From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL]
Date: Saturday, January 24, 2015 1:24:52 PM

Mr. Crumbley:

With regards to the Ocean Isle Beach terminal groin project (SAW-2011-01241), I am opposed to the project. Terminal groins are not long term solutions to beach erosion issues, often causing erosion in adjacent areas. They are not a wise use of limited financial or human resources. With climate change upon us, beach erosion is going to accelerate and these problems will become more frequent and larger. This in addition to the fact that these are transient barrier islands and we can not engineer our way around erosion problems.

Thank you for listening.

[redacted]

Sent from Windows Mail

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] Comment on Project for Terminal Groin Ocean Isle Beach
Date: Tuesday, January 27, 2015 1:06:58 AM

Thank God! We desperately need this. I pray that the Application from the Town of Ocean Isle will be approved and construction started ASAP.

We have worked long and hard to obtain this. This is so exciting for all property owners there. BRING IT ON!

Thank you so very much.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

From:	Stanley, Joyce
To:	Crumbley, Tyler SAW
Subject:	[EXTERNAL] Comments on the Draft Environmental Impact Statement (DEIS) Town of Ocean Isle Beach Shoreline Management Project, NC - ER 15-0078
Date:	Friday, March 06, 2015 12:06:10 PM
Attachments:	Town of Ocean Isle Beach Shoreline Management Project - ER 15-0078.doc

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Joyce A. Stanley, MPA
Regional Environmental Protection Specialist
US Department of the Interior
Office of Environmental Policy and Compliance
(404) 331-4524 - Office
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United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Richard B. Russell Federal Building
75 Spring Street, S.W., Suite 1144
Atlanta, Georgia 30303

ER 15/0078
9041.3b

March 16, 2015

Mr. Tyler Crumbley,
Project Manager
Wilmington Regulatory Division
U. S. Army Corps of Engineers
69 Darlington Ave.
Wilmington, NC 28403 -1343

Re: Comments and Recommendations on the Draft Environmental Impact Statement for the Town of Ocean Isle Beach Management Project, North Carolina

Dear Mr. Crumblev:

The U.S. Department of the Interior (Department) has reviewed the Draft Environmental Impact Statement (DEIS) for the Town of Ocean Isle Beach Shoreline Management Project. We offer the following comments in accordance with the National Environmental Policy Act (NEPA), Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. l53l et seq.), and the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

Project Description

The project is on the oceanfront of the eastern end of Ocean Isle Beach, adjacent to Shallotte Inlet and the Atlantic Ocean, in Brunswick County, North Carolina. According to the DEIS, the purpose of the proposed project is to mitigate chronic erosion on the eastern portion of the Town's oceanfront shoreline so as to preserve the integrity of its infrastructure, provide protection to existing development, and ensure the continued use of the oceanfront beach along this area.

The applicant's preferred alternative includes construction of a 750 lf terminal groin with a 300 lf anchorage system. The applicant also proposes to dredge portions of Shallotte Inlet every five years and place 264,000 cubic yards (cy) of beach fill along approximately 3,214 lf of shoreline west of the terminal groin. Beach fill, groin construction, and sand fillet maintenance activities are proposed to be conducted between November 16 and April 30. The preferred alternative also

includes the continuation of the Corps of Engineers Coastal Storm Damage Reduction (CSDR) project on Ocean Isle Beach.

Federally-listed species

The following Federally- listed species are found within the project area: West Indian manatee (Trichechus manatus), piping plover (Charadrius melodus), red knot (Calidris canutus rufa), seabeach amaranth (Amaranthus pumilus), and the Kemp's ridley (Lepidochelys kempi), hawksbill (Eretmochelys imbricata), leatherback (Dermochelys coriacea), loggerhead (Caretta caretta), and green (Chelonia mydas) sea turtles. Whales, shortnose sturgeon (Acipenser brevisrostrum), Atlarftic sturgeon (Acipenser oxyrinchus), and sea turtles in the water are under the jurisdiction of NOAA Fisheries' Protected Species Division.

Of the five sea turtle species, the leatherback, loggerhead, Kemp's ridley, and green sea turtle may nest in the project area. On July 10, 2014, the Department designated Critical Habitat for the Northwest Atlantic Ocean distinct population segment of the loggerhead sea turtle. Critical Habitat Unit LOGG-T-NC-08 is just east of the project area on Holden Beach.

Piping plover critical habitat unit NC-17 is located in Shallotte Inlet and on Holden Beach, east of the proposed project. The entire unit is privately owned. This unit begins just west of Skimmer Court on the western end of Holden Beach. It includes land south of SR 1116, to where densely vegetated habitat, not used by the piping plover, begins and where the constituent elements no longer occur to the MLLW along the Atlantic Ocean. It includes the contiguous shoreline from MLLW to where densely vegetated habitat, not used by the piping plover, begins and where the constituent elements no longer occur along the Atlantic Ocean, Shallotte Inlet, and Intracoastal Waterway stopping north of Skimmer Court Road. The unnamed island and emergent sandbars to MLLW within Shallotte Inlet are also included.

On December 11, 20l4, the Department listed the rufa red knot (or red knot) as threatened throughout its range. The rule became effective on January 12, 2015. Please refer to 79 FR 73706 for more information on the listing of the red knot.

The Corps has determined that the proposed project may affect federally listed endangered or threatened species, and has requested initiation of formal consultation. Potential affects to the piping plover, red knot, West Indian manatee, seabeach amaranth, and sea turtles are being addressed through formal consultation. Therefore, this letter primarily addresses comments concerning the project itself and the DEIS.

We recommend that the proposed project not be authorized. The proposed project has the potential to adversely affect nesting female sea turtles, nests, and hatchlings on the beach, piping plovers, red knots, and seabeach amaranth within the proposed project area.

Potential effects to sea turtles include disorientation of hatchling turtles on beaches adjacent to the construction area as they emerge from the nest and crawl to the water as a result of lighting or presence of the groin, and behavior modification of nesting females during the nesting season resulting in false crawls or situations where they choose marginal or unsuitable nesting areas to

deposit eggs due to escarpment formation or presence of the groin within the action area. The presence of the groin could affect the movement of sand by altering the natural coastal processes and could affect the ability of female turtles to nest, the suitability of the nest incubation environment, and the ability of hatchlings to emerge from the nest and crawl to the ocean. The presence of the groin may create a physical obstacle to nesting sea turtles, and the proposed groin is anticipated to result in decreased nesting and loss of nests that do get laid within the project area for all subsequent nesting seasons following the completion of the proposed project.

Potential effects to piping plover and red knots include degradation and loss of habitat, particularly down-drift of the structure. Groins can act as barriers to longshore sand transport and cause downdrift erosion (Hayes and Michel 2008), which prevents optimal habitat creation by limiting sediment deposition and accretion. The proposed action has the potential to adversely affect wintering and migrating red knots, wintering and migrating piping plovers and their habitat from all breeding populations, and breeding piping plovers from the Atlantic Coast breeding population that may use the project area. Potential effects to piping plover and red knot include direct loss of foraging and roosting habitat in the Action Area and in the updrift and downdrift portions of the project area, degradation of foraging habitat and destruction of the prey base from sand disposal, and attraction of predators due to food waste from the construction crew. Plovers and red knots face predation by avian and mammalian predators that are present year-round on the wintering and nesting grounds. Although the piping plover is not currently known to nest in the Action Area, the stabilization of the shoreline may also result in less suitable nesting habitat for all shorebirds, including the piping plover.

Structural development along the shoreline and manipulation of natural inlets upset the naturally dynamic coastal processes and result in loss or degradation of beach habitat (Melvin et al. 1991). As beaches narrow, the reduced habitat can directly lower the diversity and abundance of biota, especially in the upper intertidal zone. Shorebirds may be impacted both by reduced habitat area for roosting and foraging, and by declining intertidal prey resources (Defeo et al 2009; Dugan and Hubbard 2006). Shorebird habitat has been, and may continue to be, lost where hard structures have been built (Clark in Farrell and Martin 1997). In addition to directly eliminating red knot habitat, hard structures interfere with the creation of new shorebird habitats by interrupting the natural processes of overwash and inlet formation. Where hard stabilization is installed, the eventual loss of the beach and its associated habitats is virtually assured (Rice 2009), absent beach nourishment, which may also impact piping plover and red knots. Where they are maintained, hard structures are likely to significantly increase the amount of piping plover and red knot habitat lost as sea levels continue to rise.

Potential impacts to seabeach amaranth include burying, trampling, or injuring plants as a result of construction operations and/or sediment disposal activities; burying seeds to a depth that would prevent future germination as a result of construction operations and/or sediment disposal activities; and, destruction of plants by trampling or breaking as a result of increased recreational activities. The Applicant proposes to place sand between November 15 and March 31 of any given year. However, given favorable weather, seabeach amaranth plants may persist until January. Therefore, there is still the potential for sand placement to adversely impact plants in the Action Area. Indirect impacts to seabeach amaranth include degradation of habitat from stabilization of the shoreline.

The Department has significant concerns for the estimation of costs of the five alternatives. In Chapters 2 (Purpose and Need), 3 (Alternatives), 5, and 6, and Appendix A, the DEIS discusses 45 dwellings and 238 total parcels which are threatened by erosion for the next 30 years. The predicted loss or protection of these 238 parcels factors heavily in the estimated costs of each alternative. For example, on pages 27 and 28 in the discussion of the 30-year cost of Alternative 1 (No Additional Action) and Alternative 2 (Abandon/Retreat), the loss of the 238 parcels is estimated to cost $21.39 million. Conversely, the discussion of Alternative 5 (Terminal Groin with Beach Fill), the applicant's preferred alternative, makes no mention of the number of parcels that may be lost or protected by the proposed groin, and does not factor in the costs of parcel losses.

However, there is no figure showing 238 parcels and very little description in the text. Page25 states that there are “"238 parcels east of station 15+00 (located just west of Shallotte Boulevard); 45 of which have homes. All of the parcels and homes are vulnerable to erosion damage over the next 30 years, should the past erosion trends continue." A quick count of the number of parcels shown in the DEIS as affected by erosion up to year 2045 (in Figure 3.1) indicates that there are approximately 88 parcels total (this estimate is high, as some are already below high tide, and some are west of station 15+00). The DEIS does not indicate where the other 150 or so parcels are. A review of the Town's zoning map (accessed at http://www.oibgov.com/userfiles/File/Zoning_Map_Current.pdf on March 4, 2015) and information from the Brunswick County Register of Deeds (accessed March 4, 2015) indicates that most, if not all of the other 150 parcels are likely waterward of the existing shoreline, within the footprint of the proposed project, or east (downdrift) of the proposed terminal groin location. Many of these parcels are already below the high tide line and are currently unbuildable. If this is the case, then the terminal groin will not protect the majority of these parcels from erosion, as some are already lost to erosion, and the parcels to the east of the groin will receive no protection at all. East of the proposed groin, underwater parcels will remain underwater, and any buildable parcels will be threatened (and perhaps lost) due to increased erosion from the presence of the groin.

The DEIS should be revised to accurately reflect the situation of all of the parcels in the project area and the estimated losses for each alternative. Parcels that are mostly waterward of the current shoreline, within the footprint of the proposed groin, or east of the proposed groin should be considered a loss, and the costs of those losses should be added to the annual and 30-year costs of Alternative 5. The predicted loss of parcels due to Alternatives 3 and 4 should also be calculated and included in the estimated costs, as it is unlikely that many of the parcels east of station 0+00 will be protected or recovered from either of these alternatives. We note that including these costs will significantly increase the overall costs of the three build alternatives.

On Page 4, the Table in Appendix D should be revised to provide a consistent comparison of costs between the five alternatives. Currently, the costs for Alternative 5 are shown as annual and 5-year costs, while the cost of other alternatives is shown for a 30-year period.

Table 3.10 on Page 44 lists Long-Term Erosion Damages and Response Costs for Alternatives 1 and 2, but shows these costs as $0 for Alternatives 3 and 5. However, the Department does not believe that there will be no erosion damages or response costs over 30 years in the project area,

regardless of alternative chosen. Large winter storms, hurricanes and other named storms all have the potential to cause significant erosion and response costs. Page 116 in Chapter 5 states that the future impacts on development on the east end of Ocean Isle Beach was evaluated based on the continuation of erosion trends determined from surveys obtained between 1997 and 2010. There is no rationale provided for using this timespan as a baseline. Although there were several named storms that passed in the vicinity of Ocean Isle Beach during this time, only one passed over the island (with sustained winds of 35 mph), none of them had winds over 70 mph, and at least half of them had winds of less than 40 mph (http://coast.noaa.gov/hurricanes/ accessed March 6, 2015). If a 30-year timespan had been used (from 1984 to 2014), erosion from a category 4 hurricane (Hurricane Hugo) could have been included in the analysis.

