



**U.S. ARMY  
CORPS OF ENGINEERS**  
Wilmington District

**INITIAL APPRAISAL  
FOR  
CONTINUED FEDERAL PARTICIPATION  
  
CAROLINA BEACH AND VICINITY  
CAROLINA BEACH PORTION  
COASTAL STORM DAMAGE REDUCTION  
PROJECT  
NEW HANOVER COUNTY, NORTH CAROLINA  
(SECTION 216)**

**JUNE 2010**

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**INTRODUCTION**

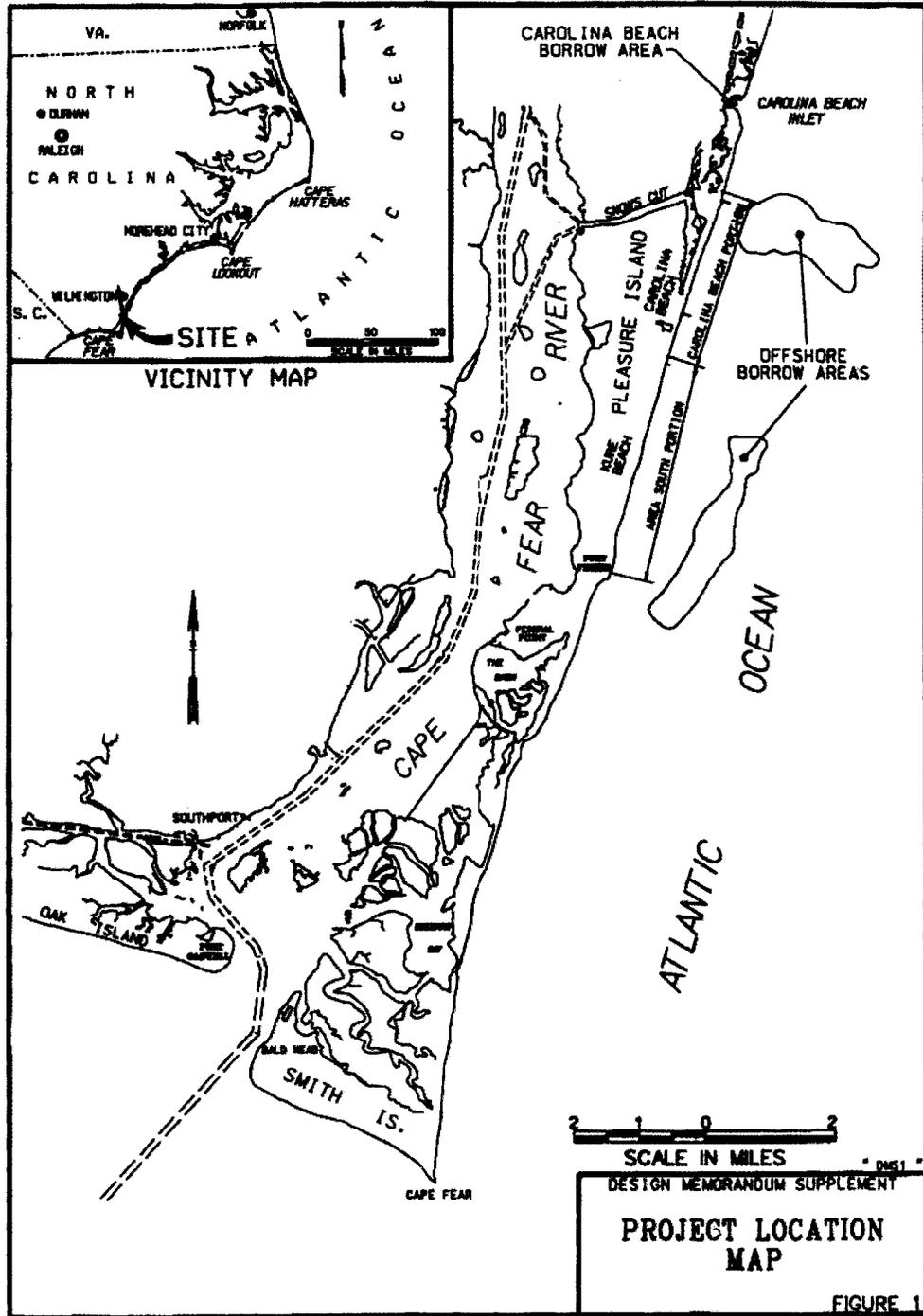
**AUTHORITY**

**Project Authorization:** The Carolina Beach & Vicinity project was authorized under the Flood Control Act of 1962, PL 87-874 (House Document 418, 87<sup>th</sup> Congress, 2<sup>nd</sup> Session). This original authorization provided for "hurricane-flood protection and beach erosion control" along 25,800 feet of ocean shoreline in two separable elements (See Figure 1). The Carolina Beach portion called for protecting 12,750 feet of shoreline within the town limits of Carolina Beach and was initially constructed during the period 1964 to 1982. The Area South of Carolina Beach would protect the adjacent 13,050 feet of shoreline south of Carolina Beach (hereinafter referred to as Area South). A Design Memorandum was prepared in 1967. However, as local interests were unable to comply with the local cooperation requirements, Area South was placed in an inactive status in 1974. Area South was reclassified as active again in 1985 when the Town of Kure Beach expressed an interest in sponsoring the project. A Design Memorandum Supplement and Environmental Impact statement (EIS) were prepared in January 1993. The Area South portion of the project was initially constructed during the period 1996 to 1999.

**Section 216 Authority:** Section 216 of the Flood Control Act of 1970 (PL 91-611) authorizes investigations for review 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.

An Initial Appraisal is the first step in pursuing initiation of studies under this authority. The purpose of the appraisal is to determine if potential problems exist which may warrant further analysis as authorized by Section 216 authority. The appraisal would be limited to the evaluation of existing, readily-available information. Due to the preliminary nature of this appraisal, only limited analytical approaches would be undertaken and best professional judgment would be utilized to the extent practicable. Should the initial appraisal identify problems warranting further study, the district would use the initial appraisal to support initiation of a reconnaissance study.

FIGURE 1: LOCATION OF CAROLINA BEACH PROJECT



**Sponsor:** Town of Carolina Beach, North Carolina for the portion of the project with authorization expiring in 2014. (The town of Kure Beach is the non-Federal sponsor for the portion known as “Area South” which authorization is not expiring.) POC is Honorable Joel Macon, Mayor, Town of Carolina Beach, 1121 North Lake Park Blvd, Carolina Beach, North Carolina 28428. The project sponsor requested the project life be extended in a letter dated February 15, 2008 (see page 13). The Town has expressed their commitment to cost sharing in a feasibility study should a reconnaissance study determine that further Federal participation is warranted.

