



**U.S. Army Corps of Engineers
Wilmington District**

**SECTION 905(b) ANALYSIS
WILMINGTON HARBOR NAVIGATION
IMPROVEMENTS**

**NEW HANOVER AND BRUNSWICK COUNTIES,
NORTH CAROLINA**

APRIL 2011

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1. STUDY AUTHORITY

a. The study of Wilmington Harbor improvements is being conducted in response to the Resolution of the Committee on Transportation and Infrastructure, Docket 2755, dated June 28, 2006, which reads as follows:

Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, that the Secretary of the Army is requested to review the report of the Chief of Engineers on Cape Fear – Northeast (Cape Fear) River, published as House Document 164, 105th Congress, and other pertinent reports to determine whether any modifications of the recommendations contained therein are advisable in the interest of navigation improvements and associated water resource development opportunities for Wilmington Harbor, North Carolina.

b. Funds in the amount of \$96,000 were appropriated in Fiscal Year 2009 and \$93,000 in FY 2010 to conduct the Reconnaissance phase of the study.

2. STUDY PURPOSE & PROCESS

The purpose of this Reconnaissance Study 905(b) Analysis is to determine whether there is a Federal Interest in participating in a cost shared Feasibility Study to investigate modification of the existing Wilmington Harbor project in the interest of navigation improvements and water resource development opportunities. The 905(b) Analysis is the first activity in the overall reconnaissance phase and is generally 6-12 months in duration. Upon completion, the 905(b) is submitted to the Corps of Engineers (Corps) South Atlantic Division Headquarters (Atlanta, Georgia) for review and certification for policy compliance. This certification is required to be accomplished prior to completion of the next activity in the Reconnaissance phase, Project Management Plan (PMP) development.

The purpose of the PMP is to identify activities in the study process and provide the basis for identifying the tasks needed to be performed during the feasibility study. PMP development will also identify the responsible parties for tasks identified and will provide estimates of the total feasibility study cost and non-Federal study sponsor's share. The PMP will be coordinated between the Corps and the non-Federal sponsor to ensure the work required for the feasibility phase is carefully developed and considered. The reconnaissance study phase ends and the feasibility phase begins when a Feasibility Cost Sharing Agreement (FCSA) is executed between the Corps and non-Federal sponsor.

In response to the study authority, the Reconnaissance Study 905(b) Analysis was initiated in June 2009. This Analysis has resulted in the finding that there is a Federal interest in continuing the study into the Feasibility phase. The 905(b) Analysis documents the basis for this finding and establishes the scope of the Feasibility phase. As such, this 905(b) Analysis will be included as part of the Project Management Plan.

3. LOCATION OF STUDY, NON-FEDERAL SPONSOR, AND CONGRESSIONAL DISTRICTS

a. Study Area

The study area is located in Brunswick and New Hanover Counties, North Carolina as shown in *Figure 1*. Brunswick County, as of 2008, had a population of 103,160, and a land area of 855 square miles. New Hanover County, as of 2008, had a population of 192,538, and a land area

of 199 square miles. The Port of Wilmington is a major contributor to the economic activity of both counties, moving \$6.4 billion in goods in 2010, and providing \$500 million in sales, property, corporate and personal taxes (¹Ref. 1). Commodities include bulk cargo and containers, with imports and exports both well-represented.

b. Project Sponsors

Potential non-Federal sponsor for the Feasibility phase of the study is the State of North Carolina.

c. Congressional District

The study area lies within the jurisdiction of the North Carolina Congressional District 7 – Representative Mike McIntyre. The State of North Carolina’s United States Senators are Senator Kay Hagan and Senator Richard Burr.

¹ “Economic Contribution of the North Carolina Ports”; North Carolina State University Institute for Transportation Research and Education; February 2011.

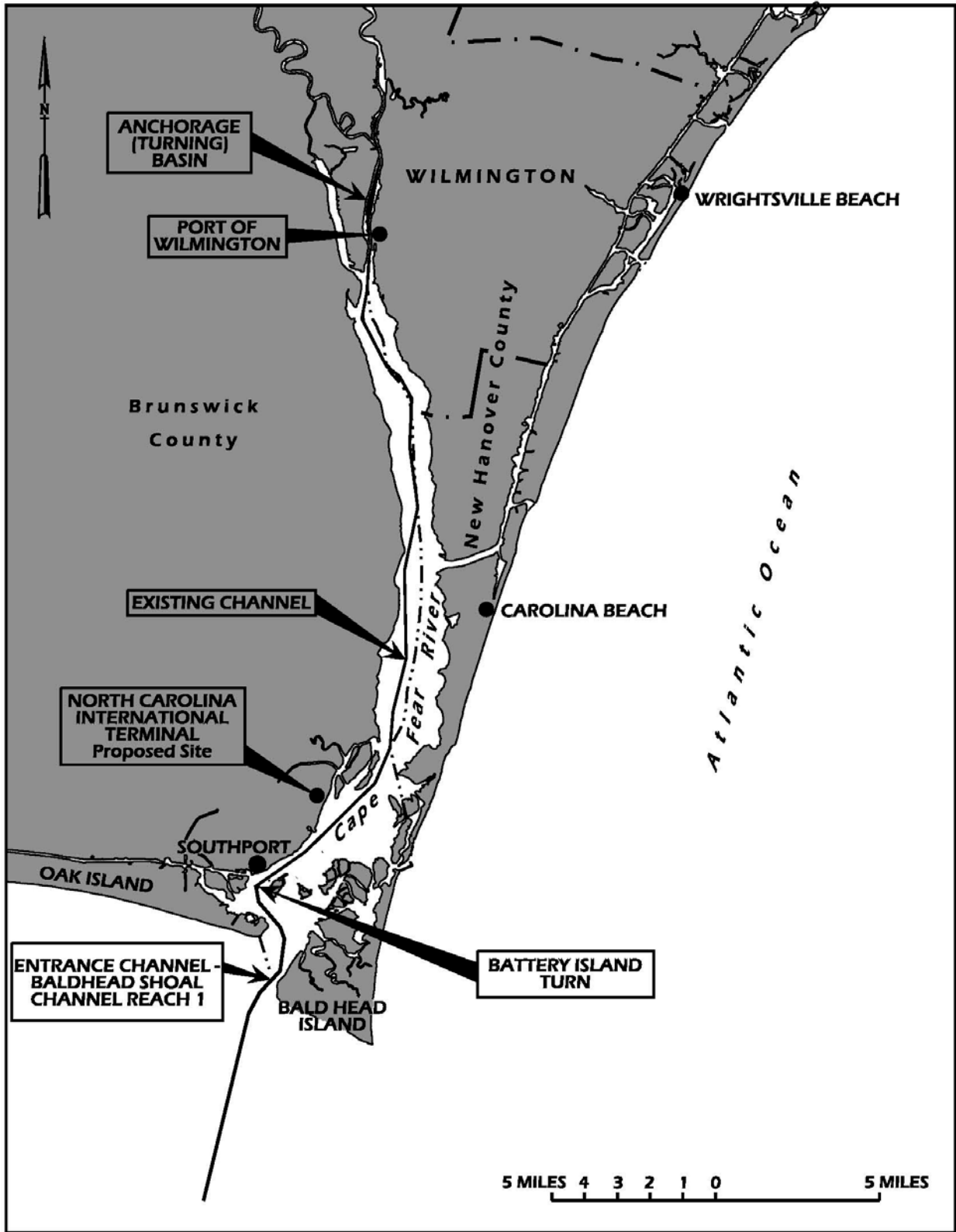


Figure 1. Reconnaissance Study Area

4. EXISTING PROJECT, PRIOR REPORTS, AND STUDIES

4.1 EXISTING PROJECT

Wilmington Harbor is a Federal navigation project located along the Cape Fear and Northeast Cape Fear Rivers in southeastern North Carolina. The project extends from the Atlantic Ocean to approximately 5.3 miles upstream of the Port of Wilmington. Continuous maintenance of the harbor began in 1870 and harbor dimensions have been increased incrementally for over 100 years.

Figure 2 on page 6, summarizes the existing project features, and the following narrative provides more details. Features constructed to date include deepening the ocean bar and entrance channels to the authorized depth of 44 feet; deepening the project to 42 feet up from Lower Swash Channel to and including the Between Channel; widening the existing 400-foot wide channel to 600 feet over a total length of 6.2 miles including Lower and Upper Midnight and Lower Lilliput channels ; widening five turns and bends by 100 to 200 feet providing a total average channel width of 500 to 675 feet; widening the Fourth East Jetty Channel to 500 feet over a total length of 1.5 miles; and deepening most of the anchorage basin.

Features yet to be completed (*Figure 2*) due to a lack of funding include deepening the remaining anchorage basin immediately upriver from the State Ports Authority dock from 38 feet to 42 feet, deepening the 32-foot channel between the Cape Fear memorial Bridge and the Hilton Railroad Bridge to 38 feet, deepening the 32-foot turning basin just above the mouth of the Northeast Cape Fear River on the west side to 38 feet, deepening the 25-foot channel from the Hilton Railroad Bridge to 750 feet upstream to a depth of 38 feet, and deepening the 25-foot channel from 750 feet upstream of the Hilton Railroad Bridge to the turning basin near the upstream limits of the project to 34 feet. Also the 34 foot channel is authorized to be widened from 200 to 250 feet and the turning basin is authorized to be widened from 700 to 800 feet and deepened to 34 feet. Improvement to the Eagle Island dredged material disposal facility is underway by incrementally raising the dikes of three cells on Eagle Island dredged material disposal facility. Mitigation requirements for the deepening work are partially complete with the acquisition of, by fee title, 30 acres of upland areas and construction of an embayment. Yet to be completed is the acquisition of about 800 acres of existing marsh and upland areas for preservation of habitat to offset losses of wetlands and primary nursery areas. This acquisition is underway, should be complete in FY 2011, and is the responsibility of the non-federal sponsor (State of North Carolina). Fish passage at Lock and Dam #1 is being constructed in accordance with a condition of the Biological Opinion addressing potential impacts to endangered species from blasting associated with deepening of the harbor. Construction is scheduled to begin in June 2011.

4.2 PRIOR REPORTS AND STUDIES

Numerous reports have been prepared for the Wilmington Harbor since it was authorized, however the reports discussed below comprise only a partial list. The following reports were found to be of particular significance as they are the major study documents related to modification of the navigation project.

Wilmington Harbor, Northeast Cape Fear River, General Design Memorandum, Wilmington, District, April 1990. Improvements recommended in this design memorandum were authorized by the Water Resources Development Act of 1986 (P.L. 99-662). The General Design Memorandum recommended widening the Fourth East Jetty Channel on the Cape Fear River from its existing width of 400 feet to 500 feet, and deepening a portion of the project on the Northeast Cape Fear River from its existing depths of 32 and 25 feet to 38 feet.

Wilmington Harbor Ocean Bar – General Design Memorandum, Supplement and Environmental Assessment, Wilmington District, September 1993. This report recommended removal of rock in the Wilmington Harbor Ocean Bar (Baldhead Shoal) Channel. The authorized, 40-foot depth was not achieved at the time of project construction (1973).

Final Feasibility Report and Environmental Impact Statement on Improvement of Navigation, Cape Fear – Northeast Cape Fear Rivers Comprehensive Study, Wilmington, North Carolina, June 1996. This report was prepared in final response to a resolution adopted 8 September 1988 by the United States House of Representatives, which directed that the existing Federal project for Wilmington Harbor be reviewed and improvements considered.

Environmental Assessment, Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, February 2000. This EA addressed preconstruction modifications to harbor improvements including Ocean Bar Channel realignment, beach placement of dredged sand, rock blasting without air curtains, and a comprehensive dredging and disposal plan.

Wilmington Harbor Section 216 Initial Appraisal U.S. Army Corps of Engineers, Wilmington District. Since initiation of this 905(b) analysis, an Initial Appraisal has been completed in accordance with Section 216 of the Rivers and Harbors and Flood Control Act of 1970. This Act authorizes investigations for modification of completed projects or their operation when found advisable due to significantly changed physical or economic conditions and for improving the quality of the environment in the overall public interest. The initial appraisal addressed issues related to navigation safety and traffic delays caused by existing channel alignments, and relocating of the existing channel adjacent to Bald Head Island and concluded that there is Federal interest to warrant studying potential solutions during a reconnaissance study effort. The initial appraisal was approved by South Atlantic Division on July 30, 2010.

