
Rockland (ME) - North Haven (ME)	Portland	Penobscot Bay	Passenger	1999	54,163	19,788	Year-round	
Rockland (ME) - Vinalhaven (ME)	Portland	Penobscot Bay	Passenger	1999	138,916	38,755	Year-round	
<b>New Hampshire</b>								
Portsmouth (NH) - Star Island, Gosport Harbor (NH)	Portsmouth	Coastal Atlantic Ocean	RoRo	n.a.	n.a.	n.a.	6/15/2000	9/30/2000
<b>Massachusetts</b>								
World Trade Center, Boston (MA) - Provincetown (MA) (high speed service)	Boston	Massachusetts Bay	RoRo	1999	16,000	n.a.	5/20/2000	10/15/2000
Rowes Wharf, Boston (MA) - Logan Airport, East Boston, Boston (MA)	Boston	Boston Harbor	RoRo	1999	122,411	n.a.	Year-round	
Long Wharf, Boston (MA) - Provincetown (MA)	Boston	Massachusetts Bay	RoRo	2000	20,000	n.a.	5/5/2000	10/9/2000
Charlestown Navy Yard, Charlestown, Boston (MA) - Lovejoy Wharf, Boston (MA)	Boston	Boston Harbor	RoRo	1999	18,331	n.a.	Year-round	
Long Wharf, Boston (MA) - Georges Island, Boston (MA)	Boston	Boston Harbor	RoRo	1999	87,320	n.a.	4/29/2000	10/9/2000
Hingham, Hingham Shipyard (MA) - Georges Island, Boston (MA)	Boston	Boston Harbor	RoRo	1999	15,340	n.a.	4/29/2000	10/9/2000
Hingham, Hingham Shipyard (MA) - Rowes Wharf, Boston (MA)	Boston	Boston Harbor	RoRo	1999	90,000	n.a.	Year-round	
Hingham, Hingham Shipyard (MA) - Rowes Wharf, Boston (MA)	Boston	Boston Harbor	RoRo	1999	829,866	n.a.	Year-round	
Salem, Blaney St. ferry landing (MA) - Georges Island, Boston (MA)	Boston	Boston Harbor	RoRo	1999	15,340	n.a.	5/20/2000	10/31/2000
Fore River, Quincy (MA) - Logan Airport, East Boston (MA)	Boston	Boston Harbor	RoRo	1999	110,000	n.a.	Year-round	
Logan Airport, East Boston, Boston (MA) - Long Wharf, Boston (MA)	Boston	Boston Harbor	RoRo	1999	7,260	n.a.	Year-round	
Pemberton Point, Hull (MA) - Long Wharf, Boston (MA)	Boston	Boston Harbor	RoRo	1999	22,000	n.a.	Year-round	
Falmouth, Falmouth Harbor (MA) - Oak Bluffs, Marthas Vineyard (MA)	Boston	Vineyard Sound	RoRo	1999	287,000	n.a.	5/26/2000	10/9/2000
Falmouth Harbor, Falmouth (MA) - Oak Bluffs, Marthas Vineyard (MA)	Boston	Vineyard Sound	RoRo	1999	25,000	n.a.	Year-round	
Edgartown, Memorial Wharf (MA) - Chappaquiddick (MA)	Boston	Edgartown Harbor	Passenger	1998	355,691	202,207	Year-round	
Long Wharf, Boston (MA) - Charlestown Navy Yard, Charlestown, Boston (MA)	Boston	Boston Harbor	RoRo	1999	383,736	n.a.	Year-round	
Lovejoy Wharf, Boston (MA) - US Federal Courthouse, Fan Pier, Boston (MA)	Boston	Boston Harbor	RoRo	1999	30,984	n.a.	Year-round	
US Federal Courthouse, Fan Pier, Boston (MA) - World Trade Center, Boston (MA)	Boston	Boston Harbor	RoRo	n.a.	n.a.	n.a.	Year-round	

Sate and Route	Metro Area	Waterbody Crossed	Type	Data Year	Passengers	Vehicles	Season	
							Start	End
World Trade Center, Boston (MA) - Lovejoy Wharf, Boston (MA)	Boston	Boston Harbor	RoRo	n.a.	n.a.	n.a.	Year-round	
Hyannis (MA) - Nantucket (MA)	Boston	Nantucket Sound	RoRo	1999	235,000	n.a.	Year-round	
Hyannis (MA) - Nantucket (MA)	Boston	Nantucket Sound	RoRo	1999	137,396	n.a.	Year-round	
Hyannis (MA) - Nantucket (MA)	Boston	Nantucket Sound	Passenger	1999	435,000	122,600	Year-round	
Hyannis (MA) - Nantucket (MA)	Boston	Nantucket Sound	RoRo	1999	206,176	n.a.	5/8/2000	10/28/2000
Hyannis (MA) - Oak Bluffs, Marthas Vineyard (MA)	Boston	Nantucket Sound	RoRo	1999	154,135	n.a.	5/8/2000	10/28/2000
Harwich Port, Saquatucket Harbor (MA) - Nantucket (MA)	Boston	Nantucket Sound	RoRo	1999	32,000	n.a.	5/15/2000	10/14/2000
World Trade Center, Boston (MA) - Provincetown (MA) (conventional service)	Boston	Massachusetts Bay	RoRo	1999	28,000	n.a.	6/21/2000	9/6/2000
Falmouth Harbor, Falmouth (MA) - Cuttyhunk (MA)	Boston	Vineyard Sound and Buzzard	RoRo	1999	1,000	n.a.	7/1/2000	8/31/2000
Plymouth (MA) - Provincetown (MA)	Boston	Massachusetts Bay	RoRo	1999	10,000	n.a.	5/20/2000	10/13/2000
Woods Hole (MA) - Oak Bluffs, Marthas Vineyard (MA)	Boston	Vineyard Sound	Passenger	1999	300,000	55,000	5/18/2000	10/26/2000
Woods Hole (MA) - Vineyard Haven, Marthas Vineyard (MA)	Boston	Vineyard Sound	Passenger	1999	2,000,000	351,400	Year-round	
Salem, Blaney St. ferry landing (MA) - Long Wharf, Boston (MA)	Boston	Boston Harbor	RoRo	1999	15,000	n.a.	4/1/2000	11/1/2000
Nantucket (MA) - Oak Bluffs, Marthas Vineyard (MA)	Boston	Nantucket Sound	RoRo	1999	24,084	n.a.	6/5/2000	9/17/2000
New Bedford (MA) - Cuttyhunk (MA)	New Bedford	Buzzards Bay	RoRo	n.a.	n.a.	n.a.	Year-round	
New Bedford, Schamonchi Dock (MA) - Vineyard Haven, Marthas Vineyard (MA)	New Bedford	Buzzards Bay	RoRo	n.a.	n.a.	n.a.	5/18/2000	10/9/2000
Fore River, Quincy (MA) - Long Wharf, Boston (MA)	Boston	Boston Harbor	RoRo	1999	250,000	n.a.	Year-round	
New London, Ferry Street (CT) - Vineyard Haven, Marthas Vineyard (MA)	New London	Rhode Island Sound	RoRo	1999	45,000	n.a.	5/15/2000	9/4/2000
<b><u>Rhode Island</u></b>								
Bristol (RI) - Hog Island (RI)	Providence	Narragansett Bay	RoRo	n.a.	n.a.	n.a.	Year-round	
Bristol (RI) - Homestead, Prudence Island (RI)	Providence	Narragansett Bay	Passenger	n.a.	n.a.	n.a.	Year-round	
Point Judith (RI) - Block Island, Old Harbor (RI)	Providence	Block Island Sound	Passenger	n.a.	n.a.	n.a.	Year-round	
Montauk (NY) - Vineyard Haven, Marthas Vineyard (MA)	Montauk	Rhode Island Sound; Vineya	RoRo	1999	40	n.a.	8/6/2000	8/8/2000
Providence, Point Street Landing (RI) - Newport, Perrotti Park (RI)	Providence	Narragansett Bay	RoRo	2000	28,500	n.a.	Year-round	
Providence, Point Street Landing (RI) - Portsmouth, Mount Hope Maritime Terminal (RI)	Providence	Narragansett Bay	RoRo	n.a.	n.a.	n.a.	Year-round	
Portsmouth, Mount Hope Maritime Terminal (RI) - Newport, Perrotti Park (RI)	Providence	Narragansett Bay	RoRo	n.a.	n.a.	n.a.	Year-round	
<b><u>Connecticut</u></b>								
New London, Ferry Street (CT) - Block Island, Old Harbor (RI)	New London	Block Island Sound	Passenger	n.a.	n.a.	n.a.	6/10/2000	9/10/2000
New London, State Street (CT) - Fishers Island (NY)	Hartford	Fishers Island Sound	Passenger	1999	164,000	47,000	Year-round	
New London, Ferry Street (CT) - Long Island (NY)	New York	Long Island Sound	RoRo	n.a.	n.a.	n.a.	Year-round	
New London, Ferry Street (CT) - Orient Point (NY) (conventional RoRo service)	Southold	Long Island Sound	Passenger	1999	919,183	379,885	Year-round	
New London, Ferry Street (CT) - Orient Point (NY) (high speed service)	Southold	Long Island Sound	RoRo	1999	215,000	n.a.	3/31/2000	11/26/2000
<b><u>New York</u></b>								
Atlantic Highlands (NJ) - Wall Street Ferry Terminal, Pier 11 (NY)	New York	New York Bay	RoRo	1999	156,000	n.a.	Year-round	
Bay Shore (NY) - Atlantique, Fire Island (NY)	Islip	Great South Bay	RoRo	1999	49,032	n.a.	5/20/2000	9/6/2000
Bay Shore (NY) - Dunewood, Fire Island (NY)	Islip	Great South Bay	RoRo	1999	65,376	n.a.	3/31/2000	10/25/2000
Bay Shore (NY) - Fair Harbor, Fire Island (NY)	Islip	Great South Bay	RoRo	1999	89,892	n.a.	3/1/2000	12/25/2000
Bay Shore (NY) - Kismet, Fire Island (NY)	Islip	Great South Bay	RoRo	1999	89,892	n.a.	4/1/2000	11/1/1931
Bay Shore (NY) - Ocean Bay Park, Fire Island (NY)	Islip	Great South Bay	RoRo	1999	114,409	n.a.	3/1/2000	11/1/1931
Bay Shore (NY) - Ocean Beach, Fire Island (NY)	Islip	Great South Bay	RoRo	1999	167,097	n.a.	Year-round	
Bay Shore (NY) - Point O'Woods, Fire Island (NY)	Islip	Great South Bay	RoRo	1999	15,600	n.a.	4/15/2000	11/1/2000
Bay Shore (NY) - Saltaire, Fire Island (NY)	Islip	Great South Bay	RoRo	1999	101,720	n.a.	Year-round	
Bay Shore (NY) - Seaview, Fire Island (NY)	Islip	Great South Bay	RoRo	1999	122,581	n.a.	3/1/2000	10/31/2000
Bemus Point (NY) - Stow (NY)	Buffalo	Lake Chautauqua	Passenger	1999	2,880	2,400	5/31/2000	9/4/1931
Patchogue, Davis Park Ferry Terminal (NY) - Davis Park, Fire Island (NY)	New York	Great South Bay	RoRo	n.a.	n.a.	n.a.	3/15/2000	12/1/2000
Patchogue, NPS Ferry Terminal (NY) - Watch Hill, Fire Island (NY)	New York	Great South Bay	RoRo	1999	25,815	n.a.	5/15/2000	10/15/2000
E 34th Street Ferry Terminal (NY) - Wall Street Ferry Terminal, Pier 11 (NY)	New York	East River	RoRo	n.a.	n.a.	n.a.	Year-round	
La Guardia Airport, Queens (NY) - E 34th Street Ferry Terminal, Manhattan (NY)	New York	East River	RoRo	1999	56,126	n.a.	Year-round	

Sate and Route	Metro Area	Waterbody Crossed	Type	Data Year	Passengers	Vehicles	Season	
							Start	End
Liberty State Park, Liberty Landing Marina (NJ) - Statue of Liberty (NY)	New York	New York Harbor	RoRo	1999	1,120,108	n.a.	Year-round	
Lincoln Harbor, Weehawken (NJ) - W 38th Street Ferry Terminal, Manhattan (NY)	New York	Hudson River	RoRo	1999	631,677	n.a.	Year-round	
Montauk (NY) - Block Island, New Harbor (RI)	Montauk	Block Island Sound	RoRo	1999	15,000	n.a.	4/15/2000	10/12/2000
Montauk (NY) - New London, Ferry Street (CT)	Montauk	Block Island Sound	RoRo	n.a.	n.a.	n.a.	5/26/2000	9/4/2000
North Haven (NY) - Shelter Island (NY)	New York	Shelter Island Sound	Passenger	1999	1,015,047	602,994	Year-round	
Sayville, Long Island (NY) - Barrett Beach, Fire Island (NY)	New York	Great South Bay	RoRo	1999	340	n.a.	7/1/2000	9/6/2000
Sayville, Long Island (NY) - Cherry Grove, Fire Island (NY)	New York	Great South Bay	RoRo	1999	180,000	n.a.	Year-round	
Sayville, Long Island (NY) - Fire Island Pines, Fire Island (NY)	New York	Great South Bay	RoRo	1999	210,000	n.a.	Year-round	
Sayville, Long Island (NY) - Sailors Haven, Sunken Forest (NY)	New York	Great South Bay	RoRo	1999	60,500	n.a.	5/12/2000	10/31/2000
Sayville, Long Island (NY) - Water Island, Fire Island (NY)	New York	Great South Bay	RoRo	1999	3,000	n.a.	5/12/2000	10/12/2000
Saint George, Staten Island (NY) - South Ferry, Whitehall Ferry Terminal (NY)	New York	New York Harbor	Passenger	1999	19,270,397	367,594	Year-round	
Highlands (NJ) - Wall Street Ferry Terminal, Pier 11 (NY)	New York	New York Bay	RoRo	1999	105,000	n.a.	Year-round	
Wall Street Ferry Terminal, Pier 11 (NY) - E 34th Street Ferry Terminal (NY)	New York	New York Harbor	RoRo	1999	91,000	n.a.	Year-round	
Greenville Piers, Jersey City (NJ) - Atlantic Basin (Redhook), Brooklyn (NY)	New York	Upper New York Bay	Rail	1999	n.a.	1,000	Year-round	
Bridgeport (CT) - Port Jefferson (NY)	New York	Long Island Sound	Passenger	1999	800,000	345,000	Year-round	
Hoboken, Hoboken Rail Terminal (NJ) - World Financial Center, Battery Park City, Manhattan (NY)	New York	Hudson River	RoRo	1999	2,352,317	n.a.	Year-round	
Hunters Point, Queens (NY) - E 34th Street Ferry Terminal, Manhattan (NY)	New York	East River	RoRo	1999	70,601	n.a.	Year-round	
Brooklyn Army Terminal, Brooklyn (NY) - Wall Street Ferry Terminal, Pier 11 (NY)	New York	New York Harbor	RoRo	1999	50,000	n.a.	Year-round	
Haverstraw (NY) - Ossining (NY)	New York	Hudson River	RoRo	n.a.	n.a.	n.a.	Year-round	
Statue of Liberty (NY) - Ellis Island (NY)	New York	New York Harbor	RoRo	1999	3,543,907	n.a.	Year-round	
Ellis Island (NY) - World Financial Center, Battery Park City (NY)	New York	New York Harbor	RoRo	1999	1,447,629	n.a.	Year-round	
Ellis Island (NY) - Liberty State Park, Liberty Landing Marina (NJ)	New York	New York Harbor	RoRo	1999	436,741	n.a.	Year-round	
Greenport, Long Island (NY) - Shelter Island Heights, Long Island (NY)	New York	Shelter Island Sound	Passenger	1999	1,153,669	615,816	Year-round	
Harborside, Exchange Place (NJ) - World Financial Center, Battery Park City (NY)	New York	Hudson River	RoRo	1999	242,360	n.a.	Year-round	
Colgate Palmolive, Exchange Place (NJ) - World Financial Center, Battery Park City (NY)	New York	Hudson River	RoRo	1999	621,895	n.a.	Year-round	
Highlands (NJ) - Wall Street Ferry Terminal, Pier 11 (NY)	New York	New York Bay	RoRo	1999	160,000	n.a.	Year-round	
Port Imperial, Weehawken (NJ) - Wall Street Ferry Terminal, Pier 11 (NY)	New York	Hudson River	RoRo	1999	120,730	n.a.	Year-round	
Port Imperial, Weehawken (NJ) - W 38th Street Ferry Terminal (NY)	New York	Hudson River	RoRo	1999	2,955,129	n.a.	Year-round	
Port Liberte, Jersey City (NJ) - Wall Street Ferry Terminal, Pier 11 (NY)	New York	Hudson River	RoRo	1999	160,584	n.a.	Year-round	
Greenville Piers, Jersey City (NJ) - Bush Terminal, Brooklyn (NY)	New York	Upper New York Bay	Rail	1999	n.a.	4,000	Year-round	
World Financial Center, Battery Park City (NY) - Statue of Liberty (NY)	New York	New York Harbor	RoRo	1999	4,308,169	n.a.	Year-round	

#### Pennsylvania

Penns Landing, Philadelphia (PA) - Camden (NJ)	Philadelphia	Delaware River	RoRo	1999	300,000	n.a.	4/1/2000	12/31/2000
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#### Delaware

Woodland, County Road 79 (DE) - Bethel, State Route 78 (DE)	Salisbury	Nanticoke River	Passenger	1999	100,710	83,925	Year-round	
Delaware City (DE) - Fort Delaware, Pea Patch Island (DE)	Philadelphia	Delaware River	RoRo	1999	20,000	n.a.	4/20/2000	10/31/2000
Fort Mott (NJ) - Fort Delaware, Pea Patch Island (DE)	Philadelphia	Delaware River	RoRo	1999	7,500	n.a.	4/20/2000	10/31/2000
Lewes (DE) - Cape May (NJ)	Atlantic City	Delaware Bay	Passenger	1999	1,258,799	394,235	Year-round	

#### Maryland

Crisfield (MD) - Ewell, Smith Island (MD)	Salisbury	Chesapeake Bay	RoRo	n.a.	n.a.	n.a.	Year-round	
Crisfield (MD) - Ewell, Smith Island (MD)	Salisbury	Chesapeake Bay	RoRo	1999	6,549	n.a.	5/27/2000	10/15/2000
Crisfield (MD) - Ewell, Smith Island (MD)	Salisbury	Tangier Sound	RoRo	n.a.	n.a.	n.a.	Year-round	
Oxford (MD) - Bellevue (MD)	Baltimore	Tred Avon River	Passenger	n.a.	n.a.	n.a.	3/1/2000	11/30/2000
Allen (MD) - Catchpenny (MD)	Salisbury	Wicomico River	Passenger	1998	139,245	116,038	Year-round	
Whitehaven, State Route 352 (MD) - Widgeon, State Route 362 (MD)	Salisbury	Wicomico River	Passenger	1998	94,910	79,092	Year-round	
Point Lookout State Park (MD) - Ewell, Smith Island (MD)	Washington	Chesapeake Bay	RoRo	1999	8,950	n.a.	6/15/2000	9/15/2000

#### Virginia

Sate and Route	Metro Area	Waterbody Crossed	Type	Data Year	Passengers	Vehicles	Season	
							Start	End
Portside, Portsmouth (VA) - High Street Landing, Portsmouth (VA)	Norfolk	Elizabeth River	RoRo	1999	98,210	n.a.		Year-round
Waterside, Norfolk (VA) - High Street Landing, Portsmouth (VA)	Norfolk	Elizabeth River	RoRo	1999	194,626	n.a.		Year-round
Waterside, Norfolk (VA) - Portside, Portsmouth (VA)	Norfolk	Elizabeth River	RoRo	1999	123,660	n.a.		Year-round
Hatton, Route 625 (south bank) (VA) - Hatton, Route 625 (north bank) (VA)	Charlottesville	James River	Passenger	1999	2,730	1,092	4/15/2000	10/15/2000
Scotland, Scotland Wharf (VA) - Jamestown, Jamestown Wharf (VA)	Norfolk	James River	Passenger	1999	2,100,000	880,485		Year-round
Portside, Portsmouth (VA) - Harbor Park, Norfolk (VA)	Norfolk	Elizabeth River	RoRo	1999	5,957	n.a.		Year-round
Reedville (VA) - Ewell, Smith Island (MD)	Richmond	Chesapeake Bay	RoRo	n.a.	n.a.	n.a.	5/1/2000	10/15/2000
Reedville (VA) - Tangier (VA)	Richmond	Chesapeake Bay	RoRo	1999	15,000	n.a.	5/1/2000	10/15/2000
Cape Charles (VA) - Little Creek (VA)	Hampton	Chesapeake Bay	Rail	1999	n.a.	4,400		Year-round
Crisfield (MD) - Tangier (VA)	Salisbury	Chesapeake Bay	RoRo	n.a.	n.a.	n.a.	5/15/2000	10/31/2000
Sunnybank, State Route 644 (VA) - Kayan, State Route 644 (VA)	Richmond	Little Wicomico River	Passenger	1999	18,189	8,855		Year-round
Hampton, Public Pier (VA) - Norfolk, on Waterside Dr. (VA)	Norfolk	Hampton Roads	RoRo	1999	60,000	n.a.		Year-round
<b>North Carolina</b>								
Elwell (NC) - Carvers Creek (NC)	Wilmington	Cape Fear River	Passenger	1999	25,544	14,099		Year-round
Cedar Island (NC) - Ocracoke (NC)	Greenville	Pamlico Sound	Passenger	1999	242,397	95,470		Year-round
Cherry Branch (NC) - Minnesott Beach (NC)	Greenville	Neuse River	Passenger	1999	478,395	290,058		Year-round
Como, State Route 1306 (NC) - Winton, State Route 1175 (NC)	Norfolk	Meherrin River	Passenger	1999	3,903	6,997		Year-round
Hatteras (NC) - Ocracoke (NC)	Washington DC	Hatteras Inlet	Passenger	1999	925,806	358,962		Year-round
Ocracoke (NC) - Swan Quarter (NC)	Greenville	Pamlico Sound	Passenger	1999	49,712	23,721		Year-round
Sans Souci (NC) - Woodard (NC)	Greenville	Cashie River	Passenger	1999	5,110	3,667		Year-round
Southport (NC) - Fort Fisher (NC)	Wilmington	Cape Fear River	Passenger	1999	426,642	149,533		Year-round
Atlantic (NC) - Core Banks, Cape Lookout Natl. Seashore (NC)	Morehead City	Core Sound	Passenger	n.a.	n.a.	n.a.	3/13/2000	12/17/2000
Davis (NC) - Core Banks, Cape Lookout Natl. Seashore (NC)	Morehead City	Core Sound	Passenger	n.a.	n.a.	n.a.	3/1/2000	12/31/2000
Harkers Island (NC) - Cape Lookout (NC)	Morehead City	Back Sound	RoRo	1999	3,461	n.a.	4/1/2000	12/1/2000
Atlantic (NC) - Portsmouth Village, Portsmouth Island (NC)	Morehead City	Core Sound	RoRo	n.a.	n.a.	n.a.		Year-round
Southport (NC) - Bald Head Island (NC)	Wilmington	Cape Fear River	Passenger	n.a.	n.a.	n.a.		Year-round
Aurora (NC) - Bayview (NC)	Greenville	Pamlico River	Passenger	1999	135,397	73,243		Year-round
Southport, Indigo Plantation (NC) - Bald Head Island (NC)	Wilmington	Cape Fear River	RoRo	1999	233,158	n.a.		Year-round
Currituck (NC) - Knotts Island (NC)	Norfolk	Currituck Sound	Passenger	1999	82,931	24,043		Year-round
<b>South Carolina</b>								
Hilton Head Island, Opossum Point Landing (SC) - Daufuskie Island, Haig Point (SC)	Savannah	Atlantic Intracoastal Waterway	RoRo	1999	150,500	n.a.		Year-round
Hilton Head Island, Broad Creek Marina (SC) - Daufuskie Island, Cooper River Landing (SC)	Savannah	Atlantic Intracoastal Waterway	RoRo	1999	10,664	n.a.		Year-round
Jenkins Island, Hilton Head (SC) - Daufuskie Island, Cooper River Landing (SC)	Savannah	Atlantic Intracoastal Waterway	RoRo	1999	4,578	n.a.		Year-round
Hilton Head Island, Harbortown (SC) - Daufuskie Island, Cooper River Landing (SC)	Savannah	Calibogue Sound	RoRo	1999	31,040	n.a.		Year-round
South Island (SC) - Georgetown, State Highway S-22-18 (SC)	Charleston	Atlantic Intracoastal Waterway	Passenger	1999	9,160	7,300		Year-round
Hilton Head Island, Salty Fare Village (SC) - Daufuskie Island, Cooper River Landing (SC)	Savannah	Atlantic Intracoastal Waterway	RoRo	n.a.	n.a.	n.a.		Year-round
<b>Georgia</b>								
St. Marys (GA) - Plum Orchard, Cumberland Island (GA)	Jacksonville	Atlantic Intracoastal Waterway	RoRo	1999	300	n.a.		Year-round
St. Marys (GA) - Cumberland Island (GA)	Jacksonville	Cumberland Sound	RoRo	1999	44,644	n.a.		Year-round
Meridian (GA) - Sapelo Island, Natl. Estuarine Research Reserve (GA)	Savannah	Doboy Sound	RoRo	1999	70,000	n.a.		Year-round
Hutchinson Island, Savannah Cove (GA) - Daufuskie Island, Cooper River Landing (SC)	Savannah	Savannah River and Atlantic	RoRo	1999	15,616	n.a.		Year-round
<b>Florida</b>								
De Land (FL) - Hontoon Island State Park (FL)	Orlando	Saint Johns River	RoRo	n.a.	n.a.	n.a.		Year-round
Georgetown (FL) - Drayton Island (FL)	Jacksonville	Lake George	Passenger	n.a.	n.a.	n.a.		Year-round
Mayport (FL) - Fort George Island (FL)	Jacksonville	St. Johns River	Passenger	1999	374,785	374,785		Year-round
Welaka Landing, Fort Gates Ferry Rd. (FL) - Fort Gates, Salt Springs Road (FL)	Daytona Beach	St. Johns River	Passenger	n.a.	n.a.	n.a.		Year-round

Source: U.S. Department of Transportation, Bureau of Transportation Statistics, National Ferry Database.

*Appendix D*

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PORT AREA  
SOCIOECONOMIC  
PROFILES

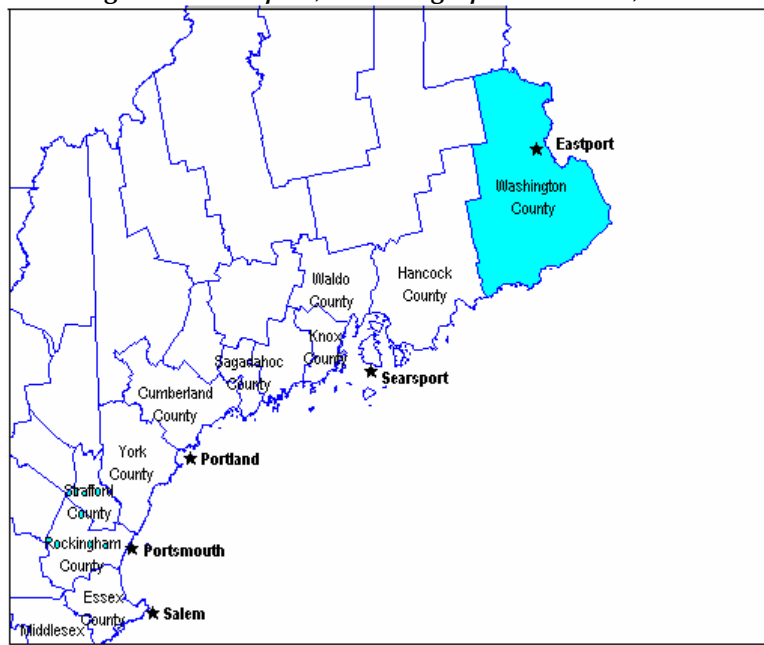
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# 1. Eastport, ME

## Location and Background Information

The Port of Eastport is located in Washington County, Maine. It is the easternmost port in the United States and is nestled in a safe harbor behind Canada's Campobello Island. The waters of Passamaquoddy Bay and Cobscook Bay converge in Eastport generating some of the highest tidal ranges in the United States. This massive flow keeps the local waters clean and productive as Eastport is home to one of the largest salmon aquaculture operations in the US. Eastport is also centrally located to many of the State's forest products industries.<sup>1</sup>

*Figure 1-1. Eastport, ME: Geographic Location, 2000*



Source: Table 3-1

## Demographics

### POPULATION

Washington County, Maine has a total population of 33,941 according to the 2000 US Census. Of the total population, 17,365 are females; representing 51.2 percent of the total population and 16,576 are males, representing 48.8 percent of the total population. The median age for the population is 40.5 years: 39.7 for males and 41.2 for females. The majority of the population is located between the 40 – 49 age range bracket, both for males and females (Figure 1-2).

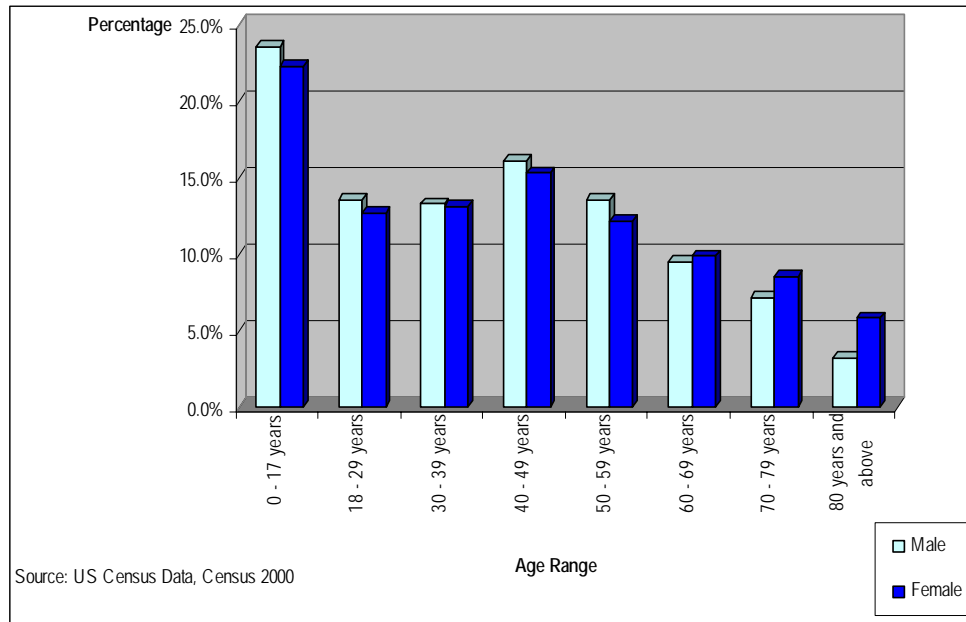
The majority of the population of this county is white (93.4 percent), followed by ‘others’ (include American Indians and Alaska Natives, Native Hawaiian and Pacific Islanders, other races and a combination of two or more races), which represent 5.8 percent of the total population. The Asian

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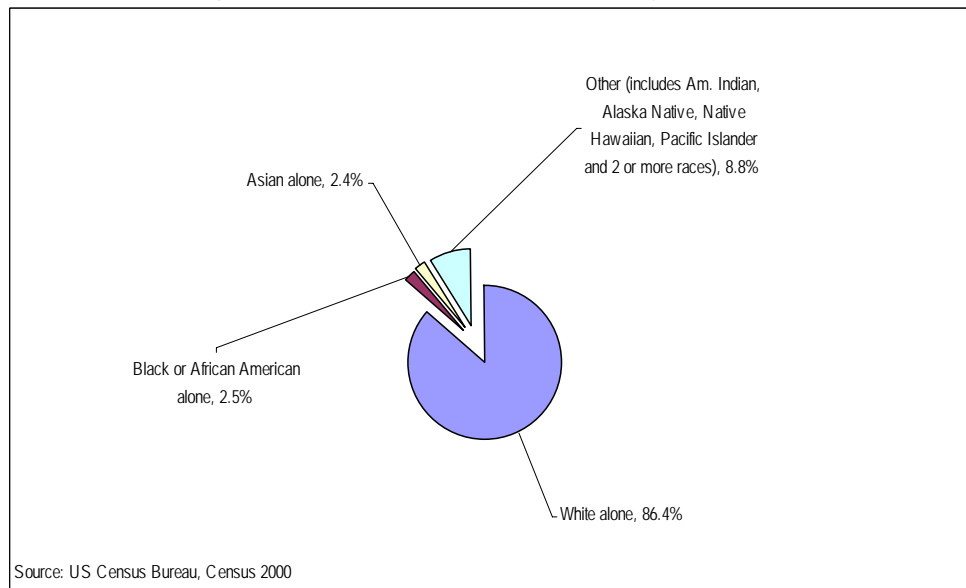
<sup>1</sup> Maine Port Authority website. URL [http://www.maineports.com/water\\_eastport.html](http://www.maineports.com/water_eastport.html)

population represents 0.5 percent of the total population, closely followed by the Black or African American population (0.3 percent). (Figure 1-3). In terms of ethnic structure and makeup, only 0.9 percent of the total population is of Hispanic or Latino origin.<sup>2</sup>

**Figure 1-2. Eastport, ME: Structure of the Population by Age Group, 2000**



**Figure 1-3. Eastport, ME: Population by Race, 2000**

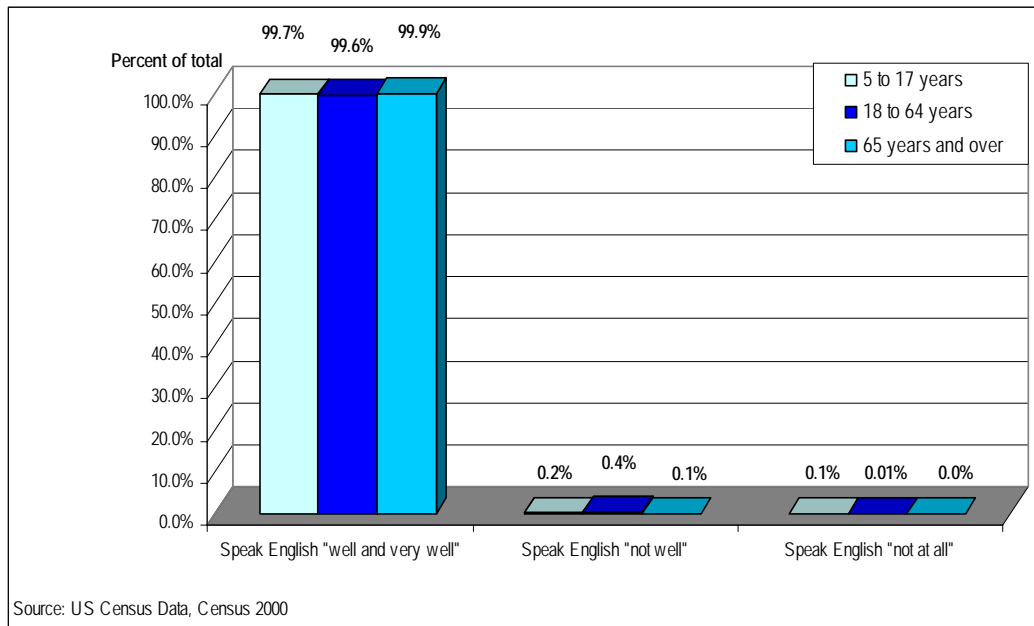


<sup>2</sup> US Census Data, Census 2000



It is evident from the data specified in Figure 1-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

**Figure 1-4. Eastport, ME: Ability to Speak English by Age Group, 2000**

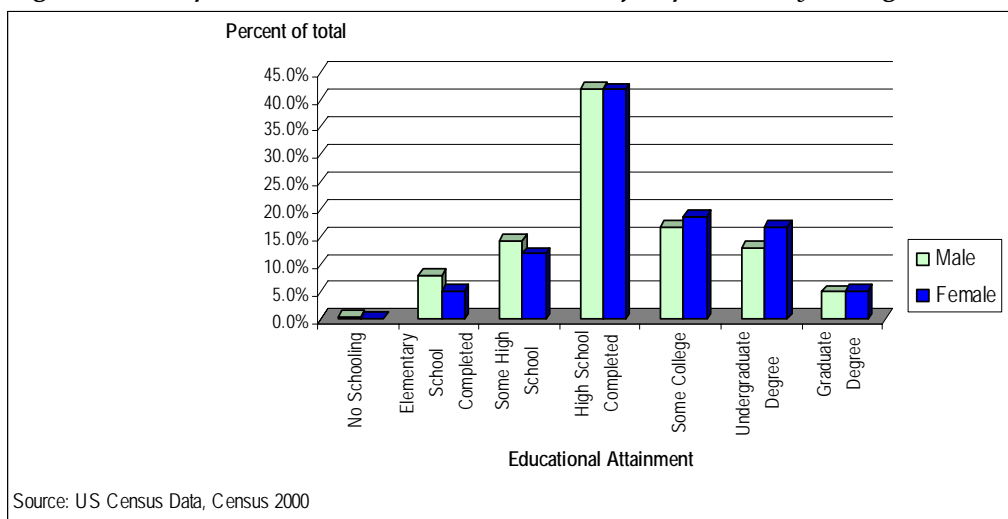


## EDUCATION

Almost half of the population of Washington County, ME has completed High School and 13.1 percent of males and 16.9 percent of females have obtained an undergraduate degree. It is interesting to observe that females' educational attainment is higher than male's post high school. (Figure 1-5).

There are only two 4-year colleges in the county of Washington in Maine: Washington County Community College and the University of Maine - Machias.

**Figure 1-5. Eastport, ME: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



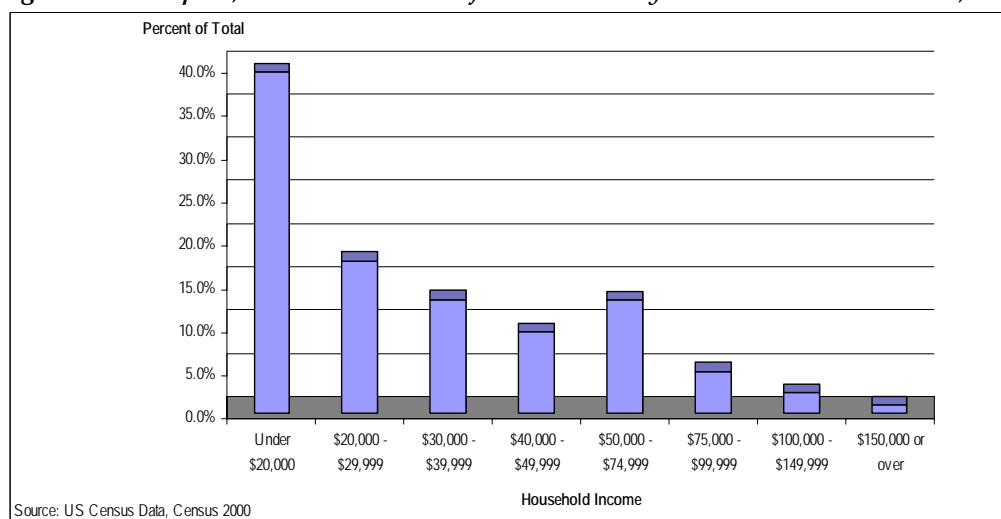
## Socio-Economic Characteristics

### INCOME

Over 40 percent of households in Washington County, ME have an income level under \$20,000. About 17.5 percent of households fall under the income bracket of \$20,000 - \$29,999. Nearly 15 percent of all households have incomes between \$30,000 and \$39,999 and an equal percentage have an income between \$50,000 and \$74,999. (Figure 1-6).

Household median income in this county as of 1999, according to the 2000 US Census, was \$25,869.00. The per capita income for 1999, according to the 2000 US Census, was \$14,119.00. The percentage of people under the poverty line in the region was 19 in the year 2000. Average household size in Washington County is 2.34.<sup>3</sup>

**Figure 1-6. Eastport, ME: Distribution of Households by Household Income Level, 1999**



### EMPLOYMENT

As is evident from Figure 1-7, most females in Washington County, Maine are employed in the education, health and social services industry (42.5 percent), followed their employment in 'other' industries, which include the arts, entertainment, recreation, food services, public administration and information (20.4 percent). For males, the distribution of employment among industries fluctuates less. The highest participation is distributed amongst three industry categories: agriculture, forestry, fishing, hunting and mining (19 percent); manufacturing (18 percent); and 'other' (16 percent).

An estimated 9.3 percent of males and 7.5 percent of females are unemployed in Washington County, Maine.<sup>4</sup>

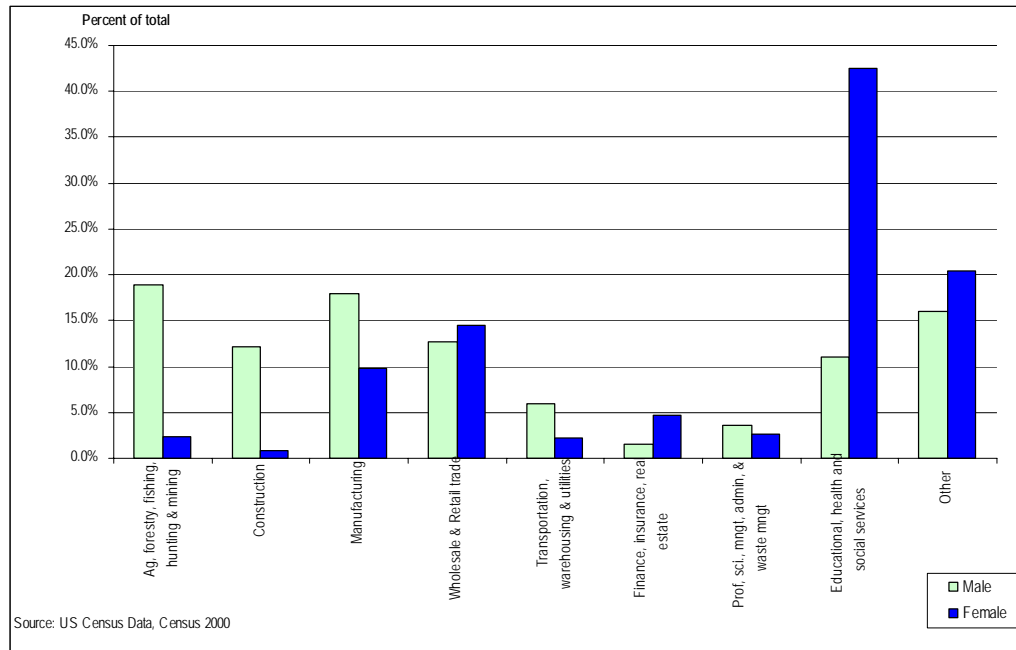
As can be observed in Figure 1-7, an estimated 14.9 percent of males and 0.1 percent of females are employed in farming, fishing and forestry occupations. About 24 percent of males and 9.9 percent of females are employed in production, transportation and material moving occupations. The

<sup>3</sup> US Census Data, Census 2000

<sup>4</sup> US Census Data, Census 2000

aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.8 percent of men's occupations and 0.3 percent of female's occupations.

**Figure 1-7. Eastport, ME: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION



The Eastport Breakwater Terminal has berthing for a vessel of up to 700 ft. An equipment maintenance shop, the Eastport Port Authority office, US Customs, and Coast Station Eastport are located just off the pier. The downtown Fish Pier berths the Port's two tugboats, Ahoskie and Pleon, on the North side, and has slips for transient boats on the South side. Approach depths to the Breakwater are over 100 feet and the mean low water depth is 42 feet. The Breakwater is also used by the aquaculture industry, commercial fishermen, and recreational boaters and fishermen.

Located at the downtown area of Eastport, the Breakwater offers cruise ships a direct docking within close proximity to all of Eastport's offerings. Estes Head Cargo Terminal can accommodate a ship of 900 feet in Berth A and one up to 550 feet in Berth B. Berth B is also an excellent berth for barges. EHCT's 43 acre site has several open storage areas, three 20,000 square foot, drive-thru warehouses, and one 43,000 square foot warehouse. The operations are easily supervised from the Federal Marine Terminals' office located just above the Estes Head pier. Approach depths to this pier are also well in excess of 100 feet and the mean low water depth is 64 feet. <sup>5</sup>

<sup>5</sup> <http://www.portofeastport.org/facilities.html>

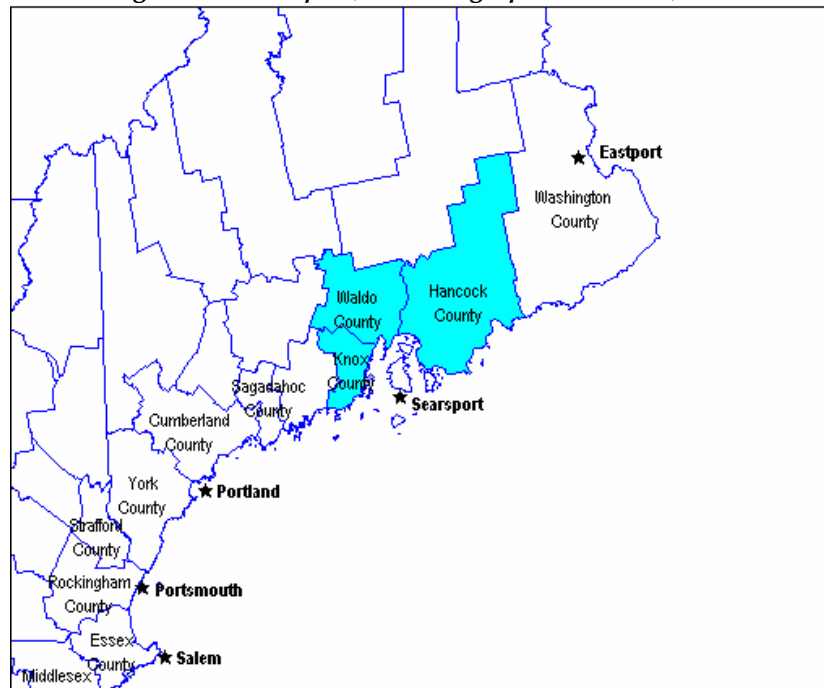


## 2. Searsport, ME

### Location and Background Information

Searsport is part of Knox County, Hancock County and Waldo County, Maine. The Port of Searsport is located at the heart of Penobscot Bay. The port has recently undergone a major reconstruction effort to effectively serve the needs of shippers moving product both into and out of Maine, and through the onsite rail yard of the Montreal, Maine & Atlantic Railway, to provide service to the heartlands of both the US and Canada.<sup>1</sup>

*Figure 2-1. Searsport, ME: Geographic Location, 2000*



Source: Table 3-1

### Demographics

#### POPULATION

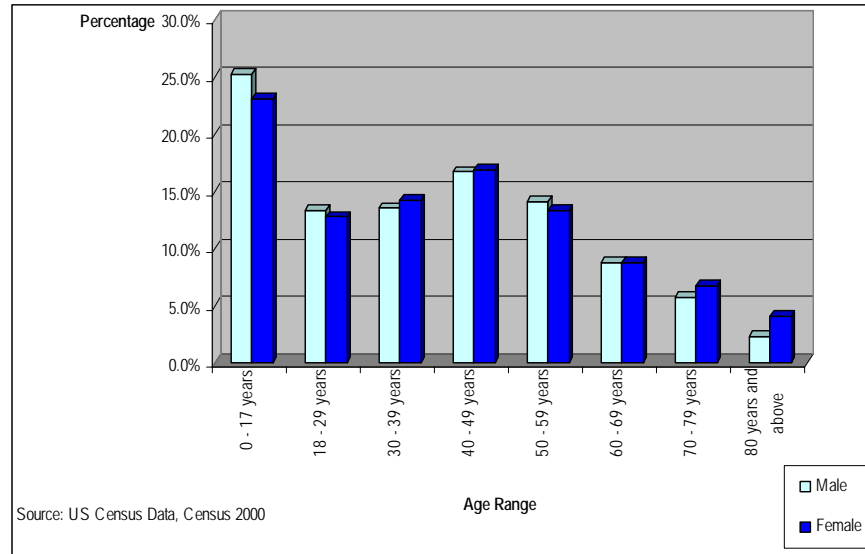
The total population of Knox, Hancock and Waldo counties, Maine is 127,689, according to the 2000 US Census. Of the total population, 17,825 are males (49.1 percent) and 18,455 are females (50.9 percent). The median age for the population is 39.3 years: 38.5 for males and 39.3 for females. It is evident from Figure 2-2 that over 15 percent of the population in this port area falls within the 40 – 49 years age bracket and about 25 percent of males and nearly the same percent of females are between the ages of 0 and 17 years.

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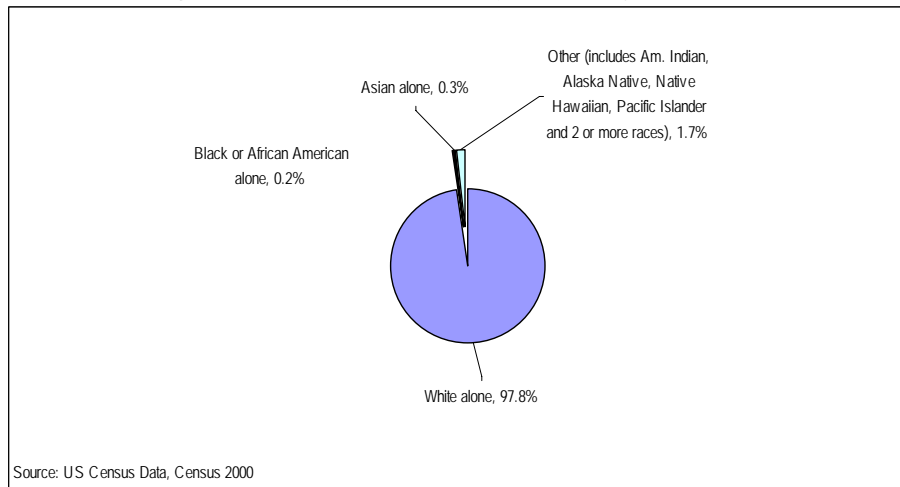
<sup>1</sup> Maine Port Authority: [http://www.maineports.com/water\\_searsport.html](http://www.maineports.com/water_searsport.html)

As can be observed in Figure 2-3, the majority of the population in the region is white (97.8 percent), followed by 'others' (include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone), which represent 1.7 percent of the total population. The Asian population represents 0.3 percent of the total population, closely followed by the Black or African American population (0.2 percent). Moreover, in terms of ethnic structure, only 0.6 percent of the total population is considered to be of Hispanic or Latino origin.<sup>2</sup>

**Figure 2-2. Searsport, ME: Structure of the Population by Age Group, 2000**



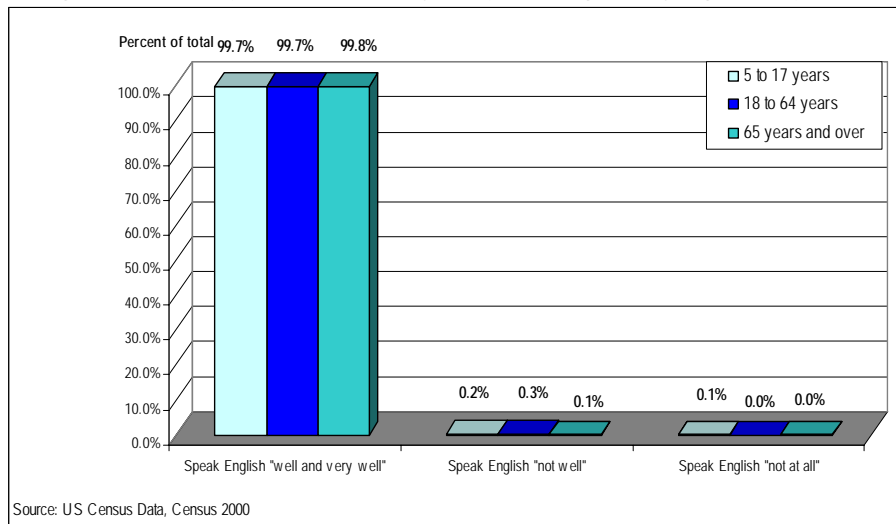
**Figure 2-3. Searsport, ME: Population by Race, 2000**



<sup>2</sup> US Census Data, Census 2000

It is evident from the data specified in Figure 2-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

**Figure 2-4. Searsport, ME: Ability to Speak English by Age Group, 2000**

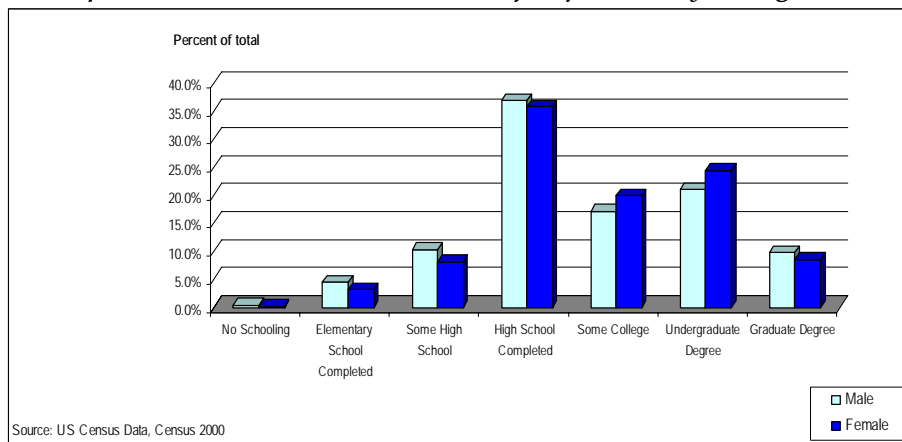


## EDUCATION

About 35 percent of males and females, ages 25 and over, have completed high school. Around 20 percent of males and 24 percent of females have obtained an undergraduate degree (Figure 2-5).

The three main colleges in the area are: College of the Atlantic, Maine Maritime Academy in Hancock County and Unity College in Waldo County.<sup>3</sup>

**Figure 2-5. Searsport, ME: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



<sup>3</sup> Searsport Community Profile: <http://www.epodunk.com/>

## Socio-Economic Characteristics

### INCOME

Household median income in the region in 1999 was \$35,606.50 and per capita income was \$19,188.70. The percentage of people under the poverty line in the region was 11.3 in the year 2000. The average household size in the area in 2000 was 2.43.<sup>4</sup>

About 27 percent of households in the region in 1999 had incomes of under \$20,000 and approximately 20 percent of households had incomes between \$50,000 and \$74,999 (Figure 2-6).

**Figure 2-6. Searsport, ME: Distribution of Households by Household Income Level, 1999**



### EMPLOYMENT

As is portrayed by Figure 2-7, around 34 percent of working females are employed in the education, health and social services industry, followed by their employment in 'other industries', such as arts, entertainment, recreation, food services, public administration and information (about 23 percent). Most males are employed in 'other industries' (19 percent), followed by construction (about 16 percent) and wholesale and retail trade (16 percent).

An estimated 4.5 percent of males and 5.1 percent of females were unemployed in the area in the year 2000.<sup>5</sup>

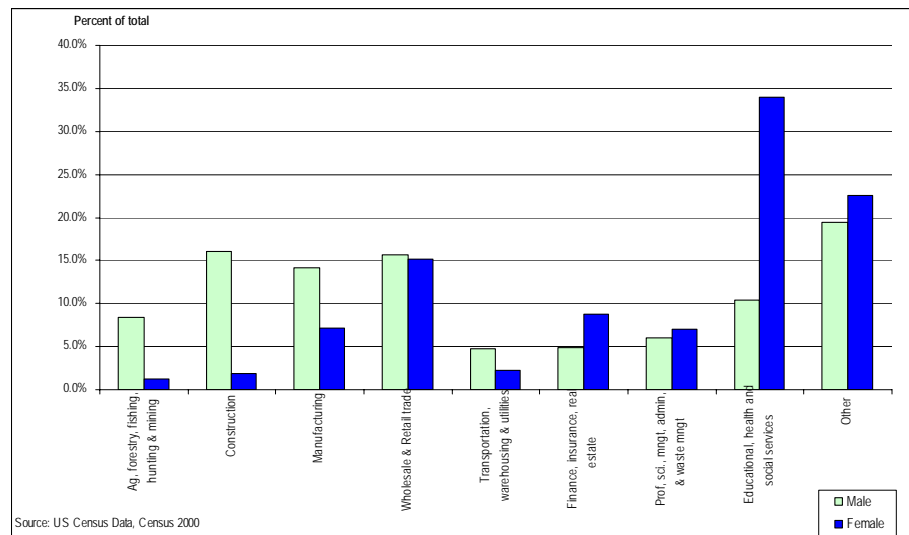
According to the 2000 US Census, an estimated 6.7 percent of males and 0.8 percent of females are employed in farming, fishing and forestry occupations. About 18.9 percent of males and 7.8 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.9 percent of male's occupations and 0.1 percent of female's occupations.

<sup>4</sup> US Census Data, Census 2000.

<sup>5</sup> US Census Data, Census 2000.



**Figure 2-7. Searsport, ME: Employed Civilian population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION

The Port of Searsport consists of the Sprague Energy Terminal on Mack Point. The facility is being redeveloped in partnership with the MDOT over the next 2 years. In the mid-1800s in Searsport, there were eight shipbuilding yards which built wooden vessels of exceptional quality. While residents built the ships, they sailed them as well. Searsport was home to one-tenth of the deep water captains in the American Merchant Marine, and produced more shipmasters per square mile than any town of its size in the world. Searsport's presence as a major seaport has been long and successful. The Sprague Energy Terminal at Mack Point in Searsport had a solid year in 2000 handling bulk and liquid cargoes. The cargo handled included items such as coal, road salt, gypsum, and coke. In 1999, the Port of Searsport also handled over 3 million barrels of liquid petroleum products.

The dry cargo pier has a working surface of 100' x 560' and a deck load capacity of 1,000 psf. It has two berths, both are 800 feet long. The liquid cargo pier has a multi purpose hose platform, with 2 berths, one that is 700 feet long and the other is 500 feet long. The port has 1.6 million barrel active tank capacity and truck and rail loading racks. It has truck and rail access and a 90,000 sq. ft. warehouse. Intermodal Truck to Rail Facility. It has over 6,500 feet of on-site rail siding interconnected with the Canadian Pacific for double stack service to the US Midwest, central Canada, and Vancouver.<sup>6</sup>

<sup>6</sup> Maine Department of Transportation website: <http://www.state.me.us/mdot/freight/searsport.php>

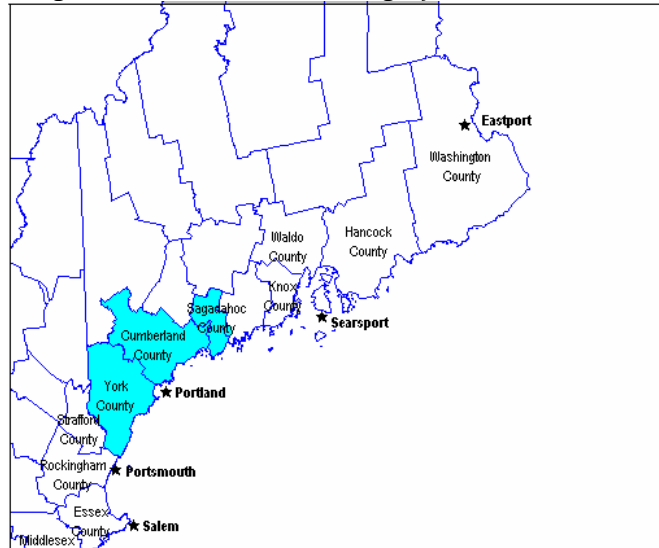
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# 3. Portland, ME

## Location and Background Information

The port of Portland is located in the Portland-South Portland-Biddeford, Maine Metropolitan Statistical Area (MSA). Portland Harbor, at the western end of Casco Bay, is the most important port on the coast of Maine. The ice-free harbor offers secure anchorage to deep draft vessels in all weather. There is considerable domestic and foreign commerce in petroleum products, paper, wood pulp, scrap metal, coal, salt and containerized goods. It is also the Atlantic terminus pipeline for shipments of crude oil to Montreal and Ontario. In 1998, Portland became the largest port in the Northeast based on throughput tonnages. A rail system connects the Port to a national network that also reaches into Canada, one of the reasons shippers bypass the crowded and more costly port cities of southern New England and the Mid-Atlantic.

*Figure 3-1. Portland, ME: Geographic Location, 2000*



Source: Table 3-1

## Demographics

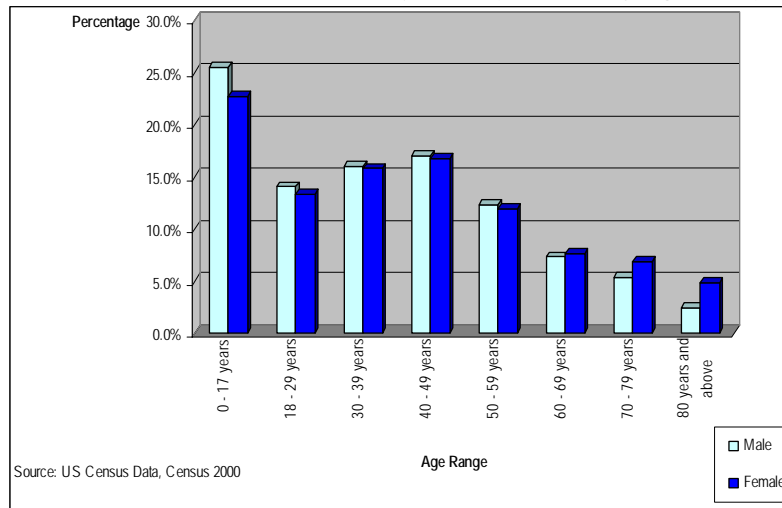
### POPULATION

The total population of the Metropolitan Statistical area is 487,568 according to the 2000 US Census. Of the total population 236,585 are males or 48.5 percent of the population and 250,983 are females or 51.5 percent of the population. The median age for the population of the area is 38.0 years: 36.9 for males and 39.0 for females. Over 15 percent of the population is located between the 40 – 49 years age range brackets, in this case of both males and females and about 25 percent of males and about 23 percent of females are between the ages of 0 to 17 years (Figure 3-2).

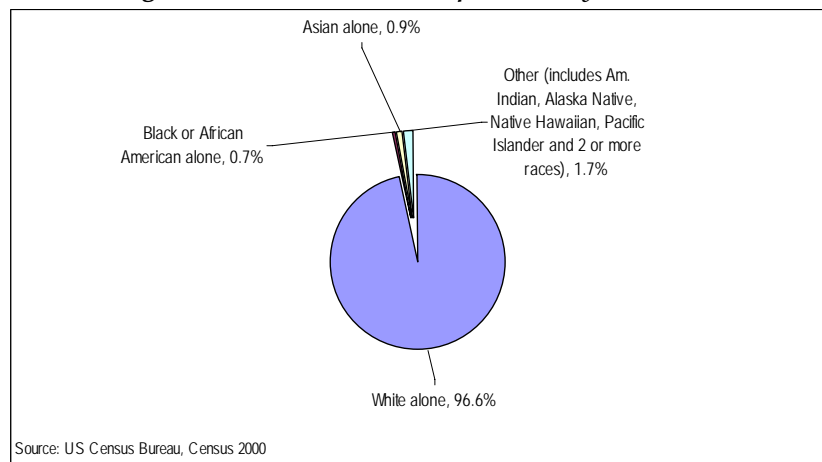
<sup>1</sup> <http://www.portofportlandmaine.org/navigation.html>

As is evident from Figure 3-3, the majority of the population in the area is white (96.6 percent), followed by ‘others’ (which include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone), representing 1.7 percent of the total population. The Asian population represents 0.9 percent of the total population, closely followed by the Black and African American population (0.7 percent). Moreover, in terms of ethnic makeup, 0.9 percent of the total population is of Hispanic or Latino origin.<sup>2</sup>

**Figure 3-2. Portland, ME: Structure of the Population by Age Group, 2000**



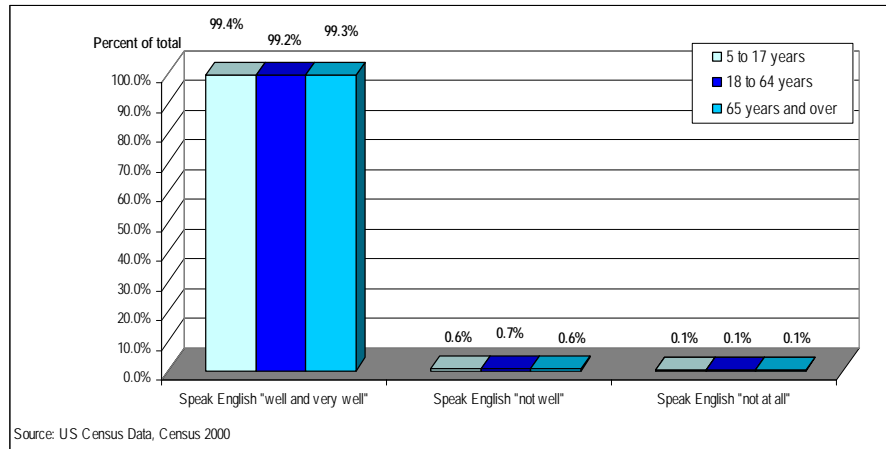
**Figure 3-3. Portland, ME: Population by Race, 2000**



<sup>2</sup> Source: US Census Data, Census 2000.

It is evident from the data specified in Figure 3-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

**Figure 3-4. Portland, ME: Ability to Speak English by Age Group, 2000**

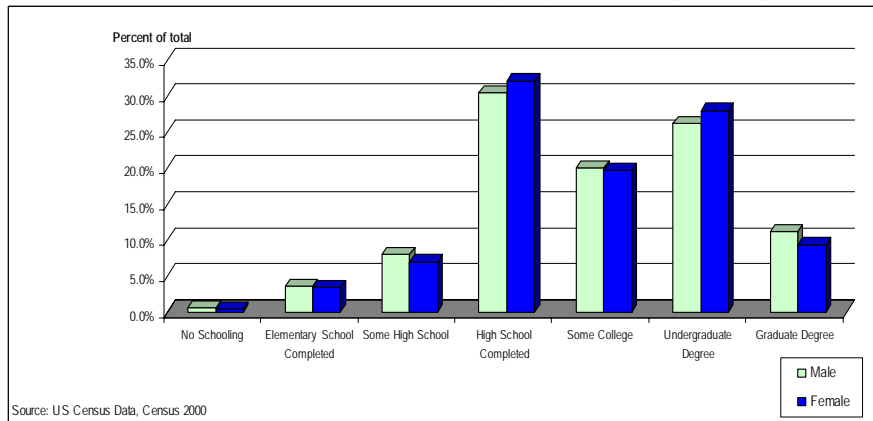


## EDUCATION

As portrayed by Figure 3-5, around 30 percent of males and females in this region have completed high school and approximately 25 percent of males and females have obtained an undergraduate degree. This percentage is followed by those who have only completed some college (about 18 – 19 percent).

Some of the colleges and universities in the area are: Bowdoin College, Maine College of Art, Saint Joseph's College and the University of Southern Maine in Cumberland County; and the University of New England and York County Community College in York County, Maine.<sup>3</sup>

**Figure 3-5. Portland, ME: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



<sup>3</sup> Portland Community Profile: <http://www.epodunk.com/cgi-bin/gayInfo.php?locIndex=2303>

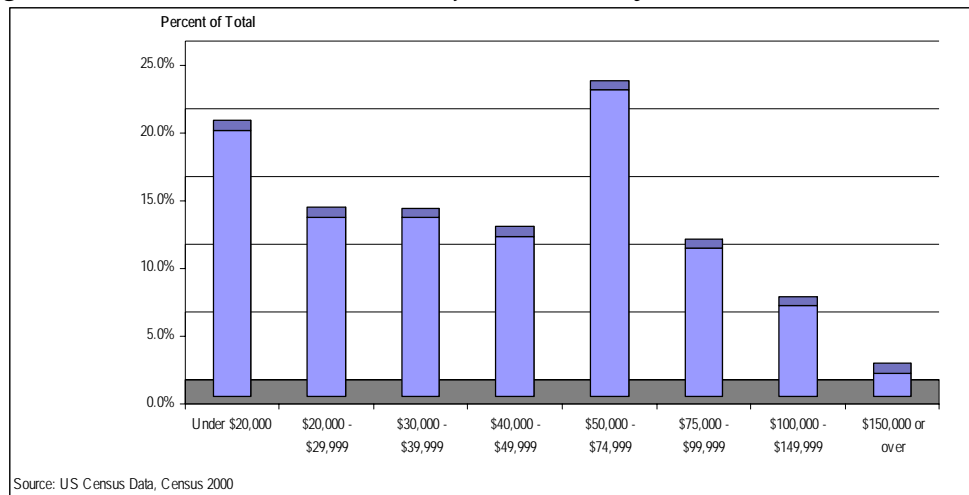
## Socio-Economic Characteristics

### INCOME

About 23 percent of households in this MSA have incomes within the \$50,000 - \$74,999 income bracket. This is followed by a rate of 20 percent of households that have incomes of under \$20,000 (Figure 3-6).

Household median income in the region in 1999 was \$43,735.62 and per capita income was \$22,647.78. The percentage of people under the poverty line in the region was 8.0 in the year 2000. Average household size in the year 2000 was 2.42.<sup>4</sup>

**Figure 3-6. Portland, ME: Distribution of Households by Household Income Level, 1999**



### EMPLOYMENT

Around 35 percent of working females are employed in educational, health and social services occupations; followed by 20 percent of females, who are employed within the 'other' category. This category includes arts, recreation, entertainment, food services, public opinion and information occupations. Males' occupations are a bit more evenly distributed among industries, yet the majority of males are employed in manufacturing and wholesale and retail trade (around 19 percent), followed by 'other' which represents about 18 percent (Figure 3-7).

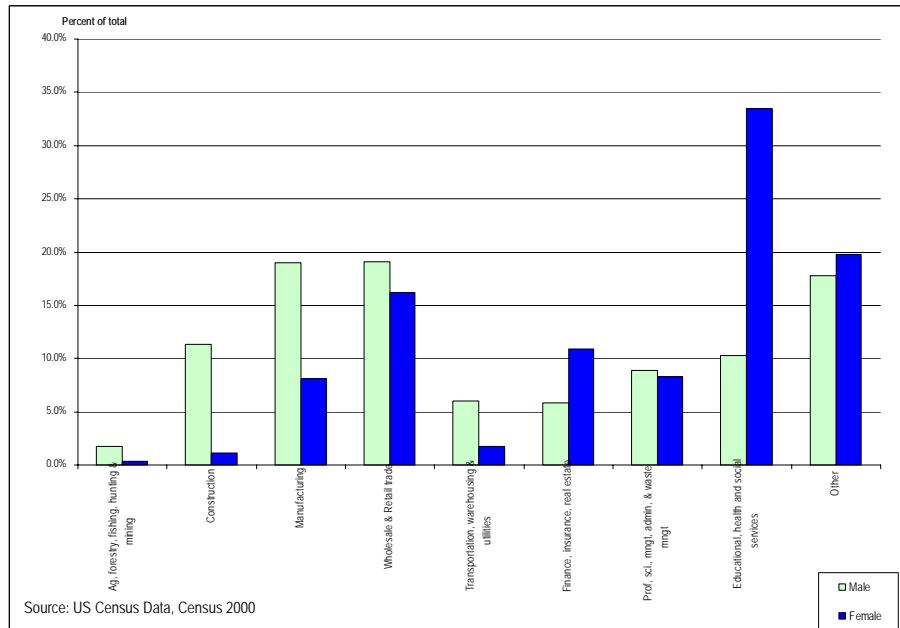
An estimated 3.6 percent of males and 3.5 percent of females were unemployed in 2000.<sup>5</sup>

According to the 2000 US Census, an estimated 1.2 percent of males and 0.1 percent of females are employed in farming, fishing and forestry occupations. About 19.7 percent of males and 6.7 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.7 percent of male's occupations and 0.1 percent of female's occupations.

<sup>4</sup> US Census Data, Census 2000.

<sup>5</sup> US Census Data, Census 2000.

**Figure 3-7. Portland, ME: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION

Terminal information at the Port of Portland:



1. Cargill Petroleum
2. Gulf Oil Terminal
3. International Marine Terminal
4. Maine State Pier (Portland Ocean Terminal, Casco Bay Lines)
5. Merrill Marine Terminal
6. Mobil Oil Terminal
7. Motiva Terminal
8. Portland Fish Pier
- 9 & 10. Portland Pipe Line Pier One (9) and Pier Two (10)
11. Sprague Energy Terminal

## PORTLAND FISH EXCHANGE



The Portland Fish Exchange is an all-display fresh fish and seafood auction operated in Portland, Maine. The Exchange offers a fair and open marketplace, bringing together Commercial Fishing Vessels (Sellers) with Wholesalers and Processors (Buyers). Fresh fish and seafood products are unloaded from fishing vessels daily and displayed for Buyers to make purchasing decisions. A daily auction is conducted at midday. Products purchased are destined for restaurants, markets, and processing plants within hours of vessel landings.

The Portland Fish Exchange is recognized throughout the Fish and Seafood Industry as a leader in innovation, quality, and integrity. Located on the waterfront in Portland, the Exchange offers ample pier and berthing space for boats. The 22,000-square-foot facility also offers numerous shipping bays for convenient loading and transport of products. Fish and Seafood can be landed at ports other than Portland and shipped via motor vehicle and/or aircraft to the auction facility for display and sale.

#### **PILOTAGE**

Pilots board 1.0 nautical mile north of the ELN Racon "PAPA" buoy at position 43-31.6 North and 70-05.5 West. Portland Pilots monitor VHF 16 and 11. Pilotage is compulsory for all foreign vessels and US vessels under register in the foreign trade drawing over nine feet. Pilotage is optional for coastwise or fishing vessels under enrollment or license that have onboard a pilot licensed by the Federal Government. The Pilot boats are black-hulled with a white superstructure with the word PILOT on both sides. One is 48 feet LOA and the other is 65 feet LOA. Vessels are requested to provide 48 and 24 hours notice of ETA and to update any appreciable changes. The pilots do not maintain the boat on station. Distance from the pilot station to the inner harbor is approximately 10 miles. <sup>6</sup>

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<sup>6</sup> Source: [http://www.portofportlandmaine.org/commercial\\_idx.html](http://www.portofportlandmaine.org/commercial_idx.html)



# 4. Portsmouth, NH

## Location and Background Information

The Port of Portsmouth, New Hampshire is part of the Rockingham County-Strafford County, New Hampshire Metropolitan Division of the Boston-Cambridge-Quincy, MA-NH Metropolitan Statistical Area (MSA). This Metropolitan division is comprised by Rockingham County, NH and Strafford County, NH.

