

## INDUSTRY STAKEHOLDER MEETING SUMMARY

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<b>INDUSTRY GROUP:</b>	Save the Cape	
<b>DATE:</b>	June 13, 2011, 1 – 3 pm	
<b>LOCATION:</b>	Bald Head Island Ferry Marina, 1301 Ferry Rd , Southport, NC	
<b>PARTICIPANTS:</b>	<u>Save the Cape</u> Joe Brawner, resident of Bald Head Island Toby Bronstein, Save the Cape, resident of Caswell Beach Kemp Burdette, Riverkeeper, Cape Fear River Watch Michael Rice, Save the Cape, resident of Southport Al Willis, resident of Southport	<u>Maritime Strategy Team</u> Rachel Vandenberg Tommy Harrelson Garold Smith Eddie McFalls Alixandra Demers

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The Maritime Strategy team met with Save the Cape on June 13, 2011 from 1pm to 2:45pm. The purpose of the meeting was to better understand the issues and concerns of Save the Cape related to potential port development in Southport and port improvement in Wilmington.

Major topics presented by Save the Cape included:

### Coastal Engineering and Dredging

- Issues driving the shoaling of the Cape Fear River
- Protection of Bald Head Island
- Coastal impacts of dredging
- Dredging costs
- What approaches are available to control sedimentation/erosion?
- Claim that no dynamic studies have been done to evaluate impacts of dredging
- Inability to turn current vessels at Port of Wilmington?

### Cost Benefit Analysis

- Transportation cost savings vs. comprehensive economic impact analysis
- Separation of Benefit Cost Analysis from economic development
- Desire to assign cost to environmental impacts

### Market Area

- Trucking cost & market area = “only one piece of the equation” bringing business to NC ports
- Volumes at private terminals around Wilmington

### Safety and Security

- Proximity to MOTSU blast area
- Proximity to nuclear facility
- What are real risks of facility vs any other use of land?

Other Environmental Issues

- Contamination of property at POW?

References and Reports Cited by Save the Cape Representatives

- TEC/PF Richardson report (this is posted on the Save the Cape website and cited in their February newsletter: <http://savethecape.org/STC/images/stories/PDFs/CFF22511.pdf>)
- Dr. Michael Mallin, UNCW
- USACE Wilmington Harbor monitoring reports

Materials provided by Save the Cape are attached.

**ATTACHMENT 1**  
**SAVE THE CAPE PRESENTATION MATERIALS**

**Some Comments  
on the  
North Carolina Maritime Strategy Study  
Scope of Work**

**June 13, 2011**



**Save the Cape, Inc.  
[www.savethecape.org](http://www.savethecape.org)**

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**Some Comments on the North Carolina Maritime Strategy Study  
Scope of Work  
June 13, 2011**

**Overview**

- The study is basically well-designed and structurally sound.
- Previous studies started with a solution and looked for a problem. This study should define the problem and look for the best solutions.
- Most significant element of the study is the use of rigorous cost-benefit analysis to evaluate and rank alternatives. That has been missing in previous studies. This study should be a prototype for North Carolina transportation decisions.

**But:**

- The study has an overlay of promotion of North Carolina ports—to draw business to NC ports. The objective should be developing business for the sake of the business—not for the sake of the ports. Ports are means to an end—not the end. This aspect of the study will disturb the integrity of the analysis and distort the result.
- The study presumes that movement of North Carolina traffic and out-of state traffic through State ports is beneficial. But the ports are subsidized. Although the State Ports occasionally show a margin of revenues over operating costs, full allocation of capital costs shows substantial losses. This is consistent with results in other states. Ports also exact a heavy toll on the environment.
- For most of the analysis, State borders should be disregarded. The analytical perspective should be the same as that of business.

## Prior Studies

### *State studies*

*Statewide Logistics Plan for North Carolina (2008)*. A plan for a plan. Not much hard information. Ports material provided by State Ports Authority.

*Governor's Logistics Task Force (2011-not yet complete)*. Not quantitative. Seven Portals Study focuses on "Logistics Villages" around airports.

*Western North Carolina Inland Port Feasibility Study (undated)*. Very useful. Interesting data on use of out-of-state ports by North Carolina importers and exporters (80%).

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- Exhibit 2a Some Warnings from the Statewide Logistics Plan
  - Exhibit 2b Ports of Choice North Carolina International Trade
  - Exhibit 2c Origin and destination ports for North Carolina exports
  - Exhibit 2d Origin and destination ports for North Carolina exports (Pie chart)

## ***Regional Port Studies***

*Gulf Engineering & Consultants* (2006). Multiport Analysis done for Savannah Harbor feasibility study. Dated, but very useful.

*Risingwater Associates* (2011). Survey of capacity, performance, and expansion plans of container terminals at Savannah, Charleston, Wilmington and Norfolk. Includes financial performance

*Jeff Davis, The Citadel* (2011). Similar study, same sources, similar results.

- 
- Exhibit 3a Total Cost Comparison for Southeastern US Ports
  - Exhibit 3b Least Cost Market Area-Port of Wilmington
  - Exhibit 3c 400-mile Trucking Limit from Existing Ports
  - Exhibit 3d Capacity Versus Demand
  - Exhibit 3e Container Movements
  - Exhibit 3f Comparative Container Charges

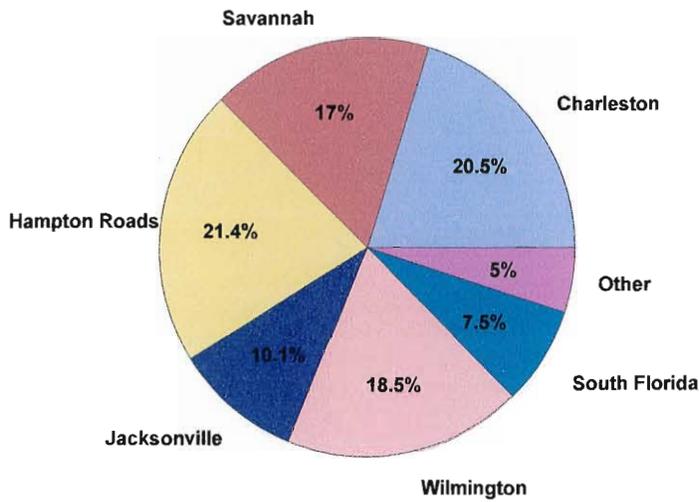
## *Some Warnings from the Statewide Logistics Plan*

- “Economic forecasts were almost always overly optimistic and did not identify and analyze alternatives.”
- “All studies had a political hidden agenda that tended to cloud real issues and the final results.”
- “State legislatures cannot mandate prosperity, particularly regarding port projects.”
- “Today’s supply chains have too much flexibility built into them that a ‘build it and they will come mentality spells disaster.”

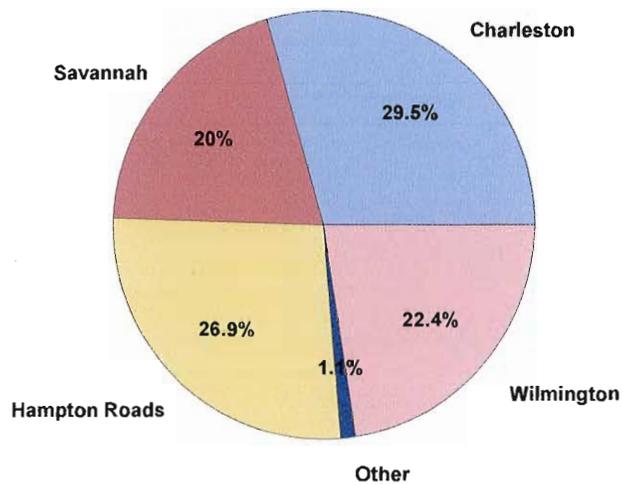
Source: Statewide Logistics Plan for North Carolina (2008).

# Ports of Choice for North Carolina International Trade

## North Carolina Exports



## North Carolina Imports



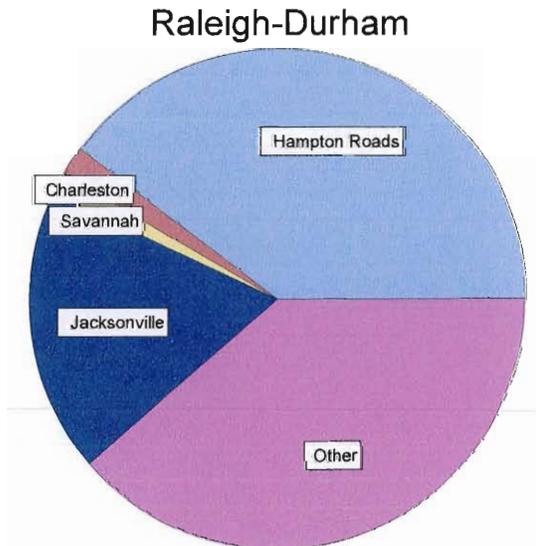
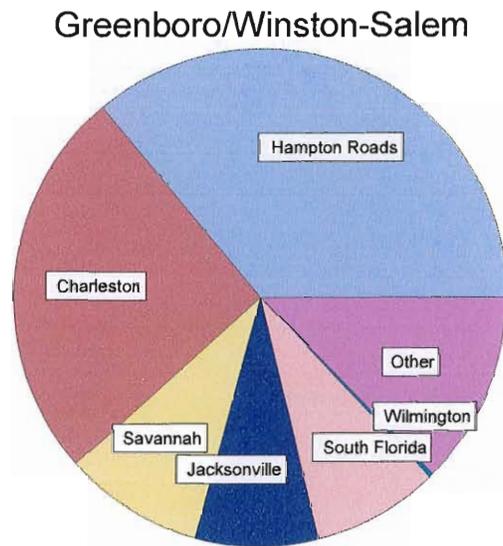
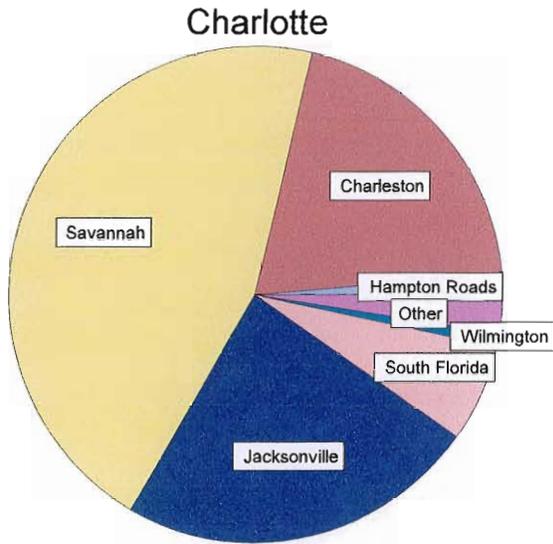
Source: Western North Carolina Inland Port Feasibility Study