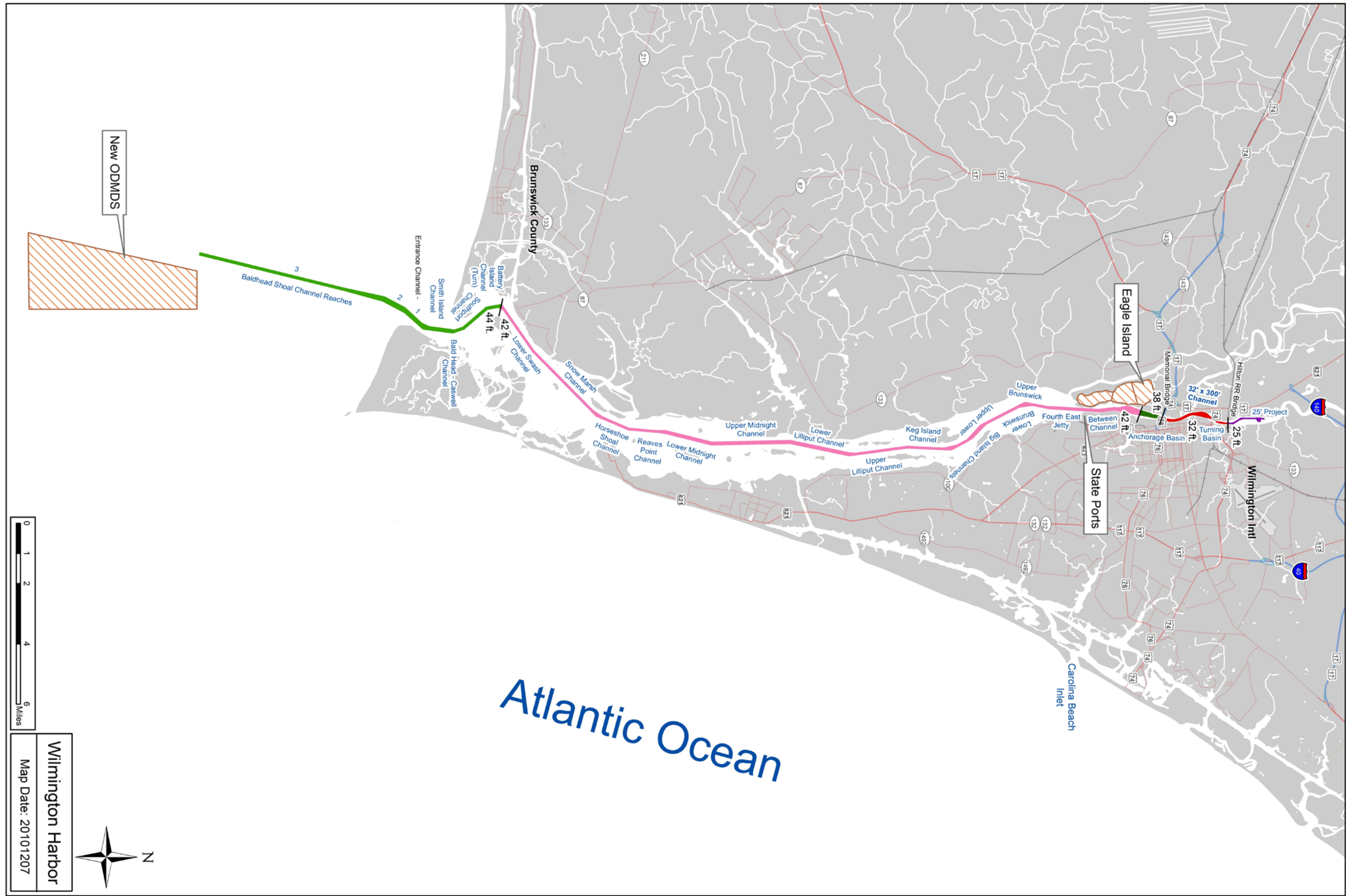


Figure 2. Wilmington Harbor Existing Depths and Features

4.3 NON-FEDERAL INTEREST

The State of North Carolina has three areas of concern regarding navigation limitations of the existing improved channel: the Wilmington Harbor Entrance Channel- Baldhead Shoal Channel Reach 1 (#1 on Figure 2); Battery Island turn (#2 on Figure 2); and Anchorage (Turning) Basin (#3 on Figure 2). The State is cognizant that many features of the existing authorized project are not complete. They support additional studies to improve the efficiency of those areas already completed, and to correct issues related to the existing navigation project.

In addition, as part of future planning, the North Carolina State Port Authority (NCSPA) purchased lands (known as the proposed “North Carolina International Terminal”) located adjacent to the Cape Fear River, between river mile 6 and 7 of the Wilmington Harbor Navigation Channel, to be considered for possible future port expansion. The 600-acre site was proposed to be developed as a marine terminal to handle container traffic in several phases. The NCSPA developed preliminary plans to show that growth in container traffic could potentially be served by a new, state-of-the-art facility with associated inland transportation and harbor improvements. The project was being considered in order to serve post-Panamax container vessels, which are larger than those currently serving the existing port. This project is currently on hold and the NCSPA has indicated that they do not wish to conduct additional channel deepening studies at this time.

5. PLAN FORMULATION

As part of any Corps study, the six planning steps set forth in the Water Resource Council's Principles and Guidelines are undertaken to focus the planning effort and to eventually select and recommend a plan for authorization, if needed. These six planning steps are: 1) specify problems and opportunities, 2) inventory and forecast conditions, 3) formulate alternative plans, 4) evaluate effects of alternative plans, 5) compare alternative plans, and 6) select the recommended plan. The iterations of the planning steps typically differ in the emphasis that is placed on each of the steps. As part of the reconnaissance phase, the step of specifying problems and opportunities is emphasized. That is not to say, however, that the other steps are ignored because the initial consideration of preliminary plans that results from the other steps is very important to the scoping of the subsequent Feasibility phase studies.

For the purposes of this reconnaissance phase study, the scope of investigations is focused on the analysis of potential net economic benefits and potential environmental effects associated with modification of the existing Federal (Corps) navigation channel. The analysis was limited to existing data.

5.1 PROBLEMS AND OPPORTUNITIES

Through the study authorization, the Secretary of the Army was requested to review existing reports to determine if any harbor navigation improvements are advisable and if any associated water resource development opportunities are present. This section describes this information in the context of problems and opportunities that can be addressed through water and related land resource management. Problems and opportunities statements will be framed in terms of the Federal objective and the specific study planning objectives. Problems and opportunities are defined in a manner that does not preclude the consideration of all potential alternatives to solve the problems and achieve the opportunities.

5.1.1 Problem Identification

Existing Navigation Problems

Turns and bends within the navigation channel have been an area of concern to vessel pilots in the Wilmington Harbor since the 38-foot project was completed in 1972. The advent of containerization shortly thereafter led to the introduction of longer and wider vessels. In response to this shift in industry standards, a channel widening study was prepared in 1994. Five turns and bends in the area between Southport and Wilmington were widened based on those study findings. Since the 1994 report, additional navigation problems have been identified.

- Shoaling on the east side of the navigation channel at Baldhead and the resultant reduced width is problematic to navigation under typical wind and tide conditions. This shoaling places vessels on the less advantageous side of the channel to navigate the bend within the Smith Island Channel reach. In order to avoid the shoaling in Baldhead Shoal Channel Reach 1, vessels are required to decrease speeds to navigate the S-shaped useable channel. The issues with this channel have been expressed by the North Carolina State Ports Authority by letter dated 5 October 2010. (Attachment 1). Vessels currently calling at the Port of Wilmington include one of 965 feet in length, and ranging from 4,600 to 4,800 TEU capacity, compared to vessels of 850 feet in length and approximately 3,800 TEU capacity, at the time of prior authorization. Current vessel restrictions are for a 38-foot “anytime” draft (State Port Pilots; COE communication – Feb 2011).
- The turn at Battery Island is problematic for certain container vessels under specific wind and tide conditions. Vessels currently calling on Wilmington Harbor, that are impacted by wind and tide at the Battery Island Turn include three vessels of 965 feet, 950 feet, and 980 feet in length, respectively, which commonly call on the Port.
- Vessels are being forced to delay their transit and await favorable tide conditions in order to serve the harbor. These delays are expensive and result in increased transportation costs. Certain vessels are also subject to draft restrictions as a result of this turn. Contributing factors, including ship handling characteristics and size, channel configuration, tide conditions, and inbound or outbound transit operation could influence safe maneuvering of these ships through the channel. Shipper concerns are documented by letter at Attachment 2.
- Current anchorage (turning) basin dimensions are not adequate to properly accommodate turning of some of the larger container vessels currently calling at the North Carolina State Ports Authority. Concerns regarding these turning basin dimensions have been expressed by the North Carolina States Ports Authority and the shipping industry. This is also documented in Attachment 2. Currently vessels are being turned on high tides, executing turning more slowly than normal, and engaging extra tug assistance to perform turning maneuvers.

Additionally, the North Carolina State Ports Authority has requested the Corps to study known challenges in the Baldhead Portion, Battery Island portion, as well as the current turning and anchorage basin at the Port of Wilmington Harbor (Attachment 1).

Potential Water Resource Development Problems

The existing authorized navigation project was designed in the early 1990’s to accommodate Panamax-class vessels. Under current conditions, Post-Panamax vessels serving the northern Europe and Suez Canal trade routes, that currently exceed the vessel class the channel was designed and constructed for in Wilmington Harbor, are now calling in increasing numbers on

the South Atlantic Coast, and it is not unreasonable to expect that there will be a desire to call at Wilmington Harbor in the future.

1. The current channel and turning basin cannot efficiently accommodate post-Panamax class vessels. These larger vessels allow for economies of scale and transportation cost savings and are a growing percentage of the world fleet.
2. Because export containers are generally heavier than imports, a shift in trades from imports to exports at Wilmington Harbor has caused container ships to sail out of the harbor at deeper drafts. As a result, the current 42-foot channel depth may not be able to continue to efficiently accommodate deeper ship drafts.

5.1.2 Opportunities

Navigation Opportunities

There is opportunity to increase the efficiency of operations in order to address future congestion, delays, and associated increased cost of commodity movement. Future delays are expected to be caused by inadequate channel dimensions. Through the modification of existing Wilmington Harbor channels, vessels will be able to call over a wider range of wind and tide conditions and larger vessels will have the opportunity to serve the port of Wilmington. In addition, if further study were to recommend modification based on increased vessels size and commodity movements, construction of non-Federal facilities may provide opportunity for increased efficiencies within the harbor.

Specifically, opportunities exist to improve efficiency of vessels transiting the Wilmington Harbor Entrance Channel, the Anchorage (Turning) Basin and the Battery Island Turn. Realignment and expansion options may improve the design performance of the channel and reduce both shoaling and potential shoreline impacts while improving navigation safety and efficiency. These may result in cost and time savings, potentially lowering project operations and maintenance costs, as well as potentially allowing for removal of draft restrictions for certain vessels.

Water Resource Development Opportunities

If economically justified and environmentally acceptable, there is opportunity to deepen the Wilmington Harbor navigation channel to accommodate larger container vessels. Particularly important are those vessels which will be accommodated by the Panama Canal Expansion Project expected to be complete in 2014. These larger vessels, commonly referred to in the shipping industry as the “post-Panamax” vessels are expected to comprise greater percentages of vessel fleet composition over the next several decades. Additional depth would be required to serve existing users of Wilmington Harbor (i.e. Yang Ming/Hanjin) by that time, as the transition from the current Panamax fleet is complete.²

5.2 NATIONAL OBJECTIVE

The Corps planning process is based on the Economic and Environmental Principles and Guidelines (P&G) promulgated in 1983. The P&G provide for development of reasonable plans that are responsive to National, State, and local concerns. Planning project benefits are quantified in this process as national economic development (NED) output, national ecosystem restoration (NER) output, or a combination of NED/NER output.

² Ralph, Bill. “Some thoughts on what the future holds for the Economy & our Ports,” South Atlantic & Caribbean Ports Association Meeting, 6 Nov 2009. <http://aapa.files.cms-plus.com/SeminarPresentations/2009Seminars/09Facilities/09FACENG_Ralph_Bill.pdf>

For water and land resources planning, the Federal objective is to contribute to NED while protecting the nation's environment and adhering to national environmental statutes, executive orders, and Federal planning requirements. NED contributions are increases in the net value of the national output of goods and services, expressed in monetary units. These NED outputs are the direct net benefits that accrue in the planning area and the rest of the nation. Contributions to NED may include increases in the net value of marketed and non-marketed goods and services.