With a deep natural harbor and river, Portsmouth is one of the oldest working ports in the United States. The Piscataqua River Basin's recorded seafaring history began with a visit in 1603 by English explorer Martin Pring and it has witnessed increasing maritime activity ever since. In 1957 the New Hampshire State Legislature created the New Hampshire State Port Authority as an autonomous state agency overseen by a board of directors appointed by the Governor and Executive Council. Today, activity at the Port includes pleasure boating and sport and commercial fishing in addition to bulk and general cargo transport to and from points worldwide.<sup>1</sup>

*Figure 4-1. Portsmouth, NH: Geographic Location, 2000*



Source: Table 3-1

## Demographics

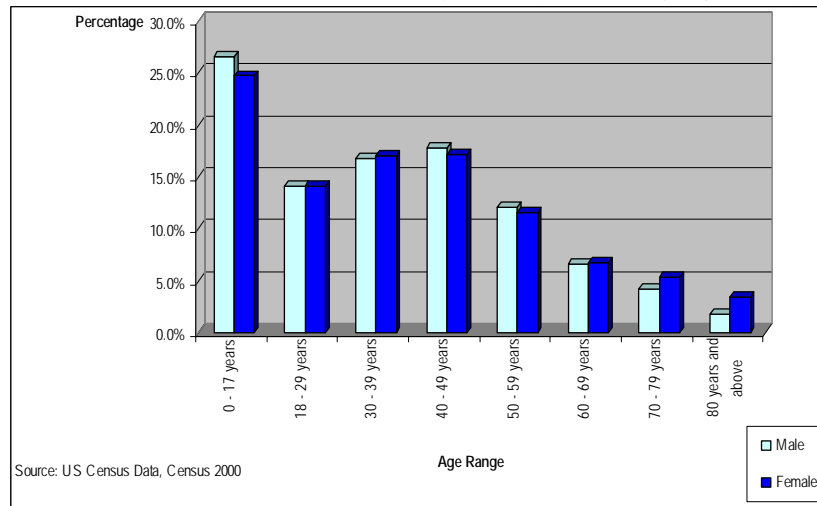
### POPULATION

The total population of this Metropolitan Division is 389,592, according to the 2000 US Census. Of this total, 191,592 or 49.1 percent are males and 198,246 or 50.9 percent are females. The median age in the area is 36.4 years; 35.9 for males and 36.9 for females. As Figure 4-2 portrays, over 15 percent of males and females are between the ages of 30 and 39, and about 17 percent are between 40 and 49 years of age. Over 25 percent of males and nearly that percentage of females are between 0 and 17 years old.

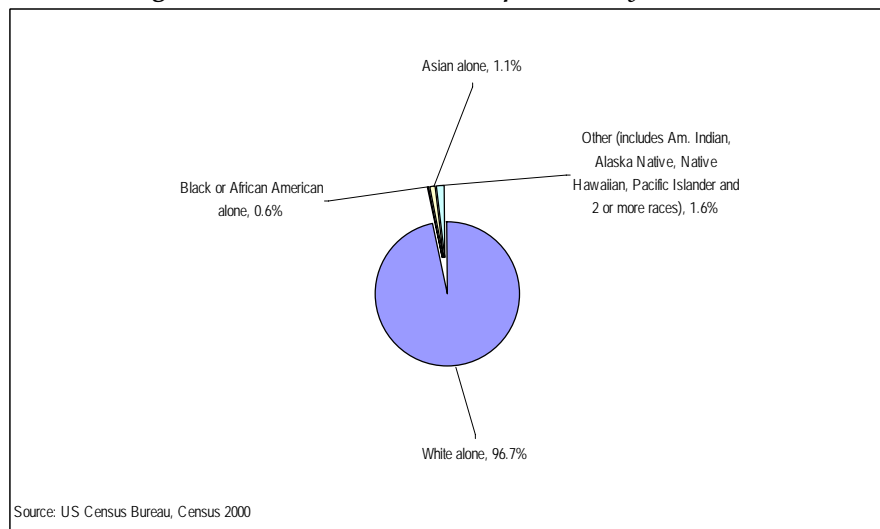
<sup>1</sup> Port of Portsmouth profile: <http://www.seacoastnh.com/business/port.html>

As shown in Figure 4-3, 96.7 percent of the population in this Metropolitan Division is white, followed by 'others' (which include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone), representing 1.6 percent of the population. The Asian population represents 1.1 percent of the total population, closely followed by the Black or African American population (0.6 percent). In terms of ethnic makeup, 1.2 percent of the total population is considered to be of Hispanic or Latino origin.<sup>2</sup>

**Figure 4- 2. Portsmouth, NH: Structure of the Population by Age Group, 2000**



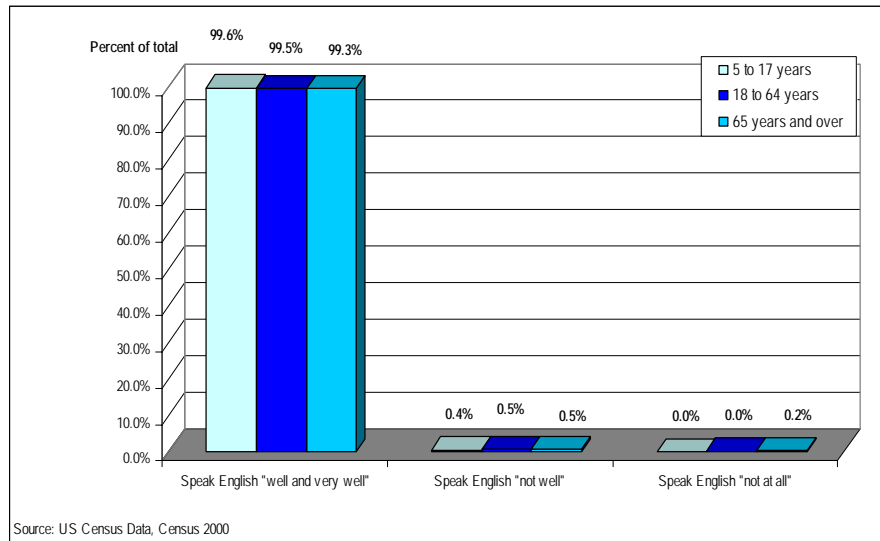
**Figure 4-3. Portsmouth, NH: Population by Race, 2000**



<sup>2</sup> US Census Data, Census 2000.

It is evident from the data specified in Figure 4-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

**Figure 4-4. Portsmouth, NH: Ability to Speak English by Age Group, 2000**

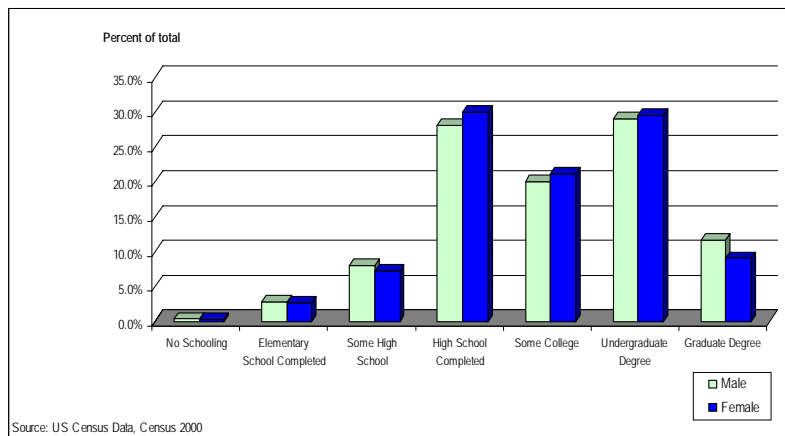


## EDUCATION

As evidenced by Figure 4-5, most of the population in this Metropolitan Division has completed high school and has obtained an undergraduate degree (about 30 percent of males and females for each category).

Some of the colleges in the area are: Chester College of New England in Rockingham County and the University of New Hampshire in Strafford County.<sup>3</sup>

**Figure 4-5. Portsmouth, NH: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



<sup>3</sup> Portsmouth, NH Community Profile: <http://www.epodunk.com/>

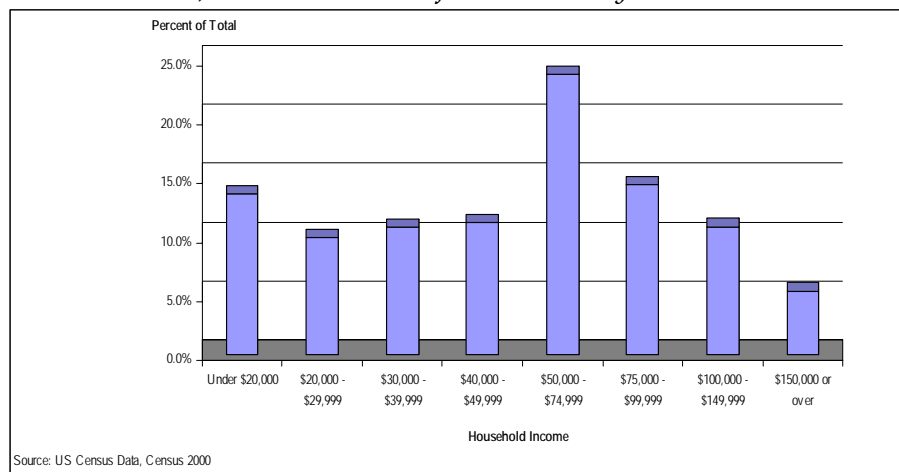
## Socio-Economic Characteristics

### INCOME

The majority of households in this region have incomes that between \$50,000 and \$74,999 (about 23 percent). Around 15 percent of households in the region have incomes in the \$75,000 - \$99,999 income bracket. The rest of households' incomes are more evenly distributed (Figure 4-6).

Household median income for 1999, according to the 2000 US Census, was \$54,291.43 and per capita income was \$24,876.54. The percentage of people under the poverty line in the region was 5.8 in the year 2000. The average household size in this Metropolitan Division in 2000 was 2.59.<sup>4</sup>

**Figure 4-6. Portsmouth, NH: Distribution of Households by Household Income Level, 1999**



### EMPLOYMENT

About 30 percent of females in this Metropolitan Division are employed in the education, health and social services industry. This is followed by 19 percent employment of females in 'other' industries, which include the arts, entertainment, recreation, public administration, food services and information. About 24 percent of males are employed in manufacturing and approximately 19 percent of males are employed in the wholesale and retail trade industry (Figure 4-7).

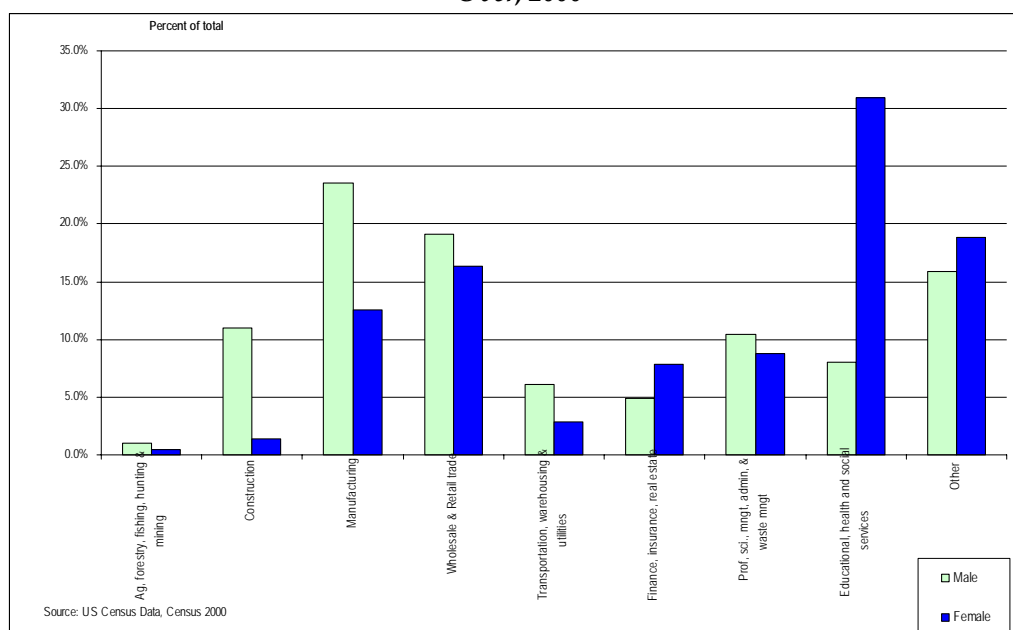
An estimated of 3.1 percent males and 3.1 percent of females were unemployed in this region in the year 2000.<sup>5</sup>

According to the 2000 US Census, an estimated 0.5 percent of males and 0.3 percent of females are employed in farming, fishing and forestry occupations. About 18.7 percent of males and 8.5 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.5 percent of male's occupations and 0.1 percent of female's occupations.

<sup>4</sup> US Census Data, Census 2000.

<sup>5</sup> US Census Data, Census 2000.

**Figure 4-7. Portsmouth, NH: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



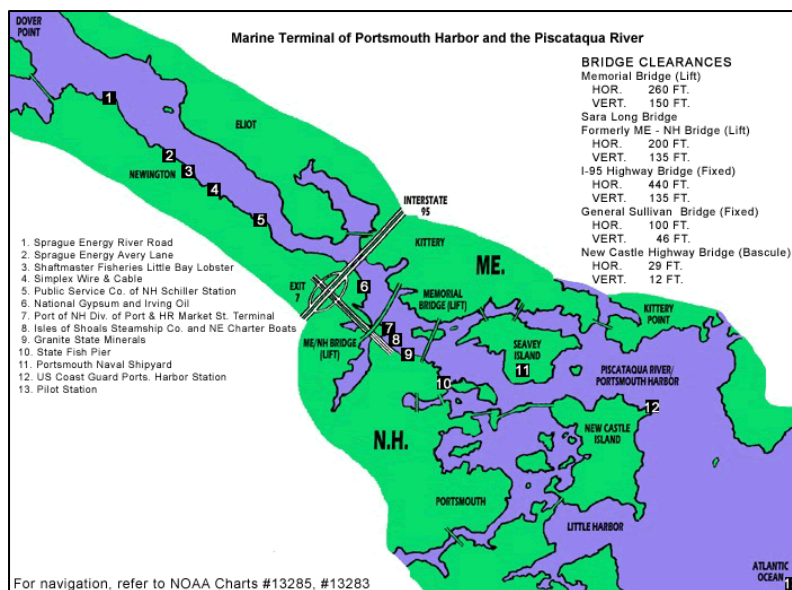
## MARITIME INFORMATION

The Port's strategic location makes it ideal for import/export with European trading partners as well as businesses in the Middle East, Africa and the Pacific Rim. The Port, ice-free year round, is the closest such port to Europe, with the transit from sea buoy 2KR only three miles. Rail service is available to the Port Authority and many other private facilities, while access to Interstate Highway 95 is only a half mile away. Pease International Tradeport is two miles away in Newington. The port channel is maintained at 35 feet and has bridge clearances between 135 and 150 feet. In total, about five million tons of cargo enter or exit Portsmouth Harbor each year. Vessels of all types visit the Port Authority, including general purpose liners, bulk carriers, passenger ships, container carriers, feeder vessels and barges. Fresh water, stores, bunkers, telephones and a heliport site are available.<sup>6</sup>

### Terminal Information

The DPH Market Street Marine Terminal, located on the Piscataqua River, is the only public access, general cargo terminal on the River. The Piscataqua is a year-round, ice-free, deep draft river. The Market Street Terminal offers 8 acres of paved outside lay down area, 50,000 sq. ft. of covered warehouse, onsite rail access, 600 ft berth, 35 ft/MLW, 312 ft berth, 22 ft/MLW. It has cargo handling capabilities for bulk cargo (scrap, salt, wood chips); break bulk (industrial and machinery parts, construction materials); project cargo (power plant components, vacuum tanks) and container cargo.

<sup>6</sup> Port of Portsmouth profile: <http://www.seacoastnh.com/business/port.html>



Charter boats operate from 3 of the Division's facilities: Hampton Harbor Marina, Hampton, NH; Rye Harbor Marina, Rye, NH; Market Street Marine Terminal-Burge Wharf, Portsmouth, NH. The vessels range from the 6 passenger (6 pack) boats to 45 passenger vessels. The boats are chartered for fishing for stripers, bluefish, cod or blue fin tuna; scuba diving excursions to the Isles of Shoals or the scallop beds; cocktail or lobster bakes; lobster trap-hauling demonstrations.

There are several party fishing boats, half-day and full-day, that operate from the Hampton and Rye Harbor Marinas. These vessels range in size up to 75 feet in length and carry up to 150 passengers. Some companies are: Atlantic Fishing Fleet, Sushi Hunter Charters, Northeast charter Boat Company, Northwind and Seafari.

Some passenger vessels offer whale watching trips that operate from the Hampton and Rye Harbor Marinas. The Isles of Shoals Steamship Company provides ferry service to Star Island at the Isles of Shoals from the Market Street Marine Terminal-Barker Wharf. The Isles of Shoals is a group of islands located approximately 7 miles off the coast of New Hampshire. The majority of activity on the islands is at the hotel/conference center on Star Island. The DPH is responsible for more than 1,500 moorings in 29 mooring fields.

### Commercial Fishing

Pursuant to State Statute RSA 12-G:43(b), the Division of Ports and Harbors (DPH) shall, "aid in the development of salt water fisheries and associated industries." The DPH has responsibility for and jurisdiction over the state-owned commercial fishing piers and facilities at Portsmouth, New Hampshire; Rye Harbor, New Hampshire; and Hampton Harbor, New Hampshire. Berths and slips are only available at Portsmouth. Due to physical limitations at Rye and Hampton, no long-term or overnight berthing is available. Commercial fishermen wishing to use the facilities must be issued a "Pier Use" permit. Bulk fuel is available through permitted vendors; contact the DPH for a list of these vendors. Ice and chandlery is available at Portsmouth. The DPH is the Grantee of Foreign-Trade Zone #81, which includes 5 sites and 1 subzone (Westinghouse Electric): The Market Street Terminal is 11 acres; Portsmouth Industrial Park is 75 acres; Dover Industrial Park, is 50 acres; Manchester Airport is 1400 acres and Pease International Tradeport, 1900 acres. <sup>7</sup>

<sup>7</sup> Port of New Hampshire website: <http://www.portofnh.org/who.html>

# 5. Boston, MA

## Location and Background Information

The Port of Boston is located in the Boston-Cambridge-Quincy, Massachusetts-New Hampshire Metropolitan Statistical Area (MSA). Boston is the oldest continually active major port in the Western Hemisphere. Though it did not become an international cargo port until 1630, for at least four thousand years previously, it had served as a settlement and trading area for Native American tribes. After the Massachusetts Bay Colony was formed, the port became a very busy place.

Concerned about their utter dependence on British trading ships, they sought greater independence by starting a vigorous shipbuilding industry of their own, and began to establish independent trading links with other colonies and countries to the north and south. For most of the century, Boston was America's largest and busiest port, serving the rapidly expanding colonies with imports of English finished goods in exchange for exports of lumber, fully constructed vessels, rum and salted fish.

Since 1980, container traffic has tripled and Boston has become one of the most modern and efficient container ports in the U.S. General cargo tonnage growth has averaged 3.6% growth each year. The passenger ship industry is also expanding in the Port of Boston. Numerous four and five star cruise lines such as Cunard, Norwegian Majesty, Hapag-Lloyd and Silversea regularly call the port. With more than 62 ship calls last year alone, the port is now considered one of the fastest-growing high-end cruise markets in the country.

Boston also hosts an enormous complex of privately owned petroleum and liquefied natural gas terminals, which supply more than 90% of Massachusetts' petroleum consumption needs. The port is home to two shipyards, numerous public and private ferry operations, world-renowned marine research institutions, marinas, a major Coast Guard facility and is one of America's highest-value fishing ports.

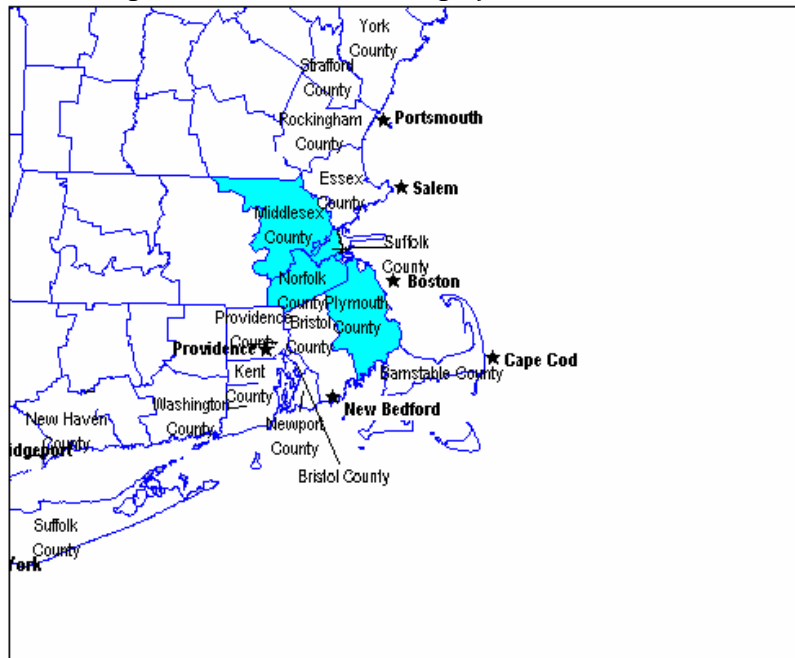
Boston is one of the most modern and efficient container ports in the U.S. Conley Terminal for containerized cargo shipments and Moran Terminal, currently leased to Boston Autoport for the import and distribution of automobiles handle more than 1.3 million tons of general cargo, 1.5 million tons of non-fuels bulk cargo and 12.8 million tons of bulk fuel cargos yearly.

With 101 passenger ships scheduled to call in the 2005 season, Cruiseport Boston is now considered one of the fastest growing high-end cruise markets in the country. The Black Falcon Cruise Terminal, located in the Boston Marine Industrial Park will serve over 210,000 cruise passengers this year. Another full cruise season is planned for 2006 between the months of April and October.<sup>1</sup>

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<sup>1</sup> Massachusetts Port Authority website: <http://www.massport.com/ports/about.html>

**Figure 5-1. Boston, MA: Geographic Location, 2000**



Source: Table 3-1

## Demographics

### POPULATION

The total population of the Boston-Cambridge-Quincy, Massachusetts-New Hampshire Metropolitan Statistical Area is of 3,278,333, according to the 2000 US Census. Of this total, 1,582,659 or 48.3 percent are males and 1,695,674 or 51.7 percent are females. The median age in this region is 35.8 years; 34.7 for males and 36.9 for females. The majority of the population in this area falls within two age brackets, 18 - 29 years and 30 - 39 years; accounting for approximately 34 percent of males and 32 percent of females (Figure 5-2).

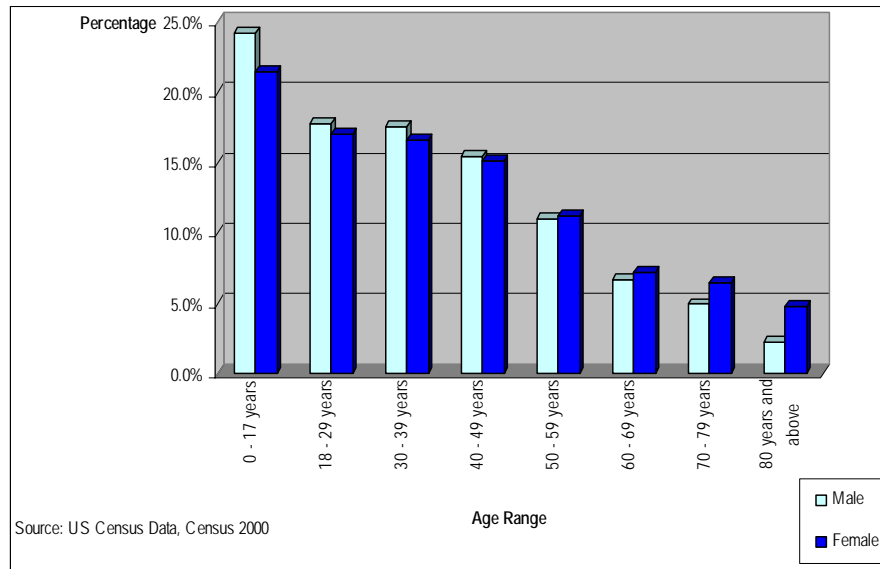
The majority of the population in this area is white (81 percent), followed by the Black or African American population, which represents 7.3 percent of the total population. The 'other' category (which includes American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone) represents 6.2 percent of the total population, followed by the Asian population, which represents 5.5 percent of the total population (Figure 5-2). In terms of ethnic makeup, 6.0 percent of the total population is considered to be of Hispanic or Latino origin.<sup>2</sup>

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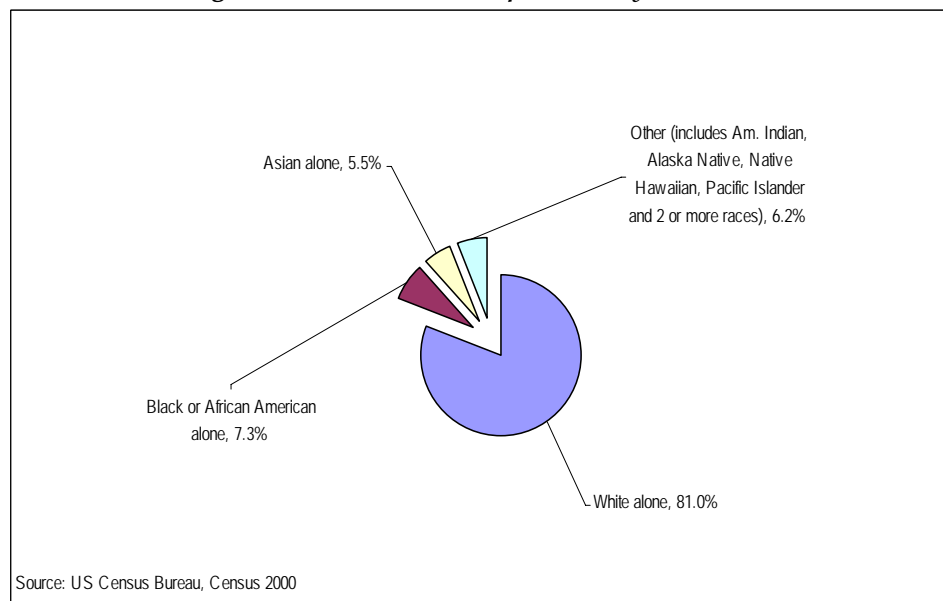
<sup>2</sup> US Census Data, Census 2000.



**Figure 5-2. Boston, MA: Structure of the Population by Age Group, 2000**

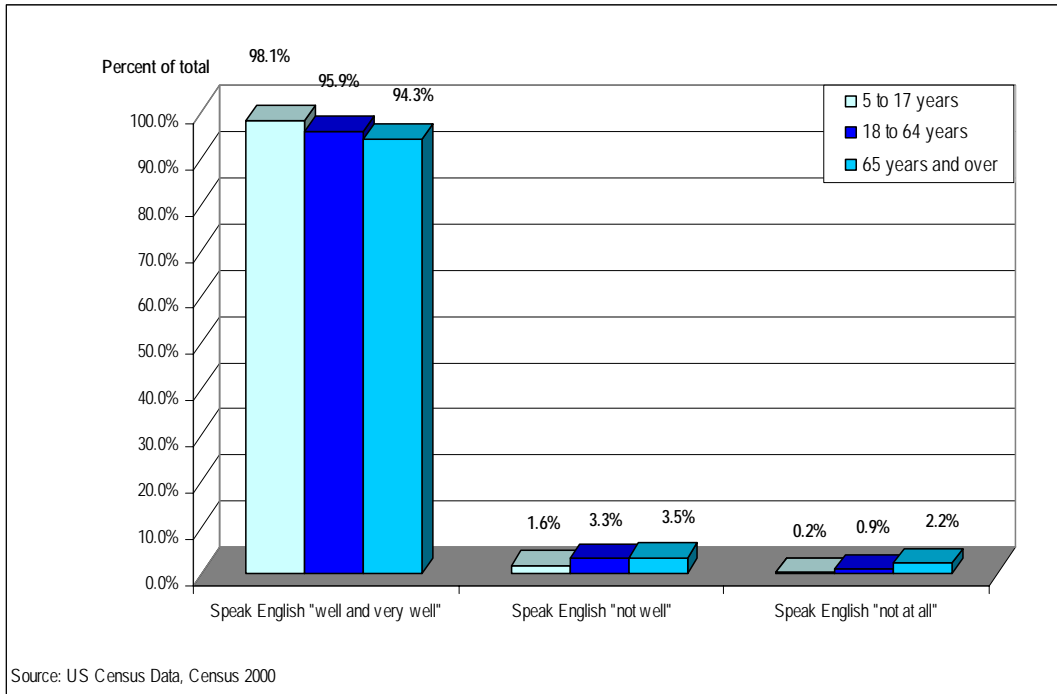


**Figure 5-3. Boston, MA: Population by Race, 2000**



It is evident from the data specified in Figure 5-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'. The older population groups dominate the language less fluently, about 5.7 percent of the population that is 65 years and over and about 4.2 percent of the population in the 18 – 64 years age bracket don't speak English well or do not speak English at all.

**Figure 5-4. Boston, MA: Ability to Speak English by Age Group, 2000**

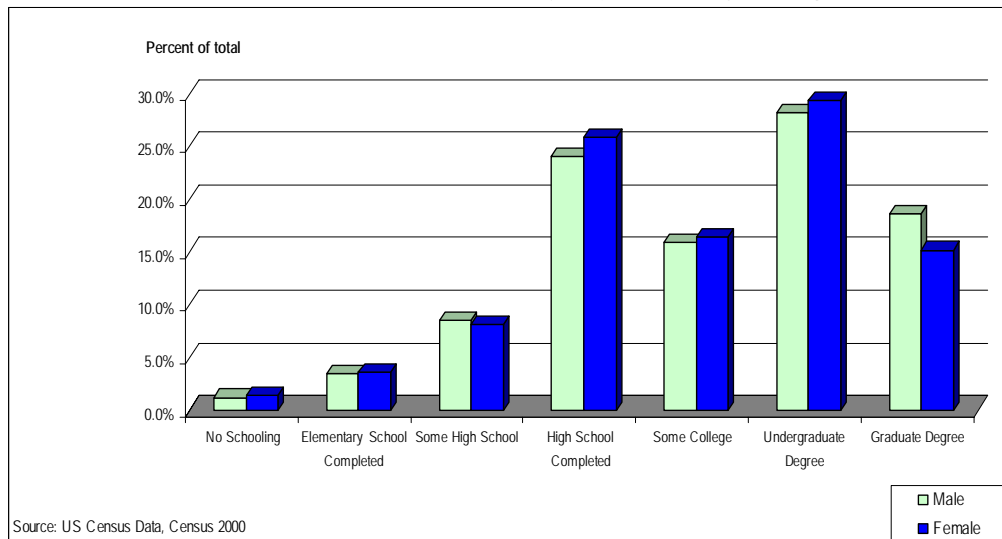


## EDUCATION

It is evident from Figure 5-5 that the majority of the population in this area has completed high school (between 24 – 25 percent) and has obtained an undergraduate degree (27 – 29 percent). Around 14 – 18 percent of the population has obtained a graduate degree.

The city of Boston is known for having one of the highest concentrations of colleges and universities in the nation. Some of the finest educational institutions in the country are located in this region, among them Harvard University and MIT. Other well-known colleges in the area are: Boston University, Tufts University, University of Massachusetts Boston, Northeastern University, Emerson College, Boston College and Wellesley College.

**Figure 5-5. Boston, MA: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



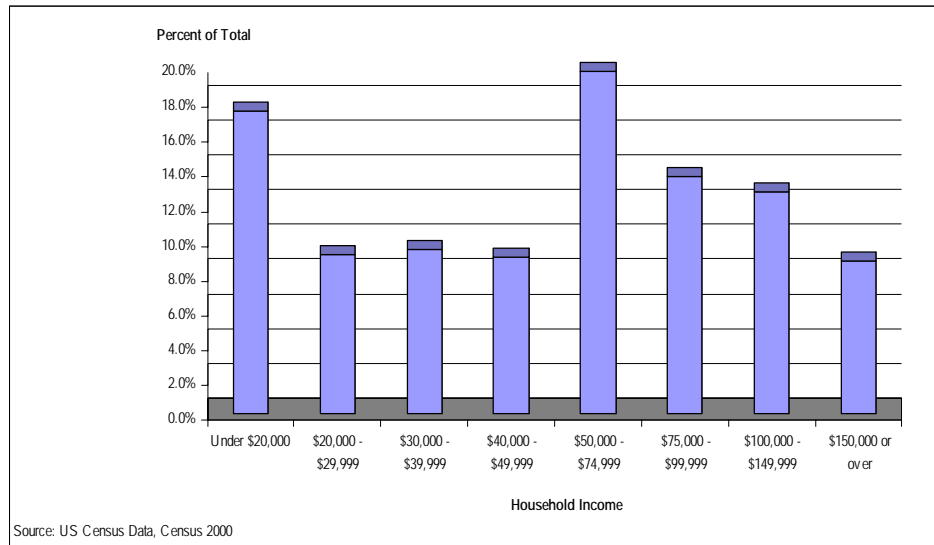
## Socio-Economic Characteristics

### INCOME

As is apparent from Figure 5-6, most households in the area fall within the income bracket of \$60,000 - \$74,999 (about 20 percent), followed by 18 percent of households that have incomes under \$20,000.

Household median income for the area for the year of 1999, according to the 2000 US Census, was \$55,882.15 and per capita income was \$28,754.99. The percentage of people under the poverty line in the region was 8.8 in the year 2000. The average household size in this area in 2000 was 2.52.<sup>3</sup>

**Figure 5-6. Boston, MA: Distribution of Households by Household Income Level, 1999**



### EMPLOYMENT

It is evident from Figure 5-7 that about 35 percent of females are employed in the education, health and social industry; whereas males are mostly concentrated in 'other' industries such as the arts, entertainment, recreation, food services, public administration and information (20 percent). Women also have a high representation in the previous category (approximately 19 percent). Slightly over 15 percent of males are employed in professional, science management, administration and waste management services industries.

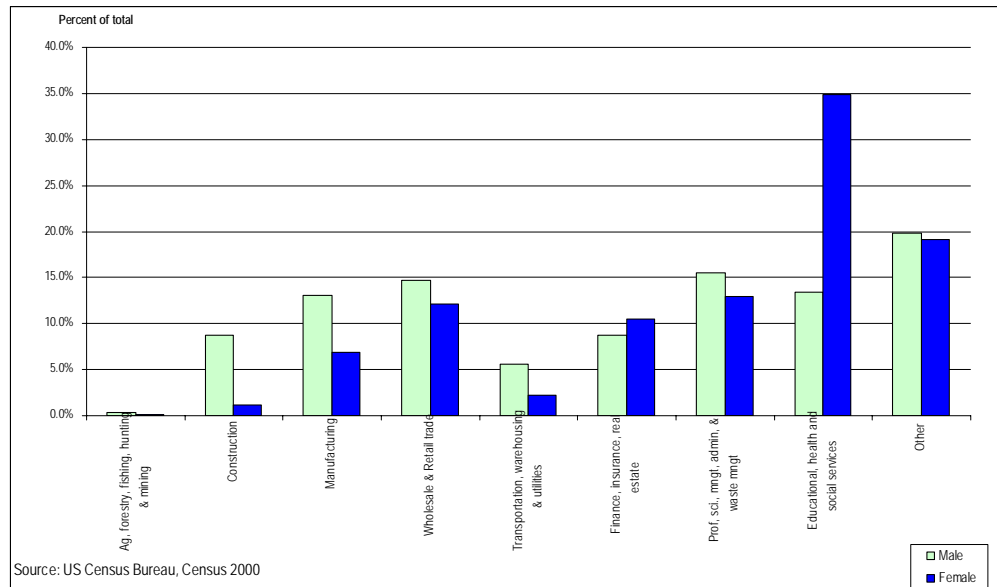
An estimated 4.3 percent of males and 4.1 percent of females were unemployed in this metropolitan statistical area in the year 2000.<sup>4</sup>

According to the 2000 US Census, an estimated 0.2 percent of males and 0.1 percent of females are employed in farming, fishing and forestry occupations. About 12.5 percent of males and 4.7 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.5 percent of male's occupations and 0.04 percent of female's occupations.

<sup>3</sup> US Census Data, Census 2000.

<sup>4</sup> US Census Data, Census 2000.

**Figure 5-7. Boston, MA: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION



The Boston Harbor Navigation Improvement Project (BHNIP), already underway, will deepen key portions of Boston's Inner Harbor, its tributary channels, and berth areas to allow the significantly larger "post-Panamax" class of vessels to call in the Port. A total of approximately 2.3 million cubic yards of material will be dredged from key portions of the channels and berths. The completion of this project, coupled with the harbor's nine foot tide swing, will allow even the largest vessels to enter the harbor safely. Boston's channels will be deeper than those of many of the east coast ports,

greatly enhancing the Port of Boston's competitive position and providing a significant economic benefit to the New England region.

Dredging of Boston's Inner Harbor began in August 1998 by Great Lakes Dredge & Dock Company. Dredging is proceeding rapidly with most of the silt material already removed from the Reserved Channel and the Mystic River. Three disposal cells have been constructed, filled, and capped in the Mystic River, and three other cells are currently open and being used for disposal in the Mystic and Chelsea Rivers. Several of the berths adjoining the project have been dredged and project benefits are already beginning to be realized.

Massport, in cooperation with The Massachusetts Highway Department and the City of Boston, has developed a permitted overweight container route between Conley Terminal, near-dock sites in Boston, and the CSX rail transfer facility four miles to the west. Companies that pay the federal Harbor Maintenance Tax for goods moving through Massachusetts ports, are eligible for a dollar-for-dollar Massachusetts tax credit. This credit applies to containerized cargo, break bulk, and road vehicles.

Multiple off-dock transloading facilities including warehouse space and cooler facilities for perishables, and several trucking operations are available close to Massport maritime facilities. The Massachusetts Seaport Bond Bill provides partial funding for Double stack rail clearances in the state, and Massport is working with the Executive Office of Transportation and Construction to expedite signing of the Master Agreement between the railroads. Furthermore, Massport works closely with the U.S. Department of Agriculture and private companies to provide fumigation services as needed for cargo in the port.<sup>5</sup>

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<sup>5</sup> Massachusetts Port Authority website: [http://www.massport.com/ports/about\\_value.html](http://www.massport.com/ports/about_value.html)

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## 6. Salem, MA

## Location and Background Information

The Port of Salem is located in the Essex County, MA Metropolitan Division, which is part of the Boston-Cambridge-Quincy, Massachusetts – New Hampshire Metropolitan Statistical Area (MSA). Founded in 1626, Salem became one of the first and most significant commercial seaports in colonial America. Located along the northeastern coast of Massachusetts, Salem is the second largest and deepest natural harbor of the commonwealth.<sup>1</sup>

*Figure 6-1. Salem, MA: Geographic Location, 2000*



Source: Table 3-1

## Demographics

## POPULATION

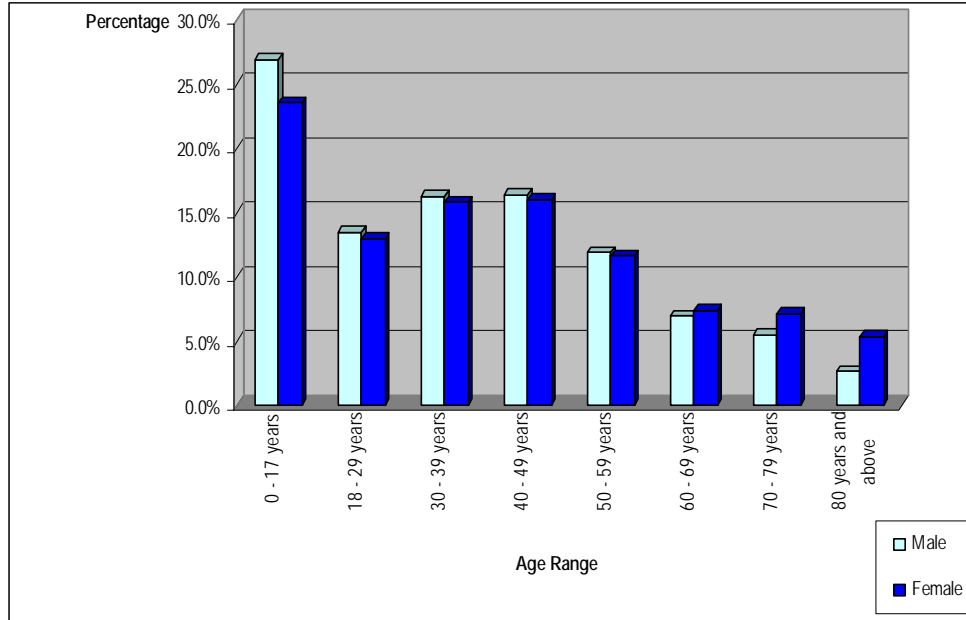
The total population of Essex County, MA is 723,419, according to the 2000 US Census. Of this total, 346,421 or 47.9 percent are males and 376,998 or 52.1 percent are females. The median age in the county is 37.5 years; 36.2 for males and 38.6 for females. The majority of the population is concentrated in two age brackets: 30 – 39 years and 40 – 49 years; approximately 32 percent of males and 30 percent of females (Figure 6-2).

As evidenced by Figure 6-3, the majority of the population in the county is white (86.4 percent), followed by 8.8 percent of ‘others’ (which include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone). The Black or African American population represents 2.5 percent of the total population, closely followed by the Asian population (2.4 percent). In terms of ethnic structure, 11.0 percent of the total population is considered to be of Hispanic or Latino origin.<sup>2</sup>

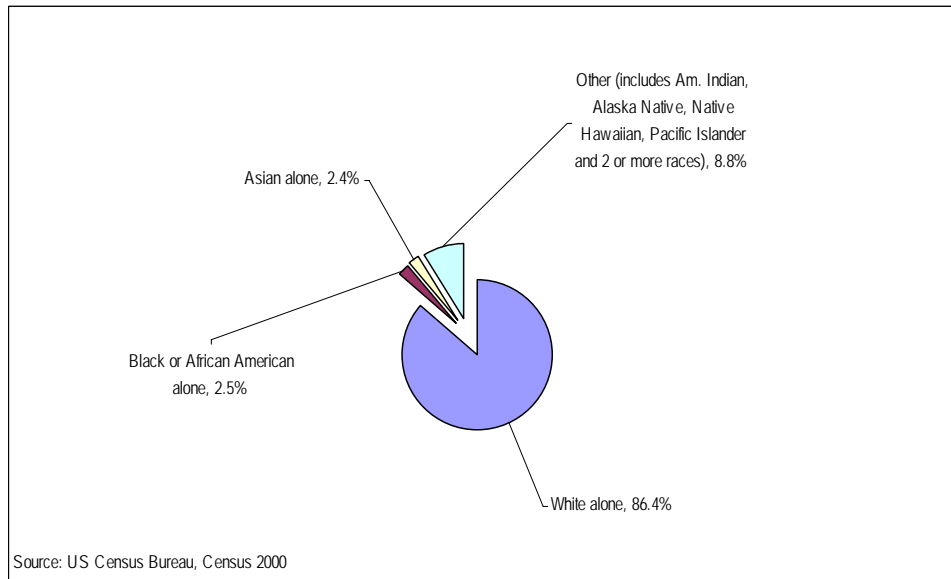
<sup>1</sup> Seaport Advisory Council webpage: <http://www.mass.gov/seaports/salem.htm>

<sup>2</sup> Source: US Census Data, Census 2000.

**Figure 6-2. Salem, MA: Structure of the Population by Age Group, 2000**



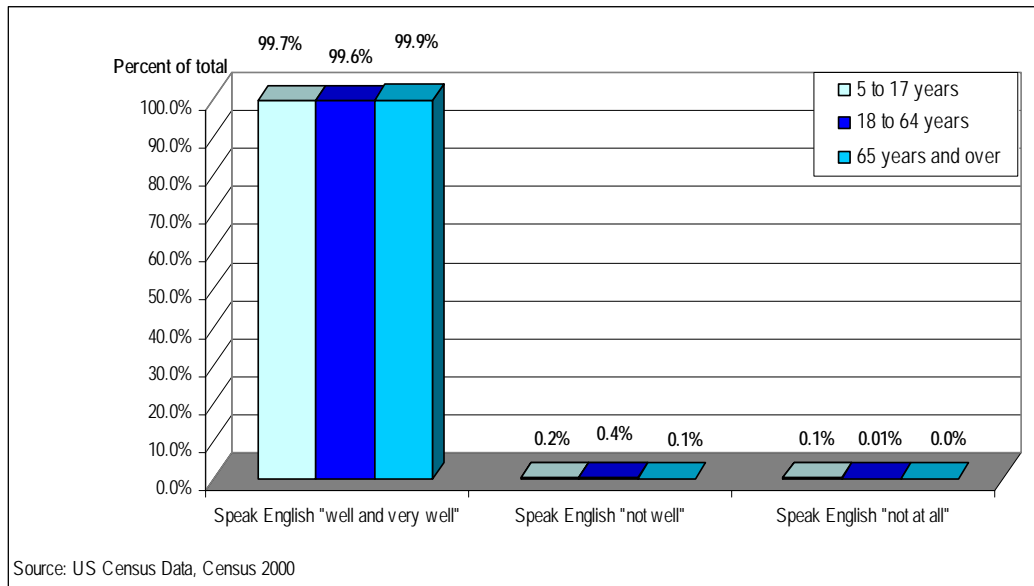
**Figure 6-3. Salem, MA: Population by Race, 2000**





It is evident from the data specified in Figure 6-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

**Figure 6-4. Salem, MA: Ability to Speak English by Age Group, 2000**

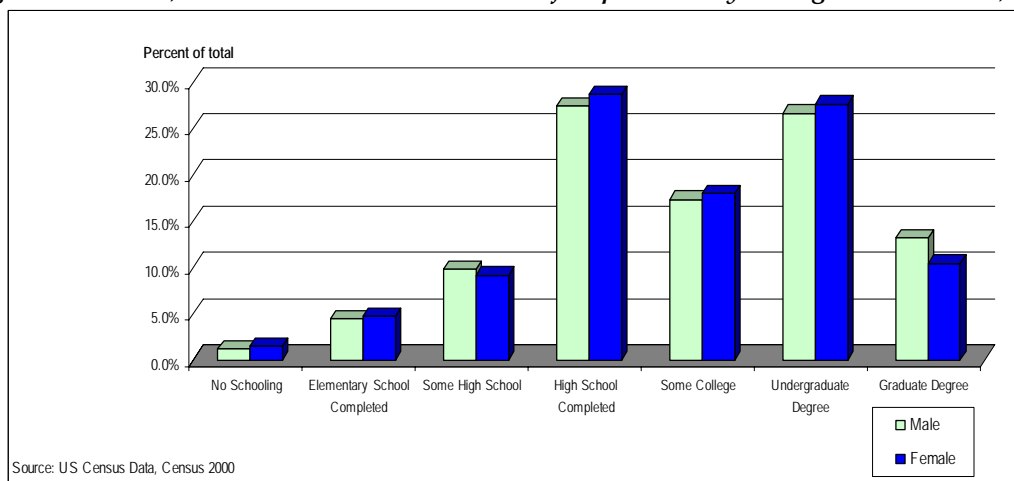


## EDUCATION

About 26 percent of males and 27 percent of females have completed high school in the area, and about 25 – 26 percent of males and females have obtained an undergraduate degree (Figure 6-5).

Salem is home to Salem State College and Marian Court College.<sup>3</sup>

**Figure 6-5. Salem, MA: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



<sup>3</sup> Salem Community Profile: <http://www.epodunk.com/>

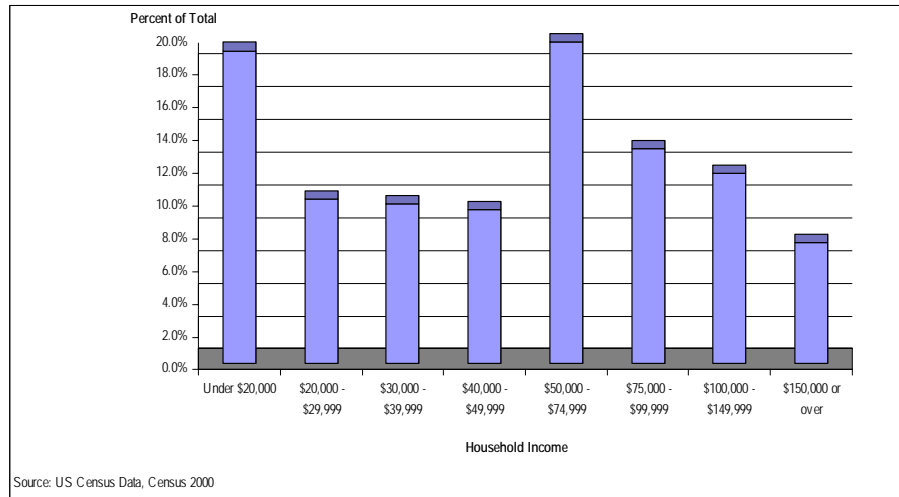
## Socio-Economic Characteristics

### INCOME

As is portrayed by Figure 6-6, most households in Essex County, MA have an income of under \$20,000 or in the bracket of \$50,000 - \$74,999 (20 percent in each category).

Household median income in 1999, according to the 2000 US Census, was \$51,576 and per capita income was \$26,358. The percentage of people under the poverty line in the region was 8.9 in the year 2000. The average household size in 2000 was 2.57.<sup>4</sup>

**Figure 6-6. Salem, MA: Distribution of Households by Household Income Level, 1999**



### EMPLOYMENT

Around 34 percent of working females in this region are employed in educational, health and social services industries and around 19 percent of them are employed in 'other' industries, including occupations in the arts, entertainment, recreation, food services, public administration and information. Approximately 21 percent of males are employed in the manufacturing sector, and 18 percent of them are employed in 'other' industries (Figure 6-7).

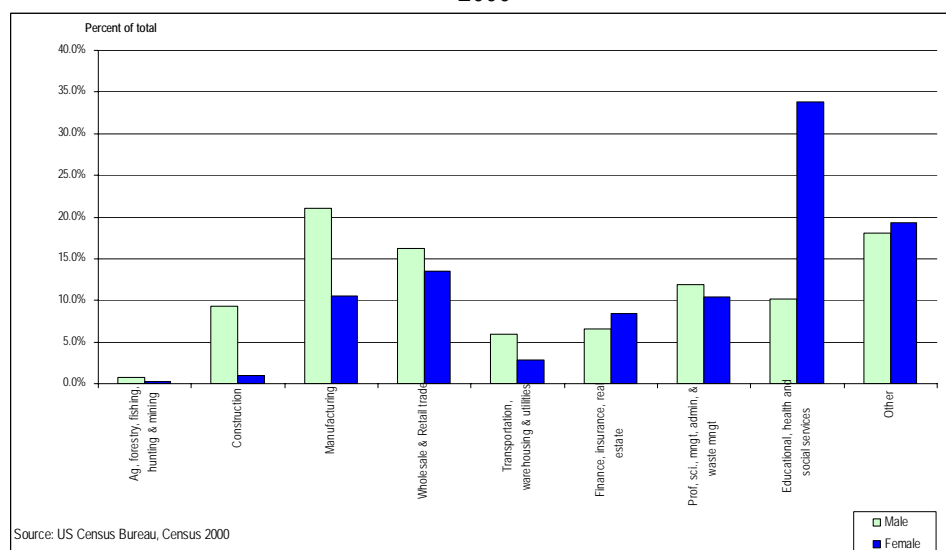
An estimated 4.5 percent of males and 4.7 percent of females were unemployed in 2000.<sup>5</sup>

According to the 2000 US Census, an estimated 0.5 percent of males and 0.1 percent of females are employed in farming, fishing and forestry occupations. About 17.0 percent of males and 7.4 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.5 percent of male's occupations and 0.043 percent of female's occupations.

<sup>4</sup> US Census Data, Census 2000.

<sup>5</sup> US Census Data, Census 2000.

**Figure 6-7. Salem, MA: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION

The Port of Salem won early fame as the center of an active shipping trade to the ports of Asia. Salem's vessels and sea captains established lucrative trading routes to China, Japan, Polynesia and throughout the Pacific Basin. Between 1750 and 1810, thousands of sailing voyages began and ended in the Port of Salem. Shipping activity diminished after the War of 1812, and Salem lost its prominence to emerging ports with facilities for new, larger clipper ships. Commercial shipping returned to Salem Harbor in 1940 with the construction by New England Power Company of an electric generating plant. A new deep-water channel was dredged to allow for fuel delivery, and these facilities are the base for all bulk cargo shipments today. Salem's port facilities receive more than one million tons of coal and three million barrels of petroleum products each year. These products arrive in vessels as large as 800 feet in length and 34 feet of draft. A major port expansion project, now underway, will enlarge port capacity, increase allowed draft and produce a new ship berth facility designed to serve cruise vessels and coastal ferry operations. This \$18-million infrastructure improvement will reestablish the regional prominence of this historic seaport.

Attractions such as the Peabody-Essex Museum, House of Seven Gables, Salem Witch Museum and the National Maritime Historic Site of the National Park Service are among the key attractions in Salem.<sup>6</sup> The Port of Salem is located on the Northeastern coast of Massachusetts, 12 miles north of Boston. It has one 800-foot berth and is operated by the New England Power Company. Salem has a cargo of more than one million tons of coal and three million barrels of oil annually. Its main trade is with South America and other states in the United States.

The Port has storage capacity for 100,000 tons of bulk and one million barrels of oil and it offers fuel, water and stores services. The Port is one mile away from an existing rail and is three miles away from Route 128/I-95. Future plans include the expansion of the existing ship basin and the construction of a second 600-foot pier and cruise terminal.<sup>7</sup>

<sup>6</sup> Seaport Advisory Council website: <http://www.mass.gov/seaports/salem.htm>

<sup>7</sup> Port Advisory Council website: <http://www.mass.gov/seaports/salem.htm>

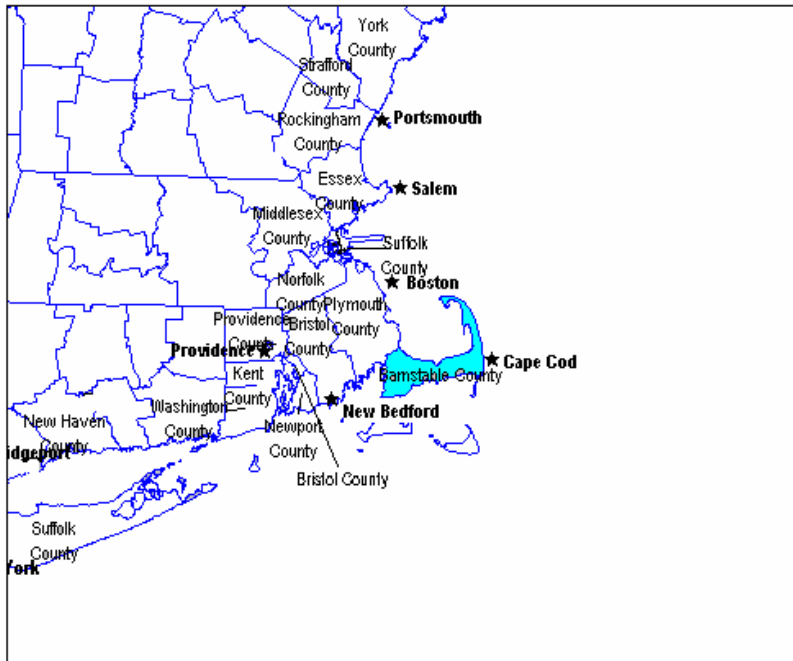
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# 7. Cape Cod Bay, MA

## Location and Background Information

The Port of Cape Cod is located in the Barnstable Town, Massachusetts Metropolitan Statistical Area (MSA). This MSA is comprised by Barnstable County, MA.

*Figure 7-1. Cape Cod Bay, MA: Geographic Location, 2000*



Source: Table 3-1

## Demographics

### POPULATION

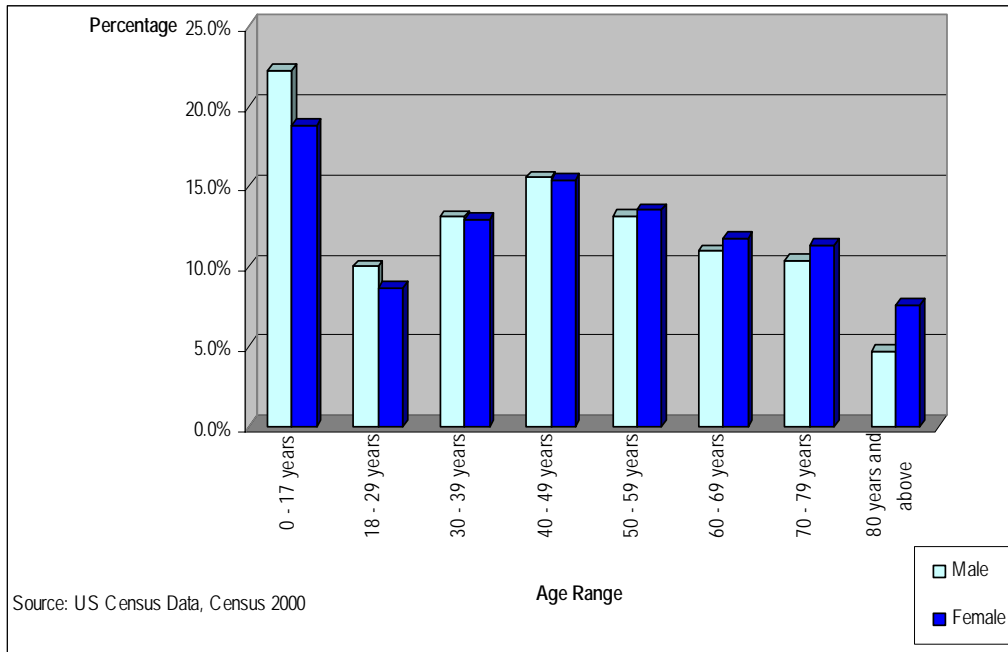
Total population of the Barnstable Town, MA MSA is 222,230; according to the 2000 US Census. Of this total, 105,199 or 47.3 percent are males and 117,031 or 52.7 percent are females. The median age for the region is 44.6; 42.9 for males and 46.1 for females.

As Figure 7-2 shows, the majority of the population in this county is white (94.3 percent), followed by 'others' (include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone), which represent 3.5 percent of the total population. The Black or African American population represents 1.5 percent of the total population, closely followed by Asian population (0.6 percent). In terms of ethnic makeup, 1.3 percent of the total population is considered to be of Hispanic or Latino origin.<sup>1</sup>

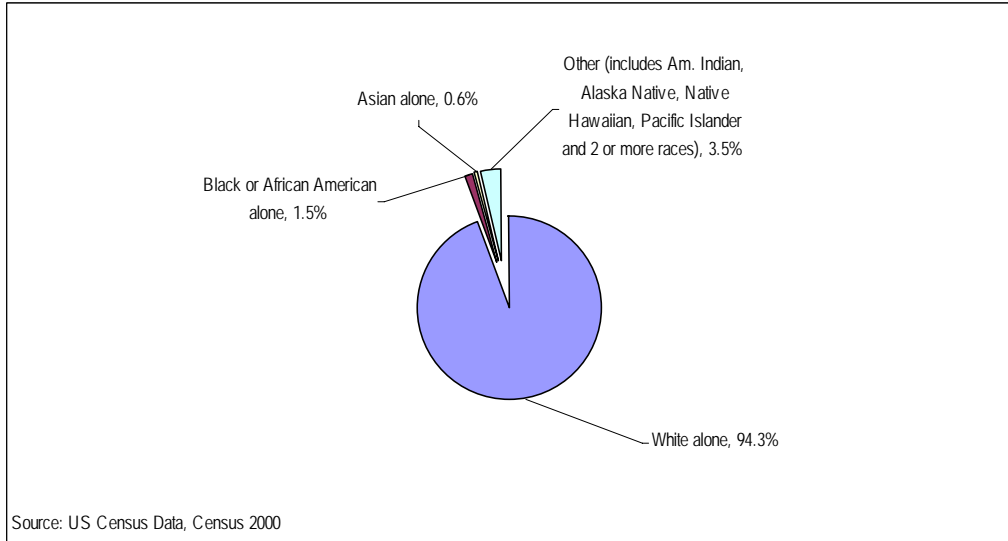
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<sup>1</sup> US Census Data, Census 2000

**Figure 7-2. Cape Cod Bay: Structure of the Population by Age Group, 2000**

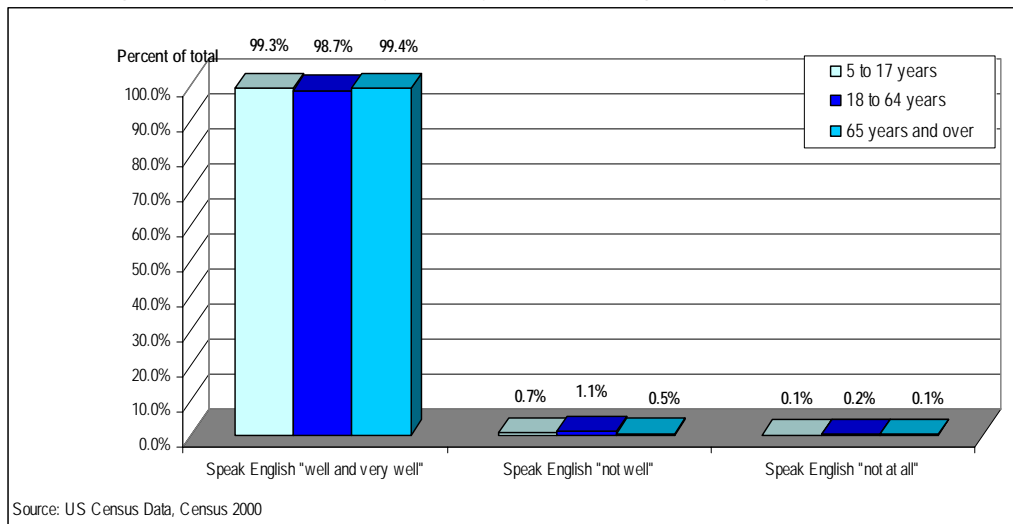


**Figure 7-3. Cape Cod Bay: Population by Race, 2000**



It is evident from the data specified in Figure 7-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

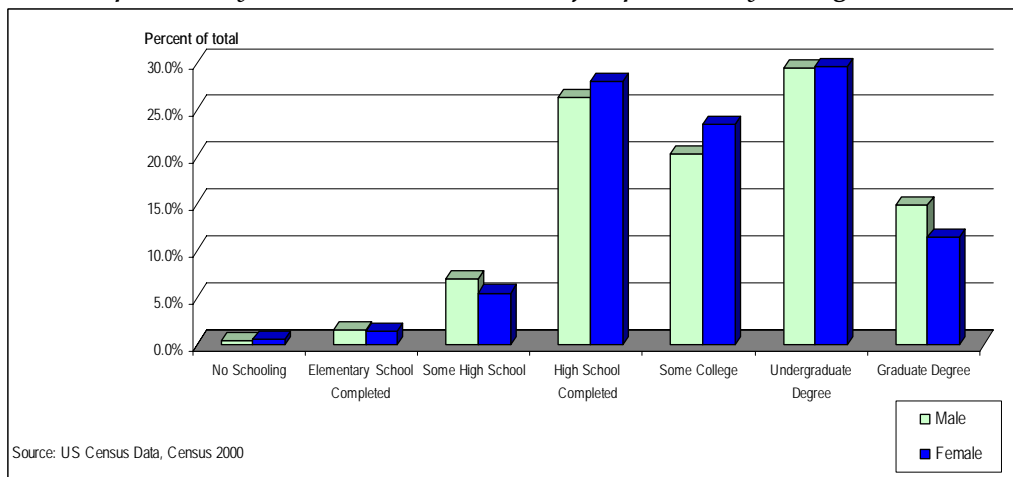
**Figure 7-4. Cape Cod Bay: Ability to Speak English by Age Group, 2000**



## EDUCATION

Most of the population in the region has obtained an undergraduate degree and has completed college. In lesser numbers, some people have finished some college or obtained a graduate degree (Figure 7-5).

**Figure 7-5. Cape Cod Bay: Educational Attainment of Population by Sex Ages 25 and over, 2000**



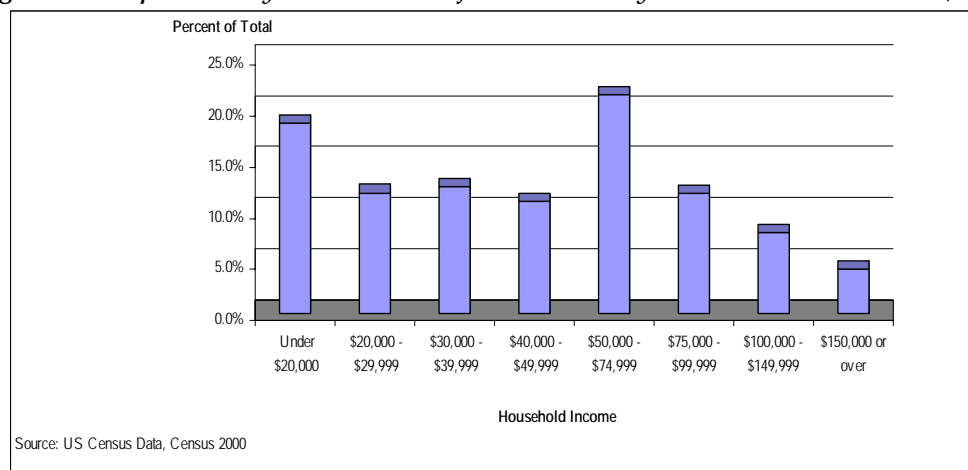
## Socio-Economic Characteristics

### INCOME

About 22 percent of households in the region have incomes that fall within the \$60,000 - \$74,999 income bracket. Twenty percent of households have incomes under \$20,000.

Household median income in the Cape Cod Bay area in 1999, according to the 2000 US Census, was \$45,933.00. The per capita income for 1999, according to the 2000 US Census, was \$25,318. The percentage of people under the poverty line in the region was 6.9 in the year 2000. The average household size is 2.28.

*Figure 7-6. Cape Cod Bay: Distribution of Households by Household Income Level, 1999*



### EMPLOYMENT

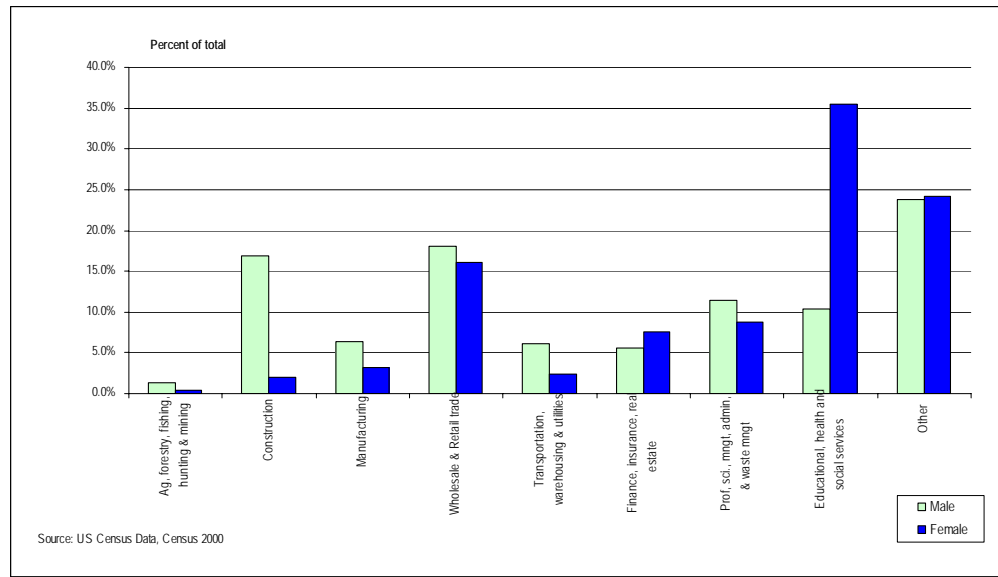
Around 35 percent of working females in this region are employed in educational, health and social services sectors and around 24 percent of them are employed in 'other' industries, including occupations in the arts, entertainment, recreation, food services, public administration and information. Approximately 23 percent of males are employed in 'other' industries and 18 percent of them are employed in the wholesale and retail sector (Figure 6-7).

An estimated 5.6 percent of males and 4.6 percent of females are unemployed.

According to the 2000 US Census, an estimated 1.2 percent of males and 0.1 percent of females are employed in farming, fishing and forestry occupations. About 11.2 percent of males and 3.5 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.9 percent of male's occupations and 0.1 percent of female's occupations.



**Figure 7-7. Cape Cod Bay: Employed Civilian population by Sex and Industry 16 years and over, 2000**



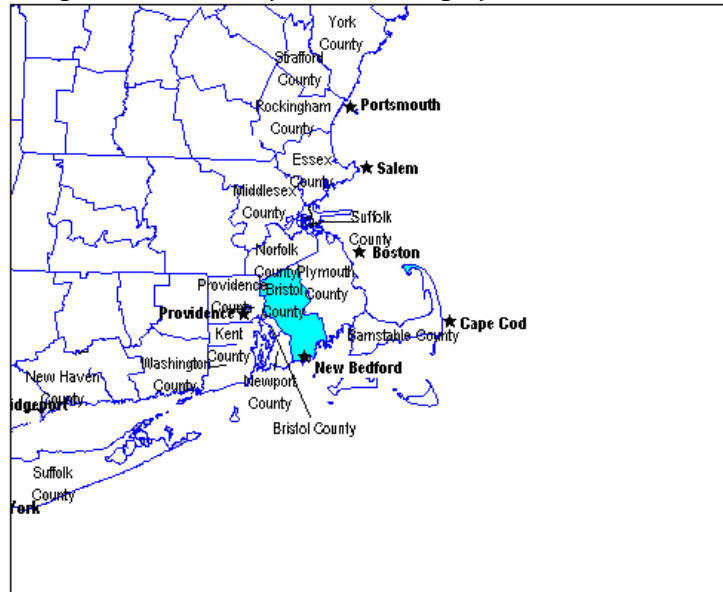
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# 8. New Bedford, MA

## Location and Background Information

The Port of New Bedford is part of the Providence-New Bedford-Fall River, Rhode Island – Massachusetts Metropolitan Statistical Area (MSA). New Bedford is located in Bristol County, MA. New Bedford is centrally located on the southeastern coast of Massachusetts. It provides easy access to New England and Canadian markets and has established itself as one of the busiest ports in Massachusetts. Since the early 1960s, the Port of New Bedford has been one of the area's largest handlers of perishable goods, servicing vessels from around the world. Shipments include fruit, vegetables, and bulk commodities of frozen fish and meat products. Currently, New Bedford has various vessel berths and is able to accommodate the largest refrigerated vessels afloat. <sup>1</sup>

*Figure 8-1. New Bedford, MA: Geographic Location, 2000*



Source: Table 3-1

## Demographics

### POPULATION

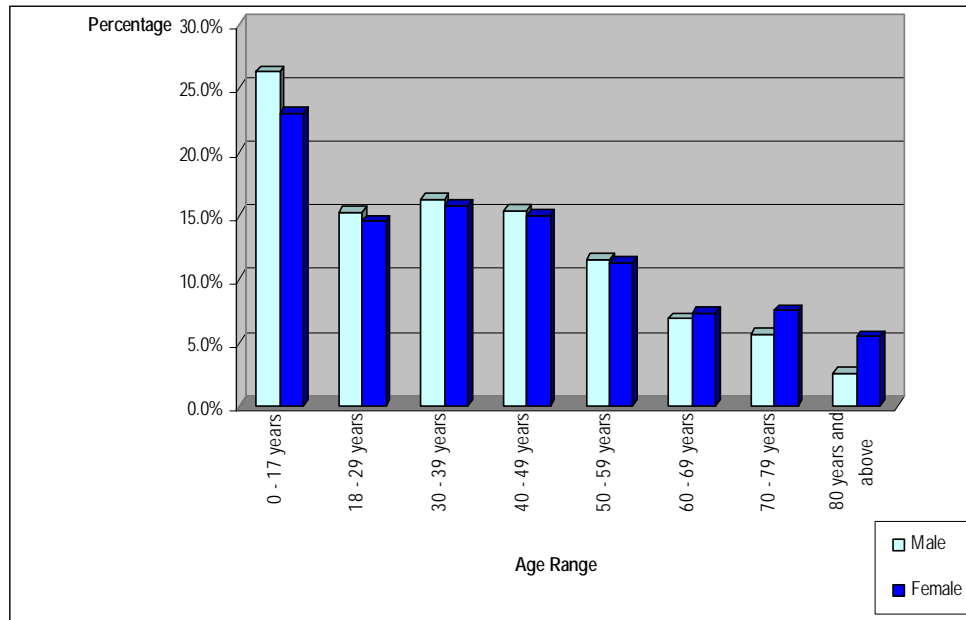
The total population of Bristol County, MA is of 534,678, according to the 2000 US Census. Of this total, 256,747 or 48 percent are males and 277,931 or 52 percent are females. The median age of the population is 36.7 years; 35.4 for males and 38 for females. As evidenced by Figure 8 - 2, about 30 percent of males and females fall within the 30 – 39 and 40 – 49 years age bracket.

The majority of the population in the county is white (91 percent), followed by ‘others’ (which include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone), which represent 5.6 percent of the total population. The African American or Black population

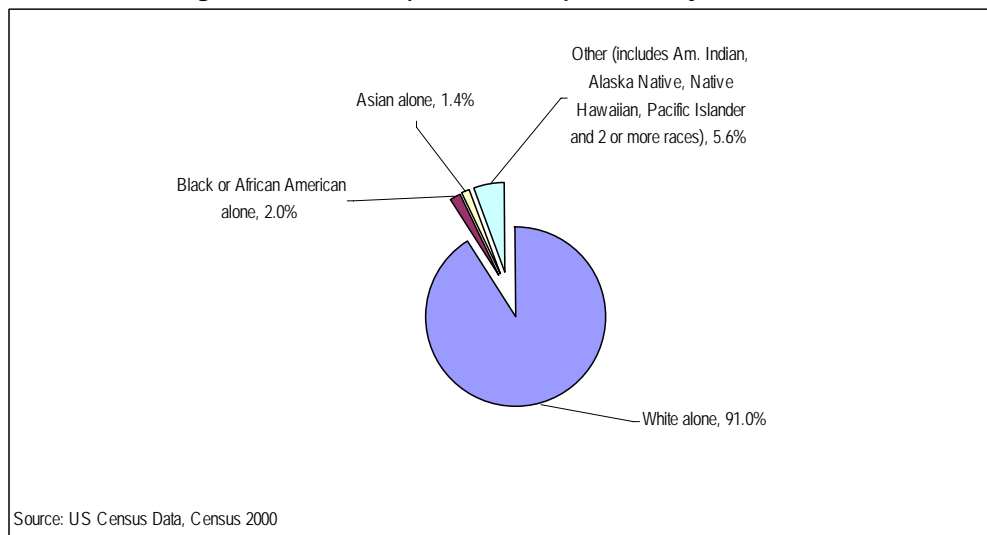
<sup>1</sup> Seaport Advisory Council: <http://www.mass.gov/seaports/newbed.htm>

represents 2 percent of the total population; closely followed by the Asian population, which represents only 1.4 percent (Figure 8-3). Moreover, in terms of ethnic structure, 3.6 percent of the total population is considered to be of Hispanic or Latino origin.<sup>2</sup>

**Figure 8- 2. New Bedford, MA: Structure of the Population by Age Group, 2000**



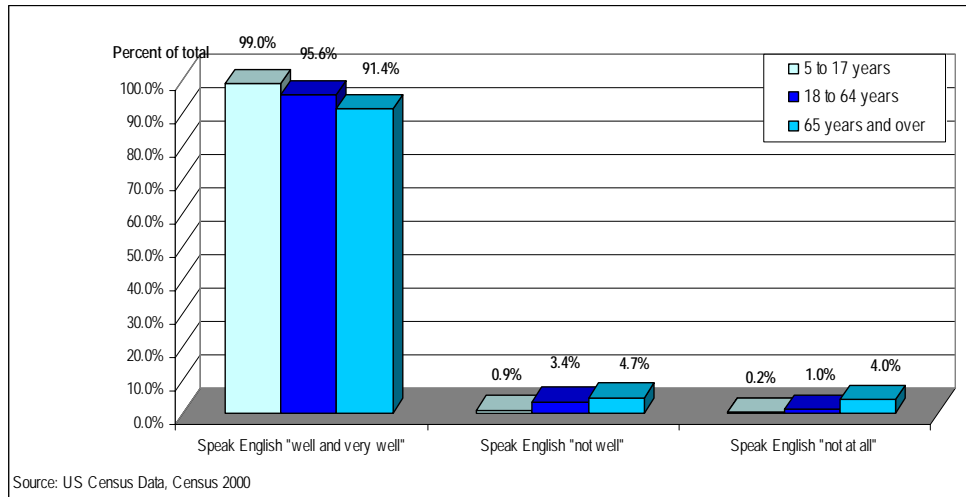
**Figure 8-3. New Bedford, MA: Population by Race, 2000**



<sup>2</sup> US Census Data, Census 2000

It is evident from the data specified in Figure 8-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'. However, an estimated 8.7 percent of the population in the age range of 65 years and over, do not dominate the English language completely.