**Exhibit 25: Origin and Destination Ports for North Carolina  
Export Commodities, by Region (2007)**

<b>Ports</b>	<b>North Carolina</b>	<b>Western North Carolina</b>	<b>Charlotte</b>	<b>G'boro / Winston- Salem</b>	<b>Raleigh - Durham</b>	<b>Hickory - Unifour</b>
<b>Total TEUs</b>	<b>113,800</b>	<b>10,300</b>	<b>21,900</b>	<b>15,600</b>	<b>3,550</b>	<b>5,750</b>
<b>% of Total NC</b>	<b>100.0%</b>	<b>9.1%</b>	<b>19.2%</b>	<b>13.7%</b>	<b>3.1%</b>	<b>5.1%</b>
<b>Charleston</b>						
TEUs	23,300	3,500	4,400	3,900	100	3,300
%	20.5%	34.0%	20.1%	25.0%	2.8%	57.4%
<b>Savannah</b>						
TEUs	19,400	3,100	9,900	1,400	50	900
%	17.0%	30.1%	45.2%	9.0%	1.4%	15.7%
<b>Norfolk</b>						
TEUs	24,300	600	300	5,700	1,400	150
%	21.4%	5.8%	1.4%	36.5%	39.4%	2.6%
<b>Jacksonville, FL</b>						
TEUs	11,500	1,300	5,200	1,300	650	450
%	10.1%	12.6%	23.7%	8.3%	18.3%	7.8%
<b>Wilmington, NC</b>						
TEUs	21,000	-	150	50	-	-
%	18.5%	0.0%	0.7%	0.3%	0.0%	0.0%
<b>South Florida</b>						
TEUs	8,500	1,600	1,400	1,300	-	650
%	7.5%	15.5%	6.4%	8.3%	0.0%	11.3%
<b>Other</b>						
TEUs	5,800	200	550	1,950	1,350	300
%	5.1%	1.9%	2.5%	12.5%	38.0%	5.2%

Source: Western North Carolina Inland Port Feasibility Study

# Ports Used for North Carolina Exports



Source: Western North Carolina  
Inland Port Feasibility Study

## *Regional Port Studies*

*Gulf Engineering & Consultants* (2006). Multiport Analysis done for Savannah Harbor feasibility study. Dated, but very useful.

*Risingwater Associates* (2011). Survey of capacity, performance, and expansion plans of container terminals at Savannah, Charleston, Wilmington and Norfolk. Includes financial performance

New { *Jeff Davis, The Citadel* (2011). Similar study, same sources, similar results.

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Exhibit 3a	Total Cost Comparison for Southeastern US Ports
Exhibit 3b	Least Cost Market Area–Port of Wilmington
Exhibit 3c	400-mile Trucking Limit from Existing Ports
Exhibit 3d	Capacity Versus Demand
Exhibit 3e	Container Movements
Exhibit 3f	Comparative Container Charges

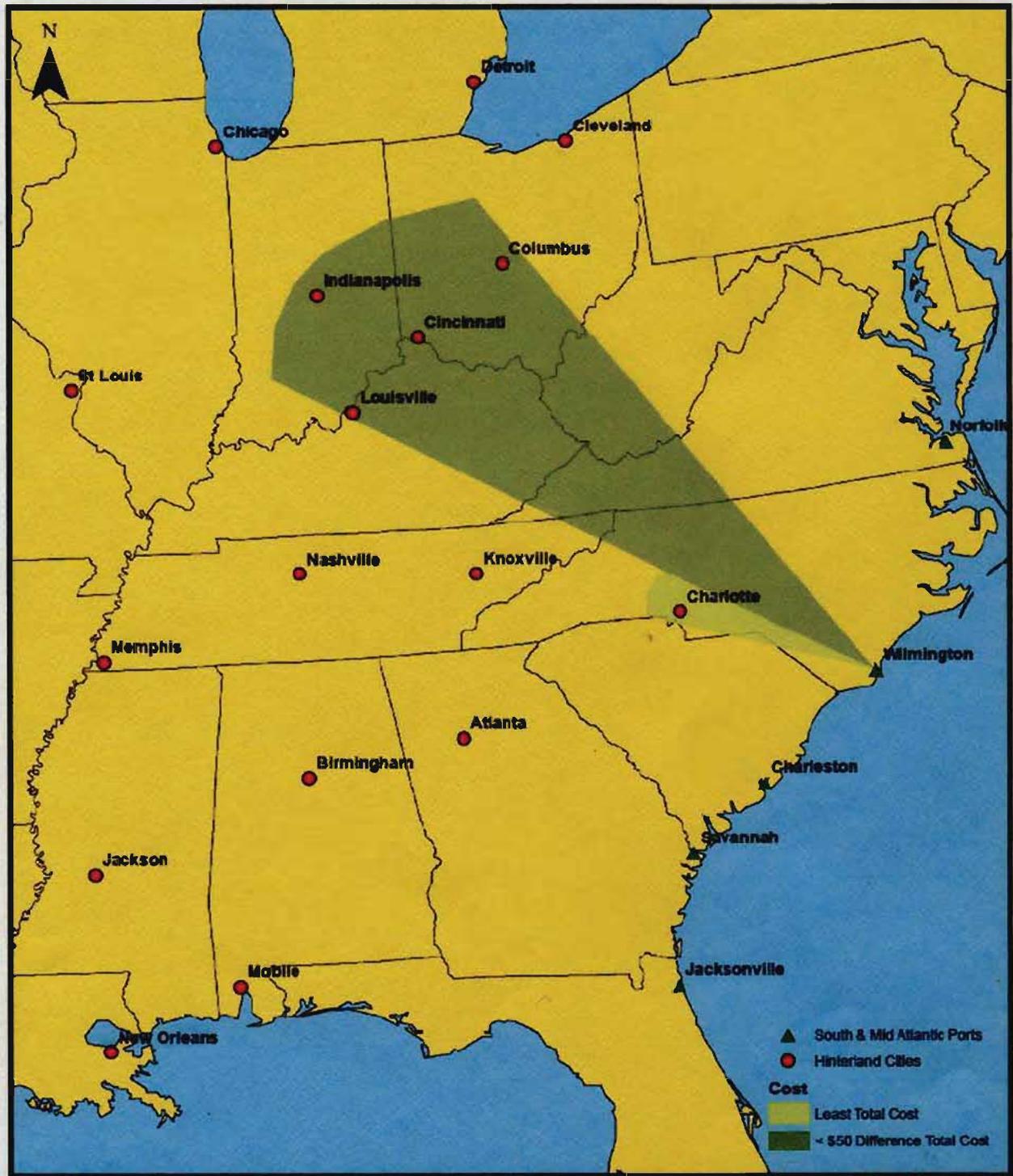
## Total Cost Comparison for Southeastern US Ports

<i>Hinterland</i>	Mid-Atlantic and South Atlantic Ports				
	Difference in Total Cost				
	<i>Jacksonville</i> \$	<i>Savannah</i> \$	<i>Charleston</i> \$	<i>Wilmington</i> \$	<i>Norfolk</i> \$
New Orleans	0.00	86.74	126.63	174.67	264.93
Mobile	0.00	66.55	127.72	175.76	266.02
Memphis	40.36	0.00	64.98	99.39	138.92
St. Louis	40.90	0.00	12.08	68.29	46.74
Jackson	41.45	0.00	24.08	72.11	160.19
Birmingham	41.99	0.00	24.62	72.66	160.74
Atlanta	40.36	0.00	24.08	72.11	159.65
Charlotte	103.52	43.52	3.23	0.00	71.17
Nashville	40.90	0.00	12.08	80.29	100.19
Knoxville	100.28	39.74	0.00	68.22	83.21
Louisville	87.74	40.29	0.00	45.86	24.30
Cincinnati	99.74	39.74	0.00	23.49	45.57
Columbus	35.19	44.43	84.71	144.71	0.00
Indianapolis	87.74	40.29	0.00	45.86	24.30
Chicago	118.52	50.35	10.06	55.92	0.00
Detroit	191.07	131.08	91.88	83.74	0.00
Cleveland	186.16	125.62	85.88	77.74	0.00

Notes: Highlighted cells denote least total transportation delivered costs for particular hinterland cities and ports. Some cost inputs have been estimated.

Source: G.E.C., Inc.

# Least Cost Market Area—Port of Wilmington



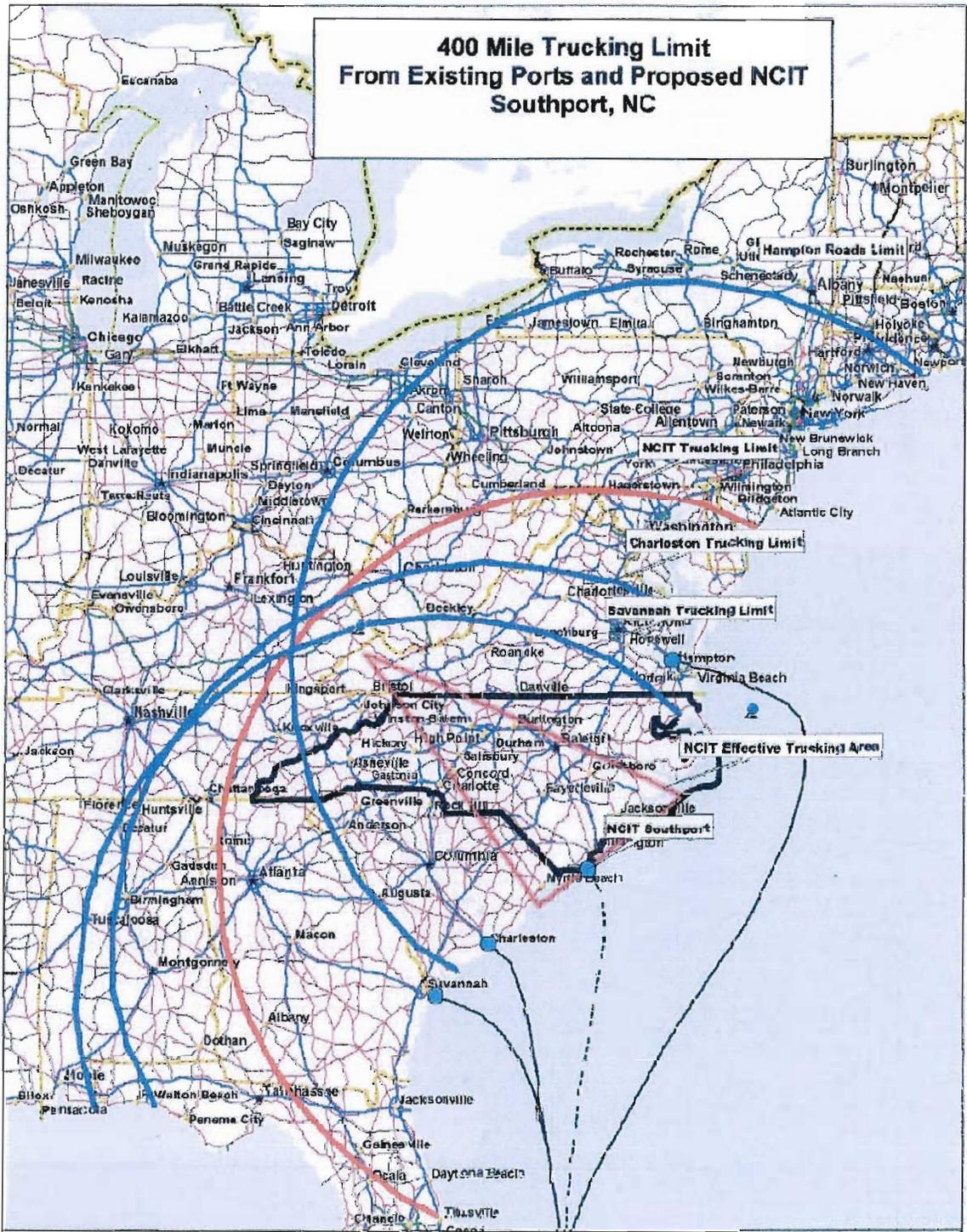
**Incremental Difference in Least Total Transportation Cost for Wilmington Compared to the other Mid and South Atlantic Ports (\$/TEU) (Without Project)**

