



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

**SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT**

**FIGURE EIGHT ISLAND SHORELINE MANAGEMENT PROJECT
FIGURE EIGHT ISLAND, NORTH CAROLINA**

PREPARED BY:

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and

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Abstract: The Supplemental Environmental Impact Statement was prepared in response to Figure Eight Island Home Owners Association's proposal to implement a shoreline management plan in response to experienced erosion along the oceanfront and sound front shoreline within the northern end of Figure Eight Island.

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EXECUTIVE SUMMARY

This Environmental Impact Statement (EIS) meets requirements under the Federal Environmental Assessment and Review Process in determining how to best meet the needs of the people and the environment. This EIS includes an evaluation of resources and considerations involved in responding to the chronic erosion on the northern portion of Figure Eight Island to preserve the integrity of its infrastructure, provide protection to existing development, and ensure the continued use of the oceanfront beach along the northernmost three miles of its oceanfront shoreline. Significant resources which occur in the study area include socioeconomic resources, marine resources, terrestrial resources, threatened and endangered species, recreation and aesthetic resources, and cultural resources.

Chronic erosion problems along the northern sections of Figure Eight Island's ocean shoreline have been persistent since the early 1990's when the orientation and position of the main ebb channel through Rich Inlet moved northward. The northward movement of the main ebb channel was accompanied by the northward shift of the south side of the ebb tide delta away from the north end of Figure Eight Island, thus removing the protection it provided to the northern portion of the island. In addition to erosion issues along the ocean shoreline south of Rich Inlet, erosion is also prevalent along portions of the Nixon Channel shoreline extending from Rich Inlet southwest to the entrance to Nixon Creek. This erosion along the estuarine shoreline is associated with the proximity of the main flow channel to the shoreline.

As a result of this chronic erosion, Figure Eight Island is threatened with economic losses resulting from damages to structures and their contents due to hurricane and storm activity and the loss of beach and sound front land due to shoreline erosion. The total assessed tax value of property within the limits of Figure Eight Island is approximately \$907,352,900 based on the 2012 reappraisal. Also, periods of severe shoreline recession have adversely affected a number of biological resources including nesting habitat for endangered and threatened sea turtles.

To alleviate these problems attributed to erosion, several potential solutions were evaluated within this EIS. These include abandoning the existing infrastructure and retreating from the ocean and sound front shoreline; continued management of the ocean and sound shoreline with present and past activities such as beach scraping, periodic nourishment, and/or placement of sandbags; relocating the inlet to a more optimal orientation accompanied with beach nourishment along the eroding shorelines; beach nourishment alone; and the construction of a terminal groin accompanied with beach nourishment. After consideration of the costs, benefits and environmental consequences of the proposed and alternative actions, the initial evaluation of project alternatives indicated that the optimal solution would entail the relocation of the inlet to the south which would allow the northern shoreline to regain protection from the ebb tide shoal. At that time, hardened structures including terminal groins were illegal in the State of

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North Carolina. However, during the 2011 legislation session, the North Carolina Legislature passed Session Law 2011-387, Senate Bill 110 which allows consideration of terminal groins adjacent to tidal inlets. The legislation limited the number of terminal groins to four (4) statewide and included a number of provisions and conditions that must be met in order for the groins to be approved and permitted. With this law in place, the terminal groin alternatives were revisited as a feasible solution to the erosion problem.

Following further extensive alternatives analysis, the Applicant's Preferred Alternative, which has been modified since the release of the Draft EIS, includes the construction of a terminal groin 154 m (505 ft) in length with a 303 m (995 ft) shore anchorage section to protect against possible flanking of the landward end of the structure. In this regard, flanking is defined as erosion around the landward end of a structure which ultimately exposes the normally "dry" side of the structure to the water. This structure is intended to control tidal current induced shoreline changes immediately south of Rich Inlet. In addition to the construction of the terminal groin, several areas of the shoreline would be nourished with material excavated from the previously permitted area within Nixon Channel. Beach fill would be placed along 426 m (1,400 ft) of the Nixon Channel shoreline just south of Rich Inlet. In addition, material will be used to nourish 1,372 m (4,500 ft) of ocean shoreline extending from Rich Inlet south to 322 Beach Road North (Figures 3.16a and 3.16b). The previously permitted area in Nixon Channel would be dredged to its previously permitted depth of -2.7 m (-9 ft) MLW [or -3.5 m (-11.4 ft) NAVD] and widths. Periodic nourishment of the beach fill would be accomplished approximately every five years in conjunction with maintenance dredging of the existing navigation feature in Nixon Channel.

This EIS contains the following information:

- **Chapter 1, Introduction** – Explains the purpose of the development of an EIS, describes agency and public coordination efforts, issues and concerns elicited by the development of the EIS and discusses applicable laws, rules and regulations.
- **Chapter 2, Purpose and Needs** – Identifies purpose and needs of the project and discusses how the shoreline along Figure Eight Island has been managed in the past.
- **Chapter 3, Project Alternatives** – Describes project rationale and alternatives considered.
- **Chapter 4, Affected Environment** – Identifies existing resources which occur in the study area.
- **Chapter 5, Environmental Consequences** – Evaluates the project alternatives and discusses the anticipated changes to the existing environment including direct, indirect, and cumulative effects.
- **Chapter 6, Avoidance and Minimization** – Describes several actions and measures incorporated to avoid or minimize adverse effects to resources.