The NED analysis will not be performed as part of this Reconnaissance Study but will be evaluated and a NED plan selected during the Feasibility Phase of the Study.

5.3 PLANNING OBJECTIVE AND CONSTRAINTS

The study objective and constraints listed below were developed for the Wilmington Harbor Navigation Improvements 905(b) Analysis to comply with the study authority and to respond to study area problems and opportunities.

905(b) Analysis Objective:

Determine if there is a Federal interest in conducting a Feasibility Study for:

- Improving the efficiency of Wilmington Harbor navigation channel, without increasing safety risks, in order to increase NED benefits.
- Increasing water resource development opportunities for Wilmington Harbor.

Further, the 905(b) Analysis should attempt to demonstrate the economic viability of at least one feasible alternative to solve at least one existing problem at Wilmington Harbor.

Unlike planning objectives that represent desired positive changes, planning constraints represent restrictions that should not be violated. The planning constraints will be reexamined and finalized in the feasibility phase. The planning constraints identified in this preliminary analysis are as follows:

- a. Compliance with applicable executive orders, statutes, and regulations including but not limited to:
 - Archaeological and Historic Preservation Act,
 - Archaeological Resources Protection Act,
 - Clean Air Act,
 - Clean Water Act,
 - Coastal Barrier Resources Act,
 - Coastal Zone Management Act,
 - Magnuson-Stevens Fishery Conservation and Management Act,
 - Marine Protection, Research and Sanctuaries Act
 - Endangered Species Act, and
 - National Environmental Policy Act

- b. Project must be economically justified with expected benefits over a 50-year period of analysis.

5.4 PLANNING CRITERIA

The following are preliminary criteria for evaluating potential project alternatives. These criteria would be finalized in the feasibility report.

- a. The modification to the existing Federal navigation project must be economically justified with expected benefits exceeding expected costs over a 50-year period of analysis.
- b. The evaluated potential alternatives will provide a long-term solution that is technically feasible and environmentally sound.

5.5 POTENTIAL ALTERNATIVES

The following alternatives analysis is performed at the reconnaissance level, and therefore does not constitute a complete analysis of the full array of potential alternatives nor does it define a preferred alternative or NED plan. Detailed analyses would be conducted in the feasibility phase and would involve evaluation of all reasonable alternatives to address the problems and opportunities. Such alternatives would include, but would not be limited to, analysis of alternative channel alignments, turning basin needs, upgrading existing facilities, structural and non-structural measures and channel depths. Feasibility level studies allow for an in-depth understanding of environmental, economic, and technical considerations allowing for a thorough analysis and documentation of tradeoffs between project alternatives. In contrast, this limited analysis during the reconnaissance phase requires the development of reasoned assumptions and best professional judgment to support the analysis of federal interest in further study.

This 905(b) Analysis addresses the identified navigation problems, as well as navigation and water resource development opportunities (section 5.1). For the purpose of this Reconnaissance Study, three alternatives were analyzed. The *Navigation Improvements (Minor Modifications)* alternative addresses the existing navigation problems and does not address opportunities to fully accommodate post-Panamax vessels. The *NCIT Channel* alternative addresses both the existing navigation problems as well as additional water resource development opportunities, such as accommodation of post- Panamax vessels. The *No Action* alternative looked at the existing navigation channel remaining at its current authorized depth, dimension and location.

5.5.1 Navigation Improvements (Minor Modifications)

For the purpose of this 905(b) report, the following three components have been combined to meet the study objective. These components together address the existing navigation problems; they do not take full advantage of opportunities for additional water resource development.

The minor improvements proposed for Wilmington Harbor would allow longer and wider vessels to call compared to the current Panamax design vessel (limited by existing Panama Canal locks to less than 965 feet). But without additional deepening, the longer and wider vessels would be limited to an estimated 38-foot draft at any tide and about 42-feet using high tide for underkeel clearance.

The potential alignments illustrated in *Figures 3, 4, and 5*, have been coordinated with the Wilmington Cape Fear Pilots Association which has indicated its support for the study of these minor modifications. More detailed analysis would be needed to determine what alternatives would be most technically and economically feasible, but were not possible at this reconnaissance level of detail.

Anchorage (Turning) Basin Expansion

Figure 3 provides an illustration of a potential turning basin expansion. The existing width of the turning basin is not adequate for the larger container vessels, which currently include vessels of 950 feet and 965 feet in length, approximately 100 feet longer than the design vessel accommodated in the 1996 project modifications, and would not allow post-Panamax vessels to

call in the future. A potential alternative measure shown in *Figure 3* could increase the dimensions of the turning basin from the existing 950-foot length x 1,200-foot width to a 1,450-foot length x 1,450-foot width. This measure would shift the turning area upstream. The turning area could be centered between the Chevron Terminal and the Hess Terminal to avoid the terminal berth areas. The slight upstream shift of the turning area would also allow for widening that avoids the Eagle Island Disposal Area dikes. This would allow a greater safety clearance for existing Panamax vessels and allow longer vessels to call the NCSPA terminal. This measure might not be sufficient to accommodate all post-Panamax vessels, however.

Any expansion into this area would require mitigation (see section 5.8.1).



Figure 3. Anchorage (Turning) Basin Expansion

Battery Island Turn

The Battery Island turn is problematic for three container vessels currently calling on the Port of Wilmington, under specific conditions of wind and tide. Vessels are being forced to delay their transit and await favorable tide conditions in order to serve the harbor. Current operational practice by the port's pilots restricts vessel transits through the Battery Island Turn to a three to four hour window each day (Pilot Notice; February 2011). These delays are expensive and result in increased transportation costs. These same three vessels, which call frequently at the Port, are also being subject to draft restrictions as a result of this turn. Contributing factors influencing maneuvering of these ships through the channel include the ship handling characteristics and size, channel configuration, tide conditions, and inbound or outbound transit operation. The handling characteristics of certain companies' container ships are less responsive than other container ships of the same class. Turning these ships is challenging due

to the dimensions of the turn and the adjacent channels. Battery Island Channel is 2,589 feet long with a 30 degree, 36 minute turn angle at the southern end and a 65 degree, 3 minute turn angle at the northern end. Given the dimensions of the channel and a combined north and south turning maneuver of 95 degree, 39 minute, safely navigating these ships through the Battery Island Channel, and the turns at either end, is an extremely complex maneuver. Strong ebb and flood tidal currents significantly affect ship maneuverability. The most difficult transit of the Battery Island Channel occurs when a ship is inbound with a maximum ebb tide current. These issues have resulted in vessel delays of several hours each transit (Port of Wilmington pilots; COE communication, February 2011) and issues of vessel safety in serving the Port of Wilmington.

Realigning or widening the Battery Island Portion has the potential to improve navigation safety and efficiency and reduce vessel delays, which currently average three to four hours per transit, for three vessels that commonly call on the Port. One possible alternative for improving the Battery Island Turn is shown in *Figure 4*.

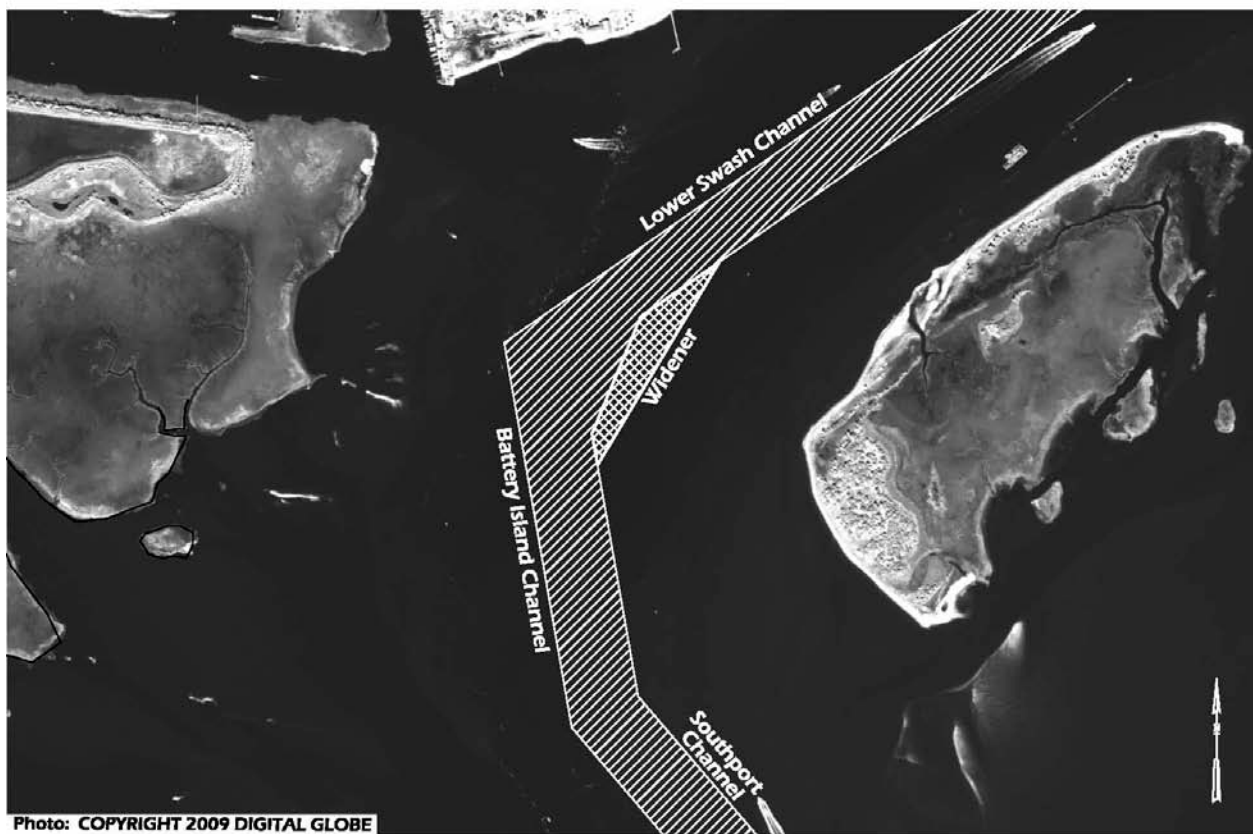


Figure 4. Battery Island Turn

Wilmington Harbor Entrance Channel-Baldhead Shoal Channel

Certain reaches of the Wilmington Harbor entrance channel were relocated as part of a 1997 Value Engineering Study (discussed below). This entrance channel is located in close proximity to the Bald Head Island shoreline and its location has resulted in allegations of shoreline impact from Baldhead interests. The current alignment has proven susceptible to rapid and persistent

shoaling theoretically attributable to a combination of natural forces and impacts from adjacent, private beach renourishment projects, and Federal shoreline disposal projects.

Increasing the distance from the channel edge of the Baldhead Shoal portion of the study area to the island may potentially allow for reduced future maintenance costs, improved overall reliability and increased full channel availability. Shoaling on the Bald Head Island side of the channel and the resultant reduced width (currently estimated at 350 feet, versus the authorized width of 450 feet; COE communication; March 2011) places vessels on the less advantageous side of the channel to safely navigate the bend with Smith Island Channel. Avoidance of the shoaling in Baldhead Shoal Channel Reach 1 combined with typical wind and tide conditions requires decreased vessel speeds under most conditions. Realignment options that could be investigated may improve the design performance of the channel and reduce both shoaling and potential shoreline impacts, while improving navigation efficiency.

Relocation of the channel as it relates to facilitation of navigation was considered by the study team. Generally, straighter alignments are more conducive to navigation than alignments with turns. Many potential alternative alignments to achieve this were given cursory consideration. *Figure 5* below provides an illustration of a potential alternative channel alignment of the Baldhead Shoal portion of the study area, which would provide for a straighter channel alignment thereby facilitating navigation. This alignment also moves the channels further away from adjacent beaches, which may also reduce shoaling, decrease navigation maintenance costs, and reduce project costs. *Figure 5* below is a conceptual illustration only and is not exhaustive in terms of potential alternatives that could facilitate navigation in the channel reaches under consideration.