**Figure 8-4. New Bedford, MA: Ability to Speak English by Age Group, 2000**

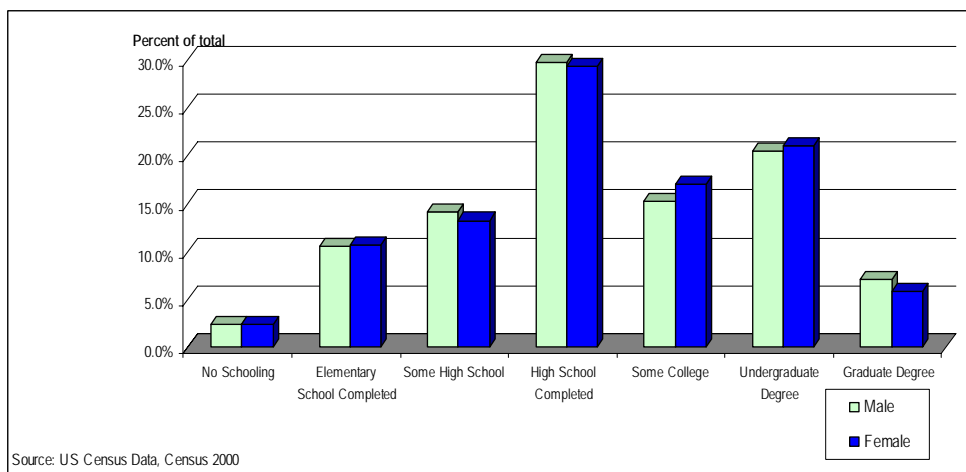


## EDUCATION

As is evident from Figure 8-5, almost 30 percent of females and males, ages 25 or over, have completed high school. About 20 percent of both sexes have an undergraduate degree and around 15 percent of both sexes have completed some college.

There are several colleges and universities in Bristol County, MA, among them: Southern New England School of Law, Stonehill College, University of Massachusetts - Dartmouth, Wheaton College and Bristol Community College.

**Figure 8-5. New Bedford, MA: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



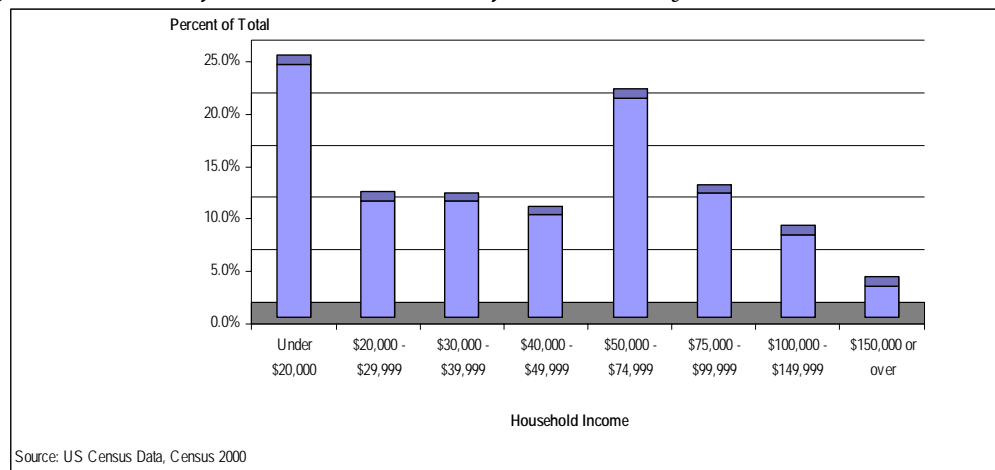
## Socio-Economic Characteristics

### INCOME

Figure 8-6 clearly portrays that about 25 percent of households in Bristol County, MA have an income of under \$20,000. This percentage is closely followed by households in the \$50,000 - \$74,999 income bracket, which represent about 20 percent of all households. Less than 5 percent of households in the region have incomes of \$150,000 or over.

Household median income in 1999 in the area, according to the 2000 US Census, was \$43,496 and per capita income was \$20,978. The percentage of people under the poverty line in the region was 10 in the year 2000. The average household size in 2000 was 2.54.<sup>3</sup>

*Figure 8-6. New Bedford, MA: Distribution of Households by Household Income Level, 1999*



### EMPLOYMENT

Around 35 percent of females of the employed civilian population in the region ages 16 or over are employed within the educational, health and social services industry; about 17 percent are employed in 'other' industries, such as the arts, entertainment, recreation, food services, public administration and information. About 22 percent of working males are employed in the manufacturing industry, approximately 18 percent are employed in the wholesale and retail trade industry and nearly 17 percent are employed in 'other' industries.

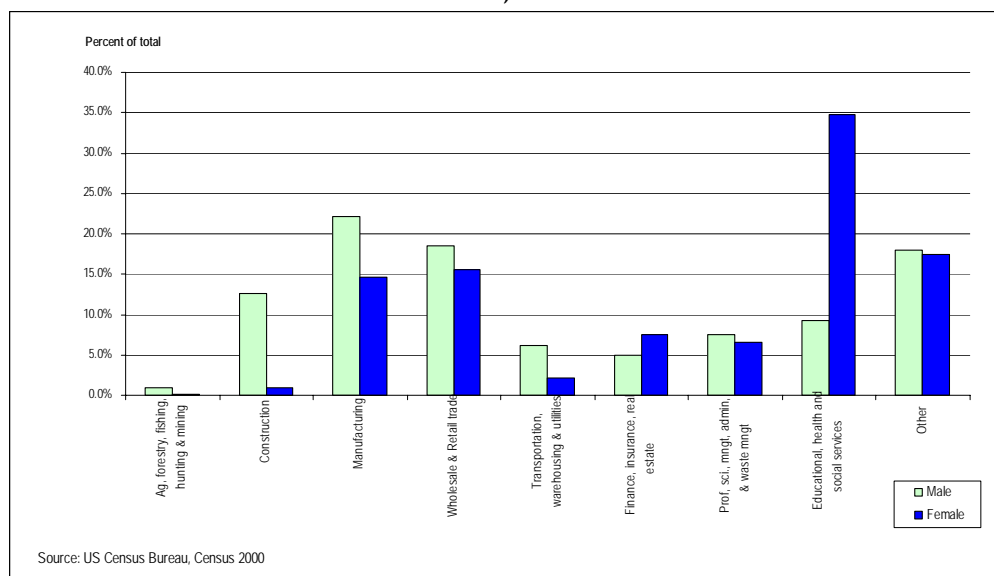
An estimated 6.3 percent of males and 5.2 percent of females were unemployed in Bristol County, MA in the year 2000.<sup>4</sup>

According to the 2000 US Census, an estimated 0.6 percent of males and 0.1 percent of females are employed in farming, fishing and forestry occupations. About 23.3 percent of males and 11.9 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.6 percent of male's occupations and 0.05 percent of female's occupations.

<sup>3</sup> US Census Data, Census 2000.

<sup>4</sup> US Census Data, Census 2000.

**Figure 8-7. New Bedford, MA: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION



is one of the safest havens on the eastern seaboard.

New Bedford Harbor is at the mouth of the Acushnet River, which flows south into Buzzards Bay and the Atlantic Ocean. The entrance to the harbor is only nine nautical miles from the beginning of the Cape Cod Canal shipping channel. The Port of New Bedford is a deep-water port with depths of 30 feet. The harbor features a hurricane barrier that stretches across the water from the south end of New Bedford to the Town of Fairhaven. The barrier's 150-foot opening is closed during hurricane conditions and coastal storms. As a result, the harbor

The port has a history of seafaring traditions that continue today with an active fishing fleet, ferry services, and cruise ship docking. The port is supported by the city's outstanding, multi-ethnic work force and international distribution services, which include an adjacent airport as well as rail and interstate highway connections. With over 950 recreational boat slips, New Bedford Harbor also is an important center for recreational boating.

New Bedford Harbor is one of the nation's major fishing ports. The port has ranked first in the U.S. for the last three years, based on value of product landed (source: National Marine Fisheries Service). The fishing fleet includes more than 250 vessels operating out of the port. These vessels consist mainly of steel hull construction and are rigged for ground fish and scallops, providing the highest quality seafood products worldwide. The harbor's seafood processing industry has grown in recent years to become a nationally and internationally recognized industry center.

Across the harbor, shipyards line the Fairhaven waterfront. Marine service and vessel repair industries in Fairhaven have established reputations along the East Coast. Two major shipyards, D.N. Kelley & Son and Fairhaven Shipyard, are known internationally for quality repair on all types of boats.

Support industries include vessel maintenance and repair conducted at dockside or at repair facilities along the New Bedford Waterfront. Equipment and provisions to support the fishing fleet and other commercial and recreational vessels, such as food, ice, fuel, oils, electronics, and other products, also are available at the port.

The Port of New Bedford is the largest breakbulk handler of perishable items in Massachusetts and adjacent states. Commodities brought by refrigerated vessels from around the world primarily include fresh fruit and fish, as well as substantial volumes of frozen fish. The Port has direct Atlantic service from Norway calling at Maritime International Terminal every two weeks to satisfy the needs of Massachusetts fish processors and distributors. With its waterfront warehouse capacity, Maritime International has one of the largest U.S. Department of Agriculture-approved cold treatment centers on the East Coast for the use of restricted imported fruit. The terminal receives approximately 25 vessels a year. Each vessel carries about 1,000 tons of fish or, if carrying fruit, about 2,000 to 3,000 tons of fruit. Port calls vary between one and two days per discharge.

Ferry services are available in the port, including passenger and cargo service to Cuttyhunk Island and passenger service to Martha's Vineyard. Launch, water taxi, and charter boat services also operate in the port.

Like many modern working ports, New Bedford/Fairhaven Harbor balances maritime interests and local economic needs with environmental concerns. Several economic and environmental designations, such as the Foreign Trade Zone and No Discharge Area, currently apply to the port. Long-term projects, such as the Superfund cleanup and restoration of federal navigation channels, are taking place in the port. These projects and designations will improve the harbor's environmental health and enhance its economic growth.

#### **Designated Port Area (DPA)**

The Massachusetts Office of Coastal Zone Management has classified portions of the waterfront in New Bedford and Fairhaven as a Designated Port Area (DPA) under a program to preserve and promote maritime industry. The DPA classification encourages the creation or expansion of water-dependent industrial facilities, such as fish processing plants, in developed harbor areas. DPAs are subject to specific provisions, including land use restrictions, under Massachusetts General Law Chapter 91, which is administered by the state's Department of Environmental Protection. DPAs also are officially identified as priority areas for federal and state funding, including funds available under the Seaport Bond. (Original source: MA Coastal Zone Management Web site: [www.mass.gov/czm](http://www.mass.gov/czm))

#### **New Bedford Foreign Trade Zone**

The Port of New Bedford, New Bedford Regional Airport, and adjacent areas form the New Bedford Foreign Trade Zone (FTZ), which provides duty-free manufacturing opportunities for importers and exporters. The City of New Bedford is grantee or holder of Foreign Trade Zone (FTZ) number 28. An FTZ is a designated area that, for Customs purposes, is considered outside the U.S. Nearly any imported merchandise can be brought into the FTZ for almost any kind of manipulation duty-free, unless it enters the U.S. market. Goods in the FTZ can be assembled, manufactured or processed and final products re-exported without paying Customs duties. If the final products enter the U.S., the duty rate may be lower than the duty applicable to the product itself or its parts.

New Bedford offers international distribution services that support the FTZ. The city is accessible by sea, air, and rail services, as well as interstate highway systems. The port has shipping agencies, freight forwarding and stevedore services, and warehouse and truck-brokering facilities. The New Bedford Regional Airport is located within the FTZ. New Bedford is serviced by the CSX interstate railway. The city is adjacent to the interstate highway system and is within overnight truck delivery distance of most major cities in the Northeast industrial corridor. Long-haul trucking service to Canada and U.S. inland states also is available.



New Bedford Foreign Trade Zone number 28 is a direct port of entry to European and Latin American markets. FTZ number 28 is able to sponsor expanded general purpose sites within a 60-mile radius of the city. In addition, the FTZ has the potential to sponsor qualified subzones anywhere in Massachusetts. The FTZ Corporation recently created a subzone near the port's South Terminal area outside the Hurricane Barrier.

#### **No Discharge Area**

The U.S. Environmental Protection Agency (EPA) has designated Buzzards Bay, including New Bedford Harbor, as a No Discharge Area (NDA). In NDAs, the discharge of all boat sewage, even if it is treated, is prohibited. The Coast Guard enforces restrictions in NDAs. To help boaters comply with federal law, pumpout facilities have been established throughout the area. Pumpouts are wet vacuums that draw sewage out of boat holding tanks for proper disposal. Many of these facilities have been funded by federal grants and are available at little or no cost to boaters. (Original source: MA Coastal Zone Management Web site: [www.mass.gov/czm](http://www.mass.gov/czm))

#### **New Bedford Federal Navigation Project**

The restoration of federally authorized channel depths in New Bedford/Fairhaven Harbor is one of the federal navigation - or dredging - projects maintained by the U.S. Army Corps of Engineers/New England District. The main deep-draft channel to New Bedford has an authorized depth of 30 feet, while shallow draft channels for the fishing fleet at Fairhaven have depths of 15 and 10 feet. The shallower channels on the Fairhaven side of the harbor require maintenance dredging of about 70,000 cubic yards of shoal material. The deeper channels serving the New Bedford waterfront would require dredging of about 1.3 million cubic yards to restore the authorized project dimensions.

The Army Corps assisted the Massachusetts Office of Coastal Zone Management (CZM) in preparation of a Dredged Material Management Plan to identify a disposal site for maintenance dredging of navigation channels in New Bedford and Fairhaven. The state study examined the dredging needs of the federal navigation project for New Bedford and numerous state, municipal, and private facility dredging needs for a 20-year period. Environmental permitting on the project has been completed. The New Bedford Harbor Development Commission is working with the Army Corps and Environmental Protection Agency to coordinate implementation of the 20-year maintenance dredging and the Superfund cleanup. (Original source: Army Corps Web site: [www.nae.usace.army.mil](http://www.nae.usace.army.mil))

#### **New Bedford Superfund Site Cleanup**

The 18,000-acre New Bedford Harbor Superfund site extends from the northern reaches of the Acushnet River estuary south through the commercial harbor of New Bedford and into Buzzards Bay. The site contains sediments that are contaminated with polychlorinated biphenyls (PCBs) and heavy metals. The city's main working port, which houses the fishing fleet and cruise ship terminal, is not affected by the cleanup that is taking place primarily in the far north region of the harbor.

EPA issued a Record of Decision for the upper and lower harbor in 1998. The cleanup includes dredging approximately 450,000 cubic yards of PCB-contaminated sediment from the harbor. The dredged sediment will be contained in shoreline confined disposal facilities (CDFs) or transported offsite to a licensed landfill. Seawater will be removed from the sediments, treated, and discharged back into the harbor. Once completed, the CDFs will be available for reuse as shoreline open space and parks.

Steps taken to date, including posting warning signs, fencing contaminated shoreline areas and dredging the most highly contaminated hot spot sediments, have reduced threats posed by the site. Progress towards the remaining cleanup continues. EPA and the City of New Bedford have agreed on an innovative approach to increase the environmental benefit of the remedy in the north terminal section of the harbor. Once the cleanup is complete, the City will be able to reuse EPA's six-acre shoreline sediment processing facility as part of its working waterfront and intermodal, multi-user

transportation facility. Construction and minor dredging to support the main cleanup began in 2002. (Original source: EPA Web site: [www.epa.gov](http://www.epa.gov)).<sup>5</sup>

New Bedford offers international distribution services, including an adjacent airport. The port has its own ship agency, freight forwarding, stevedoring services, blast freezing, warehouse and truck brokering facilities all in one location, providing customers with "one-stop shopping." Deepwater berths and U.S. Customs-bonded refrigerated warehouses enable the port to maintain a "cold chain" for perishable products from ship to refrigerated storage. New Bedford's cold treatment facility is, in fact, the largest of its kind in North America.

The port and adjacent areas form the New Bedford Free Trade Port, which provides manufacturing opportunities for various importers and exporters. Future plans include expansion of the seaport through harbor dredging and construction of additional cold storage facilities. Marketed as a "Real Port" offering full turnkey services, New Bedford will take advantage of these improvements to promote further its capabilities for handling perishable goods.<sup>6</sup>

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<sup>5</sup> Port of New Bedford website: <http://www.ci.new-bedford.ma.us/ECONOMIC/HDC/wtrgeneral.htm>

<sup>6</sup> Seaport Advisory Council website: <http://www.mass.gov/seaports/newbed.htm>

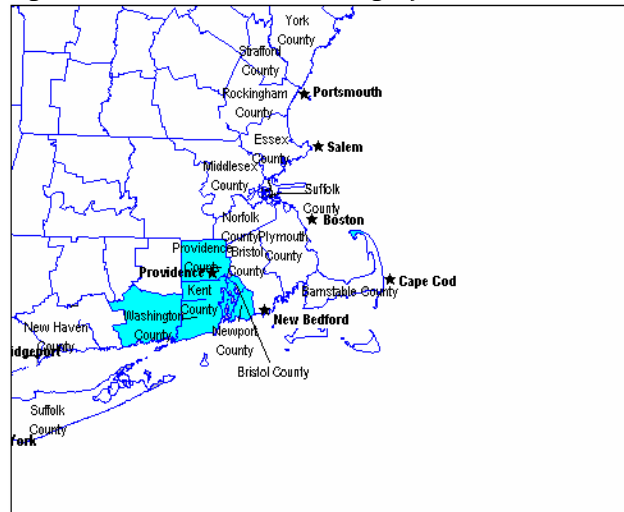
# 9. Providence, RI

## Location and Background Information

The Port of Providence is located in the Providence – New Bedford – Fall River, Rhode Island – Massachusetts Metropolitan Statistical Area (MSA). International commerce started in this port in the 1700's when the Port of Providence first established trade with China. Less than a century later, Providence is New England's third largest city and the Northeast's premiere deep water multimodal facility for international and domestic trade.

The Port of Portland, or ProvPort, was officially founded in 1994 as a fully licensed, bonded Deep Water Port specializing in Bulk and Break Bulk commodities. While China continues to be one of its main trading partners, the port has expanded its partnerships and trading status with Central and South America, Europe, the Far East, Russia, Africa, Australia and New Zealand.<sup>1</sup>

*Figure 9-1. Providence, RI: Geographic Location, 2000*



Source: Table 3-1

## Demographics

### POPULATION

The total population of this region is 1,048,319 according to the 2000 US Census. Of this total, 503,635 or 48 percent are males and 544,684 or 52 percent are females. The median age in the region is 36.7 years; 35.3 for males and 37.9 for females.<sup>2</sup> As is shown in Figure 9-2, about 25 percent of males and 22 percent of females are between the ages of 0 and 17 years. Nearly 45 percent of the population (15 percent approximately per age group) is between 18 and 49 years old.

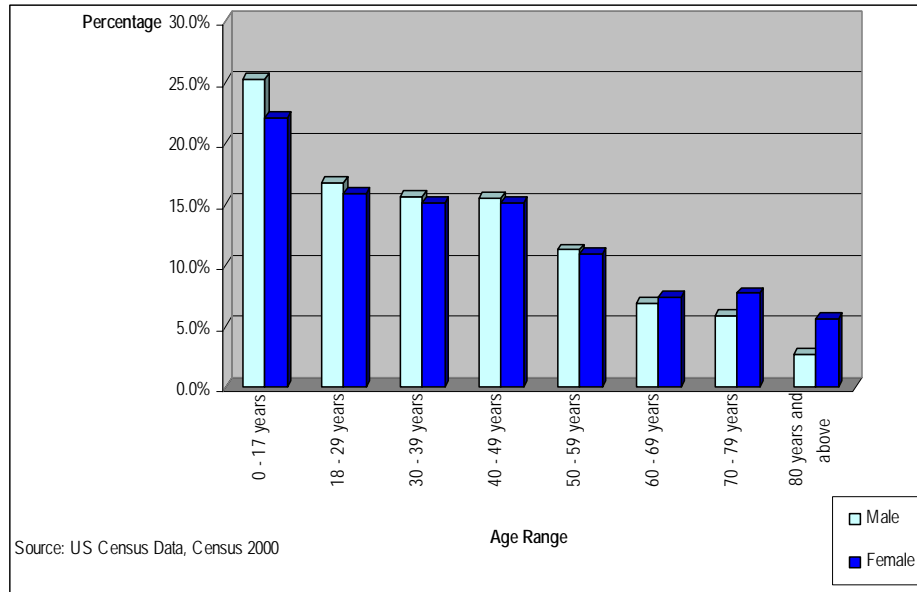
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<sup>1</sup> Providence Port Authority website: <http://www.provport.com>

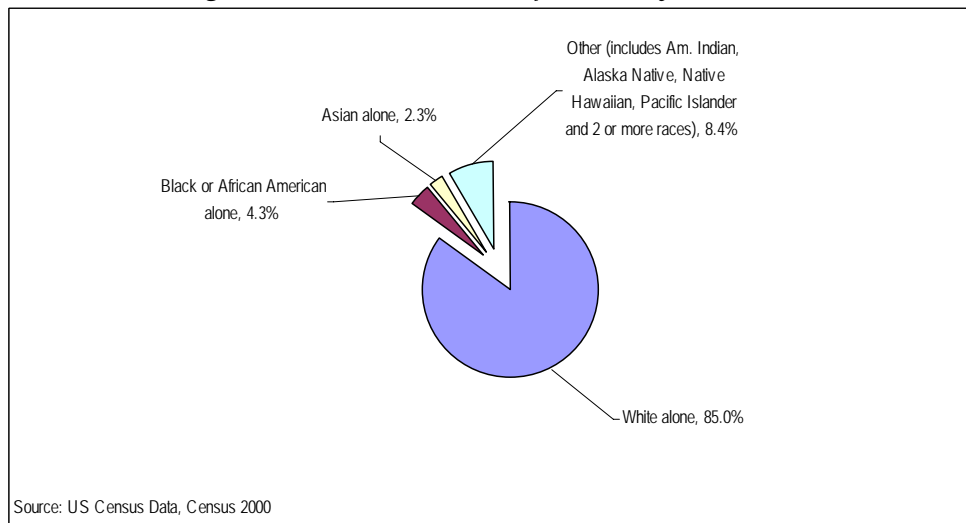
<sup>2</sup> US Census Data, Census 2000.

The majority of the population in this MSA is white (85 percent), followed by ‘others’ (which include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone), which represent 8.4 percent of the total population. The Black or African American population represents 4.3 percent, followed by the Asian population, which represents only 2.3 percent of the total population (Figure 9-3). Moreover, in terms of ethnic makeup, 8.6 percent of the total population is considered to be of Hispanic or Latino origin.<sup>3</sup>

**Figure 9-2. Providence, RI: Structure of the Population by Age Group, 2000**



**Figure 9-3. Providence, RI: Population by Race, 2000**

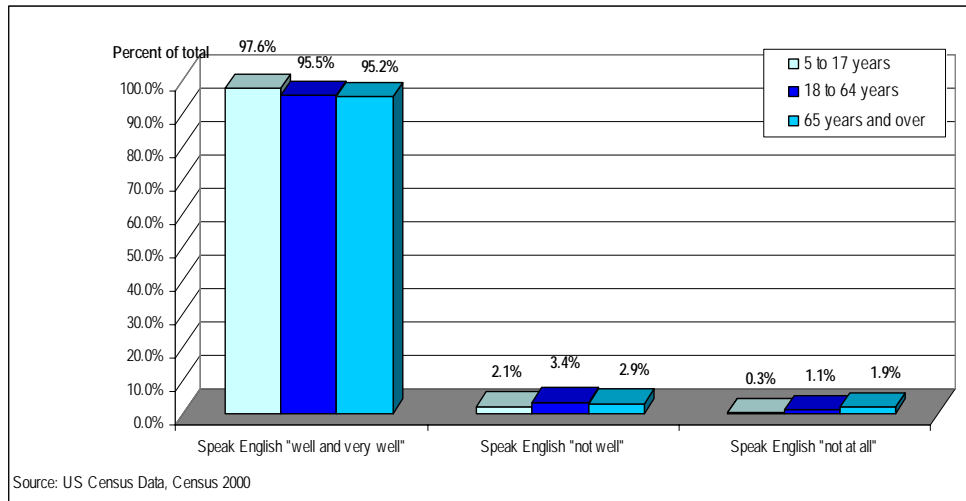


It is evident from the data specified in Figure 9-4 that most of the population in all age ranges in the area dominates the English language ‘well’ and ‘very well’. Approximately 2.3 percent of the

<sup>3</sup> US Census Data, Census 2000

population ages 5 – 17, 4.5 percent of the population ages 18 – 64 years and 4.8 percent of the population ages 65 years or older do not speak English well or do not speak English at all.

**Figure 9-4. Providence, RI: Ability to Speak English by Age Group, 2000**

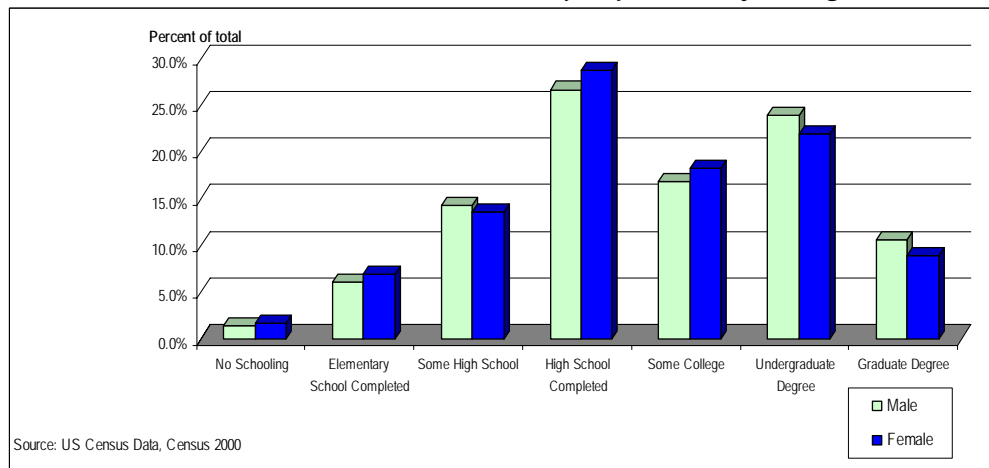


## EDUCATION

Around 25 percent of males and 27 percent of females in the region, ages 25 and over, have completed high school. Approximately 23 percent of males and 21 percent of females have obtained an undergraduate degree in this region and less than 10 percent of the population has obtained a graduate degree (Figure 9-5).

There are a number of four year colleges and universities in the region. Some of these institutions include: Brown University, Rhode Island School of Design, Johnson & Wales University, Bryant College, Providence College, New England Institute of Technology and the Rhode Island Hospital Schools of Medical Technology, Nuclear Medicine, Radiologic Technology and Ultra Sonography. <sup>4</sup>

**Figure 9-5. Providence, RI: Educational Attainment of Population by Sex Ages 25 and over, 2000**



<sup>4</sup> Providence Community Profile: <http://www.epodunk.com>

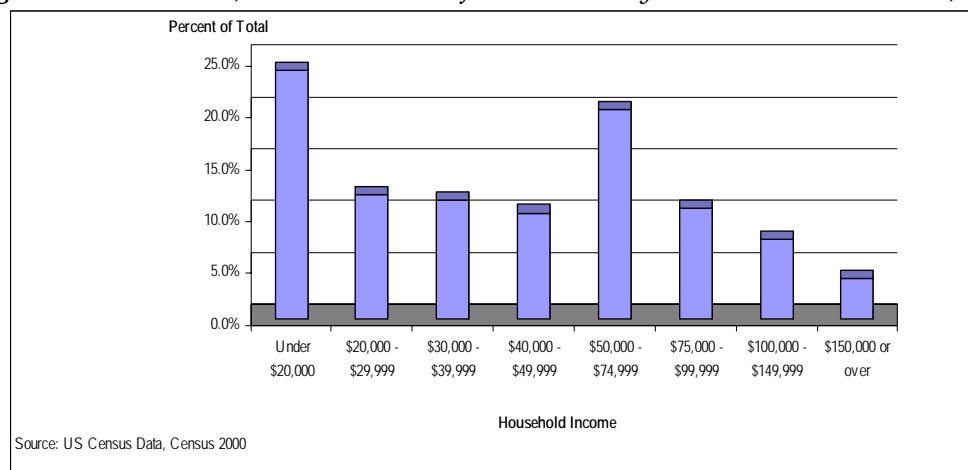
## Socio-Economic Characteristics

### INCOME

Nearly 25 percent of households in the region had incomes of under \$20,000 in 1999; and around 21 percent of households fell within the \$50,000 - \$74,999 income bracket. About 5 percent of households in the region had incomes of \$150,000 or over (Figure 9-6).

Household median income in this MSA in 1999, according to the 2000 US Census, was \$42,369.92 and per capita income was \$21,687.55. The percentage of people under the poverty line in the region was 11.9 in the year 2000. The average household size in 2000 was 2.47.<sup>5</sup>

**Figure 9-6. Providence, RI: Distribution of Households by Household Income Level, 1999**



### EMPLOYMENT

About 35 percent of females in this region (of the employed civilian population 16 years and over) are employed in educational, health and social services industries and around 20 percent are employed in 'other' industries. These industries include the arts, entertainment, recreation, food services, public administration and information. Males' employment is more evenly distributed among industries, with manufacturing, and 'other' industries as the most dominant ones, representing 20 percent of male's participation; followed by 16 percent participation in wholesale and retail trade (Figure 9-7).

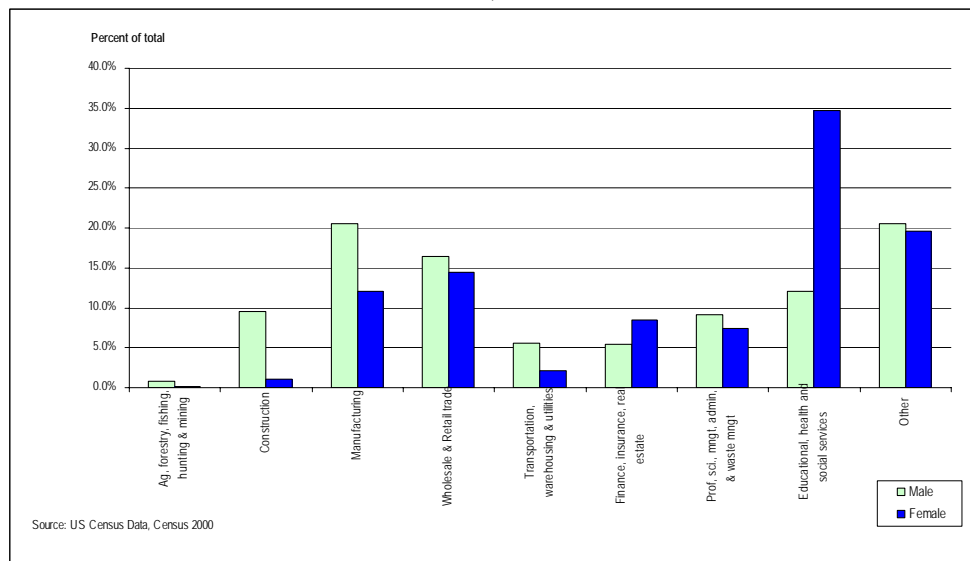
An estimated 5.6 percent of males and females were unemployed in the region in the year 2000.<sup>6</sup>

According to the 2000 US Census, an estimated 0.6 percent of males and 0.1 percent of females are employed in farming, fishing and forestry occupations. About 20.7 percent of males and 9.4 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.5 percent of male's occupations and 0.05 percent of female's occupations.

<sup>5</sup> US Census Data, Census 2000.

<sup>6</sup> US Census Data, Census 2000.

**Figure 9-7. Providence, RI: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION



ProvPort (the Port of Portland) is centrally located on the Atlantic East Coast shoreline just 150 miles from New York, 50 miles from Boston and 200 miles within major city and ports of Eastern Canada. Located just 1 mile from New England's primary Interstate I-95, ProvPort offers overnight access to all of the Northeast states and Eastern Canada.

ProvPort specializes in the handling of both Dry and Liquid Bulk and Break Bulk commodities for both imports and exports. Over 15 tons of cargo has moved across the facility since its establishment in 1994. ProvPort handles commodities such as cement, chemicals, coal, cobblestone, heavy machinery, liquid petroleum products, lumber, perlite, salt, scrap, metal and steel products.

ProvPort's premises are 105 acres and include 6 deep water berths totaling 3500 linear feet combined, 3 warehouses totaling 300,000 square feet with 10 loading bay doors, over 20 acres of paved open storage area and on-dock rail access with 3 rail spurs.

### Berths

ProvPort completed in January of 2004 its dredging project to deepen its 6 berths to a maximum depth of 40' @ MLW. The project, in conjunction with the U.S. Army Corps of Engineers New England district also involved dredging more than 6 million CY of material in Providence River to return a 7 mile stretch of the authorized Federal navigation project to full authorized dimensions of 40' deep and 600 feet wide. ProvPort offers a total of 3500 L.F. usable dockage space spread over 6 deep water berths as follows:

### Petroleum Tank Farm

ProvPort is the owner of its own Petroleum Tank Farm totaling 335,000 barrels / 12 million gallons with storage capacity in 13 above ground storage tanks. In addition, a fuel depot station consisting of

an eight bay loading rack system is available along with a 40 meter operating scale and a secured scale house and operation center.

**Cement Storage**

With two separate on-dock cement storage facilities, Glens Falls Lehigh Cement has storage capacity of over 55,000 tons of cement. Its most recent investment of \$15 million dollars enabled GFLC to create and establish the New England Distribution Center at ProvPort capable of loading and transporting it product by truck or rail to their customer base around the clock.

**Warehousing**

ProvPort offers 3 separate on dock covered warehouses totaling over 300,000 square feet used for both short and long term storage as well as viable distribution centers for the Northeast corridor. Ranging from 64,000 square feet to 130,000 square feet, ProvPort also has available 10,000 square feet of office space if required, truck bays and rail access for dock side loading/unloading.

The Marine Terminal Building is 116,000 square feet, has 10,000 square feet of office space and 10 truck bays; it is adjacent to berths 1, 2 & 3. The Ace Warehouse is 131,000 square feet, it has dock side loading, and is adjacent to berths 4 & 5. The Terminal Building is 64,000 square feet, it has dock side loading and is adjacent to berths C & 1.<sup>7</sup>

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<sup>7</sup> Providence Port Authority website: <http://www.provport.com/index.html>

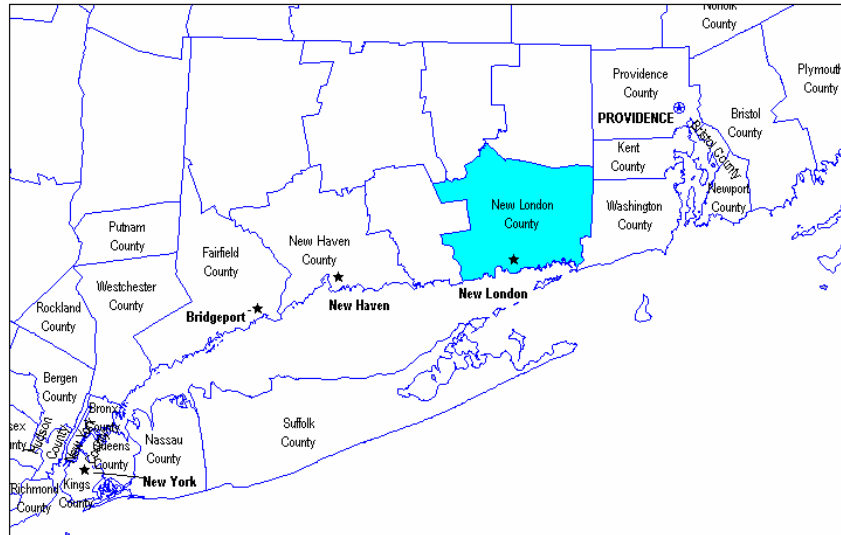


# 10. New London, CT

## Location and Background Information

The Port of New London is located in the Norwich – New London, Connecticut Metropolitan Statistical Area (MSA). This MSA is comprised of New London County, CT.

*Figure 10-1. New London, CT: Geographic Location, 2000*



Source: Table 3-1

## Demographics

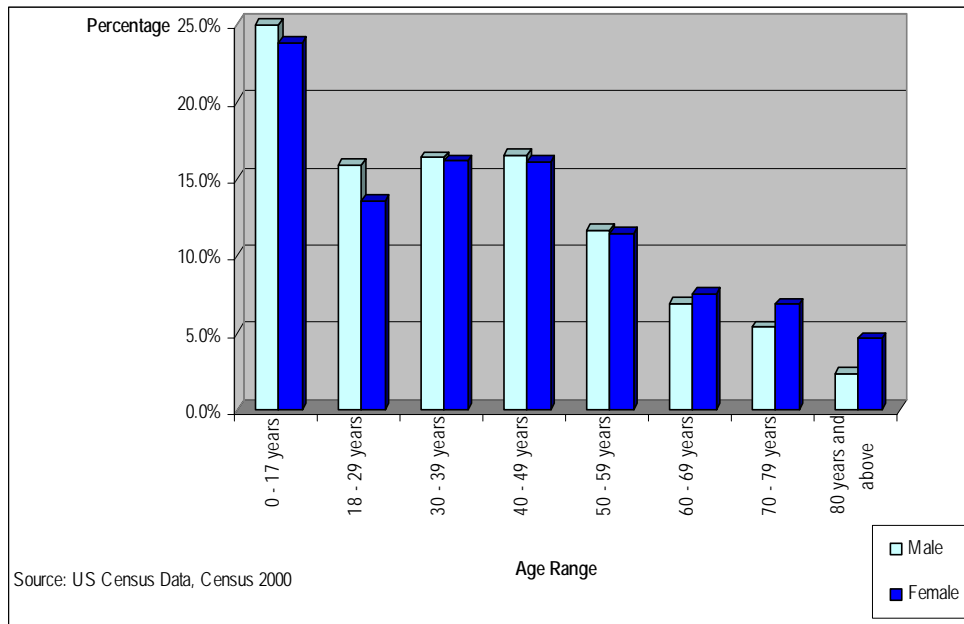
### POPULATION

New London County has a total population of 259,088, according to the 2000 US Census. Of this total, 128,172 or 49.5 percent are males and 130,916 or 50.5 percent are females. The median age in the region is 37 years; 35.9 for males and 38 for females. About 45 percent of males fall within the age brackets of 18 – 29, 30 – 39 and in the 40 – 49 years age range (15 percent approximately in each age group). About 15 percent of females fall within the 30 – 39 and the same percentage in the 40 – 49 years age bracket (Figure 10-2).

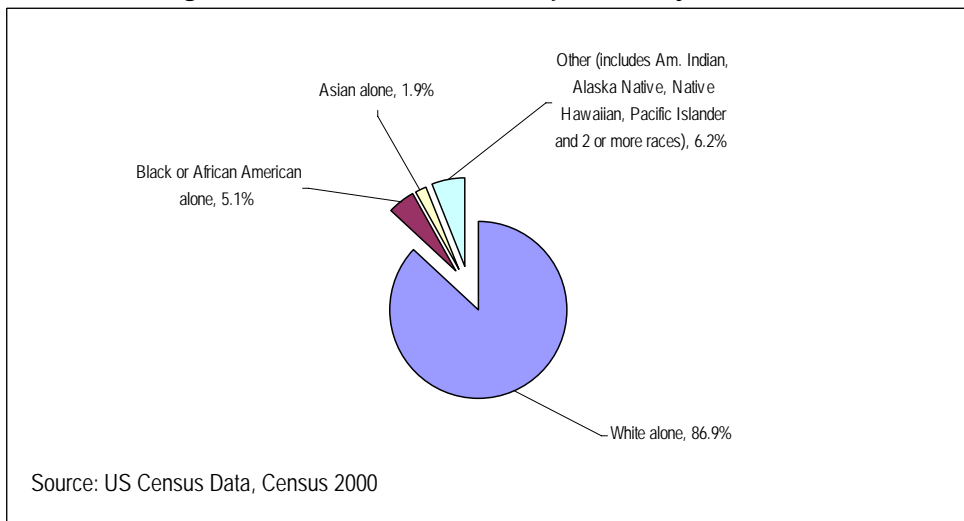
The majority of the population in New London county is white (86.9 percent); followed by ‘others’ (which include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone), representing 6.2 percent of the total population. The Black or African American population represents 5.1 percent of the total population, whereas the Asian population represents roughly 1.9 percent of the total population (Figure 10-3). Moreover, in terms of ethnic makeup, 5.2 percent of the total population is considered to be of Hispanic or Latino origin.<sup>1</sup>

<sup>1</sup> US Census Data, Census 2000.

**Figure 10-2. New London, CT: Structure of the Population by Age Group, 2000**

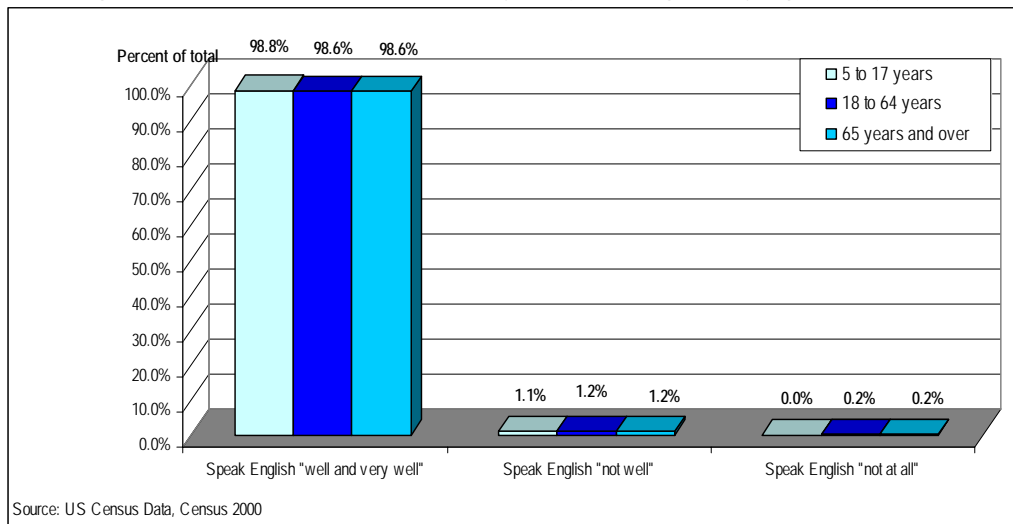


**Figure 10-3. New London, CT: Population by Race, 2000**



It is evident from the data specified in Figure 10-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

**Figure 10-4. New London, CT: Ability to Speak English by Age Group, 2000**

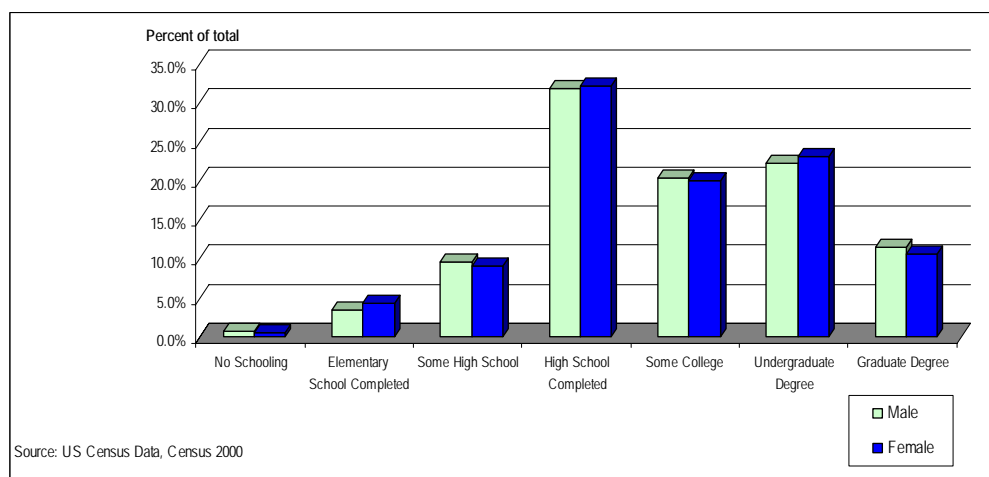


## EDUCATION

Of the population in New London County, ages 25 and over, about 30 percent of males and females have completed high school. Nearly 26 percent of males and females have obtained undergraduate degrees. This percentage is very closely followed by the rate of males and females that have finished only some college. About 10 percent of males and females have obtained graduate degrees in the region (Figure 10-5).

There are only three colleges in New London County: Connecticut College, Mitchell College and the U.S. Coast Guard Academy.

**Figure 10-5. New London, CT: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



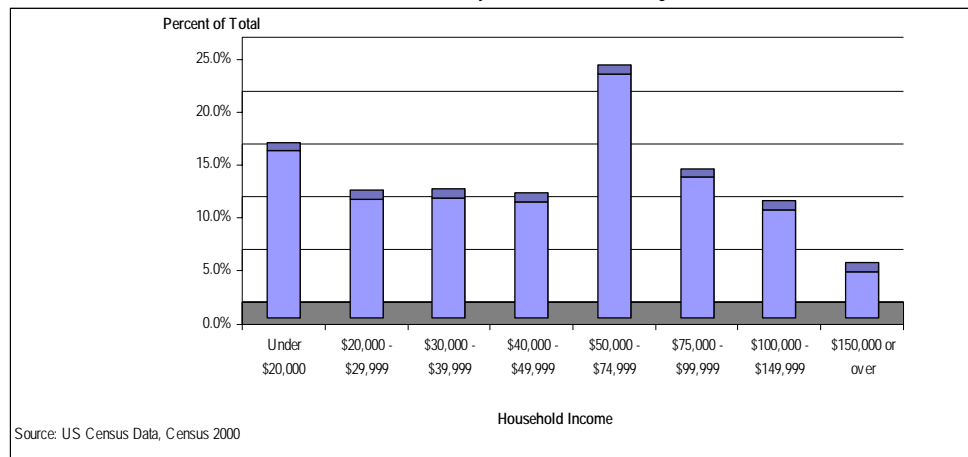
## Socio-Economic Characteristics

### INCOME

As portrayed in Figure 10-6, nearly 25 percent of households in New London County in 1999 had incomes between \$50,000 and \$74,999. About 15.8 percent of households had incomes under \$20,000 and 13 percent fell within the \$75,000 - \$99,999 income bracket. About 5 percent of households in the region had incomes of \$150,000 or over (Figure10-6).

Household median income in this county in 1999 was \$50,646 and per capita income was \$24,678. The percentage of people under the poverty line in the region was 6.4 in the year 2000. Average household size in 2000 was 2.4.<sup>2</sup>

*Figure 10-6. New London, CT: Distribution of Households by Household Income Level, 1999*



### EMPLOYMENT

As the data in Figure 10-7 shows, of the employed civilian population in the region, ages 16 or over, nearly 35 percent of working females are employed in the educational, health and social services industries and about 29 percent of them are employed in 'other' industries which include the arts, entertainment, recreation, food services, public administration and information. Males are employed in 'other' industries (25 percent); followed in a smaller proportion by occupations in the manufacturing industry (20 percent) and the wholesale and retail trade industry (15 percent).

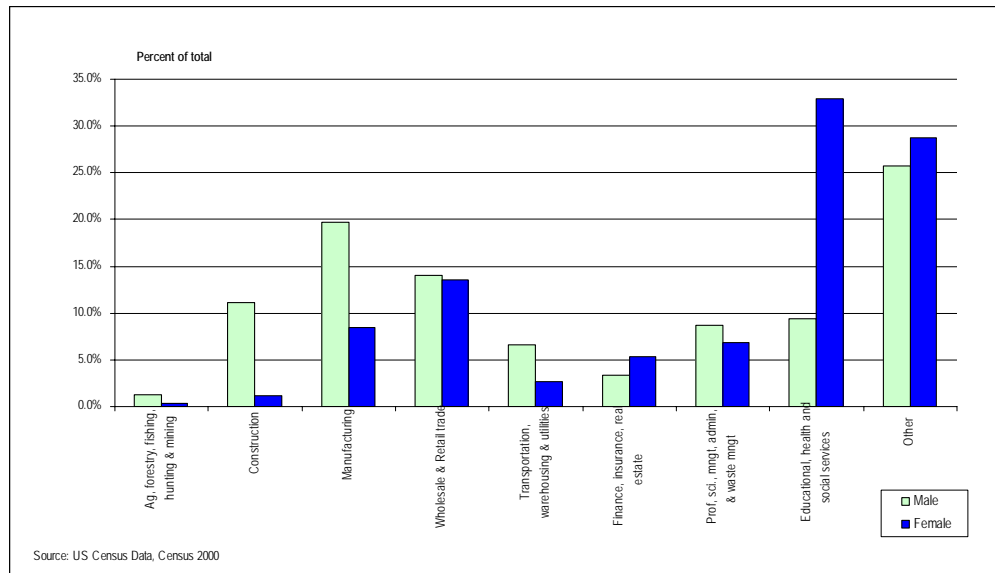
An estimated 4.0 percent of males and 3.8 percent of females were unemployed in the area in 2000.<sup>3</sup>

According to the 2000 US Census, an estimated 0.6 percent of males and 0.3 percent of females are employed in farming, fishing and forestry occupations. About 16.1 percent of males and 5.1 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.7 percent of male's occupations and 0.1 percent of female's occupations.

<sup>2</sup> US Census Data, Census 2000.

<sup>3</sup> US Census Data, Census 2000.

**Figure10-7. New London, CT: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION



Picture Source: Connecticut Department of Transportation.<sup>4</sup>

The Port of New London is serviced by the Port of Hartford.<sup>5</sup>

There is a Naval Submarine Base in New London, CT.

<sup>4</sup> Connecticut Department of Transportation website: <http://www.ct.gov/dot/cwp/view.asp?a=1380&Q=259734&dotPNavCtr=|40046|40049>

<sup>5</sup> US Customs and Border Protection website: <http://www.customs.gov/xp/cgov/toolbox/contacts/ports/ct/0413.xml>

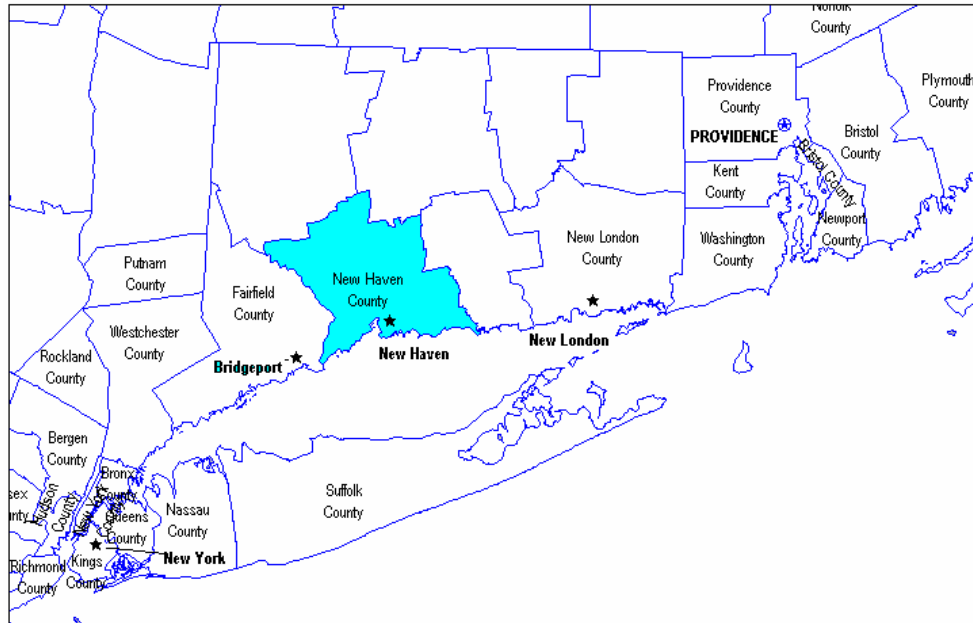
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# 11. New Haven, CT

## Location and Background Information

The Port of New Haven, Connecticut is located in the New Haven – Milford, Connecticut Metropolitan Statistical Area (MSA). This MSA is comprised of New Haven County, CT.

*Figure 11- 1. New Haven, CT: Geographic Location, 2000*



Source: Table 3-1

## Demographics

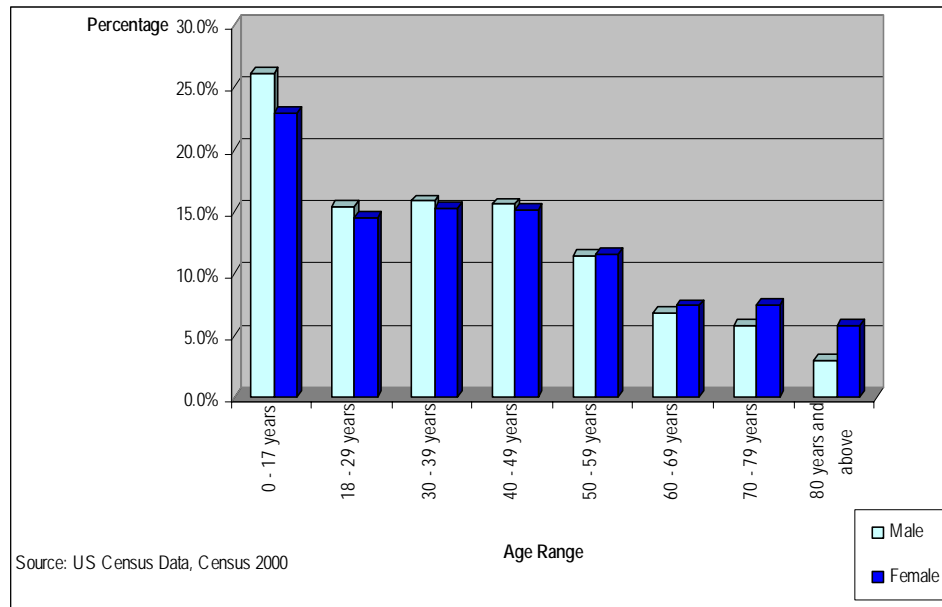
### POPULATION

The population of New Haven County in 2000 was 824,008, according to the 2000 US Census. Of this total, 395,931 or 48.0 percent are males and 428,077 or 52.0 percent are females. The median age for the population in 2000 was 37 years; 35.6 for males and 38.3 for females. As shown in Figure 11-2, about 45 percent of the population is between 18 and 49 years of age (15 percent approximately per age group).

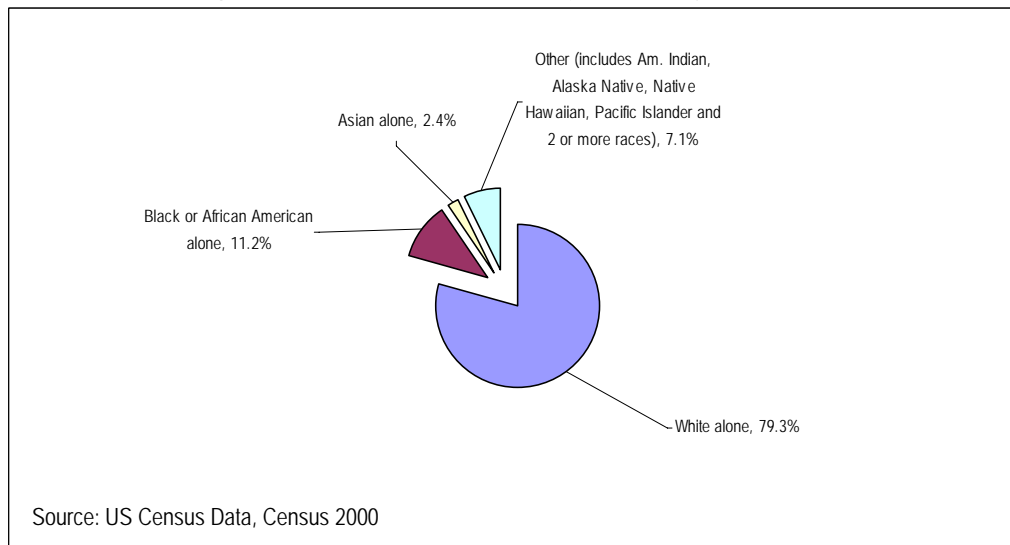
The majority of the population in New Haven County is white (79.3 percent), followed by the Black or African American population, which represents 11.2 percent of the total population. This population is followed by 'others' (which include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone), who represent 7.1 percent of the population. The Asian population represents 2.4 percent of the total population (Figure 11-3). Moreover, 5 percent of the total population is considered to be of Hispanic or Latino origin.<sup>1</sup>

<sup>1</sup> US Census Data, Census 2000.

**Figure 11-2. New Haven, CT: Structure of the Population by Age Group, 2000**



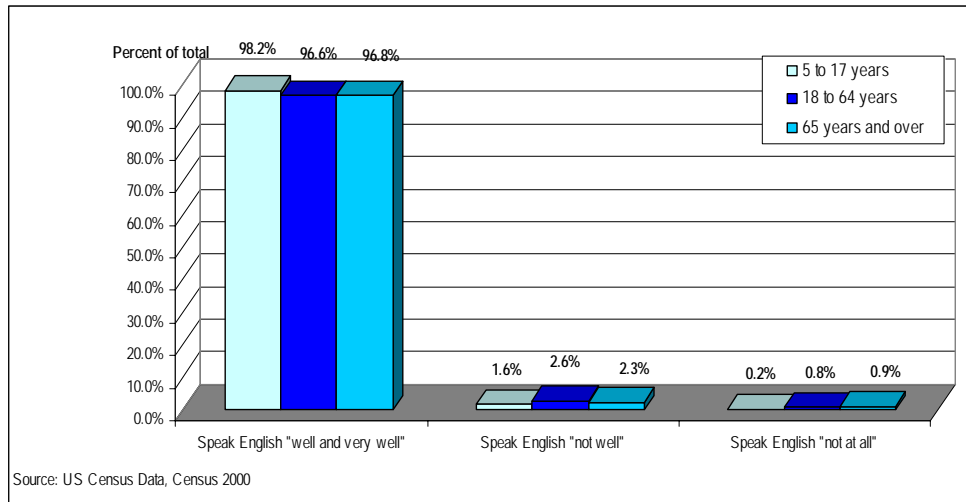
**Figure 11-3. New Haven, CT: Population by Race, 2000**



It is evident from the data specified in Figure 11- 4 that most of the population in all age ranges in the area dominates the English language ‘well’ and ‘very well’. Around 3 percent of the population in the 18 – 64 age bracket and the 65 years and over age bracket do not speak English well or don’t speak English at all.



**Figure 11- 4. New Haven, CT: Ability to Speak English by Age Group, 2000**

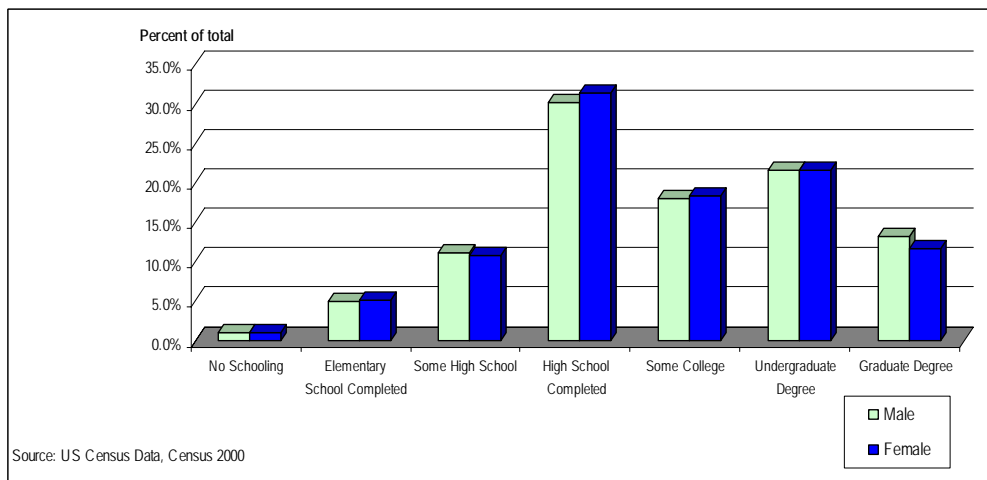


## EDUCATION

Of the population in the region, ages 25 and over, nearly 30 percent of males and females have completed high school, and 20 percent have obtained undergraduate degrees. Over 15 percent of the population has completed some college and a little over 10 percent has obtained a graduate degree (Figure 11-5).

There are several universities in New Haven County, among them: Yale University, Southern Connecticut State University, Albertus Magnus College, Gateway Community-Technical College, Quinnipac University and University of New Haven.

**Figure 11- 5. New Haven, CT: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



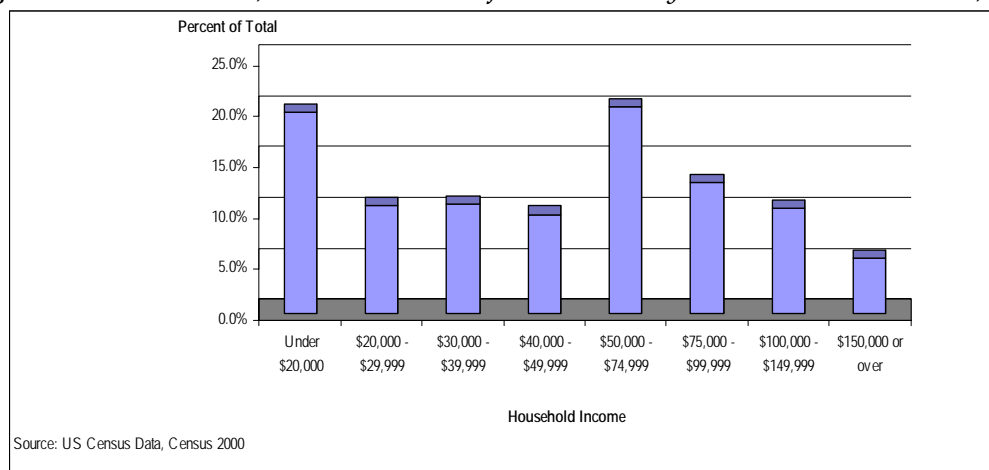
## Socio-Economic Characteristics

### INCOME

As portrayed in Figure 11- 6, about 20 percent of the households in this area in 1999 had incomes of under \$20,000. About 20 percent of households' incomes fell in the \$50,000 - \$74,999 income bracket. Less than 7 percent of households in the region had incomes of \$150,000 or over.

Household median income in New Haven, CT in 1999 was \$48,834 and per capita income in the same year was \$24,439. The percentage of people under the poverty line in the region was 9.5 in the year 2000. Average household size in 2000 was 2.5.<sup>2</sup>

**Figure 11- 6. New Haven, CT: Distribution of Households by Household Income Level, 1999**



### EMPLOYMENT

Of the employed civilian population in the region, ages 16 or over, nearly 40 percent of females are employed in the educational, health and social services industry, and over 15 percent are employed in 'other' industries, including the arts, recreation, entertainment, food services, public administration and information. Over 20 percent of males are employed in manufacturing and over 17 percent are employed in 'other' industries (Figure 11-7).

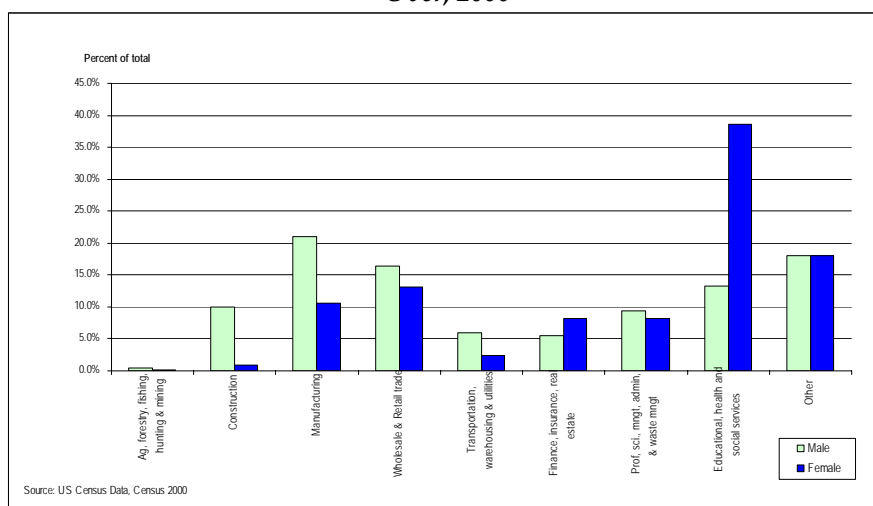
An estimated 6.2 percent of males and 5.6 percent of females were unemployed in the county in 2000.<sup>3</sup>

According to the 2000 US Census, an estimated 0.2 percent of males and 0.1 percent of females are employed in farming, fishing and forestry occupations. About 19.1 percent of males and 7.8 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.4 percent of male's occupations and 0.1 percent of female's occupations.

<sup>2</sup> US Census Data, Census 2000.

<sup>3</sup> US Census Data, Census 2000.

**Figure 11- 7. New Haven, CT: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION



The port of New Haven is located on the New Haven Harbor, less than 500 yards from Exit 49 off I-95; with immediate access to I-91 and Route 1. The ports serve vessels, barge, truck and rails. It has three berths, 2 @ 36' MLW 1 @ 39' MLW

The Port also has capability for loading up to 200 trucks per day from the ground or via loading docks. New Haven port is serviced by the Providence and Worcester railroad, connecting with CONRAIL, New England railroad CN and CP. There is private siding for loading and unloading of box cars, gondolas, flat cars, etc.

There are approximately 400,000 square feet of inside storage and approximately 50 acres of outside storage space, as well as bonded storage available. There is LME approved warehousing available for Zinc, Aluminum, Lead, Tin and Nickel. The port possesses 5 shore cranes up to 250 ton capacity; with 61 forklifts up to 26 tons capacity. The facility currently handles Steel, Copper, Zinc, Aluminum, Tin, Containers, Paper, Woodpulp, Lumber, Heavy lifts, Crane parts and Automobiles; yet facilities are capable of handling any type of Break-Bulk cargo.<sup>4</sup>

<sup>4</sup> Source: Connecticut Department of Transportation <http://www.ct.gov/dot/cwp/view.asp?a=1380&Q=259730&dotPNavCtr=|40046|#40048>

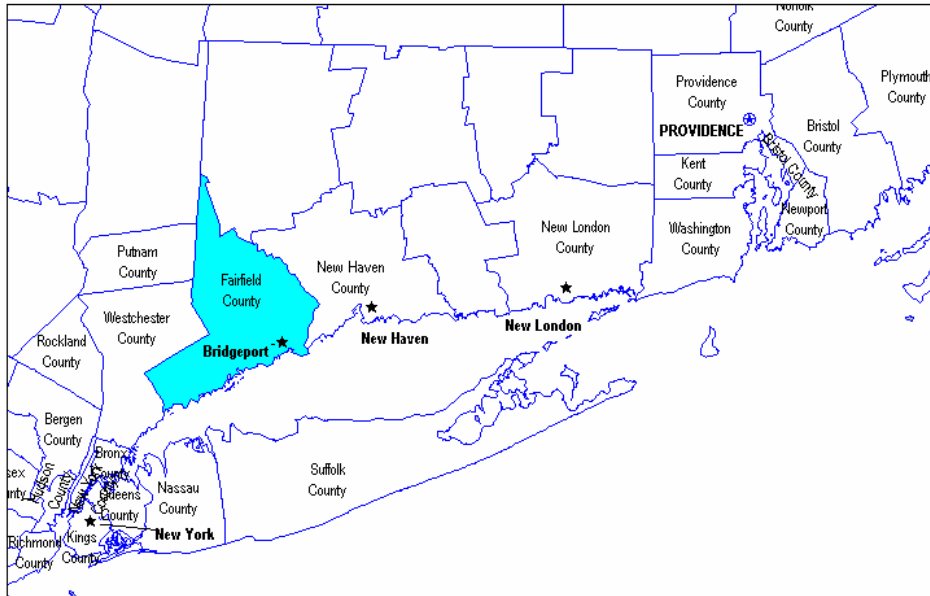
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# 12. Bridgeport, CT

## Location and Background Information

The Port of Bridgeport is located in the Bridgeport-Stamford-Norwalk, Connecticut Metropolitan Statistical Area (MSA); comprised of Fairfield County, CT. The port is located in Bridgeport Harbor, 1/4 of a mile South of I-95 at Exit 29.

*Figure 12-1. Bridgeport, CT: Geographic Location, 2000*



Source: Table 3-1

## Demographics

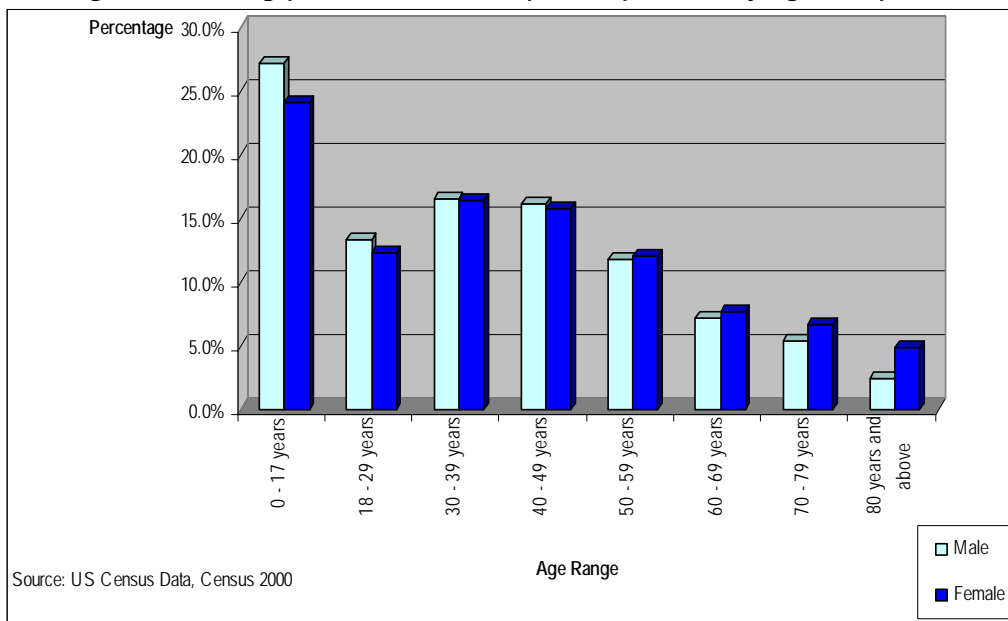
### POPULATION

The total population of the MSA in 2000 was 882,567, according to the 2000 US Census. Of this total, 426,127 or 48.3 percent are males and 456,440 or 51.7 percent are females. The average age in the region in 2000 was 37.3 years; 36.1 for males and 38.4 for females. As shown in Figure 12-2, about 30 percent of males and females are between the ages of 18 and 39 years (15 percent approximately per age group).

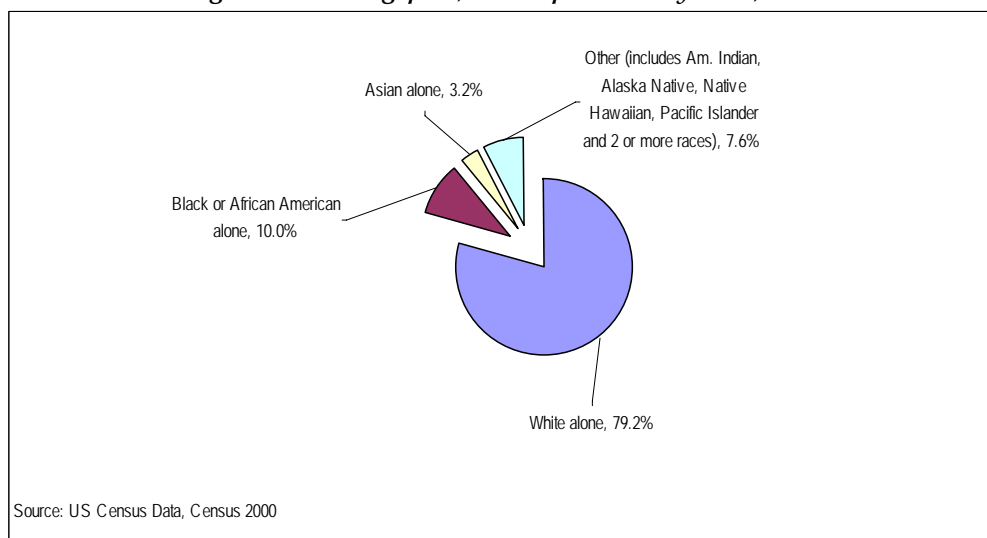
The majority of the population in the region is white (79.2 percent), followed by the Black or African American population, which represents 10 percent of the total population. 'Others' (which include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone) represent 7.6 percent of the population, whereas only 3.2 percent of the population is Asian (Figure 12-3). Moreover, in terms of ethnic makeup, 11.8 percent of the total population is of Hispanic or Latino origin.<sup>1</sup>

<sup>1</sup> US Census Data, Census 2000.