## **PURPOSE AND SCOPE**

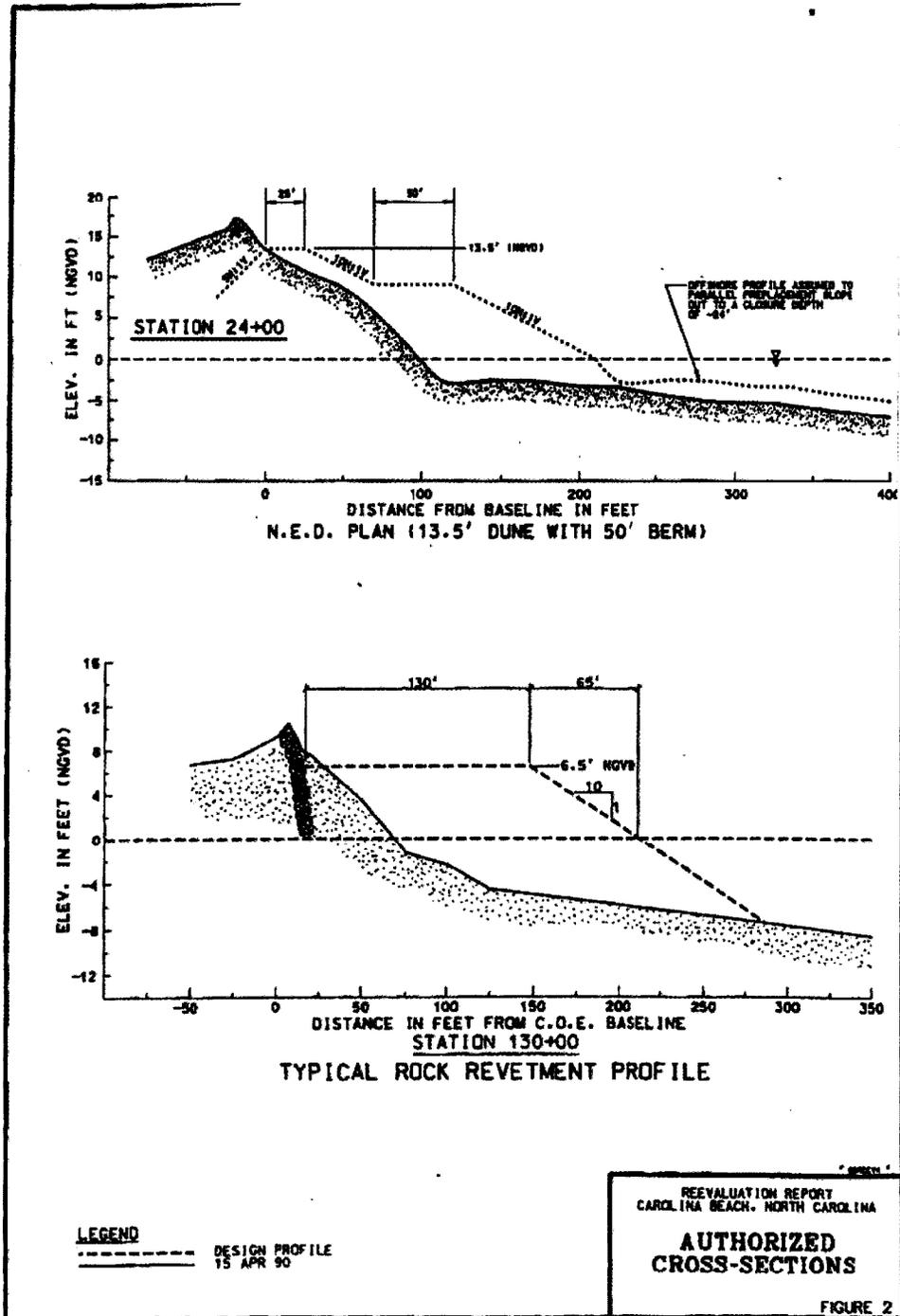
**Overall Purpose:** Even though the Carolina Beach and Vicinity was authorized with 2 separable elements – Carolina Beach Portion and Area South Portion (Authorized through 2048), this Initial Appraisal will address only the Carolina Beach Portion.

The original project was designed to provide for Beach Erosion Control and Hurricane Wave Protection in the area and to match the natural berm height of the beach. In February 1993 a Section 934 Re-evaluation Report was completed establishing that Federal participation in the Carolina Beach portion of the project be extended to 50 years thru 2014 from initiation of initial construction. The design template for Carolina Beach included a dune 25 feet wide at elevation 13.5 feet NGVD fronted by a protective berm 50 feet wide at elevation 10.5 feet NGVD (See Figure 2). The Carolina Beach Portion was originally designed to provide protection against a 100-year storm surge elevation. The design berm width of 50 feet optimized the project’s estimated annual storm damage reduction net benefits at \$4,900,600 for Carolina Beach at 1992 price levels and an interest rate of 8.25 percent. It was originally estimated that the renourishment of Carolina Beach would require 1,159,200 cubic yards every 3 years. Carolina Beach Inlet, located at the north end of Carolina Beach, has been the borrow source for the Carolina Beach Portion of the authorized project.

The Section 934 Re-evaluation Report also proposed two minor changes to the project. The first recommended a permanent pipeline route from Carolina Beach Inlet along the beach to the project area. The second change recommended the acquisition of two parcels of land along the southern shoulder of Carolina Beach Inlet. This recommendation was included as a precautionary measure to be exercised when it was deemed necessary to cut away dry lands which had accreted into the borrow area and severely limited the borrow area capacity.

The purpose of this Initial Appraisal Report is to initiate the process to justify further Federal participation in the Carolina Beach and Vicinity, Carolina Beach Portion, Coastal Storm Damage Reduction Project beyond the initial 50 year life of the existing project.