The 13-year baseline also does not provide the same potential level of impacts from sea level rise. The North Carolina Coastal Resources Commission (CRC) Science Panel predicted in December 2014 that the relative sea level rise by 2045 in Southport, North Carolina would be at least 1.9 inches, and as high as 8.5 inches (Draft CRC Science Panel Sea Level Report, December 31, 2014). Considering the historic rates of sea level rise presented on page 132 (8.16 inches per century in Wilmington, and 1.03 feet per century in Charleston), sea level may rise at a minimum of 2.45 inches to 3.71inches over the next 30 years. The DEIS states that there will be no direct or indirect impacts in the project area from such an increase. However, regardless of the alternative, it is likely that dwellings, particularly those on the oceanfront will be impacted by increases in sea level rise over the next 30 years. Because sea level rise is not consistent through time and space, the impacts are often most first noticed when a storm-surge or spring tides occur. Over the 30-year proposed project life, it is more likely that named storms would cause erosion despite the precautions taken, and that costs would be incurred for beach bulldozing, additional emergency nourishment, or other response activities. Further, if the presence of the groin encourages development of currently undeveloped parcels that are on the oceanfront or waterward of current dwellings, erosion and response costs (beach bulldozing, emergency sand placement, infrastructure repair, demolition and solid waste costs) could be expected over the life of the project for Alternative 5 that would not be expected for the other 4 alternatives. The DEIS is silent on this issue.

Also in Table 3.10 on Page 44, the Department recommends that the $21.39 million included for loss of parcels be revised to remove costs for parcels which are currently under water or within the footprint or east of the proposed terminal groin. Since most of these parcels are already unbuildable, and the terminal groin will not provide significant improvement in condition, the loss of them should not be counted for Alternatives 1 and 2 if they are not counted in the other alternatives.

On page 63 in Chapter 4, the reference to Figure 4.12 is in error. Please revise.

On pages 74-76 in Chapter 4, please update the sea turtle nesting data for all species to include 2013 and 2014 data. A green sea turtle nested in Holden Beach in 2013.

On Page 97, Figure 4.14, the Department recommends that the written description of the piping plover critical habitat be used, rather than the old shape file.

Please update Chapter 4 to include red knot records.

The DEIS does not adequately address accelerated erosion downdrift of the groin or the potential impacts from downdrift erosion and regular dredging (every five years to maintain the groin, every three years for the Corps CSDR project). Chapter 5 (page 175) and Appendix C change the topic from potential impacts of this groin on sand transport and intertidal habitats in Shallotte Inlet to a discussion of the impact of the Oregon Inlet jetties on Pea Island. Oregon Inlet and Shallotte Inlet are very different systems, and the DEIS does not explain how they are comparable. We note that there is no habitat above MLLW (including no intertidal habitat) downdrift of the Oregon Inlet jetty, and the stabilization of the shoreline within the sand fillet of the jetty has resulted in degradation or loss of intertidal habitats. The DEIS (page 176) states that the model shows the loss of approximately I-2 acres of intertidal habitats in Shallotte Inlet due to the project, but that habitat is expected to persist and recover within 2 years of dredging based on the rate of infill that currently occurs. However" the rate of infill that is referenced is not the rate that will occur after the groin is constructed, since the model shows that the rate of sediment transport will be reduced. There is no discussion in Chapter 5 or Appendix A of the expected passage rates of sand across the groin, or the expected infill rate after construction, and based on the information provided, it is not possible to determine impacts of the groin on the persistence or formation of intertidal shoals and flats in Shallotte Inlet.

On Page 177, please change "nesting habitat for seabeach amaranth..." to "habitat for seabeach amatanth. . . ."

On Page 178, the DEIS should address the indirect impacts of stabilization of a dynamic system. The DEIS states that the "increase in stable dry beach as a result of the implementation of Alternative 5 is considered more advantageous to resident and migratory fauna." However, the resident and migratory fauna, particularly the shorebirds such as piping plover and red knot, rely on the dynamic coastal processes such as overwash, to provide optimal foraging, roosting, and nesting habitat. The presence of the groin and other hard structures prevents such processes. In addition, groins accelerate erosion on the downdrift side, thereby causing direct and indirect impacts to the dry beach and intertidal habitats.

In Chapter 5 and Appendix A of the DEIS, the accretion and erosion patterns indicated by the Delft3D model are shown only for three years post-project. Given that this is a 30-year project, and the groin is proposed to be on a 5-year maintenance schedule, the DEIS should clarify why only three years of modeling is shown. In addition, no modeling runs are included to show the expected accretion or erosion patterns for Alternative 4. Information for Alternative 4 should be added to the DEIS.

On Page 62 of Appendix A, the DEIS states that the model results for Alternative 1 underestimated the sediment retention rate of the borrow area, and that the modeled rate was approximately 80% of the measured rate. According to page 62 of the DEIS, the modelers assume that all of the other model runs also underestimated the sediment retention rate in the borrow area by the same amount, and adjusted the modeled rates for the terminal groin alternative without further justification. Alternatives 2, 3, and 4 were not considered in this exercise on page 2 or in Table 4.15, and only Alternatives 1 and 5 are used to compare model

volume changes in the Shallotte Inlet complex. The Department recommends that information for Alternatives 2-4 be included in Table 4.15 of Appendix A.

As stated above, the Department recommends that the project, as currently proposed not be authorized, due to potential impacts to piping plovers, red knot, seabeach amaranth, and sea turtles. We recommend that the Final EIS incorporate our comments listed above. Thank you for the opportunity to comment on this project. If you have questions concerning these comments, please contact Kathy Matthews on (919) 856-4520, Ext. 27 or via e-mail at Kathryn_matthews@fws.gov. I can be reached via email at joyce_stanley@ios.doi.gov or on (404) 331-4524.

Sincerely,

Joyce Stanley, MPA
Regional Environmental Assistant

cc:
[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] Draft Environmental Report Ocean Isle Beach
Date: Sunday, February 22, 2015 5:04:42 PM

Hello Mr. Crumbley,

I'm also a Federal employee (DoD...you can look me up in the global) so I realize that asking for a draft of a report may be a little premature. However, I received your name from some other property owners at Sunset Beach and thought I would ask if it was really available.

Thanks

[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] No groion on any the southern most islands on NC coast
Date: Saturday, March 07, 2015 5:31:52 PM

Having grown up in NC and visiting Sunset Beach Island since 1968, I do not want anybody screwing around with Mother Nature trying to change our beaches. Just look at Cape Hatteras to see how Mother Nature did what it wanted to do regardless of what the Corp tried to do to keep the Ocean at bay. So stop wasting taxpayers money and let Mother Nature run her course.

[redacted]
Living on
sunset Beach Island

[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] No on the groin
Date: Friday, February 27, 2015 1:26:10 PM

Spending $46 million to protect property worth $7.5 million is not very smart. I'm opposed to hardening North Carolina's shore. I vote against this groin.

[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] ocean isle beach terminal groin
Date: Thursday, March 12, 2015 6:11:27 PM

Hi,
Considering al the applications and meetings that have taken place, In your opinion what is the likelihood that the terminal groin project will be built at ocean isle beach, NC
Thank you for your opinion, I understand this will not be fact.
[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] Ocean isle terminal groin
Date: Saturday, February 28, 2015 10:09:55 AM

We can not alter sea life and the process the earth naturally takes by engineers to save two dozen homes.

I am being stated now for the record that I will not have my taxes increased for the

Natural occurring effects of what our precious earth wants back.

Stop the Greed, karma is a .....

[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] OIB Groin
Date: Saturday, February 21, 2015 3:50:52 PM

Please do not consider approving the Terminal Groin at the east end of the island. It is mind boggling to me that NC or the Core of Engineers can justify causing erosion on one part of our coastline by constructing something that, in all likely hood, will not be a definite or likely a permanent solution to the problem at hand. Why on God's green earth do people make decisions that negatively impact the environment and others with no regard for either.

[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] OIB terminal groin
Date: Thursday, February 05, 2015 3:56:26 PM

We would like to make the comment that we are all for the terminal groin at OIB and think that it is a wonderful project.

[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] OIB Terminal Groins
Date: Sunday, March 01, 2015 4:35:41 PM

I wish to express my concern and opposition to the proposed terminal groin project at Ocean Isle Beach, NC.

While this project may benefit a small number of property owners on the east end of Ocean Isle Beach, it will CAUSE erosion on other parts if the island, Sunset Beach and possibly Holden Beach. Sunset Beach is actually accruing sand and never has a penny been spent there for beach renourishment. The terminal groins would certainly change that!

Please look out or the best interests of ALL property owners and tax payers in Brunswick County and DO NOT allow terminal groins at Ocean Isle Beach.

Thank you or your consideration.

Sincerely,

[redacted]

Sent from my iPad

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] OIB
Date: Saturday, March 14, 2015 8:45:14 AM

Tyler Crumbley
U.S. Army Corps of Engineers

The terminal groin at Ocean Isle Beach will be a great option for the stabilizing of the beach at the east end. We need to save our natural resources, so we are very much in support of this project.

Thanks

[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] Project # SAW-2011-01241 -Ocean Isle Beach Terminal Groin proposal
Date: Friday, February 27, 2015 12:58:15 PM

Dear Mr. Crumbley,

I am writing to you in opposition to the proposed terminal groin project for the Shallotte Inlet near Ocean Isle Beach. Terminal groins are detrimental to the environment and not worth the significant financial cost. They often cause damage to beaches located south of the groin. I understand that there are property owners who feel their interests are being threatened, but it is not up to taxpayers to fight a battle that these property owners should have expected. As a homeowner on Topsail Island, I built there with the full knowledge that I was investing in property on a barrier island. I understand that the geography of a barrier island is ever-changing and I do not expect others to pay the cost of my own personal decision. Investing taxpayer money in such a project is foolish and wrong.

I ask that the US Army Corps of Engineers not approve this proposal.

Thank you for your consideration.

Regards,
[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] Proposed Ocean Isle Beach Terminal Groin
Date: Saturday, March 07, 2015 5:22:08 PM

Dear Sir:

It is unfortunate that some people foolishly built or bought homes in a fragile and transient environment on the east end of Ocean Isle Beach. However, there is no point in throwing good money after bad.

I am writing you to express my opposition to the proposed terminal groin to be placed on the east end of Ocean Isle Beach. This proposal is both wasteful from the standpoint of taxpayer funds and unsound from a scientific perspective. Placement of a groin on the east end of Ocean Isle Beach may reduce erosion on the east end, but it will accelerate erosion on the middle of Ocean Isle beach. The net benefit will be zero at best. It also may be harmful to the marine eco system on adjacent inlets.

[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] Public Comments by David Eastburn for Project: SAW-2011-01241 (Draft E.I.S.)
Date: Friday, March 13, 2015 1:23:11 PM
Attachments: Public Comments by DAE.pdf
Map3.pdf
Map2.pdf
Map1.pdf
Map4.pdf

Dear Mr. Crumbley,

Attached is a letter containing my comments about the Draft Environmental Impact Statement for Project SAW-2011-01241. Thank you for the opportunity to comment on this controversial project. If you have any questions about my comments or wish to discuss them in more detail, please contact me via email at [redacted] or by phone at [redacted].

Sincerely,

[redacted]
Concerned Citizen
Sunset Beach, NC

March 12, 2015 (via e-mail)

Re: Project SAW-2011-01241 (Draft Environmental Impact Statement)

TO: Mr. Tyler Crumbley
U.S. Army Corps of Engineers
Wilmington Regulatory Division
69 Darlington Avenue
Wilmington, NC 28403

FR: [redacted]
Homeowner
Sunset Beach, NC
---Mailing Address---
[redacted]
[redacted]

Dear Mr. Crumbley,

I have followed this project with great interest from its outset. I attended and spoke at the recent public meeting held in Shallotte on March 3, 2015. Please consider these written comments as supplemental to and further clarification of the comments I made at that meeting.

First, I have great sympathy for those individual homeowners who have lost property as a result of erosion and storm damage at the east end of the island of Ocean Isle Beach. This is truly tragic.

However, I do not believe that taxpayers should bear the expense of protecting or enhancing the property values of a select few. While the Town of Ocean Isle Beach claims they will pay for this project, we all know that Federal, State, County and Town taxpayer money has already been spent and will continue to be.

If this project is ultimately approved, in addition to the assurances and other remedies outlined below, the Town of Ocean Isle should establish a special tax district to incur the incremental cost of installation, maintenance and mitigation required by this project. Such special tax districts are common, for instance, to maintain canals or other infrastructure specific to that geographic area and serve to minimize expense to other taxpayers.

The **Project Description** (taken directly from the Public Notice dated January 23, 2015) reads, in part:

> "In June, 2011, Senate Bill 110 authorized the permitting of terminal groins at four (4) inlets in North Carolina. As part of the Senate Bill, requests for terminal groins must include the following provisions: a monitoring plan; a baseline for assessing adverse impacts and thresholds for when adverse impact must be mitigated; a description of mitigation measures to be undertaken should the impact thresholds be reached; and a plan to modify or remove the terminal groin if adverse impacts cannot be mitigated."

The EIS, however, does not address any potential impact or mitigation on islands or properties immediately down-drift from this project, including the western end of Ocean Isle Beach, the island of Sunset Beach and Bird Island (an uninhabited conservation zone).

I would like to state my support for comments made previously by the Town Council of Sunset Beach relating to the monitoring and mitigation aspects of this project:

"The DEIS must adequately address the down-drift ocean-side environmental impact well beyond the proposed groin. Costal scientists have long warned about down-drift effects, including effects on adjacent islands. In an open letter signed by 43 of the country's top coastal scientists, the scientists state, 'there is no debate: A structure placed at the terminus of a barrier island, near an inlet, will interrupt the natural sand bypass system, deprive the ebb and flood tide deltas of sand and cause negative impacts on adjacent islands.' And, 'permitting the construction of terminal groins will harm the coast and place down-drift property at risk."