**Figure 12-2. Bridgeport, CT: Structure of the Population by Age Group, 2000**

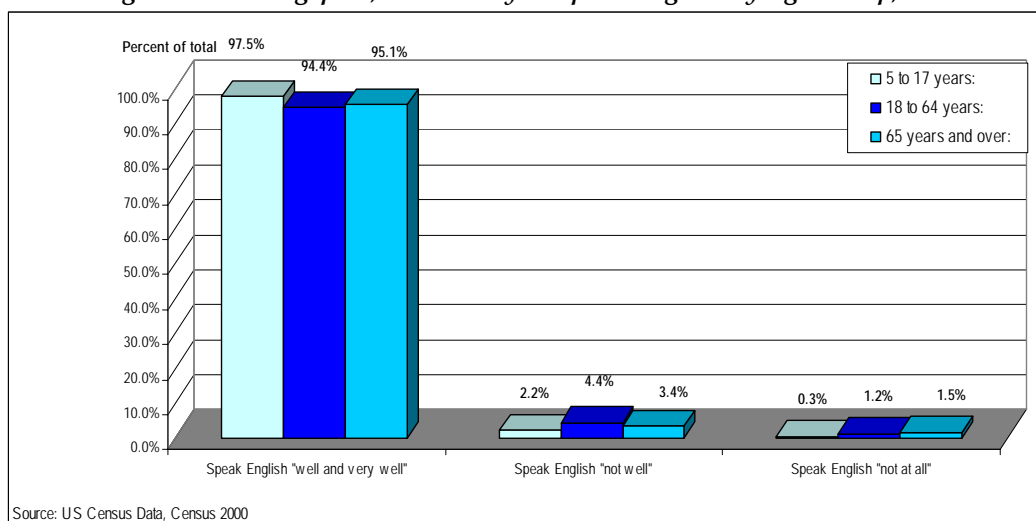


**Figure 12-3. Bridgeport, CT: Population by Race, 2000**



It is evident from the data specified in Figure 12-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'. About 5.6 percent of the population in the 18 – 64 years age bracket does not speak English well and approximately 5 percent of the population 65 years and over cannot speak English at all.

**Figure 12-4. Bridgeport, CT: Ability to Speak English by Age Group, 2000**

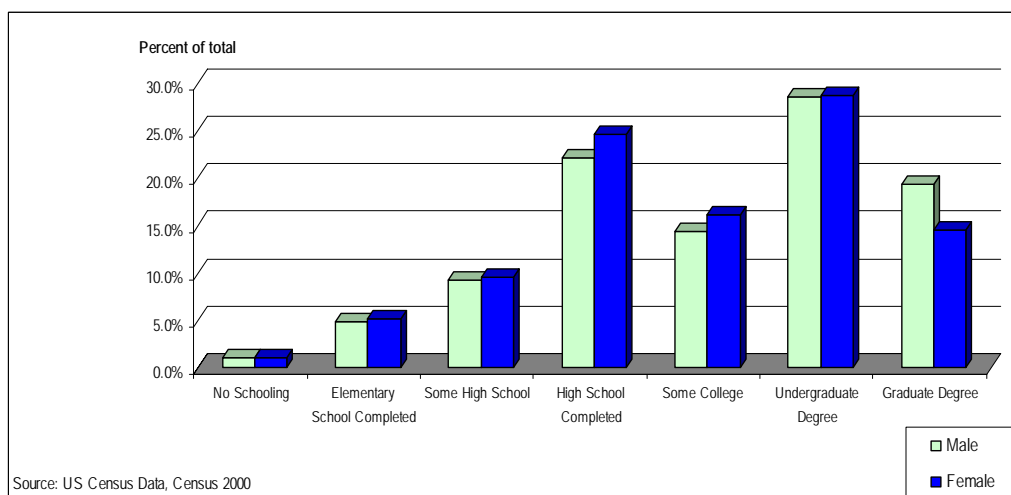


## EDUCATION

Nearly 30 percent of males and females, ages 25 or over in Fairfield County, have obtained an undergraduate degree. About 20 percent of males and 25 percent of females have finished high school. Approximately 18 percent of females and 14 percent of males have obtained graduate degrees (Figure 12-5).

There are several universities in Fairfield County; among them: University of Bridgeport, Butler Business School, Fairfield University, Sacred Heart University, Saint Vincent's College and Western Connecticut State University.<sup>2</sup>

**Figure 12-5. Bridgeport, CT: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



<sup>2</sup> Bridgeport Community Profile: <http://www.epodunk.com/>

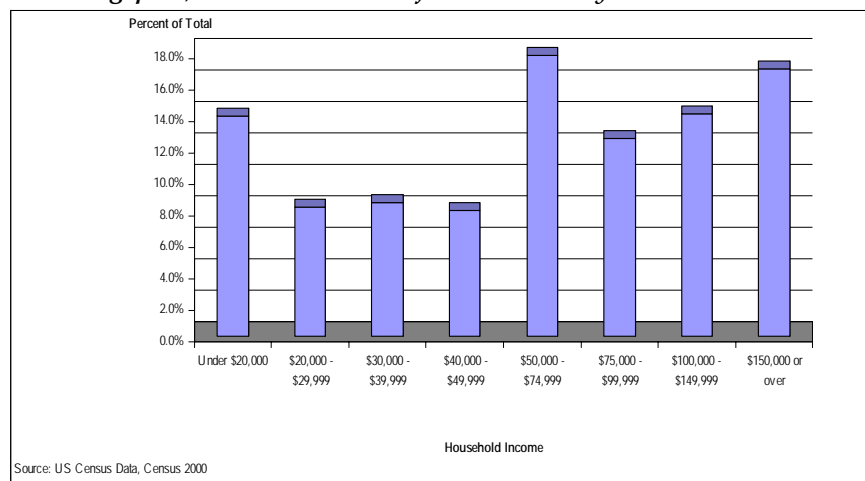
## Socio-Economic Characteristics

### INCOME

As portrayed in Figure 12-6, about 18 percent of the households in this area in 1999 had incomes in the \$50,000 – \$74,999 income bracket and 17 percent of households had incomes of \$150,000 or over. Around 14 percent of households had incomes under \$20,000.

Household median income in the county in 1999 was \$65,249 and per capita income in the same year was \$38,350. The percentage of people under the poverty line in the region was 6.9 in the year 2000. Average household size in 2000 was 2.67.<sup>3</sup>

*Figure 12-6. Bridgeport, CT: Distribution of Households by Household Income Level, 1999*



### EMPLOYMENT

Of the employed civilian population in the region ages 16 or over, nearly 30 percent of females are employed in the educational, health and social services industry, and almost 20 percent are employed in 'other' industries, including the arts, recreation, entertainment, food services, public administration and information. About 18 percent of males are employed in 'other' industries and nearly 15 percent are employed in the wholesale and retail trade industry. Less than 0.2 percent of the population is employed in forestry, agriculture, mining, fishing or hunting industries (Figure 12-7).

An estimated 4.8 percent of males and 4.7 percent of females were unemployed in the region in the year 2000.<sup>4</sup>

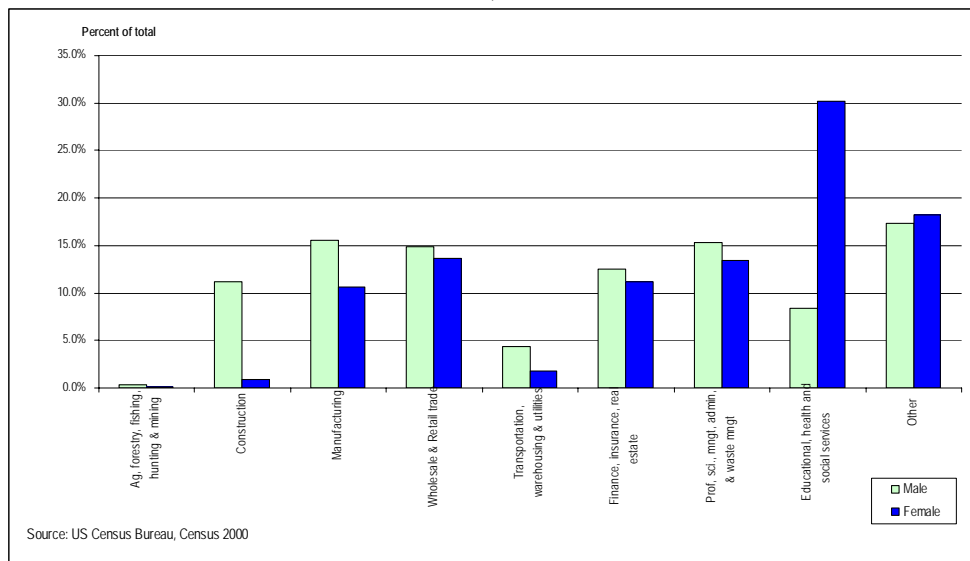
According to the 2000 US Census, an estimated 0.1 percent of males and 0.1 percent of females are employed in farming, fishing and forestry occupations. About 12.3 percent of males and 5.7 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.2 percent of male's occupations and 0.03 percent of female's occupations.

<sup>3</sup> US Census Data, Census 2000.

<sup>4</sup> US Census Data, Census 2000.



**Figure 12-7. Bridgeport, CT: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION



The port of Bridgeport is located in Bridgeport Harbor, 1/4 of a mile South of I-95 at Exit 29. The port serves vessels, barge, and trucks. It has 2 Berths @ 33 draft MLW and over 40 pieces of Electric Forklift equipment for handling cargo in refrigerated warehouses/ships. The port has 20 additional pieces of forklift equipment for up to 20 ton capacity. There are approximately 20 acres outside for storage/staging area; 130,000 square feet dry storage space inside; 85,000 square feet of refrigerated warehouse space with temperature capability to 32° F and there is bonded storage available (certified by USDA for Cold Treatment). Bananas, Plantains, Apples, Pears, Citrus, Melons, Forest Products, Miscellaneous General Cargo, Cars/Trucks and Containers are the type of cargo

handled.<sup>5</sup>

The Bridgeport Port Authority was created in 1993. The city of Bridgeport transferred ownership of the Water Street Dock and the transfer triggered Connecticut state law forming a Port Authority. The purpose of the transfer was to reconstruct the Water Street Dock and build a ferry terminal on the site. The primary tenant in the port is Bridgeport-Port Jefferson Steamboat Company ("Ferry Co."). It is a year round passenger and vehicular service provided between Bridgeport and the Village of Port Jefferson, Long Island, NY. The train and bus terminals are located within minutes from Bridgeport Harbor (by foot). Bridgeport Harbor is located within 60 miles of New York, and 150 miles of Boston.

<sup>5</sup> Connecticut Department of Transportation website: <http://www.ct.gov/dot/cwp/view.asp?a=1380&Q=259718&dotPNavCtr=|40046|#40047>

Bridgeport-Port Jefferson Steamboat Company has been providing ferry services from Bridgeport Harbor to Long Island since 1883.

The Ferry Terminal cost a total of \$4.2 million. For the Water Street Dock; the initial repairs and reconfiguration in 2000 – 2001 was \$2,092 million. A new access road for boarding vehicles was completed in 1997 – 1998 at cost of 1.535 million. A total of \$7,827,000 has been invested in the Water Street Dock facility to date, with additional \$6.45 million planned.

Overall crossing traffic has increased 51 percent from 1997 to 2004; passenger only traffic increased 48.36 percent (passengers in 2004 exceeded 900,000); and all vehicle traffic increased 56.43 percent (passenger vehicle traffic in 2004 exceeded 450,000 vehicles). Truck traffic in 2004 exceeded 10,000 (truck traffic increased 19 percent from 2003; since 1997 truck traffic increased over 179 percent).

Ferry services like the Bridgeport-Port Jefferson Ferry provide a local transportation alternative. Passengers typically include business commuters, travelers and those who simply want to enjoy a relaxing ride on the water. Highest passenger only traffic remains from May through September. The typical summer traveler goes to Bridgeport for a ballgame, concert and restaurants and to Port Jefferson for boutique shops and restaurants. In 2004, the ridership was 1.39 million passengers and vehicles. In 1999 a new investment of \$14 million was made; for the addition of a vessel; this increased the total fleet number to 3 vessels providing daily route service. In 2003; an aging vessel was replaced (about \$15 million); yet 14-16 round trips are made daily (6am-9pm), offering year-round service.

Bridgeport Harbor is underutilized but is growing. Channel depth is 15 feet. New business for the harbor includes Derecktor Shipyards, construction of new vessels, repair and services of all types of vessels. Shipyards include 600 metric ton travel lift. The future for Bridgeport Harbor will include barge feeder service and will operate between Bridgeport and the ports of New York and New Jersey. There is an RFP process underway. There is also a proposal for a High Speed Ferry Service that is planned to operate between Bridgeport, Stamford and New York. <sup>6</sup>

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<sup>6</sup> Presentation made by Bridgeport Port Authority Executive Director, Joseph A. Riccio Jr. on February 16, 2005. From American Association of Port Authorities Cruise Workshops: "Niche Markets". URL: [http://www.aapa-ports.org/programs/seminar\\_presentations/05\\_Cruise/Riccio\\_Joe.pdf](http://www.aapa-ports.org/programs/seminar_presentations/05_Cruise/Riccio_Joe.pdf)

# 13. Long Island, NY

## Location and Background Information

The Port of Long Island is part of the Nassau-Suffolk, NY Metropolitan Division (comprised by Nassau and Suffolk Counties). This Metropolitan Division is part of the New York - Northern New Jersey - Long Island, New York- New Jersey - Pennsylvania Metropolitan Statistical Area (MSA).

*Figure 13-1. Long Island, NY: Geographic Location, 2000*



Source: Table 3-1

## Demographics

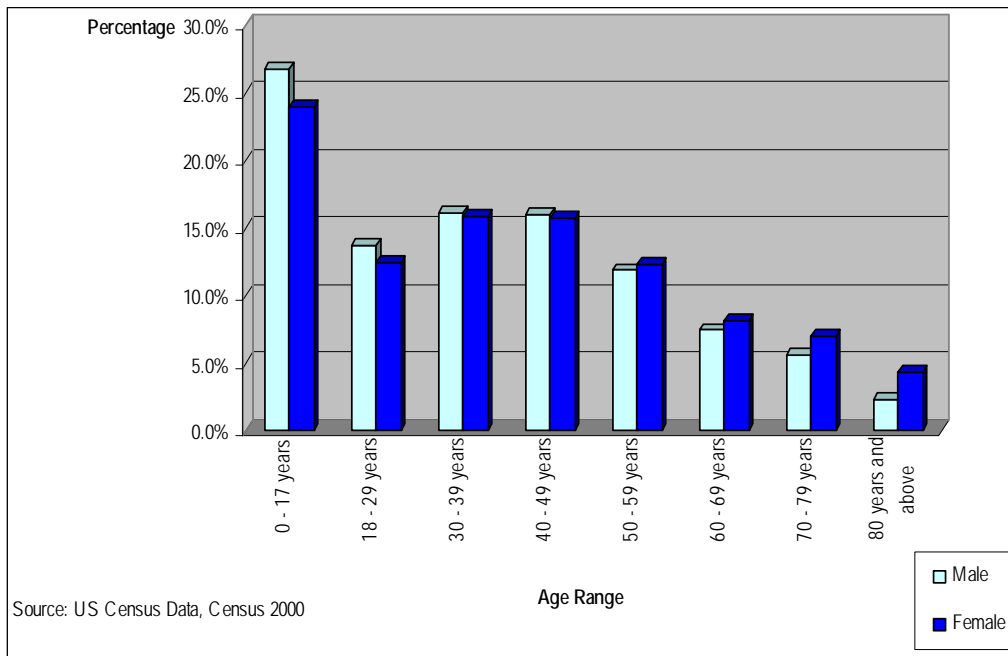
### POPULATION

The total population of Nassau and Suffolk counties in 2000 was 2,753,913 according to the 2000 US Census. Of this total, 1,337,327 or 48.6 percent were males and 1,416,586 or 51.4 percent were females. The median age for the region in the same year was 37.5 years; 36.3 for males and 38.8 for females. It is evident by Figure 13-2 that 30 percent of the population is located in the 30-39 and 40-49 years age brackets (15 percent approximately in each age group).

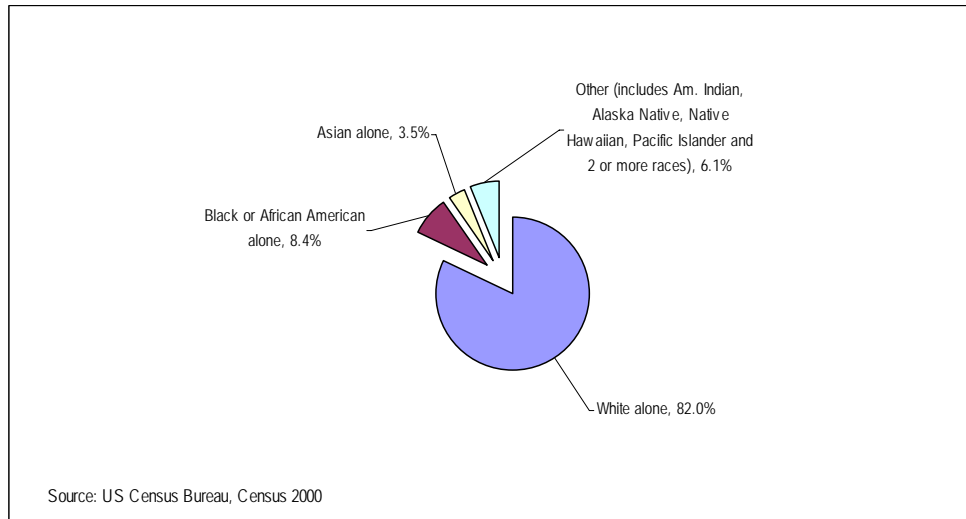
As portrayed by Figure 13-3, 82 percent of the population in these counties is white, 8.4 percent is Black or African American. 'Others' constitute 6.1 percent of the total population (include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone) and the Asian population represents roughly 3.5 percent of the total. Moreover in terms of ethnic makeup, 10.3 percent of the total population is considered to be of Hispanic or Latino origin.<sup>1</sup>

<sup>1</sup> US Census Data, Census 2000.

**Figure 13-2. Long Island, NY: Structure of the Population by Age Group, 2000**

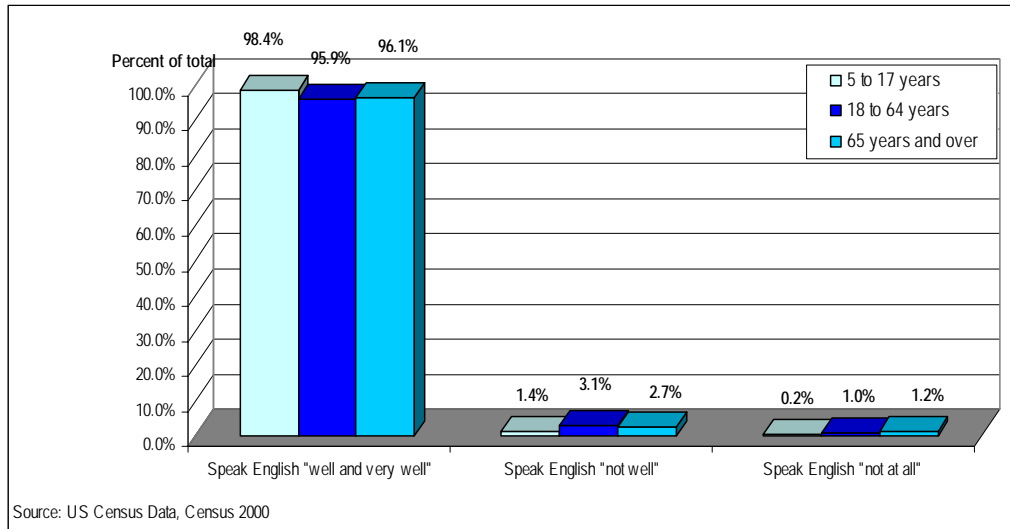


**Figure 13-3. Long Island, NY: Population by Race, 2000**



It is evident from the data specified in Figure 13-4 that most of the population in all age ranges in the area dominates the English language ‘well’ and ‘very well’. About 5.8 percent of the population aged 18 and over does not speak English well and about 2 percent of this population does not speak English at all.

**Figure 13-4. Long Island, NY: Ability to Speak English by Age Group, 2000**

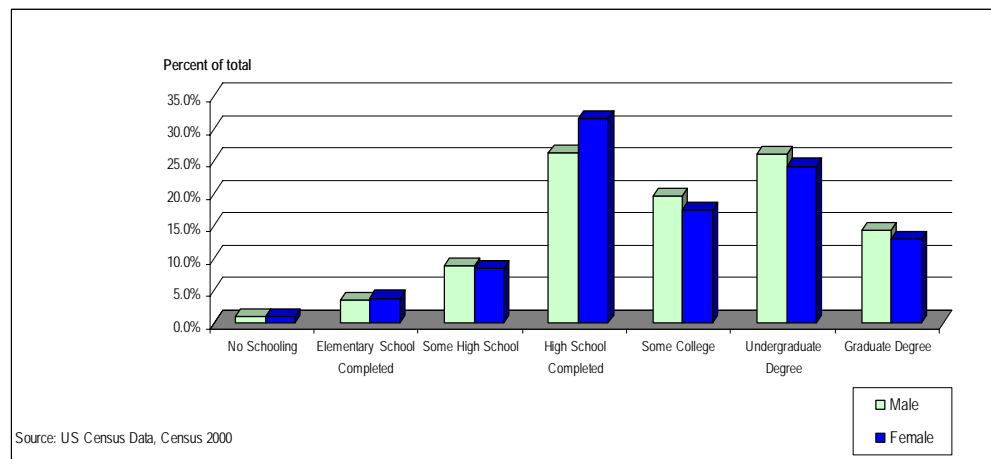


## EDUCATION

As shown in Figure 13-5, of the population in Nassau and Suffolk counties, ages 25 and over, about 25 percent of males and 30 percent of females have completed high school and around 25 percent of males and 23 percent of females have obtained an undergraduate degree. Nearly 15 percent of males and females have obtained graduate degrees.

Some of the colleges around the area are: Adelphi University, Molloy College, Nassau Community College, New York College of Health Professions, New York Institute of Technology - New York, United States Merchant Marine Academy, Dowling College, Long Island University and SUNY Stony Brook. <sup>2</sup>

**Figure 13-5. Long Island, NY: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



<sup>2</sup> Nassau and Suffolk Counties community profiles: <http://www.epodunk.com/>

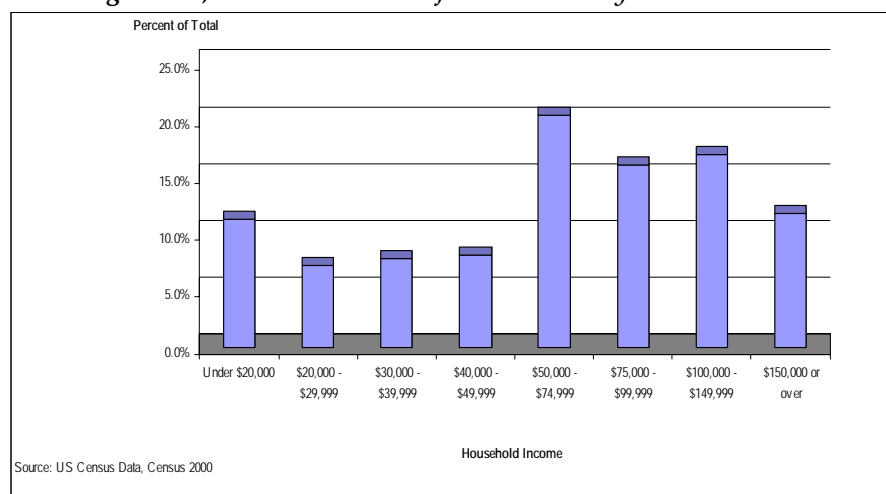
## Socio-Economic Characteristics

### INCOME

About 20 percent of households in this Metropolitan Division had incomes between \$50,000 and \$74,000 in 1999. About 17 percent of households had incomes between \$75,000 and \$99,999 and over 17 percent had incomes between \$100,000 and \$149,999. More than 10 percent of households in this area had incomes of \$150,000 or above (Figure 13-6).

Household median income in Long Island in 1999 was \$68,579.14 and per capita income for the same year was \$29,278.16. The percentage of people under the poverty line in the region was 5.6 in the year 2000. The average household size in 2000 was 2.95.<sup>3</sup>

*Figure 13-6. Long Island, NY: Distribution of Households by Household Income Level, 1999*



### EMPLOYMENT

Of the employed civilian population in Long Island, 16 years or over, more than 35 percent of females are employed in the educational, health and social services industry, and about 17 percent are employed in 'other' industries, such as the arts, recreation, entertainment, food services, public administration and information. Over 20 percent of males are employed in 'other' industries and over 15 percent are employed in the wholesale and retail trade industry (Figure 13-7).

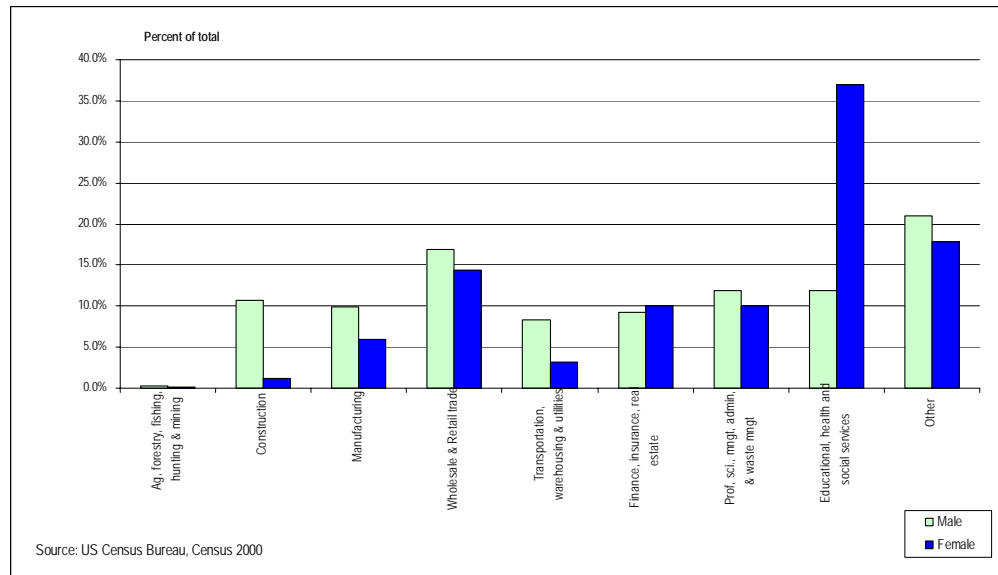
An estimated 3.7 percent of males and 3.9 percent of females were unemployed in this Metropolitan Division in 2000.<sup>4</sup>

According to the 2000 US Census, an estimated 0.2 percent of males and 0.1 percent of females are employed in farming, fishing and forestry occupations. About 13.3 percent of males and 4.7 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.6 percent of male's occupations and 0.1 percent of female's occupations.

<sup>3</sup> US Census Data, Census 2000.

<sup>4</sup> US Census Data, Census 2000.

**Figure 13-7. Long Island, NY: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



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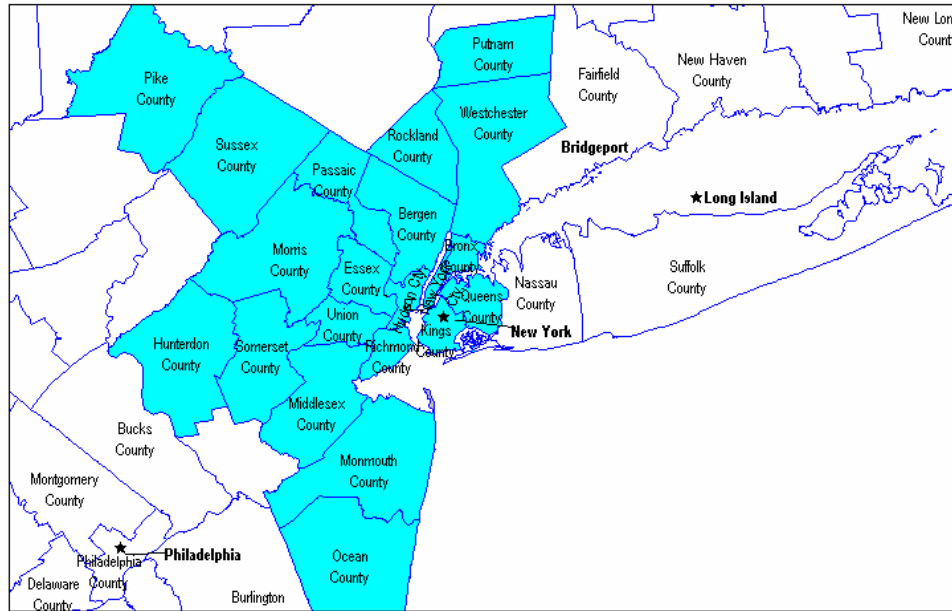


# 14. Ports of New York – New Jersey

## Location and Background Information

The Ports of New York and New Jersey are located within the New York – Northern New Jersey – Long Island, NY-NJ-PA Metropolitan Statistical Area (MSA).

*Figure 14-1. New York-New Jersey: Geographic Location, 2000*



Source: Table 3-1

## Demographics

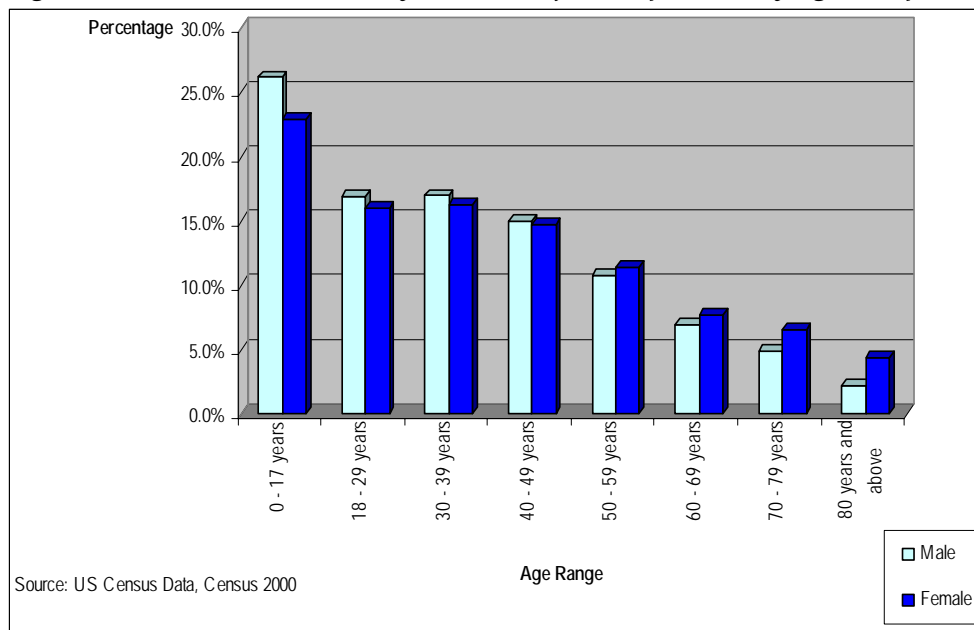
### POPULATION

The combined total population for this MSA in 2000 was 15,569,089, according to the 2000 US Census. Of this total, 7,453,615 or 47.9 percent are males and 8,115,474 or 52.1 percent are females. The median age for the region in the year 2000 was 35.5 years; 34 for males and 36.8 for females. As is evident through Figure 14-2, about 15 percent of the population is between 18 – 29 years and around 15 percent of the population is between the ages of 30 and 39. Less than 5 percent of the population is 80 or above.

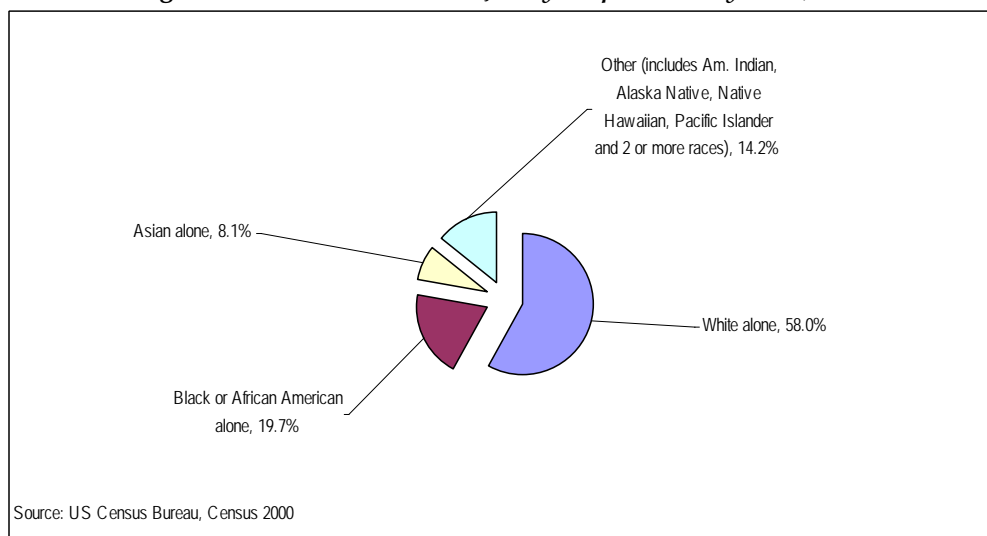
The majority of the population is white in the region (58 percent), followed by the Black or African American population, which represents 19.7 percent of the total population. 'Others' (which include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone) represent around 14.2 percent of the population. The Asian population represents only 8.1 percent of the total population (Figure 14-3). Moreover, in terms of ethnic makeup, 21.1 percent of the total population is considered to be of Hispanic or Latino origin. <sup>1</sup>

<sup>1</sup> US Census Data, Census 2000.

**Figure 14-2. New York-New Jersey: Structure of the Population by Age Group, 2000**

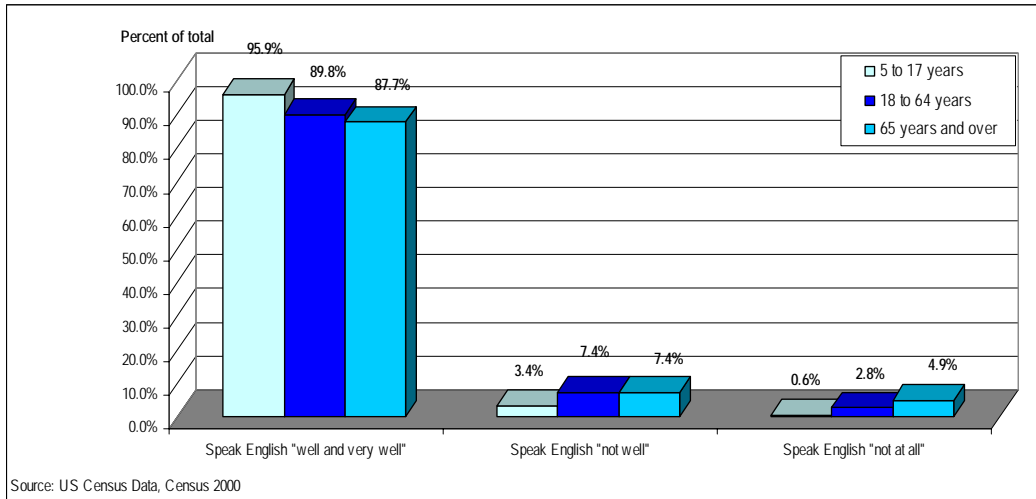


**Figure 14-3. New York - New Jersey: Population by Race, 2000**



It is evident from the data specified in Figure 14-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'. It is important to note that almost 10 percent of the population in the 18 – 64 years age bracket and 12.3 percent of the population that is 65 years and over do not speak English, or don't speak it well.

**Figure 14-4. New York-New Jersey: Ability to Speak English by Age Group, 2000**

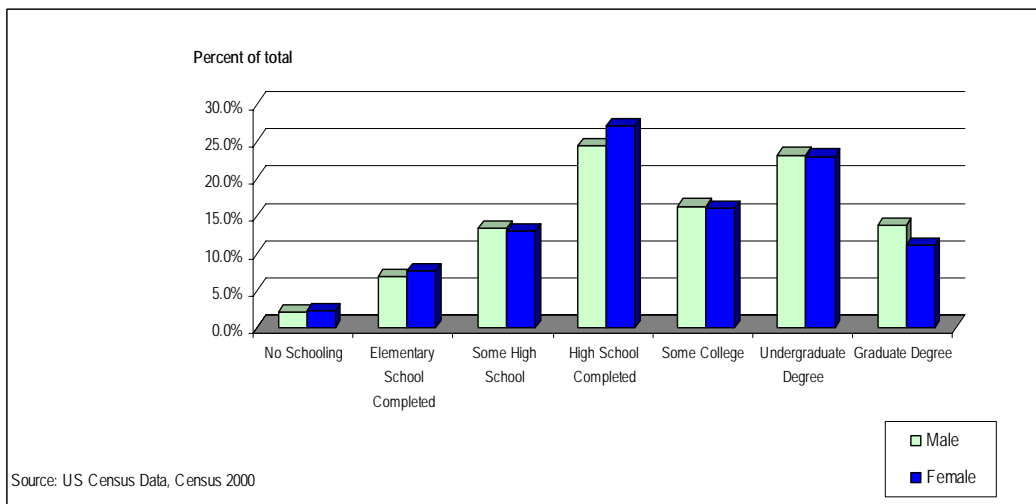


## EDUCATION

Of the population in this region, ages 25 and over, about 25 percent of males and females have completed high school, and over 20 percent have obtained an undergraduate degree. About 15 percent of the population has finished only some college. Over 10 percent of the population has obtained a graduate degree (Figure 14-5).

Just New York County has 38 four-year colleges; among them New York University, CUNY, Fashion Institute of Technology, Julliard, Barnard College and Columbia University.

**Figure 14-5. New York-New Jersey: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



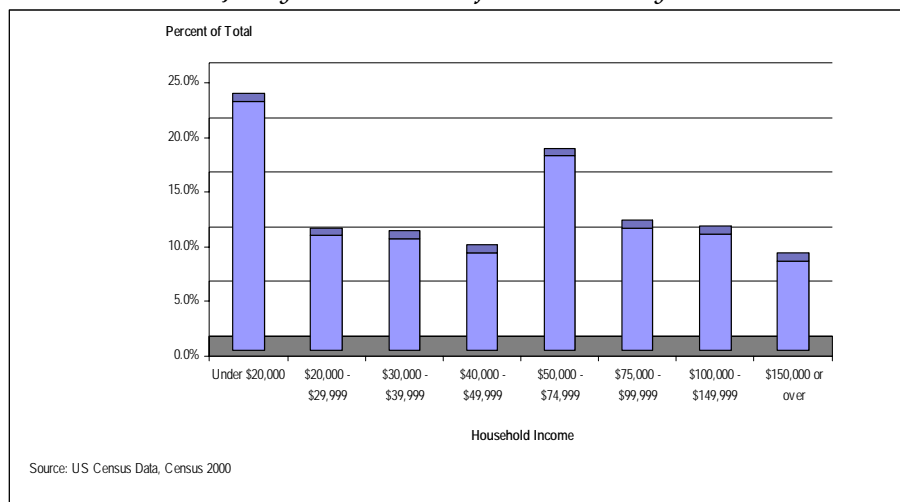
## Socio-Economic Characteristics

### INCOME

As portrayed in Figure 14-6, about 23 percent of the households in this area in 1999 had incomes of under \$20,000. About 17 percent of households' incomes fell in the \$50,000 - \$74,999 income bracket and almost 10 percent of households in the region had incomes of \$150,000 or over.

Household median income in this MSA in 1999 was \$48,417.19 and per capita income in the same year was \$25,693.16. The percentage of people under the poverty line in the region was 15.1 in the year 2000. Average household size in 2000 was 2.67.<sup>2</sup>

*Figure 14-6. New York-New Jersey: Distribution of Households by Household Income Level, 1999*



### EMPLOYMENT

Of the employed civilian population in the region, ages 16 or over, nearly 35 percent of females were employed in the educational, health and social services industry, and about 20 percent were employed in 'other' industries, including the arts, recreation, entertainment, food services, public administration and information. Over 20 percent of males were employed in 'other' industries and 15 percent were employed in the wholesale and retail trade industry (Figure 14-7).

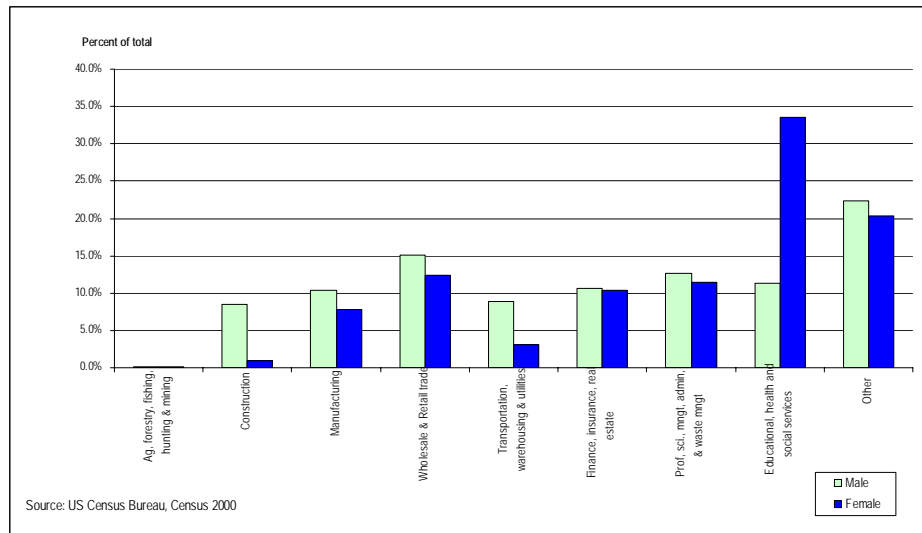
An estimated 7.1 percent of males 7.8 percent of females were unemployed in the region in the year 2000.<sup>3</sup>

According to the 2000 US Census, an estimated 0.1 percent of males and 0.04 percent of females are employed in farming, fishing and forestry occupations. About 15.4 percent of males and 6.0 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.6 percent of male's occupations and 0.1 percent of female's occupations. Less than 0.2 percent of the population is employed in agriculture, forestry, fishing, farming or mining industries.

<sup>2</sup> US Census Data, Census 2000.

<sup>3</sup> US Census Data, Census 2000.

**Figure 14-7. New York-New Jersey: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION



The Port of New York and New Jersey is the gateway to the most concentrated and affluent consumer market in the world. Each year, more than 25 million tons of oceanborne general cargo moves through the port, including 4.5 million TEUs (twenty-foot equivalent units) of containerized cargo. The Port Newark/Elizabeth-Port Authority Marine Terminal complex (NJ), the PA Auto Marine Terminal (NJ), Brooklyn Piers and Red Hook Container Terminal (NY) and Howland Hook Marine Terminal (NY) handle most of the cargo and these facilities are managed by the Port Authority of New York and New Jersey. In addition, there are private operators such as Global Marine Terminal and a number of marine

terminals operated by private bulk cargo operators. The Passenger Ship Terminal known as New York Cruise Terminal for passenger ship service is operated by P&O Ports North America for the City of New York.

### Port Newark/ Elizabeth

Port Newark and the Elizabeth-Port Authority Marine Terminal operate as one fully integrated marine terminal, forming the largest and most comprehensive collection of maritime cargo handling facilities on the East Coast of North America. The entire complex is part of Foreign-Trade Zone No. 49, operated by the Port Authority of New York and New Jersey.

### Auto Marine Terminal

The Port Authority's Auto Marine Terminal covers 130 acres along the Jersey City/Bayonne waterfront on the Port Jersey and Greenville peninsulas in New Jersey. It is dedicated exclusively to the movement of vehicle imports and exports. The terminal includes two ship berths totaling 1,800 linear feet open vehicle storage areas, offices and processing buildings for the facility two tenants,

BMW of America's Port Jersey Vehicle Preparation Center, and Northeast Auto Marine Terminal (NEAT). CSX and Norfolk Southern offer direct service to the facility through its adjacent automobile rail terminal. It is also included in Foreign-Trade Zone No. 49, which is operated by the Port Authority.

**PA Auto Marine Terminal:**

The PA terminal area covers 130 acres/53 hectares and includes two ship berths; totaling 1,800 feet or 549 meters. The berth space is intermodal, with 32 feet or 10 meters MLW depth at dock.

**Brooklyn Piers**

The Brooklyn Piers are leased for stevedoring and warehousing primarily breakbulk cargo. Right now, the Port Authority and the New York City Economic Development Corporation are reviewing parts of the property in order to make recommendations for future use. The entrance gates for the piers are at the foot of Atlantic Avenue. The primary cargo types in the piers are bulk and neo-bulk. The terminal area covers 40 acres or 16.2 hectares and the length of the ship berth is 5,000 feet or 1,524 meters; the depth at dock in Piers 6-8 are 32-34 feet MLW (9-10 meters MLW) and in pier 12 is 30-40 feet MLW (9-12 meters MLW).

**Red Hook Container Terminal**

Red Hook Container Terminal features some of the port's most up-to-date facilities for containerized and non-containerized cargoes. With natural 40-foot depths, Red Hook ideally accommodates fully loaded ships with deep drafts. And, on-dock fumigation facilities make Red Hook the natural entry port for specialized commodities such as coffee and cocoa from Central and South America. Red Hook Terminal is operated by American Stevedoring Inc. The entrance gates to the terminal are at the foot of Hamilton Avenue and the primary types of cargo are containers/ Ro-ro and breakbulk. The terminal area covers 80 acres or 32 hectares. The length of ship berth is 2,080 feet or 634 meters for containers and 3,410 feet or 1039 meters for breakbulk. The depth at dock is 42 feet MLW or 12.8 meters MLW. Stuffing and stripping facilities in the terminal are 345,000 square feet and there is a near-dock connection with NY Cross Harbor Railroad and a cross Harbor Container Barge to/from Port Newark. The terminal has 72 reefer plug slots for maintenance and repair and has equipment such as toploaders-45-tons, 3 forklifts-26-ton, 22 Paper clamps-54", and 30 Yard Hustlers-100-ton.

**Howland Hook Marine Terminal**

Howland Hook Marine Terminal is a key terminal as well as a growing container facility in the Port of New York and New Jersey. Strategically located in the northwest corner of the Borough of Staten Island in New York City, the terminal was developed by the City of New York. Its entrance gate is on North Washington Avenue and Western Avenue. It was leased by the Port Authority of New York and New Jersey in 1985. In 2001, The Port Authority purchased an additional 124 acres, a former Proctor & Gamble property known as Port Ivory for future development.

New York Container Terminal Inc. operates a container terminal on the original 187-acre site. The Port Authority is constructing a 39-acre intermodal rail terminal on a section of the Port Ivory tract, and is currently leasing some of the Port Ivory property for warehousing and distribution uses. The primary cargo types handled in the terminal are containers, general cargo and breakbulk. The length of ship berth is 3,000 feet or 914 meters and the depth at dock is 42 feet MLW or 12.8 meters for 2,300 feet of berth and 37 feet or 10.7 meters for 700 feet of berth. The container cranes are 412,000 square feet and include deep-freeze, refrigeration and have undergone U.S. Customs inspection. The terminal has 47 acres of open container storage and one 64,000 -square foot temperature-controlled storage building.

**Global Marine Terminal**

The only privately owned and operated container terminal at the Port of New York and New Jersey, the Global Marine Terminal spans 100 acres that includes 1,800 feet of berth space with six container cranes, including four Post-Panamax cranes. Global Marine Terminal is located in Jersey City, NJ,

adjacent to the Port Authority's Auto Marine Terminal and its entrance gate is on Port Jersey Boulevard.

The primary cargo types handled in the terminal are containers-ro-ro and heavy lift. The depth at dock is 40 feet MLW. The terminal has 10 rubber-tired gantry cranes (RTGs equipped with GPS), 8 toploaders-30 ton, 4 sideloaders-8 ton, 52 yard tractors and 24 forklifts-30 ton, 26-ton and 15-ton. The terminal is intermodal, due to its proximity to North Jersey rail yards.

### **New York Cruise Terminal**

The New York City Passenger Ship Terminal, owned by the City of New York and operated by P&O Ports North America, provides five 1,000-foot-long berths suitable for servicing the world's largest cruise vessels at a convenient location on the Hudson River only a few blocks west of Times Square in the heart of Manhattan. The terminal occupies the West Side of 12th Avenue between 46th and 54th streets. P&O Ports North America customers include Carnival, Celebrity, Costa, Crystal Cruises, Cunard, Holland America, Norwegian, P&O Cruises, Princess, Radisson Seven Seas, Royal Caribbean, Seabourn and Silversea. The terminal is also home to an array of trade shows and special events managed by P&O Ports North America.

### **Other Terminals**

In addition to terminals owned and operated by the Port Authority of New York and New Jersey, the Port of New York and New Jersey depends on the stewardship of private operators to help manage the port terminal network. Private operators such as Global Marine Terminal, the City of New York's South Brooklyn Terminal, and a number of marine terminals operated by private oil companies along the southern New Jersey coastline, handle loads such as imported liquid bulk crude oil. The NYC Passenger Ship Terminal is operated by P&O Ports North America for the City of New York. Private operators like Global Marine Terminal help augment the facilities developed and managed by the Port Authority.

### **Port and Waterways Development**

To meet the demands of growing industry, a \$1 billion investment is already underway to reconfigure existing terminals, deepen the harbor's channels and berths, and improve inland access by rail and barge — all to create the most efficient and cost-effective port possible. The improved port will feature new high-capacity, environmentally friendly cranes that can load and unload containers more quickly, and an improved transportation infrastructure that will alleviate traffic and port congestion. At the same time, deepened channels and berths will allow for the more cost-efficient and environmentally friendly transport of cargo.

### **Dredging**

Right now, the largest dredging fleet since World War II is at work in the New York/New Jersey Harbor. The Port Authority of New York and New Jersey, working together with the US Army Corps of Engineers, the States of New York and New Jersey, and the City of New York, has developed the dredging initiative as a long-term solution to address the navigational needs of the new deep-draft containerships. At the same time, this initiative is stimulating economic growth and investment in maritime uses throughout the port region. By consolidating resources, the deepening project will be completed with less environmental impact, and businesses will benefit from 45 to 50-foot channels in the more nearer future.<sup>4</sup>

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<sup>4</sup> New York and New Jersey Port Authority webpage: <http://www.panynj.gov/>

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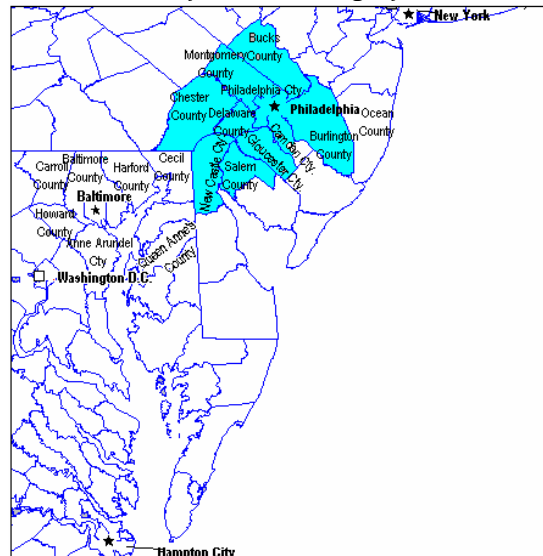


# 15. Philadelphia, PA

## Location and Background Information

The Port of Philadelphia is located in Delaware Bay and is part of the Philadelphia-Camden-Wilmington, Pennsylvania- New Jersey- Delaware- Maryland Metropolitan Statistical Area (MSA). For more than 300 years Philadelphia has been an important port city and a major center for international commerce. Only a few short years after William Penn's vessel "The Welcome" landed on the shores of the Delaware River, heralding the establishment of Penn's "City of Neighborhoods", Philadelphia became the New World's leading center for trade and commerce, a title it held for more than a hundred years. Even today, with major port complexes serving major metropolitan centers throughout the country, Philadelphia and its international seaport maintain a preeminent position in several areas of trade, such as the importing of perishable cargoes from South America and high-quality paper products from Scandinavia.<sup>1</sup>

*Figure 15-1. Philadelphia, PA: Geographic Location, 2000*



Source: Table 3-1

## Demographics

### POPULATION

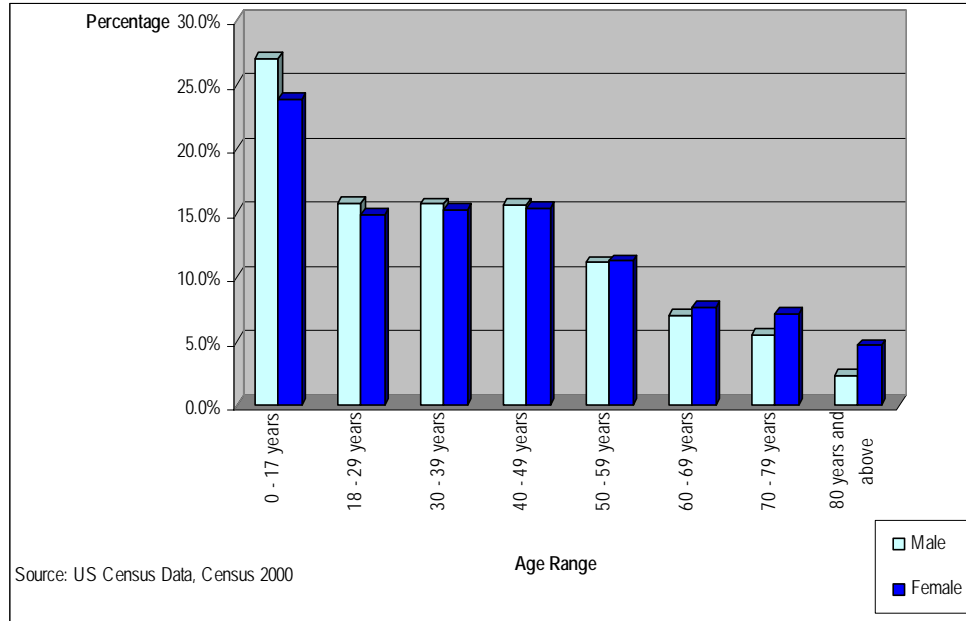
Total population of this MSA in 2000 was 5,687,147 according to the 2000 US Census. Of this total, 2,731,176 or 48 percent were males and 2,955,971 or 52 percent were females. The median age in the region in 2000 was 36.2 years; 34.8 for males and 37.5 for females. As shown in Figure 15-2, about 45 percent of the population is evenly distributed among the 18 - 29, 30 - 39 and 40 - 49 age brackets (around 15 percent per category).

The majority of the population in the region is white (72.6 percent), followed by the Black or African American population, which represents 19.7 percent of the total population. 'Others' (include

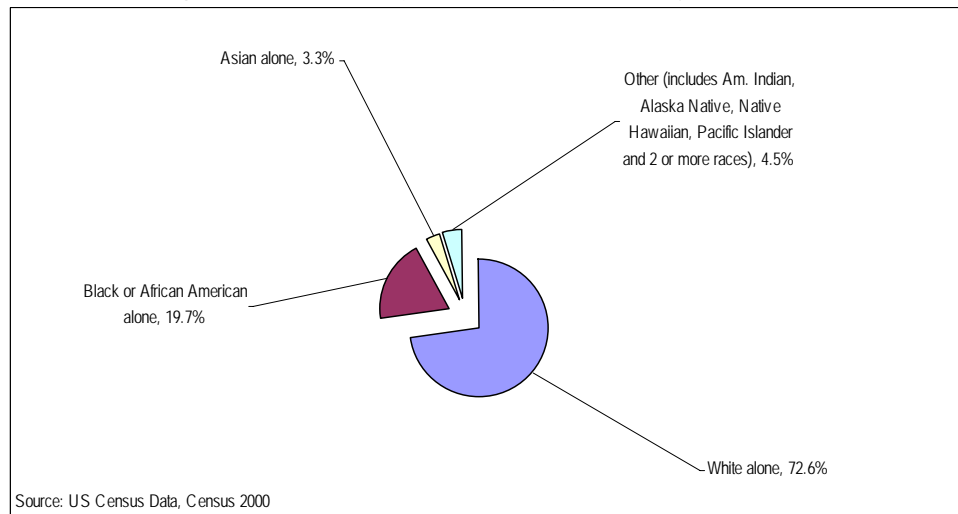
<sup>1</sup> Philadelphia Regional Port Authority: <http://www.philaport.com/history.htm>

American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone) constitute 4.5 percent of the population. The Asian population represents only 3.3 percent of the total population (Figure 15-3). Moreover, in terms of ethnic makeup, 5.0 percent of the total population is considered to be of Hispanic or Latino origin.<sup>2</sup>

**Figure 15-2. Philadelphia, PA: Structure of the Population by Age Group, 2000**



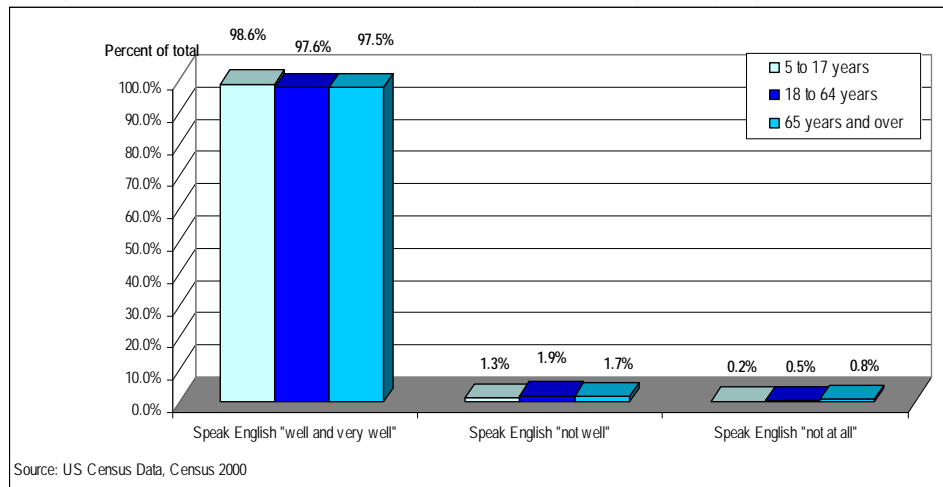
**Figure 15-3. Philadelphia, PA: Population by Race, 2000**



<sup>2</sup> Source: US Census Data, Census 2000.

It is evident from the data specified in Figure 15-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

**Figure 15-4. Philadelphia, PA: Ability to Speak English by Age Group, 2000**

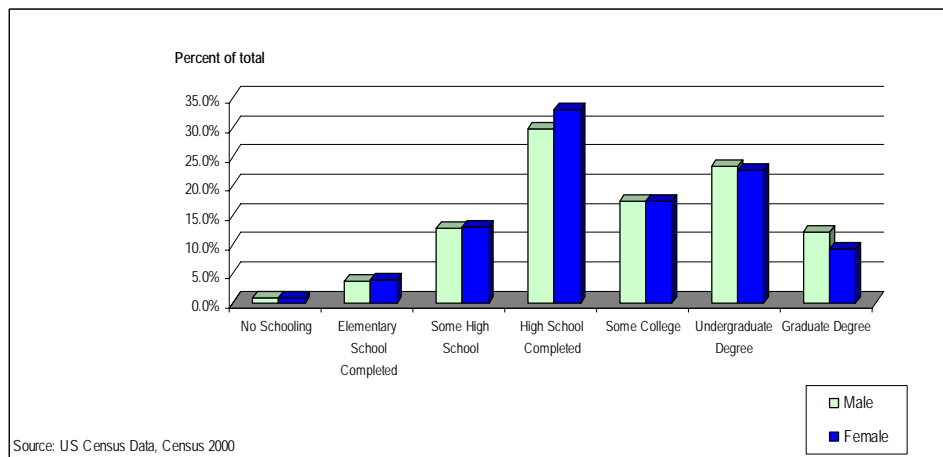


## EDUCATION

As shown in Figure 15-5, of the population ages 25 or over, about 30 percent of males and females have completed high school and around 20 percent have obtained an undergraduate degree. Only 10 percent of males and around 8 percent of females have obtained graduate degrees.

There are several colleges and universities in this MSA, the following are some of these institutions: University of Pennsylvania, Temple University, Philadelphia University, Bryn Mawr College, Manor College, Penn State, Swarthmore College and Villanova University.

**Figure 15-5. Philadelphia, PA: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



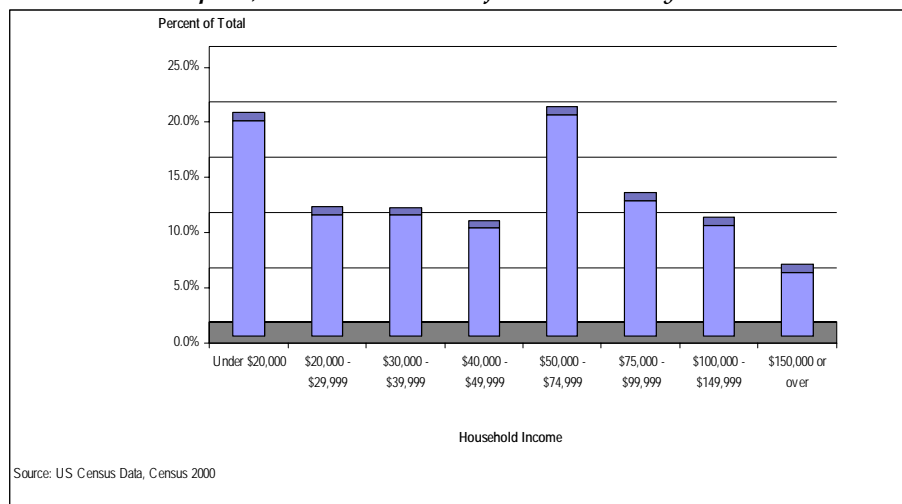
## Socio-Economic Characteristics

### INCOME

Nearly 20 percent of households in the area in 1999 had incomes between \$50,000 and \$74,999 and about 20 percent had incomes under \$20,000. Almost 10 percent of households in the area had incomes of \$150,000 or over (Figure 15-6).

Household median income in 1999 in the MSA was \$49,076.83 and per capita income was \$23,971.86. The percentage of people under the poverty line in the region was 10.8 in the year 2000. The average household size in 2000 was 2.59.<sup>3</sup>

*Figure 15-6. Philadelphia, PA: Distribution of Households by Household Income, 1999*



### EMPLOYMENT

Of the employed civilian population in the region, ages 16 or over, nearly 35 percent of females are employed in the educational, health and social services industry and nearly 20 percent are employed in other industries. These industries include the arts, entertainment, recreation, food services, public administration and information. Nearly 20 percent of males are employed in 'other' industries, about 15 percent are employed in the manufacturing industry and around 17 percent are employed in the wholesale and retail trade industries (Figure 15-7).

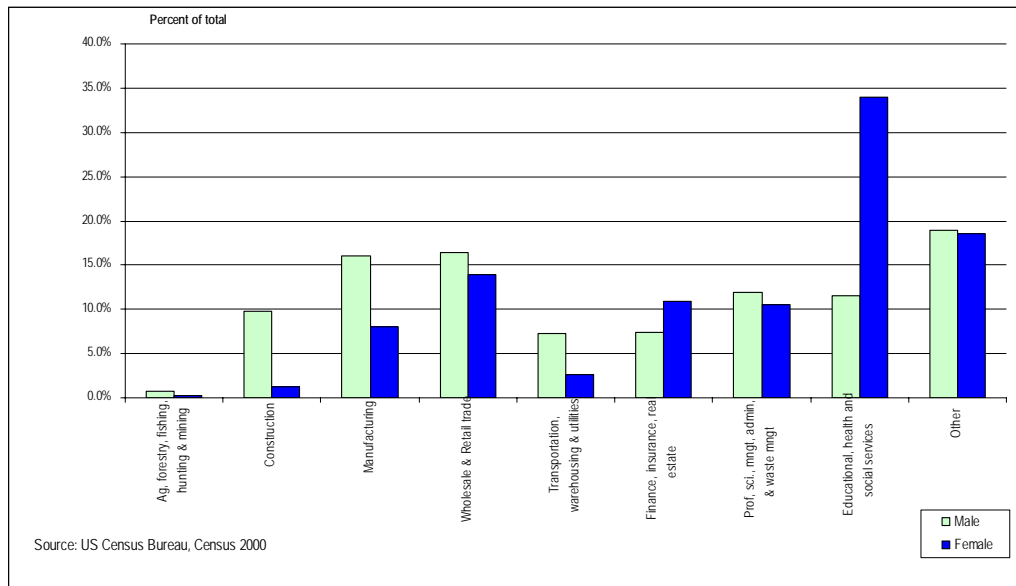
An estimated 6.1 percent of males and 6 percent of females were unemployed in the region in the year 2000.<sup>4</sup>

According to the 2000 US Census, an estimated 0.3 percent of males and 0.1 percent of females are employed in farming, fishing and forestry occupations. About 17.0 percent of males and 5.5 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.5 percent of male's occupations and 0.049 percent of female's occupations.

<sup>3</sup> US Census Data, Census 2000.

<sup>4</sup> US Census Data, Census 2000.

**Figure 15-7. Philadelphia, PA: Employed Civilian population by Sex and Industry 16 years and over, 2000**



## MARITIME INFORMATION



For most of its early history, the Port of Philadelphia thrived and expanded without major guidance from a central governing authority or organization. Rather, disparate private concerns built and maintained piers and waterfront warehouses, moving a wide variety of imported and exported goods through those facilities. It was during these initial years that all manner of breakbulk cargoes moved over the city's docks, establishing early on Philadelphia's reputation for the fast, expert handling of any cargo imaginable. Ultimately, city government took a more active hand in

the organization of the city's waterfront, and municipally-owned piers and warehouses sprang up amidst the privately-owned facilities.

For most of the early years of the 20th century, the Philadelphia waterfront was overseen and managed by the Department of Wharves, Docks, and Ferries, a division of the City of Philadelphia's Department of Commerce. The Department of Wharves, Docks, and Ferries oversaw the construction and maintenance of municipally-owned piers and port facilities, and had some regulatory power for the overall Philadelphia waterfront.

In 1965, the non-profit, quasi-public Philadelphia Port Corporation was established. The corporation had the power to issue municipal bonds to raise funds for port improvements. Revenue to pay the bonds' debt service was realized primarily through leasing the agency's port facilities to private operating companies. These private companies operated their respective port facilities on a day-to-day basis, with marketing assistance from the Philadelphia Port Corporation. Major port improvements were made in the 1960s and 70s under the auspices of the Philadelphia Port Corporation. These included the construction of the 106-acre Packer Avenue Marine Terminal (still the Port of Philadelphia's largest facility) and the Tioga Marine Terminal in the 1970s.

Like many ports throughout the United States (and especially competing ports along the East Coast) the capital-intensive requirements to maintain and improve the Port of Philadelphia eventually outgrew the funding capabilities of the City of Philadelphia and its port agency. The Commonwealth of Pennsylvania recognized the vital importance of its seaport asset and it agreed to assist in the maintenance, expansion, and promotion of its international seaport in Philadelphia. The first step was the creation of the Philadelphia Regional Port Authority (PRPA), an independent state agency, in 1990. It immediately replaced the Philadelphia Port Corporation.

Along with creating PRPA, the state purchased all publicly-owned port facilities from the City of Philadelphia, charging PRPA with the mission of managing and maintaining them. A major state capital budget was also established, which allowed PRPA to make an initial round of needed capital improvements during the early 1990s, such as the addition of on-dock warehouse space at Tioga Marine Terminal and new warehouse space and refrigeration at Pier 82.

Since its inception more than ten years ago, PRPA has overseen other major improvements to the Port, as well as aggressively assisting its terminal operators in marketing the Port around the world. PRPA also works with other port agencies and port-related concerns along the Delaware River on issues of mutual concern, such as maintaining sufficient channel depth and monitoring regulatory issues.

PRPA and its 11-member Board of regional business leaders have recently overseen a variety of notable developments at the Port of Philadelphia. In October of 2002, PRPA was named the nation's 14th Strategic Military Port by the U.S. Defense Department, making it one of only 14 U.S. ports permitted to handle our nation's military cargoes destined for different points around the globe. Shortly after that, in January 2003, PRPA was selected as a homeport for two U.S. Navy Large, Medium Speed Roll On/Roll Off (LMSR) ships. These Naval supply vessels, docked at PRPA's Tioga Marine Terminal, are often utilized to deliver the military cargoes now handled by PRPA as a result of its Strategic Military Port designation.

On the commercial front, 2002 and 2003 also saw the advent of dramatic new cargo services at the Port. With the establishment of P&O Nedlloyd's "Around the World" service at the Packer Avenue Marine Terminal, PRPA now offers regular service to North Europe and Mediterranean ports for the first time in more than a decade, as well as significantly enhanced service with longtime trading partners Australia and New Zealand. With new carrier Bertling Line now calling the Tioga Marine Terminal, that facility's already excellent South American services have been enhanced by regular calls by this major carrier of finished wood cargoes and other breakbulk products.

With many challenges on the horizon, 2004 and beyond will be a challenging time for the Philadelphia Regional Port Authority. A current major initiative is to finally bring the Delaware River Channeling Deepening Project to fruition, so our main artery of commerce can finally be deepened from 40 to 45 feet. PRPA's Southport Development Project, which aims to be the first major expansion of the Port of Philadelphia in more than a generation, is also a priority. And, of course, there are the usual ongoing concerns of securing new customers and keeping PRPA's facilities efficient and modern. The Philadelphia Regional Port Authority (PRPA) is the grantee of Free Trade Zone number 35 which covers Southeastern Pennsylvania

## **FACILITIES:**

### **Packer Avenue Marine Terminal**

Located in South Philadelphia, Pennsylvania; this terminal handles containers, steel, meat, fruit, heavy lift/project. The terminal area is 106 acres and has 6 berths with a length of 3,800 linear ft.; 1 RO/RO, 40 foot depth; dry, heated and reefer warehouses; container cranes, heavy lift cranes, rail services. The terminal has 4 storage warehouses: 1 dry/heated - 100,000 sq. ft., 1 dry - 90,000 sq. ft., 1 dry - 100,000 sq. ft. and 1 refrigerated - 2,200,000 cu. ft.

**Pier 96 & Pier 98 Annex**

The piers are located in South Philadelphia and have a combined area of 56 acres. Pier 96 has an area of 9.7 acres and Pier 98 Annex has an area of 45.2 acres. It has 2 berths with a length of 1,320 linear ft. (402.3 m.) each and 32 foot depth. The piers specialize in cargo such as automobiles, project, trucks and heavy equipment. The piers have two sheds: an auto-washing shed - 15,000 sq. ft. and a service building - 80,000 sq. ft. The accessory shop accommodates 125 vehicles and the auto-washing system handles 125 vehicles per hour (a computer tracking system follows the entire process). They are also designated as a Foreign-Trade Zone.

**Pier 82**

The pier is a fruit-handling facility and it is located in South Philadelphia; handles fruits and vegetables, other breakbulk, project. It has an area of 18.4 acres, and has 2 berths of 1,139 linear ft. and 855 linear ft. and that are 32 foot in depth. The pier has 1 warehouse that is heated/chilled and has an area of 130,000 sq. ft. with a humidification system. The pier has 12 loading docks (6 canopied), 24 reefers and loading platforms for 17 trucks.

**Pier 84**

The pier is located in South Philadelphia and handles cocoa beans and cocoa products. It has an area of 23 acres and has 1 berth of 855 linear ft. in length and 32 feet in depth. The pier has two storage warehouses for dry & heated storage: a dry storage facility that is 500,000 sq. ft. and a dry storage facility that is 40,000 sq. ft. It also has canopied loading platforms for over 40 trucks. Value added services offered at the pier include de-bagging, super sacking, weighing and testing.

**Piers 78 & 80**

Located in South Philadelphia, these piers are a forest products distribution center. They handle newsprint, coated paper, wood pulp, lumber and other forest products. The terminal area is 39.8 acres and has 6 berths. Pier 78 has 2: 1 that is 900 linear ft., the other is 854 linear ft. Pier 80 has 4 berths, 2 berths with RO/RO ramps; one that is 994 linear ft. in length, and another one that is 1,144 linear ft. in length. All berths are 35 ft in depth. The piers have direct to storage/truck/rail and RO/RO capabilities. It has over 100 customized lift trucks with advanced pressure-controlled paper handling capabilities; 5 fifth wheels; 40 tractors; 35 flatbeds and 30 vans. It has 40 truck bays and accommodations for 50 rail cars. The piers are a designated Foreign-Trade Zone.

**Piers 38 & 40**

The piers are part of the Forest Products Distribution Center and are located in Philadelphia's central waterfront district. They handle newsprint, coated, wood pulp and other forest products. The terminal has an area of 12 acres and has 3 berths that are 550 linear ft, 551 linear ft. and 620 linear ft in length and are 35 foot deep. The terminal has 2 dry warehouses, each 180,000 sq. ft. The terminal also has 16 truck bays and accommodations for 10 rail cars. It has 25 forklifts equipped with paper roll and/or pulp clamps; 30 tractors; 35 flatbeds and 20 vans.