Major Conclusions

Chronic erosion has been a major threat to many of the resources along the northern portion of Figure Eight Island. Action is being requested to alleviate this threat. The Figure Eight Beach Homeowners Association (Figure "8" Beach HOA) is seeking Federal and State permits to allow development of a management plan for Rich Inlet, which includes the construction of a terminal groin with supplemental dredging, that would mitigate chronic erosion on the northern portion of Figure Eight Island to preserve the integrity of its infrastructure, provide protection to existing development, and ensure the continued use of the oceanfront beach along the northernmost three miles of its oceanfront shoreline.

Area of Controversy

The Applicant's Preferred Alternative involves the construction of one of the four terminal groins allowable since becoming legal in the State of North Carolina with the passage of Senate Bill 110 in July 2011 and the subsequent legislation in SB 151 that passed in 2013. Hardened structures, including terminal groins, had been illegal within the State since 1985. A full understanding of how certain conditions related to the implementation of SB 110 and SB 151 continues to be evaluated; and the installation of a groin structure within Rich Inlet and how it will affect the surrounding resources has raised concerns.

Issues to be Resolved

It is anticipated that State and Federal agencies, along with the public, will provide comments to this supplement which may result in additional avoidance and minimization measures including proposed monitoring initiatives. Additional consultation will be conducted with National Marine Fisheries Service Protected Resources Division and U.S. Fish and Wildlife Service pursuant to Section 7 of the Endangered Species Act; and with National Marine Fisheries Service Habitat Conservation Division pursuant to Magnuson-Stevens Fishery Conservation and Management Act. On-going coordination with the North Carolina Division of Coastal Management will continue and the details of the implementation stages are expected by the release of the Final Environmental Impact Statement.

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– *Subpart B Delft3D Model Results*
– *Subpart B1 Delft3D Model Results-Model Results Given April-June 2006 Eroded Conditions*
– *Subpart B2 Delft3D Model Results- Model Results Given Present (Feb.-March 2012) Conditions*
– *Subpart C GENESIS Model Results*

Appendix C Cultural Resources Report

Appendix D Geotechnical Investigation Report

Appendix E Impact Summary Table

Appendix F Cumulative Effects Assessment

Figure Eight Island Shoreline Management Project EIS

List of Preparers

Name	Responsibility	Qualifications
James Jarrett, P.E.	Project Manager/Coastal Engineering. Alternatives Design and Analysis	B.S. Civil Engineering; M.S. Civil Engineering. 47 years of experience with coastal engineering and coastal protection project design along with project management.
Gordon Thompson, P.E.	QA/QC/Coastal Engineer	B.S Civil Engineering, M.S, Coastal Engineering. 15 years of experience with the design, permitting and construction oversight of major beach restoration projects.
Chris Day, P.E.	Coastal Engineer. Numerical Modeling	B.S. Civil Engineering, M.S. Applied Marine Physics. 17 years of experience in hydrodynamic, coastal erosion, and economic modeling studies and designing shore protection projects.
Andy Wycklendt, P.E.	Coastal Engineer. Numerical Modeling	B.S. Ocean Engineering, M.S. Ocean and Resources Engineering. 12 years of experience modeling coastal processes, design and construction of coastal restoration and shoreline protection projects.
Heather Vollmer	Geographic Information Systems (GIS) Analyst. Environmental Consequences, Graphics	B.S., Environmental Studies; M.S. Environmental Studies. 16 years of experience in GIS database development and management.
Brad Rosov	Project Biologist, Affected Environment, Environmental Consequences	B.A. Biology; M.S. Marine Biology. 8 years of experience in permitting, environmental documentation, NEPA, habitat assessments, and endangered species evaluations.
Greg Finch	Biologist. Affected Environment, Environmental Consequences.	B.A. Environmental Science. 13 years of experience in permitting, environmental documentation, NEPA, habitat assessments, and endangered species evaluations.
Ken Willson	Geologist. Geotechnical Report	B.S. Earth Science, M.S. Geology. 11 years of experience in geophysical surveying and geotechnical assessments.
Gordon Watts	Marine Archeologist. Cultural Resources Report.	B.A, History, M.A., History, PhD, Maritime History and Nautical Archaeology. 40+ years of experience in underwater target assessment, cultural resource management/mitigation studies,

Figure Eight Island Shoreline Management Project EIS

		and historic shipwreck mapping.
Dr. Bill Cleary	Professor of Geology. Inlet Related Shoreline Change analysis.	B.S. Geology; M.S. Geology; Ph.D, Geology. 45 years of experience in coastal geology and inlet/shoreline morphology
Mickey Sugg	Regulatory Project Manager, U.S. Army Corps of Engineers Wilmington District Regulatory Division. Review SEIS for compliance with NEPA.	B.A. Biology; B.S. Environmental Studies. 24 years of experience in regulatory permitting review.
Dale Beter	Wilmington Field Office Chief, U.S. Army Corps of Engineers Wilmington District Regulatory Division. Review SEIS for compliance with NEPA.	M.S. Ecology. Professional Wetland Scientist (PWS) Certified. 20 years of experience in regulatory permitting review.
Carl Pruitt	Assistant District Counsel, U.S. Army Corps of Engineers Wilmington District Office of Counsel. Review SEIS for compliance with NEPA.	JD School of Law; B.A. 12 years of legal experience with the U.S. Army Corps of Engineers.