"The DEIS must propose adequate funding for monitoring the environmental effects of the groin, as the law requires, along with monitoring or mitigation on adjacent islands and estuaries…."

"If the groin causes damage to nearby islands or estuaries, the DEIS must propose appropriate funding for mitigation, as the law requires, as well as provisions for removal of the groin. All funding should be placed in escrow and monitored by the Corp of Engineers in accordance with its standard practices."

Further, I would like to state my support for comments made previously by Jan Harris of Sunset Beach relating to the monitoring and mitigation aspects of this project:

1. Sunset Beach island is an accreting beach; the only one in North Carolina and possibly on the East Coast. We have never had, nor ever needed, beach renourishment. Tax dollars, whether they be federal, state, or local have never been used to enhance Sunset Beach's beautiful, God created, beach.
2. The island of Sunset Beach is a down drift beach from the proposed Ocean Isle Beach Terminal Groin.
3. Scientists are pretty united in their opinion that Sunset Beach will erode as a result of the building of a 750 foot terminal groin at Shallotte Inlet at Ocean Isle. It is predicted that erosion will begin occurring mid-island Ocean Isle and will go all the way beyond Bird Island.
4. **SUNSET BEACH WAS NOT MENTIONED AT ALL IN THE DEIS**
5. In order to protect the island of Sunset Beach, the following should be required in the permitting of the groin:
    a. Any erosion to Sunset Beach will be deemed to be a result of the Ocean Isle Terminal Groin.
    b. If erosion occurs, the groin will be removed at Ocean Isle's expense.
    c. Sunset Beach will be returned to its pre-terminal groin state at Ocean Isle's expense.
    d. Sunset Beach must be guaranteed in writing by Ocean Isle that the above protection is available and adequate.This can be done by means of a bond procured by Ocean Isle. If Ocean Isle is as sure as they say that "no harm will come to Sunset Beach" as a result of the groin, then a Bond should be fairly inexpensive to obtain.
6. The permitting process should accept no less.

I strongly urge the Corp to incorporate the requirements outlined in 5.a.-d. into the EIS and make them requirements for any permitting as well.

The Public Notice goes on to say, under **Evaluation**:

"The decision whether to issue a permit will be based on an evaluation of the probable impacts including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are … consideration of property ownership, and, in general, the needs and welfare of the people."

I saw no consideration given to property ownership with the DEIS. It should be pointed out that the vast majority of property that stands to gain the most benefit from this project is owned or controlled by one family – the Odell Williamson Family, its trusts and heirs.

The attached Map1 shows a plat of the lots at the east end of Ocean Isle Beach, designated "Section A." All lots shaded in green, yellow or blue are owned or controlled by the Williamson family. Green is owned or controlled by the Williamson Family Trusts (LaDane and DeCarol Williamson, trustees) and/or legacy lots. Blue is OIB Holdings (Williamson controlled). And, yellow is Ocean Isle Developing, also Williamson controlled. Sources: rod.brunsco.net/realestate.html for plats and deeds and gis.brunsco.net for tax records. Map2, which is of approximately the same scale as Map1, is from maps.google.com and shows actual structures currently existing in the same area.

Further, Map3 and Map4 show properties in the affected area currently rented by Sloane Realty, a family business of the current mayor of Ocean Isle Beach, Debbie Sloane Smith. In addition, the Sloane Realty web site currently lists 287 properties for sale on the island of Ocean Isle Beach. Certainly the Sloane business and family interests would gain from this project. Sources: www.sloanerealty.com and www.secretary.state.nc.us/search/index/corp .

Williamson Realty also rents properties on the island of Ocean Isle Beach with 287 currently listed. The Secretary of State of North Carolina lists the principals as: Betty S. Williamson, President; Joseph F. Williamson, Secretary; and Charles D. Williamson, Vice President. Sources: www.williamsonrealty.com and www.secretary.state.nc.us/search/index/corp.

Commissioner Bob Williams is also a real estate agent with business interests on the Island of Ocean Isle Beach - http://www.nccoastalproperty.com/agents.

As you can see at the Town of Ocean Isle Beach website, www.oibgov.com/board-of-commissioners.cfm, the realty companies are well represented. At least Debbie Sloane Smith (mayor) and Betty Williamson (commissioner) are principals with local realty companies that will benefit greatly from the proposed terminal groin project. Is it any wonder that this board of commissioners is promoting this project?

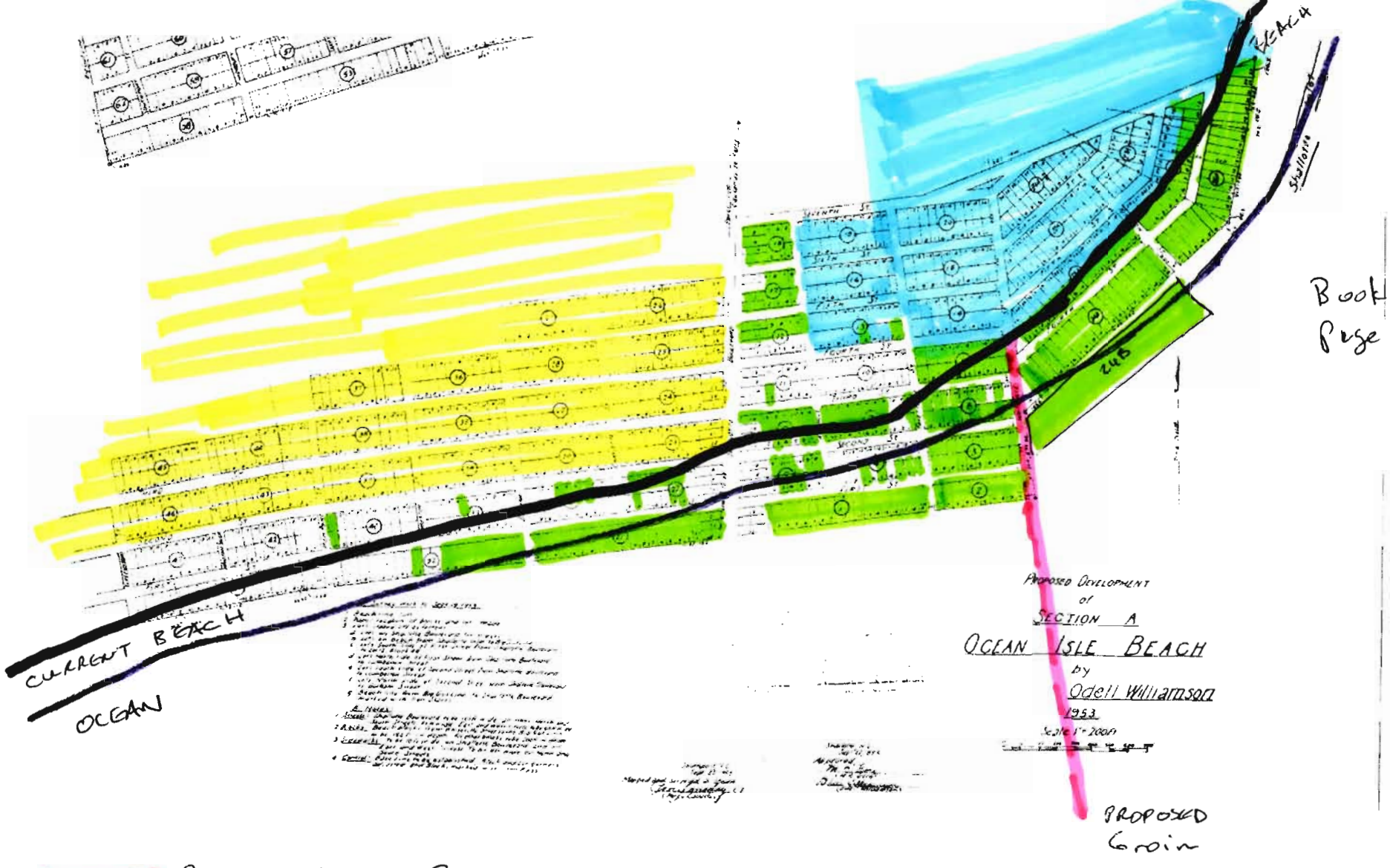
Regardless of who is promoting this project and who stands to gain, it is obvious from all of the scientific reports that have been done that there is at least a significant chance there will be down-drift damage as a result of installing a terminal grown at the proposed location. The residents of Ocean Isle Beach and Sunset Beach need assurances, as required by law, that baselines will be established, monitoring will be required and enforced, and if any damage occurs as a result of this project the Town of Ocean Isle will be financially responsible for removal of the terminal groin and remediation of any damage.

Thank you for the opportunity to provide these comments. Should you have any questions or wish to discuss these comments further, please contact me at [redacted].

Sincerely,

[redacted]

[redacted]
Concerned Citizen
Of Sunset Beach, NC



Book 1
Page 335

PROPOSED TERMINAL GROIN

FIRST LINE OF VEGETATION

APPROXIMATE MEAN HIGH TIDE

WILLIAMSON FAMILY TRUST & LEGACY

OCEAN ISLE DEVELOPING (WILLIAMSON OWNED)
& OI INVESTMENT PROPERTIES (WILLIAMSON)

WILLIAMSON & OIB HOLDINGS


Intracoastal Waterway
Imagery ©2015 Google Map data ©2015 Google 500 ft

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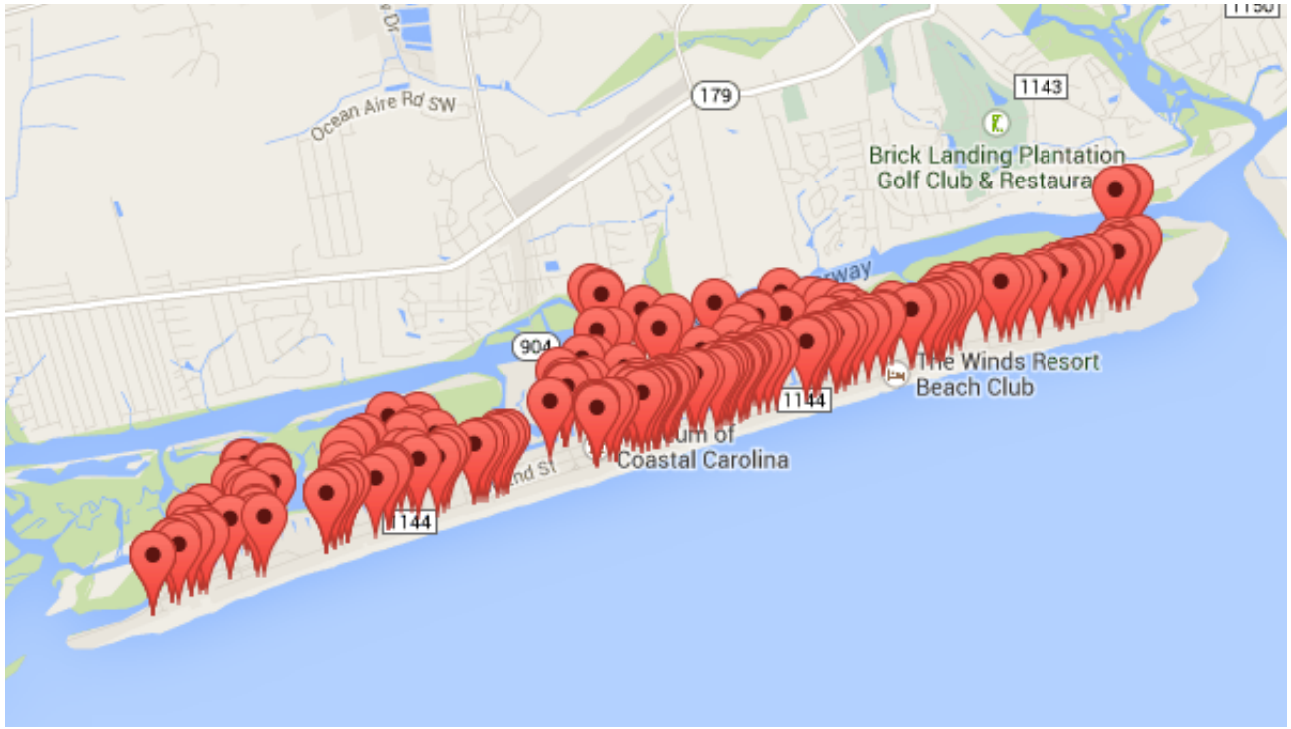
- Vacation Planner
  - List of all Properties
  - Special Discounts
  - Request Area Information
  - Newly Listed Rentals
  - Rental Policies & Procedures
  - Linen and Equipment Rentals
  - Ocean Isle Properties Map
  - Sunset Beach Properties Map
  - Island Map
  - Live Beach Cam
  - Tides and Weather
  - Reviews
- Golfing
- Destination Guide
  - Ocean Isle Beach
  - Sunset Beach
  - Calendar of Events
  - Area Map & Directions
  - Attractions