Note: Some cost inputs have been estimated and need further development



Figure: 68  
 Date: March 2006  
 Scale: 1 inch equals 120 miles  
 Source: GEC  
 Map Author: C. Perez

# 400 Mile Trucking Limit From Existing Ports and Proposed NCIT Southport, NC

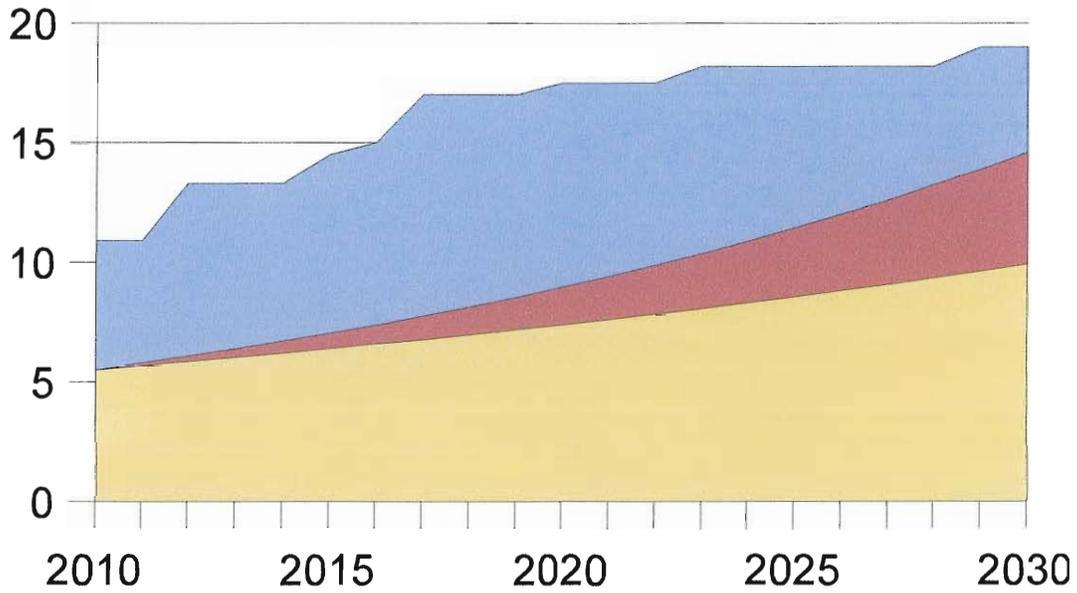


**DeLORME**  
© 2001 DeLorme, Topo USA® L.L.C.  
Zoom Level: 4-5 Datum: WGS84

# Southeastern Container Port Capacities

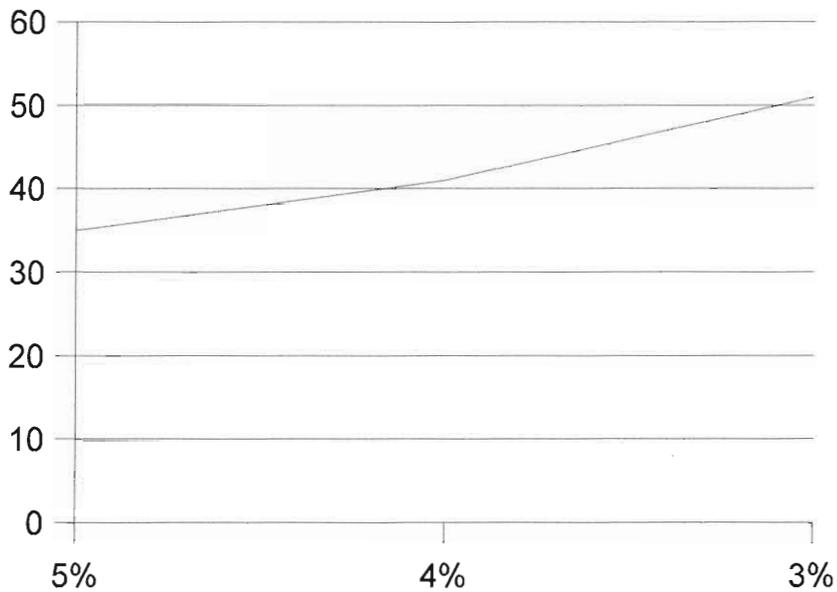
## Capacity versus Demand Growth

TEU X 1,000,000



## Year of Capacity Saturation

Year of 21st Century

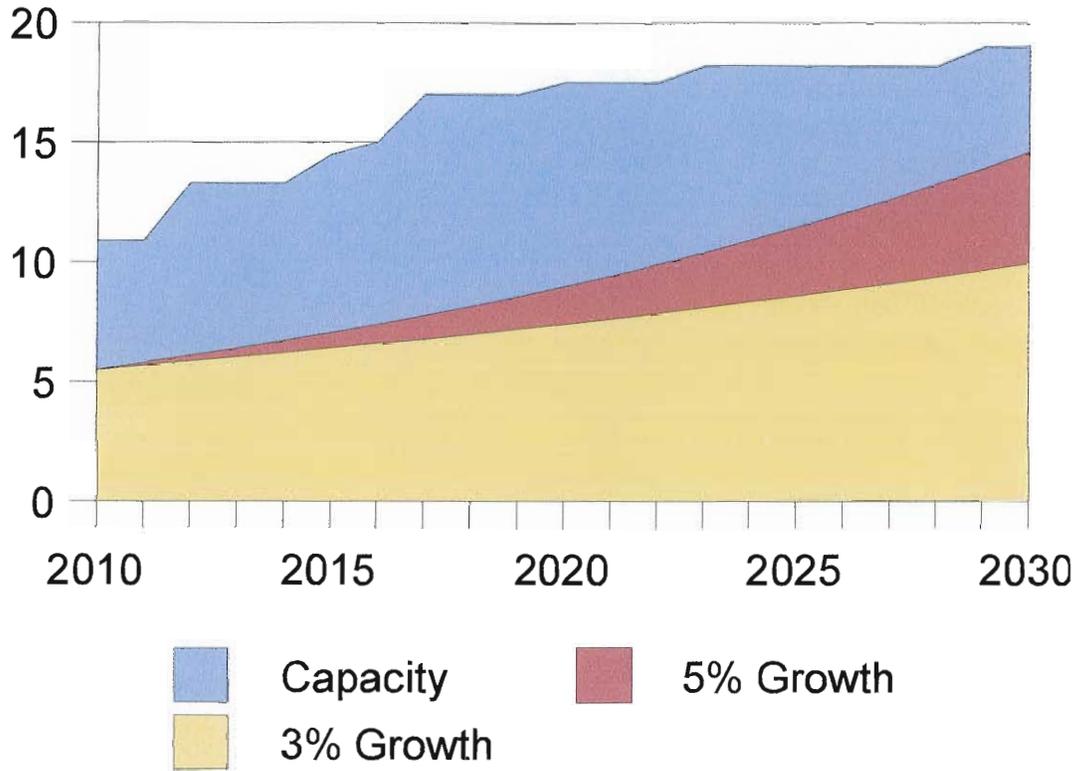


Annual Rate of Growth of Container Movements

# Southeastern Container Port Capacities

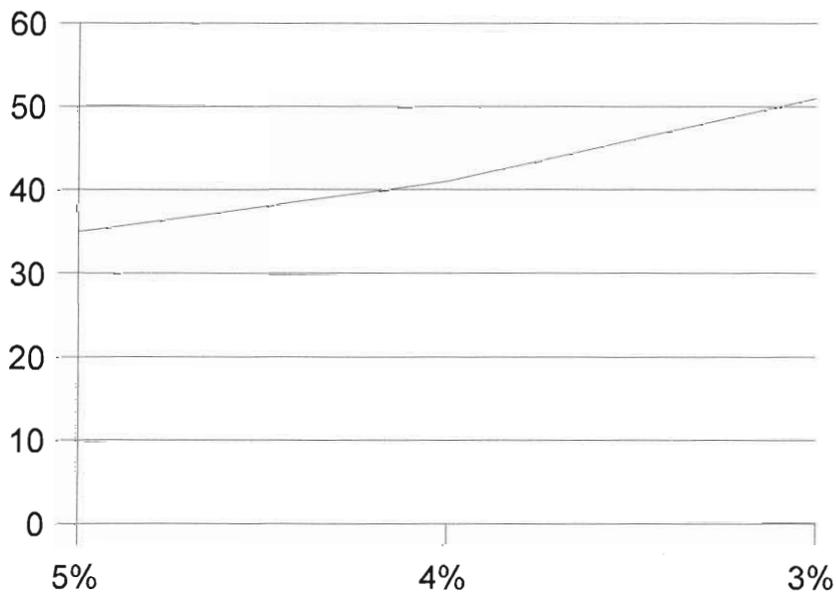
## Capacity versus Demand Growth

TEU X 1,000,000



## Year of Capacity Saturation

Year of 21st Century

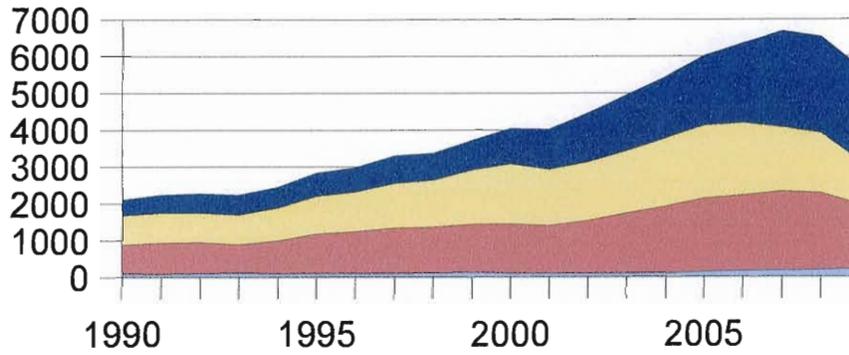


Annual Rate of Growth of Container Movements

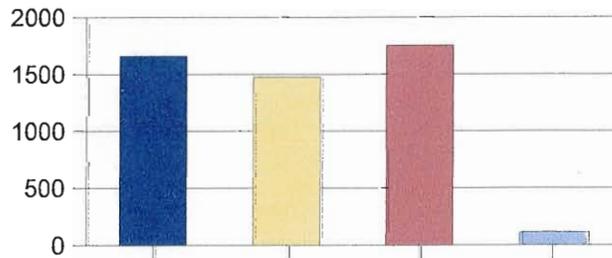
## Southeastern US Container Movements and Ship Calls