**Tioga Marine Terminal**

The terminal is located in Northeast Philadelphia and handles containers, refrigerated fresh fruit, paper, plywood, cocoa beans, autos, palletized, project, breakbulk, steel and automobiles. The terminal has an area of 96.5 acres and has 6 berths that are 3,822 linear ft in length and 36 feet deep and 1 RO/RO. The terminal has 4 sheds: 1 compartmented 300,000 sq. ft. warehouse: 150,000 sq. ft. refrigerated, 150,000 sq. ft. heated; 1 cold storage - 90,000 sq. ft. with racked storage for 6,000 pallets; 1 heated storage - 97,500 sq. ft. and 1 dry - 40,000 sq. ft. The terminal has 180 reefer outlets, and 2 kocks container gantry cranes: each 45 short tons (40.9 metric tons); with hydraulic and mechanical mobile cranes available container cranes. It also has canopied loading platforms for 100 trucks and 8 T.I.R. lanes for truck gates; 3 with scales. The terminal has fumigation capabilities for 800,000 fruit boxes a day; trailer offices for customers and 2,000 ft. of rail siding for intermodal COFC transfer.<sup>5</sup>

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<sup>5</sup> Philadelphia Regional Port Authority: <http://www.philaport.com/history.htm>

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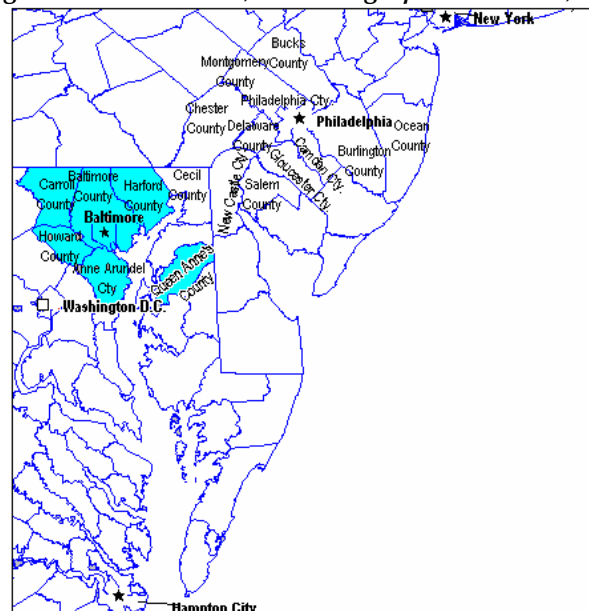


# 16. Baltimore, MD

## Location and Background Information

The Port of Baltimore is located in the Baltimore-Towson, Maryland Metropolitan Statistical Area (MSA). Strategically located in the Mid-Atlantic region of the U.S. east coast, Baltimore sits in the center of the enormous Washington/Baltimore Common Market. This inland location makes it the closest Atlantic port to major Midwestern population and manufacturing centers and a day's reach to 1/3 of U.S. households. The port provides immediate access to the 6.8 million people in the Washington/Baltimore region, the nation's fourth-largest and one of the wealthiest consumer markets in the U.S. <sup>1</sup>

*Figure 16-1. Baltimore, MD: Geographic Location, 2000*



Source: Table 3-1

## Demographics

### POPULATION

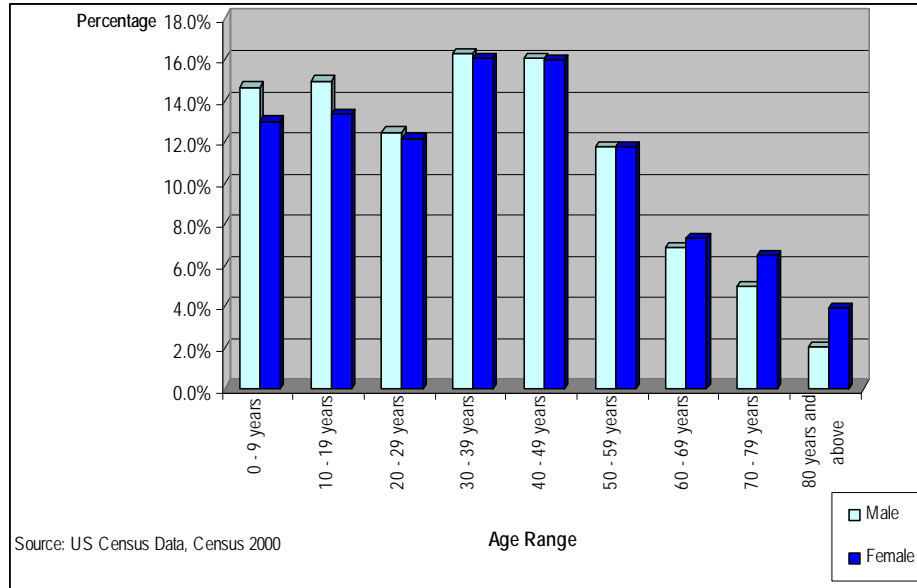
The total population of the Baltimore-Towson, MD Metropolitan Statistical area is 2,552,994 according to the 2000 US Census. Of the total population, 1,228,231 or 48.1 percent are males and 1,324,763 or 51.9 percent are females. The median age for the population is 36.3 years; 35.1 for males and 37.4 for females. The majority of the population is located between the 30 - 39 and 40 - 43 age range brackets; this in the case of males and females (Figure 16 -2).

The majority of the population in this area is white (67.4 percent), followed by the Black or African American population, which represents 27.2 percent of the total population. The Asian population represents 2.7 percent of the total population, and 'others' (which include American Indians, Alaska

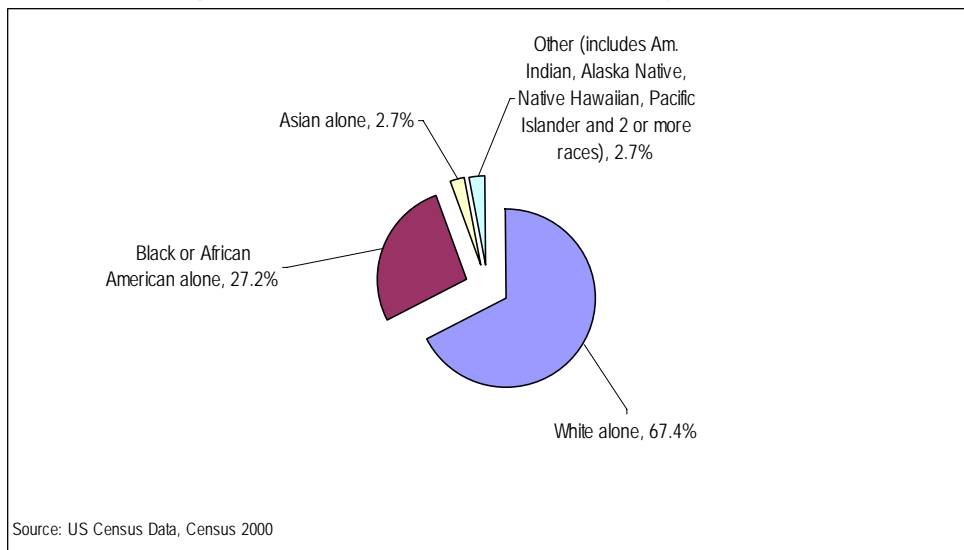
<sup>1</sup> Source: Maryland Department of Transportation. URL: <http://www.mdot.state.md.us>

natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone) constitute 2.7 percent of the population as well (Figure 16-3). In terms of ethnic makeup, only 2.0 percent of the population of this MSA is of Hispanic or Latino origin.<sup>2</sup>

**Figure 16-2. Baltimore, MD: Structure of the Population by Age Group, 2000**



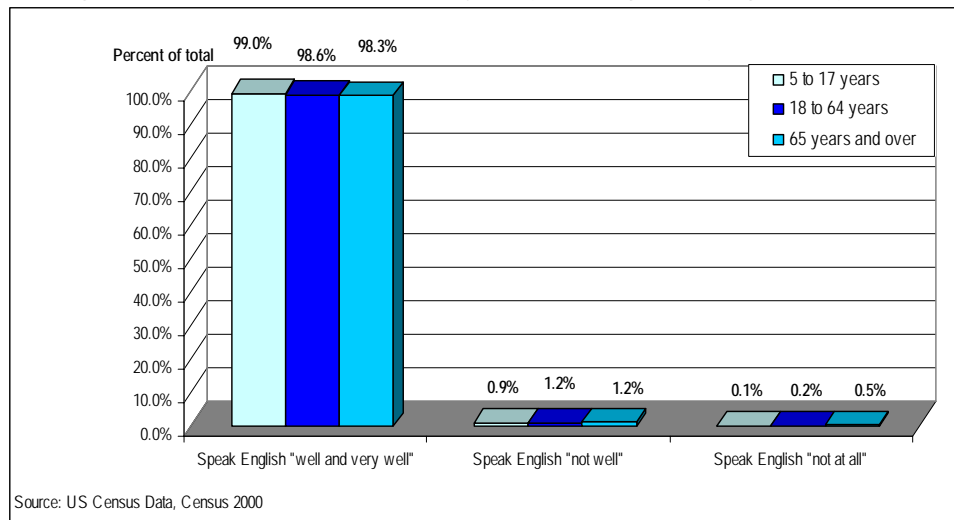
**Figure 16-3. Baltimore, MD: Population by Race, 2000**



<sup>2</sup> Source: US Census Data, US Census 2000

It is evident from the data specified in Figure 16-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

**Figure 16-4. Baltimore, MD: Ability to Speak English by Age Group, 2000**

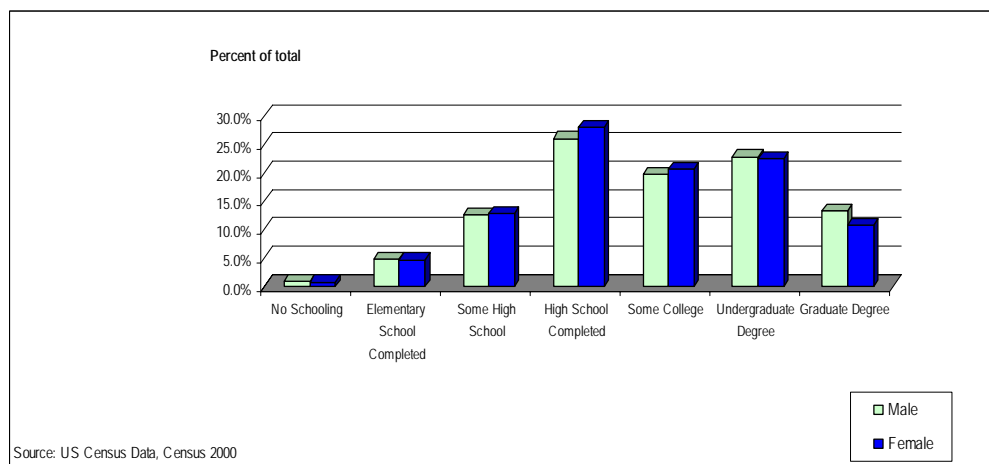


## EDUCATION

Of the population in the region, ages 25 and over, about 25 - 27 percent of the population has completed high school and a high percentage has also either completed some college or obtained an undergraduate degree. Approximately 10 - 15 percent of the population has obtained a graduate degree; males more so than females, but only by a small percentage (Figure 16-5).

Maryland has 24 four-year colleges and universities, 4 two-year colleges and 120 private career schools approved by the Maryland Higher Education Commission.<sup>3</sup> About half of the four-year colleges are located within the Baltimore-Towson, MD MSA. One of the best known universities in the area is Johns Hopkins University, especially known for its excellent medical school.

**Figure 16-5. Baltimore, MD: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



<sup>3</sup> Source: Maryland State Archives. URL: <http://www.mdarchives.state.md.us>

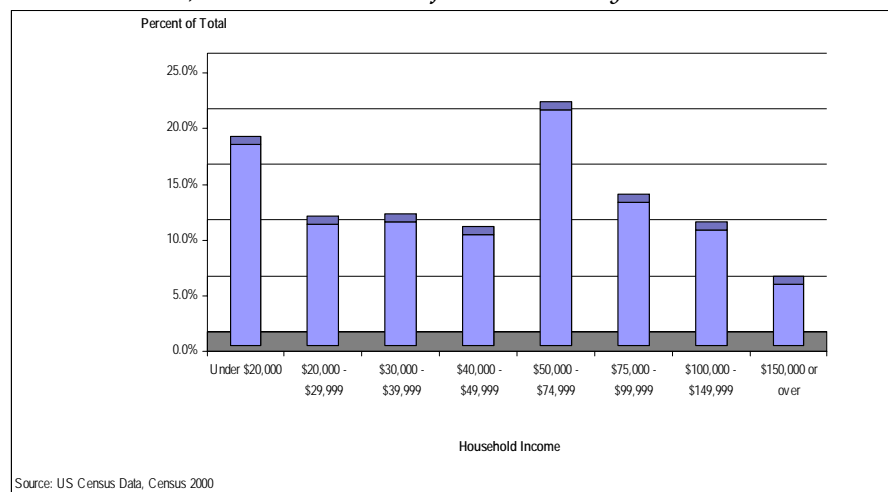
## Socio-Economic Characteristics

### INCOME

As portrayed in Figure 16-5, about 22 percent of the households in this area in 1999 had incomes between \$50,000 and \$74,999. Nearly 20 percent of households had incomes under \$20,000. Less than 7 percent of households in the region had incomes of \$150,000 or over (Figure 16-6).

Household median income in Baltimore, MD in 1999 was \$50,572.21 and per capita income in the same year was \$24,398.48. The region is considered to be among the country's wealthiest. Maryland has the second highest household income in the nation.<sup>4</sup> The percentage of people under the poverty line in the region was 9.8 in the year 2000. Average household size in 2000 was 2.6.<sup>5</sup>

*Figure 16-6. Baltimore, MD: Distribution of Households by Household Income Level, 1999*



### EMPLOYMENT

Of the employed civilian population in the Baltimore-Towson, MD MSA, ages 16 or over, nearly 35 percent of females were employed in the educational, health and social services industry and almost 25 percent were employed in 'other' industries, including the arts, recreation, entertainment, food services, public administration and information. Nearly 25 percent of males are employed in 'other' industries and 15 percent are employed in the wholesale and retail trade industry (Figure 16-7).

An estimated 4.8 percent of males and 5.1 percent of females were unemployed in the region in 2000.<sup>6</sup>

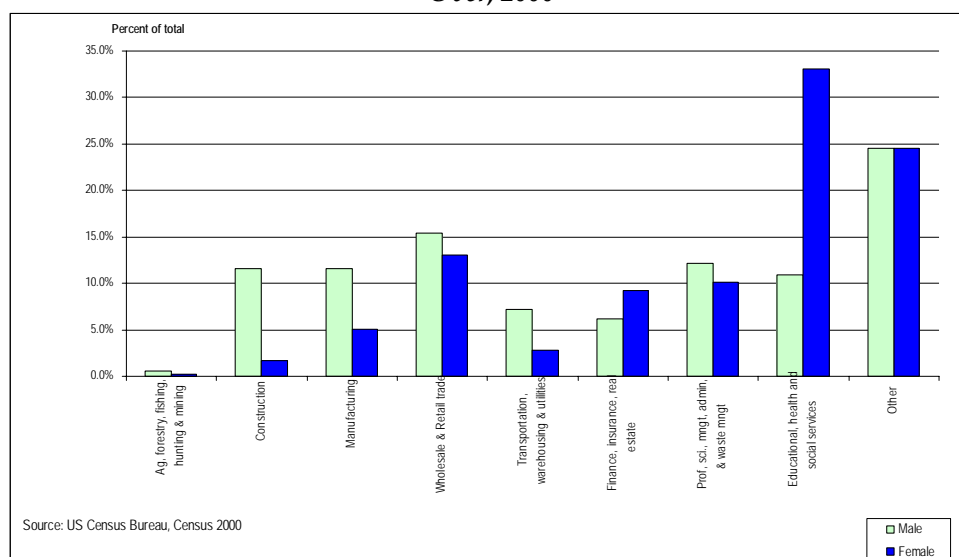
According to the 2000 US Census, an estimated 0.2 percent of males and 0.1 percent of females are employed in farming, fishing and forestry occupations. About 15.6 percent of males and 4.5 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.5 percent of male's occupations and 0.1 percent of female's occupations.

<sup>4</sup> Source: Maryland Department of Transportation. URL: <http://www.mdot.state.md.us>

<sup>5</sup> Source: US Census Data, Census 2000

<sup>6</sup> US Census Data, Census 2000

**Figure 16-7. Baltimore, MD: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION



The Port of Baltimore is regarded as one of America's top container terminals, providing technological advances that have transformed port operations from clipboard to keyboard. The port boasts computerized gate complexes, hand held computers and scanners and the use of Electronic Data Interchange (EDI)-all which greatly increase the port's efficiency and cost-effectiveness.

The Port of Baltimore is a significant economic engine for the entire region, generating \$1.5 billion in revenue annually and employing 16,100 Marylanders in direct jobs, and another 17,600 in Induced and Indirect jobs. Port-related jobs are diverse and include everything from truck drivers, longshoremen, tugboat operators, and rail yard workers, to employees of the Maryland Port Administration (MPA). The MPA is charged with stimulating the flow of waterborne cargo through the entire port community, maintaining the terminals, and marketing the Port of Baltimore worldwide.

Other governmental agencies, such as U.S. Customs and the Army Corps of Engineers, along with the private sector with its variety of businesses, play a vital role in making the Port of Baltimore successful. From freight forwarders to bay pilots to warehouse operators- all contribute to making the Port of Baltimore efficient, cost effective and easy to use.

The port of Baltimore has six public terminals and seven private terminals. The public terminals are the following:

### Seagirt Marine Terminal

The Seagirt Marine Terminal stands as a working monument to the Port of Baltimore's innovative and progressive spirit. Opened in 1990, Seagirt features the latest in cargo-handling equipment and systems. The design behind this high-tech facility system stems from one simple principle: keep the cargo moving. The computerized gate complex serves as the nerve center for the 275-acre container terminal. Seagirt's automated system consolidates the steps necessary to generate the Trailer

Interchange Report (TIR). When trucks enter Seagirt, an electronic sign-bridge over 13 of the 14 inbound lanes directs the drivers to the appropriate lane, where a remote intercom system allows them to quickly exchange information with clerks in the gate house.

Seagirt's hours and 14 portals make ingress for trucks quick and easy. The newly-enhanced NAVIS system allows truckers, forwarders, and brokers to access the exact status of their container and will even send an email notifying them when it is ready for pick-up. The Seagirt computer system's electronic data interface capabilities automatically receive and send information to the terminal's steamship line customers. With just a few keystrokes, the carriers receive instantaneous information on the cargo and equipment, helping them generate timely reports that can boost their efficiency.

The \$220-million terminal's seven 20-story high-speed computerized cranes dominate the port's skyline. In the hands of the port's skilled International Longshoremen's Association (ILA) operators, these 100-foot gauge, post-Panamax cranes are among the most productive in the industry, averaging 33 to 35 containers an hour.

Three of the cranes feature the latest dual-hoist systems, which lift two containers simultaneously to expedite the loading and discharge of the vessel. Capable of handling 150,000 containers a year, Seagirt's practical yard layout places the storage area directly behind the berths, further increasing the productivity of the vessel loading and discharge operations.

Further enhancing Seagirt's efficiency is the adjacent Intermodal Container Transfer Facility, which brings the railhead to within 1,000 feet of the bulkhead and makes the Seagirt complex the port's intermodal hub. The port's progressive labor-management approach complements Seagirt's advanced equipment, technology and systems to further its reputation as one of the nation's most productive terminals.

#### **Dundalk Marine Terminal**

With 13 berths, 9 container and two gantry cranes and direct rail access, the 570-acre terminal remains the Port of Baltimore's largest and most versatile general cargo facility. Dundalk handles cargo equipment such as containers, automobiles, farm, construction, wood pulp, steel, breakbulk, project cargo and other Roll On/Roll Off (RO/RO) equipment.

APM Terminals, Inc. operates a private terminal within Dundalk, further enhancing the port's efficiency. Opened in 1993, this private terminal features many of the same automated efficiencies first introduced to the port in 1990 at the Seagirt Marine Terminal, which is generally regarded as the finest container terminal in the country. Maryland International Terminals (M.I.T.) also operates a private container terminal within Dundalk.

Approximately 135 acres, these "terminals within a terminal" (APM and MIT) includes computerized gate complexes that consolidate and improve the Trailer Interchange Report (TIR) process. Using remote intercom systems, truck drivers can communicate directly with clerks in the gatehouse, who instantaneously type the necessary information into a computer. The enhanced NAVIS system also enables truckers, forwarders, and brokers to access the status of specific containers, for up-to-the-minute information.

Over the past several years, Baltimore ranked as one of the nation's top three automobile handling ports. Several auto processors maintain operations at Dundalk, which offers 152.2 acres of storage. Dundalk's direct rail access also allows unit trains to routinely deliver dozens of units of farm and/or construction equipment to the terminal at once. Combined with rail access provided by Norfolk Southern and CSXT, Dundalk's size makes it ideal for handling large breakbulk and project cargo. The terminal's expansive covered storage space can easily house weather-sensitive cargoes such as high-quality steel coils, raw rubber, and wood pulp, one of the fastest-growing cargoes at the port.

The Port of Baltimore recently invested \$21 million on crane upgrades at Dundalk. A container crane with a top capacity of 40 containers per hour. Improvements to the speed and capacity of existing cranes. Outreach was increased to 126 feet, so the outermost container row on a Panamax ship can now be reached at full trolley speed. A new heavy lift crane. The truck-mounted Manitowoc M-250T boasts a maximum capacity of 300 long tons, and its mobility makes it available at any of the Port of Baltimore's terminals on an as-needed basis.

#### **N. Locust Point**

Over the past century, North Locust Point has adapted and changed to meet the varied needs of the port. It has welcomed immigrants, served as a cargo pier for the Baltimore & Ohio Railroad, and handled many different types of breakbulk and liquid and drybulk cargoes. Today, the 90-acre terminal has been redeveloped to enhance the port's forest products capabilities. The addition of a 45 long ton (45.7 M.T.) container crane, coupled with on-dock rail access, allows for the smooth loading and discharge of steel directly between vessel and rail car. The addition of the container crane boosts the efficiency of the terminal's container operations, while two 75-ton (68 M.T.) gantry cranes provide the heavy-lift capability needed for large breakbulk and project shipments.

North Locust Point provides water access for one of the port's grain elevators, and is home to several latex importers. The terminal has ample storage capacity. With 19 acres (7.9 ha) of outside space and two sheds with a combined 365,206 square feet (33,275 square meters), North Locust Point can easily accommodate the storage of steel, breakbulk and project cargoes. While North Locust Point has changed many times in its proud history, one constant remains: its ability to meet the varied needs of the port's customers.

#### **S. Locust Point**

While all of the port's general cargo terminals enjoy excellent highway access, South Locust Point has Interstate 95 -- the "Main Street" of the East Coast -- literally running past its front door. From South Locust Point, trucks can travel almost anywhere in the country without hitting a single traffic signal. The Maryland Port Administration (MPA) opened South Locust Point in 1979 to meet the growing needs of the port's customers. South Locust Point can handle any type of general cargo.

The MPA completed a major expansion of South Locust Point in 1988, doubling the size of the terminal to almost 80 acres and creating four general cargo berths. The multi-million-dollar project increased the terminal's productivity and efficiency by developing another container berth and adding a third container crane. South Locust Point features three 40-long ton (40.6 M.T.) container cranes, as well as a 100-short ton (90.7 M.T.) revolving gantry crane for handling heavy breakbulk and project cargoes. The facility's size and versatility make it ideally suited to handle the needs of medium-sized steamship lines, multi-purpose vessels and any cargo that needs to hit the road in a hurry.

#### **Fairfield Auto Terminals**

Together with automobiles and light trucks, tractors, agricultural vehicles, trucks, wheeled cranes, and the like make Baltimore the number one port in the United States for handling "Ro/Ro." The "Fairfield" area of the port includes four specialized terminals for handling and processing autos, light trucks and similar ro-ro cargo.

Currently, an MPA facility exists, 44.1 acres in size with 50,000 square ft. of modern building space, for processing autos and light trucks. Typically, this includes accessorizing, minor repair operations and final dealership preparation. The terminal is adjacent to a public berth, also owned by MPA. A vessel discharging new vehicles can berth within a few hundred feet of the facility. A second facility, owned by MPA and leased to ATC Logistics of Maryland, is Masonville Marine Terminal. This state-of-the-art facility consists of nearly 50 acres, with a 94,000 sq. ft. building, also designed for processing automobiles. Access is a mere half mile from the vessel. Plans are underway to add an additional berth to the site.

Amports owns and operates two other terminals in this area. These are the Atlantic Terminal, 55 acres with its own pier facility, and Chesapeake Terminal, 70 acres with an additional 26 planned for development. The Port's famous QCHAT Program, Quality Cargo Handling Action Team, is based at the Atlantic facility.

### **Intermodal Container Transfer Facility**

The Port of Baltimore's Intermodal Container Transfer Facility (ICTF) moves cargo between bulkhead and railhead in record time. Adjacent to Baltimore's modern Seagirt Marine Terminal, the 70-acre ICTF allows cargo to catch a train to almost anywhere. CSX Intermodal (CSXI) operates the port's on-dock railyard, which has steadily increased its volume since opening in 1988. Baltimore's ICTF has quickly emerged as an integral link in CSXI's impressive nationwide intermodal system.

With six trains daily, CSXI offers direct service to the Southeast and Midwest, and connections to the rest of the continental United States and Canada. CSXI also operates a service between the ICTF to Montreal and Toronto. The Seagirt ICTF offers double-stack capability, as well as providing shippers and steamship lines with reverse landbridge opportunities to the rest of the country.

The dedicated truck entrance of the automated pre-check system speeds the pick-up and delivery process for cargo. The facility features a separate gate for domestic shipments. The Seagirt ICTF uses the latest in intermodal equipment and a skilled labor force to keep the ICTF running efficiently. Two transtainers -- rubber-tired gantry cranes which straddle the rail tracks -- facilitate the rapid loading and discharge of two trains simultaneously. Toploaders are used to mount and dismount containers to and from chassis.

With its location adjacent to the Seagirt Marine Terminal, cargo flows effortlessly between the two facilities, while the intra-terminal Colgate Creek Bridge connects the Seagirt, the port's largest general cargo facility. In 1992, the International Longshoremen's Association, whose members supply the facility's labor force, and the Steamship Trade Association of Baltimore agreed to an unprecedented five-year agreement contract that adds a third shift, allowing the ICTF to operate 24 hours a day, seven days a week.

### **Private Terminals:**

The Rukert Marine Terminal specializes in metals, ores, fertilizers, alloys; the Sparrows Point Terminal is a bulk and breakbulk loading & unloading facility; the Baltimore Metal & Commodities Terminal specializes in metals, soft commodities & project cargo; Highland Marine Terminal; the CNX Marine Terminals, Inc. specialize in bulk, breakbulk, project and general cargo, stevedoring and lay berthing; the Terminal Corporation has more than a century of experience handling unitized, break bulk and project cargoes and the Westway Terminal Company, Inc. specializes in the handling of agricultural products, molasses products, and chemicals.

The City of Baltimore Foreign-Trade Zone (FTZ) number 74 was established in 1982. Since its establishment, the growth of the FTZ in Baltimore has caused both expansion and modification due to a number of requests and in response to the tremendous benefits to certain industries. This growth, in turn, has created job, additional cargo tonnage for the port and increased the tax base of the community. Zone space was originally 60,000 sq. ft. in 1982 and presently contains over 1,400 acres at 11 sites in the city of Baltimore. As documented in the 2000 Annual Report, the General Purpose Zone and Sub-Zone of FTZ #74 provided over 970 jobs and served 92 users during fiscal year 2000; handling 37 different commodities from 45 countries of origin with a value in excess of \$15 million.<sup>7</sup>

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<sup>7</sup> Source: Maryland Department of Transportation website: <http://www.marylandports.com/>

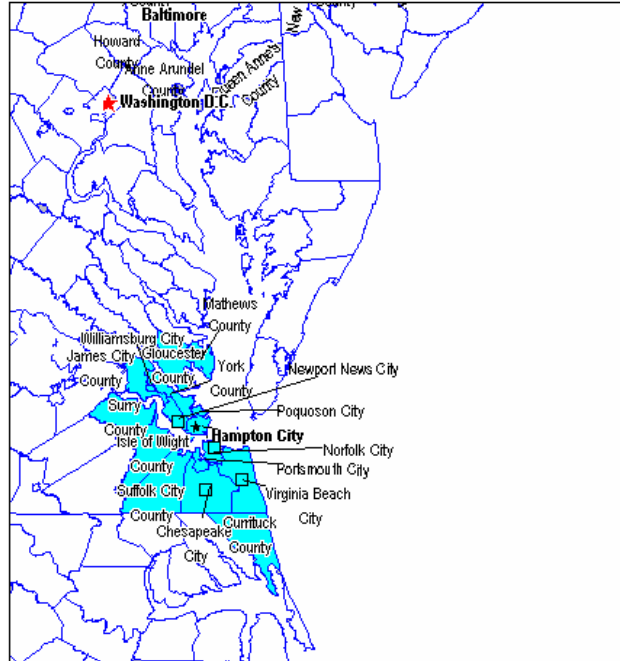


# 17. Hampton Roads, VA

## Location and Background Information

The Port of Hampton Roads is located in the Virginia Beach-Norfolk-Newport News, Virginia- North Carolina Metropolitan Statistical Area (MSA).

*Figure 17-1. Hampton Roads, VA: Geographic Location, 2000*



Source: Table 3-1

## Demographics

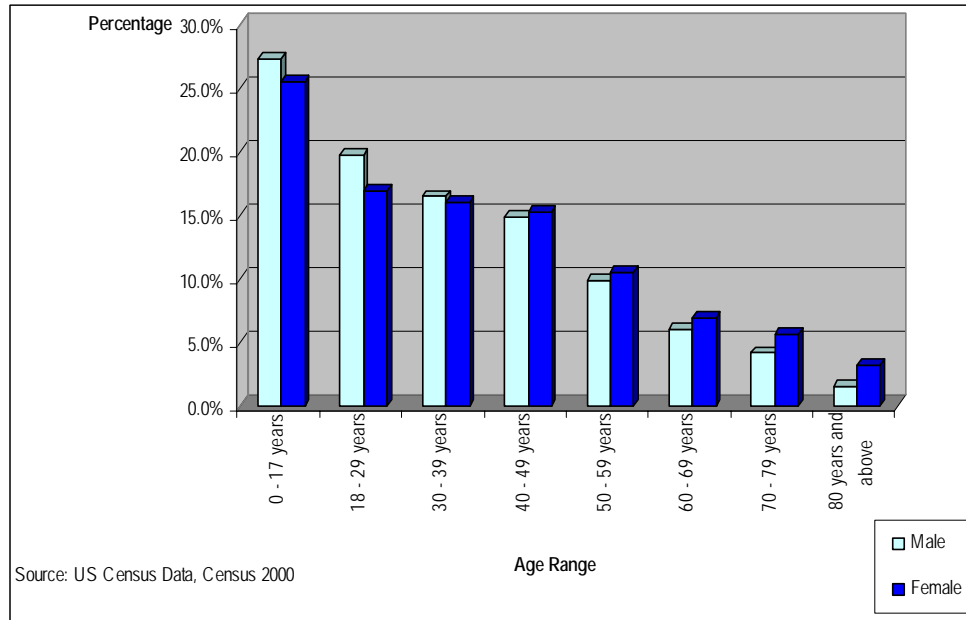
### POPULATION

The total population of this MSA in the year 2000 was 1,576,370, according to the 2000 US Census. Of this total, 776,342 or 49.2 percent were males and 800,028 or 50.8 percent were females. The median age for the population in the same year was 33.5 years; 32.1 for males and 35 for females. As shown in Figure 17-2, almost 20 percent of males and over 15 percent of females are between the ages of 18 and 29. Around 15 percent of males and females are between the ages of 30 and 39.

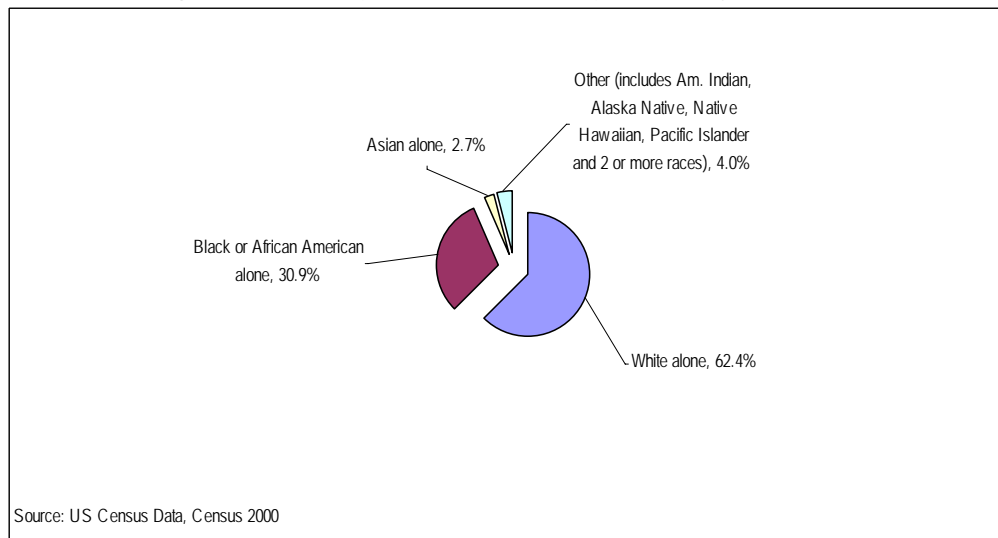
About 62.4 percent of the population in the region is white, 30.9 percent is Black or African American, 4.0 percent are considered 'others' (include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone), and 2.7 of the population is Asian (Figure 17- 3). In terms of ethnic makeup, 3.1 percent of the total population is considered to be of Hispanic or Latino origin.<sup>1</sup>

<sup>1</sup> US Census Data, Census 2000.

**Figure 17- 2. Hampton Roads, VA: Structure of the Population by Age Group, 2000**

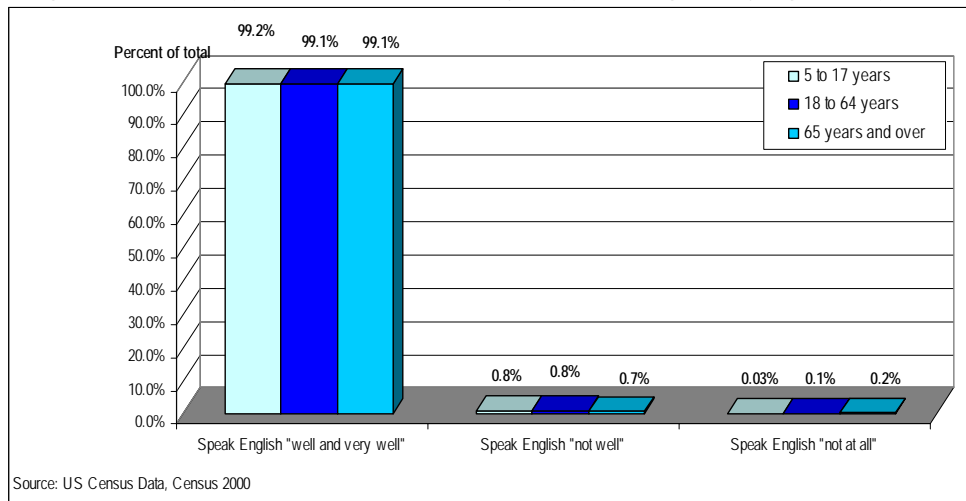


**Figure 17- 3. Hampton Roads, VA: Population by Race, 2000**



It is evident from the data specified in Figure 17- 4 that most of the population in all age ranges in the area dominates the English language ‘well’ and ‘very well’.

**Figure 17- 4. Hampton Roads, VA: Ability to Speak English by Age Group, 2000**

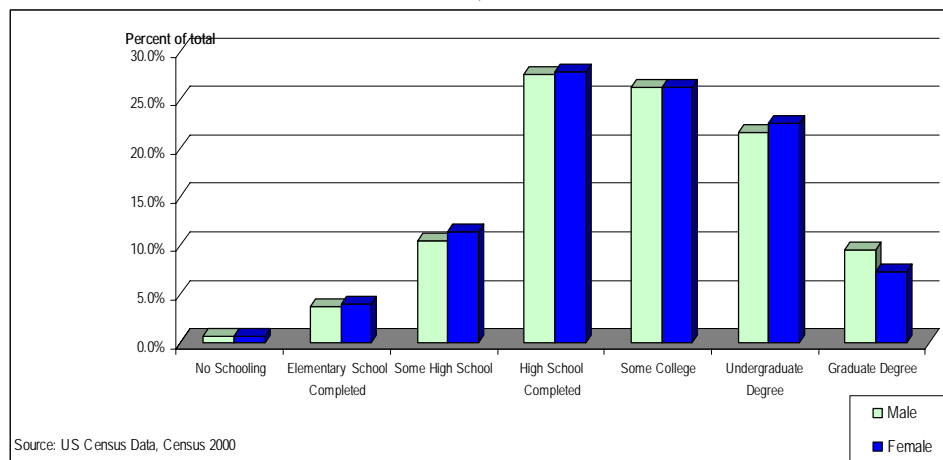


## EDUCATION

Of the population in the region, ages 25 and over, over 25 percent of males and females have completed high school, and about 25 percent have completed some college. Around 20 percent of males and females have obtained an undergraduate degree. Less than 10 percent of the population has obtained a graduate degree (Figure 17-5).

Some of the colleges and universities around the area are: Atlantic University, College of William and Mary, Eastern Virginia Medical School, Hampton University, Johnson & Wales University, Norfolk State University, Regent University and Virginia Wesleyan College. There are four military bases in the area: Fort Monroe, Fort Eustis, Langley AFB, Naval Station Norfolk. <sup>2</sup>

**Figure 17- 5. Hampton Roads, VA: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



<sup>2</sup> Hampton Roads, VA Community Profile: <http://www.epodunk.com>

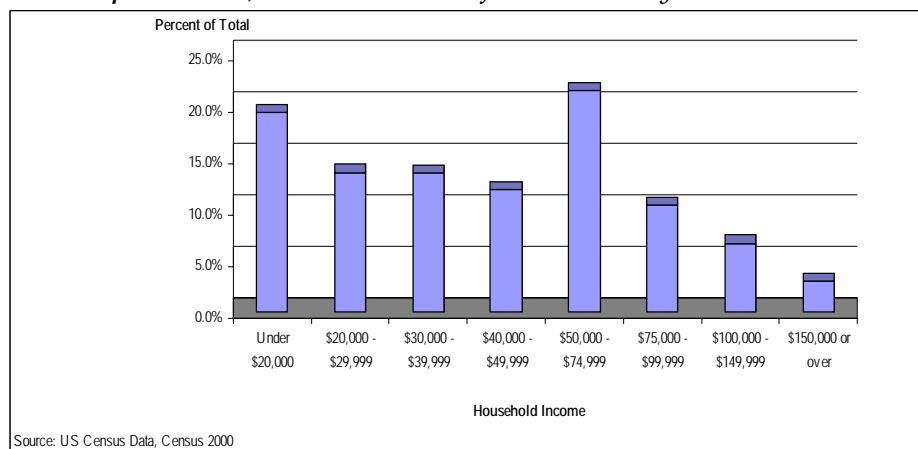
## Socio-Economic Characteristics

### INCOME

As portrayed in Figure 17-6, about 23 percent of the households' incomes in this area in 1999 fell in the \$50,000 - \$74,999 income bracket. Around 20 percent of households had incomes of under \$20,000. Less than 5 percent of households in the region had incomes of \$150,000 or over.

Household median income in Hampton Roads in 1999 was \$43,085.86 and per capita income in the same year was \$20,312.54. The percentage of people under the poverty line in the region was 10.6 in the year 2000. Average household size in 2000 was 2.61.<sup>3</sup>

**Figure 17- 6. Hampton Roads, VA: Distribution of Households by Household Income Level, 1999**



### EMPLOYMENT

Of the employed civilian population in the region, ages 16 or over, over 35 percent of females are employed in the educational, health and social services industry, and nearly 20 percent are employed in 'other' industries, including the arts, recreation, entertainment, food services, public administration and information. Twenty-five percent of males are employed in 'other' industries, 15 percent are employed in the manufacturing industry and 15 percent are employed in the wholesale and retail trade industry (Figure 17-7).

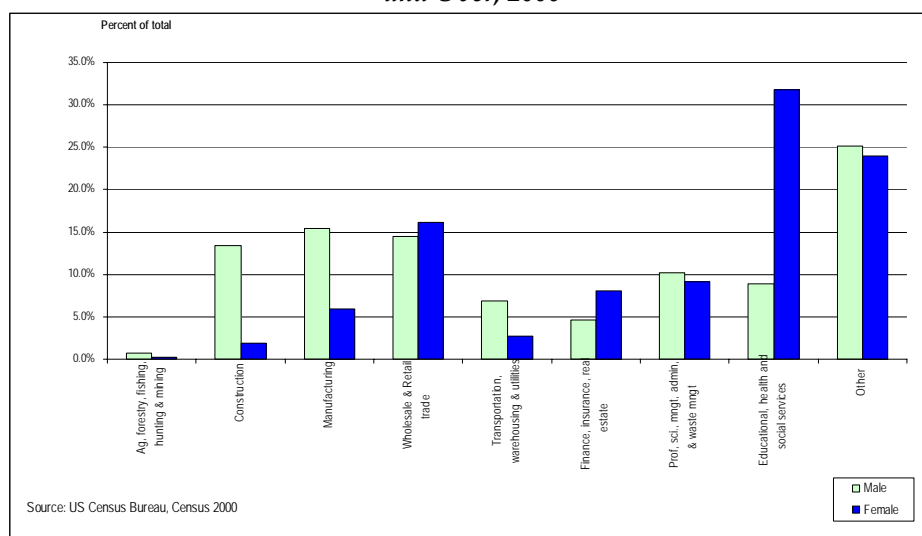
An estimated 4.4 percent of males and 5.8 percent of females were unemployed in the region in 2000.<sup>4</sup>

According to the 2000 US Census, an estimated 0.4 percent of males and 0.2 percent of females are employed in farming, fishing and forestry occupations. About 17.5 percent of males and 6.4 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.9 percent of male's occupations and 0.1 percent of female's occupations.

<sup>3</sup> US Census Data, Census 2000.

<sup>4</sup> US Census Data, Census 2000.

**Figure 17-7. Hampton Roads, VA: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION



The Virginia Port Authority is an agency of the Commonwealth of Virginia, reporting to the Secretary of Transportation. It is the state's leading agency for international transportation and maritime commerce, charged with operating and marketing the marine terminal facilities through which the shipping trade takes place. The agency owns four general cargo terminals: Norfolk International Terminals, Portsmouth Marine Terminal, Newport News Marine Terminal, and the Virginia Inland Port in Front Royal; which are operated

by its affiliate, Virginia International Terminals, Inc.

Hampton Roads is served by the Port and its three Marine Terminals located in Norfolk, Newport News and Portsmouth. More than 95 percent of the world's shipping lines call on the Port of Hampton Roads, linking Virginia to more than 250 ports in over 100 world-wide locations. It is the second busiest general cargo port on the East Coast, handling over 39 million tons of cargo annually 50 feet of deep ice-free harbor. The Port purchased 8 of the world's largest and fastest cranes, each capable of moving up to 40 fifty-ton containers per hour. During the past 12 years, general cargo handled by the port increased by more than 30 percent, and it is forecasted to further increase 300 percent by 2010.<sup>5</sup>

Virginia's strategic mid-Atlantic location and unparalleled transportation infrastructure offer steamship lines and shippers unbeatable access to two-thirds of the U.S. population with more than 75 international shipping lines and one of the most frequent direct sailing schedules of any port. Virginia has the best natural deepwater harbor on the U.S. East Coast. Fifty-foot-deep, unobstructed channels provide easy access and maneuvering room for the largest of today's container ships. Virginia ports are located just 18 miles from the open sea on a year-round, ice-free harbor and have long maintained a reputation for efficient and uncongested intermodal service. As the largest intermodal facility on the U.S. East Coast, Virginia offers six direct-service trains to 28 major cities each day. More than 50

<sup>5</sup> <http://www.hreda.com/research/Port032005.pdf>

motor-carrier companies offer full freight-handling and load-consolidation services. A modern network of interstate and local highways permits fast, direct inland motor-freight transportation to any point in the United States.

The Port of Virginia has been a boon to Virginia and the world for nearly four centuries. From the early founding as "America's First Port" at Jamestown in 1607 through the era of the great clipper ships to the present day sophistication of computerized intermodal technology, Virginia has been at the forefront of every major change in the shipping industry.

In addition to the advantages offered by easy access to the open sea, the Port of Virginia is served by one of the nation's more efficient inland transportation networks. Cargo is transported with speed and efficiency by 30 miles of on-dock rail. Over 130 trucking companies and two of the nation's largest railroads, CSX and Norfolk Southern, enable the Port of Virginia to serve two-thirds of the U.S. population within 24 hours.

The Port of Virginia consistently ranks as one of the leading ports in the United States in terms of total foreign waterborne commerce. In terms of general cargo (containerized and break bulk cargo), our port is the second largest port on the U.S. East Coast, just behind New York/New Jersey. Between 1982 and 2001, general cargo tonnage at Virginia's state-owned ports increased from 2.5 million tons in 1982 to 11.5 million tons in 2001, an unmatched growth record among U.S. ports. In terms of total cargo (which includes container, break bulk and bulk cargo), the Port handled over 37 million short tons.

Many factors have contributed to the Port's phenomenal growth, but none is as important as unification of the ports in the Hampton Roads harbor. In 1981, the Virginia General Assembly passed landmark legislation designed to unify the ports under a single agency, the Virginia Port Authority, with a new single operating company, Virginia International Terminals, Inc. In the years preceding unification, ports in the Hampton Roads harbor were privately operated by competing companies, which caused sporadic, sustained growth and splintered marketing efforts. Unification has made the Port of Virginia the fastest growing port complex in the United States.<sup>6</sup>

### **Newport News Marine Terminal**

Newport News Marine Terminal (NNMT) has gained a reputation as the premier steel and project cargo handling port on the U.S. East Coast. NNMT boasts various heavy-lift crane capabilities, warehouse space, and container cranes. And NNMT now offers the advantages of a fully dedicated, on-terminal paper distribution facility, the Lydall Paper Distribution Center. The facility is operated by Lydall Distribution Services, Inc., a company with an outstanding reputation for its expertise in understanding the special nature and requirements of paper cargoes. The 100,000 square foot distribution warehouse will offer the transportation advantages of The Port of Virginia's on-dock rail and its competitive transportation infrastructure.

The terminal has an area of 140.64 acres with direct rail access and has on-pier trackage for direct cargo loading on and off ships to and from rail. The main Channel Depth is 45 feet. Pier B on the North side is 990 feet long and includes 170-foot mooring dolphins/catwalk. The south side is 620 feet long and 550 feet wide. It has three berths handling RO/RO cargo and breakbulk cargo and 34-foot aprons. The water depth on the north side is 32 feet; on the south side is 32 feet and offshore is 33 feet. The pier deck elevation (MLW) is 15.0 feet. Pier C on the North side is 935 feet long and 540 feet wide with 184-foot aprons for handling breakbulk cargo, serviced by two PACECO cranes; the water depth is 40 feet. The south side is 935 feet long, 540 feet wide, with 184-foot aprons for handling RO/RO and container cargo, serviced by one PACECO portainer crane and one CMI crane capable of a 182-LT heavy lift. The water depth is 36 feet and the pier deck elevation (MLW) is 14.5 feet. The terminal has covered Pier Storage: Pier B with 270,000 square feet and Pier C with 124,000 square feet; it has 256,000 square feet for dry storage. Its container storage has stacked capacity for 790 containers (two high) and

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<sup>6</sup> Hampton Roads Maritime Association webpage: <http://www.portofhamptonroads.com>

chassis capacity for 1,210 containers. The terminal has 43 acres for open yard storage. The terminal's roadway access is via Interstates 64 and 664 and U.S. Route 17; rail service provided by CSX

#### **Norfolk International Terminals**

Norfolk International Terminals (NIT) is the largest terminal. NIT is home to the world's largest container cranes. These Suez-class container cranes, each measuring 219 feet are the largest in the world. They can work ships with containers stacked 22 across, moving as many as forty 50-ton containers in an hour. Recently completed, NIT North has effectively doubled the cargo handling capacity of the terminal.

#### **Portsmouth Marine Terminal**

Portsmouth Marine Terminal (PMT) is the second largest terminal with respect to containership berth space. Among PMT's many cranes is the fourth Kone supercrane with lift capacity of 40 LT. PMT's versatility makes it excellent for handling containers, RO/RO and breakbulk cargo. Features of this terminal include refrigerator hook-ups, specialized warehouse space, fumigation facilities and straddle-carrier container stacking.

#### **Virginia Inland Port**

Operated as an intermodal container transfer facility, the Virginia Inland Port (VIP) provides an interface between truck and rail for the transport of ocean-going containers to and from The Port of Virginia. Containers are transported by truck to the VIP for immediate loading upon a rail car or for short-term storage prior to loading. Containers arriving from Hampton Roads terminals are unloaded from the train and dispatched by truck to inland destinations. Land is available to steamship lines for container storage and ancillary service companies.

The Port of Virginia is Foreign Trade Zone number 20. <sup>7</sup>

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<sup>7</sup> Virginia Port Authority webpage: <http://www.vaports.com>

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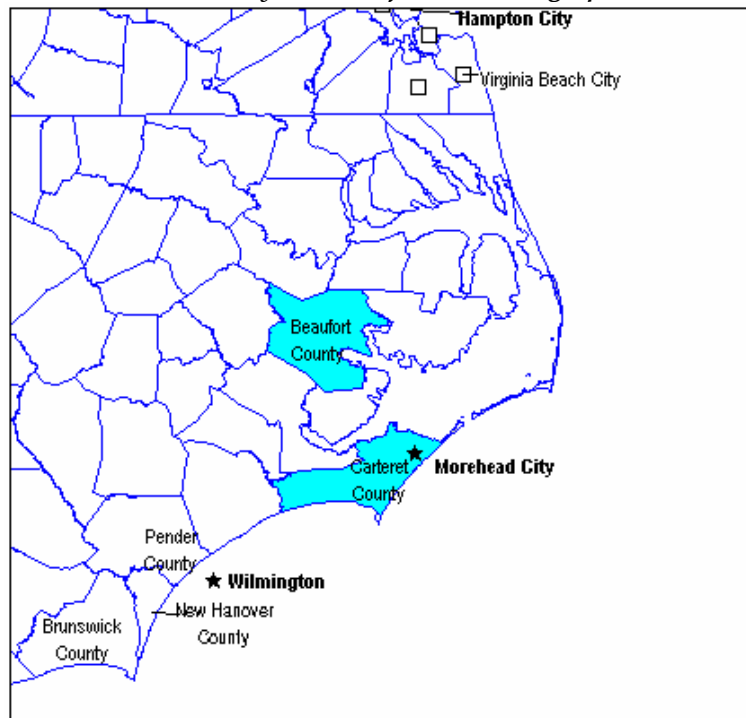


# 18. Morehead City and Beaufort, NC

## Location and Background Information

The Port of Morehead City and Beaufort, is part of the Morehead City, North Carolina and the Washington, North Carolina Micropolitan Statistical Areas.

*Figure 18-1. Morehead City and Beaufort, NC: Geographic Location, 2000*



*Source: Table 3-1*

## Demographics

### POPULATION

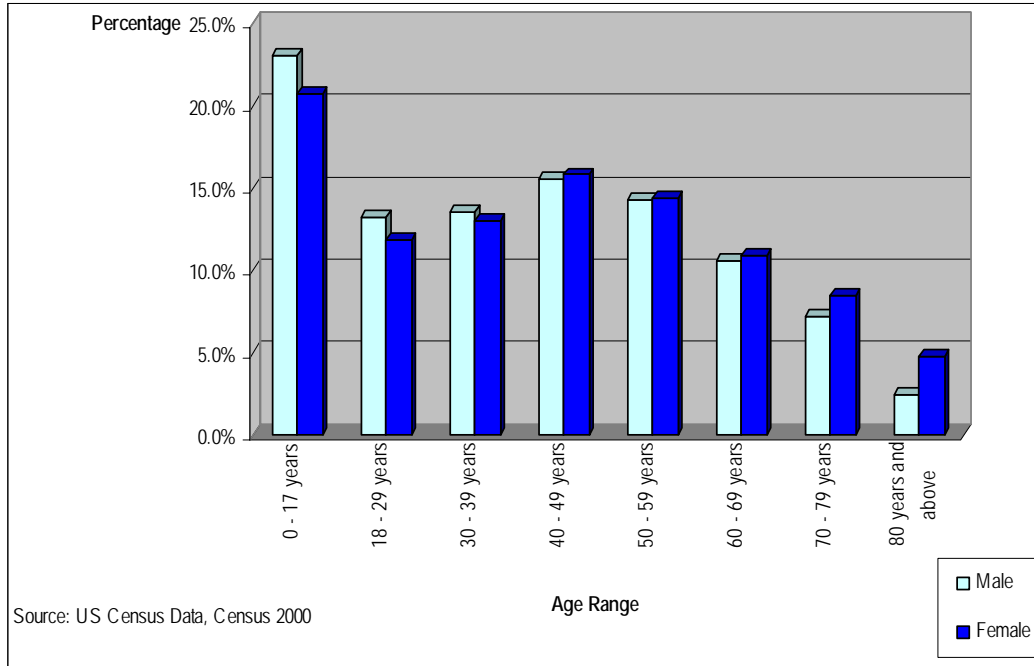
The total population of both Micropolitan Statistical Areas combined is of 104,341, according to the 2000 US Census. Of this total 50,595 or 48.5 percent are males and 53,746 or 51.5 percent are females. The median age for the region is 41.4 years; 39.9 for males and 42.7 for females. A little over 15 percent of the population falls within the 40-49 years age bracket, and about 14 percent falls within the 50 - 59 age bracket (Figure 18-2).

As portrayed by Figure 18-3, the majority of the population in the region is white (80.7 percent), followed by the Black or African American population (16.7 percent). 'Others' (include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone) represent 2.3 percent of the population. The Asian population represents only 0.4 percent of the total population. Moreover, in terms of ethnic makeup, 2.1 percent of the total population is considered to be of Hispanic or Latino origin.<sup>1</sup>

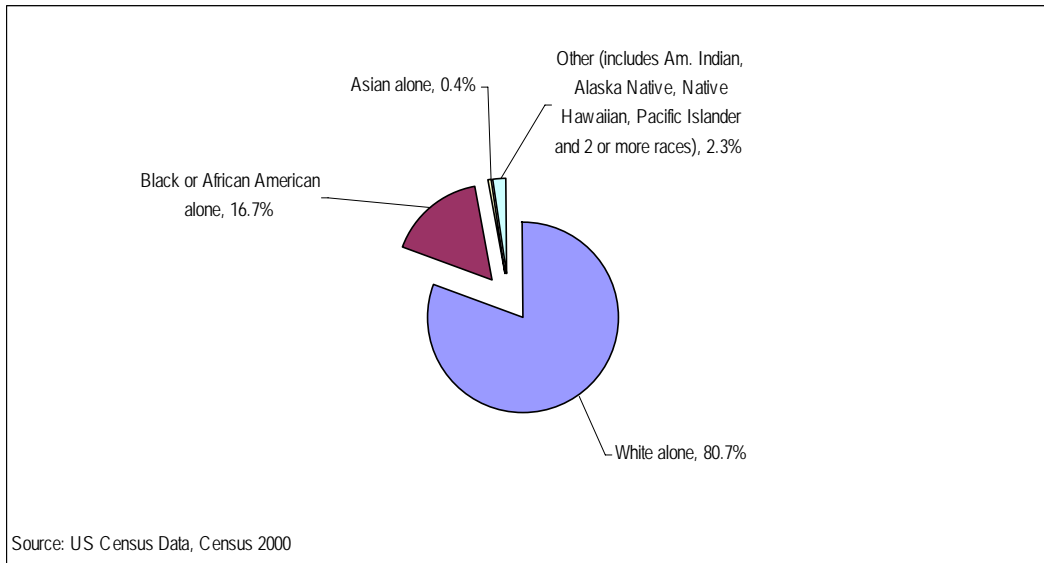
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<sup>1</sup> US Census Data: Census 2000.

**Figure 18-2. Morehead City and Beaufort, NC: Population by Race, 2000**

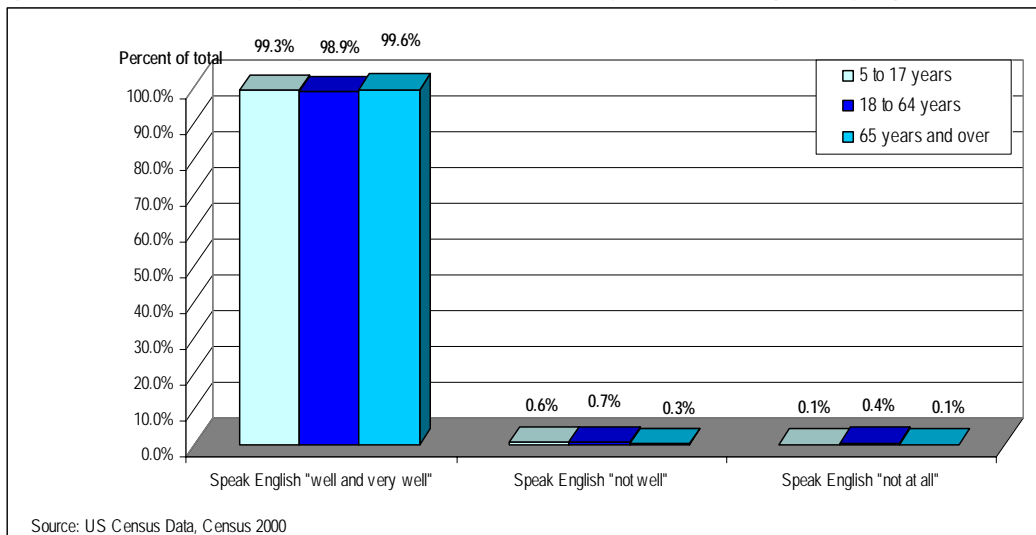


**Figure 18-3. Morehead City and Beaufort, NC: Population by Race, 2000**



It is evident from the data specified in Figure 18-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

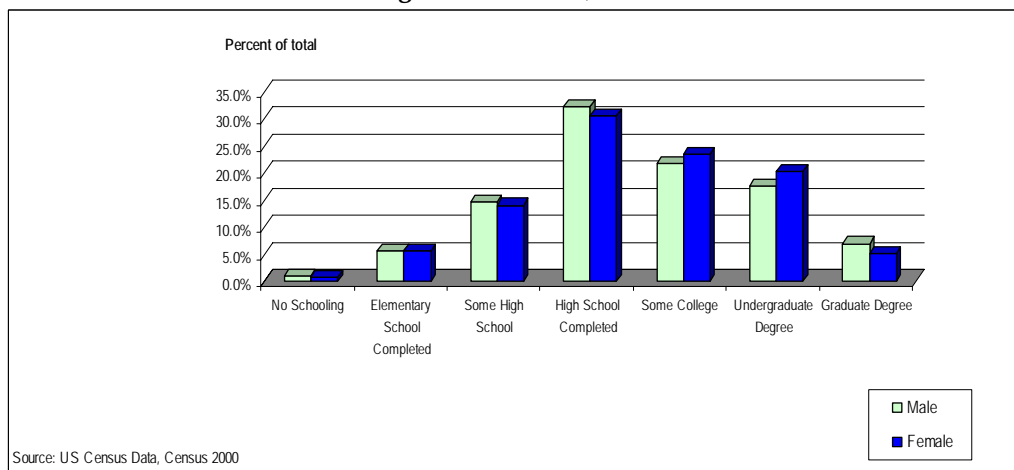
**Figure 18-4. Morehead City and Beaufort, NC: Ability to Speak English by Age Group, 2000**



## EDUCATION

It is evident by Figure 18-5, that of the population ages 25 and over, 35 percent of males and nearly the same percentage of females have completed high school. Around 25 percent of males and a bit over that percentage of females have finished some college and approximately 21 percent of males and 24 percent of females have obtained an undergraduate degree in the region. The only college in the area is Carteret Community College.

**Figure 18-5. Morehead City and Beaufort, NC: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



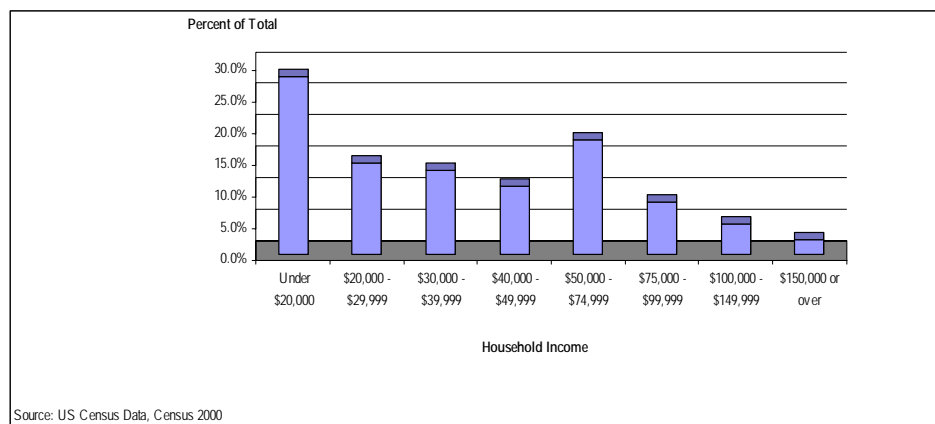
## Socio-Economic Characteristics

### INCOME

As revealed by Figure 18-6, 30 percent of households in these Micropolitan statistical areas have incomes of under \$20,000 and nearly 20 percent of households have incomes in the \$50,000 - \$74,999 income bracket. Less than 5 percent of households had incomes of \$150,000 or over.

Household median income in the region in 1999 was \$35,284.46 and per capita income for the same year was \$19,304.69. The percentage of people under the poverty line in the region was 14.5 in the year 2000. The average household size in 2000 was 2.36.<sup>2</sup>

*Figure 18-6. Morehead City and Beaufort, NC: Distribution of Households by Household Income Level, 1999*



### EMPLOYMENT

Of the employed civilian population aged 16 years or over in the region, 35 percent of working females are employed in the educational, health and social services industry. Nearly 24 percent of females are employed in other industries; these include the arts, entertainment, recreation, food services, public administration and information. The same percentage of males are employed in other industries as well. About 17 percent of males are employed in the construction industry, followed by males' participation in the manufacturing and wholesale and retail trade industries, which represent 15 percent each (Figure 18-7).

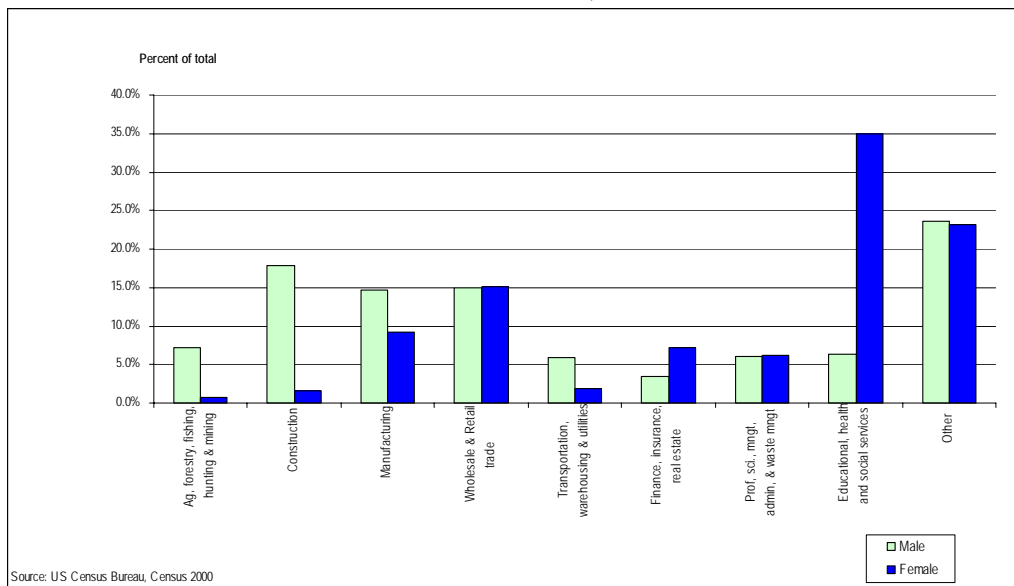
An estimated 4.9 percent of males and 6.1 percent of females were unemployed in the region in the year 2000.<sup>3</sup>

According to the 2000 US Census, an estimated 4.3 percent of males and 0.3 percent of females are employed in farming, fishing and forestry occupations. About 19.6 percent of males and 9.1 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 1.8 percent of male's occupations and 0.1 percent of female's occupations.

<sup>2</sup> US Census Data, Census 2000.

<sup>3</sup> US Census Data, Census 2000.

**Figure 18-7. Morehead City and Beaufort, NC: Employed Civilian Population by Sex and Industry  
16 Years and Over, 2000**



## MARITIME INFORMATION



The 45-foot channel at the Port of Morehead City makes it one of the deepest ports on the U.S. East Coast. Only 4 miles from the ocean, the port handles breakbulk and bulk cargo with access to Interstates 95 and 40 via U.S. Highways 70 and 17 and daily train service from Norfolk Southern. Across the Newport River from the port is Radio Island, a prime site for development. The Ports Authority is offering approximately 150 acres -

suitable for port industrial development, complete with municipal water and sewer and an NC-approved Environmental Impact Statement for marine terminal development.

With the volume of international trade expected to double by 2020, forward-looking businesses and industries can get ahead of the curve by taking advantage of the services offered by the North Carolina State Ports Authority. North Carolina's Ports of Wilmington and Morehead City, plus inland terminals in Charlotte and in the Piedmont Triad at Greensboro, are "ready, willing and able" to serve as competitive alternatives to ports in neighboring states for competitive access to the global markets. Owned and operated by the Ports Authority, North Carolina's port system combines modern facilities and abundant capacity with the commitment to excel in service to customers.

The Ports' central Eastern seaboard location is closest to the center of the southeast US market -- the fastest growing region in the country. The Ports Authority, along with the North Carolina Department of Commerce, is actively recruiting retail distribution centers to the state. Excellent sites are available for distribution center placement, as well as a labor pool well suited to fill materials handling positions. The North Carolina community college system has developed a course of study specifically

for retail distribution center training. Current and planned improvements in the regional transportation network provide a new platform for distribution when combined with upgraded capabilities at the Port of Wilmington to handle large quantities of imported goods. A unique NC Ports tax credit is also available to port users.

The seaport town of Morehead City is located on Bogue Sound on the coast of North Carolina and has become a popular fishing resort as well as the state's only deepwater port north of Wilmington. Across the Atlantic Intracoastal Waterway is the colonial fishing town of Beaufort and Atlantic Beach, Fort Macon, and Theodore Roosevelt Natural Area State parks are on Bogue Banks offshore. Inland you can explore the Croatan National Forest.

Morehead City was founded in 1853 by John Morehead, governor of North Carolina to be the projected terminus of the Atlantic and North Carolina Railroad, which duly arrived in 1858. It was captured by Union troops in 1862. The colonial seaport town of Beaufort, the third-oldest town in North Carolina, lies on Port Royal Island in the Barrier Islands on North Carolina's Outer Banks, just west of Cape Hatteras National Seashore. This picturesque seaside city, founded in 1715 on the site of an Indian village, was named after the 2nd Duke of Beaufort. Apart from its beautiful gardens, sights of interest include more than 100 colonial houses in the 21 block historic district, the town's Old Burying Ground and the Mariner's Museum which emphasizes the natural history of this coastal region. Spanish explorers first noted the harbour in 1520. In 1562, Jean Ribaut and his band of French Huguenots settled here and established the first Protestant colony in America. Like other settlements along the southeast coast, Beaufort was laid claim to by the Spanish, English, Scots, and Native Americans at one time or another. Beaufort Harbor was also the base of the pirate Edward Teach (Blackbeard) and his ship Queen Anne's Revenge.<sup>4</sup>

#### **Facilities**

The port is four miles from the open sea and is situated along the Newport River and Bogue Sound. It has 5,500 feet of continuous wharf and has two berths served by modern ship-loader and maximum loadout rate of 3,000 tons per hour of bulk cargo. It has a dry-bulk facility (used mainly for phosphate) with 225,000-ton capacity warehouse, conveyor system and shiploader and an open storage dry-bulk facility which can outload 1,000 tons per hour with a 2 million-ton annual capacity. The terminal has a concrete capped sheet pile bulkhead, solid fill with 1,000 psf concrete deck with rubber and/or timber fender system. The deck height averages 10 ft. above mean low water and apron widths from unrestricted to 45 ft. opposite transit sheds. It has Roll-on/Roll-off ramp and a well-lit terminal and 24-hour security provided by North Carolina State Certified Port Police, as well as a Barge Fleeting Area and 150 acres available for port industrial development on Radio Island.

There are two sites in the port approved as Foreign Trade Zone 67. Site One is 190,374 square feet of warehouse space within main terminal and Site Two is a 40-acre tract of undeveloped land, four miles west of the port. It [provides for storage, manipulation, exhibition and limited manufacturing operations and can lower, defer or avoid import duties; and can accommodate special purpose subzones.

The port has 457,564 sq.ft. of covered, sprinklered warehouse storage and 353,765 sq.ft. of transit shed storage; as well as rail access to warehouses and transit sheds and 14 acres of paved, open storage. There is a switching railroad operated by Carolina Rail Services and Norfolk Southern access. The berths are served by two surface tracks, two platform level tracks, and two depressed tracks at the rear of the transit sheds and covered railcar loading. There is additional railhead and railcar storage on Radio Island and west of Morehead City

Morehead City's first major port development came during the 1850's with a pier, warehouse and rail facility known as Pier No.1. Following the North Carolina tradition, it handled mostly naval stores and

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<sup>4</sup> URL: [http://www.choosingcruising.co.uk/cruiseweb/Cruises\\_Calling.asp?nCall=Morehead+City&nCat=P](http://www.choosingcruising.co.uk/cruiseweb/Cruises_Calling.asp?nCall=Morehead+City&nCat=P)

salt. Takeover by Federal troops during the Civil War and a damaging storm in 1876 further hampered the development of the Morehead City port for many years.

The argument for state-owned ports began in the 1920's, when North Carolina's economic development was handicapped because of higher freight rates than those charged by Virginia competitors - a situation partly due to the state's notable lack of adequate ports and water transportation. A referendum on spending \$8.5 million to improve the situation was defeated in 1924, with most of the Piedmont counties voting against it.

The value of deepwater ports was recognized by the state legislature in 1945 with the creation of the NC State Ports Authority. Its job: to create two competitive ports through the sale of revenue bonds. Its ultimate mission: to create a better atmosphere for the development of North Carolina industry.

The General Assembly in 1949 approved the issue of \$7.5 million in bonds for construction and improvement of seaports to promote trade throughout the state. Terminals equipped to handle oceangoing vessels were completed at Wilmington and Morehead City in 1952.

Their positions nearly midway between major competing ports in Virginia and South Carolina have made them more accessible to North Carolina traders. In fact, it was the Wilmington harbor's location near some of the state's earliest businesses - pine tar, rice and tobacco - that helped make the city the largest in the state until the early 1900's.

With ships came rail, and up until the 1960's, Wilmington was the headquarters of the Atlantic Coast Line Railroad - now part of CSX. During World War II, Wilmington was the site of major shipbuilding efforts - including an operation that built vessels out of concrete.

Now, times have changed, and so have the methods of shipping. And that has meant some major changes to keep the ports competitive. In the mid 1970's the Ports Authority bought two container cranes, eventually locating both at Wilmington. This multi-million dollar purchase of cranes the size of skyscrapers was deemed necessary because more and more cargo was being shipped in "boxes" - containers the size and shape of small mobile homes.

Morehead City has become a major port for phosphate products. And it can handle containers using its larger cranes in tandem. Wilmington, meanwhile, has acquired a total of five container cranes even as it ships wood products and other bulk and breakbulk commodities. To facilitate the growth in container traffic, two inland terminals were opened in the mid 1980's in Greensboro and Charlotte. The Ports Authority continues to remain competitive, with major projects planned at both facilities. At Morehead City, planning continues for expansion onto Ports Authority property on Radio Island. The Wilmington Harbor Deepening Project brought 42-foot deep water the entire length of the Cape Fear River navigational channel, from the ocean near Southport to the Port - readying the port for the larger ships of the future.<sup>5</sup>

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<sup>5</sup> North Carolina Ports website: <http://www.ncports.com>

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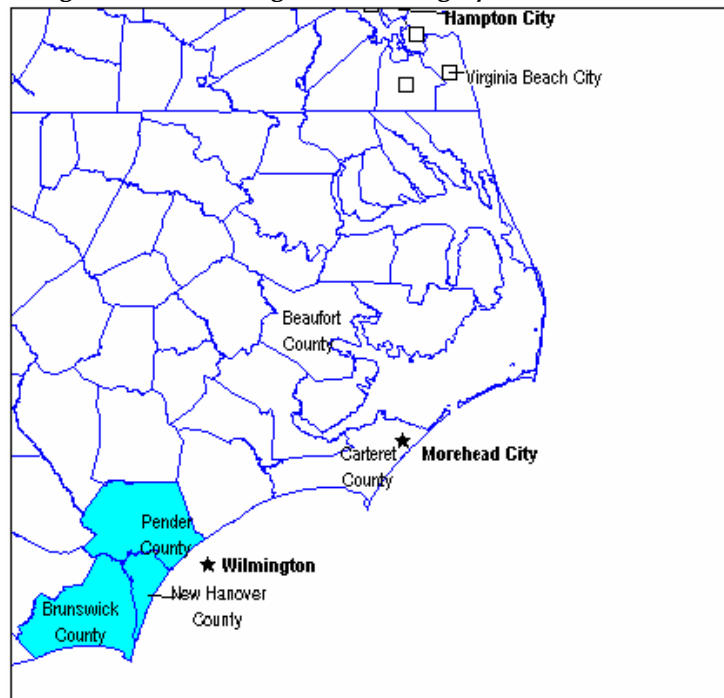


# 19. Wilmington, NC

## Location and Background Information

The Port of Wilmington is part of the Wilmington, North Carolina Metropolitan Statistical Area (MSA).

*Figure 19-1. Wilmington, NC: Geographic Location, 2000*



Source: Table 3-1

## Demographics

### POPULATION

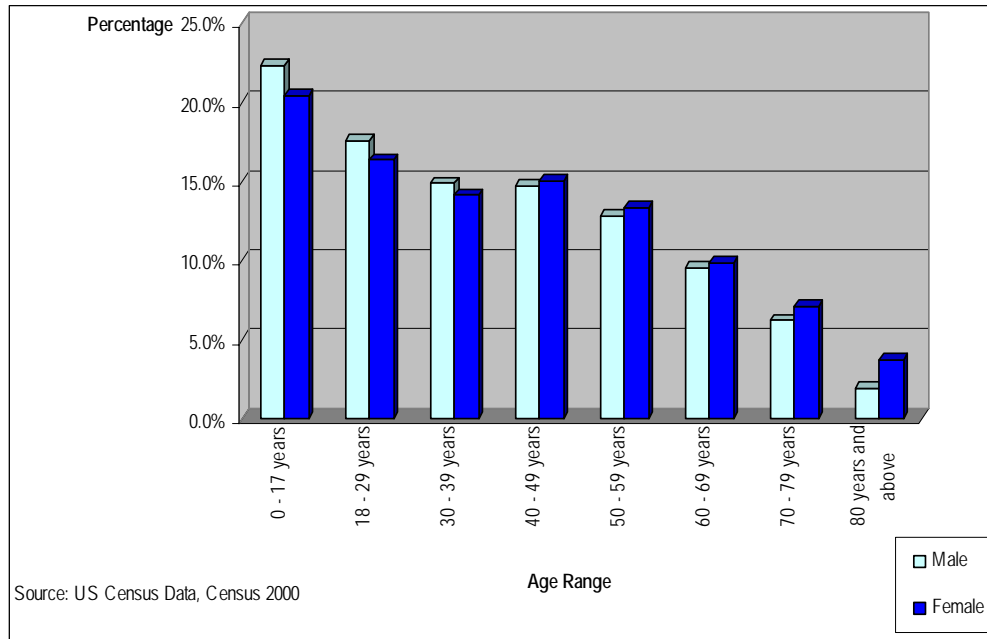
The total population of this MSA is 274,532, according to the 2000 US Census. Of this total, 133,999 or 48.8 percent are males and 140,533 or 51.2 percent are females. The median age in the region is 38.2 years; 37.0 for males and 39.5 for females. As portrayed in Figure 19-2, over 15 percent of males and females are between 18 to 29 years old and nearly 15 percent fall in the 40 – 49 years age range.