- Dining Out
- Fishing Charters
- Longterm
- Real Estate
  - Residential Real Estate
  - Commercial Real Estate
  - New Home Communities
  - New Construction
- Owner Services
  - Owner Login
  - Property Management
- Our Company
  - About Us
- Contact Us

Rental Properties for Ocean Isle Beach



Rental Properties for Ocean Isle Beach - Click Property To View Details

Canal

1) 22PENI - Canal House
2) 2PENI - Canal House
3) 31LAU - Canal House
4) 55MON - Canal Home
5) 89FAIR - Canal House
6) 87FAIR - Canal House
7) 51FAI - Canal House
8) 19FAIR - Canal House
9) 61CON - Canal House
10) 31RICH - Canal Home
11) 43SCOT - Canal House
12) 2NEW - Canal House
13) 41UNI - Canal House
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15) 11RAE - Canal House
16) 20DARE - Canal House
17) 18DARE - Canal Home
18) 38LEL - Canal House
19) 10LEL - Canal House
20) 17CUMB - Canal House
21) 9GOLD - Canal Home
22) 217E2 - Canal Home
23) 235E2 - Canal House
24) 11LEE - Canal House

Causeway Inn

25) CI105 -Causeway Inn 105
26) CI101 - Isle Be Back
27) CI102 - Sail Away
28) CI103 - Flippin' Out
29) CI202 - Suite Escape
30) CI204 - Causeway Inn #204
31) CI206 - Sunny Daze
32) CI207 - The Dolphin
33) CI208 - Causeway Inn #208
34) CI209 - Causeway Inn #209
35) CI210 - Jamaican Hideaway
36) CI211 - Parrot Suite
37) CI215 - Ocean Breeze
38) CI216 - Y's the Rum Gone
39) CI304 - The Suite Life
40) CI305 - Oceanview 4 U
41) CI309 - Pier Pleasure
42) CI311 - Isle A While
43) CI313 - The Wahoo
44) CI316 - The Penthouse

Mid-Island

45) 3SEA - Island Park
46) CHA5 - Channel Harbor Condo
47) CHB1- Channel Harbor Condo
48) 24ATL - Mid-Island House
49) IV157B - Islander Villa
50) IV160A - Islander Villas
51) IV125C - Islander Villa
52) IV125E - Islander Villa
53) IV123D - Islander Villa
54) CSJ30 - Channel Side Condo
55) DL1I - Dockside Landing Condo
56) 2668B - Starboard Condo
57) 2662B - Starboard by the Sea
58) 2663D - Starboard By the Sea
59) 2507C - Starboard by the Sea
60) 17ISLE - Mid-Island Home
61) 22ISLE - Mid Island Home
62) 7ISLE - Mid Island House
63) DUS21D - Mid Island Condo
64) 32DUN - Mid-Island House
65) 47PRI - Mid Island House
66) 62W2 - Mid Island House
67) 60E2 - Mid-Island House
68) 168E2 - Mid-Island Home
69) 294E2 - Mid Island Home
70) 342E2 - Mid Island House
71) 458E4 - Mid Island House

Oceanfront

72) OP303 - Ocean Point Condo
73) OP402 - Ocean Point Condo
74) OP605 - Ocean Point Condo
75) P1206 - Ocean Point Condo
76) OS2C3 - Oceanfront Condo
77) OS2D3 - Oceanfront Condo
78) OS2D4 - Oceanfront Condo
79) OS1F4 - Oceanfront Condo
80) OS2B4 - Oceanfront Condo
81) WJ2H - Oceanfront Windjammer Condo
82) WJ1M - Windjammer Condo
83) WJ3L - Windjammer Condo
84) WJ3P - Windjammer Condo
85) SCE1 - Oceanfront Condo
86) SCA3 - Ocean Side View
87) SCC3 - Oceanfront Condo
88) SCD3 - Oceanfront Condo
89) SCF3 - Oceanfront Condo
90) SCD2 - Oceanfront Condo
91) 353W1 - Oceanfront House
92) 349W1 - Oceanfront Home
93) OVA1 - Ocean Isle Villas
94) OVA2 - Ocean Isle Villas
95) OVD1 - Ocean Isle Villas
96) 297W1 - Oceanfront House
97) PB2F - Oceanfront Condo
98) PB2H - Oceanfront Condo
99) PB1A - Oceanfront Side View
100) 271W1- Oceanfront Quadplex
101) 271W2 - Oceanfront Quadplex
102) 271W3 - Oceanfront Quadplex
103) 271W4 - Oceanfront Quadplex
104) 251W1 - Oceanfront Home
105) 239WE- Oceanfront Duplex
106) 239WW - Oceanfront Duplex
107) 235WE - Oceanfront Duplex
108) 235WW - Oceanfront Duplex
109) 211W1 - Oceanfront House
110) 117W1- Oceanfront House
111) 95WE - Oceanfront Duplex
112) 95WW - Oceanfront Duplex
113) 107W1 - Oceanfront House
114) BVA4 - Oceanfront Condo
115) 99W1 - Oceanfront House
116) 81W1 - Oceanfront House
117) 77W1 - Oceanfront House
118) 75W2 - Oceanfront Condo
119) 75W4 - Oceanfront Condo
120) 65W1 - Oceanfront House
121) OC107-Ocean Cove Condo
122) OC214- Ocean Cove Condo
123) OC122 - Ocean Cove Condo
124) OC217 - Ocean Cove Condo
125) OC101 - Ocean Cove Condo
126) OC113 - Ocean Cove Condo
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134) OC302 - Ocean Cove Condo
135) OC304 - Ocean Cove Condo
136) OC306 - Ocean Cove Condo
137) DUA3- Oceanfront Condo
138) ICA2 - Oceanfront Condo
139) ICB1 - Oceanfront Condo
140) ICB2 - Oceanfront Condo
141) ICB3 -Oceanfront Condo
142) ICB4 - Oceanfront Condo
143) 54EE - Oceanfront Duplex
144) 54EW - Oceanfront Duplex
145) 58EE - Oceanfront Duplex
146) 58EW - Oceanfront Duplex
147) 64EE - Oceanfront Duplex
148) 64EW - Oceanfront Duplex
149) 72EE - Oceanfront Duplex
150) 72EW- Oceanfront Duplex
151) 76EE - Oceanfront Duplex
152) 76EW - Oceanfront Duplex
153) 78E1 - Oceanfront Luxury House
154) 80E1 - Oceanfront Luxury House
155) 86E1-Oceanfront Home
156) 108E1 - Oceanfront House
157) 90E1 - Oceanfront House
158) 114EE - Oceanfront Duplex
159) 114EW - Oceanfront Duplex
160) 118E1 - Oceanfront House
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162) 134E1 - Oceanfront House
163) 140E1 - Oceanfront Luxury House
164) 146E1 - Oceanfront House
165) 148E1 - Oceanfront House
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173) 186EE - Oceanfront Duplex
174) 186EW - Oceanfront Duplex
175) 194E1 - Oceanfront House
176) 222E1 - Oceanfront House
177) 228E1- Oceanfront House
178) 234EE- Oceanfront Duplex
179) 234EW- Oceanfront Duplex
180) 236E1 - Oceanfront House
181) 252E1- A - Oceanfront Duplex
182) 252E1-B - Oceanfront Duplex
183) 254E1 - Oceanfront House
184) 260E1 - Oceanfront House
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186) 286E1 - Oceanfront House
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205) 468E3-Oceanfront House
206) 470E3 - Oceanfront House
207) 480E3 - Oceanfront House

Oceanview

208) SCH2 - Side View Condo
209) IVB3C - Islander Villa
210) IVB3F - Islander Villa
211) IV161F - Oceanview -Islander Villa
212) IV159F - Islander Villa
213) IVJ4B - Islander Villas
214) IVJ4F - Islander Villa
215) IV117D -Oceanview Islander Villa
216) IV117F - Islander Villa
217) OVF1 - Ocean Isle Villas
218) 83W2 - Third Row Home
219) 253E1 - Ocean View House
220) 255EE - Oceanview/Second Row Duplex
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228) 437E2 - Oceanview House
229) SD2A3 - Sand Dwellers II Condo
230) SDD15 - Sand Dwellers Condo
231) 441E3 - Ocean View House
232) 443E3 - Ocean View House
233) 468E4 - Oceanview House

Second Row

234) SVA1 - Sand Villas Condo
235) 232W1 - Second Row House
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237) 57E1 - Second Row Home
238) 59E1 - Second Row House
239) 75E1 - Second Row House
240) 81E1- Second Row Home
241) 83E1 - Second Row House
242) 105E1 - Second Row House
243) 139E1 - Second Row House
244) 141E1 - Second Row House
245) 145E1 - Second Row Home
246) 179E1 - Second Row House
247) 245E1 - Second Row House
248) 333E1 Second Row House
249) 354E2 - Second Row Luxury Home
250) 356E2 - Second Row Luxury Home
251) 380E2 - Second Row House
252) 388E2 - Second Row House

Third Row

253) 48E2 - Third Row House
254) 242E2 - Third Row House
255) 262E2 - Third Row House

Waterway View

256) 143VIA - Soundfront Home
257) 41DRIFT - Sound Front Home
258) 133W3 - Soundfront House
259) 1GATHA - Waterway View Home
260) 94MON - Intracoastal Waterway House
261) 11OLD - Intracoastal Waterway Home
262) 15OLD - Intracoastal Waterway Home
263) 14BAY - Intracoastal Waterway Home
264) 14BAY2- Intracoastal Waterway Home

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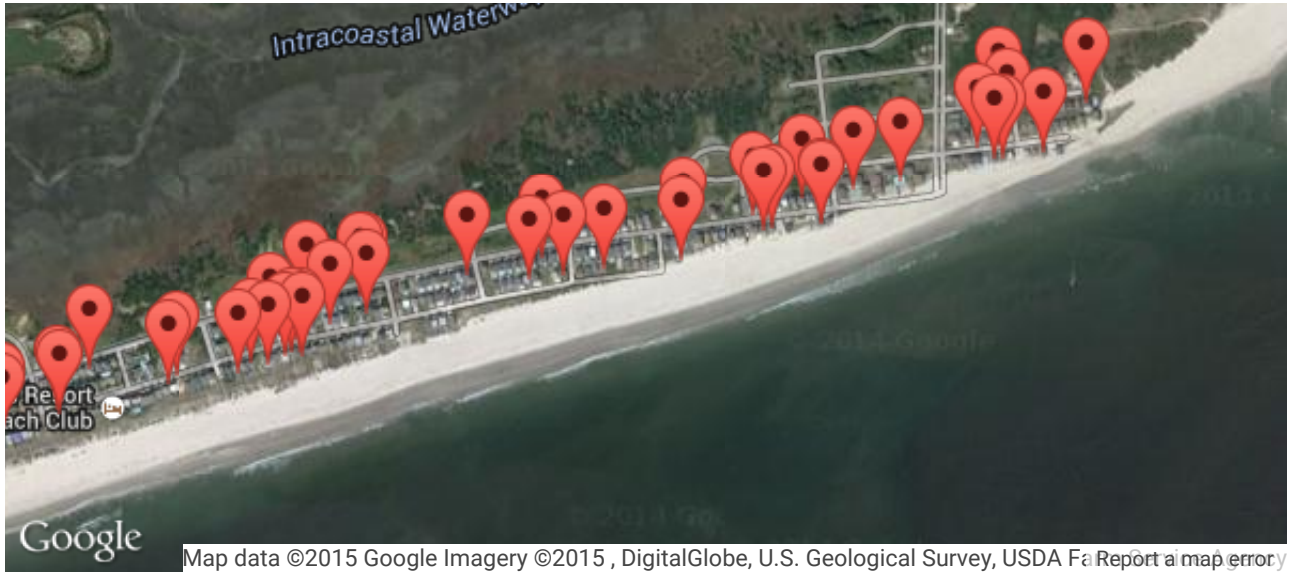
Rental Properties for Ocean Isle Beach



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Causeway Inn

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99) PB1A - Oceanfront Side View
100) 271W1- Oceanfront Quadplex
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149) 72EE - Oceanfront Duplex
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152) 76EW - Oceanfront Duplex
153) 78E1 - Oceanfront Luxury House
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176) 222E1 - Oceanfront House
177) 228E1- Oceanfront House
178) 234EE- Oceanfront Duplex
179) 234EW- Oceanfront Duplex
180) 236E1 - Oceanfront House
181) 252E1- A - Oceanfront Duplex
182) 252E1-B - Oceanfront Duplex
183) 254E1 - Oceanfront House
184) 260E1 - Oceanfront House
185) 270E1 - Oceanfront House
186) 286E1 - Oceanfront House
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Oceanview

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210) IVB3F - Islander Villa
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225) 391E1 - Ocean View House

226) 399E1 - Ocean View House
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228) 437E2 - Oceanview House
229) SD2A3 - Sand Dwellers II Condo
230) SDD15 - Sand Dwellers Condo
231) 441E3 - Ocean View House
232) 443E3 - Ocean View House
233) 468E4 - Oceanview House

Second Row

234) SVA1 - Sand Villas Condo
235) 232W1 - Second Row House
236) 116W1 - Second Row House
237) 57E1 - Second Row Home
238) 59E1 - Second Row House
239) 75E1 - Second Row House
240) 81E1- Second Row Home
241) 83E1 - Second Row House
242) 105E1 - Second Row House
243) 139E1 - Second Row House
244) 141E1 - Second Row House
245) 145E1 - Second Row Home
246) 179E1 - Second Row House
247) 245E1 - Second Row House
248) 333E1 Second Row House
249) 354E2 - Second Row Luxury Home
250) 356E2 - Second Row Luxury Home
251) 380E2 - Second Row House
252) 388E2 - Second Row House

Third Row

253) 48E2 - Third Row House
254) 242E2 - Third Row House
255) 262E2 - Third Row House

Waterway View

256) 143VIA - Soundfront Home
257) 41DRIFT - Sound Front Home
258) 133W3 - Soundfront House
259) 1GATHA - Waterway View Home
260) 94MON - Intracoastal Waterway House
261) 11OLD - Intracoastal Waterway Home
262) 15OLD - Intracoastal Waterway Home
263) 14BAY - Intracoastal Waterway Home
264) 14BAY2- Intracoastal Waterway Home

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Sloane Vacations Ocean Isle Beach
16 Causeway Drive Ocean Isle Beach, North Carolina 28469
info@sloanevacations.com
Phone: 866-931-5201

Sloane Vacations Sunset Beach • 420 Sunset Boulevard
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- Sunset Beach NC Condo Rentals
- Sunset Beach NC House Rentals

Our Privacy Policy.