### Annual Container Movements

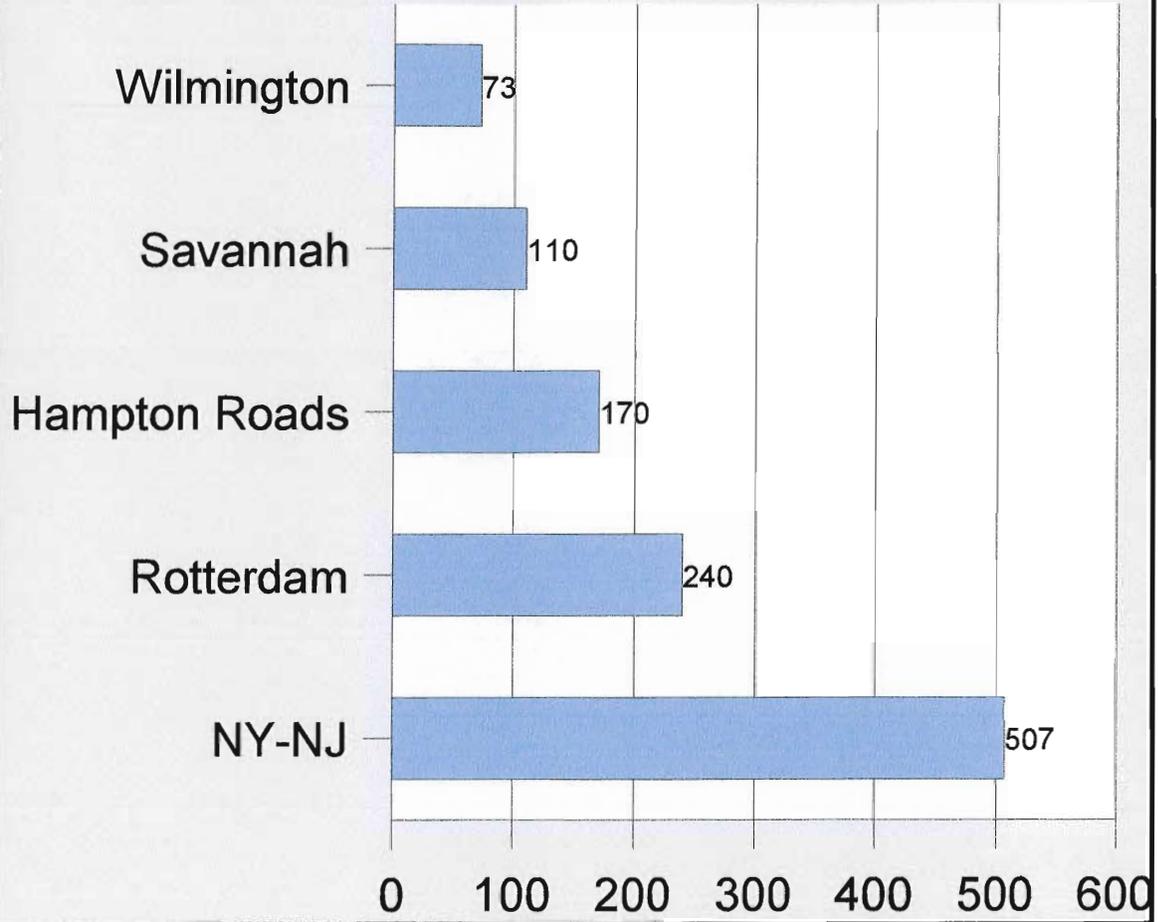
TEU X1000



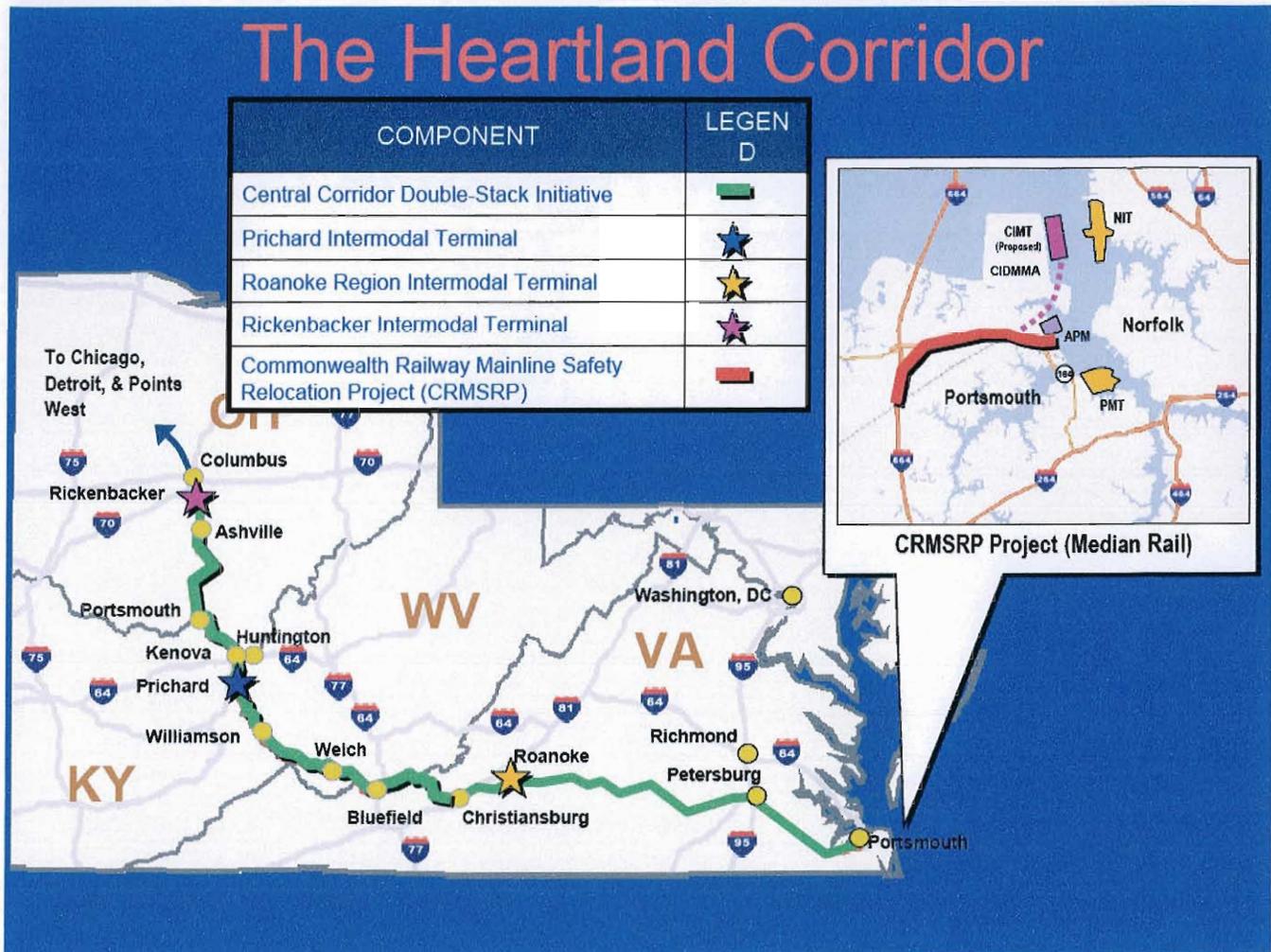
### Container Ship Calls



## Container Terminal Handling Charges



# Norfolk Southern Railway Heartland Corridor Serving Norfolk



Source: Norfolk Southern Railway Company

## *NCIT Studies*

*CH2M Hill, Inc.* (2008) \$6 million. Preliminary engineering with business plan. Very comprehensive. Includes infrastructure needs—rail, highway and dredging. No environmental review.

Exceedingly optimistic and highly qualified business plan based on capturing substantial container movements from other ports.

*TEC/PFRichardson.* (2010). Review of CH2M Hill plan and revised cost estimate: \$4.4 billion. Not released by State Ports Authority

*Risingwater Associates* (2010). Critique of NCIT delivered to Governor's Logistics Task Force. Focus on challenges presented by site and flaws in CH2M Hill revenue projections. Includes cost-benefit analysis and environmental review.

*Michael Mallin, UNCW* (2011). Environmental review.

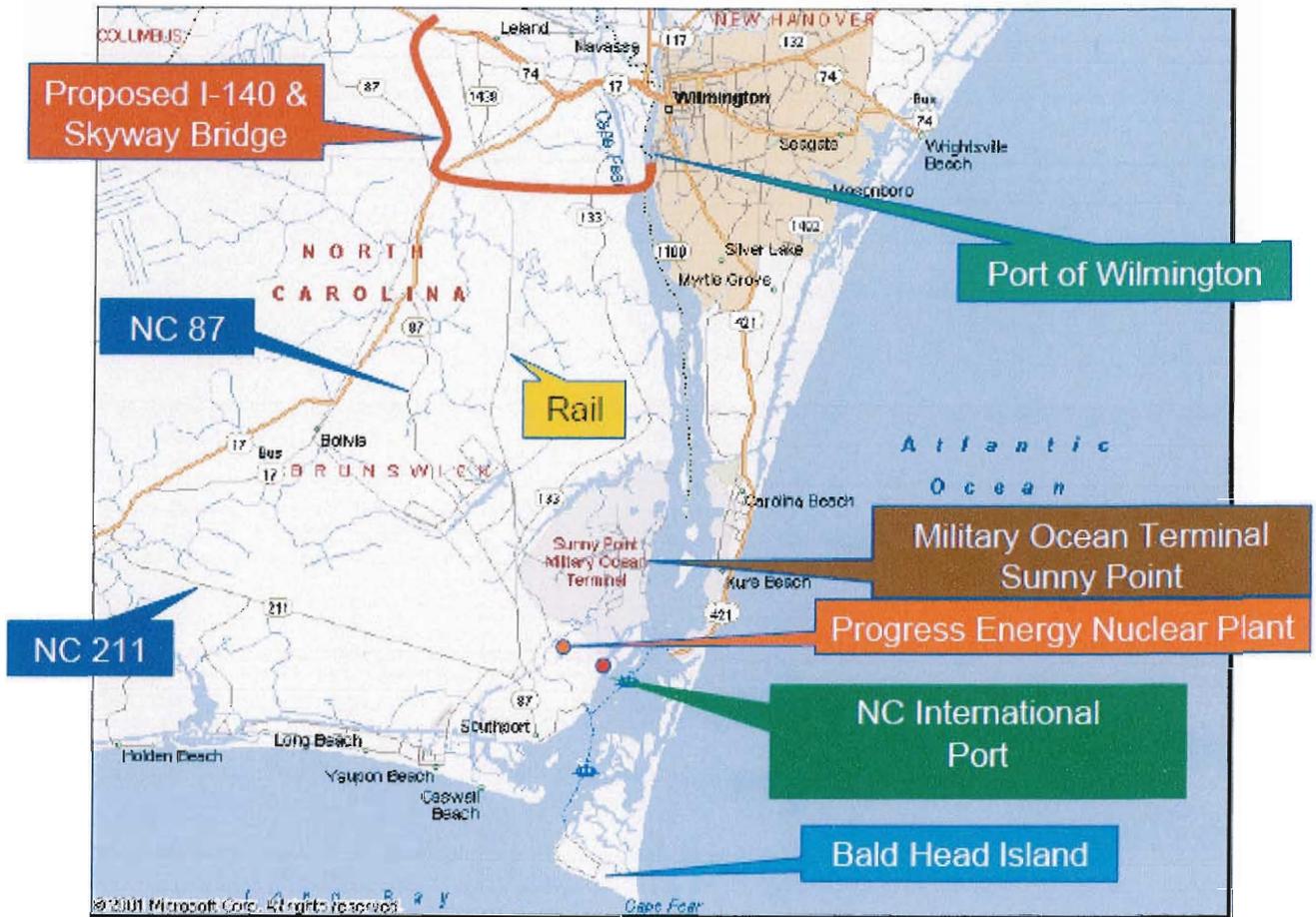
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Exhibit 4a. Location map