FIGURE 2: DESIGN OF THE CAROLINA BEACH PROJECT



## GENERAL

**Project Overview:** As stated earlier, the construction of the Carolina Beach Portion was initiated in 1964 with additional construction increments occurring in 1967, 1970, 1971, 1973, 1981 and 1982 for a total placement of 8,217,000 cubic yards. In 1970 and 1973 a 2,050 foot rock revetment wall was constructed at the northern end of the project with the placement of 23,000 tons of stone using PL 84-99 funding. No renourishment occurred between 1974 and 1980. In December 1980 two storms eroded 191,000 cubic yards of material from the already deteriorated project. In 1981 PL 84-99 funds were used to place 250,000 cubic yards in the most deteriorated area between Stations 80+00 and 116+40. Renourishment cycles occurred in the years 1985 (765,000 CY), 1988 (951,000 CY) and 1991 (1,008,000 CY), 1998(1,204,000 CY), 2001(567,000 CY), 2004(800,000 CY), 2007(632,000 CY) and 2010(690,000 CY) using the designated borrow area of Carolina Beach Inlet.

### CAROLINA BEACH INLET DESIGNATED BORROW AREA



Based on past performance of beach fills created with material from Carolina Beach Inlet, the material is very compatible for use as beach fill material on Carolina Beach. As such, it is anticipated that this will be the designated borrow site for the re-authorized project.

## **MAINTENANCE**

Non-Federal project sponsors are responsible for lands, easements, rights-of-way, relocations, and suitable borrow and/or disposal areas required for maintenance of the project. Sponsors are required to monitor their project annually to determine losses of nourishment material from the project design section and to determine impact of project construction on sea turtle nesting. Project inspections include periodic beach profiles, surveys, data collection, and other activities sufficient to document current beach sand volumes. Sponsors are also required to reshape the beach and dune profile using material within the project area and to maintain vegetation, public dune crossovers and other project features associated with the beach and dune. Sponsors shall also provide and maintain necessary access roads, parking areas and other public use facilities open and available to all on equal terms. The replacement of dune vegetation following periodic nourishment and replacement of dune crossovers is also a non-Federal responsibility. The sponsor for the Carolina Beach Portion has fulfilled all of their non-Federal responsibilities to date in accordance with their Project Cooperation Agreement (PCA).

## **RELATED STUDIES**

### **PREVIOUS PL 84-99 ASSISTANCE**

In 1970, and again in 1973, PL 84-99 funds were used to construct a stone revetment totaling 2,050 linear feet was constructed from 13<sup>th</sup> Street to the northern town limit of Carolina Beach. The revetment has a base width varying in width from 35 feet to 50 feet, a crown width of 6 feet and a height of 12.0 feet MLW. A total of 23,000 tons of stone were placed at a cost of \$816,900.

During the period between 1974 and 1980 the Carolina Beach project was not maintained by the Federal Government and the project deteriorated. In 1981, 250,000 cubic yards of sand from Carolina Beach Inlet was placed on the most highly damaged portion of the beach using PL 84-99 funds. Construction was concentrated between Stations 80+00 and 116+40 with transition zones extending from Stations 70+00 to 80+00 and from 116+40 to 125+80.

## **ENVIRONMENTAL SETTING AND NATURAL RESOURCES**

### **STUDY AREA**

The Carolina Beach and Vicinity project has two separable elements as authorized by the 1962 Flood Control Act. The entire project, 25,800 linear feet (4.89 miles) of ocean front shoreline is located in the southern part of New Hanover County, North Carolina. It includes portions of the Town of Carolina Beach and the Town of Kure Beach. As stated previously, this Initial Appraisal Report will address only the Carolina Beach Portion.

### **SOCIO-ECONOMIC STRUCTURE**

Carolina Beach is a town in New Hanover County, North Carolina, located 13 miles south of Wilmington on Pleasure Island. Pleasure Island was formed when the construction of the Atlantic Intracoastal Waterway constructed Snow's Cut and separated Federal Point from the mainland. The town has a land area of 2.4 square miles, including 2.2 square miles of land and 0.2 square miles of water. The year-round resident population is about 6,000, an increase of 25 percent since the 2000 census. The population density is about 2,400 persons per square mile. Per capita income for 2008 is estimated at \$24,000 and median household income at \$45,000 with about 9% of the population living in poverty. The population of Carolina Beach expands to an estimated 15-20,000 during summer months. (Information on Kure Beach is not included because it's not proposed for re-evaluation.)