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] Re: Draft Environmental Report Ocean Isle Beach
Date: Sunday, February 22, 2015 5:51:30 PM

Disregard. I found it.

From: [redacted]
To: "tyler.crumbley@usace.army.mil" <tyler.crumbley@usace.army.mil>
Sent: Sunday, February 22, 2015 5:04 PM
Subject: Draft Environmental Report Ocean Isle Beach

Hello Mr. Crumbley,

I'm also a Federal employee (DoD...you can look me up in the global) so I realize that asking for a draft of a report may be a little premature. However, I received your name from some other property owners at Sunset Beach and thought I would ask if it was really available.

Thanks

[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] SAW-2011-01241
Date: Wednesday, January 28, 2015 1:58:51 PM

Mr. Crumbley,

Regarding the construction of the terminal groin at Ocean Isle Beach, NC we fully support and are in favor of this project going forwards in 2015. This would be a huge benefit to help battle the coastal erosion and protect our beach from further damage. We have been residents of OIB for many years and have witnessed the impact of beach erosion many times. It would make a world of difference if our beach was protected by the groin.

Thanks for letting us comment,

[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] Support - Project SAW-2011-01241 Ocean Isle Terminal Groin
Date: Saturday, March 14, 2015 12:22:15 PM

Tyler Crumbly
<mailto:Tyler.Crumbley@usace.army.mil> Tyler.Crumbley@usace.army.mil
fax: 910-251-4025
U.S. Army Corps of Engineers
Wilmington Regulatory Division
69 Darlington Ave.
Wilmington, NC, 28403

RE: SUPPORT - Project SAW-2011-01241 - Ocean Isle Terminal Groin

Dear Tyler,

I am writing to you today, to urge you to SUPPORT the project to construct a terminal groin on the east end of Ocean Isle Beach.

Project SAW-2011-01241 is needed/required to maintain and preserve this important beach area for the state of NC. This proposed project has been studied for years with positive results. The studies show a terminal groin to be the best solution to address the erosion issues while also maintaining the delicate environmental balance we enjoy on our beaches.

Please SUPPORT - Project SAW-2011-01241 - Ocean Isle Terminal Groin.

Thank you,
[redacted]

[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] SUPPORT - Project SAW-2011-01241 - Ocean Isle Terminal Groin
Date: Saturday, March 14, 2015 12:26:29 PM

Tyler Crumbly

Tyler.Crumbley@usace.army.mil <mailto:Tyler.Crumbley@usace.army.mil>

U.S. Army Corps of Engineers

Wilmington Regulatory Division

69 Darlington Ave.

Wilmington, NC, 28403

RE: SUPPORT - Project SAW-2011-01241 - Ocean Isle Terminal Groin

Dear Tyler,

I am writing to you today, to urge you to SUPPORT the project to construct a terminal groin on the east end of Ocean Isle Beach.

Project SAW-2011-01241 is needed/required to maintain and preserve this important beach area for the state of NC. This proposed project has been studied for years with positive results. The studies show a terminal groin to be the best solution to address the erosion issues while also maintaining the delicate environmental balance we enjoy on our beaches.

Please SUPPORT - Project SAW-2011-01241 - Ocean Isle Terminal Groin.

Thank you,

[redacted]

[redacted]

[redacted]

Thank you!

[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Cc: [redacted]
Subject: [EXTERNAL] Support for Project SAW-2011-01241-Ocean Isle groin
Date: Sunday, March 15, 2015 2:24:58 PM

Dear Mr.Crumbly,

I am writing you today urging you to SUPPORT the terminal groin project on the east end of Ocean Isle Beach. We have lived in this area for over 30 years watching our beach erode away. Studies show this groin to be a positive step and the best solution to save this area. Please support Project ASAW-2011-01241. My family and many others will appreciate it.

Thank you,

[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] Support for Project SAW-2011001241 Ocean Isle Terminal Groin
Date: Saturday, March 14, 2015 5:20:49 AM

Tyler Crumbley

U.S. Army Corps of Engineers

I am sending this message in support of the project to construct a terminal groin on the east end of Ocean Isle Beach. We have seen the results of doing nothing all these years and believe that this project represents the best chance of preserving this beautiful beach area. This project has been studied for years and has been shown to be the best option to address the erosion problem on our beaches. Those who oppose this project speculate on what the adverse effects might be but those of us in support of this project need only visit our beach to see the results of not addressing this situation.

Thank You

[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] Terminal Groin at Ocean Isle Beach
Date: Saturday, February 28, 2015 1:21:14 PM

I would like to go on record as being against the construction of the Terminal Groin at Ocean Isle Beach. Spending tax payer money on an experiment that is unlikely to protect a few homes on the East End of Ocean Isle Beach is neither cost effective nor environmentally sound. These types of structures will have unwanted consequences to other homeowners up or down the beach and will result in more problems than they will solve.

--

[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] Terminal Groin on East End of Ocean Isle Beach
Date: Tuesday, March 10, 2015 10:52:27 AM
Attachments: [redacted]
Aerial Photo of groins.docx
Groins in FL.jpg

Good Morning Tyler,

I would like to convey the reasons why the COE should deny a permit to allow a terminal groin to be placed on the east end of Ocean Isle Beach (OIB). Attached is an email from Dr. Wilson Laney who is the Coordinator for the South Atlantic Fish and Wildlife Conservation Office, U.S. Fish and Wildlife Service which clearly states the strong opposition the USFW has for placing this groin on OIB. The email states the "science is unequivocal"! It also states "A project of this nature will destroy the ecological functioning of this inlet and the surrounding areas". This should be significant reason to deny the terminal groin. However there are at least three other major reasons as outlined below.

1. The N.C. Coastal Resources Commission spent $300,000 on a report to find out if terminal groins placed on the East and Gulf coasts are protecting expensive beachfront property without destroying the beach in the process. One of the conclusions of the report is "Under particular conditions, it may be possible to limit adverse effects with terminal structures without detrimental effects to the adjacent shorelines". Not exactly a ringing endorsement! This conclusion along with the attached statement from USFW should send a very strong message that this terminal groin is a very bad idea.

2. Science has clearly demonstrated that terminal groins will temporary stop erosion behind the groin but will trigger erosion on the other side of the groin. All one has to is look at photos of the coasts of NJ and FL to see that once a single groin is put into place this will trigger cascade effect of additional groins (Attachment 3 is NJ and Attachment 4 is FL).

3. The sea level is rising today faster than it has in the past 20,000 to 30,000 years! Terminal groins will NOT stop erosion due to sea level rise. Thus terminal groins are only a short term fix. It will cost millions of dollars to construct and maintain this groin. Unfortunately, once this groin is in place, it will cost additional millions of dollars to construct and maintain the cascade of additional groins! The cost of the ecological damage to the inlet and to fishermen this groin will cause can't be estimated at this time.

[redacted]

Weaver, Cameron

From: Weaver, Cameron
Sent: Monday, December 19, 2011 12:11 PM
To: Wilson_Laney@fws.gov
Cc: Wilson, Debra; Snider, Holley; Huggett, Doug
Subject: RE: Ocean Isle Beach Terminal Groin Scoping
Attachments: Ocean Isle Beach Terminal Groin.pdf

Mr. Laney:

Thank you, sir, for your input. With this reply, I have forwarded your comments to the DCM District Manager, the DCM Field Representative and to Doug Huggett so that they are aware of your concurrence with USFWS' position on this issue. And I have added you to the distribution list for information on this project should I receive/distribute anything further. If you did not receive the entire email string and attachment that I originally sent to John Ellis, they are attached here.

Let me know if I may be of assistance.

Cameron

Cameron Weaver
Cameron.Weaver@ncdenr.gov
Environmental Assistance Coordinator
NCDENR / Division of Environmental Assistance and Outreach (DEAO)
127 Cardinal Drive
Wilmington, NC 28405
910-796-7303 (F) 910-350-2004
http://ncenvironmentalassistance.org/

From: Wilson_Laney@fws.gov [mailto:Wilson_Laney@fws.gov]
Sent: Monday, December 19, 2011 1:43 PM
To: Weaver, Cameron
Cc: Pete_Benjamin@fws.gov; John_Ellis@fws.gov; Tom_Augspurger@fws.gov
Subject: Ocean Isle Beach Terminal Groin Scoping

Cameron:

Reference Pete Benjamin's e-mail message to you dated/time-stamped December 16, 2011, 10:49 am [text pasted below in bold for your information].

I see Fish and Wildlife Service participation in this discussion as a very low priority. The issues are clear. A project of this nature will destroy the ecological functioning of this inlet and the surrounding areas. The science is unequivocal. I see no unique issues or areas of significant uncertainty in need of further evaluation. We oppose this project. There is nothing more to discuss. FYI, the Holden Beach side of the inlet (including the unnamed sandbars and islands in the inlet) is piping plover critical habitat. The project would destroy critical habitat and as such would require formal consultation. It would also adversely affect sea turtles under our jurisdiction and sea beach amaranth, so we will need to consult regarding them as well when and if the time comes. I know the regulatory agencies are fully familiar with

the Section 7 process and the information that will be needed to initiate consultation. I also understand that as regulatory agencies NCDENR and the Corps must go through the steps of reviewing this request and preparing the necessary assessments to document the effects of the proposed action. I have full confidence in your ability to do so. **Feel free to keep us apprised via email as you move through the review process, and feel free to contact me or John Ellis if you have any specific questions, but we are operating on a very limited budget and are short staffed, so we must focus our limited resources where there are substantial natural resource issues to be resolved. The implications of this project on the area's natural resources are clear. As such, at this time our resources are needed elsewhere.**

I concur with Pete's assessment of the impacts of the proposed Ocean Isle Beach Terminal Groin. I serve to provide technical support to him and his staff, with regard to fisheries-related issues which fall under the jurisdiction of the Atlantic States Marine Fisheries Commission, and the South Atlantic Fishery Management Council. I serve as the FWS Regional Director's (for ASMFC) or Assistant Regional Director-Fisheries (for the SAMFC) representative on these two institutions.

Construction of the proposed groin would likely have a significant impact on the transport of larval fish, shrimp, crabs and other estuarine-dependent species which are under the jurisdiction of either the Atlantic States Marine Fisheries Commission, and/or the South Atlantic Fishery Management Council. One or both of these management institutions may wish to comment on the proposed project, therefore I am requesting that you add me to your distribution list for the proposed project.

Should you have questions regarding the jurisdiction of either of these institutions with regard to fishery resources which would be impacted by the proposed project, please feel free to contact me.

/s/ Wilson
R. Wilson Laney, Ph.D., Coordinator
South Atlantic Fish and Wildlife Conservation Office
U.S. Fish and Wildlife Service
P.O. Box 33683
Raleigh, North Carolina 27636-3683
Voice: 919-515-5019
Cell: 252-339-5717
Fax: 919-515-4454
e-mail: Wilson_Laney@fws.gov

----- Forwarded by John Ellis/R4/FWS/DOI on 12/13/2011 09:40 AM -----

"Weaver, Cameron"
<cameron.weaver@ncdenr.gov>

12/08/2011 02:34 PM

To "Baker, Jessi E" <jessi.baker@ncdenr.gov>, Ron Sechler <ron.sechler@noaa.gov>, "Snider, Holley" <holley.snider@ncdenr.gov>, "Wilson, Debra" <debra.wilson@ncdenr.gov>, "Simpson, Shaun" <shaun.simpson@ncdenr.gov>, "Huggett, Doug" <doug.huggett@ncdenr.gov>, "Timpy, David L SAW" <David.L.Timpy@usace.army.mil>, "Ellwood, Molly M." <molly.ellwood@ncwildlife.org>, "Hall, Rhonda" <rhonda.hall@ncdenr.gov>, "Humphrey, Jeremy" <jeremy.humphrey@ncdenr.gov>, "Coburn, Chad" <chad.coburn@ncdenr.gov>

cc Daisy Ivey <daisy@oibgov.com>, "james.Jarrett@shawgrp.com" <james.Jarrett@shawgrp.com>, "john_ellis@fws.gov" <john_ellis@fws.gov>, "Willis, Linda" <linda.willis@ncdenr.gov>, Brigit Flora <bflora@brunsco.net>

Subject Ocean Isle Beach Terminal Groin Scoping meeting

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] Terminal Groin on Ocean Isla Beach, NC (OIB)
Date: Friday, March 13, 2015 8:54:17 PM
Attachments: Scan.pdf

Dear Sir:

Attached is a research paper presented to me by Dr. Len Pietrefesa, professor emeritus at North Carolina State University. His expertise teaching and research is in estuarine and continental margin physical oceanographic processes, geophysical fluid dynamics, western boundary currents, abiotic influences on fish recruitment, satellite oceanography, air-sea coupling, coastal flooding due to hurricanes and severe storms, air-sea interaction, and weather and climate impacts. I think his research speaks for itself when considering the overall cost and impact of the terminal groin.