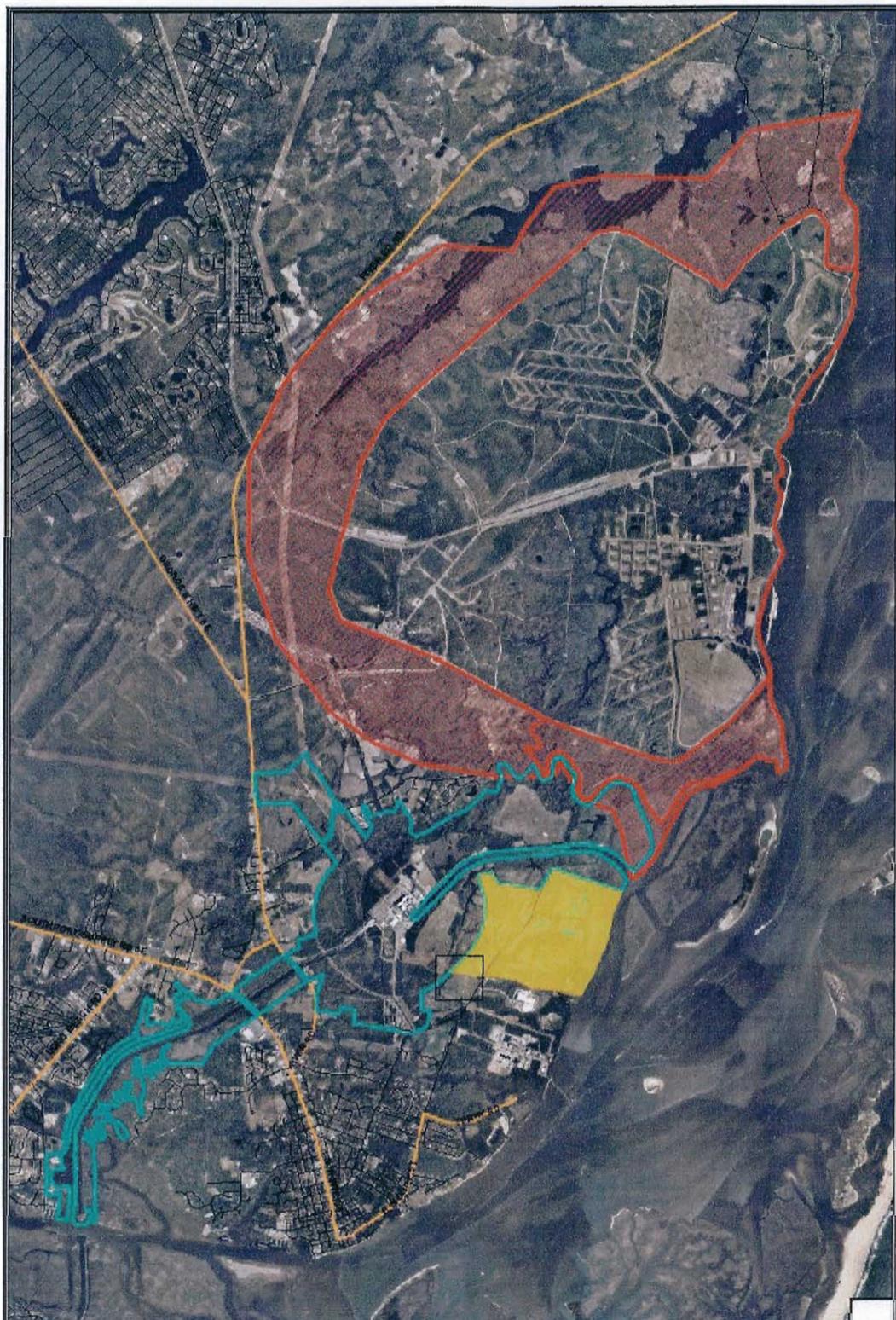
Exhibit 4b. Aerial photo

Exhibit 4c. Container Movement Projections

# North Carolina International Port Location



Source: North Carolina State Ports Authority



Prepared by Brunswick County GIS Dept.  
 0 0.7  
 1 inch equals 0.7 miles

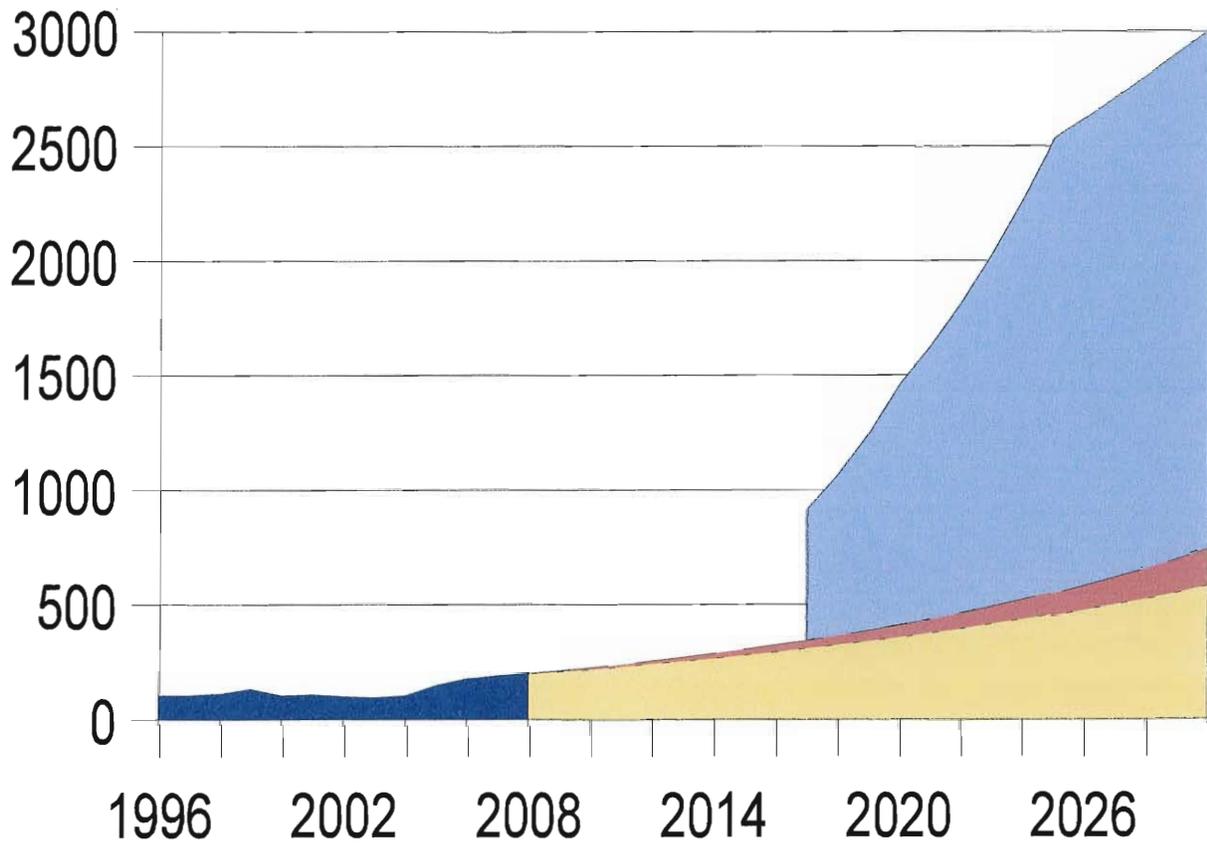
# North Carolina International Port



Brunswick County assumes no legal responsibility for the nature or accuracy of any information contained on this map. This map may not be accurate or up to date. All map information must be verified by field. Contacted on 10/20/2010. State Plane Coordinate, 1983 NAD datum.

# *North Carolina International Terminal Container Movement Projections*

Annual Container Movements  
TEU X1000



## Wilmington Harbor

*Corps of Engineers* (1996) Feasibility for deepening channel to 42 feet. Includes EIS. Basic reference. Includes private facilities as well as State Port.

*Risingwater Associates* (Draft-2010). Analysis of channel turn at Battery Island. Currently being revised.

*Moffatt & Nichol* (2010) Feasibility study for Wilmington and Morehead City used for support of revenue bonds. Includes cargo movement history and lease-cost path analysis.

*Moffatt & Nichol* (2011) Business plan for Wilmington and Morehead City. Very good, with least-cost path analysis. Identifies many problems with increasing traffic and expansion of Port of Wilmington.

This study does not go far enough. It does not include any cost estimates or financial analysis. It identifies two of the three major problems with use of the Cape Fear River for large vessels—the turning basin and the channel turn at Battery Island—but does not develop solutions. Or even suggest they can be solved.

*Corps of Engineers* (2011). Section 905(b) analysis preparatory to feasibility study. Awful piece of work, in terms of presentation and analysis. Does have cost estimates and identifies environmental issues. Identifies the three problems with the Cape Fear River for navigation. Benefits analysis is badly flawed and includes illegal counting of transferred benefits.