The majority of the population is white (79.5 percent); followed by the Black or African American population, which represents 17 percent of the total population. 'Others' (which include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone) represent 2.8 percent of the total population. The Asian population represents only 0.6 percent of the total population (Figure 19-3). Moreover, in terms of ethnic makeup, 2.5 percent of the total population is considered to be of Hispanic or Latino origin.<sup>1</sup>

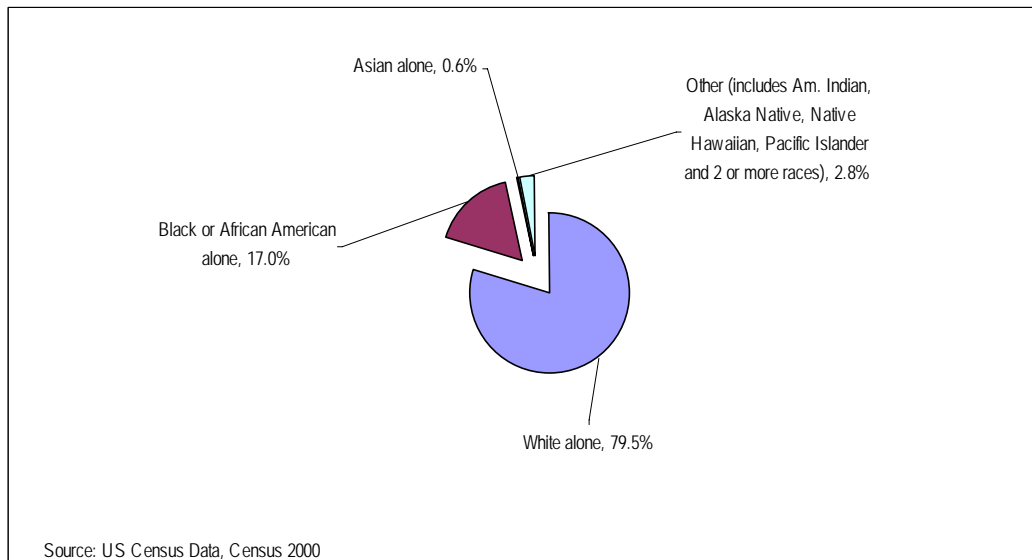
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<sup>1</sup> US Census Data, Census 2000.

**Figure 19-2. Wilmington, NC: Structure of the Population by Age, 2000**

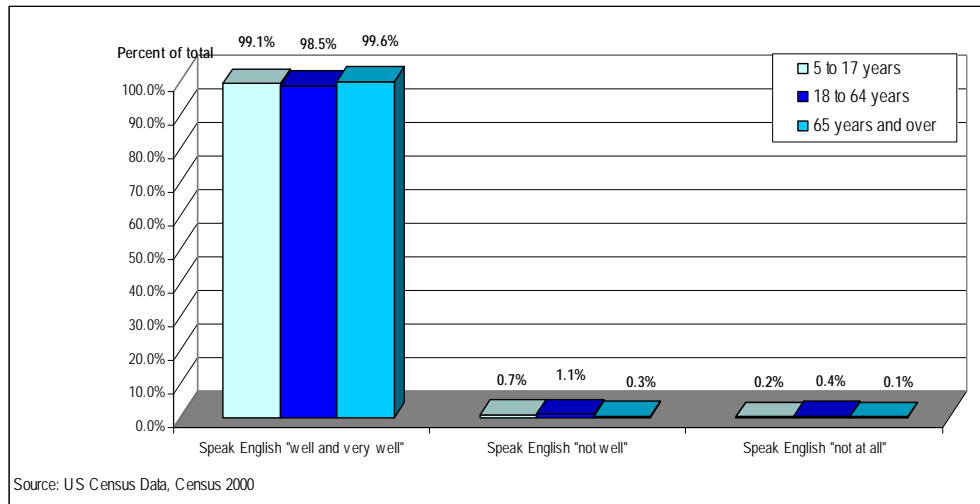


**Figure 19-3. Wilmington, NC: Population by Race, 2000**



It is evident from the data specified in Figure 19-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

**Figure 19-4. Wilmington, NC: Ability to Speak English by Age Group, 2000**

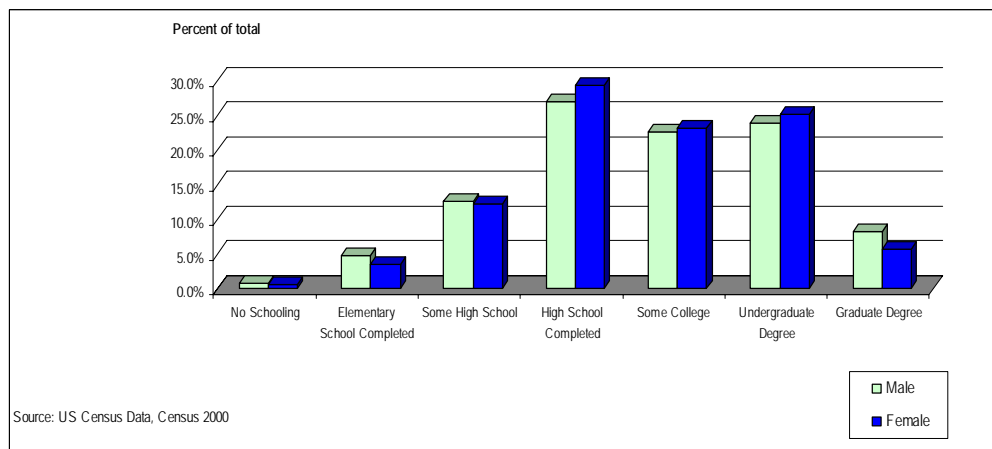


## EDUCATION

It is evident from Figure 19-5, that 25 percent of males and around 28 percent of females, ages 25 or over, have completed high school. About 22 percent of males and 24 percent of females have obtained an undergraduate degree, and about 21 - 22 percent of males and females have at least completed some college.

Some of the colleges and universities around the area are: University of North Carolina, Cape Fear Community College, Miller-Motte Business College and Mount Olive College-Wilmington.

**Figure 19-5. Wilmington, NC: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



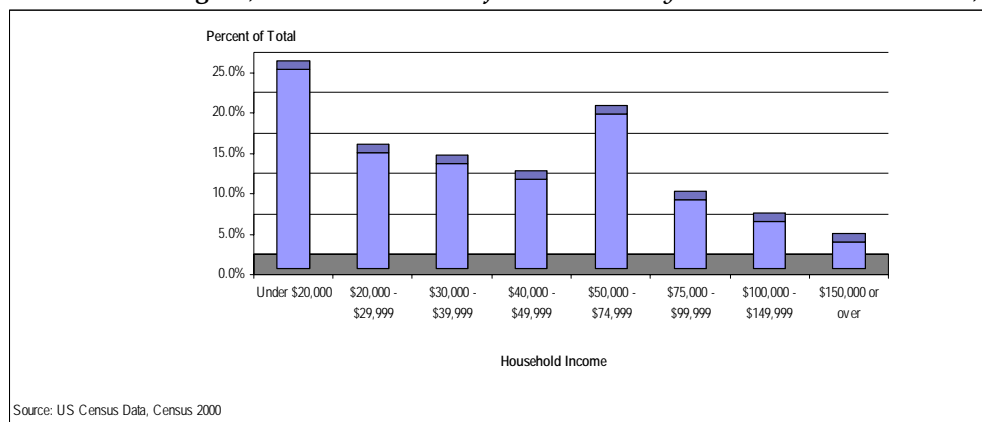
## Socio-Economic Characteristics

### INCOME

Around 25 percent of households in the Wilmington, NC MSA had incomes of \$20,000 or under in 1999. About 20 percent of households in the region had incomes between \$50,000 and \$74,999. Less than 5 percent of households had incomes of \$150,000 or over (Figure 19-6).

Household median income in the region in 1999 was \$38,437.56 and per capita income for the same year was \$21,468.56. The percentage of people under the poverty line in the region was 13 in the year 2000. The average household size in 2000 was 2.34.<sup>2</sup>

*Figure 19-6. Wilmington, NC: Distribution of Households by Household Income Level, 1999*



### EMPLOYMENT

As shown in Figure 19-7, of the employed civilian population aged 16 years or over, nearly 31 percent of females are employed in the educational, health and social services industry. About 23 percent of females are employed in 'other industries', which include the arts, entertainment, recreation, food services, public administration and information. Over 20 percent of males are employed in 'other' industries, followed by the construction (nearly 20 percent) and wholesale and retail trade (about 16 percent).

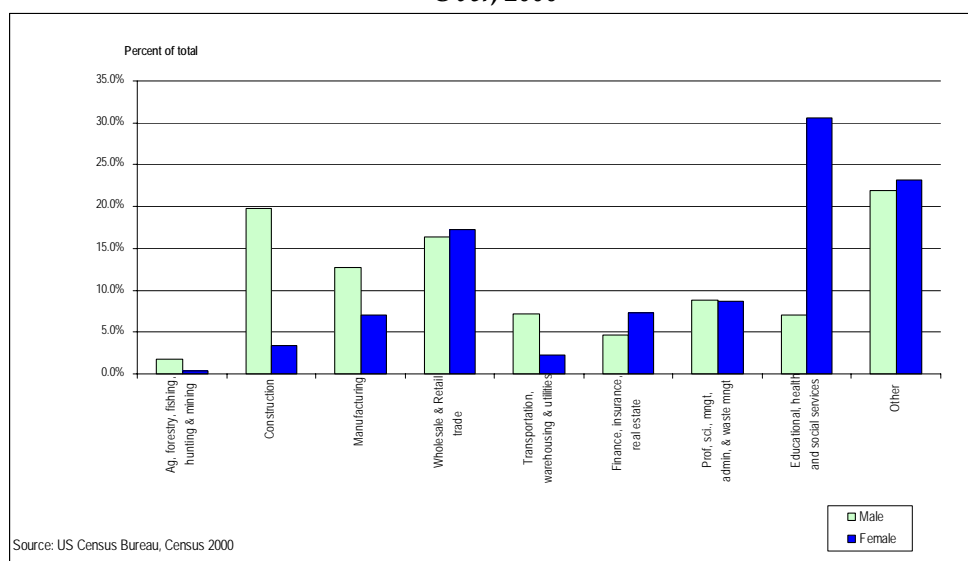
An estimated 5.2 percent of males and 5.7 percent of females were unemployed in the region in the year 2000.<sup>3</sup>

According to the 2000 US Census, an estimated 1.0 percent of males and 0.2 percent of females are employed in farming, fishing and forestry occupations. About 17.7 percent of males and 6.9 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.6 percent of male's occupations and 0.2 percent of female's occupations.

<sup>2</sup> US Census Data, Census 2000.

<sup>3</sup> US Census Data, Census 2000.

**Figure 19-7. Wilmington, NC: Employed Civilian population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION



Located on the east bank of the Cape Fear River, the Port of Wilmington offers facilities to handle containerized, bulk and breakbulk cargoes. The Port's new 42-foot channel allows current container vessel customers an additional 15% vessel capacity. The port has direct interstate access to Interstates 95 and 40 and daily train service from CSX Railways. Wilmington is one of the few South Atlantic ports with readily available berths and container storage areas and equipment.

With the volume of international trade expected to double by 2020, forward-looking businesses and industries can get ahead of the curve by taking advantage of the services offered by the North Carolina State Ports Authority. North Carolina's Ports of Wilmington and Morehead City, plus inland terminals in Charlotte and in the Piedmont Triad at Greensboro, are "ready, willing and able" to serve as competitive alternatives to ports in neighboring states for competitive access to the global markets. Owned and operated by the Ports Authority, North Carolina's port system combines modern facilities and abundant capacity with the commitment to excel in service to our customers.

The Ports' central Eastern seaboard location is closest to the center of the southeast US market -- the fastest growing region in the country. The Ports Authority, along with the N.C. Department of Commerce, is actively recruiting retail distribution centers to the state. Excellent sites are available for distribution center placement, as well as a labor pool well suited to fill materials handling positions. The North Carolina community college system has developed a course of study specifically for retail distribution center training. Current and planned improvements in the regional transportation network provide a new platform for distribution when combined with upgraded capabilities at the Port of Wilmington to handle large quantities of imported goods. A unique NC Ports tax credit is also available to port users.

The Port of Wilmington is located on the east bank of Cape Fear River and it is 26 miles from open sea. Its channel is 42 ft., mean low water and its wharf frontage is 6,768 ft. long, divided between container and general cargo operations. It has a concrete pile wharf construction with solid or concrete deck fronted with rubber fender system and a deck height that averages 12 ft. above mean low water. The Port has an open storage dry bulk facility which can outload over 800 tons per hour with a 70,000 ton storage capacity and a covered dry bulk facility with 2.5-million-cubic-foot storage capacity and import conveyor system for grain and fertilizers which can handle 1,000 tons per hour. The facility has nearly 100 acres available for development north of the present terminal, other berths with contiguous open apron areas of up to 300 ft. wide and a well-lit terminal and 24-hour security provided by North Carolina State Certified Port Police officers.

The entire Wilmington Terminal was designated Foreign Trade Zone 66 and it provides for storage, manipulation, exhibition and limited manufacturing operations. It can lower, defer or avoid import duties and can accommodate special purpose subzones.

Wilmington Port has over 1 million square feet of covered, sprinklered storage and has both road and rail access to all storage buildings. The terminal has about 100 acres of paved, open area and nearly 25 acres semi-improved open storage area. Furthermore, it has 31,200 square feet dedicated steel coils warehouse with a 30-ton remote control bridge crane and nearly one-half million square feet warehouse space dedicated to forest products, including a new 108,000 square feet forest products center. The terminal has two chambers providing vacuum methyl bromide and detia and a special covered, in-container fumigation area.

The terminal has CSX rail service twice daily and easy vehicular access with US Highways 17, 74, 76 and 421 and Interstates 95 and 40; inland service by CSX Intermodal and Norfolk Southern and connecting rail line, owned and operated by Wilmington Terminal Railroad, with interchanging cars between port and CSX system. It furthermore has equipment for handling all rail traffic, including double-stack trains, has roll-on/roll-off capacity at ramps and has transit sheds and warehouses with depressed tracks.

#### **North Carolina Ports History**

Since Europeans first viewed the area, the river known ominously as the Cape Fear has been vital to the fortunes of both buccaneers and businessmen. History shows it was the pirate Stede Bonnet - by most accounts a poor sailor who already had been convicted as a pirate and pardoned - who may have realized the river's name. After returning to piracy, he tried to escape capture in the early 1700's by hiding up the Cape Fear. But he forgot the first rule of pirates - always have more than one escape route. Bonnet was caught as soon as the British reached the mouth of the river.

Union vessels didn't have as much luck with the blockade runners of the Confederacy, who continued to escape capture and bring needed supplies back to the port at Wilmington during the Civil War. In fact, Wilmington was the last port open to blockade runners. When it finally fell in early 1865, it signaled the end of Confederate hopes. Since then, though, most seagoing traffic hasn't needed an escape route - merely a North Carolina berth. That meant the Cape Fear River and Wilmington, and the deepwater harbor at Morehead City.

Morehead City's first major port development came during the 1850's with a pier, warehouse and rail facility known as Pier No.1. Following the North Carolina tradition, it handled mostly naval stores and salt. Takeover by Federal troops during the Civil War and a damaging storm in 1876 further hampered the development of the Morehead City port for many years.

The argument for state-owned ports began in the 1920's, when North Carolina's economic development was handicapped because of higher freight rates than those charged by Virginia competitors - a situation partly due to the state's notable lack of adequate ports and water

transportation. A referendum on spending \$8.5 million to improve the situation was defeated in 1924, with most of the Piedmont counties voting against it.

The value of deepwater ports was recognized by the state legislature in 1945 with the creation of the NC State Ports Authority. Its job: to create two competitive ports through the sale of revenue bonds. Its ultimate mission: to create a better atmosphere for the development of North Carolina industry.

The General Assembly in 1949 approved the issue of \$7.5 million in bonds for construction and improvement of seaports to promote trade throughout the state. Terminals equipped to handle oceangoing vessels were completed at Wilmington and Morehead City in 1952.

Their positions nearly midway between major competing ports in Virginia and South Carolina have made them more accessible to North Carolina traders. In fact, it was the Wilmington harbor's location near some of the state's earliest businesses - pine tar, rice and tobacco - that helped make the city the largest in the state until the early 1900's.

With ships came rail, and up until the 1960's, Wilmington was the headquarters of the Atlantic Coast Line Railroad - now part of CSX. During World War II, Wilmington was the site of major shipbuilding efforts - including an operation that built vessels out of concrete.

Now, times have changed, and so have the methods of shipping. And that has meant some major changes to keep the ports competitive. In the mid 1970's the Ports Authority bought two container cranes, eventually locating both at Wilmington. This multi-million dollar purchase of cranes the size of skyscrapers was deemed necessary because more and more cargo was being shipped in "boxes" - containers the size and shape of small mobile homes.

Morehead City has become a major port for phosphate products. And it can handle containers using its larger cranes in tandem. Wilmington, meanwhile, has acquired a total of five container cranes even as it ships wood products and other bulk and breakbulk commodities. To facilitate the growth in container traffic, two inland terminals were opened in the mid 1980's in Greensboro and Charlotte. The Ports Authority continues to remain competitive, with major projects planned at both facilities. At Morehead City, planning continues for expansion onto Ports Authority property on Radio Island. The Wilmington Harbor Deepening Project brought 42-foot deep water the entire length of the Cape Fear River navigational channel, from the ocean near Southport to the Port - readying the port for the larger ships of the future.<sup>4</sup>

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<sup>4</sup> North Carolina Ports website: <http://www.ncports.com>

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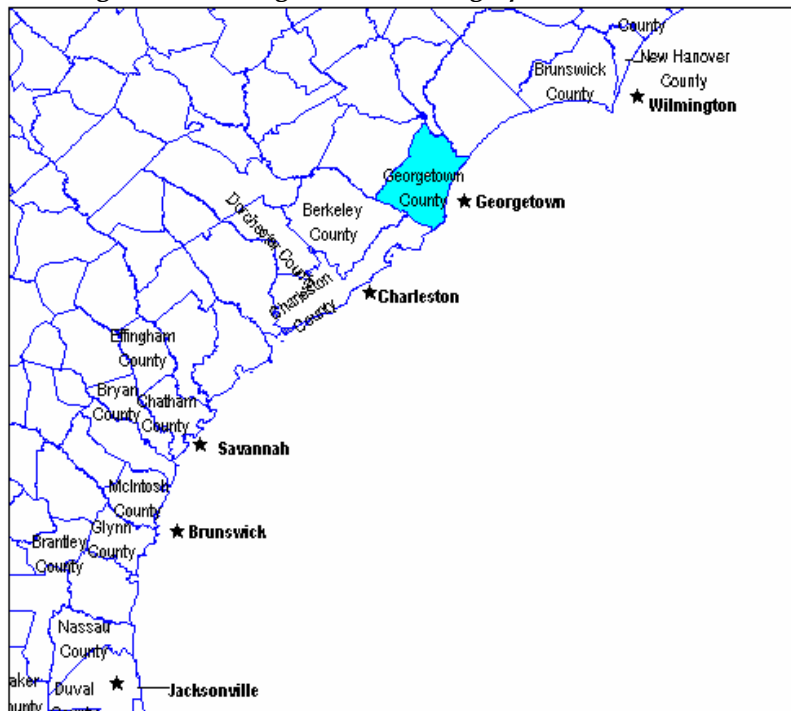


# 20. Georgetown, SC

## Location and Background Information

The Port of Georgetown is located within the Georgetown, South Carolina Micropolitan Statistical Area.

*Figure 20-1. Georgetown, SC: Geographic Location, 2000*



Source: Table 3-1

## Demographics

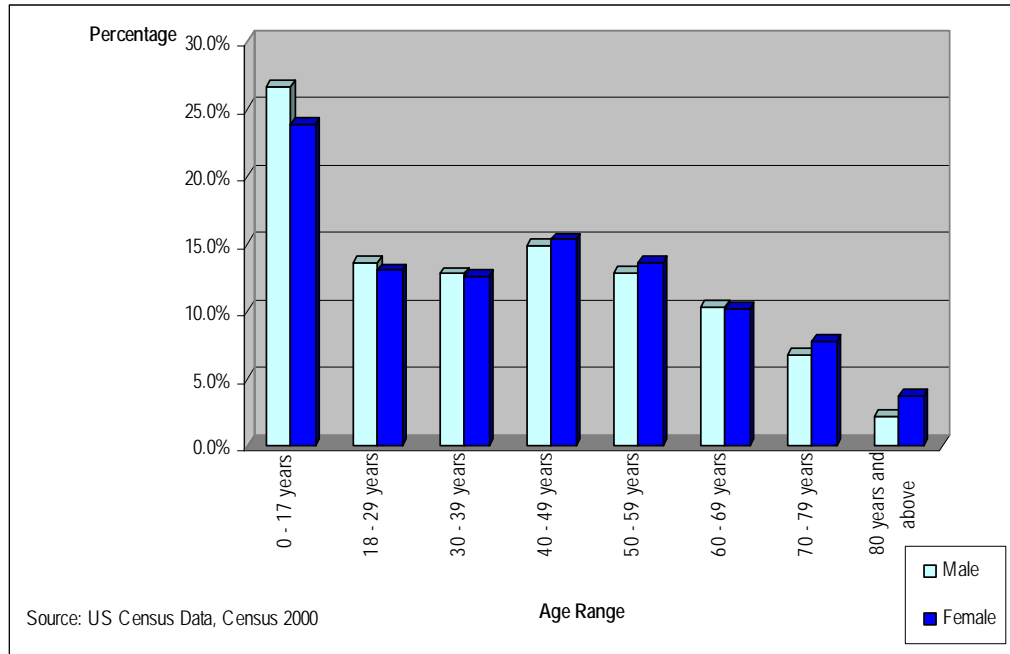
### POPULATION

The total population of this Micropolitan Area is 55,797, according to the 2000 US Census. Of this total, 26,700 or 47.9 percent are males and 29,097 or 52.1 percent are females. The median age for the region in 2000 was 39.1 years; 37.8 for males and 40.3 for females. Nearly 15 percent of the population falls in the 40 – 49 years age range. Nearly 14 percent of females and about 14 percent of males fall within the 50 – 59 years age range (Figure 20-2).

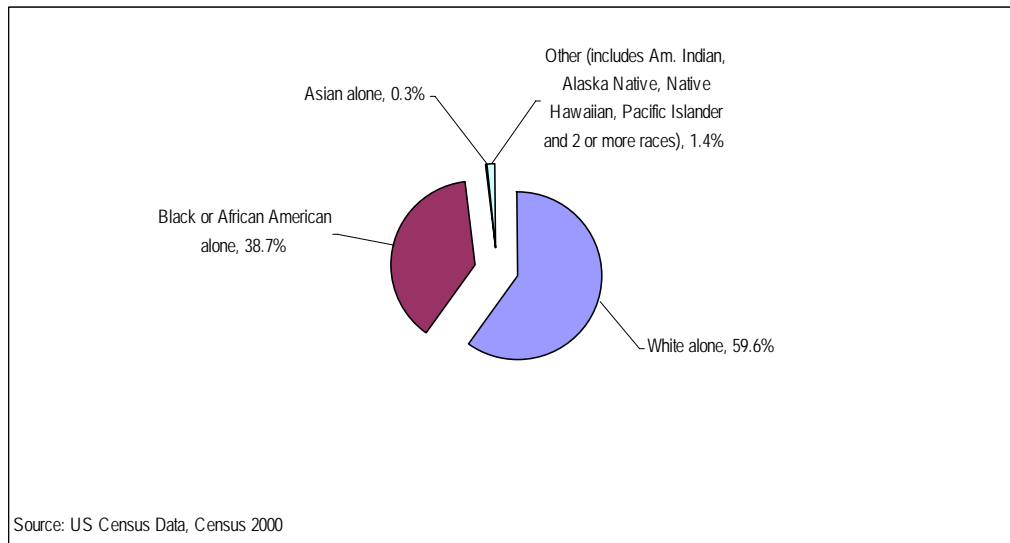
As portrayed by Figure 20-3, 59.6 percent of the population in the region is white, followed by the Black or African American population, which represents 38.7 percent of the total population. ‘Others’ (which include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone) represent 1.4 percent of the population. The Asian population represents roughly 0.3 percent of the total population. Only 1.5 percent of the total population is considered to be of Hispanic or Latino origin.<sup>1</sup>

<sup>1</sup> US Census Data, Census 2000.

**Figure 20-2. Georgetown, SC: Structure of the Population by Age, 2000**

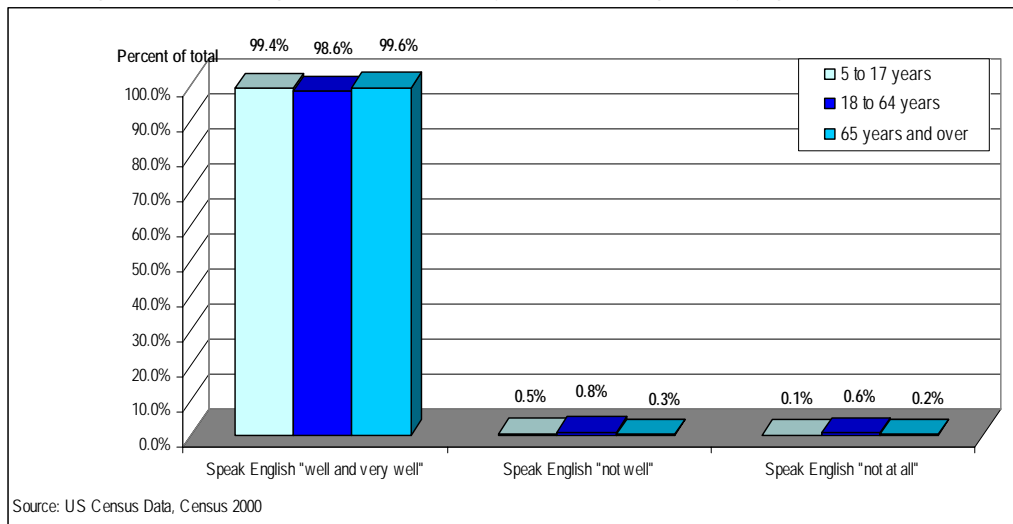


**Figure 20-3. Georgetown, SC: Population by Race, 2000**



It is evident from the data specified in Figure 20-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

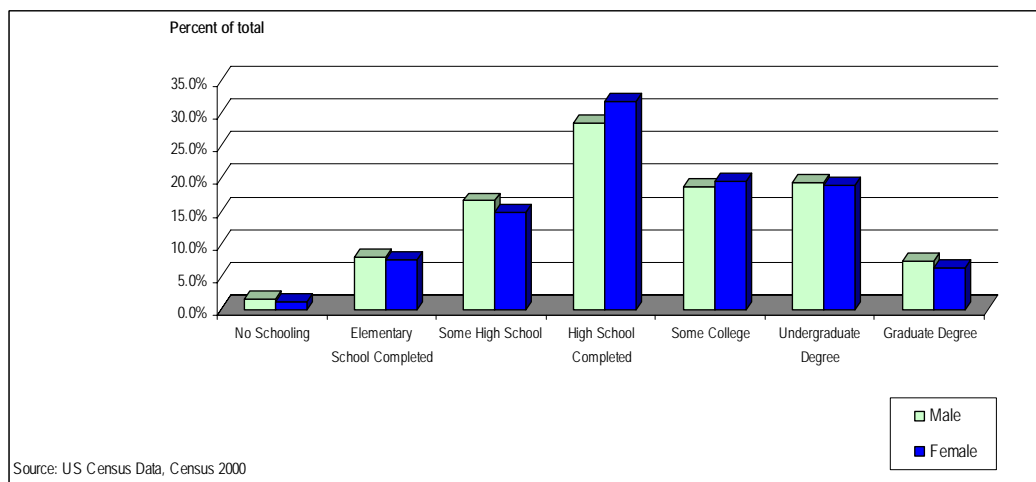
**Figure 20-4. Georgetown, SC: Ability to Speak English by Age Groups, 2000**



## EDUCATION

As portrayed by Figure 20-5, over 30 percent of females and 25 percent of males, ages 25 or over, have completed high school. More than 17 percent of males and females have completed some college and nearly 20 percent of males and females have obtained an undergraduate degree in the region.

**Figure 20-5. Georgetown, SC: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



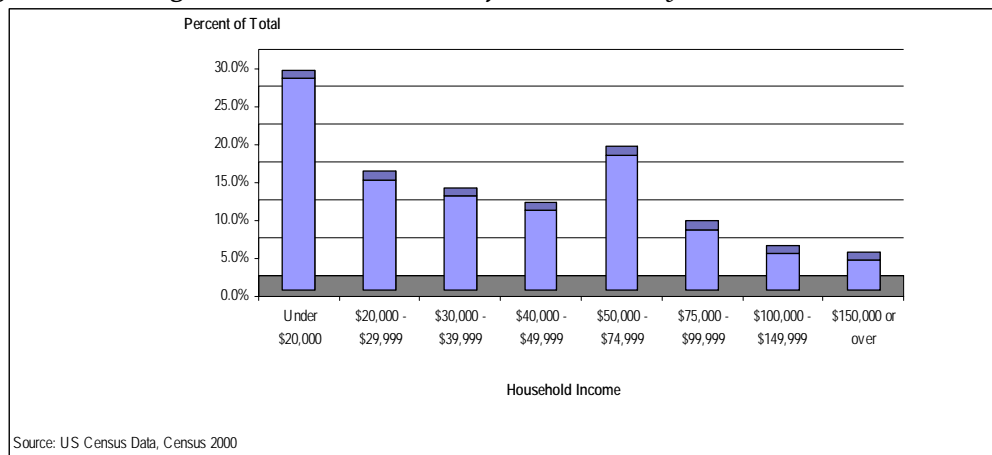
## Socio-Economic Characteristics

### INCOME

According to the 2000 US Census, nearly 30 percent of households in the region in 1999 had incomes of under \$20,000. About 19 percent of households in the same period had incomes that fell within the \$50,000 - \$74,999 income bracket. Around 5 percent of households in the region had incomes of \$150,000 or over (Figure 20-6).

Household median income in 1999 in the region was \$35,312 and per capita income for the same year was \$19,805. The percentage of people under the poverty line in the region was 17.1 in the year 2000. The average household size in 2000 was 2.55.<sup>2</sup>

*Figure 20-6. Georgetown, SC: Distribution of Households by Household Income Level, 1999*



### EMPLOYMENT

As shown on Figure 20-7, of the employed civilian population ages 16 years and over, almost 30 percent of females are employed in the educational, health and social services industry and 25 percent of females are employed in 'other' industries; which include the arts, entertainment, recreation, food services, public administration and information. About 23 percent of males are employed in the manufacturing industry and almost 20 percent of them are employed in 'other' industries.

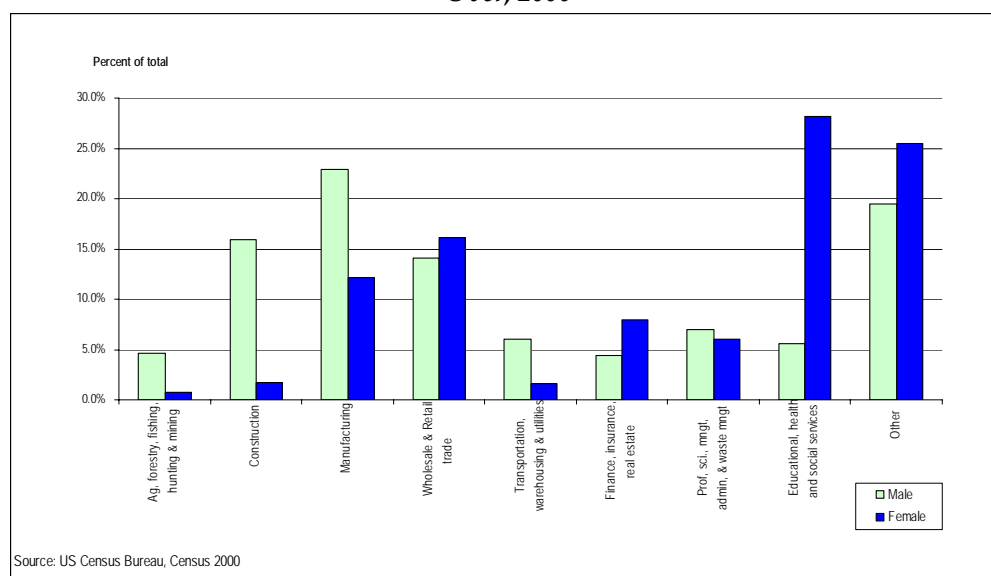
An estimated 6.2 percent of males and females were unemployed in 2000 in the region.<sup>3</sup>

According to the 2000 US Census, an estimated 3.0 percent of males and 0.5 percent of females are employed in farming, fishing and forestry occupations. About 22.7 percent of males and 13.1 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.5 percent of male's occupations and 0.1 percent of female's occupations.

<sup>2</sup> US Census Data, Census 2000.

<sup>3</sup> US Census Data, Census 2000.

**Figure 20-7. Georgetown, SC: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION

The Port of Georgetown is the South Carolina State Ports Authority's dedicated breakbulk and bulk cargo facility. With an expanded berth, ample open and covered storage, specialty cargo handling facilities, and a team of workers experienced in the field, Georgetown can handle cargo efficiently and safely. Top commodities for the Port of Georgetown are steel, salt, cement, aggregates, and forest products.

Breakbulk cargo handling including Georgetown's own Intermodal Breakbulk Service (IBS) is one of the port's key services. The port's innovative IBS lets shippers and consignees combine a multitude of transportation costs and functions -- stevedoring, storage, port handling, truck and/or rail, etc. -- as a single operation under one invoice. This ability saves time, money, and administrative hassles.

Georgetown was built for breakbulk cargo. It has 3 berths totaling 1,700 ft.; 139,800 square-feet of covered storage; 2 transit warehouses totaling 103,000 square-feet; 3 enclosed sheds totaling 36,800 square-feet and 27.9 acres of open storage (covered and open storage rail access provided). It has a 100-ton mobile crane available and its specialty is in handling facilities on terminal for metals, cement, salt, and forest products and has a fleet of cargo handling equipment.<sup>4</sup>

<sup>4</sup> South Carolina State Port Authority: [http://www.port-of-charleston.com/term\\_and\\_infra/georgetown/PortGeorgetown.asp](http://www.port-of-charleston.com/term_and_infra/georgetown/PortGeorgetown.asp)

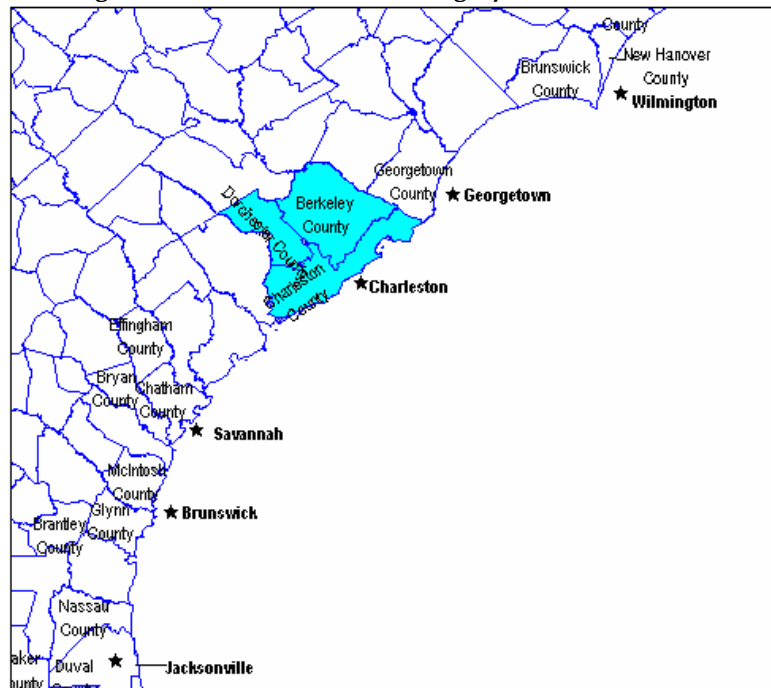
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# 21. Charleston, SC

## Location and Background Information

The Port of Charleston is part of the Charleston-North Charleston, SC Metropolitan Statistical Area (MSA).

*Figure 21-1. Charleston, SC: Geographic Location, 2000*



Source: Table 3-1

## Demographics

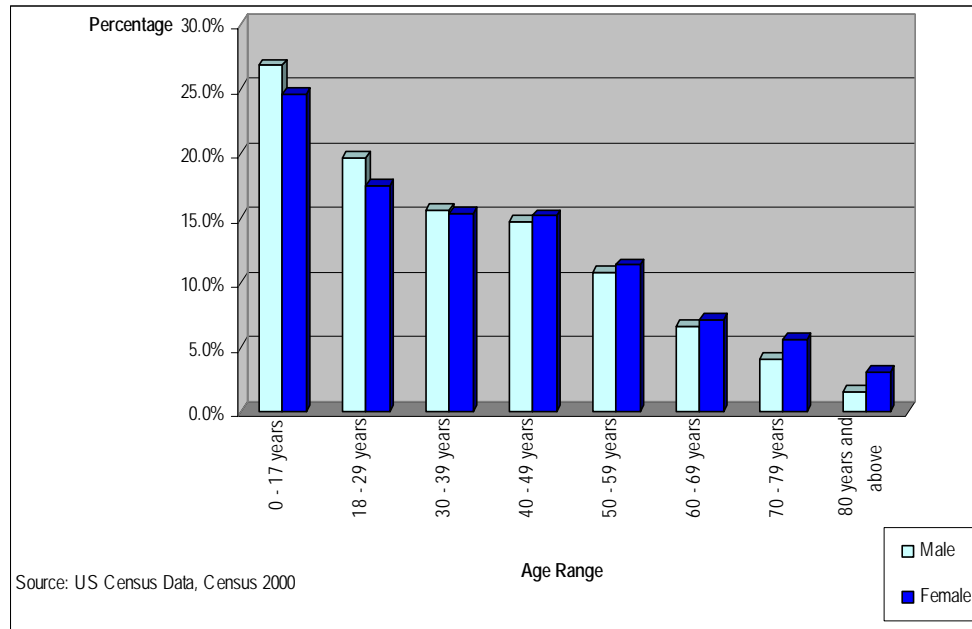
### POPULATION

The total population of the Charleston-North Charleston, SC MSA is 549,033, according to the 2000 US Census. Of this total 269,433 or 49.1 percent are males and 279,600 or 50.9 percent are females. The median age for the region for the year 2000 was 33.9 years; 32.3 for males and 35.4 for females. Nearly 20 percent of males and about 17 percent of females in the region fall within the 18 - 29 years age bracket and about 15 percent of males and females fall within the 30 - 39 age range (Figure 21-2).

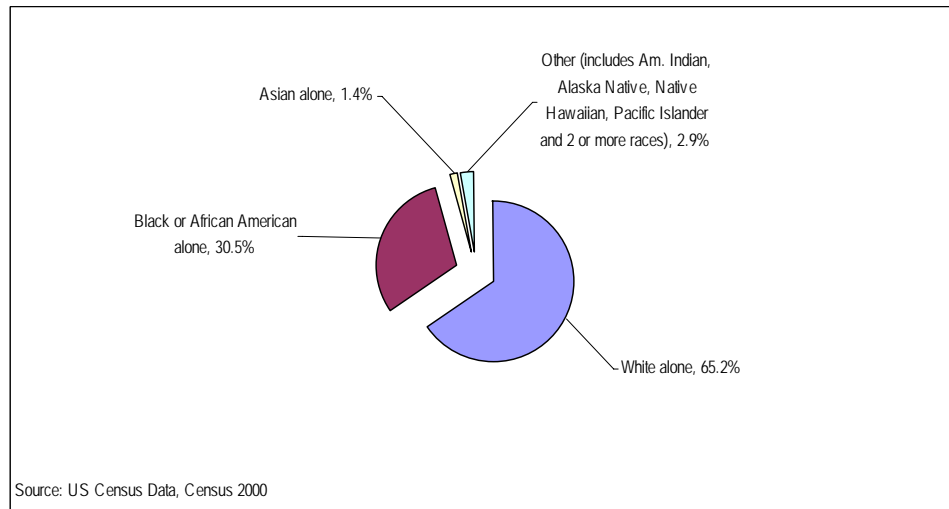
The majority of the population in the region is white (65.2 percent). The Black or African American population represents 30.5 percent of the total population. 'Others' (which include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone) represent 2.9 percent of the total population of this area, followed by the Asian population, which only represents 1.4 percent of the total population (Figure 21-3). Only 2.4 percent of the total population is considered to be of Hispanic or Latino origin.<sup>1</sup>

<sup>1</sup> Source: US Census Data, Census 2000.

**Figure 21-2. Charleston, SC: Structure of the Population by Age, 2000**



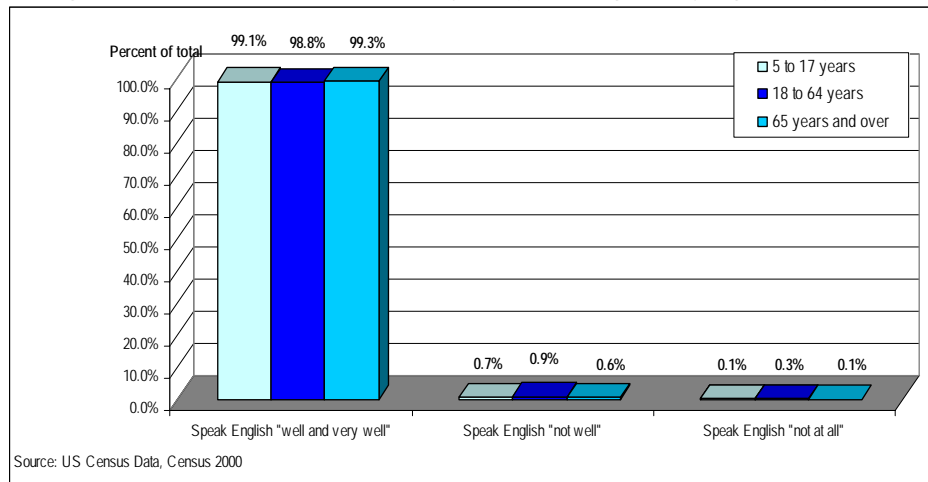
**Figure 21-3. Charleston, SC: Population by Race, 2000**





It is evident from the data specified in Figure 21-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

**Figure 21-4. Charleston, SC: Ability to Speak English by Age Group, 2000**

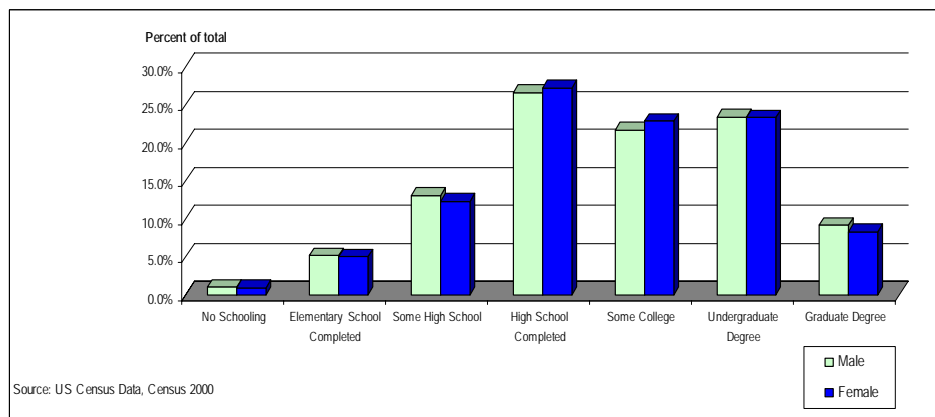


## EDUCATION

As shown on Figure 21-5, of the population ages 25 and over in the region, over 25 percent of males and females have completed high school. Around 22 percent of males and females have obtained an undergraduate degree and over 20 percent of males and females have completed some college. Nearly 10 percent of the population has obtained a graduate degree.

Some of the colleges and universities around the area are: Charleston Southern University, College of Charleston, The Citadel, Johnson & Wales University-Charleston, and Medical University of South Carolina.

**Figure 21-5. Charleston, SC: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



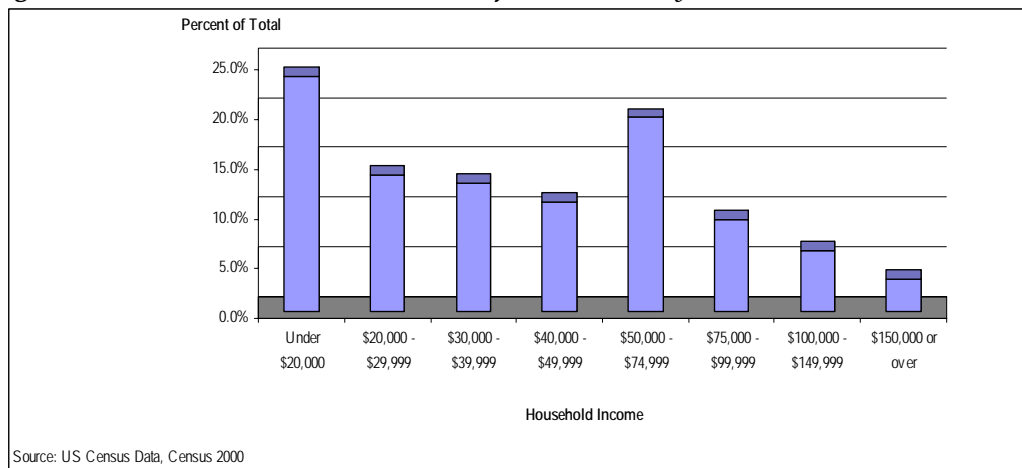
## Socio-Economic Characteristics

### INCOME

In 1999, nearly a quarter of households in the Charleston – North Charleston, NC MSA had an income of under \$20,000. Over 20 percent of households had incomes between \$50,000 and \$74,999. About 5 percent of households had incomes of \$150,000 or over (Figure 21-6).

Household median income in 1999 in the region was \$39,232.49 and per capita income for the same year was \$19,771.84. The percentage of people under the poverty line in the region was 14 in the year 2000. The average household size in 2000 was 2.56.<sup>2</sup>

**Figure 21-6. Charleston, SC: Distribution of Households by Household Income Level, 1999**



### EMPLOYMENT

From the employed civilian population ages 16 or over in the region, nearly 35 percent of females are employed in the educational, health and social services industry and almost 25 percent of females are employed in 'other' industries, which include the arts, entertainment, recreation, food services, public administration and information. Nearly 25 percent of males are employed in 'other' industries, about 15 percent are employed in the construction industry, and the same percentage of males are also employed in the wholesale and retail trade industry (Figure 21-7).

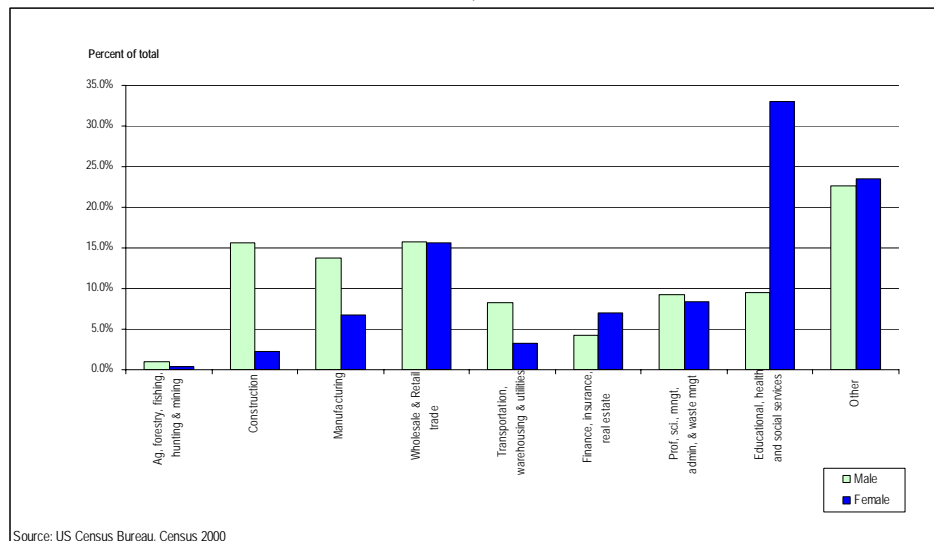
An estimated 4.9 percent of males and 5.8 percent of females were unemployed in the region in the year 2000.<sup>3</sup>

According to the 2000 US Census, an estimated 0.7 percent of males and 0.3 percent of females are employed in farming, fishing and forestry occupations. About 18.8 percent of males and 7.0 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.6 percent of male's occupations and 0.2 percent of female's occupations.

<sup>2</sup> Source: US Census Data, Census 2000.

<sup>3</sup> US Census Data, Census 2000.

**Figure 21-7. Charleston, SC: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION

The Port of Charleston has 6 main terminals: The PortCharleston Terminals, the Columbus Street Terminal, the North Charleston Terminal, the Wando Welch Terminal, the Union Pier Terminal and the Veterans Terminal.

### Colombus Street Terminal

The Columbus Street Terminal (CST) is Charleston's premier combination breakbulk and container terminal. With dockside warehouses, dockside rail access, dockside breakbulk gantry cranes, dedicated container berths and post-Panamax container cranes, Columbus Street is a multi-purpose facility. The terminal is well-suited to container, common breakbulk, bulk, rolling stock, heavy-lift, and project cargo. The terminal has 6 berths: 2 for containers and 4 for breakbulk. It has 3,875 continuous feet of berth space, 4 container cranes (2 post-Panamax), 78 acres of open storage for containers and other cargo, EDI compatible container gates, on-terminal roadability facility and a large on-dock staging apron.

CST also has 457,500 square-feet of sprinkler-protected warehouses with covered rail access, ship side rail service, an on-terminal rail yard, 24-hour security with manned guard gate and chain-link and barbed-wire fencing, easy access to I-26 and one hour to open ocean.

### North Charleston Terminal

The North Charleston Terminal (NCT) is a modern container handling facility with complete with post-Panamax container cranes, an on-terminal container freight station, an on-terminal rail yard, and direct easy access to I-26 and I-526. The terminal has 3 container berths totaling 2,500 feet of berth space and one dedicated grain elevator berth, 6 container cranes (3 post-Panamax), 123 Acres of open storage, on-terminal intermodal rail access and dockside rail service.

NCT has a 118,500 square-foot container freight station, 91,000 square-feet of leased warehouse space just outside terminal gates, breakbulk and RO-RO capability and a 1.5 million bushel export grain elevator. It also counts with chain-link and barbed-wire fencing with 24-hour manned security gates, easy interstate highway access and 2 hours to open ocean.

### Wando Welch Terminal

Wando Welch Terminal (WWT) has received worldwide recognition for its innovative design and overall terminal productivity. Opened in 1982, the final stage of terminal construction was recently completed in the form of a 4th container berth, 3 new post-Panamax container cranes, and nearly 90 acres of additional container storage space. At present, it is the port's largest terminal in terms of volume and physical size. The terminal is 16.4 nautical miles from sea buoy, has 3,800 continuous ft. (1,128 m.) of berth space, 10 container cranes (4 are Super post-Panamax, 4 are post-Panamax, and 2 are Panamax), 194 acres of container storage space.

The terminal furthermore counts with an on-terminal 200,000 square foot container freight station, an on-terminal U.S. Customs and U.S. Department of Agriculture inspection facilities, an on-terminal fumigation area, an on-terminal maintenance facility and an on-terminal administration buildings and executive meeting center. It is less than one mile from I-526 interchange and has chain-link and barbed wire boundary fencing, 24-hour security, seven-days-a-week.

#### **Union Pier Terminal**

Union Pier Terminal (UPT) is one of PortCharleston's dedicated breakbulk and RO-RO cargo terminals. A recent terminal redesign has significantly increased the open storage area and improved traffic flow into and out of the facility. It has 4 berths totaling 2,470 continuous feet of berth space, and 698,049 square feet of sprinkler-protected transit sheds. There are multiple rail lines serving warehouses and dockside open storage areas and covered rail access to all warehouses, as well as asphalt and concrete open storage areas. There are smooth transitions between dockside aprons and ground-level open storage and excellent security with visibility-restricted screening on chain-link and barbed-wire fencing with a manned 24-hour guard gate.

#### **Veterans Terminal**

Veterans Terminal (VT) is a 110 acre fully secured dedicated bulk, break-bulk, RO-RO, and project cargo facility located on the Cooper River. VT can provide long term outside storage in dedicated yard space or covered sprinkler protected warehouse. Union and Non-Union stevedoring complements our determination to provide the customer with the most modern and flexible port facility in the Southeast. The terminal is 1.5 hours steaming time from the sea buoy and is 1.5 miles from Interstate I-26. There is rail service by both NS & CSX.

PortCharleston is regarded by many in the maritime industry to be among the most productive ports in the world. PortCharleston consistently tops 40 gross moves per hour per crane and has set a new U.S. record of 64.8 moves ph/pc. Charleston has industry-leading crane operators and a unique team of maritime professionals working on the docks. Even though port employees run the dockside cranes and container yard handling equipment, it takes a team effort to consistently deliver high productivity. This can be found on Charleston's waterfront. Ocean carriers, ILA workers, stevedores, agents, and port employees work in concert to keep productivity high.

Additionally, PortCharleston has an advantage in geography. Charleston's terminals are closer to the open sea than any competing port by a significant margin. With deep channels, channels wide enough for ships to easily pass, and such a short distance to travel, Charleston's facilities allow your ships to spend a minimum amount of time in-port.

Being half-way between New York and Miami, Charleston provides easy highway and rail access to the industry-rich Southeast hinterland. This region is growing in population and manufacturing and ocean carriers need top-notch access. Charleston offers that access like no competitor. Also, PortCharleston has been making heavy investments in equipment and processes to lower trucker turn time on the terminals. In the common-user yards and gates, trucker turn time has been cut by more than half in the last year. This makes the yard operation more efficient for the carrier and delivers the customer's cargo faster.<sup>4</sup>

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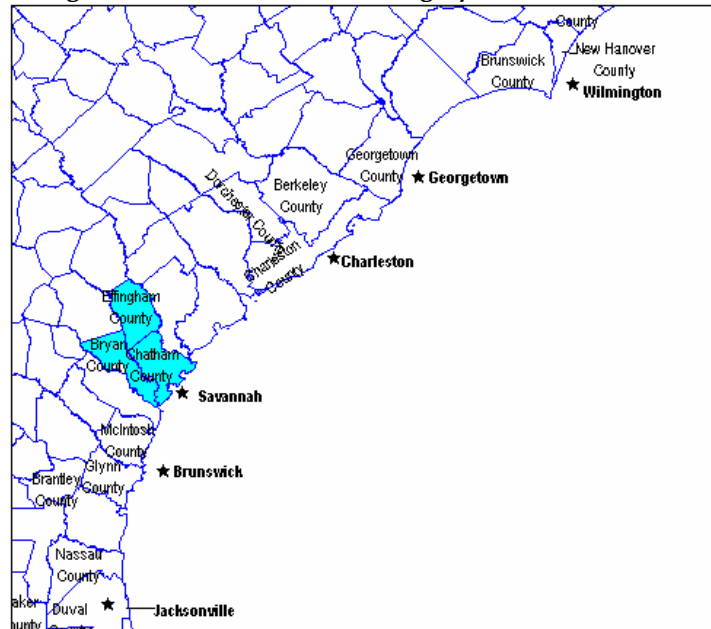
<sup>4</sup> South Carolina State Port Authority website: [http://www.port-of-charleston.com/Term\\_and\\_Infra/Charleston/whycharleston.asp](http://www.port-of-charleston.com/Term_and_Infra/Charleston/whycharleston.asp)

# 22. Savannah, GA

## Location and Background Information

The Port of Savannah is part of the Savannah, Georgia Metropolitan Statistical Area (MSA).

*Figure 22-1. Savannah, GA: Geographic Location, 2000*



Source: Table 3-1

## Demographics

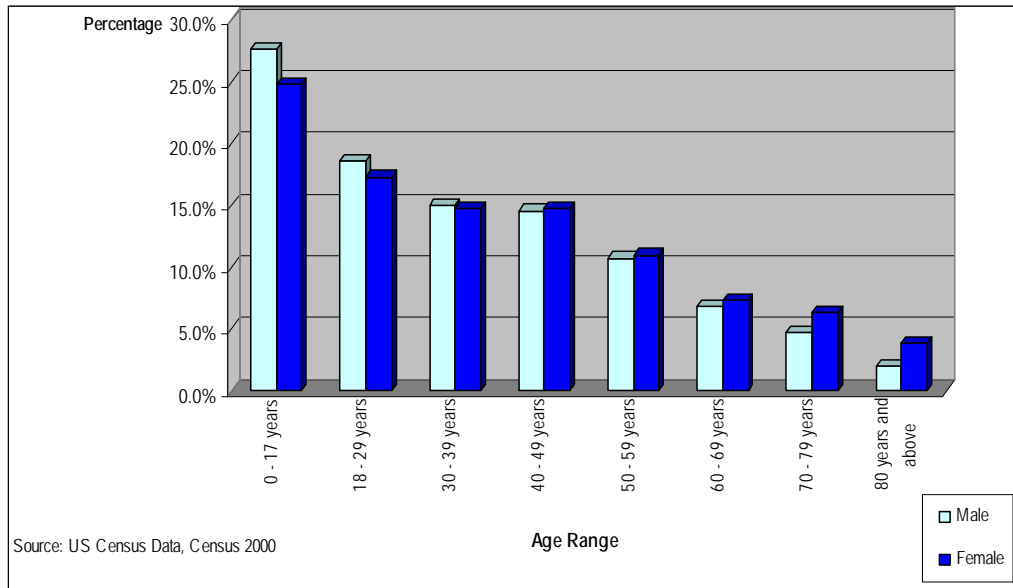
### POPULATION

The total population of the Savannah, GA MSA is 293,000, according to the 2000 US Census. Of this total, 142,039 or 48.5 percent are males and 150,961 or 51.5 percent are females. The median age for the population in the region is 34.2 years; 32.6 for males and 35.7 for females. Over 25 percent of males and females in the region fall within the 18 - 29 years age bracket and about 30 percent of males and females (about 15 percent per age bracket) fall within the 30-39 and 40-49 years age range (Figure 22-2).

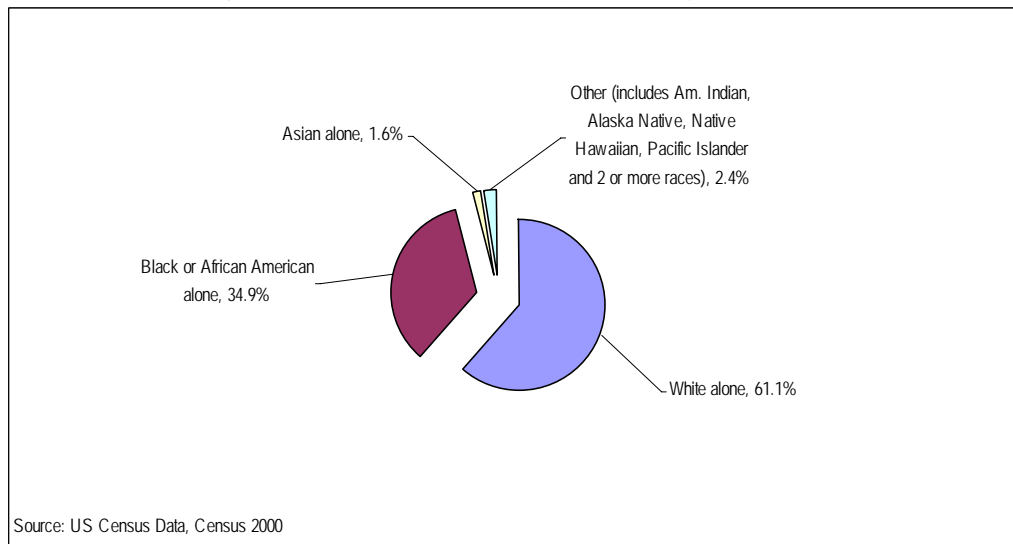
The majority of the population in the region is white (61.1 percent), followed by the Black or African American population, which represents 34.9 percent of the total population. 'Others' (include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone) represent 2.4 percent of the population. The Asian population represents only 1.6 percent of the total population (Figure 22-3). Moreover, in terms of ethnic makeup, only 2.0 percent of the total population is considered to be of Hispanic or Latino origin<sup>1</sup>.

<sup>1</sup> US Census Data, Census 2000.

**Figure 22-2. Savannah, GA: Structure of the Population by Age Group, 2000**

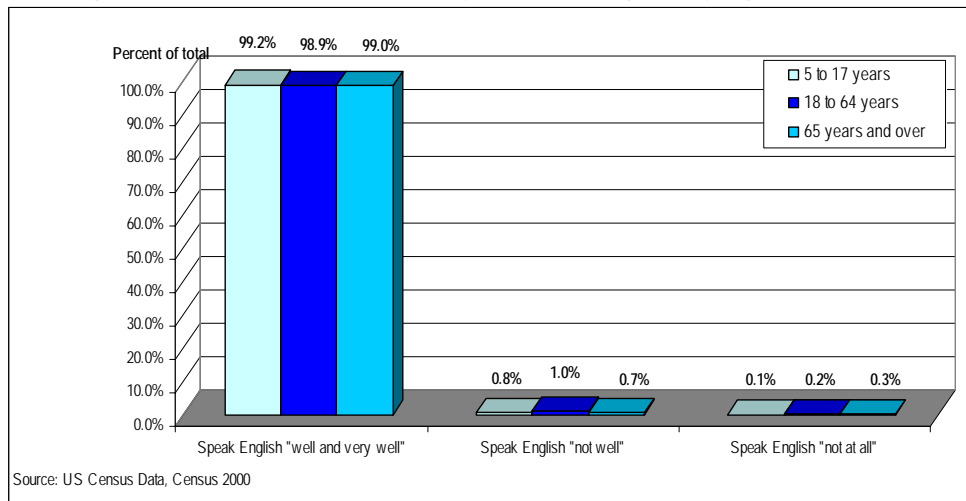


**Figure 22-3. Savannah, GA: Population by Race, 2000**



It is evident from the data specified in Figure 22-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

**Figure 22-4. Savannah, GA: Ability to Speak English by Age Group, 2000**

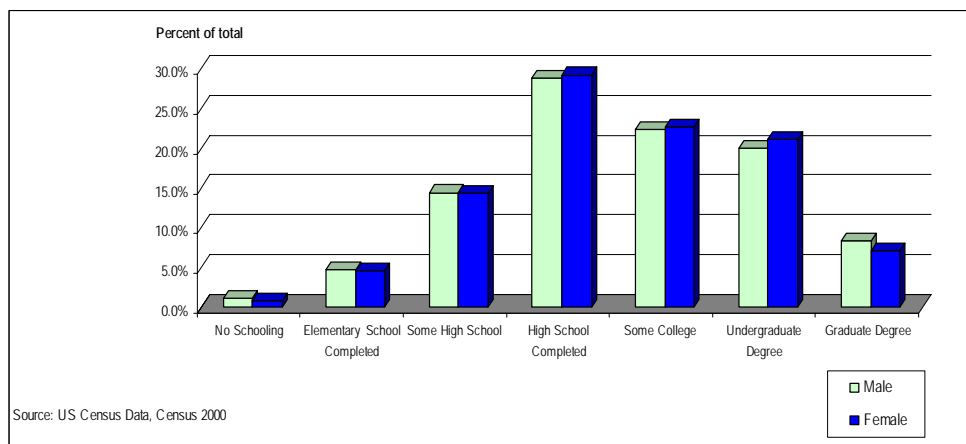


## EDUCATION

Of the population in the region that is 25 years old or over, about 27 percent of males and 28 percent of females have completed high school. Over 20 percent of males and females have completed some college and around 20 percent of males and females have obtained an undergraduate degree. About 6 percent of the population has obtained a graduate degree (Figure 22-5).

Some of the colleges and universities in the area are: Savannah State University, Armstrong Atlantic State University, Savannah College of Art And Design, and Savannah Technical College.

**Figure 22-5. Savannah, GA: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



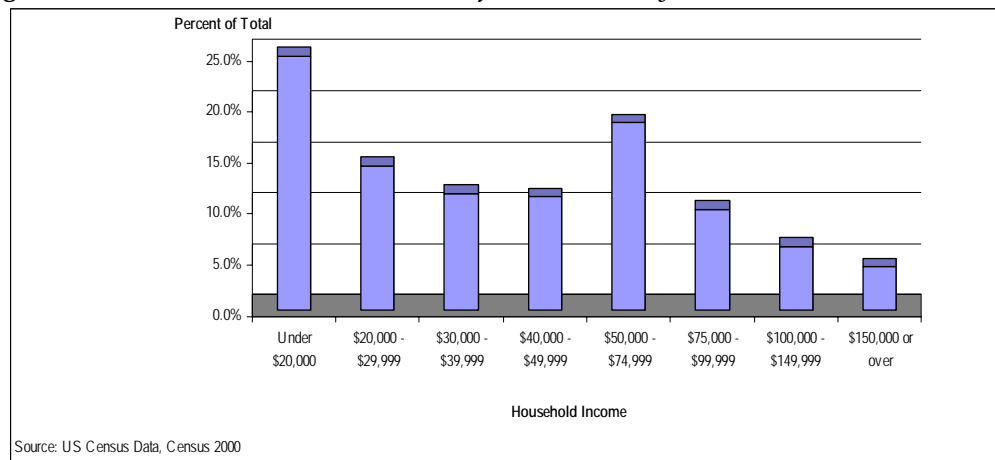
## Socio-Economic Characteristics

### INCOME

In 1999, about a quarter of the households in the Metropolitan Division of Savannah, GA had incomes of under \$20,000. Nearly 20 percent of households had incomes that fell within the \$50,000 - \$74,999 income bracket. About 5 percent of households had incomes of \$150,000 or over (Figure 22-6).

Household median income in the region in 1999 was \$39,557.87 and per capita income in the same year was \$20,751.51. The percentage of people under the poverty line in the region was 14.5 in the year 2000. The average household size in 2000 was 2.57.<sup>2</sup>

*Figure 22-6. Savannah, GA: Distribution of Households by Household Income Level, 1999*



### EMPLOYMENT

As portrayed by Figure 22-7, of the employed civilian population ages 16 years or over, nearly 35 percent of females are employed in the educational, health and social services industry and 25 percent of them are employed in 'other' industries, which include the arts, entertainment, recreation, food services, public administration and information. Over twenty percent of males are employed in 'other' industries, 17 percent are employed in the manufacturing industry and 15 percent are employed in wholesale and retail trade industries.

An estimated 4.9 percent of males and 5.9 percent of females were unemployed in the year 2000.<sup>3</sup>

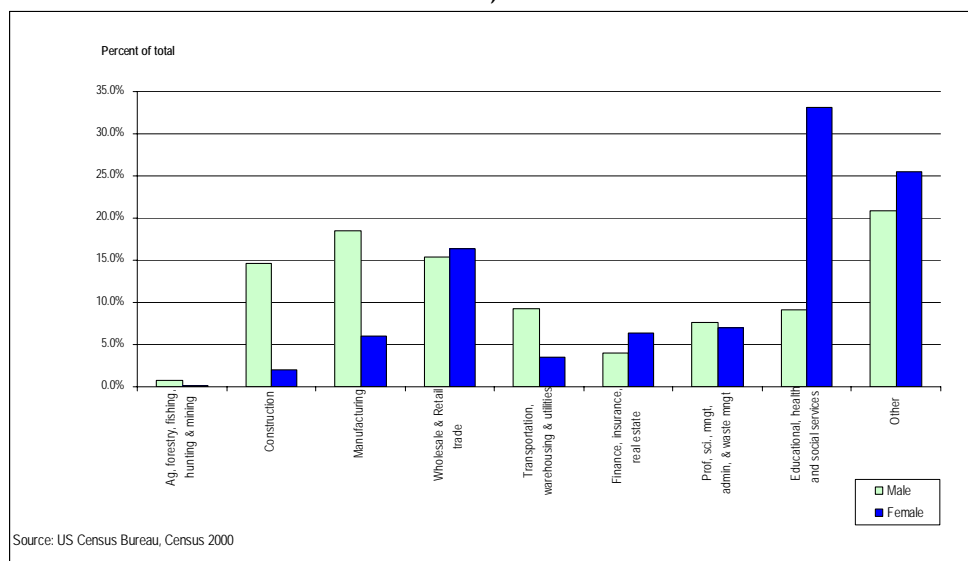
According to the 2000 US Census, an estimated 0.5 percent of males and 0.1 percent of females are employed in farming, fishing and forestry occupations. About 21.5 percent of males and 5.9 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 1.0 percent of male's occupations and 0.2 percent of female's occupations.

<sup>2</sup> US Census Data, Census 2000.

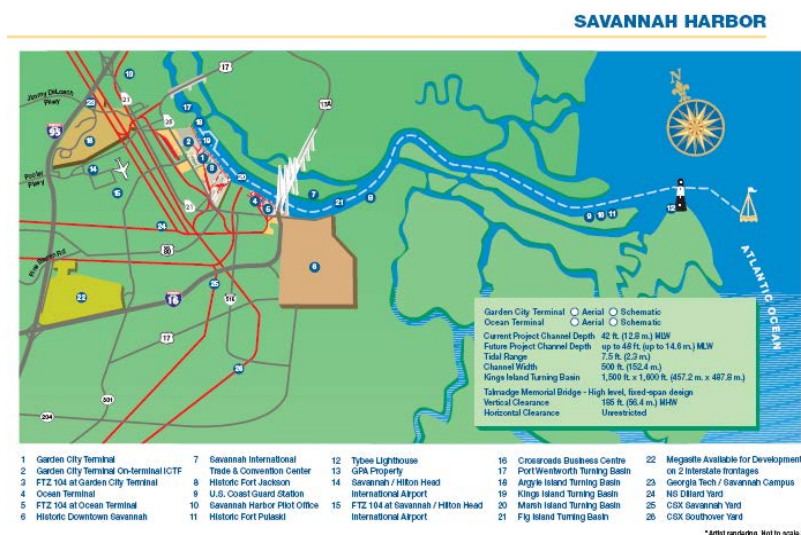
<sup>3</sup> US Census Data, Census 2000.



**Figure 22-7. Savannah, GA: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION



### Garden City Terminal

Owned and operated by the Georgia Ports Authority, Garden City Terminal is a secured, dedicated container facility, the largest of its kind on the U.S. East and Gulf coasts. The 1,200-acre single-terminal facility features 7,726 linear feet of continuous berthing and more than 1.3 million square feet of covered storage. The terminal is equipped with thirteen high-speed container cranes (2 super post-panamax & 11 post-panamax), as well as an extensive inventory of yard handling equipment.

Garden City Terminal is within 6.3 miles of Interstate 16 (East / West) and 5.6 miles of Interstate 95 (North / South) with access to more than 100 trucking companies. CSX Transportation and Norfolk Southern Railroad provide Class I rail service. As a key intermodal advantage, the "James D. Mason" on-terminal intermodal container transfer facility, or "Mason" ICTF, provides overnight rail service to

Atlanta. Two to four day delivery via the ICTF is also available to inland destinations such as Charlotte, Chicago, Dallas and Memphis.

With the continuing diversification of Savannah's ocean carrier portfolio, more and more retailers are making Savannah the port of choice for their import distribution centers. Together, Savannah area distribution centers cover more than 9 million square feet of warehousing and annually generate more than 300,000 TEU's. Sailings as fast as 22 days from Asian-based ports and 9 days from Europe mean your shore-to-door transits define the term expedited.

Savannah boasts all the additional ingredients for the ideal retail distribution center equation: numerous, affordable construction-ready sites; two major interstates in close proximity to the Garden City Terminal; local and state government with a keen interest in development and job creation; a workforce versed in critical logistics skills; two Class I railroads providing convenient connections to key consumer concentrations nationwide.

#### **Ocean Terminal**

Owned and operated by the Georgia Ports Authority, Ocean Terminal is a secured, dedicated breakbulk facility specializing in the rapid and efficient handling of a vast array of forest and solid wood products, steel, RoRo (Roll-on / Roll-off), project shipments and heavy-lift cargoes.

The 208-acre facility features 6,688 linear feet of deepwater berthing, approximately 1.5 million square feet of covered storage and 96 acres of open, versatile storage. Served by over 100 trucking companies, Ocean Terminal is ideally situated within 1.2 miles of Interstate 16 (East / West) and 10 miles of Interstate 95 (North / South). Norfolk Southern Railroad provides switching services on-terminal. Line-haul services are provided by two Class I rail providers, CSX Transportation and Norfolk Southern Railroad.<sup>4</sup>

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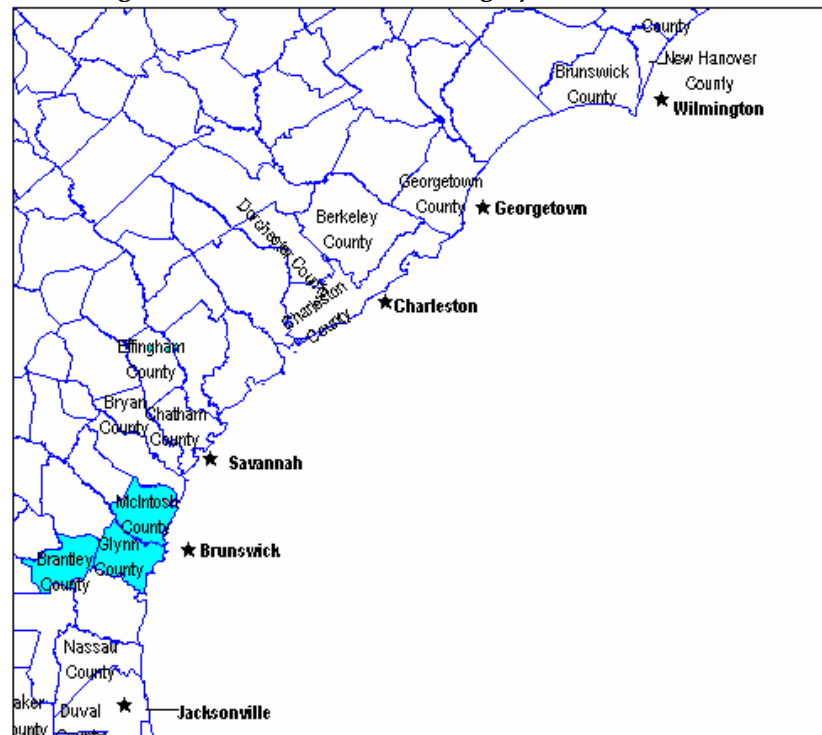
<sup>4</sup> Georgia Ports Authority website: <http://www.gaports.com>

# 23. Brunswick, GA

## Location and Background Information

The Port of Brunswick is located in the Brunswick, GA Metropolitan Statistical Area (MSA).

*Figure 23-1. Brunswick, GA: Geographic Location, 2000*



Source: Table 3-1

## Demographics

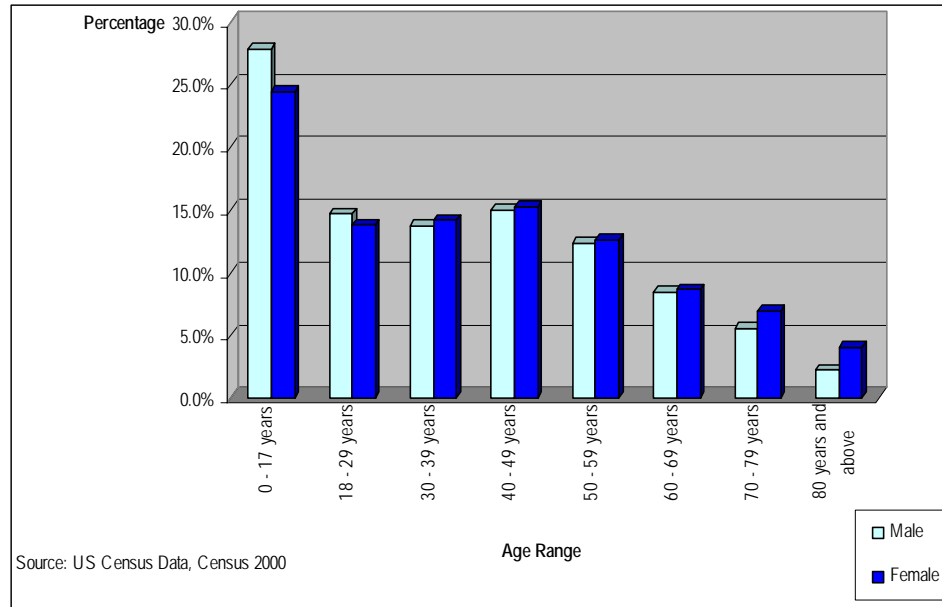
### POPULATION

The total population of the MSA in the year of 2000 was 93,044, according to the 2000 US Census. Of this total, 15,034 or 48.4 percent were males and 48,010 or 51.6 percent were females. The median age for the region in 2000 was 37.3 years, 35.8 for males and 38.5 for females. Nearly 30 percent of males and nearly 25 percent of females are between the ages of 0 and 17 years. About 15 percent of males and females fall within the 40-49 years age range (Figure 23-2).