### **FISH AND WILDLIFE RESOURCES**

**Endangered Species:** Since all aspects of the proposed work will occur either in the ocean or on the ocean beach, the project will not affect any listed species occurring in forested or freshwater habitats. Thus, species such as the red cockaded woodpecker and rough-leaved loosestrife will not be affected by the proposed action.

Species that could be present in the project area during the proposed action are the blue, finback, humpback, right, sei, and sperm whales. Also, the hawksbill, Kemp's ridley, leatherback, loggerhead, and green sea turtles could occur in the project area. However, loggerheads and greens are the primary sea turtle nesters. The Florida manatee rarely visits the area but they do pass through when moving up the coast where they have been seen in various locations throughout North Carolina. The piping plover is an occasional visitor and winters adjacent to the area. The U.S. Fish and Wildlife Service (USFWS) has designated critical habitat for the wintering piping plover on the northern end of Carolina Beach (North Carolina Piping Plover Unit, NC-14). Sea-beach amaranth is also found on both Carolina Beach and Kure Beach during the summer.

Within the EA/FONSI for Carolina Beach and Vicinity project dated October 1993, the U.S. Army Corps of Engineers, Wilmington District (USACE), requested that formal

consultation be initiated for the proposed project with the USFWS and the National Marine Fisheries Service (NMFS) pursuant to Section 7 of the Endangered Species Act of 1973, as amended. The USACE requested USFWS to combine their Biological Opinion for the Carolina Beach – Area North and the Carolina Beach and Vicinity – Area South. The NMFS stated that the project is not likely to adversely affect threatened or endangered species under their jurisdiction. USFWS provided the USACE with a biological opinion dated August 9, 1993. The findings from the USFWS' BO dated August 9, 1993 stated that the proposed project would not jeopardize the continued existence of the loggerhead sea turtle, green sea turtle, and sea beach amaranth. Prior to construction, USFWS will be notified so that the piping plover (and its designated habitat) will not be adversely impacted.

Within the EA/FONSI for the Proposed Change in Construction Schedule, Carolina Beach and Vicinity-Area South dated July 1995, the USACE requested that formal consultation be initiated for the proposed project with the USFWS and the National Marine Fisheries Service (NMFS) pursuant to Section 7 of the Endangered Species Act of 1973, as amended. By letter dated May 18, 1995, the NMFS stated that the project is not likely to adversely affect threatened or endangered species under their jurisdiction. USFWS provided the USACE with a biological opinion dated June 20, 1995. The findings from the USFWS' BO dated June 20, 1997 stated that the proposed project would not jeopardize the continued existence of the loggerhead sea turtle, green sea turtle, and sea beach amaranth. Prior to construction, USFWS will be notified so that the piping plover (and its designated habitat NC-14) will not be adversely impacted. The USACE, Wilmington District will comply with all reasonable and prudent measures provided in the USFWS' BO's dated August 9, 1993 and June 20, 1995 will be met for the proposed action. Reasonable and prudent measures that relate to construction timing include:

- All work will be conducted between November 30 and April 30 of any year. All equipment (i.e., staging areas and pipeline) will be off the ocean beach by April 30.
- Visual surveys for escarpments along the project area will be made immediately after completion of the project and prior to May 1. If escarpments are found exceeding 18 inches in height for a distance of 100 feet, they will be leveled prior to the sea turtle nesting season.
- After completion of the project and prior to 1 May, the beach may be tilled to reduce sand compaction. Prior to any beach tilling, coordination with representatives from the NC Wildlife Resources Commission will be undertaken.

Adherence to the above precautions and those found in the referenced USFWS BO's should minimize the effects to nesting sea turtles and emerging sea turtle hatchlings. This project will continue to recreate lost habitat and protect existing turtle nesting habitat.

## **Executive Order 11988: FLOOD PLAIN DEVELOPMENT**

The Carolina Beach and Vicinity project is in the base flood plain (100 year flood) and has previously been evaluated in accordance with Executive Order 11988. Relocation of the Carolina Beach and Vicinity project outside the flood plain is not possible since it is located on an island and fronts the Atlantic Ocean. Relocation of the project would also not be responsive to the problems and needs of the study area. A non-flood plain alternative for the potential development with the project would be to restrict all future development to those areas outside the flood plain or elevated above the flood plain. Potential flood plain development with the project area would be restricted as a result of local ordinances and State law. Any induced potential damage as a result of project implementation would be minimal. The project would have minimum impact on the natural and beneficial values of the flood plain. In the without project flood plain (that area immediately adjacent to the proposed project), there will be minimal loss of natural resources due to potential development.