## **Limitations of the Cape Fear River**

*Great natural harbors typically grow and develop into great centers of population and commerce*

- North Carolina does not have a natural deep water harbor
- The NC shoreline is shallow, heavily sedimentary, and dynamic
- The Cape Fear River is shallow as is its long pathway to deep ocean water
- The State coastline has not been friendly to maritime traffic.
- The State coastline has no great center of population, industry or commerce

*The natural evolution of the Cape Fear River delta is instructive in helping to understand the maritime limitations of the area*

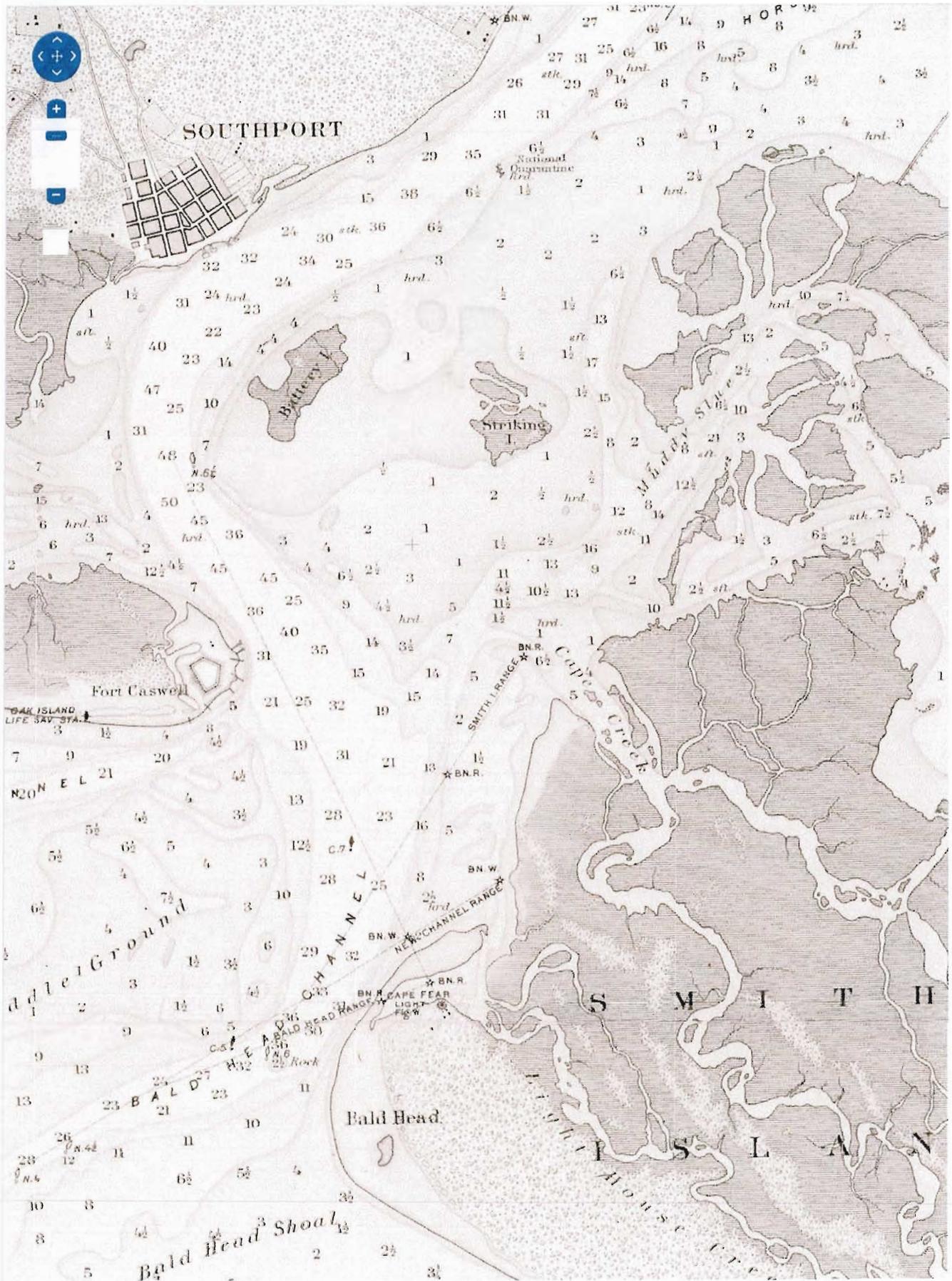
- The low, sandy sedimentary delta was formed over centuries as were the massive, shallow shoals just off of the coast
- Deep water, in maritime terms, is more than 20 miles offshore
- Frying Pan Shoals is one of the largest accumulations of large grained sand on the Atlantic coast
- The near-shore ocean bottom is dynamic and changes with variations in waves, winds, currents, etc.

*The construction and maintenance of increased navigation channel depths have further destabilized and altered the natural geological processes within the Cape Fear River Inlet*

- Natural, evolutionary sediment movement has been lost
- The 8 to 12 foot natural depth of the channel has been increased to 46 feet through the ocean bar and the channel location has been fixed
- More water flows through the inlet and at higher velocities
- The maintained navigation channel has bifurcated the inlet and eliminated sediment transfer across the inlet
- Much sediment has been removed from the channel and lost to the local sediment system
- Shoaling rates in the channel have increased.
- Beach and near-shore shoal erosion near the channel have increased and shoaling patterns have changed.

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Exhibit 7 Early Chart

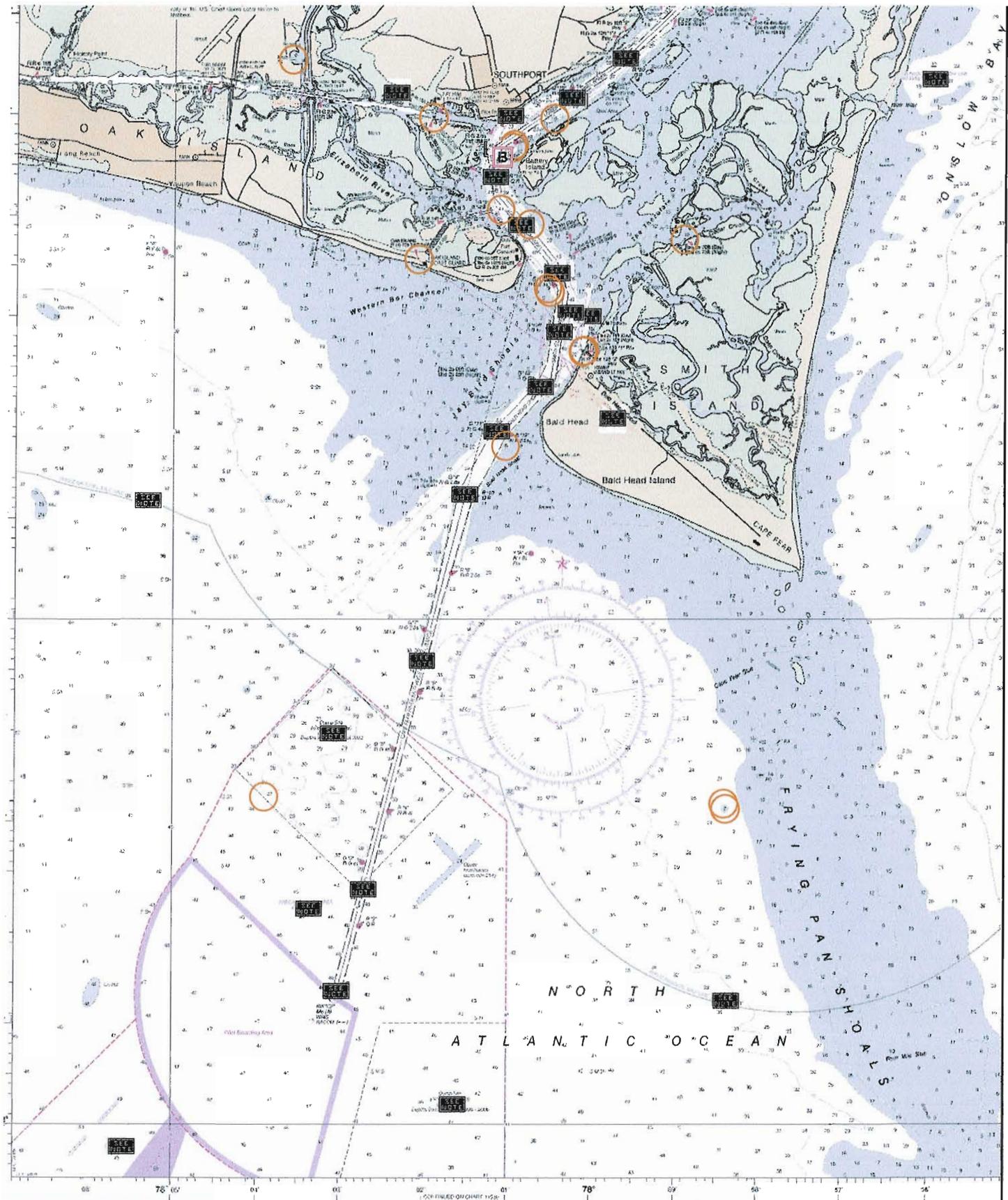


*Man-made changes to the navigation channel have grown in magnitude and appear to accelerate increases in physical instability of the inlet as well as the rate of environmental change*

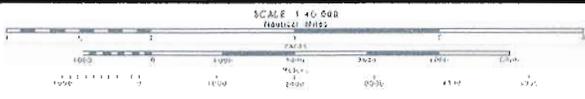
- Channel depth was about 12 feet in the early 1800's and 20 feet by the early 1900's; it was increased to 44 feet in 2000 and now 53 feet is being considered; the Military Ocean Terminal at Sunny Point has a depth of 34 feet at the berths.
- Dredging records show that the deeper the channel the more dredging is required to maintain the authorized channel depth and width. A deeper channel must be longer at the ocean bar.
- The ocean bar and the inner ocean bar are especially prone to sedimentation
- The USACE estimates that \$30 million is needed for channel dredging in FY12; only about 40% of this funding will be made available, resulting in draft restrictions and shipper inefficiencies

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Exhibit 8 Chart of Ocean Bar



Published at Washington, D.C.  
 U.S. DEPARTMENT OF COMMERCE  
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
 NATIONAL OCEAN SERVICE  
 COAST GUARD



Cape Fear River  
 SOUNDINGS IN FEET - SCALE 1:40,000

Chart Name:  
 Chart ID:  
 Top Left:  
 Bottom Right:

CAPE FEAR RIVER - CAPE FEAR TO WILMINGTON  
 11537 1  
 33° 56' 4" N 78° 6' 58" W  
 33° 43' 31" N 77° 55' 4" W

© MAPTECH, INC.