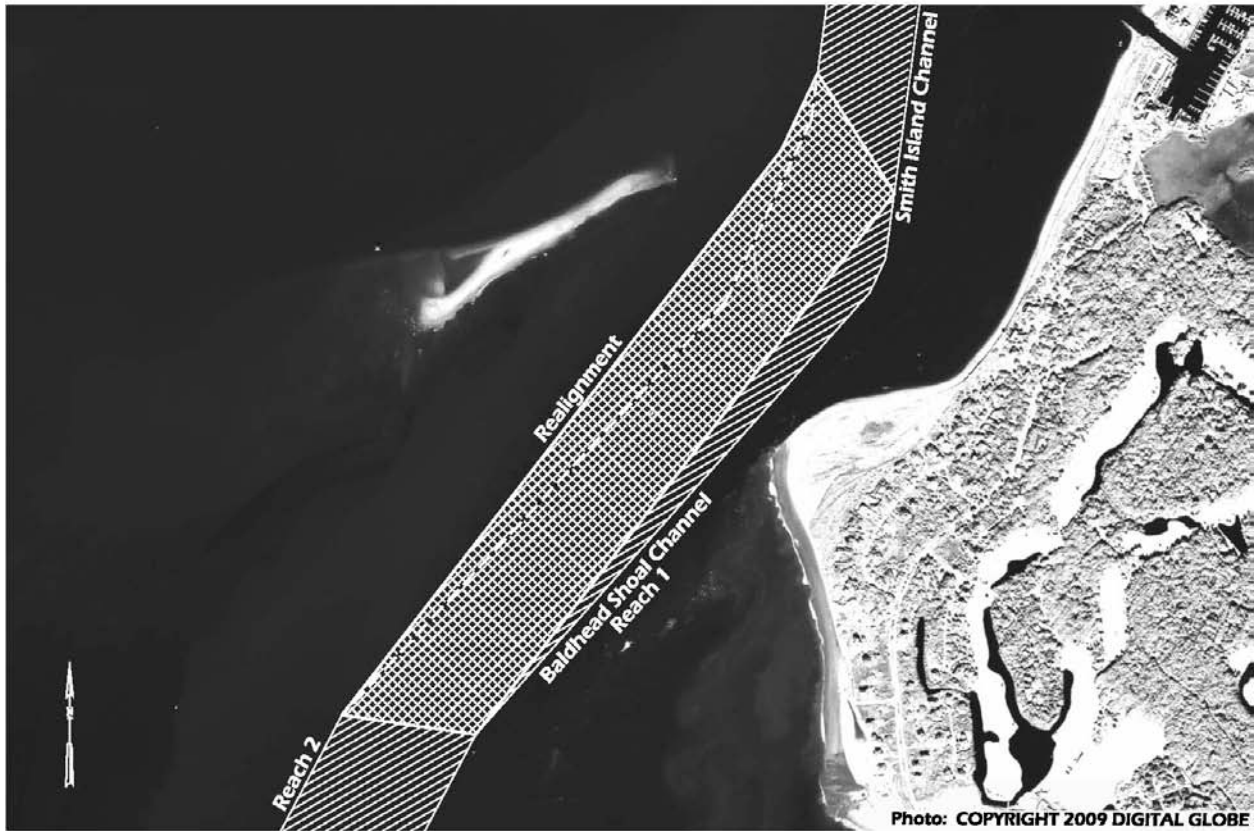


Figure 5. Wilmington Harbor Entrance Channel - Baldhead Shoal Channel Reach 1

5.5.2 “North Carolina International Terminal” (NCIT) Channel

Presently there are no terminals or infrastructure at this site, which are needed to support the economic and environmental feasibility of any channel realignment or deepening of the Harbor.

Channel Alignment

Because Congressional direction included funding to evaluate a potential “North Carolina International Terminal” (NCIT), a channel alignment to serve that potential site was also evaluated at a very preliminary level of analysis(*Figure 6*). This alternative addresses the opportunity to allow current and future shippers to more fully utilize larger class vessels and reduce anticipated future congestion via an alternative berth location within the harbor. The assumed design vessel for this analysis used a Yang Ming “U” class vessel. This vessel is 1,100 ft long, 140 ft wide, and has a draft of 47 ft., with a nominal capacity of 8,200 Twenty Foot Equivalent Units (TEUs). A brief discussion regarding reconnaissance level assumptions on channel alignment, depth and dimensions are provided below.

Based on limited analysis and existing information, it was determined that utilization of the existing channel alignment, with some modification, could accommodate the design (post-Panamax) vessel while minimizing costs and environmental impact associated with the channel realignment. A mild bend in the channel was also included to avoid excavating rock as indicated

in Figure 6. The NCIT site would also require a short access channel from the Cape Fear River to the proposed site.

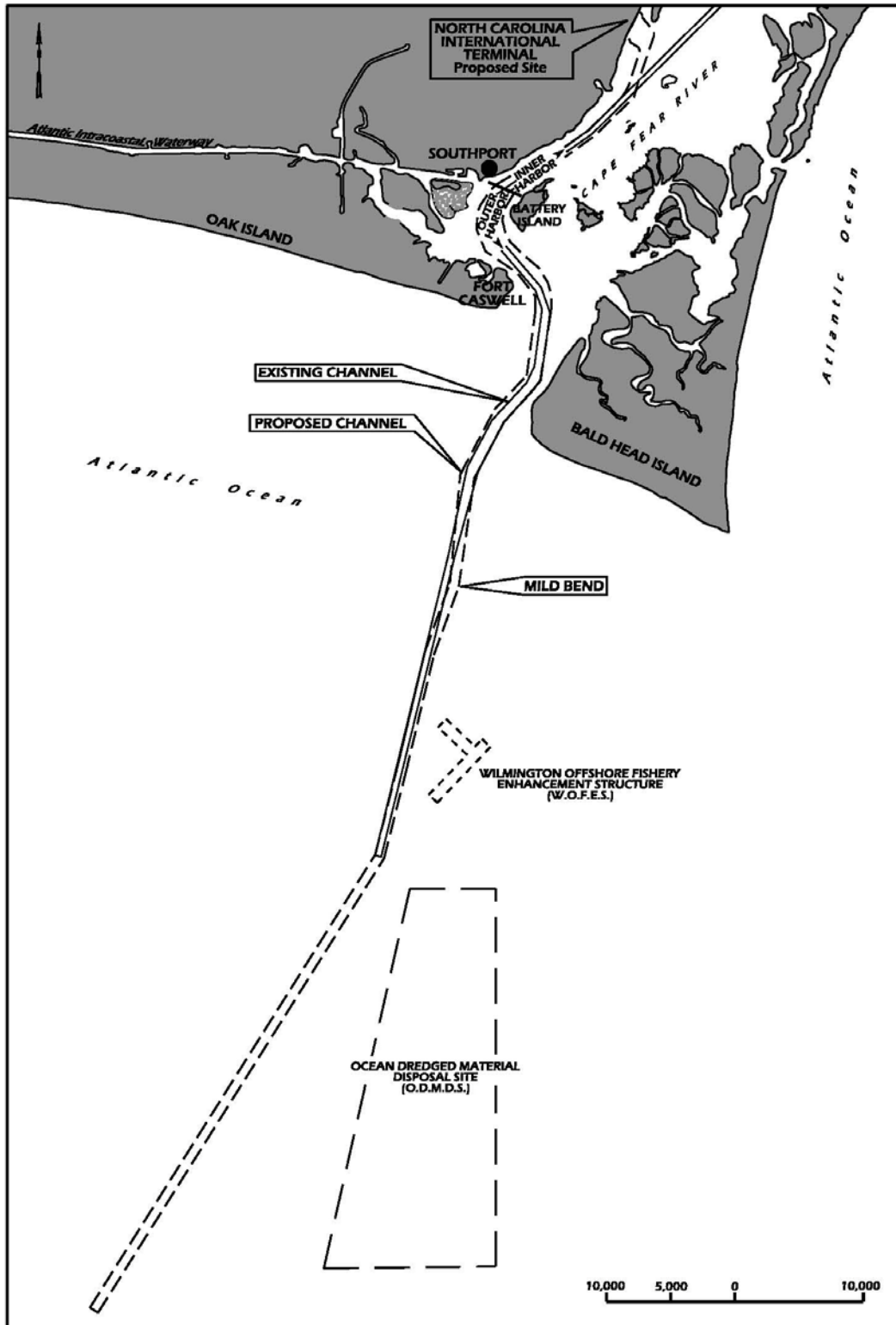


Figure 6. Proposed channel alignment for the North Carolina International Terminal.

Channel Depth and Dimension

Additional channel depth would allow current and future shippers to more fully utilize larger class vessels and would reduce anticipated future congestion. The current depth of the existing inner harbor channel is 42 feet. For the purposes of this reconnaissance study, deepening the existing harbor to depths as deep as 48 feet and 50 feet were investigated. Both the 48 foot and 50 foot depths would require additional deepening of approximately two feet or more in outer harbor channel reaches to account for the potential for wave action and swells. The delineation between the inner harbor channel and outer harbor channel is at the intersection of Battery Island Channel and Lower Swash Channel. An additional channel depth, referred to as “overdepth,” is also needed to provide for efficient construction and maintenance of the channel. There are two types of overdepth, required and allowable. One foot overdepth is required in areas of rock for safety clearance purposes. Two foot allowable overdepth applies to all areas and is provided because of the inability to dredge to a uniform depth. Therefore, deepening would include two feet of allowable overdepth in all areas and one foot of additional required overdepth in areas of rock. The channel depths investigated in this analysis are summarized below:

48 Foot Inner Harbor Channel

Inner Harbor Channel:

- Non rock areas -48' plus 2' of allowable overdepth (-50')
- Rock areas -48' plus 1' required overdepth plus 2' of allowable overdepth (-51')

Outer Harbor Channel:

- Non rock areas -50' plus 2' of allowable overdepth (-52')
- Rock areas -50' plus 1' required overdepth plus 2' of allowable overdepth (-53')

50 Foot Inner Harbor Channel

Inner Harbor Channel:

- Non rock areas -50' plus 2' of allowable overdepth (-52')
- Rock areas -50' plus 1' required overdepth plus 2' of allowable overdepth (-53')

Outer Harbor Channel:

- Non rock areas -52' plus 2' of allowable overdepth (-54')
- Rock areas -52' plus 1' required overdepth plus 2' of allowable overdepth (-55')

Based on the design vessel, the necessary channel dimensions were developed per U.S. Army Corps of Engineers guidance in Engineer Manual (EM) 1110-2-1613, “Hydraulic Design of Deep Draft Navigation Projects”. Channel sideslopes would be 5 horizontal to 1 vertical. EM 1110-2-1613 recommends a channel width of two and one half to four times the design vessel’s beam. Four times 160 feet results in a channel width of 640 feet. The strong currents near the mouth of the Cape Fear River complicate the design of the turns in this area. After examining the ship tracks from a previous ship simulation study, it was decided to use the existing ratio of ship length to turn radius as a design parameter. Increasing the length of the design vessel from 950 feet to 1,200 feet increases the turning radius for the Battery Island and Smith Island turns from 2,900 feet to 3,900 feet. A comprehensive ship simulation study would be performed during the feasibility phase for alignment alternatives to assist in determination of an optimal channel configuration.

5.5.3 No Action Alternative

The No Action alternative would result in the existing navigation channel remaining at its current authorized depth, dimension and location. This alternative will be considered further in the

quantified in this process as national economic development (NED) output, national ecosystem restoration (NER) output, or a combination of NED/NER output.

For water and land resources planning, the Federal objective is to contribute to NED while protecting the nation’s environment and adhering to national environmental statutes, executive orders, and Federal planning requirements. NED contributions are increases in the net value of the national output of goods and services, expressed in monetary units. These NED outputs are the direct net benefits that accrue in the planning area and the rest of the nation. Contributions to NED may include increases in the net value of marketed and non-marketed goods and services.

The NED analysis will not be performed as part of this Reconnaissance Study but will be evaluated and a NED plan selected during the Feasibility Phase of the Study.

5.6 PROJECT AREA CONDITIONS

5.6.1 Historic Conditions

The historic conditions are those that occurred immediately before and after the authorization and construction of the 42-foot deepening and widening project. The deepening project was completed up to the NCSPA docks in 2004, and the passing lane and channel widening portion was completed in 2006. The NCSPA data from immediately before and after this project is shown in *Table 1* below.

