



**US Army Corps  
of Engineers®**  
Buffalo District

# Presque Isle Beneficial Use of Dredge Material Demonstration Project

City of Erie, Erie County, Pennsylvania

Scoping Information



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Buffalo District, U.S. Army Corps of Engineers  
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# 1 INTRODUCTION

The National Environmental Policy Act (NEPA) directs Federal agencies to initiate "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to the proposed action." The Buffalo District - U.S. Army Corps of Engineers (USACE) has prepared this scoping information packet to elicit public and agency concerns, clearly define the environmental issues and alternatives that should be examined, and identify Federal, state and local requirements that may need to be addressed in the study of the proposed beneficial use of dredged material demonstration project in the vicinity of Presque Isle with the city of Erie, Pennsylvania. This information has been prepared as part of the formal scoping process pursuant to NEPA and the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR Part 1500 et seq.).

Section 204 of the 1992 Water Resources and Development Act provides the authority for USACE to carry out projects for the protection, restoration and creation of aquatic and ecologically related habitats, including wetlands, and to reduce storm property damage, in connection with dredging for construction, operation, or maintenance of an authorized navigation project. This scoping document covers the proposed placement of dredged material along the lakeside of Presque Isle Peninsula at three locations near the terminal end of the peninsula to determine if the dredge material can effectively be used to nourish and potentially accelerate the growth of the terminal end of the peninsula without causing adverse environmental impacts.

## 2 BACKGROUND

### 2.1 Location and Study Area

Presque Isle Peninsula and Erie Harbor are located on the southern shore of Lake Erie in the City of Erie, Pennsylvania, 78 miles southwest of Buffalo, NY and 102 miles northeast of Cleveland, OH. The peninsula is a recurving sand spit that forms and protects the harbor, and is home to Presque Isle State Park.

The International Joint Commission (IJC), a binational commission advising governments on issues involving the boundary waters between Canada and the United States since 1973, has identified 43 Areas of Concern (AOCs) on the Great Lakes where poor water quality impairs use, or local environmental standards are not being met. An "Area of Concern" is a designation of an area derived from the Great Lakes Water Quality Agreement, signed between the U.S. and Canada in 1972." Areas of Concern" are defined as "geographic areas that fail to meet the general or specific objectives of the agreement where such failure has caused or is likely to cause impairment of beneficial use of the areas ability to support aquatic life." These AOC's are typically near urban and industrial centers, where harmful substances from industrial processes have contaminated the rivers sediment.

In January 1991, Presque Isle Bay was designated as the 43rd AOC by the State Department in response to concerns raised by the local community. Waste disposal practices before state and federal regulatory programs were established had resulted in the discharge of industrial and domestic wastewater into the bay or to its streams and tributaries. This

contaminated the bay with pollutants including excessive nutrients, organic compounds and heavy metals.

Through the Remedial Action Plan process, the Pennsylvania Department of Environmental Protection (PADEP) and the Presque Isle Bay Public Advisory Committee identified two major impairments in the bay: Fish tumors or other deformities and restrictions on dredging. An evaluation identified two main pollutants in the sediment – heavy metals such as nickel, lead and cadmium, and polycyclic aromatic hydrocarbons (PAHs). Fish tumors and other deformities were believed to be related to the sediment contamination. The city of Erie made changes to its wastewater collection, conveyance and treatment system that reduced sewer overflow and stormwater runoff into the bay. Over time, the city's waterfront became more commercial and less industrial. In 2002, improvements in the health of the local fish population and natural sediment led to the bay being designated as an AOC in the recovery stage.

In February 2013, the Presque Isle Bay AOC has been taken off the list of the most polluted places around the Great Lakes. The decision was made by the U.S. Department of State in consultation with the U.S. Environmental Protection Agency, the International Joint Commission and the Commonwealth of Pennsylvania after reviewing the success of various cleanup activities in the bay. Presque Isle Bay is now the second site in the nation to be taken off the list of Great Lakes AOC's.