***Building , operating and maintaining a port and navigation channel in a man-made (artificial) harbor can be very expensive and is often impractical.***

- Deep water for vessel access is expensive to build and to maintain
- Artificially deep channels become sediment collection sinks
- Generally the natural environment is adversely impacted when an artificially deep navigation channel is constructed through shallow water areas
- Techniques to manage and control of sedimentation along miles of deep water navigation channel through dynamic shoal areas appear to have not been developed
- The Cape Fear River inlet is a sensitive area and the sediment dredged must remain within the local sediment system in order to achieve highest practical physical and environmental stability

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Exhibit 9 Photo of West Beach

*Dredge Operating off of Bald Head Island*



*Important lessons can be learned from the recent Wilmington Harbor navigation channel expansion and re-alignment project.*

- Sedimentation rates are greater than predicted at start of project
- Dredging costs are higher than projected on a unit cost basis.
- The channel is not maintained at Federally authorized limits because of rapid sedimentation
- Shippers are often delayed to wait for high tide, to wait for other ships to clear the generally one-way traffic pattern in the channel as full width passing zones are not available; the authorized channel depth is designed to accommodate ships of up to 38-foot draft but only drafts of up to 36 feet can be handled on an unrestricted basis with deeper draft ships allowed through the channel only on high tides.
- It is likely that expensive structural changes (jetties) are necessary to help control sedimentation
- Pilots and shippers take increasing safety risks as channel sedimentation increases

### *More important lessons to be learned*

- Certain channel segments are currently below USACE-assigned “minimums” of at least 500 feet wide at depths of at least 42 feet; the channel off of Bald Head Island is only 350 feet wide at 42 feet or greater depth in some locations
- Federal funding is not made fully available to support planned channel maintenance cycles developed by the USACE
- Erosion rates on beaches and near-shore shoals near the channel have increased since the 42-foot channel was constructed and private and public property has been lost or damaged
- The USACE recognizes certain areas of channel improvement potential in their completed Section 905(b) Analysis of Wilmington Harbor Improvements including sedimentation and erosion problems, difficulties navigating the severe channel turns, and the inadequacy of the planned turning basin
- The dynamic nature is not fully understood and no long-term projections of how inlet instabilities will impact channel costs, the neighboring barrier islands, or the local and extended environment

***Recent examination of potential for accommodating larger vessels suggests the limits of the River have been reached.***

- The channel turn at Battery Island does not conform to Corps of Engineers engineering standards for Panamax vessels and has proven difficult to navigate.
- Moffatt & Nichol determined with a simulation study that “the existing channel alignment at the Battery Island Reach is not satisfactory to safely transit an 8000 TEU vessel.” An earlier study by CH2M Hill, Inc., also concluded that a channel conforming to the engineering standards cannot be fit within the banks of the river.
- The anchorage and turning basin at Wilmington is 1200 feet wide and occupies the entire width of the river. The Moffatt & Nichol study shows that this is below the desired width for Panamax vessels now using the port and below the minimum acceptable width for larger vessels.
- Persistent shoaling of the anchorage and turning basin results in draft limitations for calling vessels.
- The Castle Hayne aquifer has been penetrated at one point and deeper dredging would put the Brunswick County water supply at risk.

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Exhibit 12a Chart of Channel Turn

Exhibit 12b Chart of Channel Turn Showing Recommended Radius

Exhibit 12c Chart of Turning Basin

Exhibit 12d Moffatt & Nichol Table of Recommended Width

Exhibit 12e Turning Basin Condition Survey

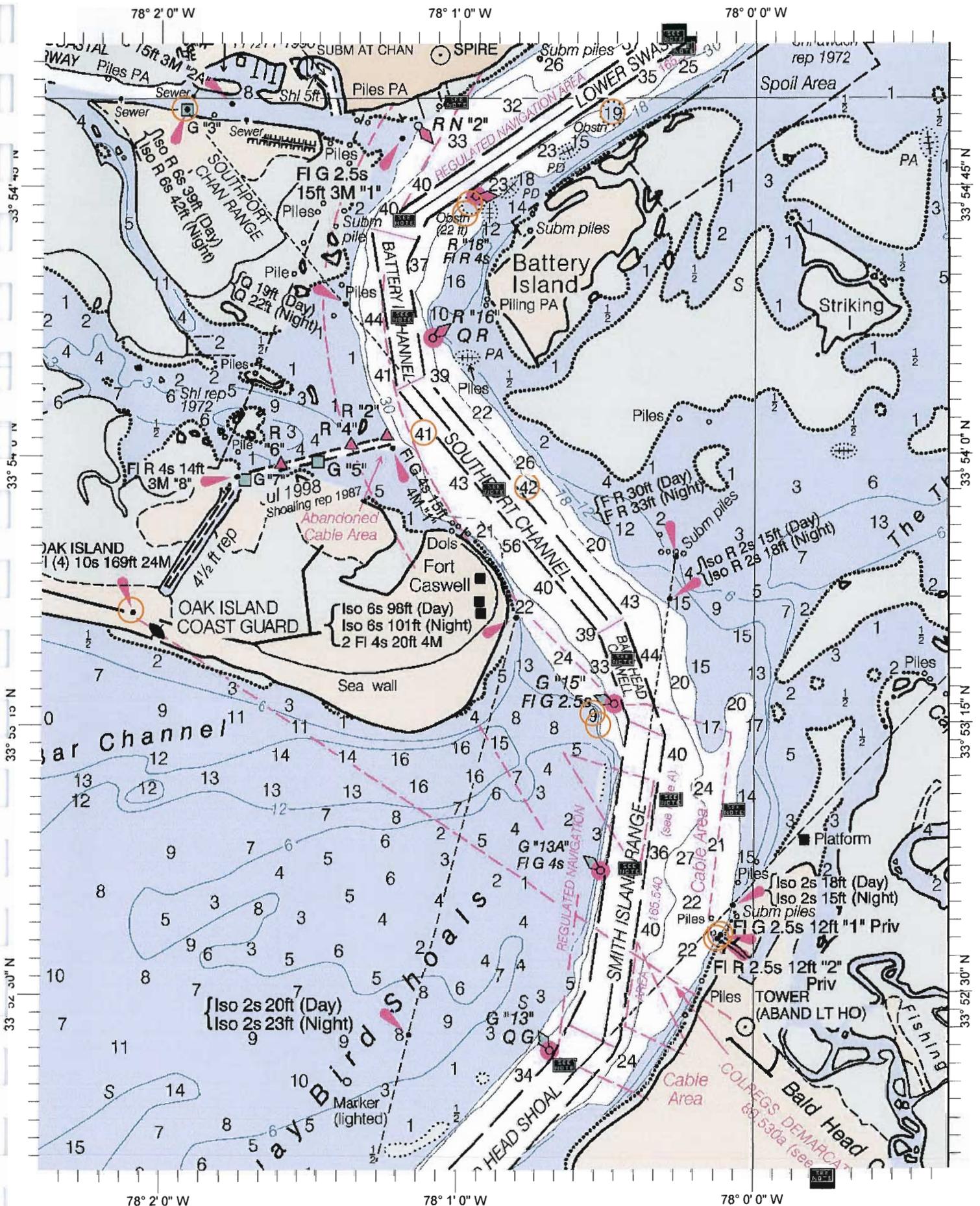


Chart Name: CAPE FEAR RIVER - CAPE FEAR TO WILMINGTON  
 Chart ID: 11537\_1  
 Top Left: 33° 55' 8" N 78° 2' 23" W  
 Bottom Right: 33° 52' 0" N 77° 59' 20" W