I truly feel sorry for the people who are affected by the erosion at the east end of OIB. Unfortunately, people have made the mistake of building too close to the ocean on the barrier islands. The islands are constantly moving and reshaping which is what they are supposed to do to protect the mainland. Renourishing the beach is an expensive and constant effort to try to halt or slow down the erosion. But, obviously with the negative information regarding the groins that has been presented to you by people educated in this area, a groin would not solve the erosion problem. In fact, it may cause a series of events that would be detrimental to the west end of OIB and Sunset Beach.

Several projects, such as Cape Hateras, Fort Macon, Pea Island, and the New Jersey shore, have been very costly and have not solved their problem.

I hope that you revisit all of the options to try to rectify the erosion problem on OIB. Please, seriously consider all of the research against the building of the terminal groin.

Sincerely,

[redacted]

A citizen of North Carolina concerned with preserving the beauty of Ocean Isle Beach, Sunset Beach, as well as all of the other beaches in North and South Carolina

Journal of Coastal Research	28	5	iii–ix	Coconut Creek, Florida	September 2012

LETTERS TO THE EDITOR

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Letters to the Editor in the *Journal of Coastal Research* are opinion pieces written by coastal researchers or laypersons that usually deal with topics that are important to the research community. Although these contributions state opinions or give perspectives on topical issues of concern, they must be based on facts and evidence. Even though Letters to the Editor may contain personal bias, the commentary should reflect a stance, concern, warning, or opinion with some basis in fact regardless of how it is interpreted. Letters to the Editor are an independent part of the JCR where opinions and positionalities are not vetted in peer review as are professional papers and technical communications. Letters to the Editor are opinion pieces that reflect authors' positions and are not necessarily a part of the journal's position on any topic.

On the Continued Cost of Upkeep Related to Groins and Jetties

L.J. Pietrafesa

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Center for Marine & Wetland Studies
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Conway, SC 29528, U.S.A.
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www.JCRonline.org

ABSTRACT

Pietrafesa, L.J., 2012. On the continued cost of upkeep related to groins and jetties. *Journal of Coastal Research,* 28(5), iii–ix. Coconut Creek (Florida), ISSN 0749-0208.

So-called terminal groins, which are actually jetties at the terminus of barrier islands where inlets are located, have been the subject of controversy for half a century in North Carolina. Coastal scientists have opposed these hardened structures and point to their destructive effects upon downstream beaches, requiring ever increasing and costly beach renourishment projects. Meanwhile, some coastal engineers have claimed that they can be used to "stabilize" migrating inlets. Local politicians, in response to real estate interests, have argued for the construction of the hardened structures and, in contrast to the claims of the scientists on the ground, have cited examples of success in North Carolina and at other locales on the U.S. eastern seaboard. So what are the facts? This Editorial presents the documented facts for North Carolina and the other U.S. east coast locales.

ADDITIONAL INDEX WORDS: *Groins, jetties, barrier islands, beaches, erosion, deposition, renourishment, inlets, storms, sea level rise, tides, waves, downstream.*

INTRODUCTION

In 2003 the North Carolina Legislature voted, yet again, unanimously to ban the construction of new, permanent erosion-control structures from NC's ocean shorelines (including inlets), Session Law 2003–427. There were no dissenting votes in either chamber. This unanimity resulted from the recognition that the North Carolina Coastal Resources Committees had imposed a ban on coastal hard structures, which was enacted in 1985. It was viewed as sound fiscal, environmental, and management policy; however, a new North Carolina Legislature reconsidered the issue and in 2011 voted in favor of Bill S832, which would permit the construction of "terminal groins" along the North Carolina coast.

In the December 2011 issue of *News Breakers*, Ocean Isle Beach (OIB), North Carolina, Mayor Debbie Smith (Smith, 2011, p. 3) states:

DOI: 10.2112/JCOASTRES-D-12A-00004.1; received and accepted in revision 23 February 2012.

Ocean Isle Beach has had a very successful beach nourishment project covering three miles of our beach since 2001. However, beach nourishment adjacent to an inlet is difficult to be maintained because of the constant shifting nature of the adjacent Shallotte Inlet; at the mouth of the Shallotte River. Recently the NC Legislature passed legislation giving coastal towns and counties a tool to utilize the stabilization of beaches adjacent to inlets. Senate Bill 110 allows pilot projects of up to four terminal groins to be constructed in North Carolina. These structures have been used successfully in many coastal states for years. In fact there are two existing terminal groins built by the State of NC that have protected historic Fort Macon on the north end of Atlantic Beach and another terminal groin that has secured the end of Bonner Bridge over Oregon Inlet.

Mayor Smith then makes a leap and claims that a terminal groin (or in classic definitions a "jetty") will stabilize Shallotte Inlet, North Carolina, at the east end of OIB, thus, in her train of logic, eradicating beach erosion. She then reaches the conclusion that the terminal groin/jetty will eliminate the continual need for costly beach renourishment projects. In the words of Mayor Smith:

continual need for costly beach renourishment projects. In the words of Mayor Smith:

With a terminal groin in place we may reduce the renourishment cycles which will certainly be a substantial cost savings for our beach management program. Other viable benefits from construction of a terminal groin are elimination of unsightly sand bag installations, improvement of the natural habitat for birds and turtles and better protection of our roads, utilities and properties.

Mayor Smith is not alone in her belief in the positive value of hardening the fragile beaches of North Carolina. In the January 12, 2012, issue of the *Brunswick Beacon* (Lewis, 2012), Mayor Alan Holden is calling for a groin/jetty to be built at the east end of Holden Beach, which is east of OIB. There are also potential applications for hardened structures at Figure Eight Island, North Carolina; Bald Head Island, North Carolina; North Topsail Beach, North Carolina; and Shackleford Banks, North Carolina.

It is of note here that the classic definition of a jetty is the emplacement of a solid structure, generally perpendicular to the coastline, and more often than not at the terminus of an island. The word jetty has taken on negative connotations from the coastal sciences community because they have come to be associated with many examples of structures that have created more damage, which required costlier solutions that never worked permanently. Thus, the reference in the Mayor's write-up to "renourishment cycles" is explained. Alternatively, the term "terminal groin" has been classically known as the last or terminal groin in a field of groins and is thus far more palatable to the uninformed ear than the alternative jetty. But the point here is not to debate definitions; rather, it is to present the facts and thus expose the misrepresentations.

In her article Mayor Smith then provides aerial photos. One was taken in 1993 of Fort Macon, North Carolina, at the eastern end of Atlantic Beach, North Carolina, with no beach obvious, east of the Fort Macon groin. The second aerial photo, taken in 2007, shows copious amounts of sand in place to the east of the groin, leading to the obvious conclusion that the groin/jetty was responsible for the sand accretion. This all sounds and looks good, but unfortunately the claims made by the Mayor are misleading, misrepresentative, incomplete, and thus dangerously incorrect. So, just what are the facts of the matter for Fort Macon/Atlantic Beach, North Carolina, and for other locales along the eastern seaboard of the United States where groins/jetties have been placed at a tidal inlet or river mouth?

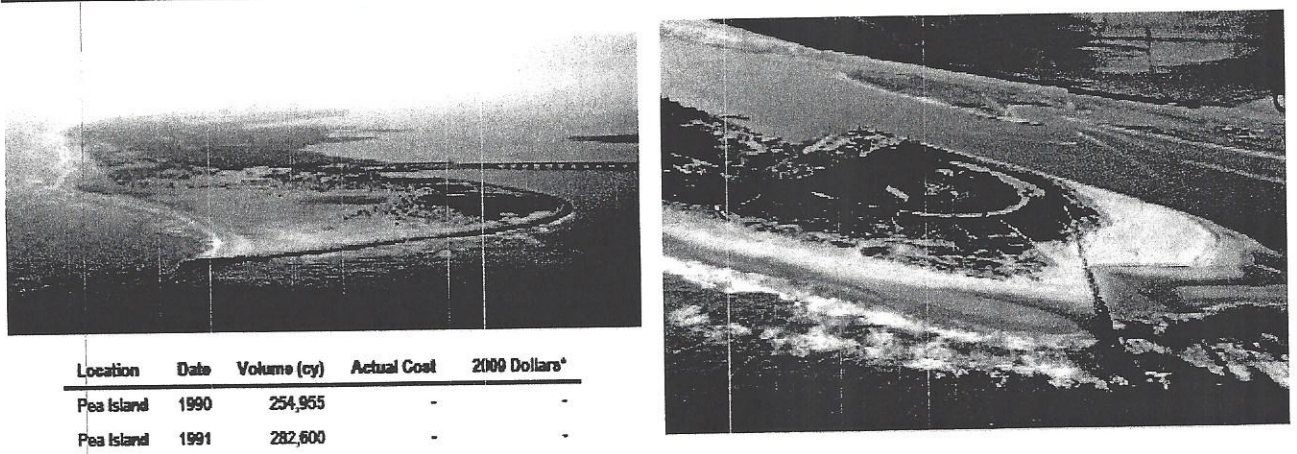
THE FACTS

From the early 19th century and well into the 20th century there was a series of failed engineering projects, all designed ostensibly to stabilize the inlet at the eastern end of Atlantic Beach, North Carolina, just beyond Fort Macon. The many prior projects had attempted to stabilize, *i.e.,* stop, the migrating island end and thus, presumably, prevent the naturally occurring erosion of beach sediments at that locale. In 1960 a major, presumably more comprehensive, construction project was initiated and was completed in 1970, with the final stage of emplacement of a rock groin/jetty. Therefore, the groin that Mayor Smith alludes to in the 1993 photograph actually had been in place, in its entirety, in 1970.

It is of considerable note here that along the eastern seaboard of the United States, from Maine to the Florida Keys, coastal sediments move on average from north to south and east to west. These sediments emanate from coastal rivers and embayments and from marine sediments resuspended during the passage of severe storms along the adjacent continental shelf. During the passages of atmospheric storms these sediments are carried in the directions of the ocean currents and waves, which along the eastern seaboard of the United States are directed predominantly from north to south and east to west as the storms move predominantly from south to north. This is because winter storms, also called "nor-easters," and hurricanes move from SW to NE, and the winds on the coastal sides of the storms blow toward the SW quadrant. As a consequence, barrier islands actually move or "migrate" from north to south and east to west on average during the passages of these storms, which are highly persistent and energetic. Further the islands also move toward the mainland on the back or sound sides of the islands. These naturally occurring processes are well known to the coastal science community. It is also well known that when hardened structures are put in place in an effort to subvert or prevent the naturally occurring processes, they result in serious damage to the beaches and moreover could actually destroy the barrier islands. To counteract these destructive effects, massive expenditures of investments to accelerate the "beach renourishment" projects have been required. The facts speak for themselves. Let us revisit Atlantic Beach/Fort Macon.

The completed construction of the Atlantic Beach/Fort Macon Groin/Jetty in 1970 was supposed to result in the salvation of the beach, which had a long documented history of being eroded, and the build-up and build-out of the east end of Atlantic Beach. In 1961, during the initial stages of groin/jetty construction, a $6.78 million (in 2009 dollars, which will be the case for all figures quoted) beach-renourishment project was also conducted, and the beach was restored. Yet in 1973, just 12 years after the prior 1961 major beach-renourishment project and only 3 years after the groin was completed, a new beach-renourishment project had to be staged. Why? The answer was to deal with the exacerbated erosion that had occurred during and following groin/jetty construction-completion because of, not in lieu of, the groin/jetty. The cost of the project was $1.99 million. So, did the new groin coupled with the $8.77 million spent in beach renourishment solve the problem at Fort Macon, North Carolina? The answer is no, as presented in further discussion.