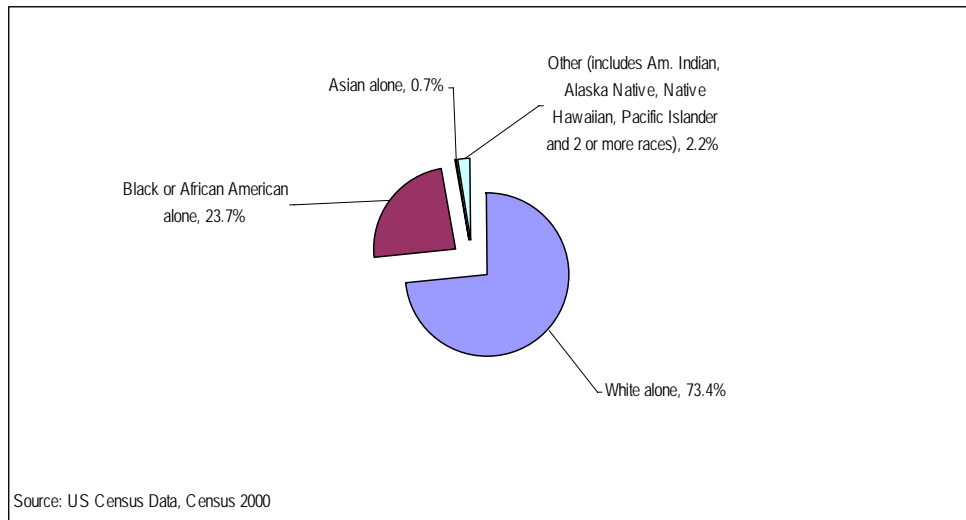
The majority of the population in the region is white (73.4 percent), followed by the Black or African American population, which represents 23.7 percent of the total population. 'Others' (which includes American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone) constitute 2.2 percent of the population; and the Asian population represents only 0.7 percent of the total population (Figure 23-3). Moreover, in terms of ethnic makeup, only 2.4 percent of the total population is considered to be of Hispanic or Latino origin.<sup>1</sup>

<sup>1</sup> Source: US Census Data, Census 2000.

**Figure 23-2. Brunswick, GA: Structure of the Population by Age Group, 2000**

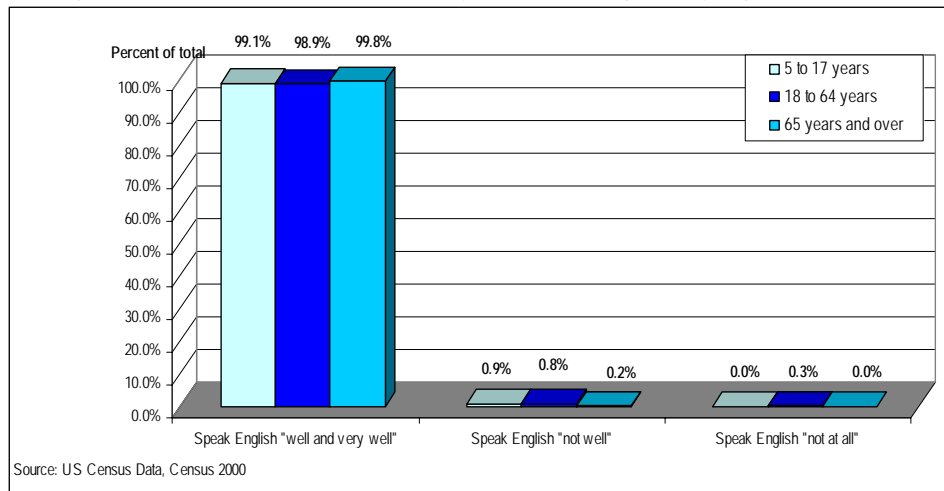


**Figure 23-3. Brunswick, GA: Population by Race, 2000**



It is evident from the data specified in Figure 23-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

**Figure 23-4. Brunswick, GA: Ability to Speak English by Age Group, 2000**

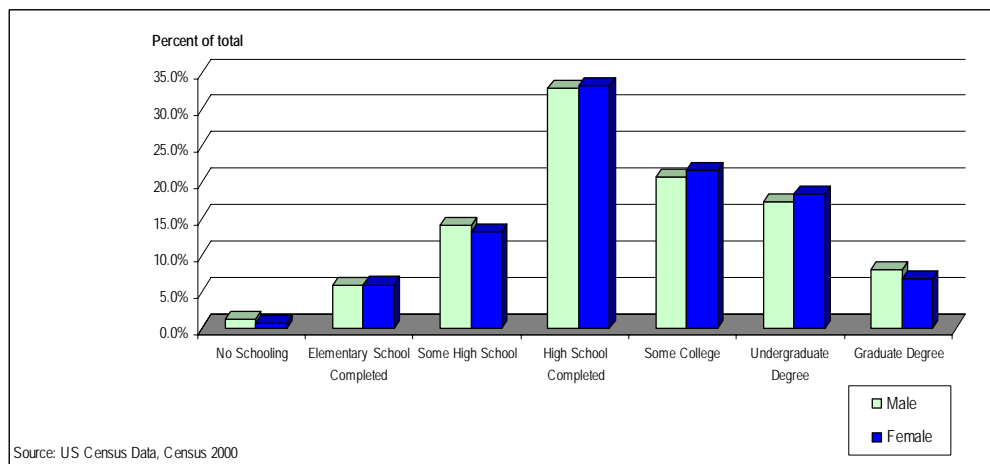


## EDUCATION

As portrayed by Figure 23-5, of the population that is 25 years old or over, about 30 percent of males and females have completed high school. About 20 percent of males and females have completed some college and 15 percent of males and females have obtained an undergraduate degree.

Coastal Georgia Community College is the only college in the area.<sup>2</sup>

**Figure 23-5. Brunswick, GA: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



<sup>2</sup> Brunswick, GA Community Profile: <http://www.epodunk.com>

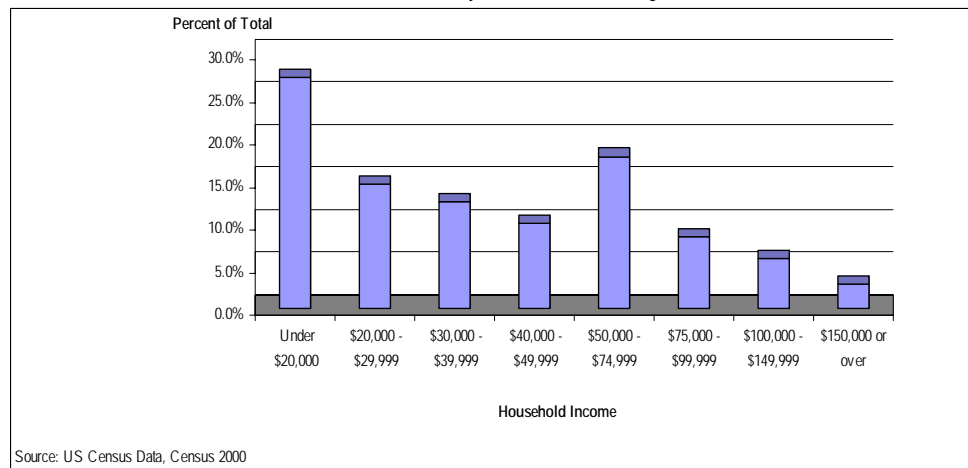
## Socio-Economic Characteristics

### INCOME

About 28 percent of households in this region in 1999 had an income under \$20,000. Nearly 20 percent of households had incomes that fell within the \$50,000 – \$74,999 income bracket (Figure 23-6).

Household median income in the Brunswick GA MSA in 1999 was \$36,539.46 and per capita income for the same year was \$19,581.15. The percentage of people under the poverty line in the region was 15.6 in the year 2000. The average household size in 2000 was 2.48.<sup>3</sup>

**Figure 23-6. Brunswick, GA: Distribution of Households by Household Income Level, 1999**



### EMPLOYMENT

As shown on Figure 23-7, of the employed civilian population ages 16 or over, 30 percent of females are employed in the educational, health and social services industry, and about 28 percent are employed in 'other' industries, which include the arts, entertainment, recreation, food services, public administration and information. Over 25 percent of males are employed in 'other' industries, and 45 percent of males (distributed fairly evenly among each industry- around 15 percent each) are employed in the construction, wholesale and retail trade and manufacturing industries.

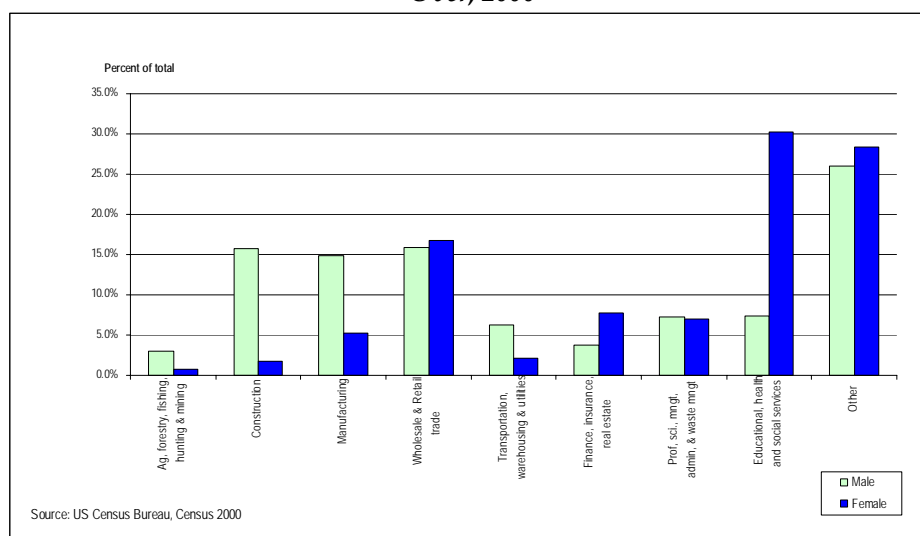
An estimated 4.1 percent of males are unemployed; whereas 6.9 percent of females are unemployed in the region.<sup>4</sup>

According to the 2000 US Census, an estimated 1.8 percent of males and 0.3 percent of females are employed in farming, fishing and forestry occupations. About 21.0 percent of males and 6.9 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.6 percent of male's occupations and 0.04 percent of female's occupations.

<sup>3</sup> US Census Data, Census 2000.

<sup>4</sup> Source: US Census Data, Census 2000.

**Figure 23-7. Brunswick, GA: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION



### Marine Port Terminals

Owned by the Georgia Ports Authority and leased to Logistec U.S.A., Marine Port Terminals is a secured, deepwater facility specializing in the productive handling of a diverse mix of breakbulk and bulk commodities. The 145-acre (58.7-ha) facility features 2,415 linear feet (736 linear meters) of berthing and 491,000 square feet (45,617 square meters) of covered storage. Marine Port Terminals is ideally situated within 7 miles (11.3 km) of Interstate 95 (North / South). On-terminal interchange and line-haul services are provided by two Class I rail providers, CSX Transportation and Norfolk Southern Railroad.

**Mayor's Point Terminal**

Owned and operated by the Georgia Ports Authority, Mayor's Point Terminal is a secured, dedicated breakbulk facility specializing in the rapid and efficient handling of a vast array of forest products and solid wood products. The 22-acre (8.9-ha) facility features 1,750 linear feet (533 linear meters) of berthing, 355,000 square feet (32,980 square meters) of intransit space, 2,000 feet (610 m) of covered rail siding and 7.9 acres (3.21 ha) of open, versatile storage. As a key U.S. South Atlantic gateway, the Port of Brunswick provides a competitive portfolio of ocean carrier services, as well as excellent interstate and rail connections to all major Southeast, Midwest and Gulf Coast commerce centers. Mayor's Point Terminal is ideally situated within six miles (9.7 km) of Interstate 95 (North / South). Two Class I rail providers, CSX Transportation and Norfolk Southern Railroad, offer exceptional service.<sup>5</sup>

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<sup>5</sup> Georgia Ports Authority website: <http://www.gaports.com>

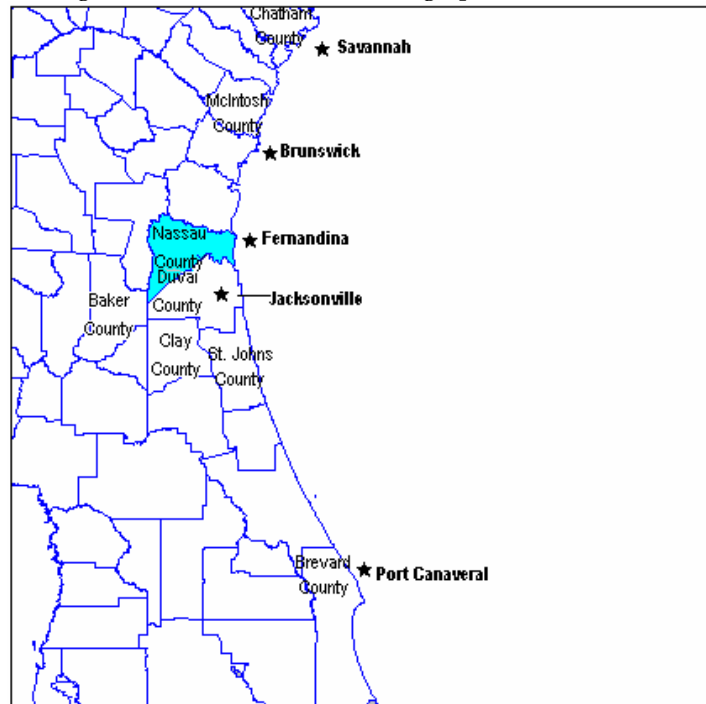


# 24. Fernandina, FL

## Location and Background Information

The Port of Fernandina is located in Nassau County, FL.

Figure 24-1. Fernandina, FL: Geographic Location, 2000



Source: Table 3-1

## Demographics

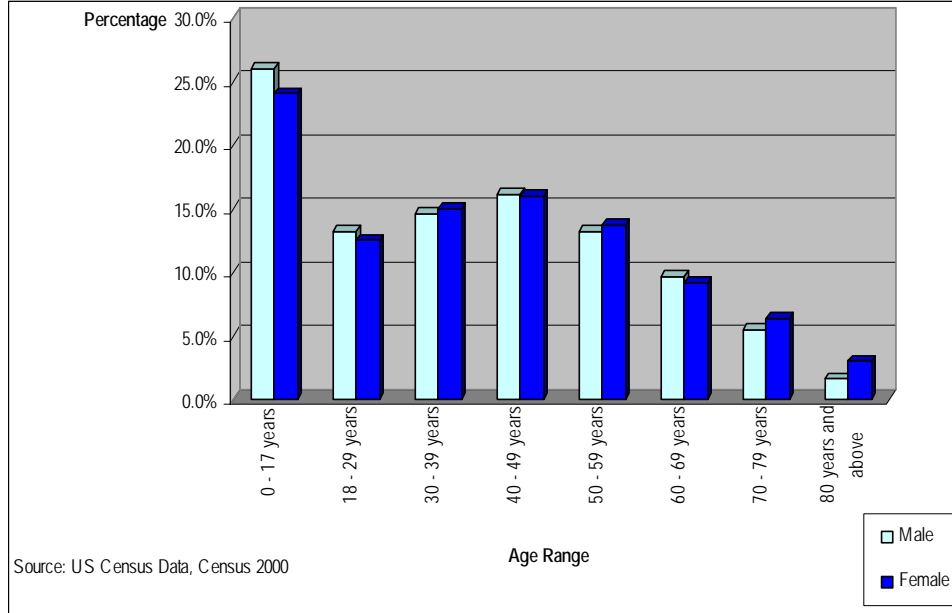
### POPULATION

The total population in this county for the year 2000 was 57,663, according to the 2000 US Census. Of this total, 28,443 or 49.3 percent were males and 29,220 or 50.7 percent were females. The median age for the population for the same year was 38.3 years; 37.6 for males and 38.9 for females. About 25 percent of males and nearly 25 percent of females are between the ages of 0 and 17 years. About 15 percent of males and females fall within the 40-49 years age range (Figure 24-2).

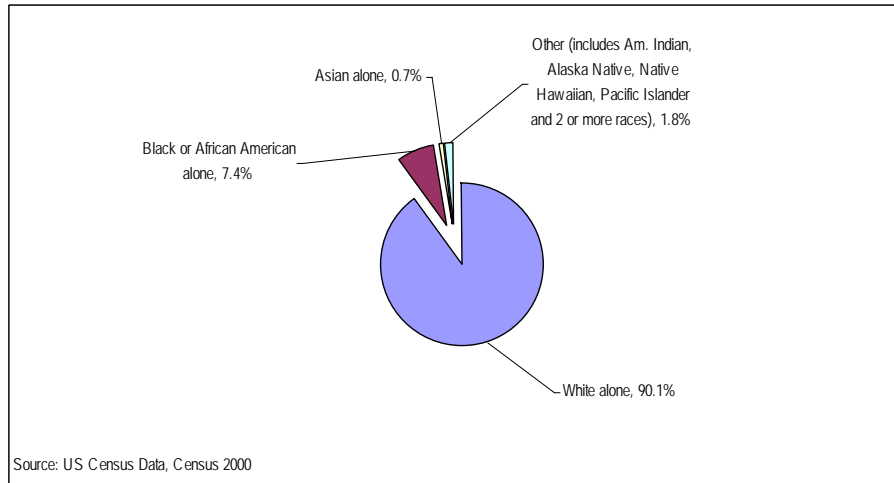
As shown on Figure 24-3, 90.1 percent of the total population is white, 7.4 percent is Black or African American, 1.8 percent are part of the 'other' category (American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone) and 0.7 percent of the population is Asian. Only 1.8 percent of the total population is considered to be of Hispanic or Latino origin.<sup>1</sup>

<sup>1</sup> Source: US Census Data, Census 2000.

**Figure 24-2. Fernandina, FL: Structure of the Population by Age Group, 2000**

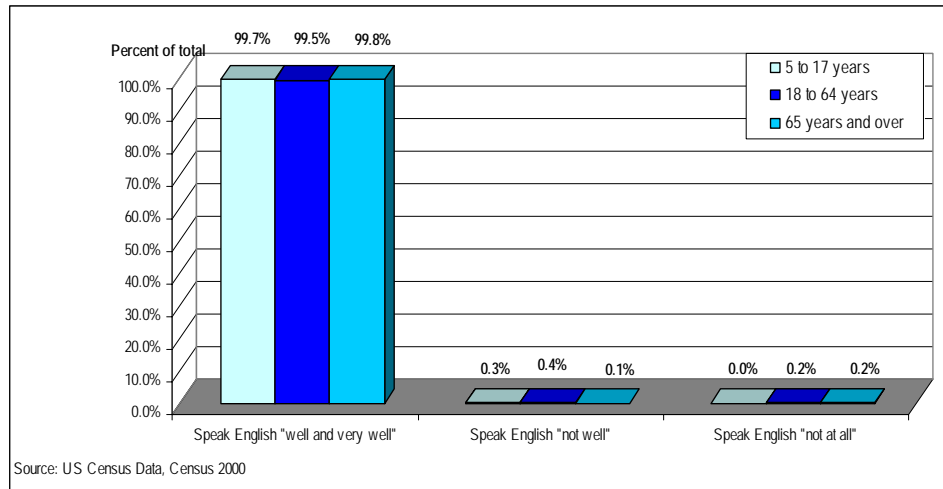


**Figure 24-3. Fernandina, FL: Population by Race, 2000**



It is evident from the data specified in Figure 24-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

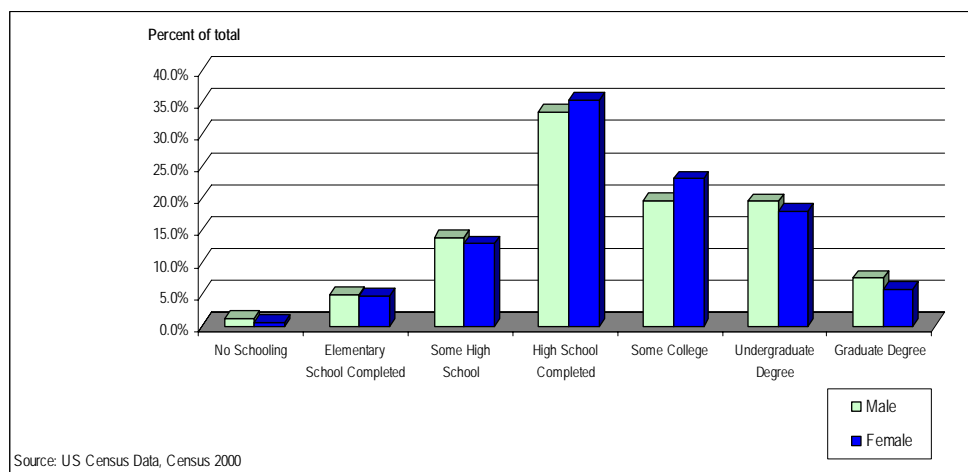
**Figure 24-4. Fernandina, FL: Ability to Speak English by Age Group, 2000**



## EDUCATION

As portrayed by Figure 24-5, of the population of Nassau County, FL, ages 25 and over, over 35 percent of males and females (nearly 40 percent of females) have completed high school. Over 18 percent of males and females have completed some college and between 15 – 20 percent of males and females have obtained an undergraduate degree.

**Figure 24-5. Fernandina, FL: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



## Socio-Economic Characteristics

### INCOME

Nearly a quarter of all households in Nassau County, FL in 1999 had an income that fell in the \$50,000 - \$74,999 income bracket. About 20 percent of households in the county had an income under \$20,000 (Figure 24-6).

Household median income in the county in 1999 was \$46,022 and per capita income for the same year was \$22,836. The percentage of people under the poverty line in the region was 9.1 in the year 2000. The average household size in 2000 was 2.59.<sup>2</sup>

**Figure 24-6. Fernandina, FL: Distribution of Households by Household Income Level, 1999**



### EMPLOYMENT

As portrayed in Figure 24-7, of the employed civilian population, ages 16 or over, over 50 percent of females were employed in the educational, health and social services industries, and other industries (25 percent per industry). The 'other' category includes industries such as the arts, recreation, entertainment, food services and information. About 22 percent of males are employed in 'other' industries; around 16 percent of them are employed in the construction industry and 18 percent in the manufacturing industry.

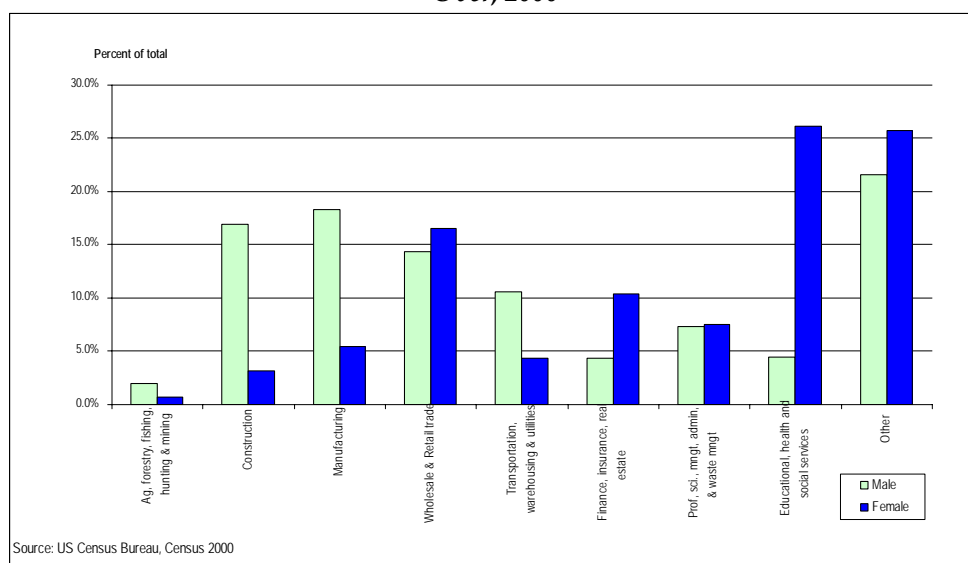
An estimated 4.4 percent of males and 5.2 percent of females are unemployed in the county.<sup>3</sup>

According to the 2000 US Census, an estimated 1.0 percent of males and 0.1 percent of females are employed in farming, fishing and forestry occupations. About 24.1 percent of males and 7.0 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.4 percent of male's occupations and 0.1 percent of female's occupations.

<sup>2</sup> US Census Data, Census 2000.

<sup>3</sup> US Census Data, Census 2000.

**Figure 24-7. Fernandina, FL: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION

Fernandina Beach in the Center of Activity and the "Crown Jewel" of Amelia Island. The town of Fernandina by the early 1800's had become a thriving seaport town. Both the "locals," as residents call themselves, and visitors to the Island appreciate the area's rich and colorful history. Fernandina Beach is the only city in the United States to have served under eight (8) flags.

The Port of Fernandina was the heart of the development of the city from its earliest days, but that changed dramatically in 1862, when Confederate forces were forced to abandon the Island. With the advancement of Federal troops, Fernandina's economy was wrecked. Its port, shops, warehouses were destroyed and the railroad, heavily damaged. By 1870, Fernandina had begun rebuilding the port and the town and once again became a bustling and thriving seaport town, relying primarily on the shipping industry, shrimping, and the tourist trade. The town was then rocked by another disaster, a devastating fire which burned and destroyed the original wooden structures from the docks to 3rd Street. This required another extensive rebuilding process.

Major William B. C. Duryee, who had served with the Occupational Forces of the Union Army, returned to Fernandina, purchased property at the west end of what is now Centre Street, and built a two-story masonry structure, unique for its time, due to its being built on pilings sunk into the earth for support. The building was completed in the mid 1880's. The first occupant was Major Duryee's business, which dealt in hay, grain, and oats. Also occupying the building was the First Customs House in the United States. Major Duryee also served as Collector of Customs. The lease was made by the U.S Treasury for \$180.00 per annum. The Customs House occupied this space until the early 1900's. The Duryee Building, home now to the Marina Restaurant, was also the home of the oldest newspaper in the State of Florida. A very colorful and flamboyant Major George Fairbanks, who was the Editor, recorded Fernandina's life and history during that period of time. The 'Florida Mirror' later became the Fernandina Beach News-Leader, which continues in operation today. The First Bank of Fernandina was also located in the Duryee Building. This Bank was later sold and became the First National Bank of Florida.<sup>4</sup>

<sup>4</sup> URL: <http://www.ameliaisland.com/fbhist.htm>

**Nassau Terminals - Port of Fernandina (AAPA Member)**

Nassau Terminals provides terminal and stevedoring services as the operator of the Port of Fernandina under contract with the local port authority. The Port specializes in breakbulk forest products and container liner services to the Caribbean and South America.<sup>5</sup>

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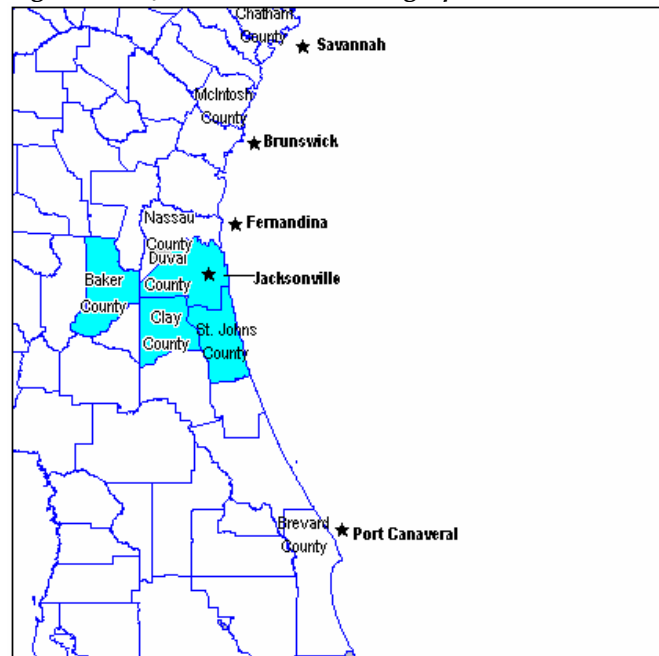
<sup>5</sup> American Association of Port Authorities website: <http://www.aapadirectory.com/cgi-bin/showpage.cgi?id=3914>

# 25. Jacksonville, FL

## Location and Background Information

The Port of Jacksonville, Florida is part of the Jacksonville, FL Metropolitan Statistical Area (MSA).

*Figure 25-1. Jacksonville, FL: Geographic Location, 2000*



Source: Table 3-1

## Demographics

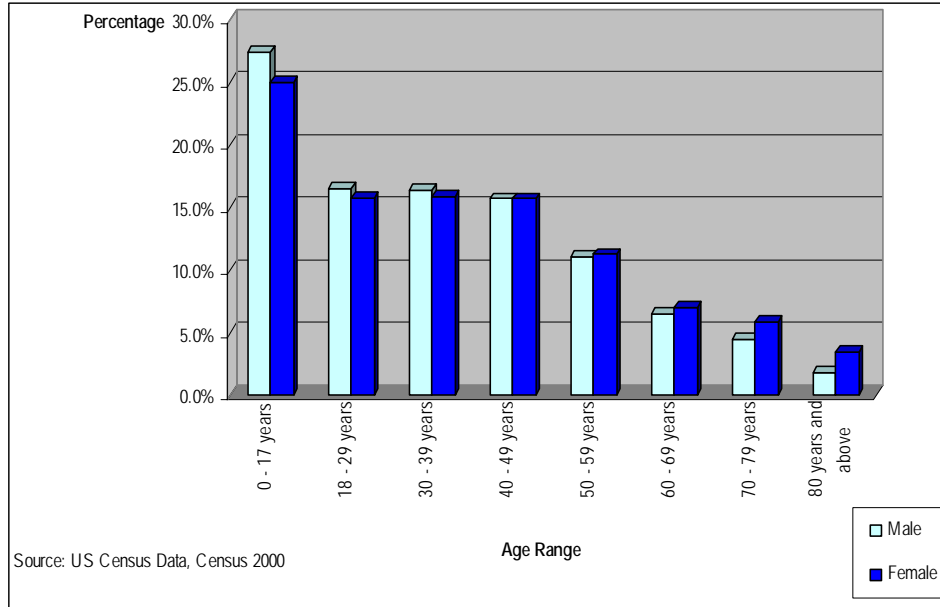
### POPULATION

The total population of the Jacksonville, FL MSA in 2000 was 1,065,087, according to the 2000 US Census. Of the total, 518,618 or 48.7 percent were males and 546,469 or 51.3 percent were females. The median age for the MSA in the same year was 35.1 years; 33.9 for males and 36.1 for females. About 27 percent of males and nearly 25 percent of females are between the ages of 0 and 17 years. About 45 percent of males and females (15 percent per age group approximately) are between the ages of 18 and 49 years (Figure 25-2).

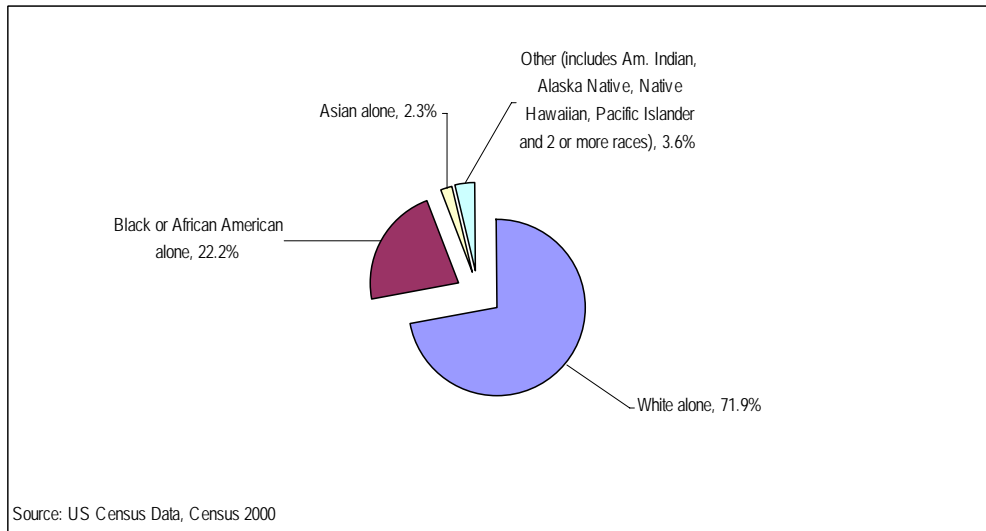
As shown in Figure 25-3, 71.9 percent of the total population is white, 22.2 percent is Black or African American, 3.6 percent is categorized as 'others' (includes American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone) and 2.3 percent is Asian. Furthermore, in terms of ethnic makeup, around 3.9 percent of the total population is considered to be of Hispanic or Latino origin.<sup>1</sup>

<sup>1</sup> Source: US Census Data, Census 2000.

**Figure 25-2. Jacksonville, FL: Structure of the Population by Age Group, 2000**



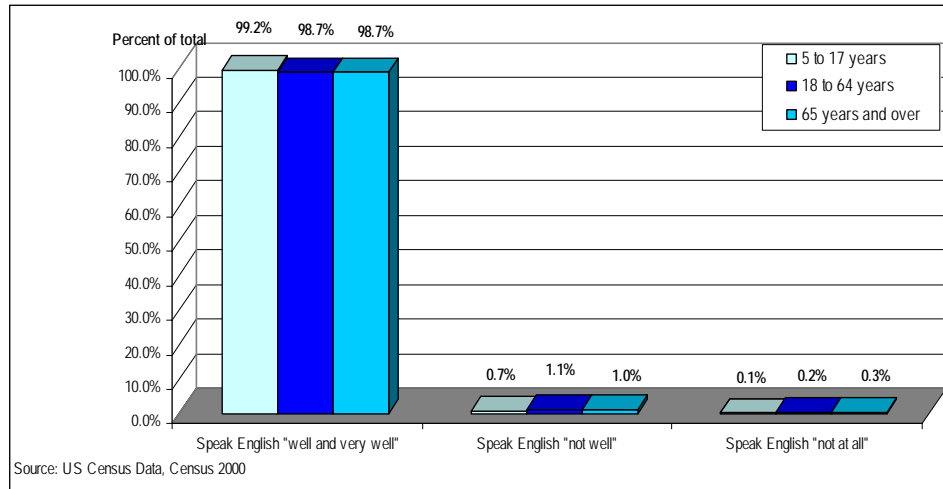
**Figure 25-3. Jacksonville, FL: Population by Race, 2000**





It is evident from the data specified in Figure 25-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

**Figure 25-4. Jacksonville, FL: Ability to Speak English by Age Group, 2000**

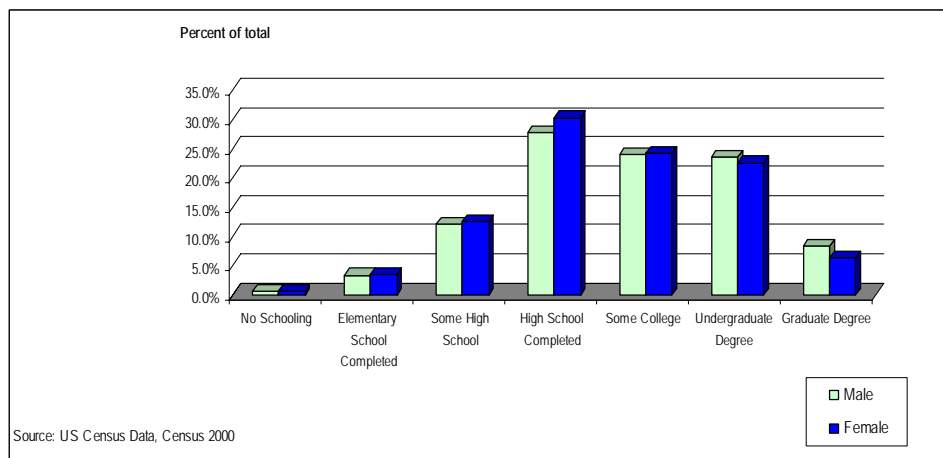


## EDUCATION

As portrayed in Figure 25-5, of the population in the Jacksonville, FL MSA aged 25 or over, nearly 30 percent of females and 25 percent of males have completed high school. About 23 percent of males and females have completed some college and over 20 percent of males and females have obtained an undergraduate degree.

Some of the colleges and universities in the area are: Edward Waters College, Florida Community College at Jacksonville, Jacksonville University, Jones College - Jacksonville, Trinity Baptist College and the University of North Florida.

**Figure 25-5. Jacksonville, FL: Educational Attainment of Population by Sex Ages 25 and Over, 2000**



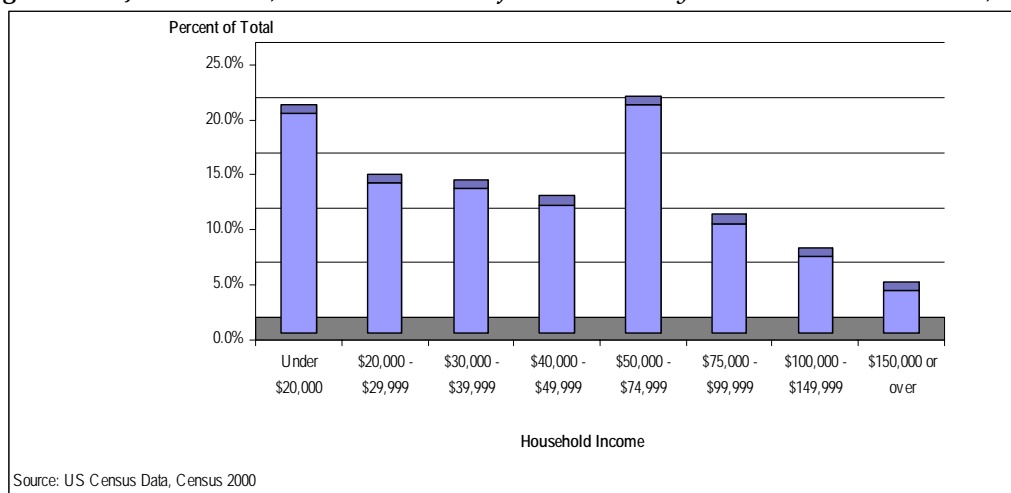
## Socio-Economic Characteristics

### INCOME

About 22 percent of households in the Jacksonville, FL MSA in 1999 had an income that fell within the \$50,000 - \$74,999 income bracket and around 20 percent of households had incomes below \$20,000. Only 5 percent of households had incomes of \$150,000 or over (Figure 25-6).

Household median income in 1999 in the region according to the 2000 US Census was \$42,825.10 and per capita income was \$21,567.15. The percentage of people under the poverty line in the region was 10.8 in the year 2000. The average household size for 2000 was 2.54.<sup>2</sup>

**Figure 25-6. Jacksonville, FL: Distribution of Households by Household Income Level, 1999**



### EMPLOYMENT

Of the employed civilian population, aged 16 or over, in the Jacksonville, FL MSA in 2000, over 25 percent of females were employed in the educational, health and social services industries and over 20 percent were employed in 'other' industries. 'Other' industries include the arts, recreation, entertainment, food services and information. About 20 percent of males were employed in 'other' industries and around 17% were employed in the wholesale and retail trade industries. Less than 1 percent of males and females were involved in agriculture, mining, fishing, farming or forestry industries (Figure 25-7).

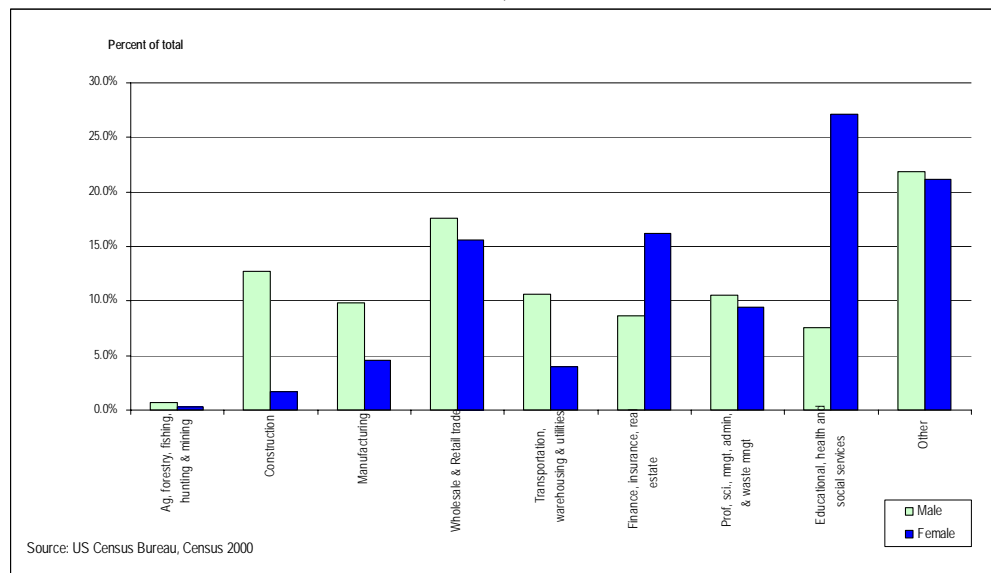
An estimated 4.2 percent of males and 4.9 percent of females were unemployed in the MSA in the year 2000.<sup>3</sup>

According to the 2000 US Census, an estimated 0.5 percent of males and 0.1 percent of females are employed in farming, fishing and forestry occupations. About 17.4 percent of males and 5.2 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.7 percent of male's occupations and 0.1 percent of female's occupations.

<sup>2</sup> US Census Data, Census 2000.

<sup>3</sup> US Census Data, Census 2000.

**Figure 25-7. Jacksonville, FL: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION



The Jacksonville Port Authority (JAXPORT) is a full-service international trade seaport in Northeast Florida. JAXPORT offers multiple cargo terminals and unmatched opportunities for intermodal transportation of container, automobile, bulk, breakbulk and refrigerated cargoes, as well as cruise passenger service.

JAXPORT owns and operates three public marine terminals and one passenger cruise terminal in Jacksonville Florida: the Blount Island Marine Terminal, the Talleyrand Marine Terminal, the Dames Point Marine Terminal, and the temporary JAXPORT Cruise Terminal. JAXPORT develops, manages and markets those publicly-owned facilities to promote the growth of maritime and related industries in Jacksonville Florida and beyond. JAXPORT also offers year-round cruise ship service aboard Carnival Cruise Lines' ship Celebration. The Celebration sails from the

JAXPORT Cruise Terminal.

The port of Jacksonville, Florida, has a rich maritime history. Travel back to 1562 and you would see Jean Ribault and his French Huguenots crossing a shallow sand bar into what is now called the St. Johns River. In 1565, English traders sailed into the mouth of the St. Johns and traded guns and ammunition for food and a vessel with the French Huguenots who had settled at Fort Caroline. This transaction was the first recorded act of international waterborne commerce in the New World; hence Jacksonville is known as America's First Port.

In 1963, Florida Legislature created the Jacksonville Port Authority. The City transferred to the JPA the Talleyrand Municipal Docks near downtown and a tract of land known as Goat Island, later renamed Blount Island. The original Charter granted the Port Authority 1.5 mils of ad valorem taxing authority. The Florida State Legislature amended JPA's Charter, repealing the port's 1.5 mils of ad valorem

authority and capping the annual City's allocation to the port at its present millage value, \$800,000. To this day, JAXPORT has no taxing authority.

In 1964, voters approved port improvements and the issuance of a \$25 million General Obligation Bond for port improvements. In 1968, as part of the consolidation of the City of Jacksonville and Duval County, the City transferred ownership and management of its airports to the JPA. In addition to its maritime responsibilities, the Port Authority managed operations at Jacksonville International Airport, Craig Airport and Herlong Airport until October 1, 2001, when a separate Jacksonville Airport Authority was created to manage those facilities.

In 1972 JPA sold the eastern half of Blount Island to Offshore Power Systems, Inc. when this company announced plans to build floating nuclear power stations. For a variety of economic reasons, the project never moved forward and the property was sold to Gate Maritime, Inc. In 1978 the U.S. Army Corps of Engineers deepened the St. Johns River from 34 to 38 feet, a depth maintained for more than 20 years. In 1992 JPA facilities handled 5,001,074 tons in fiscal year 1992, the first time the port reached the five million ton mark. In 1998 JPA acquired the final property for its third marine terminal: Dames Point. While JPA owns nearly 600 acres at the site in Northeast Jacksonville, plans call for potentially leaving more than one third of the property in its natural state to protect environmentally sensitive wetlands. In 1999 JPA facilities set a port record by moving 7,524,271 tons of cargo in fiscal year 1999. This marked the ninth consecutive year of tonnage growth at the port. In 2001 Port security becomes paramount, and in the same year, the Florida Legislature repealed the JPA's existing charter and abolished the JPA by enacting Chapter 2001-319, Laws of Florida. Two new authorities were created: the Jacksonville Airport Authority took over control and operations of all aviation facilities formerly controlled by the JPA, and the Jacksonville Seaport Authority (doing business as the Jacksonville Port Authority, or JAXPORT) was created to handle all matters related to the marine operations and facilities formerly controlled by the JPA. The seaport continued to call itself the "Jacksonville Port Authority" or "JAXPORT."

In 2002 JAXPORT completed the first strategic business plan for the new JAXPORT, placing an emphasis on growing the port's business and economic impact for the community. In 2003 U.S. the U.S. Army Corps of Engineers deepened the St. Johns River from 38 to 41 feet. In 2003 Celebrity Cruises and Carnival Cruise Lines both announced plans to begin regular service from Jacksonville - the city's first regular cruise service. JAXPORT built a temporary cruise terminal in only six months. Celebrity kicked off their Jacksonville service with an 11-night cruise to the Caribbean on October 27, 2003 aboard the 1,375-passenger Zenith.

JAXPORT's three marine terminals handled a record-setting 7.6 million tons of cargo in Fiscal Year 2004, including more than 530,000 vehicles - making JAXPORT one of the largest vehicle handling ports in the country.

#### **Blount Island Marine Terminal**

Located just nine nautical miles from the Atlantic Ocean, the Blount Island Marine Terminal has 5,280 feet of berthing space on 41 feet of deepwater. Blount Island has an additional 1,350 feet of berthing space on 38 feet of water. This 754-acre terminal is JAXPORT's largest container facility - handling 80 percent of the nearly 700,000 TEUs moved annually through JAXPORT facilities. The terminal dedicates more than 150 acres to container storage, and 240,000 square feet of dockside transit shed to house commodities such as stainless steel, liner board, wood pulp and other cargoes in need of warehousing.

Blount Island also is one of the largest vehicle import-export centers on the East Coast, and the terminal handles recreational boats, tractors, paper, wood pulp, forest products and a variety of general cargoes. The entire terminal is covered under JAXPORT's Foreign Trade Zone No. 64 license and can be activated for qualified users.

To help speed both ships and cargo on their way, JAXPORT deploys nine cranes on the island, including eight container cranes. The efficient movement of cargo is facilitated by the terminal's on-dock rail served directly by CSX Corporation.

### **Talleyrand Marine Terminal**

The Talleyrand Marine Terminal is located 21 miles from the Atlantic Ocean on the St. Johns River. This 173-acre terminal has 38 feet of water along its docks. Talleyrand handles South American and Caribbean containerized cargoes, breakbulk commodities such as steel and paper, imported automobiles, frozen and chilled goods and liquid bulk commodities.

Ocean carriers calling the Talleyrand Marine Terminal offer direct access to world trade lanes for all U.S. bound or originated containerized cargo through Freeport, Bahamas. This efficient transportation link bridges Freeport and major U.S. markets through Jacksonville.

The terminal also offers on-Dock warehousing; JAXPORT Refrigerated Services, an ICS Logistics Company, offers 160,000-square feet of warehouse space which can handle cargo in ambient, cooler or freezer conditions. This facility is located within 75 feet of Talleyrand's vessel berthing area. It offers on-Dock Rail Facilities; it provides direct switching for Norfolk Southern, CSX and Florida East Coast Railroad. Furthermore, the entire terminal is within FTZ #64.

The Talleyrand terminal is serviced by three Class 1 railroads, and is easily reached by I-95 and I-10 leading to U.S. 1 and Jacksonville's 20th Street Expressway. Currently, long-time JAXPORT tenant ICS Logistics is constructing a 553,000-square foot warehouse at the Talleyrand Marine Terminal to store an assortment of cargoes. ICS projects warehouse operations to create 45-60 new full and part-time jobs in Jacksonville, with the potential to create as many as 500 direct and indirect jobs over the course of 30 years. Construction is expected to be complete by the close of 2005. Once built, the new warehouse will give ICS more than 700,000-square feet of warehouse space at Talleyrand.

### **Dames Point Marine Terminal**

The Dames Point Marine Terminal is JAXPORT's newest marine facility. The terminal fronts on the harbor's 41-foot deep channel. Located on more than 585 acres of land owned by JAXPORT, this terminal is only 12 miles from the open sea. Dames Point is one of the few major greenfield sites on the U.S. East coast available for port development.

JAXPORT is currently expanding Dames Point's bulk terminal to 22 acres, and plans call for adding facilities to support new breakbulk cargoes and potentially new container or Ro/Ro operations. JAXPORT is now soliciting new business partnerships with investor/operators for further development of this site.

The JAXPORT Cruise Terminal, located one mile northwest of the Dames Point Marine Terminal, offers service to cruise ships calling Jacksonville. JAXPORT has committed more than \$200 million in capital projects over the past decade to improve its three marine terminals and Jacksonville's harbor.

At the Dames Point Marine Terminal, JAXPORT has recently expanded its bulk terminal to 22 acres, and plans call for adding facilities to support new breakbulk cargoes and potentially new container or Ro/Ro operations.<sup>4</sup>

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<sup>4</sup> Jacksonville Port Authority website: <http://www.jaxport.com/>

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# 26. Port Canaveral, FL

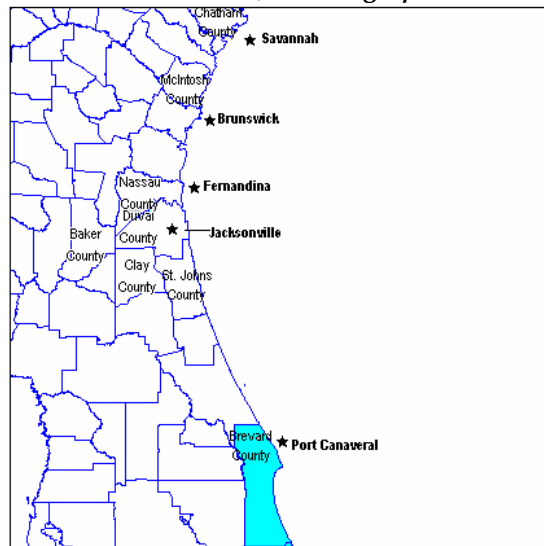
## Location and Background Information

Port Canaveral is located in the Palm Bay-Melbourne-Titusville, Florida Metropolitan Statistical Area (MSA). This MSA is comprised of Brevard County, FL. The port is strategically located on Florida's Central Atlantic Coast and has the necessary intermodal connections to reach all of Florida and the Southeast U.S. In addition, it is an ideal hub between the Southeast U.S., the Caribbean and Central America.

In operation for more than half a century, Port Canaveral has built its reputation as a business-friendly port and a reliable facilitator of breakbulk cargo, with an excellent background in: fresh produce, frozen food, single-strength juice and juice concentrate, milled lumber, bagged cement, steel and newsprint. Efficient handling systems carry cargo from vessels to warehouses. More than three million tons of bulk cargo moves through Port Canaveral per year. The port has cement, petroleum and aggregate facilities, as well as conveyors and hoppers for efficient loading of products directly into trucks.

1

*Figure 26-1. Port Canaveral, FL: Geographic Location, 2000*



Source: Table 3-1

## Demographics

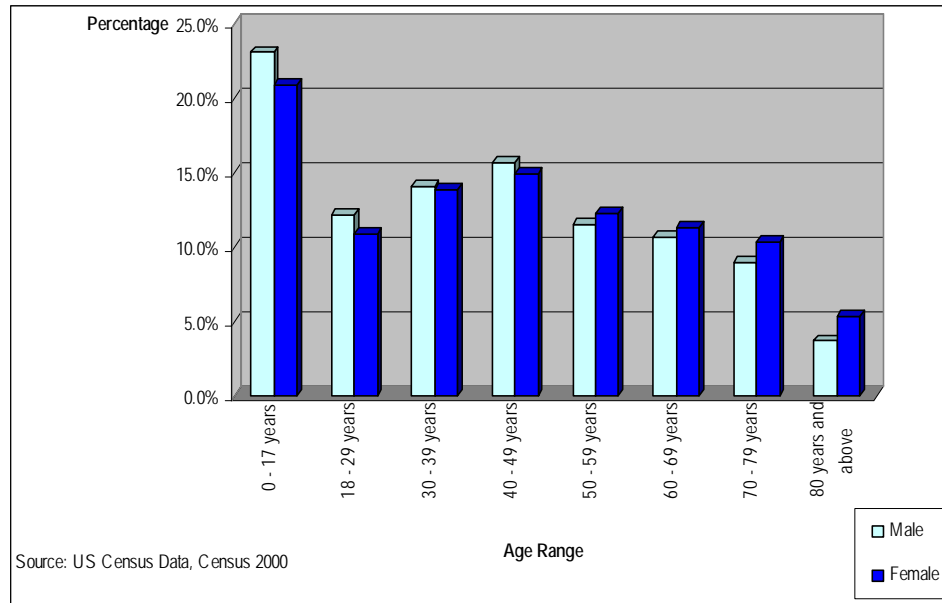
### POPULATION

Brevard County had a total population of 476,230 in the year 2000, according to the 2000 US Census. Of this total, 233,186 or 49 percent were males and 243,044 or 51 percent were females. The median age in the county in 2000 was 41.4 years, 40.3 for males and 42.6 for females. Over 20 percent of males and females are between the ages of 0 and 17 years. About 15 percent of males and females fall within the 40-49 years age range (Figure 26-2).

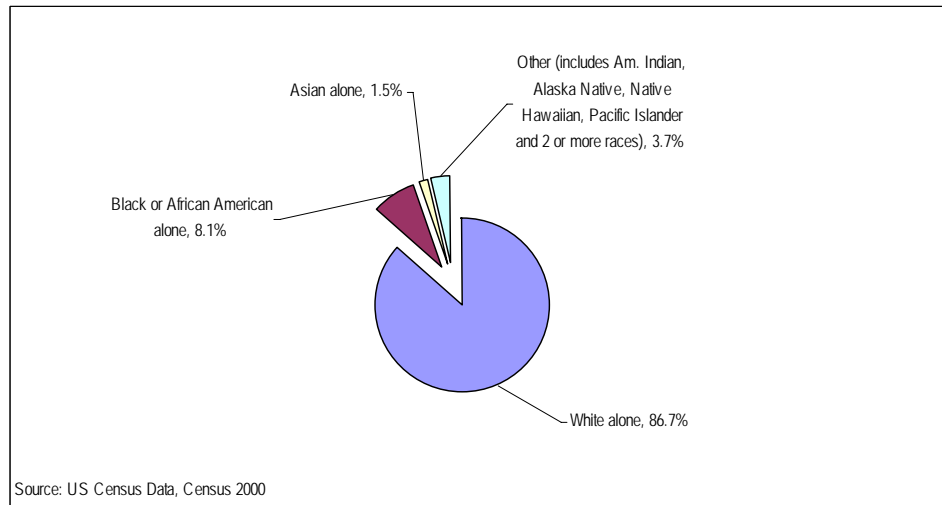
<sup>1</sup> Port Canaveral website: <http://www.portcanaveral.org>

As shown in Figure 26-3, 86.7 percent of the population in Brevard County, FL is white, 8.1 percent of the population is Black or African American. 'Others' (which include American Indians, Alaska natives, Hawaiian natives, Pacific Islanders, and 2 or more races alone), represent 3.7 percent of the population and the Asian population represents only 1.5 percent of the total population. About 4.6 percent of the total population is considered to be of Hispanic or Latino origin.<sup>2</sup>

**Figure 26-2. Port Canaveral, FL: Structure of the Population by Age Group, 2000**



**Figure 26-3. Port Canaveral, FL: Population by Race, 2000**

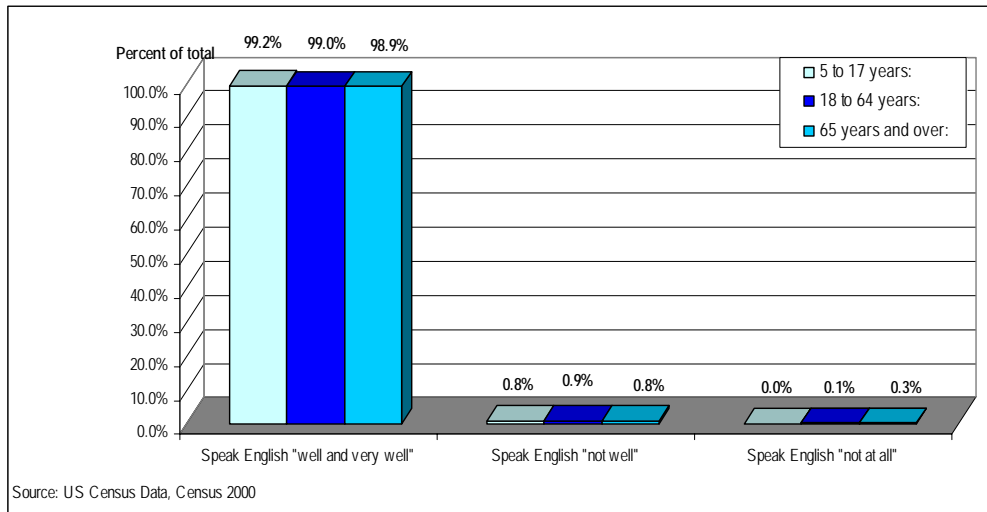


<sup>2</sup> US Census Data, Census 2000.



It is evident from the data specified in Figure 26-4 that most of the population in all age ranges in the area dominates the English language 'well' and 'very well'.

**Figure 26-4. Port Canaveral, FL: Ability to Speak English by Age Group, 2000**

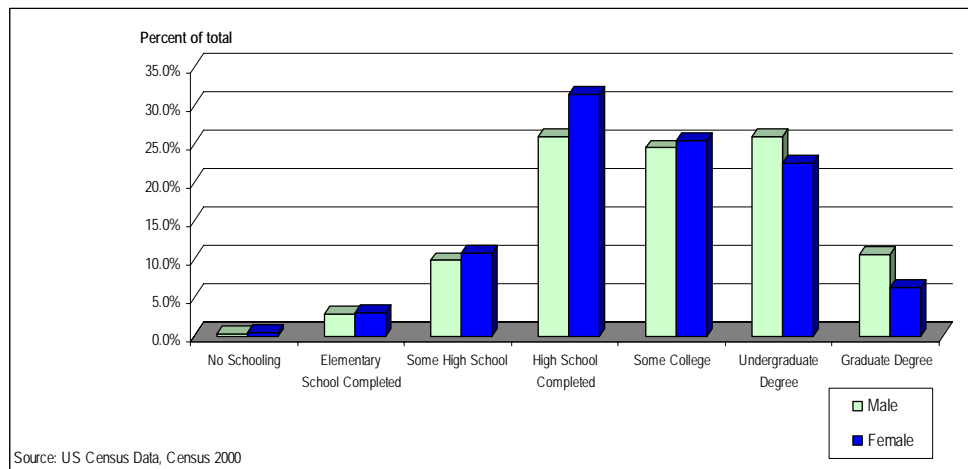


## EDUCATION

Of the population in Brevard County, FL, ages 25 or over, 30 percent of females and 25 percent of males have completed high school. About 25 percent of the population has finished some college, and about 21 percent of females and 25 percent of males have obtained an undergraduate degree (Figure 26-5).

There are only two higher education institutions in the area: Brevard Community College and the Florida Institute of Technology.

**Figure 26-5. Port Canaveral, FL Educational Attainment of Population by Sex Ages 25 and Over, 2000**



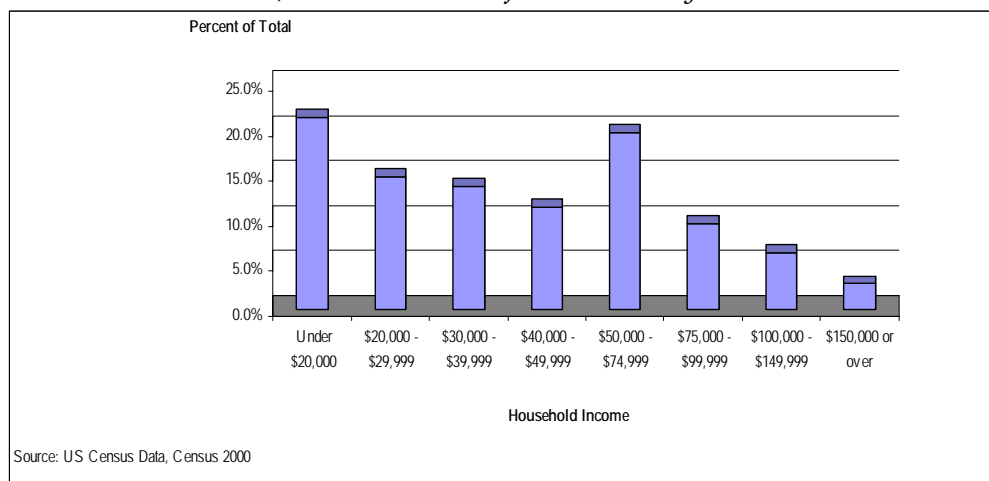
## Socio-Economic Characteristics

### INCOME

About 23 percent of all households in the county had an income of under \$20,000 in 1999, and over 20 percent of households fell within the \$50,000 - \$74,999 income bracket. Less than 3 percent of households had incomes of \$150,000 or above (Figure 26-6).

Household median income in the region in 1999 was \$40,099 and per capita income for the same year was \$21,484. The percentage of people under the poverty line in the region was 9.5 in the year 2000. The average household size in 2000 was 2.35.<sup>3</sup>

**Figure 26-6. Port Canaveral, FL: Distribution of Households by Household Income Level, 1999**



### EMPLOYMENT

As shown in Figure 26-7, of the employed civilian population in Brevard County, FL, ages 16 or over, around 29 percent of females are employed in the educational, health and social services industry. This percentage is closely followed by females employed in 'other' industries (25 percent), which include the arts, recreation, entertainment, food services and information. About 25 percent of males are employed in 'other' industries, 17 percent of them are employed in the manufacturing industry and 15 percent are employed in the wholesale and retail trade industry.

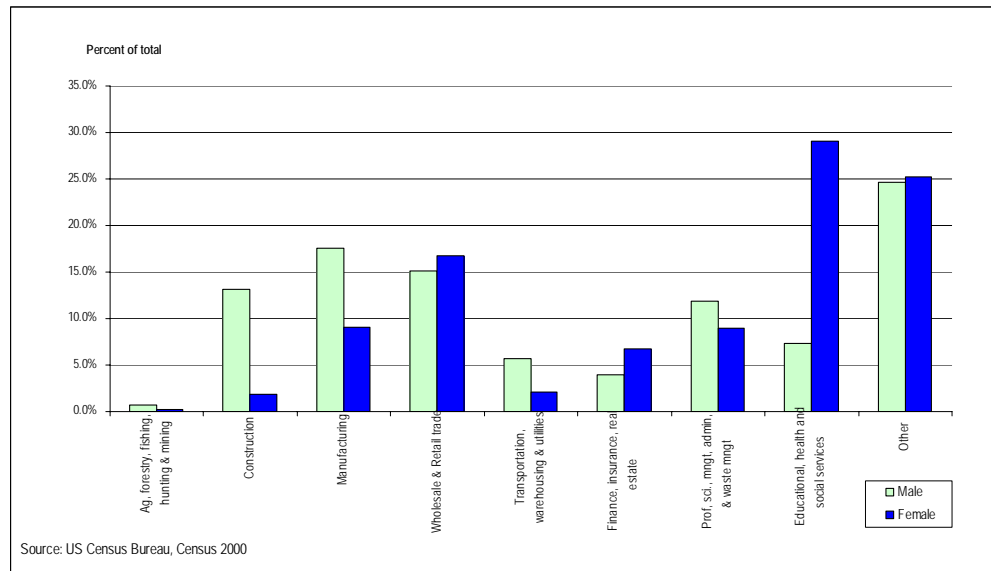
An estimated 4.8 percent of males and 5.0 percent of females were unemployed in the region in the year 2000.<sup>4</sup>

According to the 2000 US Census, an estimated 0.5 percent of males and 0.1 percent of females are employed in farming, fishing and forestry occupations. About 14.8 percent of males and 6.2 percent of females are employed in production, transportation and material moving occupations. The aforementioned occupations include rail, water and other transportation occupations. Rail, water and other transportation occupations represent only 0.6 percent of male's occupations and 0.1 percent of female's occupations.

<sup>3</sup> US Census Data, Census 2000.

<sup>4</sup> US Census Data, Census 2000.

**Figure 26-7. Port Canaveral: Employed Civilian Population by Sex and Industry 16 Years and Over, 2000**



## MARITIME INFORMATION

The Canaveral Port Authority is an independent governmental agency created by the Florida Legislature. The Canaveral Harbor Port District was created by House Bill 1136, Chapter 28922, from the Laws of Florida Special Acts of 1953. It established a port district in the central and north areas of Brevard County, Florida, and designated the area as the Canaveral Port District. As an independent governing body, the Canaveral Port Authority can levy ad valorem taxes, incur indebtedness through the sale of bonds, establish Federal Maritime Commission -regulated tariff rates and negotiate for government grants. Five elected commissioners representing the five port regions are the governing body of Port Canaveral and have jurisdiction over all fiscal and regulatory policies and operations of the Port.

For the past 50 years, Port Canaveral has been offering cargo services in Florida. It handles a variety of cargoes on an ongoing basis: cement, petroleum, aggregate, fresh produce and other perishables, frozen food, single-strength juice and juice concentrate, milled lumber, steel, newsprint, and special project cargo. In addition, the port has the facilities for handling containerized cargoes. The port has 24-hour cargo terminals, a south Intermodal Gate to provide faster truck throughput at the south cargo piers, with a fiber optic weighing and tracking system for breakbulk cargo.

Each cargo berth pier is 400 feet with a 50-foot apron. The **North Cargo Piers 1 and 2 (continuous)** have 1,260 feet of docking space extending north/south with -38'9" MLW draft, with a 66-foot apron. Vessel length is unlimited. North Cargo Pier 3 has 800 feet of docking space extending east/west with -32' MLW draft. Vessel length is unlimited. North Cargo Pier 4 has 800 feet of docking space extending east/west with -36' MLW draft. The pier is equipped with a cement unloader and with pipes for self unloading of cement ships. Vessel length is unlimited but not to extend more than 140 feet to west of pier face.

South Cargo Piers 1, 2 and 3 (continuous) have 1,616 feet of docking space with -34' 10" MLW draft. South Cargo Pier 3 is equipped with petroleum manifolds for five products. Vessel length is unlimited. Tanker Berth 1 has 900 feet of docking space with -39' 6" MLW draft. It is equipped for five

petroleum products and bulk cement self unloaders. Vessel length is unlimited but not to extend more than 140 feet to west of pier face. South Cargo Pier 4 has 800 feet of docking space with 39' 6" MLW draft with a 50-foot apron. It is equipped with four load arms for loading and discharging number 6 oil to and from shore-side facilities. South Cargo Pier 5 has 800 feet of docking space with 39' 6" MLW draft, it also has 400 feet of pier space with a 50-foot apron.

The port features nearly 14 acres of covered warehouse storage facilities, as well as dry warehouse and temperature/humidity-controlled areas. It also provides special storage facilities for: cement and petroleum; and 120,000 square feet of general purpose foreign trade zone warehousing.

Private terminal and warehouse operators at the port include:

**Mid-Florida Freezer Warehouses, Ltd:** boasts the largest, privately held, vessel-side freezer/chill facility in the South, with 8.6 million cubic feet. Mid Florida Freezer also operates more than 400,000 square feet of dry vessel-side cargo warehouses.

**Ambassador Services, Inc:** offers ship agency, cruise ship stevedoring, logistics, equipment fabrication, rail terminal operations, receiving and processing building products for distribution and warehouse operations, are but a sampling of their many areas of expertise.

**The Foreign Trade Zone Group, Inc:** operating an expanding FTZ climate-controlled warehouse, The Foreign Trade Zone Group offers computerized inventory systems management services, record storage and value added distribution services. CBP house broker and freight forwarders are available on site.

**Integrated Distributions Services, Inc:** climate-controlled FTZ warehouse. Offers general warehousing and record storage with computerized inventory systems management and pick up and delivery services. IDS opened the first Container Freight Station in the port in 1999.

#### **Cruise Terminals:**

##### **North Side Terminals**

Terminal No. 5 has a 2,000 x 1,200' turning area Cruise, 970 feet of docking space, 565 feet of pier space, 40 feet wide with -35 MLW draft, 63,000 square feet embarkation/baggage handling facility and 1,536 paved parking spaces. Cruise Terminal No. 8 has 1,000 feet of docking space, 50-foot wide -35 feet MLW draft, 70,000 square feet embarkation/baggage handling facility and 1,100 parking spaces. Cruise Terminal No. 9/10 has 1,100 feet of docking space, 700 feet of pier space, 50 feet wide with -35 MLW draft, 80,000 square foot embarkation/baggage handling facility and 2,150 paved parking spaces, including 1,200-vehicle parking garage.

##### **South Side Terminals**

These terminals have 2,153 feet of continuous dock with -28 feet MLW draft. Cruise Terminal No. 2 has 8,500 square feet of embarkation space and 17,000 square feet of baggage handling area and 246 paved parking spaces. Cruise Terminal No. 3 has 8,500 square feet of embarkation space and 16,000 square feet of baggage handling area and 662 paved parking spaces. Cruise Terminal No. 4 has 9,200 square feet of embarkation area and 20,000 square feet of baggage handling area and 699 paved parking spaces. Two large- or three medium-length cruise ships can be accommodated at Cruise Terminals 2, 3 and 4 to a total of 2,153 feet.

Port Canaveral is Foreign Trade Zone number 136.<sup>5</sup>

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<sup>5</sup> Port Canaveral website: <http://www.portcanaveral.org>

*Appendix E*

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RESTRICTED PERIOD U.S. AND FOREIGN FLAG  
VESSEL ARRIVALS BY PORT AREA,VESSEL TYPE  
VESSEL SIZE AND ALTERNATIVE

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Table E-1. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004

Port Area: Total East Coast

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	8	3	-	-	-	1	1	20	-	3	-	1	-	-	-	-	-	-	37
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	9	-	-	29	34	31	75	28	84	37	96	51	-	-	-	-	-	-	474
Freight Barge	18	10	41	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104
General Dry Cargo Ship	3	1	2	-	2	9	2	-	-	-	-	-	-	-	-	-	-	-	19
Passenger Ship	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	57
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	3	2	2	88	31	12	-	-	-	-	-	-	-	-	-	-	-	-	138
Tank Barge	195	298	87	98	52	1	4	-	-	-	-	-	-	-	-	-	-	-	735
Tanker	208	-	-	25	-	-	52	98	44	52	-	-	-	-	-	-	-	-	479
Towing Vessel	199	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	199
Other a/	19	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21
Total	719	316	132	275	119	54	134	146	128	92	96	52	-	-	-	-	-	-	2,263
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	7	7	-	-	-	1	3	38	-	6	1	1	-	-	-	-	-	-	64
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	8	-	-	24	47	22	93	33	88	33	89	51	-	-	-	-	-	-	488
Freight Barge	25	15	42	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	115
General Dry Cargo Ship	6	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	12
Passenger Ship	145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	145
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	2	4	107	28	19	-	-	-	-	-	-	-	-	-	-	-	-	160
Tank Barge	243	353	142	135	68	-	4	1	-	2	-	-	-	-	-	-	-	-	948
Tanker	210	-	-	21	-	-	57	95	30	54	5	-	-	-	-	-	1	-	473
Towing Vessel	338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	338
Other a/	25	6	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	32
Total	1,007	383	188	320	143	48	158	167	118	95	95	52	-	-	-	-	1	-	2,775
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	7	2	-	-	-	-	1	15	-	3	-	1	-	-	-	-	-	-	29
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	8	-	-	27	34	25	63	22	73	30	85	43	-	-	-	-	-	-	410
Freight Barge	5	9	41	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	88
General Dry Cargo Ship	-	-	2	-	2	8	2	-	-	-	-	-	-	-	-	-	-	-	14
Passenger Ship	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	1	2	-	83	28	12	-	-	-	-	-	-	-	-	-	-	-	-	126
Tank Barge	174	253	70	89	40	1	3	-	-	-	-	-	-	-	-	-	-	-	630
Tanker	174	-	-	23	-	-	37	83	36	38	-	-	-	-	-	-	-	-	391
Towing Vessel	174	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	174
Other a/	11	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Total	598	267	113	255	104	46	106	120	109	71	85	44	-	-	-	-	-	-	1,918
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	7	6	-	-	-	1	3	28	-	5	-	-	-	-	-	-	-	-	50
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	6	-	-	22	46	19	76	27	75	28	80	45	-	-	-	-	-	-	424
Freight Barge	12	14	40	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96
General Dry Cargo Ship	4	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	9
Passenger Ship	97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	97
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	2	2	95	26	16	-	-	-	-	-	-	-	-	-	-	-	-	141
Tank Barge	220	315	118	123	59	-	2	1	-	1	-	-	-	-	-	-	-	-	839
Tanker	173	-	-	16	-	-	43	75	28	47	3	-	-	-	-	-	-	-	385
Towing Vessel	254	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	254
Other a/	15	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21
Total	788	343	160	286	131	41	124	131	103	81	83	45	-	-	-	-	-	-	2,316

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-2. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004

Port Area: Total East Coast

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b>2003 Alternative 3 Restricted period arrivals</b>																			
Bulk Carrier	28	112	104	154	69	180	122	192	214	151	75	78	126	10	-	2	4	2	1,623
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	8	-	11	3	-	21	8	13	15	-	-	79
Container Ship	80	212	187	192	197	109	537	346	575	417	991	612	-	8	-	-	-	-	4,463
Freight Barge	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	131	206	161	95	74	45	37	65	76	55	-	-	-	-	-	-	-	-	945
Passenger Ship	194	331	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	559
Refrigerated Cargo Ship	4	121	188	26	2	4	27	-	-	-	12	-	-	-	-	-	-	-	384
Ro-Ro Cargo Ship	121	31	470	447	152	99	18	32	93	4	108	-	-	-	-	-	-	-	1,575
Tank Barge	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Tanker	63	56	188	85	63	126	144	370	335	441	67	262	83	31	251	202	132	105	3,004
Towing Vessel	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Other a/	10	11	1	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	26
Total	640	1,080	1,338	999	557	563	889	1,013	1,293	1,079	1,256	952	230	57	264	219	136	107	12,672
<b>2004 Alternative 3 Restricted period arrivals</b>																			
Bulk Carrier	23	127	124	142	85	188	119	199	177	138	94	98	165	4	-	-	1	4	1,688
Combination Carrier (e.g. OBO)	1	2	-	-	-	-	3	16	-	10	1	2	9	8	1	7	-	-	60
Container Ship	73	172	189	117	218	161	583	493	540	432	891	666	1	-	-	-	-	-	4,536
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	108	213	181	85	80	79	30	71	99	109	-	-	-	-	-	-	-	-	1,055
Passenger Ship	228	415	39	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	695
Refrigerated Cargo Ship	-	119	121	29	1	22	29	-	2	-	12	-	-	-	-	-	-	-	335
Ro-Ro Cargo Ship	101	44	452	416	109	118	36	32	95	12	123	-	-	-	-	-	-	-	1,538
Tank Barge	-	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Tanker	59	52	126	73	57	101	167	384	276	531	82	247	111	22	231	255	123	145	3,042
Towing Vessel	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42
Other a/	18	13	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
Total	653	1,157	1,248	877	550	669	967	1,195	1,189	1,232	1,203	1,013	286	34	232	262	124	149	13,040
<b>2003 Alternative 6 Restricted period arrivals</b>																			
Bulk Carrier	21	73	71	115	56	136	90	133	164	115	60	65	97	10	-	2	4	2	1,214
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	5	-	11	1	-	18	6	11	2	-	-	54
Container Ship	77	184	162	162	162	88	442	288	463	347	847	525	-	8	-	-	-	-	3,755
Freight Barge	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	114	168	115	75	65	37	31	43	57	44	-	-	-	-	-	-	-	-	749
Passenger Ship	17	37	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58
Refrigerated Cargo Ship	4	88	171	21	2	3	24	-	-	-	12	-	-	-	-	-	-	-	325
Ro-Ro Cargo Ship	52	27	413	399	129	83	16	29	79	2	89	-	-	-	-	-	-	-	1,318
Tank Barge	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Tanker	12	42	100	74	45	94	78	241	242	332	49	223	72	30	180	87	103	78	2,082
Towing Vessel	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Other a/	7	8	1	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	18
Total	12	42	100	74	45	94	78	241	242	332	49	223	72	30	180	87	103	78	9,580
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>2004 Alternative 6 Restricted per</b>																			
Bulk Carrier	7	8	1	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-
Bulk Carrier	21	85	101	92	64	139	85	129	124	106	76	68	143	4	-	-	1	3	1,241
Combination Carrier (e.g. OBO)	1	2	-	-	-	-	3	11	-	10	1	1	9	8	1	3	-	-	50
Container Ship	68	145	167	101	175	141	492	413	443	370	755	559	-	-	-	-	-	-	3,829
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	93	168	133	72	68	55	25	60	86	73	-	-	-	-	-	-	-	-	833
Passenger Ship	62	94	3	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	165
Refrigerated Cargo Ship	-	90	113	23	1	22	25	-	2	-	12	-	-	-	-	-	-	-	288
Ro-Ro Cargo Ship	52	34	390	361	104	95	32	27	82	10	103	-	-	-	-	-	-	-	1,290
Tank Barge	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Tanker	13	41	96	66	51	77	100	247	177	382	67	204	88	18	167	124	97	109	2,124
Towing Vessel	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18
Other a/	15	9	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28
Total	343	668	1,012	723	463	529	762	887	914	951	1,014	832	240	30	168	127	98	112	9,873

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.