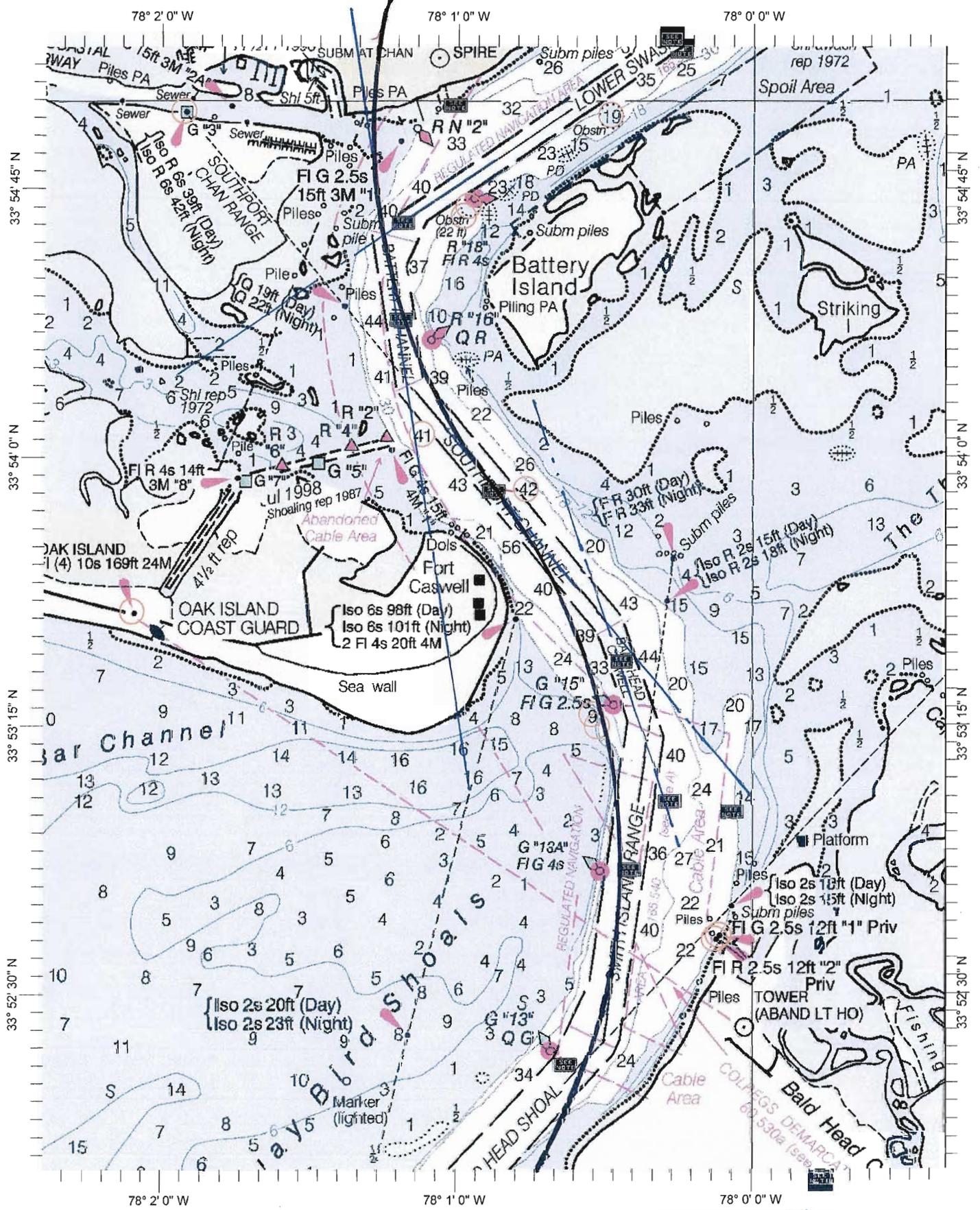


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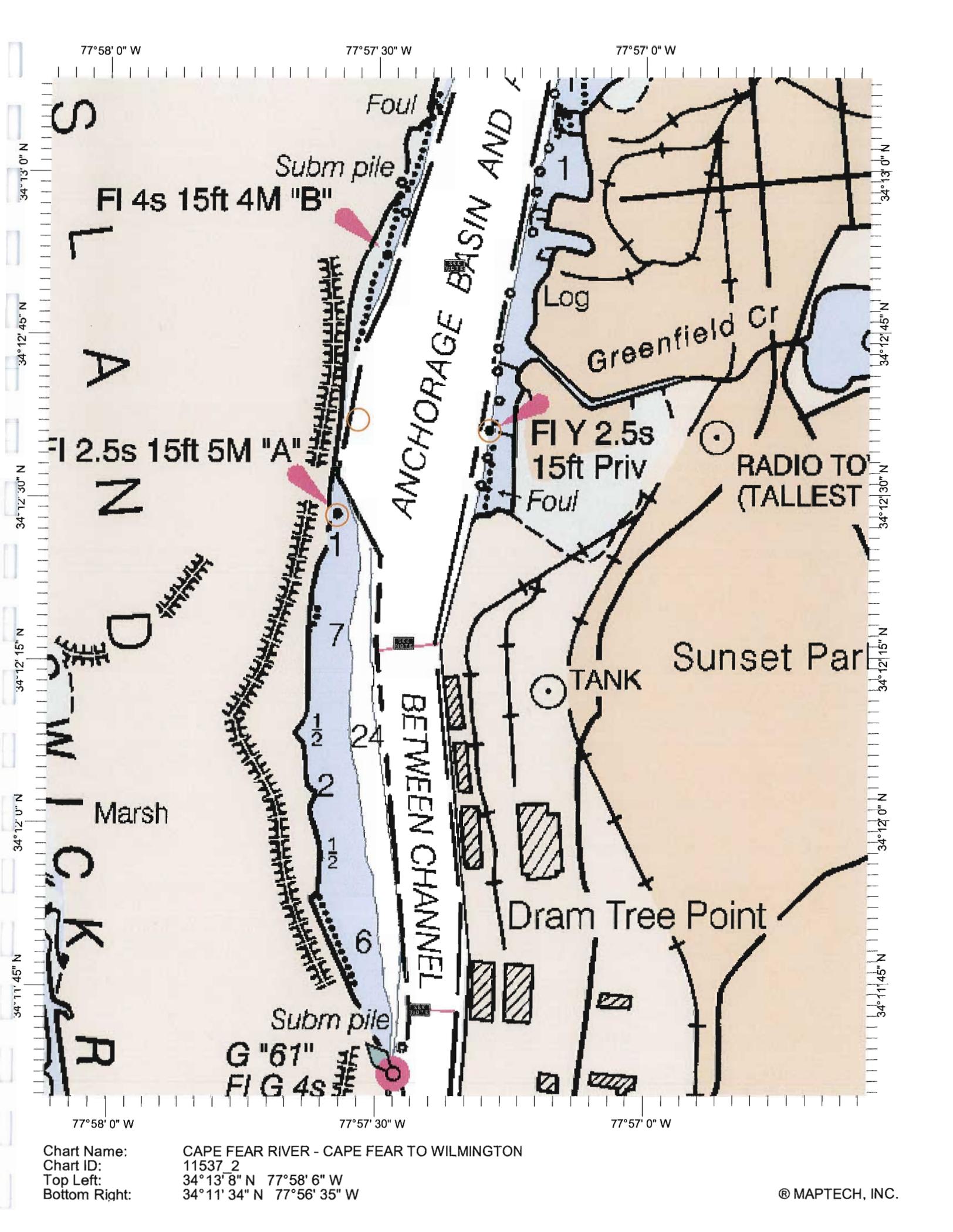


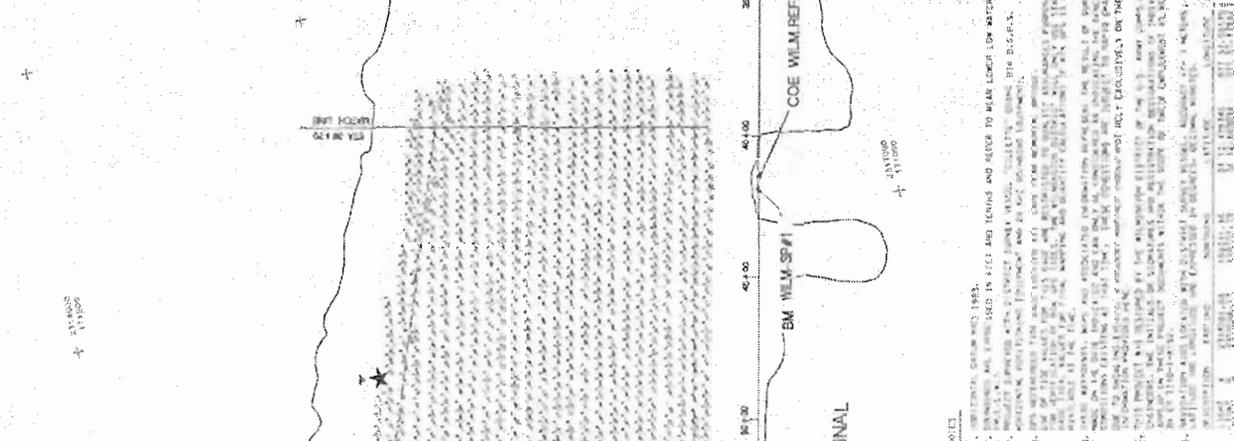
Chart Name: CAPE FEAR RIVER - CAPE FEAR TO WILMINGTON  
 Chart ID: 11537\_2  
 Top Left: 34°13'8" N 77°58'6" W  
 Bottom Right: 34°11'34" N 77°56'35" W

**Table 4.12: Comparison of Turning Basin Requirements per Container Ship Size Calling at POW**

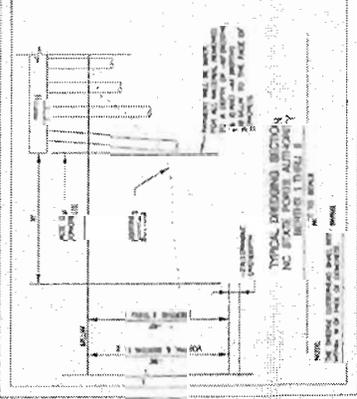
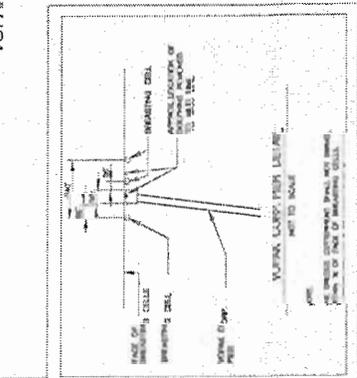
	Vessel Length	Acceptable Turning Basin	Desired Turning Basin
Current largest ship	965ft	1,200ft	1,500ft
6,000 TEU ship	1,044ft	1,300ft	1,570ft
8,000 TEU ship	1,214ft	1,520ft	1,820ft

Source: Moffatt & Nichol

CONDITION SURVEY



NOTES:  
 1. SURVEYED UNDER THE 1983 ACT.  
 2. ALL POINTS WERE USED IN 1951 AND 1952 AND WERE USED TO MARK LOW WATER.  
 3. SURVEY POINTS WERE CHECKED BY THE U.S. NAVY ENGINEERING DISTRICT, WASHINGTON FIELD OFFICE, IN 1951 AND 1952.  
 4. THE SURVEY WAS MADE BY THE U.S. NAVY ENGINEERING DISTRICT, WASHINGTON FIELD OFFICE, IN 1951 AND 1952.  
 5. THIS PROJECT WAS DESIGNED BY THE WASHINGTON DISTRICT OF THE U.S. NAVY ENGINEERING DISTRICT, WASHINGTON FIELD OFFICE, IN 1951 AND 1952.  
 6. THE SURVEY WAS MADE BY THE U.S. NAVY ENGINEERING DISTRICT, WASHINGTON FIELD OFFICE, IN 1951 AND 1952.  
 7. THE SURVEY WAS MADE BY THE U.S. NAVY ENGINEERING DISTRICT, WASHINGTON FIELD OFFICE, IN 1951 AND 1952.  
 8. THE SURVEY WAS MADE BY THE U.S. NAVY ENGINEERING DISTRICT, WASHINGTON FIELD OFFICE, IN 1951 AND 1952.



*Does it make sense to build a deep water port on a shallow river located miles from deep ocean water in an area that has little appropriate support infrastructure for anything other than its tourism, recreation and retirement oriented economy?*

- The main Federal maritime interest in the area appears to be the Military Ocean Terminal at Sunny Point which now is limited to 30-foot draft vessels.
- Nearby ports on good natural harbors (Chesapeake Bay and Charleston) have proven economic capability to all destinations beyond eastern and central North Carolina; development of these Ports for deep water will cost less in every regard than a deep water facility along the Cape Fear River.
- If the economic benefit is primarily for North Carolina, will the required State contribution to project cost be increased as suggested in the President's proposed FY2012 USACE budget?
- Increasing depths beyond 45 feet invokes different state/Federal cost-sharing formulae: the State would pay 60% of construction cost and 50% of maintenance. At lesser depths the State pays 35% of construction cost and does not pay anything for maintenance.

## **Recommendations and Considerations for Analytic Procedures**

- The lessons of cargo movements, costs and revenues at existing facilities should be considered carefully. State Ports enjoy parity of depth with other ports in the current Panamax era and offer lower rates and tax credits, yet handle only about 20% of North Carolina's international trade.
- The distances between the State Ports and the markets developed in the Moffatt & Nichol least-cost path analysis do not fully explain the distribution of cargo movements through State Ports.
- Larger ports offer more frequent service to more destinations and more backhaul opportunities. This results in a natural attraction of additional cargo movements, even if the cost is slightly higher.
- Shippers and railroads will not make additional investment to move traffic they already enjoy to another port.
- Wilmington Harbor has several facilities other than the State Port, which account for a substantial amount of vessel and cargo movements. For some purposes such movements should be included in the analysis; for others not.
- North Carolina is not an island. The analysis must include all transportation facilities used by North Carolina importers and exporters, without regard to location within or without the State. That is the analysis that would be made by businesses in choosing routes and facilities. Additional facilities and improvements within the State must always be evaluated in the multi-state context.

- The full costs of building, operating and maintaining ports and their related infrastructure, including channel dredging, must be considered.
- Ports should be treated as means to an end, like roads and railroads. Ports do not return profits to the State directly, and capital costs must be subsidized. Unless it can be demonstrated that the State would benefit from cargo movements not originating in or destined for North Carolina locations, such movements should be disregarded. It is possible, however, that additional traffic from out-of-state sources can be used to share fixed costs.
- Geography is a formidable obstacle.
- Cost-benefit analysis of transportation alternatives will be a great step forward for North Carolina. The process and application should be explained in detail as a primer for future studies of this type.
- Contemporary means of quantifying environmental effects should be included in the cost-benefit analysis. Ports and related infrastructure have an environmental cost.

Chart: 11520    Edition: 44    Edition Date: October 2010    Clear Dates: NM - 6/11/2011    LNM - 5/31/2011

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