From 1973 to 2007 there has been an additional seven renourishment projects that have been staged at Fort Macon, North Carolina, for a total expenditure of $44,894,830 in public dollars. The beach-renourishment project that occurred in 2007 is the reason that the aerial photo shown in the *News Breakers* article showed sand on the beaches. In fact the 1993 photo shows a situation in 1993 where no sand was present, some 24 years following groin/jetty construction. This was followed in 1994 by a $5.45 million renourishment project, the fruits of which disappeared within several years and had to be redone in 2002 and again in 2005. So from 1973 to 2007, a period of 34



Location	Date	Volume (cy)	Actual Cost	2009 Dollars*
Pea Island	1990	254,955	-	-
Pea Island	1991	282,600	-	-
Pea Island	1992	184,300	-	-
Pea Island	1992	1,078,000	-	-
Pea Island	1993	433,235	-	-
Pea Island	1995	203,191	$1,294,327	$1,806,528.88
Pea Island	1996	500,217	-	-
Pea Island	1997	294,000	$1,159,642	$1,536,861.62
Pea Island	1998	260,183	$637,448	$831,846.18
Pea Island	1999	328,919	$545,515	$696,494.30
Pea Island	2000	419,305	$1,228,564	$1,517,576.19
Pea Island	2001	513,706	$2,568,530	$3,084,977.12
Pea Island	2002	732,852	$2,822,329	$3,337,047.13
Pea Island	2003	1,029,543	$3,860,786	$4,463,173.53
Pea Island	2004	616,448	$2,510,229	$2,826,618.85
Pea Island		7,131,454	$16,627,370	$20,101,123.80

Location	Date	Volume (cy)	Actual Cost	2009 Dollars*
Fort Macon	1961	-	$952,000	$6,772,540.74
Atlantic Beach/Fort Macon	1973	504,266	$414,807	$1,987,233.83
Atlantic Beach/Fort Macon	1978	1,179,600	$1,565,177	$5,106,245.93
Atlantic Beach/Fort Macon	1986	4,168,600	$5,316,038	$10,317,236.56
Atlantic Beach/Fort Macon	1990	-	-	-
Atlantic Beach/Fort Macon	1994	4,664,000	$3,794,727	$5,446,508.67
Atlantic Beach/Fort Macon	2002	209,348	-	-
Atlantic Beach/Fort Macon	2005	2,800,000	$12,900,000	$14,049,903.23
Fort Macon	2007	211,000	$1,184,500	$1,215,160.51
		13,736,814	$26,127,249.00	$44,894,829.47

*The BLS CPI inflation calculator uses the average Consumer Price Index for a given calendar year. This data represents changes in prices of all goods and services purchased for consumption by urban households. This index value has been calculated every year since 1913. For the current year, the latest monthly index value is used.

Figure 1. Aerial photographs of Pea Island (left) and Atlantic Beach/Fort Macon (right) and table of beach renourishment projects for each by year and cost for each island terminus. Note the eroded, cuspate coastline downstream of the Pea Island groin and the eroded coast on the leeside of the Fort Macon groin. (Color for this figure is only available in the online version of this paper.)

That does not seem like a very good investment of precious public tax-payer dollars and moreover totally refutes the argument that groin/jetties are "a" or "the" solution to beach erosion. To the contrary, the case that seems to have been built by this example is that the hardened structures are a major culprit and are a partial cause of the problem.

Mayor Smith also mentions the groin/jetty built at the terminus of Pea Island as another North Carolina success story. Has this been the case for Pea Island? The facts state that from 1990 through 2004, $20.2 million in public tax-payer money has been spent at Pea Island in renourishment projects. The table of the actual facts of renourishment projects and associated costs at Atlantic Beach/Fort Macon and Pea Island are presented in Figure 1. The aerial photos shown were taken in 2009. Clearly Fort Macon will soon require another costly renourishment project. Moreover, the beach to the west of the groin/jetty has undergone a stark recession and will also require costly renourishment. These data are from public records. The total cost of renourishment for Fort Macon and Pea Island has been $64, 905,952 to date.

Mayor Smith also notes in her article that, "These structures have been used successfully in many coastal states for years" (Smith, 2011, p. 3). Again, what are the facts? As shown in Figure 2, the 15 such structures put in place from Ocean City, Maryland, to Boca Grand Pass, Florida (not including North Carolina), have required $778,798,382 in beach-renourishment projects. These numbers are well documented in Riggs (2009) and Riggs and Ames (2011).

The total 17 groin/jetty structures from Florida to Maryland have required expenditures of $843,704,334 up through 2009; this is $49,629,431 per structure (Figure 2). In North Carolina alone the rate of renourishment cost to the public has been $11,180,109/decade or $5,900,055 per groin/jetty per decade. This is a daunting figure for an island such as OIB. Who will pay the documented costs of approximately $6 million per decade? And what land is being protected? If the photographs do not lie, then very few land owners are actually being protected. Certainly the land downstream of the structures will be deprived of sediments, as shown over and over. The classic textbook example of the downstream damage affected by these

Location of Terminal Structure	Volume Emplaced	Cumulative Cost
BOCA GRANDE PASS (FL)	1,336,781	$17,542,500
JOHNS PASS (FL)	13,248,650	$162,417,417
BAKERS HAULOVER (FL)	17,150,775	$38,229,274
CLEARWATER PASS (FL)	10,902,450	$151,791,898
ST. LUCIE INLET (FL)	30,985,280	137,950,278
BIG CARLOS PASS (FL)	360,000	$3,237,280
BLIND PASS (FL)	5,506,700	$11,582,900
NASSAU SOUND (FL)	6,185,096	$10,874,735
PORT CANAVERAL (FL)	15,614,000	$92,748,198
REDFISH PASS (FL)	6,864,600	$20,222,483
ST. AUGUSTINE INLET (FL)	5,465,500	$12,662,600
MIDWAY INLET (SC)	530,700	$2,312,000
ST. HELENA SOUND (SC)	6,012,149	$17,778,553
TYBEE ISLAND (GA)	5,960,000	$9,736,000
OCEAN CITY INLET (MD)	14,366,391	$89,712,266
TOTAL	140,489,072	$778,798,382

Figure 2. Table of Florida, Georgia, South Carolina, and Maryland groins and the renourishment projects required to replace eroded beaches by volume of sediment and cost associated with each project. (Color for this figure is only available in the online version of this paper.)

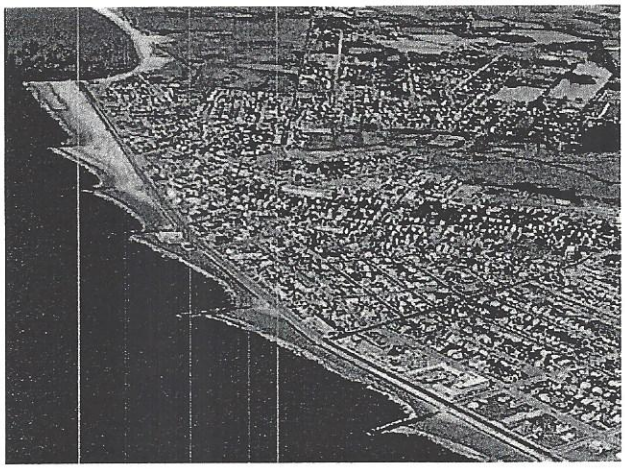
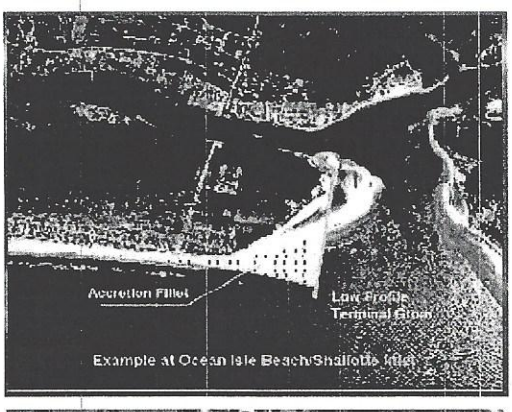


Figure 3. Aerial photograph of New Jersey shoreline showing eroded, cuspate shoreline downstream of groins. (Color for this figure is only available in the online version of this paper.)

structures is shown for the New Jersey coast in further discussion (Figure 3), a horrifying prospect for a small, 6.5 mi in length, barrier island. Pity the homeowners at the central and west end of OIB, and pity the homeowners of Sunset Beach, an island only 3.5 mi long and in the lee of OIB. Legal experts and banking interests fear that coming property owner law suits will surely bankrupt such small and resource-limited barrier islands. Further, if a groin/jetty is built at the east end of Holden Beach, it will deprive OIB of Cape Fear River sediment effluents as well those emanating from the Lockwood Folly Inlet. Both the Cape Fear River Plume and the Lockwood Folly Inlet Plume turn, on average, toward the west as they out-well onto the adjacent Continental Shelf. Thus OIB beaches will be further starved, as will the Sunset Beach beach.

The message to the public regarding groins and jetties are as follows. (1) Individual snapshots to prove a particular perspective should not be used when the photos simply represent one particular time in a long series of groin/jetty and beach-renourishment projects. (2) The true record of what has actually transpired and what the associated costs have been should be presented. (3) An honest, unbiased effort to understand naturally occurring processes should be made by managers and decision makers. Naturally occurring processes, such as frequent atmospheric storms, will not be denied as to have taken place. (4) Public decision makers, who in many cases have a principal knowledge base that is real estate development and who may have vested interests, should not be spending public funds nor advocating for the expenditure of public funds where a conflict of interest may exist. (5) The public should be fully informed of the folly of building on the tips of barrier islands because these locales are highly naturally unstable and cannot be stabilized. The tips of barrier islands will and must move because the islands must migrate to survive rising sea level and continued atmospheric storms. (6) The North Carolina Legislature nor any other state legislative body should not be so controlled by the real estate and construction lobby that it makes ill-conceived decisions that put the public beaches at risk, which it has done in the case of North Carolina. (7) The banking community should be fully aware of the risks of subsidizing housing at the tips of barrier islands and thus not make building loans for such construction. (8) Sea level is rising and groins and jetties will exacerbate the erosion effects of storms occurring on a higher base of sea level. (9) Cost analyses of the continued costs of counter-acting the damage done by groins and jetties should be conducted using the facts. (10) The tax value and taxes derived from properties purportedly to be protected by the structures should be part of a cost-benefit analysis. The question should be whether the taxes to be derived are sufficient to cover the continuing costs associated with these structures? Here again, we consider public records.

Andy Coburn of Western Carolina University conducted the analysis subsequently summarized. Basically, using the U.S. Army Corps of Engineers, figures of the property that will purportedly benefit from an OIB east-end groin/jetty is shown in the ellipse (Figure 4). This is a government drawn figure. It is ambitious at best, but we will accept it at face value. The total properties in the ellipse number 60. Here we note that the assumption is that the groin/jetty will benefit all OIB properties in the ellipse, but that is not a solid assumption. In fact the aerial photos of Fort Macon, North Carolina, and the New Jersey coast speak to that untruth. Moreover, the structure will hurt all OIB properties to the west of the ellipse. But I digress. (1) The total appraised value of properties inside of the ellipse is $18,100,460 (2009 assessments); (2) the average appraised value/property inside of the ellipse is $301,674; (3) the county tax revenue/year (at 0.305/100) is $55,206; (4) the county tax revenue/property/year is $920; and (5) the total OIB tax revenue/year (at 0.09/100) is $16,290. This cost–benefit analysis begs two questions. (1) How is multimillion dollars of costs of construction a value to the community? Moreover, (2)



Shallotte Inlet/Ocean Isle Beach (within red circle):
Total Properties: 60
(NOTE: Terminal groin assumed to benefit all properties in red)

Assessed Value

2009 Assessed Value of Properties: $18,100,460 ($301,674/property)

2009 Brunswick County Assessed Value: $31,392,480,327.87
Percent of 2009 County Assessed Value: 0.058%

2009 OIB Assessed Value: $2,640,888,866
Percent of 2009 OIB Assessed Value: 0.685%

County Tax Value (@ .305/100)

- 2009 County Ad Valorem Tax Revenue: $95,747,065.00
- 2009 County Ad Valorem Tax Revenue Generated by Properties: $55,206 ($920/Property)
- 2009 County Ad Valorem Tax Revenue Generated by Properties: 0.058%

OIB Tax Value (@ .09/100)

- 2009 OIB Ad Valorem Tax Revenue: $2,376,800
- 2009 OIB Ad Valorem Tax Revenue Generated by Properties: $16,290 ($272/Property)
- 2009 OIB Ad Valorem Tax Revenue Generated by Properties: 0.685%

Occupancy Tax Revenue

- FY 2006-07 OIB Occupancy Tax Received: $1,134,847
- # of Structures Rented: 828 (p19 OIB LUP)
- Occupancy Tax/Structure: $1,371
- Estimated Occupancy Tax Revenue: (60x.33)x$1,371 = $27,145/Yr

Figure 4. Ocean Isle Beach (OIB) North Carolina tax value and tax benefits of proposed OIB groin. The U.S. Army Corps of Engineers projected that 60 properties (in the red ellipse) would be protected by the proposed groin. Andrew Coburn of Western Carolina University conducted an analysis of county and town tax records, which show that these properties 0.058% (or less than six-hundredths of one percent) to the Brunswick County Tax Base and 0.685% (or less than seven-tenths of one percent) to the OIB Tax Base. (Color for this figure is only available in the online version of this paper.)

How do the continuing costs of approximately $6,000,000 per decade a value to barrier islands such as OIB? The answer to both questions is, It is not! The public should vote this ill-conceived, misguided initiative down, resoundingly.