Table 1. Port of Wilmington 12-Year Tonnage and Vessel Trend

Year	Breakbulk	Container	Bulk	Total	TEUs	Ships	Barges	Tons/ves call
1999	731,944	694,950	929,855	2,356,749	113,185	445	115	4,208
2000	798,139	633,651	794,918	2,226,708	100,546	393	63	4,883
2001	844,052	600,014	768,376	2,212,442	96,380	364	100	4,768
2002	1,001,728	628,800	490,929	2,121,457	91,784	341	100	4,811
2003	976,082	613,923	630,799	2,220,804	99,677	320	122	5,024
2004	1,054,214	624,170	648,381	2,326,765	96,077	328	48	6,188
2005	1,271,417	781,046	951,601	3,004,064	133,723	362	14	7,990
2006	1,235,331	955,370	1,270,589	3,461,290	166,625	429	9	7,902
2007	897,776	1,174,335	1,368,550	3,440,661	173,111	381	0	9,031
2008	701,993	1,404,401	1,361,815	3,468,209	204,896	339	0	10,231
2009	413,446	1,338,436	1,322,963	3,074,844	194,608	362	0	8,494
2010	207,335	1,917,232	1,304,755	3,429,327	250,048	442	0	7,759
Average tons per vessel call before deepening (1999-2003)				4,739				
Average tons per vessel call after deepening (2005-2010)				8,568				
Increase in efficiency				81%				

The average tons per NCSPA vessel call have increased 81 percent since this project was completed. The use of tugs and barges, a common historic method of transportation before the project, has become unnecessary and completely stopped (use of tugs to negotiate Battery Island Turn is impractical due to distances involved). The typical vessel in the harbor has gone from sub-Panamax to Panamax as a result of the project, hence the increase in commerce per vessel call. Container tons have tripled and TEUs have increased two and a half times since 2004, for an annual growth rate of 20 percent.

5.6.2 Existing Conditions

The existing conditions are defined in this report as the project conditions that currently exist plus any changes that are expected to occur prior to project year one, anticipated in 2020 for major improvements and 2017 for minor improvements. The Wilmington Harbor 42-foot project was designed to serve Panamax container vessels. When the project was authorized in 1996, Sub Panamax and Panamax vessels made up about 80 percent of the container capacity in the World Fleet and new-build vessels. These vessels were the most common in all trade routes, but are now being replaced by larger, more efficient post-Panamax container vessels on many routes. The existing Port of Wilmington cannot accommodate fully loaded post-Panamax vessels because the 42-foot depth restriction and the turning basin is not wide enough for the additional vessel length.

A review of existing literature indicates a rapid growth of container trade since containerization began in 1980. This segment has been the fastest growing U.S. trade for the last 30 years. Trade is growing at twice the rate of Gross Domestic Product (GDP). It is expected that this growth will continue, thereby providing both opportunities and requirements for additional container port facilities throughout the United States.³

The possible expansion of Wilmington Harbor would provide important opportunities for military logistics, including the Military Ocean Terminal at Sunny Point (MOTSU) and strategic activities at Wilmington. An April 2007 Department of Defense Report to Congress on projected requirements for military throughput at strategic seaports indicates that Wilmington and Morehead City are among the nation's fifteen strategic seaports, capable of handling commercial and military requirements simultaneously. Plans for the proposed NCIT Terminal (now on hold) intended to augment these capabilities with improved rail access, roll on-roll off (Ro-Ro) capabilities, and an ability to handle special military shipments. Adjacency to the All American Defense Corridor, an area around Fort Bragg that encompasses both the Port of Wilmington and the Research Triangle, is another consideration.

5.6.3 Future Conditions

The with- and without-project conditions represent future states beginning in project year one and extending over a 50-year period of analysis. For the purposes of this reconnaissance study, the years 2020 through 2070 will be examined. The purpose of identifying the differences between the with and without project conditions is to note the changes expected to occur in the future as a result of the project compared to the conditions that would occur in the future without the project. As a result of these different conditions, project benefits and project related costs can be identified and quantified. The without project condition is the most likely condition expected to exist over the 50-year period in the absence of the proposed project, including any known changes in the law or public policy. In other words for this project, the without project conditions are those that are expected to occur over time without further channel deepening and/or expansion of the existing harbor facilities.

The South Atlantic Region is one of the fastest growing parts of the Country. Five South Atlantic States (North Carolina, South Carolina, Georgia, Alabama and Tennessee) have a current population of 47 million people, but are expected to grow to 82 million by 2050. Much of this growth is occurring in an area known as the Piedmont Atlantic Mega-Region, a growing crescent of economic activity from Raleigh-Durham through Birmingham. This region includes 34 million people and a growing base of jobs and income. It is growing faster than the

³ Seaport Consultants Canada, Inc., "The World Economy and Container Trade Tank." March 2009: Issue 6.

surrounding areas and much faster than the United States as a whole. The port of Wilmington is ideally suited to serve this growing part of the nation.⁴

The State of North Carolina continues to grow rapidly, principally in its Metropolitan areas of Asheville, Charlotte, Greensboro, Raleigh-Durham and Wilmington. The state is also growing in jobs and income, thus producing a larger share of the Gross National Product. Future projections show North Carolina becoming the seventh largest state in the United States by 2050. In 2010, the State is projected to have 756 million tons of commerce worth \$820 billion with other states, most of it moving by highway and rail. By 2020, this commerce is expected to grow to 944 million tons worth \$1.34 trillion dollars. Only one percent of this commerce currently moves by water through the State's ports and waterways.⁵

Information from Lloyd's Registry shows that container vessels have been getting larger for many years, and this trend is now occurring at an increasing rate. *Figure 7* shows the percentage of total TEU for each ship category for 1995-2015 worldwide. For containerships on order with delivery dates between 2010 and 2015, more than 70 percent of the total orders are on post-Panamax size vessels and almost 40 percent of the total orders are on Super post-Panamax alone (the largest class for which the Panama Canal Expansion project was designed). The average size containership new-build has increased from about 2,000 TEU when Wilmington Harbor was authorized to 42-feet to about 5,500 TEU for expected deliveries in the next few years. These new vessels will be too large to serve the existing Wilmington Harbor, and many other existing South Atlantic ports. While the current vessels on order do not go out beyond 2015, we expect this trend to continue and that larger more efficient post-Panamax vessels will take over the container trade on all large-volume trade routes.

⁴ Littlefield, Ron and Catherine L. Ross. "Piedmont Atlantic MegaRegion." 03 March 2006. Georgia Tech Center for Quality Growth and Regional Development. <<http://smartech.gatech.edu/handle/1853/20077>>.

⁵ List, George F., et al. "Statewide Logistics Plan for North Carolina: An Investigation of the Issues with Recommendations for Action." May 2008.

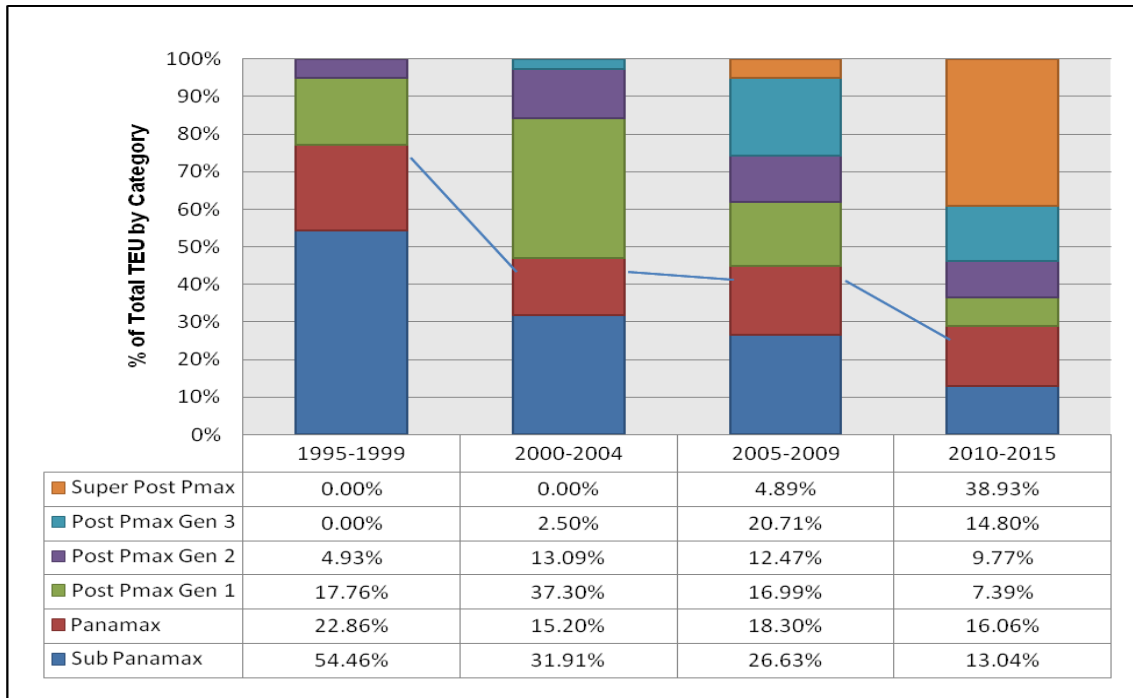


Figure 7. Total TEU by Ship Category

The NCSPA has looked at its hinterland and service areas as part of its planning and marketing activities. These are markets in North Carolina and Eastern Tennessee that are closest to the Port of Wilmington or easily accessible by road and rail services. In 2008, the Port of Wilmington had opportunity, with the correct infrastructure, to be the least cost port for over 1.8 million TEUs. Current container throughput at Wilmington Harbor is approximately 267,750 TEUs, compared to approximately 245,000 in 2010, and 103,672 in 1996. Project area conditions for the existing, future without-, and future with-project conditions were evaluated based on both economic and environmental considerations. These two considerations are described separately in the following sections.

5.7 ECONOMIC CONSIDERATIONS

The economic considerations documented below are a preliminary analysis of potential benefits attributable to the proposed navigation improvement. Detailed analysis would be conducted in the feasibility phase and would involve economic evaluation of all reasonable alternatives to address the problems and opportunities.

5.7.1 Navigation Improvements (Minor Modifications)

Benefits for the proposed minor improvements would be based on transportation cost savings for the expected container throughput based only on the existing NCSPA facility. Current NCSPA capacity is approximately 300,000 TEUs, but is expandable as traffic and trade increase. Improving the two turns and enlarging the Turning Basin would allow current vessels to call with fewer restrictions and allow first generation post-Panamax vessels to call if light loaded to less than 42-foot draft. Potential representative benefits were developed using a cost per mile analysis, utilizing information from Corps of Engineers findings on transportation costs per Twenty Foot Equivalent Units (TEU) using different size vessels. Based on other comparable navigation studies conducted for the southeast US in recent years as a proxy for

potential savings with channel modification,, transporting containers using Panamax ships at typical service draft costs about \$30 per TEU per 1,000 miles sailing distance. Using various trip lengths from 4,000 to 11,000 miles (depending on trade route) results in TEU costs from \$120 to \$330 each way for shipping from Northern Europe, the Far East and South America. Shifting those containers to post-Panamax ships that would be light loaded in order to call the port of Wilmington could potentially save approximately 10 percent or \$12 to \$33 per TEU. Weights were developed based on analysis of expected number of TEUs transported along trade routes in Wilmington.

Table 2. Trade Route Potential Benefits

Trade Route	One-way Distance (Miles)	Current cost per TEU mile (\$)	Current Cost per TEU (\$)	Cost per TEU mile Light post-Panamax (\$)	Cost per TEU post-Panamax (\$)	Savings per TEU (\$)	Weighting by # TEU's	Weighted Savings per TEU (\$)
Far East - Panama Canal	11000	0.03	330	0.028	308	22	0.6	13.20
South America	5000	0.03	150	0.028	140	10	0.2	2.00
Northern Europe	4000	0.03	120	0.028	112	8	0.2	1.60

Total Savings \$ 16.80

Based on potential reduction in vessel delays and the potential to reduce transportation cost by using larger vessels, it is expected that the modifications would be economically justified.

Costs are based on expected first costs for the assumed channel improvements with the described depth and dimensions. These numbers include the estimated costs for dredging, disposal, mitigation and project maintenance. Projections in shoaling were used to compute the increased costs of maintenance dredging, which were included to determine Average Annual costs. These costs were then increased to include interest during construction. Interest and amortization was calculated at the current interest rate of 4 1/8 percent over the 50-year period of analysis. Cost and benefits for the proposed navigation improvements alternative are summarized in *Table 3*.