## **2.2 Description of Federal Navigation Project**

The Federal navigation project at Erie Harbor, including its operation and maintenance, was authorized by the River and Harbor Acts of 1899, 1910, 1935, 1950, 1954, 1958 and 1960. The existing Federal harbor at Erie was constructed for the purpose of providing a deep draft commercial harbor for the shipping of a number of commodities (Figure 1). Erie Harbor consists of a set of piers (north and south pier) that separate Presque Isle Bay from the shore, an entrance channel, and the "Inner Harbor." The entrance channel extends several thousand feet from the 29 foot contour in Lake Erie to the inner end of the two piers and has a width of approximately 220 feet. The authorized depth of the entrance channel is 29 feet. Within Presque Isle Bay, the Inner Harbor has various authorized depths, from 18 feet down to 29 feet. The portions of the Federal channels that are maintained are those actively utilized by Great Lake ships that transport limestone and salt to the docks of Erie Sand & Gravel. Erie Harbor is dredged infrequently, on an as needed basis. The harbor was last dredged in 2015 with 250,000 cubic yards of material removed. These sediments are disposed of at a suitable open lake placement site. Dredging activities are scheduled for 2016 with approximately 230,000 cubic yards of material to be dredged.

## **2.3 Presque Isle State Park**

In 1921 the State Legislature authorized the creation of Presque Isle State Park. Presque Isle State Park is a 3,112 acre Pennsylvania state park on a recurving sand spit that extends into Lake Erie. The peninsula sweeps northeastward, surrounding Presque Isle Bay along the park's southern coast. The Presque Isle peninsula formed on a moraine more than 11,000 years ago and is constantly being reshaped by waves and wind. This leads to seven ecological zones within the park, which provide a classic example of ecological succession. Given the very dynamic and