Basically, it should be understood that beach migration is a naturally occurring process. The beaches move when energetic atmospheric storms, which create highly energetic coastal ocean currents and large amplitude waves, then mechanically move sediments along, away from and toward the coast. The Egyptians, Chinese, Greeks, and Romans all understood this. Moreover Native American Indians, the earliest inhabitants of the coastal areas of the eastern seaboard of the United States, understood this. The approach taken by those cultures was to go wherever the beaches were. In fact the Romans were known to create rice fields in the wetlands behind European barrier islands; patties that are still lucrative enterprises today. The inlets, which must move as the islands migrate, are also natural passageways for estuarine-dependent finfish and are heavily used by marine wildlife for food and habitats. Any changes in the inlet functioning will necessarily impact wildlife balances and survival.

Well-intentioned coastal engineers, whose business is construction, have tried many so-called solutions in attempts to take on, deal with, and solve inlet migration, beach movements, and sea-level rise. But all efforts involving groins and jetties have failed. In the mid-1990s, the U.S. National Academy of Sciences (NAS) and the U.S. Park Service (PS) asked a team of expert coastal scientists and engineers to study the issue of the Cape Hatteras Lighthouse, North Carolina, which was under threat of being destroyed by the encroaching Atlantic Ocean. This was after a period over which a series of groins had been built to protect the Lighthouse by stabilizing the Hatteras shoreface and in building out the beaches. Unfortunately the erosion in front of the Lighthouse was exacerbated by the groins, and the Expert Panel agreed that the only viable solution was to move the Lighthouse. The NAS and PS agreed with the recommendation; the Lighthouse was moved, and the whole issue has gone away with movable beach resources being enjoyed by the public.

Given the well-known effects of the passages of winter storms in causing coastal erosion and inlet migration, one would assume that the frequency occurrence of winter storms on an annual basis should correlate with any beach erosion and or beach-renourishment projects. As it occurs, Riggs and Ames (2011) meticulously created an "erosion *vs.* accretion" profile for Pea Island, North Carolina, using a combination of North

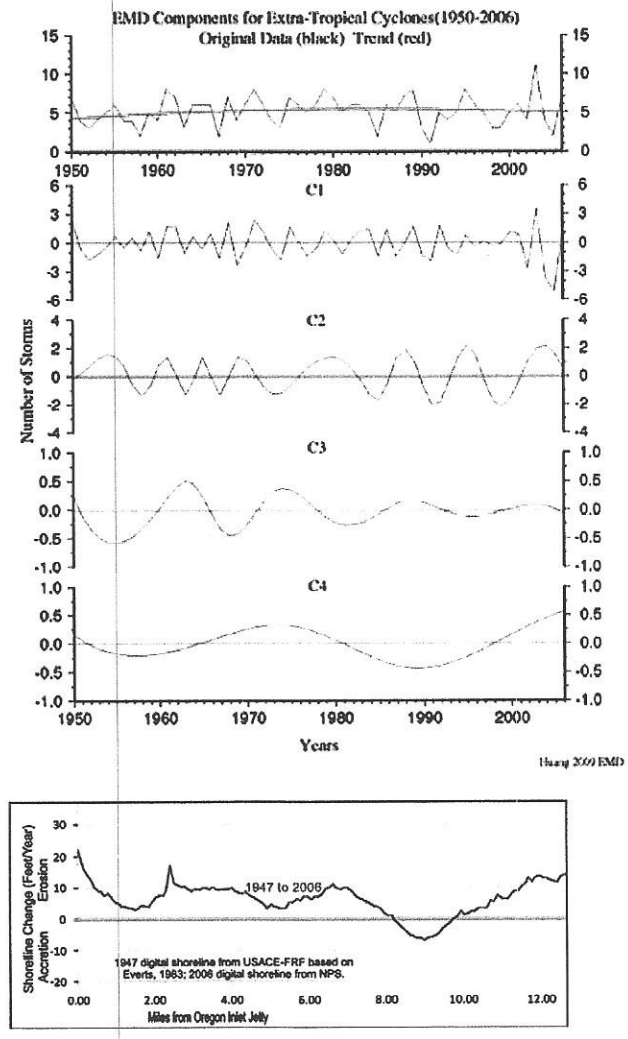


Figure 5. Rate or shoreline erosion (above red line) and or accretion (below red line) of the coastline at Pea Island from 1947 through 2006 *vs.* the ensemble empirical mode decomposition (EEMD) modal decomposition of the frequency of occurrence of atmospheric winter storms in the vicinity of Cape Hatteras, North Carolina. (Color for this figure is only available in the online version of this paper.)

Carolina Department of Transportation aerial photographs and beach surveys over the years 1947 to 2006. However, if one looks at the beach renourishment campaigns that have been staged by North Carolina for Pea Island (see Figure 1), one sees that from 1990 to 2005 there has been a series of yearly projects peaking in 1992 with 1.27 million yd of sediment dumped on the beaches. So a one-to-one annual comparison (Figure 5) is not mathematically tractable. However, if we conduct an empirical ensemble modal decomposition (Huang *et al.*, 1998) of the annual winter storm data set we find that there is a long period mode of about 30 years (Intrinsic Mode Function [IMF] mode C4). If one compares the Riggs erosion-accretion data-time series, one sees a clear relationship that suggests that over the long haul, the erosion *vs.* accretion curve is in keeping with

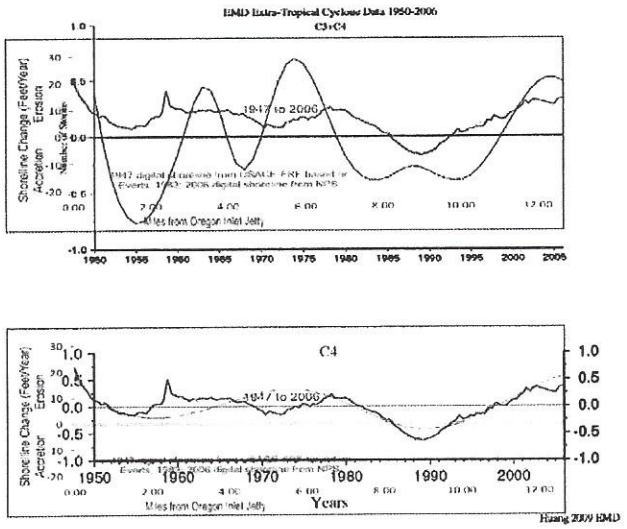


Figure 6. Rate of erosion/accretion of the coastline at Pea Island *vs.* (upper panel) the decadal plus multidecadal frequency of occurrence of winter storms (Modes C3 + C4) from Figure 5 and (lower panel) the multidecadal frequency of occurrence (Mode C4) from Figure 5. (Color for this figure is only available in the online version of this paper.)

the variability of the frequency of occurrence of U.S. east coast winter storms (Figure 6, lower panel). Unfortunately, higher frequency modes of variability, such as IMF modes (C3 + C4) *vs.* the erosion-accretion curve (also Figure 6, upper panel) are masked by renourishment projects. It is of note that the Fort Macon time series of renourishment projects (Figure 1) seems to align very well with IMF mode C2, which nominally has about a 7–8 year cycle. This suggests that if the renourishment strategy of putting sediments on the Fort Macon beaches during particularly energetic storm years or actually a sequence of them, then there is a clear argument that at a maximum, beach renourishment attributable to the combined effects of winter storm occurrence and the presence of groin/jetties will require major renourishment expenditures on no less than every 7 years and more likely more frequently.

The structures proposed in places such as Figure Eight Island, Holden Beach, and OIB are on the down-drift side of the neighboring inlet. A shore-perpendicular structure, placed at the down-drift side of an inlet, will block the natural flow of sand onto the island where the structure is located. This will cause an increase in shoreline erosion in front of oceanfront homes down-drift of the structure. Protecting homes at the inlet will be at the expense of a larger number of homes down the beach.

The unfettered flow of sand through natural inlets is an important mechanism maintaining barrier island health. Blocking this flow of sand will inhibit the ability of the barrier island to respond to rising sea level and storms. Also, groins can impact near-shore circulation by directing currents offshore, especially during storms. Groins can be particularly destructive following storms if a significant portion of the nourishment project is transported offshore, leaving the groin uncovered.

tive following storms if a significant portion of the nourishment project is transported offshore, leaving the groin uncovered. During this period the groin will block all along-coast transport until the cell is filled in again.

CONCLUSIONS

The lessons learned by the previous examples presented are as follows. (1) The public will use beaches wherever they are. (2) Sediments are not lost from the total barrier island beach system during storm passage; rather they are relocated within the system. (3) Inlets, the tips of islands, are sources of sediments that should be used naturally by the barrier island system *per se* to maintain themselves. (4) There should be a moratorium on the public policy of allowing building on the ends or tips of barrier islands. Basically these lands should be viewed as being in a continual state of migration and should be allowed to move as necessary. Inlets do not close, they just relocate. (5) Hardened structures will not stabilize inlets or eliminate erosion, rather they will cause erosion and thus should be banned in perpetuity. (6) Publicly elected officials should tell the whole story and not cherry-pick facts for their own use, and if they do, they should be held accountable. (7) Public funds should not be used for either groin/jetty or renourishment projects. This is a misuse of public revenues, and managers who do so should be held accountable.

ACKNOWLEDGMENTS

The author acknowledges the tables and imagery provided by Dr. S. Riggs of East Carolina University (ECU) and Mr. A. Coburn (Western Carolina University, WCU). The author also acknowledges the many discussions held with scientists Dr. O. Pilkey of Duke University (DU), Dr. R. Young (WCU), Dr. J.P. Walsh (ECU), Dr. Steve Culver (ECU), Dr. Dave Mallinson (ECU), Dr. P. Peterson (University of North Carolina-Chapel Hill, UNC-CH), Dr. Tony Rodriguez (UNC-CH), Dr. M. Stutz (Meredith College), and Dr. D. Heron (DU). The collective group of scientists has stated, "We are not antidevelopment. Nor are we an environmental lobby. We are simply electing to play our role in helping the state develop sound, science-based policy." Mr. J. Epps is thanked for acquiring and processing the storm data from the National Oceanic & Atmospheric Administration–National Climatic Data Center.

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From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] Terminal Groin on the East end of Ocean Isle Beach
Date: Friday, March 13, 2015 2:52:28 PM

Dear sir, I am writing this email to you as a concerned resident of the state of North Carolina and also as a property owner on the adjacent island of Sunset Beach. I am totally opposed to the concept of "hardening the shoreline" of North Carolina as an attempt to control the natural erosive forces of nature as they have shaped our coast over many centuries. One only has to look at the shorelines of New Jersey and Florida to see that jettys and terminal groins may stabilize the shoreline upstream of the prevailing current, but will necessarily deprive the shoreline downstream of the jetty of sand necessary to replace that removed by normal flow of sand downstream, thus increasing erosion downstream of any groin. More locally, the terminal groin built at Oregon Inlet has been studied for many years and the conclusions from collected data on the effects on Pea Island strongly suggest that the terminal groin is contributing to the shoreline recession problems on Pea Island. As one looks at the history of these groins, as soon as one is built, erosion downstream worsens , stimulating pressure to build another downstream to halt the erosive effects of the first, then another must be built to stop erosion from the second one and it continues as can be seen from the New Jersey shoreline. Our state wisely prevented hardening of the coastline since 1985 and in 2003 the legislature voted unanimously to adopt the CRC ban on hard structures. The NC coastal scientists position on terminal groins is that they inevitably cause downstream erosion of beaches and in 2007 a group of more than 40 coastal geologists issued a statement urging NC to continue its policy of banning hard structures. All this evidence of adverse effects of these hardening structures combined with the data of real sea level rise over the last century and projected rise of an additional 39" rise by 2100 makes any attempt to halt or change natural phenomena temporary, expensive, and futile at best. I would urge you to oppose this endeavor to build a terminal groin at the east end of Ocean Isle, but at the very least, I think that the Town of Ocean Isle should bear all the costs, that the effects of such a groin should be studied and that any harm resulting from this structure should be mitigated by Ocean Isle Beach and that Ocean Isle should be responsible financially for the cost of removal of this structure if deemed appropriate at some future date due to adverse consequences. I believe it only fair that if Ocean Isle causes harm to an adjacent shoreline such as Sunset Beach that has been experiencing sand accretion for many years, they should be financially responsible for restoration. Thank you for your attention.

[redacted]

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] TeRminal Groin
Date: Sunday, March 01, 2015 8:45:04 AM

Are you serious?? You want to spend $46.5 million of tax payer money to protect 24 ocean front properties worth $7.5million. I object to this proposal and hope that you will stop this crazy idea!!!

Sent from my iPad

From: [redacted]
To: Crumbley, Tyler SAW
Subject: [EXTERNAL] Terminal Groins @ OIB
Date: Sunday, March 01, 2015 8:49:10 PM

Dear Sir:

As a tax payer and property owner in Brunswick County, specifically Sunset Beach Island, I am alarmed, concerned and opposed to the terminal groin project proposal at Ocean Isle Beach. A project such as this may benefit some property owners on the OIB East end but please consider the harmful effects from this that would lead to erosion in other areas of OIB, as well as Sunset Beach, Bird Island and possibly Holden Beach. As you well know, Sunset Beach continues to naturally accrue sand and no local or federal money has ever been spent for beach renourishment on the island... EVER.

Please consider what is in the best interest of all Brunswick County tax payers and property owners and REJECT the proposed OIB terminal groins plan.

Thank you for your time and consideration.

Sincerely,
[redacted]

[redacted]