Table 3. Proposed Navigation Improvements Expected Costs and Benefits

	Entrance, Battery Island & 1450 Foot Turning Basin
First Costs (includes estimated costs for dredging, disposal, and mitigation)	38,700,000
Add Interest During Construction	2,400,000
Financial First Costs	<u>41,100,000</u>
Average Annual Costs	
Interest and Amortization	1,950,000
Increased Operation and Maintenance	500,000
Total Average Annual Costs	<u>2,450,000</u>
Present Worth Average Annual Benefits	<u>9,750,000</u>
Net Average Annual Benefits	<u>7,300,000</u>

The costs for dredging, disposal and mitigation are included. The improvements will serve the existing NCSPA Terminal at the same channel depth, so no associated landside facilities are assumed to be needed in order for benefits to be achieved. The container traffic projection would only be about one percent of the East Coast containerized trade volume, which is similar to Wilmington's current market share. Economic impacts to the Region and State in terms of jobs and income is not estimated in this report. Based on this preliminary analysis, the minor navigation improvements evaluated appear to be potentially economically justified (see *Table 3*) and recommends these modifications for evaluation in a feasibility study.

5.7.2 NCIT Channel

Consideration of potential benefits for the proposed major improvement project are based on similar analyses recently conducted for other southeastern ports and are based on potential transportation cost savings for a shorter channel length and the expected container throughput. Projected commodity volumes were derived from studies the North Carolina Port Authority commissioned. Using these two information pieces it is assumed a channel deepening alternative, as deep as 48 or more feet, could be economically viable with the understanding that significant landside improvements/infrastructure are needed. These benefits were developed using a cost per mile analysis, utilizing information from Corps of Engineers findings on transportation costs per Twenty Foot Equivalent Units (TEU) using different size vessels. Transporting containers using Panamax ships at typical service draft costs about \$30 per TEU per 1,000 miles sailing distance. Using various trip lengths from 4,000 to 11,000 miles (depending on trade route) results in TEU costs from \$120 to \$330 each way for shipping from Northern Europe, the Far East and South Asia. Shifting those containers to post-Panamax ships saves about 30 percent or \$36 to \$99 per TEU. Weights were developed based on analysis of expected number of TEUs transported along trade routes in similar South Atlantic ports. When the savings are weighted by the number of TEUs on each route, the average savings are about \$85 per TEU. *Table 4* summarizes the calculation of potential benefits.

Table 4. Trade Route Potential Benefits from Major Improvements

Trade Route	One-way Distance (Miles)	Current cost per TEU mile (\$)	Current Cost per TEU (\$)	Cost per TEU mile post-Panamax (\$)	Cost per TEU post-Panamax (\$)	Savings per TEU (\$)	Weighting by # TEU's	Weighted Savings per TEU (\$)
Far East - Panama Canal	11000	0.03	330	0.021	231	99	0.6	59.40
South Asia - Suez Canal	10000	0.03	300	0.021	210	90	0.2	18.00
Northern Europe	4000	0.03	120	0.021	84	36	0.2	7.20
Total Savings								\$ 84.60

Costs are based on expected first costs for the assumed channel alignment with the described depth and dimensions. These numbers include the estimated costs for dredging, disposal, mitigation and project maintenance. Projections in shoaling were used to compute the increased costs of maintenance dredging, which were included to determine Average Annual costs. These costs were then increased to include interest during construction. Interest and amortization was calculated at the current interest rate of 4 1/8 percent over the 50-year period of analysis. Cost and benefits for the proposed project depths are summarized in *Table 5*.

Table 5. Proposed Major Project Expected Costs and Benefits

	48' Inner Harbor	50' Inner Harbor
First Costs (includes estimated costs for dredging, disposal, and mitigation)	900,000,000	1,035,000,000
Add Interest During Construction	141,000,000	162,500,000
Financial First Costs	<u>1,041,000,000</u>	<u>1,197,500,000</u>
Average Annual Costs		
Interest and Amortization	49,500,000	57,000,000
Increased Operation and Maintenance	4,500,000	4,500,000
Total Average Annual Costs	<u>54,000,000</u>	<u>61,500,000</u>
Present Worth Average Annual Benefits	<u>162,000,000</u>	<u>162,000,000</u>
Net Average Annual Benefits	<u>108,000,000</u>	<u>100,500,000</u>

The costs for associated landside facilities (including mitigation) are assumed for this preliminary analysis to be self-liquidating and a non-federal responsibility. In other words, the analysis assumes the facility would be in place prior to channel deepening. Due to the speculative nature of construction of this facility, it is uncertain if it is a viable part of the most likely current future without project condition. However, as documented in the NCSPA Business Plan⁶, there is a \$225 per Box facility charge that is projected to be available to the terminal operator. This is expected to provide a cash flow of about \$125 million annually growing to \$375 million annually by year 10 and remaining constant thereafter. The only container traffic projection available during the conduct of this study was prepared by a third party and is based on the North Carolina International Terminal initially capturing a market share of 3 percent of the future East Coast containerized trade volume, and growing to 6.75 percent market share by 2030. Within 10 years, the estimated throughput of the port facility would be 3 million TEUs.⁷ Economic modeling prepared by the NCSPA⁸ suggests that project revenues under these volumes are sufficient to fund construction of the terminal and provide a return on investment. If the NCIT channel is pursued into a feasibility study, further independent verification of growth potential would be required.

⁶ CH2M Hill. "North Carolina International Terminal: Pro-Forma Business Plan" (North Carolina State Ports Authority). March 2008.

⁷ CH2M Hill. "North Carolina International Terminal: Pro-Forma Business Plan" (North Carolina State Ports Authority). March 2008.

⁸ Moffatt & Nichols. Port of Wilmington & Morehead City Feasibility Report. February 2010.

5.8 ENVIRONMENTAL CONSIDERATION

A preliminary identification of potential resource impacts utilizing professional judgment and readily available existing information was performed. Mitigation is discussed in Section 5.8.1 and is based primarily on the assumed channel configurations for both potential channel widening or realignments and for potential deepening as previously described. These potential impacts do not include impacts for any landside facilities associated with any of the analyzed alternatives.

In any follow on studies, the Corps environmental impact considerations would be documented and addressed comprehensively to fully understand the direct, indirect and cumulative effects of multiple potential actions associated with any project alternatives.

The potential effects on resources are summarized in *Table 6*. The potential effects should in no way be considered definitive, since a detailed analysis of potential environmental effects from all reasonable alternatives would be conducted in a feasibility phase study of all alternatives. None of these resources are anticipated as constraints except as noted.

Table 6. Potential Effects on Resources

Resource	Existing Condition	Conditions without Projects	Conditions with NCIT Channel	Conditions with Navigation Improvements
Geology and Groundwater	The existing channel is currently maintained to a depth of 42 feet (+ overdepth) in the inner harbor and 44 feet (+ overdepth) in the outer harbor. Prior to deepening, this depth was investigated for effect on groundwater. These studies indicated that the past deepening to 45 feet would not adversely impact groundwater resources. ⁹	No change from existing conditions.	Channel deepening and widening would require the removal of additional rock. The impact of blasting and further deepening of the navigation channel during construction may have an adverse effect on groundwater. Effect on project alternatives would be investigated, in detail, during feasibility studies to determine effects on groundwater.	Channel and basin widening could require the removal of additional rock. The impact of blasting and further widening of the navigation channel during construction may have adverse effect on groundwater. Effect on project alternatives would be investigated, in detail, during feasibility studies to determine effects on groundwater.
Water Resources	Two water quality classifications of the State of North Carolina apply to the waters of Cape Fear River in the project area: SA and HQW. SA waters are saltwaters suitable for shellfishing, fishing and contact recreation. HQW or High Quality Waters are high quality waters rated as excellent based on biological and physical/chemical characteristics.	No change from existing conditions.	Further deepening and widening may result in increase potential for saltwater intrusion. These potential effects would be investigated in detail for alternatives considered during feasibility studies.	Further channel and basin widening may result in increase potential for saltwater intrusion. These potential effects would be investigated in detail for alternatives considered during feasibility studies.

⁹ Lautier, Jeff C. 1998. Wilmington Harbor Groundwater Study, Final Report. NC Department of Environment, Health, and Natural Resources, Division of Water Resources.

Resource	Existing Condition	Conditions without Projects	Conditions with NCIT Channel	Conditions with Navigation Improvements
Water Quality	Turbidity and suspended solids are temporarily elevated from propeller wash from large ships and also during maintenance dredging and disposal operations. These conditions return to background levels shortly after dredging stops and vessel passage.	No change from existing conditions.	Turbidity and suspended solids would be elevated during the entire construction period. This could result in adverse impact to benthic resources adjacent to the channel. Maintenance operations will be similar to existing conditions. Long-term effects on water quality associated with increased vessel traffic may result from potential project alternatives. These effects would also need to be investigated in detail during feasibility studies.	Turbidity and suspended solids would be elevated during the entire construction period. This could result in adverse impact to benthic resources adjacent to the channel. Maintenance operations will be similar to existing conditions. These effects would also need to be investigated in detail during feasibility studies.
Air Quality and Noise	All dredging work would be conducted in the ocean and/or within Brunswick County. This area is classified as an attainment area by the NC Division of Air Quality. There are currently no major air quality issues. Noise is a prominent feature in navigation channel and surrounding area due to ship, small boats, and roadway traffic and other sounds associated with urban and rural environments in Brunswick and New Hanover Counties near the harbor.	No change from existing conditions.	Implementation of project alternatives would likely result in temporary increases in criteria pollutants. Effects on air quality could also occur from increases in shipping vessel traffic utilizing new harbor facilities. Detailed studies to determine effects of project alternatives on air quality and noise would be completed during the feasibility phase.	Implementation of project alternatives would likely result in temporary increases in criteria pollutants. Detailed studies to determine effects of project alternatives on air quality and noise would be completed during the feasibility phase.
Hazardous and Toxic Wastes	No hazardous or toxic wastes are known to affect the existing project.	No change from existing conditions.	No hazardous or toxic wastes are known to exist within the proposed project area.	The property abutting the east bank of anchorage exhibits a high probability for hazardous waste contamination. The site formally had wood persevering operations, and is suspected to be contaminated with pentachlorophenol (PCP), creosote and dioxins. The exact containments as well as the quantity of the containments on the site are currently unknown. Further

Resource	Existing Condition	Conditions without Projects	Conditions with NCIT Channel	Conditions with Navigation Improvements
				investigations would be required if the basin would be expanded on that side of the river.
Aquatic Resources	<p>The Cape Fear River contains a diverse aquatic community of marine and estuarine species. Among the important habitats are shallow (< 10 feet deep) water areas that contain marsh and mudflats. Deep (> 10 feet deep) water areas have minimal habitat value except in designated primary nursery areas (PNA) adjacent to the channel. This habitat occurs adjacent to the anchorage basin. Existing channel maintenance disturbs benthic populations in the existing deep channel and nearby side slopes.</p>	<p>No change from existing conditions.</p>	<p>Among the important habitats that may be impacted by the assumed channel alignment are shallow (< 10 feet deep) areas. Dredging may impact about 202 acres of shallow water habitat, 13 additional acres of tidal marsh and 442 acres of deep water habitat for a total of 657 acres within the Cape Fear River. No primary (PNA) or secondary nursery areas are located near the assumed channel or turning basin, but some of the shallow water areas may still function as nursery areas. There is potential to impact live hard bottom from the ocean portion of the channel extension. The channel improvements may also effect several essential habitat areas (EFH) designated by NMFS. These effects would be investigated in detail during the feasibility phase for project alternatives. Mitigation could be a project constraint if suitable mitigation areas cannot be located to offset the aquatic resource loss. See section 5.8.1 below.</p> <p>Impacts on aquatic resources due to blasting can be minimized by restricting blasting to cooler months, stemming blast holes, having delays between holes, and other measures.</p>	<p>Dredging may impact about 9.6 acres of shallow water habitat, 13.3 acres of tidal marsh and 13.8 acres of deep water habitat in the river for a total of 36.7 acres. Of this total, 28 acres are designated as primary nursery (PNA) in the anchorage basin (13.3 acres marsh, 9.6 acres shallow and 5.1 acres deep water habitat). No secondary nursery areas are located near the project area. The channel improvements may also effect several essential habitat areas (EFH) designated by NMFS. These effects would be investigated in detail during the feasibility phase for project alternatives. Mitigation could be a project constraint if suitable mitigation areas cannot be located to offset the aquatic resource loss. See section 5.8.1 below.</p> <p>Impacts on aquatic resources due to blasting can be minimized by restricting blasting to cooler months, stemming blast holes, having delays between holes, and other measures.</p>