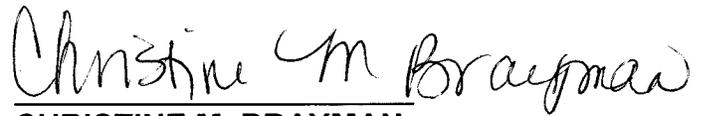
### **Public Accessibility**

As part of the obligations established in the Project Cooperation Agreement for the Carolina Beach and Vicinity, Carolina Beach Portion Shore Protection Project, the non-Federal sponsor shall assure continued conditions of public ownership and public use of the shore upon which Federal participation is based during the economic life of the project. The non-Federal sponsor shall also provide and maintain necessary access to roads, parking areas, and other public use facilities, open and available to all on equal terms.

Federal law defines periodic nourishment as 'construction' for cost-sharing purposes, and requires that Federal participation be dependent on conditions of shore ownership and use at the time of construction. In the determination of the Federal interest in cost sharing, Federal participation will be limited to areas where adequate parking and access are available. For shoreline reaches farther than ¼ mile from public parking and/or beach access points, Federal participation will not be provided. The maximum Federal participation allowable for each land use category is applied for cost sharing. Per the current authorized project's PCA, the Federal cost-share is 65%. During a public access and parking inventory prior to the most recent nourishment cycle in 2010, there was little to no change noted during this analysis that warranted adjusting the Federal participation cost-share thus Federal cost-share participation for this project remained at 65% and no modification of the PCA was required. This determination was made based on a field verification using the authorizing documents as a baseline and through coordination with the sponsor. Therefore, there is reasonable public availability of the project beaches in all areas where Federal Participation is provided.

## RECOMMENDATIONS

Based on the fact that a Coastal Storm Damage Reduction project for Carolina Beach was constructed between 1964 and completed in 1982 and ends its authorized schedule for Federally Cost-Shared Renourishment in 2014, and other information developed during preparation of this initial appraisal, I find that there is sufficient reason to investigate and determine if there is a Federal interest in continuing with the Project with the preparation of a Reconnaissance Report. Should the determination be made that there is a Federal interest in continuing with this project, then a feasibility-level report should be initiated for analyzing alternatives including continuing renourishment or possible modifications of the project.



**CHRISTINE M. BRAYMAN**

**Deputy District Engineer for**

**Programs and Project Management**

Joel Macon  
Mayor

Alan Gilbert  
Councilman

Jerry Johnson  
Councilman



Dan Wilcox  
Mayor Pro Tem

Pat Efrid  
Councilwoman

Timothy Owens  
Town Manager

**TOWN OF CAROLINA BEACH**  
1121 N. Lake Park Boulevard  
Carolina Beach, North Carolina 28428  
910 458 2978  
FAX 910 458 2997  
<http://www.townsofcarolinabeach.org>

February 15, 2008

Colonel John Pulliam  
District Commander  
Wilmington District, US Army Corps of Engineers  
Post Office Box 1890  
Wilmington, NC 28402-1890

Dear Colonel Pulliam,

On behalf of the Town of Carolina Beach, I would like for the U.S. Army Corps of Engineers to assist the Town in extending the life of the Town's shoreline protection project. For approximately 40 years, the Town of Carolina Beach has benefited from a shoreline protection project. The shoreline protection project is necessary to protect the many structures along our coastline that could be impacted by large storms. This project becomes even more important to the Town due to the uncertainty that global warming may play on frequency, duration and severity of events. As a secondary result of the shoreline projection project, the ocean beach continues to be our main economic engine and the Town continues to be a destination for visitors from outside the area.

It is our understanding that the Town's shoreline protection project will expire in 20014. In order to proceed in the process of having our project extended, I understand that the Town must have a 216 study performed. We are formally requesting that the U.S. Army Corps of Engineers assist us with the 216 study and we will cost share in the study as may be appropriate.

In closing, we value our relationship with the U.S. Army Corps of Engineers. Your assistance is always appreciated. If you have any questions regarding the matter, please contact me at (910)458-2996.

Sincerely,

Timothy W. Owens  
Town Manager

Cc: Town Council  
Glenn McIntosh

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