Table E-3. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Eastport, ME

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-4. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004

Port Area: Eastport, ME

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	6	3	-	-	2	-	3	1	-	-	-	-	-	-	-	-	16
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	1	-	-	-	-	-	1	2	1	-	-	-	-	-	-	-	-	5
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	4	5	3	-	-	-	1	3	3	-	-	-	-	-	-	-	-	19
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	6	11	6	-	-	2	2	8	5	-	-	-	-	-	-	-	-	40
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	9	8	-	-	-	-	-	2	3	-	-	-	-	-	-	-	22
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	4
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	17	-	-	-	-	-	-	-	-	17
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	9	8	-	-	-	-	2	21	3	-	-	-	-	-	-	-	43
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	1	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	3
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	2	2	1	-	-	-	-	2	-	-	-	-	-	-	-	-	-	7
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	1	2	-	-	-	-	-	1	1	-	-	-	-	-	-	-	5
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	2
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	1	2	-	-	-	-	1	3	1	-	-	-	-	-	-	-	8

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-5. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Searsport, ME

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	1	10	9	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	22
Tanker	-	-	-	-	-	-	-	2	-	4	-	-	-	-	-	-	-	-	6
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2	10	9	1	1	-	-	2	-	4	-	-	-	-	-	-	-	-	29
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	2	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Tanker	3	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	4
Towing Vessel	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	25	2	6	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	35
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	2
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	2
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-6. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Searsport, ME

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	6	-	-	1	5	-	1	-	-	1	-	-	-	-	-	-	-	14
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	18	44	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ro-Ro Cargo Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	2	33	-	-	4	18	11	7	2	3	2	-	-	-	1	-	-	83
Towing Vessel	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	21	52	37	-	1	9	18	12	7	2	5	2	-	-	-	1	-	-	167
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	6	-	-	1	-	1	1	-	1	-	-	-	-	-	-	-	-	10
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	2
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Passenger Ship	19	46	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tank Barge	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Tanker	-	-	2	-	-	3	14	26	4	20	4	1	-	-	-	-	-	-	74
Towing Vessel	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	21	55	6	1	1	3	15	27	5	21	4	1	1	-	-	-	-	-	161
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	4	-	-	2	5	2	1	-	1	-	-	-	-	1	-	-	16
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	4	-	1	3	5	2	1	-	1	-	-	-	-	1	-	-	18
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	-	-	-	-	-	4	6	-	4	-	-	-	-	-	-	-	-	14
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	1	-	-	-	4	6	-	5	-	-	-	-	-	-	-	-	16

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.  
Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-7. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Portland, ME

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	1	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Tanker	16	-	-	-	-	-	1	8	1	3	-	-	-	-	-	-	-	-	29
Towing Vessel	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Other a/	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	26	4	1	1	-	1	1	8	1	3	-	-	-	-	-	-	-	-	46
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	2
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	1	10	7	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	23
Tanker	19	-	-	-	-	-	1	4	-	-	1	-	-	-	-	-	1	-	26
Towing Vessel	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
Other a/	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	64	10	7	1	5	-	1	4	-	-	2	1	-	-	-	-	1	-	96
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	6	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	9
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	6	1	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	10
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	1	5	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Tanker	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Towing Vessel	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	9	5	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	17

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-8. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004

Port Area: Portland, ME

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	3	6	10	2	4	14	8	5	9	3	1	-	-	-	-	-	-	65
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	13	-	-	14
Container Ship	-	1	-	-	1	2	3	1	1	-	-	-	-	-	-	-	-	-	9
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	1	10	17	3	-	-	-	3	2	2	-	-	-	-	-	-	-	-	38
Passenger Ship	4	12	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	50	-	4	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	58
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	2	4	39	1	1	8	34	19	30	23	4	1	1	-	57	112	16	15	367
Towing Vessel	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	60	30	70	17	4	15	51	31	38	34	7	2	1	-	58	125	16	15	574
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	6	6	11	4	4	18	3	5	4	5	2	1	-	-	-	-	-	69
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	4
Container Ship	-	2	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	4
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	3	14	1	-	2	1	1	1	5	-	-	-	-	-	-	-	-	28
Passenger Ship	3	13	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	29	2	1	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
Tank Barge	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Tanker	-	-	5	-	1	5	25	30	35	44	-	4	2	1	51	123	14	29	369
Towing Vessel	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	42	26	33	18	5	11	44	34	41	53	7	6	3	1	51	127	14	29	545
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	-	2	1	1	3	2	-	1	3	-	-	-	-	-	-	-	14
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
Container Ship	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	8	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	4	-	-	1	5	2	11	5	-	-	1	-	16	17	4	3	69
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	8	3	6	2	1	2	8	5	11	6	3	-	1	-	16	18	4	3	97
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	2	1	4	-	-	3	-	1	-	2	-	-	-	-	-	-	-	13
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	9	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	-	1	-	-	-	4	5	9	11	-	-	-	-	12	17	-	6	65
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	11	2	5	6	-	-	7	5	10	11	2	-	-	-	12	17	-	6	94

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-9. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Portsmouth, NH

Year and period	DWT (000s)																	Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	
<u>2003 Alternative 3 Restricted period arrivals</u>																		
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	-	-	2	-	-	-	1	1	-	-	-	-	-	-	-	-	4
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	3	-	1	2	1	-	-	1	1	-	-	-	-	-	-	-	-	9
<u>2004 Alternative 3 Restricted period arrivals</u>																		
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	2
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	4
<u>2003 Alternative 6 Restricted period arrivals</u>																		
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2
<u>2004 Alternative 6 Restricted period arrivals</u>																		
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-10. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Portsmouth, NH

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	2	-	1	8	2	26	16	5	2	1	-	-	-	-	-	-	63
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	3
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	1	1	-	1	-	3	-	2	1	-	-	-	-	-	-	-	-	-	9
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	3	9	5	2	3	8	2	32	20	19	9	1	-	-	-	-	-	-	113
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	4	11	8	3	4	19	4	62	37	24	12	2	-	-	-	-	-	-	190
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	1	3	4	1	26	9	5	2	-	-	-	-	-	-	-	51
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	3
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	3	-	-	-	3	4	2	3	1	-	-	-	-	-	-	-	-	-	16
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	7	4	2	3	1	14	23	13	13	4	1	-	-	-	-	-	-	85
Towing Vessel	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Other a/	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Total	12	11	5	3	9	9	17	55	23	18	6	1	-	-	-	-	-	-	169
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	2	-	2	3	1	-	1	-	-	-	-	-	-	9
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	3	1	-	-	4	-	4	5	5	2	-	-	-	-	-	-	-	24
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	3	2	-	-	7	-	6	8	6	2	1	-	-	-	-	-	-	35
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	1	-	3	1	2	1	-	-	-	-	-	-	-	8
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	1	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	3
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	2	-	-	1	-	2	3	3	-	-	-	-	-	-	-	-	-	11
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	2	4	-	-	1	2	2	8	4	2	1	-	-	-	-	-	-	-	26

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.



Table E-11. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Salem, MA

Year and period	DWT (000s)																Total		
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120		120-150	150+
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	6
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	7
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-12. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Salem, MA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<u>2003 Alternative 3 Restricted period arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	-	3	2	-	-	1	-	-	-	-	-	6
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1	-	-	-	-	-	-	-	3	2	-	1	1	-	-	-	-	-	8
<u>2004 Alternative 3 Restricted period arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	3
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2	3	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	8
<u>2003 Alternative 6 Restricted period arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	-	1	1	-	-	1	-	-	-	-	-	3
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-	1	1	-	-	1	-	-	-	-	-	3
<u>2004 Alternative 6 Restricted period arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-13. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Boston, MA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	1	-	-	-	-	-	1	3	-	-	-	-	-	-	-	-	-	-	5
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	5	1	1	-	-	-	1	3	-	-	-	-	-	-	-	-	-	-	11
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	1	-	-	-	-	-	1	3	-	-	-	-	-	-	-	-	-	-	5
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	5	1	1	-	-	-	1	3	-	-	-	-	-	-	-	-	-	-	11
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-14. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Boston, MA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	2	11	2	5	1	2	5	2	-	2	2	-	-	-	-	-	34
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Container Ship	-	15	-	1	3	2	1	2	23	9	21	-	-	-	-	-	-	-	77
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	3	2	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	8
Passenger Ship	94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	94
Refrigerated Cargo Ship	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Ro-Ro Cargo Ship	27	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	54	-	8	1	1	9	10	64	47	19	1	4	2	-	-	-	-	-	220
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	180	21	13	16	6	17	12	70	75	30	22	6	4	-	-	-	-	-	472
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	2	11	2	5	1	2	5	2	-	2	2	-	-	-	-	-	34
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Container Ship	-	15	-	1	3	2	1	2	23	9	21	-	-	-	-	-	-	-	77
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	3	2	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	8
Passenger Ship	94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	94
Refrigerated Cargo Ship	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Ro-Ro Cargo Ship	27	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	54	-	8	1	1	9	10	64	47	19	1	4	2	-	-	-	-	-	220
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	180	21	13	16	6	17	12	70	75	30	22	6	4	-	-	-	-	-	472
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	1	3	-	-	-	1	1	1	-	-	-	-	-	-	-	-	7
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	4	-	-	-	-	-	1	7	3	5	-	-	-	-	-	-	-	20
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	9	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	8	-	4	1	-	4	-	25	18	9	-	2	-	-	-	-	-	-	71
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	18	4	7	4	-	4	-	27	26	13	5	2	-	-	-	-	-	-	110
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	1	3	-	-	-	1	1	1	-	-	-	-	-	-	-	-	7
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	4	-	-	-	-	-	1	7	3	5	-	-	-	-	-	-	-	20
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	9	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	8	-	4	1	-	4	-	25	18	9	-	2	-	-	-	-	-	-	71
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	18	4	7	4	-	4	-	27	26	13	5	2	-	-	-	-	-	-	110

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.  
Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-15. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Cape Cod, MA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<u>2003 Alternative 3 Restricted period arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<u>2004 Alternative 3 Restricted period arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
<u>2003 Alternative 6 Restricted period arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<u>2004 Alternative 6 Restricted period arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.  
Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-16. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Cape Cod, MA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	7	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	2	1	7	3	-	-	-	-	-	13
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	7	2	-	-	-	-	-	-	-	2	1	7	3	-	-	-	-	-	22
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	-	-	-	-	-	1	-	1	7	-	7	5	-	-	-	-	-	21
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2	10	1	-	-	-	1	-	1	7	-	7	5	-	-	-	-	-	34
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	1	4	1	-	-	-	-	-	-	6
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	3	-	-	-	-	-	-	-	-	1	4	1	-	-	-	-	-	-	9
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	1	-	-	4	-	2	3	-	-	-	-	-	10
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	1	-	-	-	-	1	-	-	4	-	2	3	-	-	-	-	-	11

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-17. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: New Bedford, MA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<u>2003 Alternative 3 Restricted period arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	11
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Tanker	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	3	1	-	2	-	-	-	11	-	-	-	-	-	-	-	-	-	-	17
<u>2004 Alternative 3 Restricted period arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	8
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	8
<u>2003 Alternative 6 Restricted period arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	9
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Tanker	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	3	1	-	2	-	-	-	9	-	-	-	-	-	-	-	-	-	-	15
<u>2004 Alternative 6 Restricted period arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	7
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-18. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: New Bedford, MA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	5	-	2	2	1	3	2	5	5	-	-	-	-	-	25
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	3	5	4	-	3	1	-	-	-	-	-	-	-	-	-	-	-	-	16
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	1	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	4	11	6	-	10	1	2	2	1	3	2	5	5	-	-	-	-	-	52
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	2	3	1	1	5	-	-	7	4	-	-	-	-	-	23
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	3	7	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Ro-Ro Cargo Ship	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	4	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	6
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	3	12	8	-	3	3	1	2	5	-	-	7	4	-	-	-	-	-	48
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	3	-	2	1	1	2	2	5	4	-	-	-	-	-	20
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	2	4	4	-	3	1	-	-	-	-	-	-	-	-	-	-	-	-	14
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	1	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	3	8	5	-	8	1	2	1	1	2	2	5	4	-	-	-	-	-	42
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	2	3	1	1	4	-	-	5	3	-	-	-	-	-	19
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	2	6	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Ro-Ro Cargo Ship	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	3	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	5
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2	11	6	-	3	3	1	2	4	-	-	5	3	-	-	-	-	-	40

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.



Table E-19. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Providence, RI

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tank Barge	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	5	-	-	-	-	-	1	1	-	3	-	-	-	-	-	-	-	-	10
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other <i>a/</i>	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	8	-	-	1	-	-	1	1	-	3	-	-	-	-	-	-	-	-	14
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	2	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	6
Towing Vessel	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	7	-	1	3	-	-	-	2	-	4	-	-	-	-	-	-	-	-	17
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tank Barge	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	5	-	-	-	-	-	-	1	-	3	-	-	-	-	-	-	-	-	9
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	7	-	-	1	-	-	-	1	-	3	-	-	-	-	-	-	-	-	12
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	1	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	5
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	3	-	1	2	-	-	-	1	-	4	-	-	-	-	-	-	-	-	11

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-20. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Providence, RI

Year and period	DWT (000s)																	Total	
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150		150+
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	-	6	1	3	10	8	11	5	1	2	1	-	-	-	-	-	49
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	2	8	1	-	1	-	1	-	-	-	-	-	-	-	-	-	-	13
Passenger Ship	3	10	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Refrigerated Cargo Ship	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Ro-Ro Cargo Ship	-	-	27	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	3	2	1	1	1	1	13	25	11	-	3	2	-	1	-	-	-	64
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	3	18	39	25	2	5	11	22	36	16	1	5	4	-	1	-	-	-	188
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	9	4	9	8	3	4	3	2	1	-	-	-	-	-	-	43
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	1	4	1	5	2	1	-	-	-	-	-	-	-	-	-	-	-	14
Passenger Ship	9	12	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	25	11	1	1	-	-	-	-	-	-	-	-	-	-	-	-	38
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	3	-	-	-	5	5	14	13	18	3	-	-	1	-	-	-	-	62
Towing Vessel	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Other a/	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	11	16	32	23	10	17	14	17	17	21	5	1	-	2	-	-	-	-	186
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	4	1	3	8	8	10	3	1	2	1	-	-	-	-	-	41
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	1	8	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	11
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Ro-Ro Cargo Ship	-	-	21	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	3	2	1	1	1	1	8	22	8	-	3	2	-	1	-	-	-	53
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	6	32	22	2	5	9	16	32	11	1	5	4	-	1	-	-	-	146
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	7	3	7	6	3	3	1	2	-	-	-	-	-	-	-	32
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	1	2	1	5	2	1	-	-	-	-	-	-	-	-	-	-	-	12
Passenger Ship	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	21	8	1	1	-	-	-	-	-	-	-	-	-	-	-	-	31
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	3	-	-	-	4	5	13	10	15	2	-	-	-	-	-	-	-	52
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	4	7	24	18	9	14	12	16	13	16	4	-	-	1	-	-	-	-	138

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.  
Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-21. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: New London, CT

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	16	19	6	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	47
Tanker	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	37	19	6	1	6	-	-	-	-	-	-	-	-	-	-	-	-	-	69
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Passenger Ship	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	7	13	16	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	39
Tanker	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	25	13	16	5	2	-	-	-	-	-	-	-	-	-	-	-	-	-	61
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	15	15	6	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	41
Tanker	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	33	15	6	1	5	-	-	-	-	-	-	-	-	-	-	-	-	-	60
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Passenger Ship	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	7	11	15	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	36
Tanker	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	19	11	15	4	2	-	-	-	-	-	-	-	-	-	-	-	-		

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-22. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: New London, CT

Year and period	DWT (000s)																			Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+		
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																				
Bulk Carrier	-	-	-	3	-	-	-	2	4	3	-	-	-	-	-	-	-	-	12	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	2	
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Dry Cargo Ship	-	-	1	-	-	-	1	1	-	1	-	-	-	-	-	-	-	-	4	
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tanker	-	1	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	4	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	-	1	1	3	-	-	1	4	4	8	-	-	-	-	-	-	-	-	22	
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																				
Bulk Carrier	-	2	-	-	1	-	-	-	3	-	2	-	-	-	-	-	-	-	8	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	-	-	-	-	-	-	-	1	3	1	-	-	-	-	-	-	-	-	5	
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Dry Cargo Ship	-	-	-	-	4	-	-	3	1	5	-	-	-	-	-	-	-	-	13	
Passenger Ship	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tanker	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	3	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	-	3	-	-	5	-	-	4	7	9	2	-	-	-	-	-	-	-	30	
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																				
Bulk Carrier	-	-	-	2	-	-	-	2	4	1	-	-	-	-	-	-	-	-	9	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	2	
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Dry Cargo Ship	-	-	1	-	-	-	1	1	-	1	-	-	-	-	-	-	-	-	4	
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tanker	-	1	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	3	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	-	1	1	2	-	-	1	4	4	5	-	-	-	-	-	-	-	-	18	
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																				
Bulk Carrier	-	2	-	-	1	-	-	-	3	-	2	-	-	-	-	-	-	-	8	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	-	-	-	-	-	-	-	-	3	1	-	-	-	-	-	-	-	-	4	
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Dry Cargo Ship	-	-	-	-	3	-	-	3	1	5	-	-	-	-	-	-	-	-	12	
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tanker	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	3	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	-	2	-	-	4	-	-	3	7	9	2	-	-	-	-	-	-	-	27	

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-23. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: New Haven, CT

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	20	72	22	34	4	-	-	-	-	-	-	-	-	-	-	-	-	-	152
Tanker	23	-	-	-	-	-	3	2	-	3	-	-	-	-	-	-	-	-	31
Towing Vessel	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	56	72	22	34	4	-	3	2	-	3	-	-	-	-	-	-	-	-	196
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	37	131	31	79	7	-	-	-	-	-	-	-	-	-	-	-	-	-	285
Tanker	19	-	-	-	-	-	-	3	1	1	1	-	-	-	-	-	-	-	25
Towing Vessel	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	72	131	31	79	7	-	-	3	1	1	1	-	-	-	-	-	-	-	326
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	16	67	21	30	2	-	-	-	-	-	-	-	-	-	-	-	-	-	136
Tanker	19	-	-	-	-	-	3	2	-	3	-	-	-	-	-	-	-	-	27
Towing Vessel	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	45	67	21	30	2	-	3	2	-	3	-	-	-	-	-	-	-	-	173
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	32	116	27	74	7	-	-	-	-	-	-	-	-	-	-	-	-	-	256
Tanker	18	-	-	-	-	-	-	2	1	1	1	-	-	-	-	-	-	-	23
Towing Vessel	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	62	116	27	74	7	-	-	2	1	1	1	-	-	-	-	-	-	-	291

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-24. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: New Haven, CT

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	1	1	4	10	6	3	5	4	2	2	-	-	-	-	-	-	38
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	7	1	4	-	1	-	-	4	-	-	-	-	-	-	-	-	17
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	1	-	-	4	1	28	32	12	-	-	-	-	1	-	-	-	79
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	9	2	8	14	8	31	37	21	2	2	-	-	1	-	-	-	135
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	-	-	1	4	3	4	1	4	3	-	-	-	-	-	-	-	21
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	3
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	5	5	2	1	3	-	1	1	1	-	-	-	-	-	-	-	-	19
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	1	2	-	-	-	5	14	24	18	1	2	2	-	-	-	-	-	69
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1	7	8	2	2	9	8	19	27	23	4	2	2	-	-	-	-	-	114
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	1	4	7	5	3	5	3	1	2	-	-	-	-	-	-	31
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	5	1	3	-	1	-	-	4	-	-	-	-	-	-	-	-	14
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	1	-	-	3	1	24	29	10	-	-	-	-	1	-	-	-	69
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	6	2	7	10	7	27	34	18	1	2	-	-	1	-	-	-	115
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	3	3	1	1	4	2	-	-	-	-	-	-	-	14
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	3
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	5	5	2	1	1	-	1	1	1	-	-	-	-	-	-	-	-	17
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	1	2	-	-	-	4	12	21	15	1	2	2	-	-	-	-	-	60
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1	6	8	2	1	6	7	14	24	20	3	2	2	-	-	-	-	-	99

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-25. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Bridgeport, CT

Year and period	DWT (000s)																			Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+		
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																				
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Freight Barge	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tank Barge	45	27	14	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	108	
Tanker	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	70	27	14	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	133	
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																				
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Freight Barge	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tank Barge	97	27	28	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	178	
Tanker	26	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	27	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
Total	125	27	28	26	-	-	-	1	-	-	-	-	-	-	-	-	-	-	207	
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																				
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tank Barge	42	22	10	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	94	
Tanker	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	62	22	10	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	114	
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																				
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Freight Barge	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tank Barge	92	23	26	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	163	
Tanker	19	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	20	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
Total	113	23	26	22	-	-	-	1	-	-	-	-	-	-	-	-	-	-	185	

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-26. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Bridgeport, CT

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	1	-	-	-	-	-	-	7	-	2	7	-	-	-	-	-	17
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	5	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	2	1	1	1	2	-	-	-	-	1	-	8
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	7	28	-	-	-	-	2	1	8	1	4	7	-	-	-	1	-	59
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	15	-	-	-	-	-	-	5	-	2	13	-	-	-	-	-	35
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	3	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	3	31	-	-	-	-	-	-	6	-	2	13	-	-	-	-	-	55
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	1	-	-	-	-	-	-	5	-	2	5	-	-	-	-	-	13
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	5	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	1	1	-	1	2	-	-	-	-	1	-	6
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	6	25	-	-	-	-	1	1	5	1	4	5	-	-	-	1	-	49
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	15	-	-	-	-	-	-	5	-	1	13	-	-	-	-	-	34
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	3	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	3	27	-	-	-	-	-	-	6	-	1	13	-	-	-	-	-	50

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.



Table E-27. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004

[illegible]

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-28. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Long Island, NY

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	2	-	-	-	-	-	-	3	2	19	4	1	15	8	11	5	70
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	-	1	2	-	-	-	-	-	-	3	2	19	5	1	15	8	11	5	72
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	2	-	5	3	22	4	-	10	1	6	9	62
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	2	-	5	3	22	4	-	10	1	6	9	62
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	2	-	-	-	-	-	-	3	2	16	4	1	13	6	7	4	58
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	-	1	2	-	-	-	-	-	-	3	2	16	5	1	13	6	7	4	60
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	1	-	3	2	20	3	-	10	1	6	9	55
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	1	-	3	2	20	3	-	10	1	6	9	55

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-29. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: New York City, NY

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	13	-	16	19	9	-	3	26	16	-	-	-	-	-	-	102
Freight Barge	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	6	2	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Tank Barge	8	14	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	25
Tanker	59	-	-	6	-	-	15	22	18	8	-	-	-	-	-	-	-	-	128
Towing Vessel	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
Other a/	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Total	80	15	1	26	3	16	34	31	18	11	26	16	-	-	-	-	-	-	277
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	13	4	13	27	11	-	-	18	17	-	-	-	-	-	-	103
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	1	6	6	-	-	-	-	-	-	-	-	-	-	-	-	-	13
Tank Barge	4	3	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	9
Tanker	22	-	-	1	-	-	27	22	10	12	-	-	-	-	-	-	-	-	94
Towing Vessel	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17
Other a/	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Total	55	4	2	20	10	14	54	33	10	13	18	17	-	-	-	-	-	-	250
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	11	-	13	16	7	-	2	21	14	-	-	-	-	-	-	84
Freight Barge	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Tank Barge	8	14	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	25
Tanker	55	-	-	5	-	-	10	20	16	7	-	-	-	-	-	-	-	-	113
Towing Vessel	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Other a/	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	73	15	1	22	2	13	26	27	16	9	21	14	-	-	-	-	-	-	239
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	11	4	10	21	9	-	-	18	15	-	-	-	-	-	-	88
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	5	5	-	-	-	-	-	-	-	-	-	-	-	-	-	10
Tank Barge	4	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Tanker	20	-	-	-	-	-	22	17	9	10	-	-	-	-	-	-	-	-	78
Towing Vessel	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	43	4	1	16	9	11	43	26	9	10	18	15	-	-	-	-	-	-	205

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-30. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: New York City, NY

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	1	3	10	25	2	19	14	31	45	31	15	6	5	2	-	-	-	-	209
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	1	-	2	1	-	7	4	4	-	-	-	19
Container Ship	1	12	109	50	42	29	158	101	146	125	280	226	-	-	-	-	-	-	1,279
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	5	15	2	1	1	2	2	2	-	1	-	-	-	-	-	-	-	-	31
Passenger Ship	13	28	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	53
Refrigerated Cargo Ship	-	-	8	-	-	4	-	-	-	-	2	-	-	-	-	-	-	-	14
Ro-Ro Cargo Ship	14	24	107	111	30	29	3	6	26	-	47	-	-	-	-	-	-	-	397
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	2	14	26	21	21	35	33	100	95	160	28	106	41	11	82	27	14	6	822
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	38	96	274	208	96	118	210	241	312	319	373	338	53	17	86	27	14	6	2,826
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	1	9	11	27	6	21	14	31	23	37	11	2	4	-	-	-	-	-	197
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	3	-	2	1	-	5	2	1	-	-	-	14
Container Ship	1	9	103	34	47	46	178	148	146	122	256	243	-	-	-	-	-	-	1,333
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	5	5	5	5	4	4	5	8	4	4	-	-	-	-	-	-	-	-	49
Passenger Ship	17	50	8	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	86
Refrigerated Cargo Ship	-	-	7	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	16
Ro-Ro Cargo Ship	11	28	95	101	28	33	5	6	27	1	56	-	-	-	-	-	-	-	391
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	1	11	30	17	16	16	31	111	79	171	28	75	41	14	77	36	8	12	774
Towing Vessel	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	40	112	259	195	101	129	233	307	279	337	352	320	50	16	78	36	8	12	2,864
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	3	8	22	2	17	11	24	38	26	10	5	4	2	-	-	-	-	172
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	1	-	2	1	-	6	3	4	-	-	-	17
Container Ship	1	11	94	42	35	24	130	87	122	107	244	191	-	-	-	-	-	-	1,088
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	5	12	2	1	1	2	2	2	-	1	-	-	-	-	-	-	-	-	28
Passenger Ship	1	10	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Refrigerated Cargo Ship	-	-	5	-	-	3	-	-	-	-	2	-	-	-	-	-	-	-	10
Ro-Ro Cargo Ship	12	21	96	96	25	23	3	5	22	-	38	-	-	-	-	-	-	-	341
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	2	14	20	18	16	30	29	89	85	135	25	91	38	11	68	19	11	6	707
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	23	71	228	179	79	99	175	208	267	271	320	287	48	16	72	19	11	6	2,379
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	1	7	10	19	6	19	12	22	19	30	10	2	4	-	-	-	-	-	161
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	3	-	2	1	-	5	2	1	-	-	-	14
Container Ship	1	9	91	32	37	38	151	125	123	106	219	206	-	-	-	-	-	-	1,138
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	5	4	5	4	4	2	5	7	4	3	-	-	-	-	-	-	-	-	43
Passenger Ship	5	26	3	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40
Refrigerated Cargo Ship	-	-	5	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	14
Ro-Ro Cargo Ship	9	24	84	85	26	25	5	5	23	1	48	-	-	-	-	-	-	-	335
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	1	8	27	16	16	14	27	99	64	134	27	65	34	12	66	30	8	12	660
Towing Vessel	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	26	78	225	162	89	107	200	261	233	276	305	273	43	14	67	30	8	12	2,409

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-31. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Philadelphia, PA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	2	2	2	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Tanker	4	-	-	2	-	-	5	10	3	5	-	-	-	-	-	-	-	-	29
Towing Vessel	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	18	4	2	11	-	-	5	10	3	5	-	1	-	-	-	-	-	-	59
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	1	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
General Dry Cargo Ship	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Tank Barge	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2
Tanker	5	-	-	7	-	-	8	25	1	4	-	-	-	-	-	-	-	-	50
Towing Vessel	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	41	2	4	16	-	2	8	26	1	4	-	-	-	-	-	-	-	-	104
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	2	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	2	2	2	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Tanker	4	-	-	2	-	-	3	9	2	4	-	-	-	-	-	-	-	-	24
Towing Vessel	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	18	4	2	10	-	-	3	9	2	4	-	1	-	-	-	-	-	-	53
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	1	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2
Tanker	4	-	-	6	-	-	5	22	1	3	-	-	-	-	-	-	-	-	41
Towing Vessel	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	31	1	4	15	-	-	5	23	1	3	-	-	-	-	-	-	-	-	83

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.  
Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-32. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004

Port Area: Philadelphia, PA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	20	14	18	9	36	13	32	24	25	8	2	4	-	-	-	-	-	205
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	7
Container Ship	28	64	12	45	44	3	19	6	10	12	44	-	-	-	-	-	-	-	287
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	6	41	34	27	5	5	7	3	1	2	-	-	-	-	-	-	-	-	131
Passenger Ship	8	6	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
Refrigerated Cargo Ship	3	76	127	26	2	-	27	-	-	-	5	-	-	-	-	-	-	-	266
Ro-Ro Cargo Ship	7	1	27	42	8	-	-	-	-	-	-	-	-	-	-	-	-	-	85
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	3	10	15	13	9	16	27	13	24	4	27	2	13	87	50	85	66	464
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	53	211	226	173	81	53	82	68	48	63	61	29	6	13	94	50	85	66	1,462
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	2	19	11	15	16	26	11	31	25	19	12	10	2	-	-	-	-	-	199
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	2
Container Ship	30	51	8	38	43	9	19	4	5	10	44	-	-	-	-	-	-	-	261
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	3	56	50	21	4	16	5	4	6	4	-	-	-	-	-	-	-	-	169
Passenger Ship	9	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Refrigerated Cargo Ship	-	86	89	28	1	1	29	-	2	-	6	-	-	-	-	-	-	-	242
Ro-Ro Cargo Ship	6	7	31	34	5	1	-	-	-	-	1	-	-	-	-	-	-	-	85
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	1	6	14	21	14	9	14	22	11	32	6	24	4	2	87	82	83	65	497
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	52	229	204	157	83	62	78	62	49	65	69	34	6	2	87	83	83	65	1,470
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	17	11	15	8	30	12	28	23	22	8	1	3	-	-	-	-	-	178
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	7
Container Ship	25	55	12	38	37	3	16	5	9	10	36	-	-	-	-	-	-	-	246
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	6	35	31	23	5	5	7	2	-	2	-	-	-	-	-	-	-	-	116
Passenger Ship	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	3	72	119	21	2	-	24	-	-	-	5	-	-	-	-	-	-	-	246
Ro-Ro Cargo Ship	5	1	23	37	6	-	-	-	-	-	-	-	-	-	-	-	-	-	72
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	2	10	15	8	7	13	22	9	22	4	25	2	13	73	40	77	54	396
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	39	183	206	149	66	45	72	57	41	56	53	26	5	13	80	40	77	54	1,262
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	2	18	11	14	12	19	10	23	15	17	11	9	2	-	-	-	-	-	163
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	2
Container Ship	25	45	7	31	38	9	16	3	5	9	37	-	-	-	-	-	-	-	225
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	2	46	44	19	3	12	4	4	5	3	-	-	-	-	-	-	-	-	142
Passenger Ship	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Refrigerated Cargo Ship	-	79	87	22	1	1	25	-	2	-	6	-	-	-	-	-	-	-	223
Ro-Ro Cargo Ship	5	5	27	27	5	1	-	-	-	-	1	-	-	-	-	-	-	-	71
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	1	6	11	20	14	8	14	17	9	27	6	21	2	2	74	67	72	58	429
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	39	203	188	133	73	50	69	48	36	56	61	30	4	2	74	68	72	58	1,264

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-33. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Baltimore, MD

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	20	9	4	-	-	-	-	-	-	-	-	-	-	-	-	33
Tank Barge	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	-	-	-	-	-	1	-	-	5	-	-	-	-	-	-	-	-	6
Towing Vessel	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	5	4	2	20	9	6	1	-	-	5	-	-	-	-	-	-	-	-	52
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	-	-	-	-	1	10	-	-	-	-	-	-	-	-	-	-	12
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	4
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	18	5	7	-	-	-	-	-	-	-	-	-	-	-	-	30
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	5	-	-	3	-	-	3	-	-	4	-	-	-	-	-	-	-	-	15
Towing Vessel	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	11	1	-	21	5	7	8	10	-	4	-	-	-	-	-	-	-	-	67
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	17	8	4	-	-	-	-	-	-	-	-	-	-	-	-	29
Tank Barge	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	4
Towing Vessel	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	4	2	2	17	8	5	-	-	-	4	-	-	-	-	-	-	-	-	42
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	-	-	-	-	1	8	-	-	-	-	-	-	-	-	-	-	10
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	3
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	14	4	6	-	-	-	-	-	-	-	-	-	-	-	-	24
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	5	-	-	3	-	-	3	-	-	4	-	-	-	-	-	-	-	-	15
Towing Vessel	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	9	1	-	17	4	6	7	8	-	4	-	-	-	-	-	-	-	-	56

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-34. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004

Port Area: Baltimore, MD

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	13	13	11	8	14	7	19	9	13	11	23	41	3	-	-	-	1	186
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	2	-	-	-	-	3	1	-	-	-	-	6
Container Ship	4	8	-	6	6	11	56	16	46	19	43	-	-	-	-	-	-	-	215
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	4	17	12	16	35	2	1	4	5	8	-	-	-	-	-	-	-	-	104
Passenger Ship	3	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
Refrigerated Cargo Ship	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Ro-Ro Cargo Ship	6	-	133	102	37	26	5	9	21	2	27	-	-	-	-	-	-	-	368
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	1	7	10	10	3	3	4	2	6	32	2	12	13	-	3	1	-	7	116
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	9	1	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	12
Total	18	74	172	145	89	56	75	52	87	74	83	35	57	4	3	1	-	8	1,033
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	10	18	11	5	15	6	24	21	13	13	27	45	2	-	-	-	1	211
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	1	-	-	-	1	2	1	-	-	-	-	5
Container Ship	-	2	1	2	9	16	63	30	43	18	41	-	-	-	-	-	-	-	225
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	2	19	16	22	28	5	3	7	6	13	-	-	-	-	-	-	-	-	121
Passenger Ship	10	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
Refrigerated Cargo Ship	-	1	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	4
Ro-Ro Cargo Ship	8	1	117	97	25	34	11	11	20	5	27	-	-	-	-	-	-	-	356
Tank Barge	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Tanker	-	9	9	7	5	3	7	6	3	29	8	13	19	1	1	-	1	24	145
Towing Vessel	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Other a/	-	5	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Total	25	74	166	139	72	75	90	79	93	78	89	41	66	4	1	-	1	25	1,118
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	10	10	9	6	11	6	17	7	11	8	20	33	3	-	-	-	1	152
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	2	-	-	-	-	2	-	-	-	-	-	4
Container Ship	4	6	-	4	3	9	49	12	40	17	38	-	-	-	-	-	-	-	182
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	4	16	11	15	30	2	1	3	3	8	-	-	-	-	-	-	-	-	93
Passenger Ship	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Refrigerated Cargo Ship	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Ro-Ro Cargo Ship	5	-	116	91	31	21	4	8	18	1	23	-	-	-	-	-	-	-	318
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	1	6	9	8	3	3	4	2	5	24	2	11	10	-	3	1	-	5	97
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	7	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	9
Total	14	58	150	127	73	46	65	44	73	61	71	31	45	3	3	1	-	6	871
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	8	14	10	5	13	5	21	19	12	11	19	41	2	-	-	-	-	180
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	1	-	-	-	-	2	1	-	-	-	-	4
Container Ship	-	-	1	2	7	15	52	24	38	18	34	-	-	-	-	-	-	-	191
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	1	15	12	19	24	5	3	7	5	13	-	-	-	-	-	-	-	-	104
Passenger Ship	3	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
Refrigerated Cargo Ship	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	3
Ro-Ro Cargo Ship	6	-	100	82	24	25	9	9	18	4	22	-	-	-	-	-	-	-	299
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	9	6	6	5	3	6	4	2	23	7	12	18	1	1	-	1	21	125
Towing Vessel	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Other a/	-	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Total	13	49	137	119	65	63	75	66	82	70	74	31	61	4	1	-	1	21	932

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.



Table E-35. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Hampton Roads, VA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	8	1	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	17
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	9	-	-	1	-	2	25	10	27	11	12	18	-	-	-	-	-	-	115
Freight Barge	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	-	-	-	-	-	4	1	-	-	-	-	-	-	-	-	-	-	-	5
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	5
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	1	-	-	-	-	-	7	-	-	3	-	-	-	-	-	-	-	-	11
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Total	25	2	-	3	2	7	33	18	27	14	12	18	-	-	-	-	-	-	161
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	7	2	-	-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	21
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	7	-	-	1	-	-	27	9	29	11	15	16	-	-	-	-	-	-	115
Freight Barge	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
General Dry Cargo Ship	2	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	4
Passenger Ship	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	1	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	2	-	-	3	-	-	2	1	1	-	1	-	-	-	-	-	-	-	10
Towing Vessel	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Other a/	6	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Total	38	7	2	6	2	2	29	22	30	11	16	16	-	-	-	-	-	-	181
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	7	1	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	14
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	8	-	-	1	-	1	22	8	24	9	11	15	-	-	-	-	-	-	99
Freight Barge	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	-	-	-	-	-	3	1	-	-	-	-	-	-	-	-	-	-	-	4
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	5
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	1	-	-	-	-	-	7	-	-	1	-	-	-	-	-	-	-	-	9
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Total	20	2	-	3	2	5	30	14	24	10	11	15	-	-	-	-	-	-	136
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	7	2	-	-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	21
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	6	-	-	1	-	-	24	8	26	10	12	14	-	-	-	-	-	-	101
Freight Barge	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
General Dry Cargo Ship	2	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	4
Passenger Ship	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	2	-	-	2	-	-	2	-	1	-	1	-	-	-	-	-	-	-	8
Towing Vessel	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Other a/	5	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Total	33	7	1	4	2	2	26	20	27	10	13	14	-	-	-	-	-	-	159

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-36. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Hampton Roads, VA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b>2003 Alternative 3 Restricted period arrivals</b>																			
Bulk Carrier	1	11	8	9	9	7	11	14	16	7	3	22	46	5	-	2	4	1	176
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	8	3	1	2	-	-	14
Container Ship	1	19	26	35	58	21	110	65	119	74	212	151	-	-	-	-	-	-	891
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	7	14	15	7	6	8	8	3	3	-	-	-	-	-	-	-	-	-	71
Passenger Ship	3	5	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
Refrigerated Cargo Ship	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ro-Ro Cargo Ship	2	1	6	12	15	3	3	4	12	-	29	-	-	-	-	-	-	-	87
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	7	8	5	4	7	4	3	5	16	-	18	13	3	5	2	5	6	111
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2
Total	15	57	70	68	92	46	138	89	155	97	244	191	67	11	6	6	9	7	1,368
<b>2004 Alternative 3 Restricted period arrivals</b>																			
Bulk Carrier	1	18	12	11	12	22	8	12	15	4	7	32	73	2	-	-	1	3	233
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	2	2	-	-	-	1	2	4	-	2	-	-	13
Container Ship	-	14	27	11	62	33	124	101	113	66	156	164	-	-	-	-	-	-	871
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	3	27	20	-	7	9	4	7	5	7	-	-	-	-	-	-	-	-	89
Passenger Ship	5	25	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32
Refrigerated Cargo Ship	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	5
Ro-Ro Cargo Ship	7	-	3	15	5	2	2	5	15	1	30	-	-	-	-	-	-	-	85
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	1	6	7	3	5	5	8	4	2	16	7	11	17	3	4	11	10	3	123
Towing Vessel	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Other a/	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	21	91	72	40	91	76	148	131	150	94	200	208	92	9	4	13	11	6	1,457
<b>2003 Alternative 6 Restricted period arrivals</b>																			
Bulk Carrier	1	9	7	7	8	7	10	11	13	6	3	18	35	5	-	2	4	1	147
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	7	3	-	1	-	-	11
Container Ship	1	17	22	32	49	16	89	55	97	63	190	127	-	-	-	-	-	-	758
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	6	13	13	5	4	8	7	3	3	-	-	-	-	-	-	-	-	-	62
Passenger Ship	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Refrigerated Cargo Ship	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ro-Ro Cargo Ship	1	1	6	12	11	2	3	4	10	-	24	-	-	-	-	-	-	-	74
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	-	7	7	5	4	7	3	3	4	15	-	17	12	3	5	2	3	6	103
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Total	10	49	58	61	76	40	113	76	127	84	217	162	54	11	5	5	7	7	1,162
<b>2004 Alternative 6 Restricted period arrivals</b>																			
Bulk Carrier	1	14	11	10	11	18	7	9	13	4	6	24	64	2	-	-	1	3	198
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	2	2	-	-	-	1	2	4	-	2	-	-	13
Container Ship	-	12	22	9	49	29	104	86	96	56	137	139	-	-	-	-	-	-	739
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	3	22	18	-	7	8	4	5	5	5	-	-	-	-	-	-	-	-	77
Passenger Ship	2	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21
Refrigerated Cargo Ship	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	5
Ro-Ro Cargo Ship	5	-	2	13	5	2	2	4	13	1	25	-	-	-	-	-	-	-	72
Tank Barge	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanker	1	6	6	3	5	5	6	3	1	16	6	10	13	3	4	9	9	2	108
Towing Vessel	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	16	73	60	35	77	67	125	109	128	82	174	174	79	9	4	11	10	5	1,238

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-37. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Morehead City, NC

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	1	-	1	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-	5
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	1	-	-	5	-	-	-	-	-	-	-	-	6
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	5	-	-	-	-	-	2	-	-	5	-	-	-	-	-	-	-	-	12
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	1	-	-	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-	4
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	1	-	-	4	-	-	-	-	-	-	-	-	5
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	4	-	-	-	-	-	2	-	-	4	-	-	-	-	-	-	-	-	10

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-38. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Morehead City, NC

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	2	1	-	3	4	2	-	-	-	2	-	-	-	-	-	-	-	14
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	1	1	-	-	1	1	-	-	5	-	-	-	-	-	-	-	-	-	9
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	7	2	-	2	1	7	-	1	-	-	-	-	-	-	-	-	-	-	20
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	2	-	12	2	2	-	2	-	1	-	-	-	-	-	-	21
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	10	5	1	4	5	24	4	3	5	2	2	1	-	-	-	-	-	-	66
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	-	1	1	4	2	1	3	-	1	2	1	-	-	-	-	-	17
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Container Ship	1	-	-	-	-	3	-	-	5	-	-	-	-	-	-	-	-	-	9
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	3	2	-	1	-	5	1	-	1	-	-	-	-	-	-	-	-	-	13
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	4	1	1	16	1	3	-	5	-	-	-	-	-	-	-	-	31
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	4	3	4	3	2	28	5	4	9	5	1	2	1	-	-	-	-	-	71
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	2	-	-	3	3	1	-	-	-	1	-	-	-	-	-	-	-	10
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	1	1	-	-	1	1	-	-	3	-	-	-	-	-	-	-	-	-	7
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	6	2	-	2	1	5	-	1	-	-	-	-	-	-	-	-	-	-	17
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	2	-	11	2	2	-	-	-	1	-	-	-	-	-	-	18
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	9	5	-	4	5	20	3	3	3	-	1	1	-	-	-	-	-	-	54
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	-	-	1	2	2	1	2	-	1	2	1	-	-	-	-	-	13
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Container Ship	1	-	-	-	-	3	-	-	4	-	-	-	-	-	-	-	-	-	8
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	3	2	-	1	-	5	1	-	1	-	-	-	-	-	-	-	-	-	13
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	4	1	1	13	1	3	-	4	-	-	-	-	-	-	-	-	27
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	4	3	4	2	2	23	5	4	7	4	1	2	1	-	-	-	-	-	62

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-39. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Wilmington, NC

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	2
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	3
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	2
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Tank Barge	-	5	-	7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	13
Tanker	11	-	-	-	-	-	1	-	12	1	-	-	-	-	-	-	-	-	25
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	12	6	-	9	3	-	3	-	12	3	-	-	-	-	-	-	-	-	48
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	1	-	-	1	-	-	-	1	-	-	-	-	-	-	-	3
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Passenger Ship	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Tank Barge	-	6	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Tanker	9	-	-	-	-	-	2	2	10	6	-	-	-	-	-	-	-	-	29
Towing Vessel	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Other a/	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	2
Total	16	7	-	2	4	-	4	2	10	7	1	-	-	-	-	-	-	-	53
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	2
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	2
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Tank Barge	-	4	-	6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Tanker	9	-	-	-	-	-	1	-	10	-	-	-	-	-	-	-	-	-	20
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	10	5	-	8	3	-	2	-	10	2	-	-	-	-	-	-	-	-	40
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	2
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Passenger Ship	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Tank Barge	-	6	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Tanker	9	-	-	-	-	-	2	1	9	5	-	-	-	-	-	-	-	-	26
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	14	7	-	2	4	-	2	1	9	6	1	-	-	-	-	-	-	-	46

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-40. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Wilmington, NC

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	7	6	4	7	-	10	4	7	10	3	5	-	1	-	-	-	-	-	64
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	3	-	-	1	-	-	-	-	-	4
Container Ship	2	1	2	1	1	2	1	3	13	13	9	3	-	-	-	-	-	-	51
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	11	9	5	10	4	3	3	10	14	5	-	-	-	-	-	-	-	-	74
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ro-Ro Cargo Ship	-	-	-	2	-	-	-	-	7	-	1	-	-	-	-	-	-	-	10
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	24	6	5	10	9	14	7	28	3	11	-	-	-	-	-	-	117
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	20	17	35	26	10	25	17	34	51	52	18	14	2	-	-	-	-	-	321
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	3	4	9	7	2	15	8	6	5	1	3	1	1	-	-	-	-	-	65
Combination Carrier (e.g. OBO)	1	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	3
Container Ship	2	-	3	-	-	-	-	5	7	26	1	1	-	-	-	-	-	-	45
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	13	5	9	4	2	3	1	9	17	9	-	-	-	-	-	-	-	-	72
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	1	-	3	-	-	-	-	11	-	-	-	-	-	-	-	-	-	15
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	1	3	20	9	-	3	21	13	5	31	3	14	-	-	-	-	-	-	123
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	21	13	41	23	4	21	30	33	45	69	7	16	1	-	-	-	-	-	324
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	5	5	3	7	-	9	4	7	9	3	4	-	1	-	-	-	-	-	57
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	3	-	-	1	-	-	-	-	-	4
Container Ship	2	1	1	1	1	2	1	2	10	11	7	3	-	-	-	-	-	-	42
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	10	8	4	8	4	3	2	6	12	4	-	-	-	-	-	-	-	-	61
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ro-Ro Cargo Ship	-	-	-	2	-	-	-	-	6	-	1	-	-	-	-	-	-	-	9
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	20	6	4	8	8	12	7	24	3	8	-	-	-	-	-	-	100
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	17	15	28	24	9	22	15	27	44	45	15	11	2	-	-	-	-	-	274
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	2	4	7	5	1	14	7	5	3	-	3	-	-	-	-	-	-	-	51
Combination Carrier (e.g. OBO)	1	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	3
Container Ship	2	-	3	-	-	-	-	3	7	23	1	1	-	-	-	-	-	-	40
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	11	5	7	4	2	2	1	9	15	9	-	-	-	-	-	-	-	-	65
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	1	-	2	-	-	-	-	9	-	-	-	-	-	-	-	-	-	12
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	1	2	17	9	-	3	17	12	3	25	3	11	-	-	-	-	-	-	103
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	17	12	34	20	3	19	25	29	37	59	7	12	-	-	-	-	-	-	274

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-41. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Georgetown, SC

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<u>2003 Alternative 3 Restricted period arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>2004 Alternative 3 Restricted period arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>2003 Alternative 6 Restricted period arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>2004 Alternative 6 Restricted period arrivals</u>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-42. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Georgetown, SC

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	7	3	1	4	1	-	2	4	4	-	-	-	-	-	-	-	26
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	2	4	-	-	-	-	-	-	-	-	-	6
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	7	3	1	5	1	2	6	4	4	-	-	-	-	-	-	-	33
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	3	1	6	2	2	4	4	2	-	2	-	-	-	-	-	-	-	26
Combination Carrier (e.g. OBO)	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2
Container Ship	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	1	-	1	1	2	1	-	6	-	-	-	-	-	-	-	-	-	12
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	7	1	7	3	4	5	5	8	-	2	-	-	-	-	-	-	-	42
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	7	2	-	3	1	-	2	4	4	-	-	-	-	-	-	-	23
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	1	4	-	-	-	-	-	-	-	-	-	5
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	7	2	-	4	1	1	6	4	4	-	-	-	-	-	-	-	29
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	3	1	4	2	2	3	3	2	-	2	-	-	-	-	-	-	-	22
Combination Carrier (e.g. OBO)	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Container Ship	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	1	-	1	1	2	1	-	5	-	-	-	-	-	-	-	-	-	11
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	7	1	5	3	4	4	3	7	-	2	-	-	-	-	-	-	-	36

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.



Table E-43. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Charleston, SC

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	2	27	9	57	17	52	17	-	-	-	-	-	-	181
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Passenger Ship	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	1	1	-	12	7	4	-	-	-	-	-	-	-	-	-	-	-	-	25
Tank Barge	-	-	1	3	8	-	1	-	-	-	-	-	-	-	-	-	-	-	13
Tanker	1	-	-	-	-	-	5	13	6	1	-	-	-	-	-	-	-	-	26
Towing Vessel	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Other a/	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	18	1	1	15	15	7	33	22	63	18	52	17	-	-	-	-	-	-	262
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	3	-	34	13	59	22	55	18	-	-	-	-	-	-	204
Freight Barge	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	2	-	20	5	6	-	-	-	-	-	-	-	-	-	-	-	-	33
Tank Barge	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Tanker	2	-	-	3	-	-	3	6	4	4	-	-	-	-	-	-	-	-	22
Towing Vessel	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18
Other a/	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Total	30	3	-	25	12	6	37	19	63	26	55	18	-	-	-	-	-	-	294
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	1	22	7	49	13	47	14	-	-	-	-	-	-	153
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Passenger Ship	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	1	1	-	11	6	4	-	-	-	-	-	-	-	-	-	-	-	-	23
Tank Barge	-	-	1	3	8	-	1	-	-	-	-	-	-	-	-	-	-	-	13
Tanker	1	-	-	-	-	-	4	13	5	-	-	-	-	-	-	-	-	-	23
Towing Vessel	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Other a/	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	18	1	1	14	14	6	27	20	54	13	47	14	-	-	-	-	-	-	229
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	2	-	28	10	49	18	49	16	-	-	-	-	-	-	172
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	2	-	15	5	5	-	-	-	-	-	-	-	-	-	-	-	-	27
Tank Barge	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Tanker	2	-	-	2	-	-	3	6	4	3	-	-	-	-	-	-	-	-	20
Towing Vessel	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
Other a/	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	26	3	-	17	11	5	31	16	53	21	49	16	-	-	-	-	-	-	248

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-44. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004

Port Area: Charleston, SC

Year and period	DWT (000s)																			Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+		
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																				
Bulk Carrier	1	5	2	20	4	7	9	16	18	4	2	4	8	-	-	-	-	-	100	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	2	4	25	11	13	15	110	95	86	50	190	87	-	4	-	-	-	-	692	
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Dry Cargo Ship	3	7	2	4	3	6	5	11	9	7	-	-	-	-	-	-	-	-	57	
Passenger Ship	12	12	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	
Refrigerated Cargo Ship	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
Ro-Ro Cargo Ship	-	2	28	42	9	16	1	3	6	-	4	-	-	-	-	-	-	-	111	
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tanker	-	1	6	-	-	5	1	5	13	41	3	16	-	1	-	-	-	-	92	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	18	33	66	77	29	49	126	130	132	102	199	107	8	5	-	-	-	-	1,081	
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																				
Bulk Carrier	-	1	2	3	5	3	8	20	13	6	8	2	12	-	-	-	-	-	83	
Combination Carrier (e.g. OBO)	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
Container Ship	2	5	25	3	18	25	117	119	123	53	178	77	-	-	-	-	-	-	745	
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Dry Cargo Ship	6	9	2	6	3	2	3	13	13	9	-	-	-	-	-	-	-	-	66	
Passenger Ship	35	7	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44	
Refrigerated Cargo Ship	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	3	
Ro-Ro Cargo Ship	1	-	33	29	8	13	4	-	1	-	6	-	-	-	-	-	-	-	95	
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tanker	-	1	4	-	2	2	3	7	7	45	6	17	1	-	-	-	-	-	95	
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
Other a/	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
Total	46	26	69	41	36	47	135	159	157	113	198	96	13	-	-	-	-	-	1,136	
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																				
Bulk Carrier	-	4	2	18	3	6	7	15	16	4	2	3	5	-	-	-	-	-	85	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	2	3	21	10	12	11	89	76	71	42	162	79	-	4	-	-	-	-	582	
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Dry Cargo Ship	2	7	2	4	3	6	3	9	7	5	-	-	-	-	-	-	-	-	48	
Passenger Ship	10	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	
Refrigerated Cargo Ship	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
Ro-Ro Cargo Ship	-	2	23	35	8	14	1	3	5	-	3	-	-	-	-	-	-	-	94	
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tanker	-	1	5	-	-	3	-	5	13	35	3	14	-	1	-	-	-	-	80	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	14	28	54	67	26	40	100	108	112	86	170	96	5	5	-	-	-	-	911	
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																				
Bulk Carrier	-	1	2	1	4	3	7	16	11	5	5	1	10	-	-	-	-	-	66	
Combination Carrier (e.g. OBO)	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
Container Ship	2	3	22	1	14	21	98	100	103	43	154	65	-	-	-	-	-	-	626	
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Dry Cargo Ship	6	7	2	5	2	1	2	11	13	7	-	-	-	-	-	-	-	-	56	
Passenger Ship	29	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35	
Refrigerated Cargo Ship	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	3	
Ro-Ro Cargo Ship	1	-	29	25	7	10	3	-	1	-	5	-	-	-	-	-	-	-	81	
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tanker	-	1	3	-	1	2	2	5	6	40	6	14	1	-	-	-	-	-	81	
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
Other a/	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
Total	40	21	59	32	28	39	112	132	134	95	170	80	11	-	-	-	-	-	953	

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-45. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Savannah, GA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	3	-	-	6	6	-	-	-	-	-	-	-	15
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tank Barge	-	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Tanker	-	-	-	-	-	-	5	22	2	1	-	-	-	-	-	-	-	-	30
Towing Vessel	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Other a/	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	6	3	-	1	1	-	8	22	2	7	6	-	-	-	-	-	-	-	56
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Tanker	3	-	-	-	-	-	1	17	3	3	-	-	-	-	-	-	-	-	27
Towing Vessel	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	37	-	-	-	-	-	1	17	3	4	-	-	-	-	-	-	-	-	62
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	3	-	-	6	6	-	-	-	-	-	-	-	15
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tank Barge	-	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Tanker	-	-	-	-	-	-	4	19	2	1	-	-	-	-	-	-	-	-	26
Towing Vessel	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Other a/	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	5	3	-	1	1	-	7	19	2	7	6	-	-	-	-	-	-	-	51
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Tanker	3	-	-	-	-	-	1	15	3	2	-	-	-	-	-	-	-	-	24
Towing Vessel	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	36	-	-	-	-	-	1	15	3	3	-	-	-	-	-	-	-	-	58

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-46. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Savannah, GA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	4	22	21	13	14	27	21	11	18	8	7	-	-	-	-	-	-	-	166
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	2	-	5	-	-	-	-	-	-	-	-	7
Container Ship	18	9	8	36	27	18	59	51	95	106	178	145	-	4	-	-	-	-	754
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	20	32	20	14	6	4	6	6	17	12	-	-	-	-	-	-	-	-	137
Passenger Ship	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	5
Ro-Ro Cargo Ship	9	2	11	14	19	3	6	10	18	1	-	-	-	-	-	-	-	-	93
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	4	12	19	8	8	7	31	15	15	3	23	2	-	-	-	-	-	147
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	53	70	72	96	74	60	99	111	163	147	193	168	2	4	-	-	-	-	1,312
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	5	27	15	11	16	31	16	16	15	13	6	2	1	-	-	-	-	-	174
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	4	-	4	-	-	-	-	-	-	-	-	8
Container Ship	-	12	13	26	32	15	63	77	47	117	177	181	-	-	-	-	-	-	760
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	13	17	19	11	7	14	2	5	14	22	-	-	-	-	-	-	-	-	124
Passenger Ship	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Refrigerated Cargo Ship	-	1	-	-	-	3	-	-	-	-	6	-	-	-	-	-	-	-	10
Ro-Ro Cargo Ship	6	2	28	11	7	6	13	10	20	3	1	-	-	-	-	-	-	-	107
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	1	4	13	11	7	16	8	33	15	12	4	37	14	-	-	-	1	3	179
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	31	64	88	70	69	85	102	145	111	171	194	220	15	-	-	-	1	3	1,369
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	3	19	16	12	14	24	18	8	13	7	6	-	-	-	-	-	-	-	140
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	2	-	5	-	-	-	-	-	-	-	-	7
Container Ship	18	8	7	28	23	17	50	45	78	86	151	125	-	4	-	-	-	-	640
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	16	29	17	12	5	2	5	3	14	10	-	-	-	-	-	-	-	-	113
Passenger Ship	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	5
Ro-Ro Cargo Ship	7	2	10	12	14	3	5	9	15	-	-	-	-	-	-	-	-	-	77
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	4	10	16	6	7	5	24	13	11	3	21	2	-	-	-	-	-	122
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	46	62	60	80	62	53	83	91	133	119	165	146	2	4	-	-	-	-	1,106
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	4	19	14	9	14	23	14	13	12	9	4	1	-	-	-	-	-	-	136
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	3	-	4	-	-	-	-	-	-	-	-	7
Container Ship	-	10	12	24	26	14	53	65	41	102	153	148	-	-	-	-	-	-	648
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	10	14	14	9	6	10	2	4	12	18	-	-	-	-	-	-	-	-	99
Passenger Ship	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Refrigerated Cargo Ship	-	1	-	-	-	3	-	-	-	-	6	-	-	-	-	-	-	-	10
Ro-Ro Cargo Ship	5	2	24	10	6	5	12	9	17	2	1	-	-	-	-	-	-	-	93
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	1	2	12	9	6	15	7	28	14	8	4	32	12	-	-	-	1	1	152
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	23	49	76	61	58	70	88	122	96	143	168	181	12	-	-	-	1	1	1,149

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-47. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Brunswick, GA

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	9	4	2	-	-	-	-	-	-	-	-	-	-	-	-	15
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1	-	-	9	4	2	-	-	-	-	-	-	-	-	-	-	-	-	16
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	11	4	4	-	-	-	-	-	-	-	-	-	-	-	-	19
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Total	4	3	-	11	4	4	-	-	-	-	-	-	-	-	-	-	-	-	26
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	9	4	2	-	-	-	-	-	-	-	-	-	-	-	-	15
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1	-	-	9	4	2	-	-	-	-	-	-	-	-	-	-	-	-	16
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	11	4	4	-	-	-	-	-	-	-	-	-	-	-	-	19
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other <i>a/</i>	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Total	4	3	-	11	4	4	-	-	-	-	-	-	-	-	-	-	-	-	26

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-48. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Brunswick, GA

Year and period	DWT (000s)																			Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+		
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																				
Bulk Carrier	12	2	-	3	1	4	-	1	6	3	-	1	-	-	-	-	-	-	33	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	-	-	-	-	1	1	-	3	6	-	-	-	-	-	-	-	-	-	11	
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Dry Cargo Ship	2	-	3	1	1	-	-	7	-	-	-	-	-	-	-	-	-	-	14	
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Refrigerated Cargo Ship	-	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	
Ro-Ro Cargo Ship	-	-	42	31	8	14	-	-	2	-	-	-	-	-	-	-	-	-	97	
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tanker	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	14	3	49	35	11	19	2	11	14	3	-	1	-	-	-	-	-	-	162	
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																				
Bulk Carrier	11	3	1	3	1	3	1	3	3	2	1	1	-	-	-	-	-	-	33	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	-	1	-	1	1	-	-	2	2	-	-	-	-	-	-	-	-	-	7	
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Dry Cargo Ship	1	5	2	3	1	-	-	5	6	-	-	-	-	-	-	-	-	-	23	
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Refrigerated Cargo Ship	-	1	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	
Ro-Ro Cargo Ship	-	-	31	31	15	15	-	-	1	1	-	-	-	-	-	-	-	-	94	
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	12	10	37	39	18	18	1	10	12	3	1	1	-	-	-	-	-	-	162	
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																				
Bulk Carrier	12	2	-	3	1	4	-	1	6	3	-	1	-	-	-	-	-	-	33	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	-	-	-	-	1	1	-	3	6	-	-	-	-	-	-	-	-	-	11	
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Dry Cargo Ship	2	-	3	1	1	-	-	7	-	-	-	-	-	-	-	-	-	-	14	
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Refrigerated Cargo Ship	-	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	
Ro-Ro Cargo Ship	-	-	42	31	8	14	-	-	2	-	-	-	-	-	-	-	-	-	97	
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tanker	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	14	3	49	35	11	19	2	11	14	3	-	1	-	-	-	-	-	-	162	
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																				
Bulk Carrier	11	3	1	3	1	3	1	3	3	2	1	1	-	-	-	-	-	-	33	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	-	1	-	1	1	-	-	2	2	-	-	-	-	-	-	-	-	-	7	
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Dry Cargo Ship	1	5	2	3	1	-	-	5	6	-	-	-	-	-	-	-	-	-	23	
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Refrigerated Cargo Ship	-	1	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	
Ro-Ro Cargo Ship	-	-	31	31	15	15	-	-	1	1	-	-	-	-	-	-	-	-	94	
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	12	10	37	39	18	18	1	10	12	3	1	1	-	-	-	-	-	-	162	

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.  
Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-49. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Fernandina, FL

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	17	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Other <i>a/</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	17	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-50. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Fernandina, FL

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	1	-	-	3	-	-	-	-	-	-	-	4
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	3	35	4	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	43
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	16	6	8	2	-	-	-	1	6	3	-	-	-	-	-	-	-	-	42
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	19	41	25	2	-	-	-	2	7	3	3	-	-	-	-	-	-	-	102
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	9	-	-	-	1	-	2	-	-	-	-	-	-	-	-	-	12
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	1	23	4	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	30
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	16	15	11	-	-	-	-	1	2	5	-	-	-	-	-	-	-	-	50
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	17	40	28	-	-	-	1	1	5	6	1	-	-	-	-	-	-	-	99
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	1	-	-	3	-	-	-	-	-	-	-	4
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	3	35	4	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	43
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	16	6	8	2	-	-	-	1	6	3	-	-	-	-	-	-	-	-	42
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	19	41	25	2	-	-	-	2	7	3	3	-	-	-	-	-	-	-	102
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	9	-	-	-	1	-	2	-	-	-	-	-	-	-	-	-	12
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	1	23	4	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	30
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	16	15	11	-	-	-	-	1	2	5	-	-	-	-	-	-	-	-	50
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	17	40	28	-	-	-	1	1	5	6	1	-	-	-	-	-	-	-	99

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.  
Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.



Table E-51. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Jacksonville, FL

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	13	34	9	-	-	-	-	-	-	-	-	-	-	-	-	56
Freight Barge	3	5	41	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	79
General Dry Cargo Ship	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	4
Passenger Ship	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	37	5	1	-	-	-	-	-	-	-	-	-	-	-	-	43
Tank Barge	-	-	-	3	1	1	2	-	-	-	-	-	-	-	-	-	-	-	7
Tanker	3	-	-	-	-	-	4	14	1	14	-	-	-	-	-	-	-	-	36
Towing Vessel	116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	116
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	126	5	41	83	40	15	7	14	1	14	-	-	-	-	-	-	-	-	346
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	9	40	9	-	-	-	-	-	-	-	-	-	-	-	-	58
Freight Barge	7	9	36	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	74
General Dry Cargo Ship	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	3
Passenger Ship	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	47	4	1	-	-	-	-	-	-	-	-	-	-	-	-	52
Tank Barge	-	-	-	-	7	-	2	-	-	-	-	-	-	-	-	-	-	-	9
Tanker	1	-	-	-	-	-	4	7	-	15	1	-	-	-	-	-	-	-	28
Towing Vessel	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	150
Other a/	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Total	169	9	36	78	51	13	7	7	-	15	1	-	-	-	-	-	-	-	386
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	13	34	9	-	-	-	-	-	-	-	-	-	-	-	-	56
Freight Barge	3	5	41	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	79
General Dry Cargo Ship	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	4
Passenger Ship	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	37	5	1	-	-	-	-	-	-	-	-	-	-	-	-	43
Tank Barge	-	-	-	3	1	1	2	-	-	-	-	-	-	-	-	-	-	-	7
Tanker	3	-	-	-	-	-	4	14	1	14	-	-	-	-	-	-	-	-	36
Towing Vessel	116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	116
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	126	5	41	83	40	15	7	14	1	14	-	-	-	-	-	-	-	-	346
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	9	40	9	-	-	-	-	-	-	-	-	-	-	-	-	58
Freight Barge	7	9	36	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	74
General Dry Cargo Ship	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	3
Passenger Ship	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	47	4	1	-	-	-	-	-	-	-	-	-	-	-	-	52
Tank Barge	-	-	-	-	7	-	2	-	-	-	-	-	-	-	-	-	-	-	9
Tanker	1	-	-	-	-	-	4	7	-	15	1	-	-	-	-	-	-	-	28
Towing Vessel	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	150
Other a/	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Total	169	9	36	78	51	13	7	7	-	15	1	-	-	-	-	-	-	-	386

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.  
Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-52. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Jacksonville, FL

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	4	7	1	8	2	2	11	11	4	5	5	-	-	-	-	-	61
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Container Ship	19	42	1	7	-	3	18	1	18	6	14	-	-	-	-	-	-	-	129
Freight Barge	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	38	31	4	-	5	1	2	3	8	6	-	-	-	-	-	-	-	-	98
Passenger Ship	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Refrigerated Cargo Ship	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Ro-Ro Cargo Ship	5	-	73	67	26	6	-	-	1	1	-	-	-	-	-	-	-	-	179
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	1	-	-	2	1	3	-	16	19	24	2	8	-	1	-	1	-	-	78
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Total	71	78	83	83	33	21	22	22	57	49	20	13	5	1	-	1	-	-	559
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	3	3	1	1	9	3	4	9	12	12	3	5	-	-	-	-	-	65
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	2
Container Ship	36	36	5	1	3	10	18	4	11	7	15	-	-	-	-	-	-	-	146
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	31	20	3	4	9	4	1	2	11	3	-	-	-	-	-	-	-	-	88
Passenger Ship	13	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
Refrigerated Cargo Ship	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Ro-Ro Cargo Ship	3	1	71	76	15	11	1	-	-	1	-	-	-	-	-	-	-	-	179
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	1	-	1	1	6	-	10	17	40	3	13	-	-	-	-	-	-	92
Towing Vessel	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Other a/	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Total	98	83	84	83	29	40	23	20	48	65	30	16	5	-	-	-	-	-	624
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	1	4	7	1	8	2	2	11	11	4	5	5	-	-	-	-	-	61
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Container Ship	19	42	1	7	-	3	18	1	18	6	14	-	-	-	-	-	-	-	129
Freight Barge	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
General Dry Cargo Ship	38	31	4	-	5	1	2	3	8	6	-	-	-	-	-	-	-	-	98
Passenger Ship	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Refrigerated Cargo Ship	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Ro-Ro Cargo Ship	5	-	73	67	26	6	-	-	1	1	-	-	-	-	-	-	-	-	179
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	1	-	-	2	1	3	-	16	19	24	2	8	-	1	-	1	-	-	78
Towing Vessel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other a/	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Total	71	78	83	83	33	21	22	22	57	49	20	13	5	1	-	1	-	-	559
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	3	3	1	1	9	3	4	9	12	12	3	5	-	-	-	-	-	65
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	2
Container Ship	36	36	5	1	3	10	18	4	11	7	15	-	-	-	-	-	-	-	146
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	31	20	3	4	9	4	1	2	11	3	-	-	-	-	-	-	-	-	88
Passenger Ship	13	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
Refrigerated Cargo Ship	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Ro-Ro Cargo Ship	3	1	71	76	15	11	1	-	-	1	-	-	-	-	-	-	-	-	179
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	1	-	1	1	6	-	10	17	40	3	13	-	-	-	-	-	-	92
Towing Vessel	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Other a/	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Total	98	83	84	83	29	40	23	20	48	65	30	16	5	-	-	-	-	-	624

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.

Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-53. Restricted Period Arrivals of U.S. Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Port Canaveral, FL

Year and period	DWT (000s)																		Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+	
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
General Dry Cargo Ship	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Passenger Ship	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Tank Barge	-	-	-	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	3
Tanker	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	3
Towing Vessel	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	25	-	-	1	1	-	3	-	-	1	-	-	-	-	-	-	-	-	31
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
General Dry Cargo Ship	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Passenger Ship	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2
Tanker	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	3
Towing Vessel	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	38	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	43
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																			
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.  
Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.

Table E-54. Restricted Period Arrivals of Foreign Flag Vessels 150 GRT and Above by Alternative, Port Area, and Vessel DWT, 2003 and 2004  
Port Area: Port Canaveral, FL

Year and period	DWT (000s)																			Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80-90	90-100	100-120	120-150	150+		
<b><u>2003 Alternative 3 Restricted period arrivals</u></b>																				
Bulk Carrier	2	16	2	4	1	5	1	6	2	1	-	-	-	-	-	-	-	-	40	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	-	-	-	-	-	-	2	-	4	-	-	-	-	-	-	-	-	-	6	
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Dry Cargo Ship	4	6	13	2	-	1	1	3	3	1	-	-	-	-	-	-	-	-	34	
Passenger Ship	25	189	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	220	
Refrigerated Cargo Ship	-	23	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	
Ro-Ro Cargo Ship	-	1	10	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	13	
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tanker	-	-	-	-	-	-	-	1	-	4	1	-	-	1	-	-	-	-	7	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	31	235	34	7	1	7	4	10	9	6	1	-	-	1	-	-	-	-	346	
<b><u>2004 Alternative 3 Restricted period arrivals</u></b>																				
Bulk Carrier	-	14	-	6	-	8	4	7	9	5	1	-	-	-	-	-	-	-	54	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	7	
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Dry Cargo Ship	3	12	13	3	1	3	-	1	4	5	-	-	-	-	-	-	-	-	45	
Passenger Ship	5	195	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	221	
Refrigerated Cargo Ship	-	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	
Ro-Ro Cargo Ship	3	-	15	-	-	2	-	-	-	-	1	-	-	-	-	-	-	-	21	
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tanker	-	-	-	-	-	2	-	1	-	2	1	2	-	-	1	2	-	-	11	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other a/	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
Total	12	238	49	9	1	15	4	9	20	12	3	2	-	-	1	2	-	-	377	
<b><u>2003 Alternative 6 Restricted period arrivals</u></b>																				
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<b><u>2004 Alternative 6 Restricted period arrivals</u></b>																				
Bulk Carrier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Combination Carrier (e.g. OBO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Container Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Freight Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Dry Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Passenger Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Refrigerated Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ro-Ro Cargo Ship	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tank Barge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tanker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Towing Vessel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

a/ Other includes fishing vessels, industrial vessels, research vessels, school ships.  
Source: Prepared by Nathan Associates based on analysis of U.S. Coast Guard data on vessel calls at U.S. ports, 2003-2004.