Resource	Existing Condition	Conditions without Projects	Conditions with NCIT Channel	Conditions with Navigation Improvements
Terrestrial Resources	Maintenance of the existing channel does not involve terrestrial resources except for disposal of sandy material on nearby beaches, to maintain two existing islands for colonial water bird nesting, and disposal in confined upland disposal areas like Eagle Island. The major impacts are minimized by conducting work during cooler months when biological activity is low. For example work during cooler months avoids sea turtle and bird nesting, the growing season for the threatened beach plant sea beach amaranth, and the spawning time for beach organisms like mole crabs and coquina clams.	No change from existing conditions.	As indicated in section 5.7.2, landside facilities would be implemented by the non-federal sponsor and other state and or Federal agencies. These facilities may include terminals, highway and rail facilities. These will be considered comprehensively during the feasibility phase in collaboration with the other agencies. For this preliminary analysis the scope of considerations are focused on potential effects from navigation channel improvements. Terrestrial impacts associated with channel improvement may include potential island and inlet beach erosion. Battery Island is an important white ibis rookery. There may also be impacts associated with beach disposal of sandy dredged material. These effects would be investigated in detail during the feasibility phase for project alternatives.	Terrestrial impacts associated with channel improvement may include potential erosion at Battery Island due to channel widening. Battery Island is an important white ibis rookery. There may also be impacts associated with beach disposal of sandy dredged material. These effects would be investigated in detail during the feasibility phase for project alternatives.
Endangered and Threatened Species	<p>The listed species that may occur in the harbor and near ocean waters are sea turtles, right whales, shortnose sturgeon, and West Indian manatee.</p> <p>On the area beaches, piping plovers, sea beach amaranth, and nesting sea turtles occur. Disposal of sand on the beaches occurs during cooler months to avoid impacts to these species.</p>	When fish passage is constructed at Lock and Dam #1, the Shortnose sturgeon population is expected to increase.	Adverse effect to protected species may occur in water via dredging, blasting, and vessel activities and on area beaches through disposal of sandy dredged material. Mitigation measures will be considered in detail in the feasibility phase. Measures may include performing dredging work during the cooler months, and implementing the measures indicated under existing conditions. See "aquatic resources" for information on reducing impacts of blasting. Disposal of compatible sand on nearby beaches can be beneficial	Adverse effect to protected species may occur in water via dredging, blasting, and vessel activities and on area beaches through disposal of sandy dredged material. Mitigation measures will be considered in detail in the feasibility phase. Measures may include performing dredging work during the cooler months, and implementing the measures indicated under existing conditions. See "aquatic resources" for information on reducing impacts of blasting. Disposal of compatible sand on nearby beaches can be beneficial

Resource	Existing Condition	Conditions without Projects	Conditions with NCIT Channel	Conditions with Navigation Improvements
			to sea turtles if suitable nesting habitat is eroding and placement occurs during non nesting/hatching season.	to sea turtles if suitable nesting habitat is eroding and placement occurs during non nesting/hatching season.
Cultural Resources	A large number of sites are known through historic documentation and others have been discovered as a result of professional surveys. Properties listed in or eligible for listing in the National Register of Historic Places are known throughout the lower Cape Fear area.	No change from existing conditions.	The proposed project would likely affect underwater cultural resources. Affects can be expected either through direct impact to sites and or through modifications to hydrology, especially changes in currents. Professional surveys would be required to fully identify potential effect on cultural resources. Mitigation of any impacts to resources from project alternatives would be formulated in the feasibility phase.	The proposed project would likely affect underwater cultural resources. Affects can be expected either through direct impact to sites and or through modifications to hydrology, especially changes in currents. Professional surveys would be required to fully identify potential effect on cultural resources. Mitigation of any impacts to resources from project alternatives would be formulated in the feasibility phase.
Wetlands	Tidal marsh, primarily <i>Spartina alterniflora</i>) is abundant in the project area.	No change from existing conditions.	Adverse effects on tidal marsh may occur with the implementation of project alternatives. These effects would be considered in detail during the feasibility phase. For the purposes of this preliminary evaluation, mitigation was estimated for the assumed channel alignment (see section 5.8.1).	Adverse effects on tidal marsh may occur with the implementation of project alternatives. These effects would be considered in detail during the feasibility phase.

5.8.1 Mitigation

Navigation Improvements

Efforts to avoid and minimize impacts are similar to that for the terminal discussion above. For navigation improvements, 28 acres designated as primary nursery area (PNA) would be impacted in the anchorage basin (13.3 acres marsh, 9.6 acres shallow and 5.1 acres deep water habitat). About 8.7 additional acres of deep (> 10 feet deep) water habitat would also be impacted adjacent to Battery Island. Deep water habitat outside of nursery habitat (i.e. Battery Island area) is assumed to have a lesser ecological value therefore no mitigation is considered for this habitat for the purposes of this analysis.

A 2 for 1 acre replacement is assumed for PNA (28 acres x 2 = 56 acres). Using previous mitigation costs of about \$200,000/acre (Island 13, Wilmington Harbor); the mitigation costs are approximately \$11.2 million. Therefore, the total mitigation cost including sediment testing for ocean disposal of dredge material (estimated at approximately \$200,000) is about \$11.4 million. This is included as a part of the first costs for the project previously discussed in this report. Suitable mitigation sites would be determined during the feasibility phase, and could be a project constraint if suitable mitigation areas cannot be located to offset the aquatic resource loss.

Other impacts may occur that could require mitigation such as impacts to cultural resources, salt water intrusion, and impacts due to propeller wash. These potential mitigation requirements cannot be determined at this time due to lack of information, but the associated potential mitigation costs are included within the 20 percent project contingency. Detailed studies to evaluate effects to all resources affected by project alternatives would be conducted during the feasibility stage. Appropriate monitoring plans would also be developed to assess the performance of feasible mitigation measures formulated during the feasibility study.

NCIT Channel

Efforts to avoid and minimize impacts will primarily be related to following the existing navigation channel and adjacent naturally deep water to the extent practicable. Regardless of these efforts related to any channel alternative, mitigation will be needed. This is due to the width and depth required for a navigation channel large enough to accommodate longer and deeper draft vessels. The most likely need for mitigation associated with channel excavation is related to impacts to shallow water habitat and tidal marsh. To establish an approximate mitigation cost for this preliminary evaluation, the assumed channel configuration was utilized. For this channel configuration, there would be an estimated loss of about 13 acres of tidal marsh and 202 acres of shallow (< 10 feet deep) water habitat. About 442 acres of deep (> 10 feet deep) water habitat would also be impacted. Deep water habitat is assumed to have a lesser ecological value therefore no mitigation is considered for this habitat for the purposes of this analysis.

Mitigation can take many forms, but the most acceptable is in-kind mitigation (e.g. replacing marsh and tidal shallow water habitat with the same). Mitigation requirements would be fully formulated and coordinated with resource agencies for alternatives investigated during detailed feasibility studies. However, for the purposes of this reconnaissance analysis reasoned assumptions are utilized to approximate mitigation costs. A 2 for 1 acre replacement is assumed for tidal marsh (13 acres x 2 = 26 acres). Using previous mitigation costs of about \$200,000/acre (Island 13, Wilmington Harbor); the marsh mitigation costs are approximately \$5.2 million. Since the shallow water habitat is not designated as primary or secondary nursery but still has habitat value, a 1 for 1 acre replacement is assumed (202 acres). Assuming the same replacement costs per acre as indicated above, that mitigation cost would be approximately \$40.4 million. Therefore, the total mitigation cost including sediment testing for ocean disposal of dredge material (estimated at approximately \$500,000) is about \$46.1 million.

This is included as a part of the first costs for the project previously provided in this report. Suitable mitigation sites would be determined during the feasibility phase, and could be a project constraint if suitable mitigation areas cannot be located to offset the aquatic resource loss.

Other impacts may occur that could require mitigation such as impacts to cultural resources, salt water intrusion, impacts due to propeller wash, and potential presence of live hard bottom in the ocean portion of the channel extension. These potential mitigation requirements cannot be determined at this time due to lack of information, but the associated potential mitigation costs are included within the 20 percent project contingency. Detailed studies to evaluate effects to all resources affected by project alternatives would be conducted during the feasibility stage. Appropriate monitoring plans would also be developed to assess the performance of feasible mitigation measures formulated during the feasibility study.

5.8.2 Indirect and Cumulative Effects

Indirect and cumulative effects are expected from this project. However, the effects of project alternatives cannot be determined until detailed investigations are performed during the feasibility phase. In addition to other resource areas indicated elsewhere in this document, indirect and cumulative impacts to address further in the feasibility phase would include but would not be limited to 1) security concerns related to proximity of potential terminal facilities (and associated transportation related development) to a nuclear power plant and munitions terminal, 2) increased risk of vessel accidents and product spills, 3) induced development and resulting socioeconomic and environmental impacts on the local communities, and 4) sea level rise.

6. OTHER RESOURCE AGENCIES AND PUBLIC VIEWS

Because of the nature of the reconnaissance phase, only limited and informal coordination has been conducted with resource agencies and the public. The comments received assisted the district in understanding public concern regarding the potential federal action. These concerns were considered during this reconnaissance study. The comments received will also assist the district plan public involvement activities and supplement information received during the public scoping period which will begin at the onset of the feasibility phase. A summary of comments, concerns, and views received by the Corps during the reconnaissance phase is presented below (grouped by general area of concern):

Cultural Resources

- Construction of proposed project would directly/indirectly harm cultural resources including archaeological remains and standing structures of historic value

Economics

- Business may move from the current port in Wilmington to the new facility.
- Costs (such as added infrastructure, eminent domain purchases, and mitigation for environmental damages) secondary to direct construction of the proposed project would be necessary
- Economic success of the existing Wilmington Harbor should be assessed before an additional shipping terminal is seriously considered
- Employment opportunities associated with the proposed project may not be as numerous as projected and employment opportunities associated with possibly displaced industries, such as tourism, may be lost

- Fishing industry in Brunswick County will be hurt by destruction of salt marshes should proposed project go forward
- High fuel prices may prevent the proposed project from seeing the volume of business it is being designed for
- Property values in areas surrounding the proposed project would fall
- Proposed project would be unnecessary due to presence of nearby, existing east coast ports that could be modified to accommodate increases in volume
- Proposed project would allow for inexpensive shipping of freight overseas
- Proposed project would infuse money into the economies of Brunswick County and North Carolina
- Proposed project would provide new local jobs
- Proximity of proposed project to North Carolina businesses would provide increased economic benefits
- Shipping and transportation costs may be reduced by the proposed project as compared to the existing port in Wilmington, NC
- Proposed project would continue to grow foreign economies to the detriment of the economy of the United States
- Proposed project construction methods would contribute to beach erosion placing public/private property and assets at risk
- Proposed project would hurt the tourism industry, causing jobs to be lost
- Revenue to Brunswick County in terms of tourism and recreational opportunities lost due to ecosystem impacts caused by construction and implementation of the proposed project would be high
- Taxes may be increased to pay for infrastructure needs associated with the proposed project
- The North Carolina Secretary of Commerce needs to comment on the value of the proposed project for North Carolina
- The State of North Carolina may not be able to afford the proposed project in terms of both monetary and environmental costs

Emergency Planning

- Should proposed project be constructed, Progress Energy's Brunswick Nuclear Plant would have to reevaluate its emergency plans and procedures in order to maintain safe operation

Environmental Impacts

- Effects of sea level rise due to climate change must be taken into consideration, including additional costs and physical changes to the project
- Activities directly and indirectly associated with proposed project would contribute to elevated levels of air, light, noise, and water pollution
- Blasting associated with navigation channel modification may cause fish kills.
- Certain wetlands that the proposed project would impede on are currently protected by law
- Construction of new road and railways associated with a terminal project may promote the formation of unwanted sinkholes

- Dredging and channel deepening/widening associated with proposed project would alter benthic topography and contribute to erosion of adjacent shorelines and beaches
- Essential Fish Habitat would be negatively impacted by the proposed project
- Nesting habitat for birds and sea turtles would be disrupted by the proposed project
- Proposed project construction may cause salt water intrusion and possible contamination of drinking water for citizens living in areas near the proposed project site
- Proposed project would deny future generations the opportunity to observe and appreciate natural phenomena in the project vicinity
- Proposed project would destroy the following habitat types in the Cape Fear River and nearshore Atlantic Ocean: water column, shell bottom, coastal wetland, beach, soft bottom and hard bottom, freshwater aquatic, and uplands
- Proposed project would eliminate areas with high aesthetic and ecological merits
- Proposed project would yield higher sediment loads than are currently seen in the Cape Fear River
- The possibility exists of introducing exotic, invasive species through ballast
- Wildlife (including multiple endangered species) such as shore/sea birds, fish and other aquatic flora/fauna, and land dwelling flora/fauna would be destroyed or displaced by proposed project

Environmental Justice

- Disadvantaged peoples may be disproportionately impacted by negative environmental hazards resulting from port construction

General

- The proposed project is new in many aspects and should not be thought of as an extension of the existing Wilmington Harbor

Facilities Operation

- Should proposed project be constructed, Progress Energy's Brunswick Nuclear Plant would have to address potential operational issues including maintaining proper functionality of and avoiding sediment buildup in the plant's cooling water canal, and avoiding any rainwater runoff from the port facility that may introduce chemicals or hazardous materials into cooling systems.

Infrastructure

- Existing roadways may not be adequate in supporting additional traffic associated with the proposed project
- New road/railways would have to be constructed to accommodate proposed project
- Proposed project site is located in an industrially zoned area and lies between existing industrial entities and a military installation (private and military) providing existing compatible uses
- Proposed project site is near existing infrastructure assets such as roads and rails, and also would allow easy access to the AIWW and open ocean
- Current infrastructure of Southport, NC may not be able to support the influx of people associated with the proposed project in terms of housing, utilities, and educational facilities

- Channel widening/deepening required may erode areas of Bald Head Island to the point of property and infrastructure loss
- Brunswick County may not have lands available for new roadway construction
- Establishment of NCIT may create demand for land utilization outside of the facility itself such as for housing, business parks, and shopping malls

Quality of Life

- Homeowners and retirees reside in Southport, NC in order to escape the kinds of business and industry that the proposed project would bring to the area
- Proposed project would adversely affect beaches at Bald Head Island and Oak Island and impede recreational use of regions of the Cape Fear River
- Proposed project would bring increased crime, traffic, industry, and pollution to the Southport, NC area
- Proposed project would spill out into the surrounding community upon exhaustion of lands acquired specifically for NCIT
- Proposed project would pose serious health risks for the community including diseases brought by foreign contaminants

Security

- The proximity of the proposed project to both Military Ocean Terminal Sunny Point and Brunswick Nuclear Plant provides a threat to national security

It is anticipated that due to the interest received during the development of this analysis, there will be a need for extensive coordination with the resource agencies and the public. The issues received to date will be considered in detail should a feasibility study be initiated.

7. FEDERAL INTEREST

Because transportation savings for waterborne commerce is a high-priority project purpose for the Corps of Engineers and because transportation savings in the form of National Economic Development Benefits (NED) appear to exceed the cost of at least one potential alternative, there is a Federal interest in conducting the feasibility study of the minor navigation improvements to the current project at Wilmington Harbor. Because the State of North Carolina indicated they are not interested in pursuing studies associated with NCIT, the PDT makes no finding regarding this alternative.

8. SPONSOR SUPPORT

As the non-Federal sponsor, the State of North Carolina will be required to provide 50 percent of the cost of the feasibility phase.

A letter of intent is required and has been provided by the State of North Carolina stating its willingness and ability to pursue the feasibility study and to share in its cost and indicating an understanding of the cost sharing that is required for potential project construction.

9. SUMMARY OF FEASIBILITY STUDY ASSUMPTIONS

The following assumptions will provide the initial basis for feasibility studies. These assumptions will be added to/revised as needed during future iterations of the planning steps.

- Full analysis of reasonable alternatives would be performed, including the no action alternative to optimize potential feasible alternatives in terms of location and alignment while minimizing environmental effects.
- A detailed economic analysis will be performed in order to identify the effect of proposed improvements.
- Public involvement will be ensured or achieved through public meetings and/or workshops and interagency work group meetings.
- An Environmental Impact Statement (EIS) would be prepared as appropriate to fully document the decision-making process and any recommendation in compliance with NEPA and other statutes.
- The feasibility study and EIS will address alternative methods of disposal of dredged material for any construction and operations and maintenance actions recommended
- Modeling studies conducted during the feasibility phase could include but may not be limited to hydrodynamic, shoreline erosion, saltwater intrusion, ship simulation, and economic models.
- Consideration of alternatives will be fully coordinated with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and other appropriate agencies pursuant to environmental statutes.
- The consideration of alternatives in the study would fully comply with the requirements of the Clean Water Act, as amended and the National Environmental Policy Act.
- Appropriate cultural resources investigations will be conducted within the study area to ensure historic areas are not adversely affected by proposed project plans.
- Additional Hazardous Toxic and Radioactive Waste surveys will be conducted to update existing data and to assess areas of interest not previously studied.
- An analysis of the port's hinterland for import and export commodity needs in regards to increased efficiencies will be performed.

10. FEASIBILITY PHASE MILESTONES

A detailed schedule for the Feasibility Report will be developed and included in the Project Management Plan. It is estimated that it will take 24 months to complete investigations for minor modifications and approximately 48 months to complete a channel deepening study. The Feasibility Study milestones are listed in *Table 7*.

Table 7. Feasibility Phase Schedule Milestones

Feasibility Milestones for Wilmington Harbor Improvements	Estimated End Date
Execute Feasibility Cost Sharing Agreement and Initiate Study	July 2011
Public Workshop/NEPA Scoping	Sept 2011
In-Progress Review	Mar 2012
ATR of FSM materials	Nov 2012
Feasibility Scoping Meeting	Nov 2012
ATR of Draft Report	Jan 2014
Alternative Formulation Briefing	Mar 2014
Draft Feasibility Report/Environmental Impact Statement review Division and HQ	Jun 2014
Public Review of Draft EIS/Feasibility Report (Public Hearing) & Independent External Peer Review	Oct 2014
ATR of Draft Final Report	Nov-2014
Prepare Final Report for Division	Feb 2015
Division Commander's Public Notice	Mar 2015
State and Agency review and prepare responses	Jan 2015
Civil Works Review Board (CWRB)	Apr 2015
Chief's Report	Sept 2015
Report to Assistant Secretary of the Army for Civil Works	Dec 2015
Report to OMB	Feb 2016
Record of Decision	Mar 2016
Project Authorization by Congress via Water Resources Development Act after ASA(CW) and OMB clearance	At discretion of Congress

11. FEASIBILITY PHASE COST ESTIMATE

A detailed Feasibility Phase cost estimate for the Feasibility Report will be developed and included in the Project Management Plan. It is estimated that the Study cost share will be approximately \$2,800,000 Federal and \$2,500,000 local sponsor for a total feasibility cost of approximately \$5,300,000. This study may require an Independent External Peer Review which is currently conducted at Federal expense. This review is estimated at \$300,000. The necessary major work items for the feasibility phase are listed in *Table 8*.

Table 8. Feasibility Cost by Major Work Item

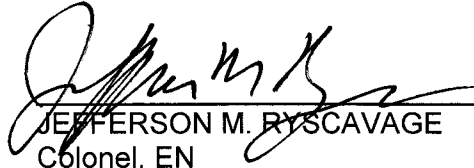
Major Work Items	Study Cost
Public Involvement	\$100,000
Economic Studies	\$400,000
Environmental Studies (Except USFWS CAR)	\$250,000
Cultural Resources Studies/Report	\$100,000
USFWS Coordination Act Report	\$20,000
Plan Formulation & Evaluation	\$350,000
Programs & Project Management	\$250,000
Surveys & Mapping	\$100,000
Hydrology and Hydraulics Studies/Report (Coastal)	\$600,000
Ship Simulation Study	\$300,000
Geotechnical Studies/Report	\$400,000
Engineering & Design Analysis Report	\$300,000
HTRW Studies/Report	\$100,000
Cost support	\$130,000
Cost risk analysis	\$40,000
Value Engineering Study	\$60,000
Real Estate Studies	\$100,000
Agency Technical Reviews	\$300,000
Independent External Peer Review (IEPR) *100% Federal Cost	\$300,000
Dredge material and ocean disposal investigations	\$200,000
Supervision & Administration	\$400,000
Contingencies (assuming 10%)	\$500,000
Total Study Cost (Approximately)	\$5,300,000
Federal	\$2,800,000
Non-Federal	\$2,500,000

12. POTENTIAL ISSUES AFFECTING INITIATION OF FEASIBILITY PHASE

Continuation of this study into the cost-shared feasibility phase is contingent upon an executed FCSA and appropriation of federal and non-federal funding.

13. RECOMMENDATIONS

I recommend that the Wilmington Harbor Navigation Improvement study only proceed into the feasibility phase where limited channel widening, turning basin enlargement, and other modifications at the existing project depth, would be further evaluated for a construction recommendation as supported by the State of North Carolina. Because the state has no interest in pursuing additional studies associated with the NCIT, I make no recommendation on this part of the study.



JEFFERSON M. RYSCAVAGE
Colonel, EN
Commanding

ATTACHMENT 1



Thomas J. Enger
Chief Executive Officer

October 5, 2010

Colonel Jefferson Ryscavage
District Commander
The United States Army Corps of Engineers
Wilmington District
69 Darlington Avenue
Wilmington, NC 28403

Dear Col. Ryscavage:


The North Carolina State Ports Authority expects that the State of North Carolina will not submit by the December 2010 deadline the Letter of Intent associated with the Reconnaissance Study. Therefore, the Authority desires that the U.S. Corps of Engineers, Wilmington District modify its focus and work within the Wilmington Harbor.

The Authority began the Reconnaissance Study process with the belief that the Brunswick County site would more easily accommodate the larger, deeper draft vessels expected to call on East Coast ports once the Panama Canal is expanded. In the absence of the project at the Brunswick County site, the Authority must address the issue of how to accommodate increasing vessel sizes. As a result, the Authority desires to examine more closely improvements that might be made in the Wilmington Harbor that will that could improve access to the Port of Wilmington as well as address other important existing issues in the channel.

The Authority unequivocally supports the modification of the U.S. Army Corps of Engineers Wilmington District Office study to focus on existing, imminent problems in the Wilmington Harbor. Specifically, the Authority strongly encourages the Corps to study known challenges in the Bald Head Portion, Battery Island Portion as well as the current turning and anchorage basin at the Port of Wilmington. The Authority requests that the USACE modify use of available funds to this purpose.

The North Carolina State Ports Authority has long appreciated and benefited from the hard work of your staff. We look forward to continuing that relationship and working with you to ensure our state ports meet the needs of its present and future customers.

Sincerely,



Thomas J. Enger
Chief Executive Officer

NORTH CAROLINA STATE PORTS AUTHORITY
P.O. Box 5912 Wilmington, NC 28402 Tel: 910-343-6212 Fax: 910-343-6237 e-mail: info@ncspa.com
www.ncspa.com

ATTACHMENT 2



YANG MING (AMERICA) CORPORATION
GENERAL AGENTS FOR
YANG MING MARINE TRANSPORT CORPORATION
Phone: 910.793.7508
Fax: 910.799.7661

Dear Mr. Carlson

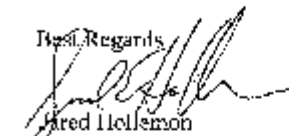
Yang Ming (America) Corp would ask that the NCSPA to address several issues with the US Army Corp of Engineers in regards to channel improvements. The first issue that currently impacts navigation of YML vessels in the Cape Fear River is the turn at Battery Island. On April 9th, 2010 the Cape Fear Pilots notified us that effective immediately they were reducing our anytime arrival draft from 35'-6" to 36'-0" on five of the nine vessels currently calling NLM on the AWIS weekly service. This reduction of anytime arrival draft is due to several factors such as overall length and maneuvering characteristics required of these vessels around the narrow turn. Several years ago the Cape Fear Pilots Association, NCSPA and Yang Ming requested the USACE to study widening the channels around Battery Island. Since that request we have experienced a reduction in anytime arrival draft as well as several delays awaiting tide window for inbound transit.

The second request we would like to propose would be the widening of the turning basin. The current width of the turning (anchorage basin) is below standards required for the larger container vessels currently calling the NCSPA. If the current basin cannot be expanded we would ask the USACE to explore alternate locations as long as the locations remain north of berth 8 & 9.

The third and last request would be the deepening of the ocean bar channel by an additional two feet to support a maximum outbound draft of 42'-0". As sailing draft in most cases is more than arrival draft due to weight of export commodities currently loading at the Port of Wilmington.

With the current expansion of the Panama Canal scheduled for completion in fiscal year 2014 these improvements would allow the NCSPA to safely and efficiently accommodate larger container vessels.

Best Regards,



Fred Hellemson
Port Manager - Mid Atlantic Region
Yang Ming America Corp