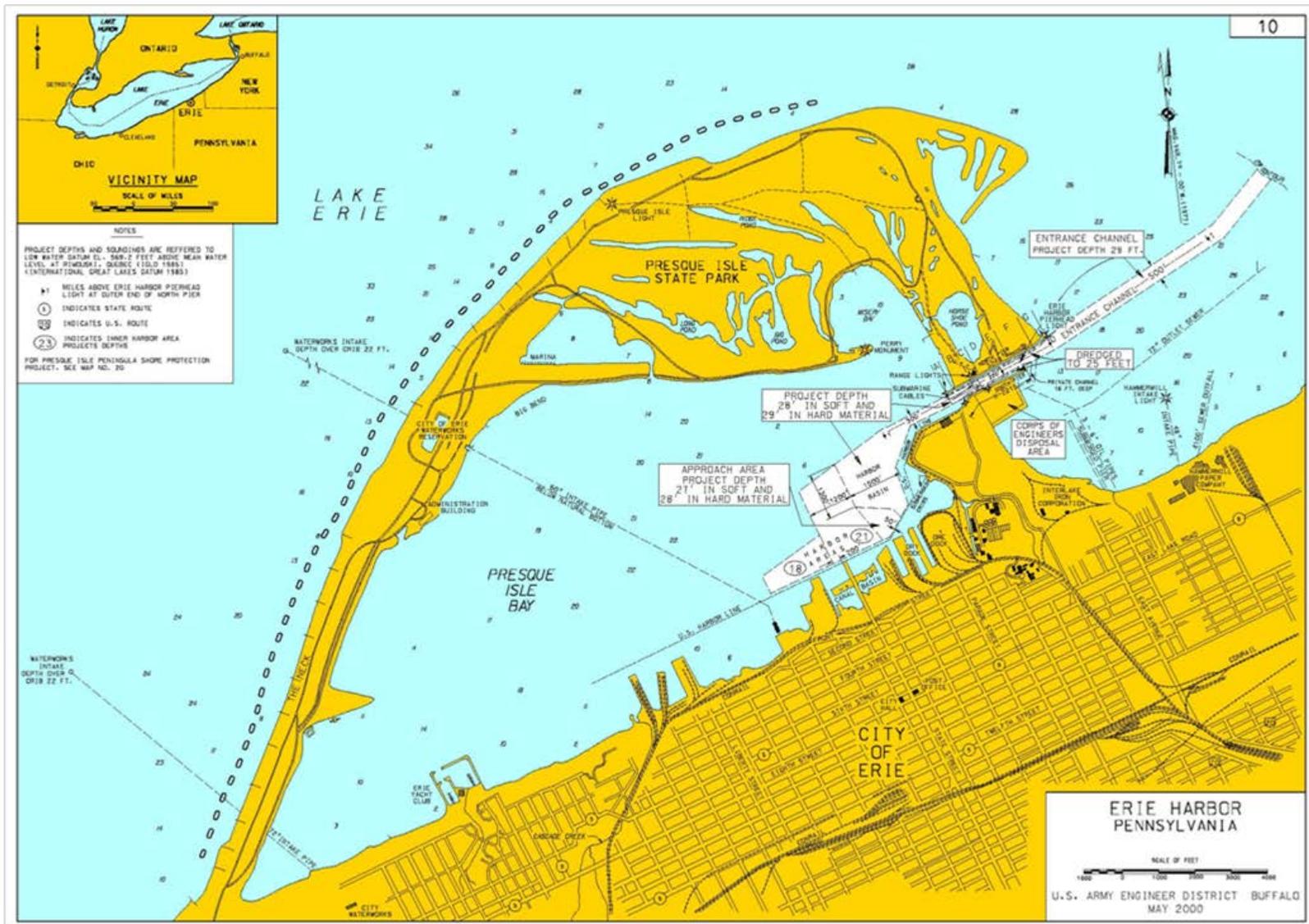


Figure 1: Erie Harbor Federal Navigation Channel

ephemeral nature of this geologic feature, there are a number of rare plant communities present at various successional stages.

From 1989 to 1992, the USACE and the Commonwealth of Pennsylvania constructed the cooperative shoreline protection project at Presque Isle State Park. The project involved the construction of 55 offshore rubble mound breakwaters and initial placement of 560,000 tons of sand beachfill along 5.5 miles of Lake Erie shoreline at Presque Isle State Park (Figure 1). Annual sand nourishment activities have been conducted for 20 years (1993-2014). The average new sand placement program places approximately 30,000 cubic yards annually. The purpose of the project is to protect the beach from erosion while allowing littoral drift material (equivalent to the amount that moved along the shoreline prior to beach nourishment programs) to move along the shoreline to Gull Point at the eastern end of the peninsula. Per the USACE Presque Isle Design Manual dated 1984, the Gull Point average annual growth should be maintained at approximately 0.4 acres per year. Based on recent shoreline change analysis 1991 to 2010, the average annual growth of Gull Point is -0.53 acres per year (Figure 2). While there has been steady eastward growth of the distal end of Gull Point, the north shore has experienced severe erosion that has outpaced the growth at the distal end and threatens the connectivity of Gull Point to the rest of the peninsula.

In 2001, the United States Fish and Wildlife Service (USFWS) designated approximately 3.7 miles of Lake Erie shoreline at Presque Isle State Park as critical habitat for the Federally endangered Great Lakes breeding population of the piping plover, thus it is important that the project continues to transport material to Gull Point to sustain and possibly grow the designated critical habitat area. The harbor maintenance requirements combined with the significant loss of Gull Point provides an opportunity to beneficially use sediment dredged from the Erie Federal Navigation Channel to nourish and possibly accelerate the growth of Gull Point.

### **3 DESCRIPTION OF THE PROPOSED PROJECT**

The goal of this project is to determine if sediments dredged from Erie Harbor can be beneficially used to nourish and potentially accelerate the growth of the distal end of the peninsula. Dredged sediment from Erie Harbor is physically characterized as fine sand, silt and clay, not suitable for direct placement upon the beach. However, these sediments may be suitable to be placed in the nearshore zone to provide beach nourishment benefits through two mechanisms: (1) Placement of dredged material in the nearshore zone, updrift of the severely eroded north shore (at the -11 ft LWD contour), may allow the material to self-sort and some fraction of the material is incorporated in the littoral drift system helping to protect the north shore and areas downdrift (Figure 3); (2) Placement of dredged material off the eastern tip of Gull Point (at the -20 ft and -11 ft LWD contour) creating a subaqueous shelf that may allow littoral sands coming from updrift to deposit on the subaqueous shelf and naturally build up the beach profile and eventually result in the growth of Gull Point and possibly increase the overall growth rate of Gull Point (Figure 3).

The demonstration project is designed to test both of these mechanisms by conducting a sediment tracer study to evaluate the dispersal patterns of the dredge material placed at

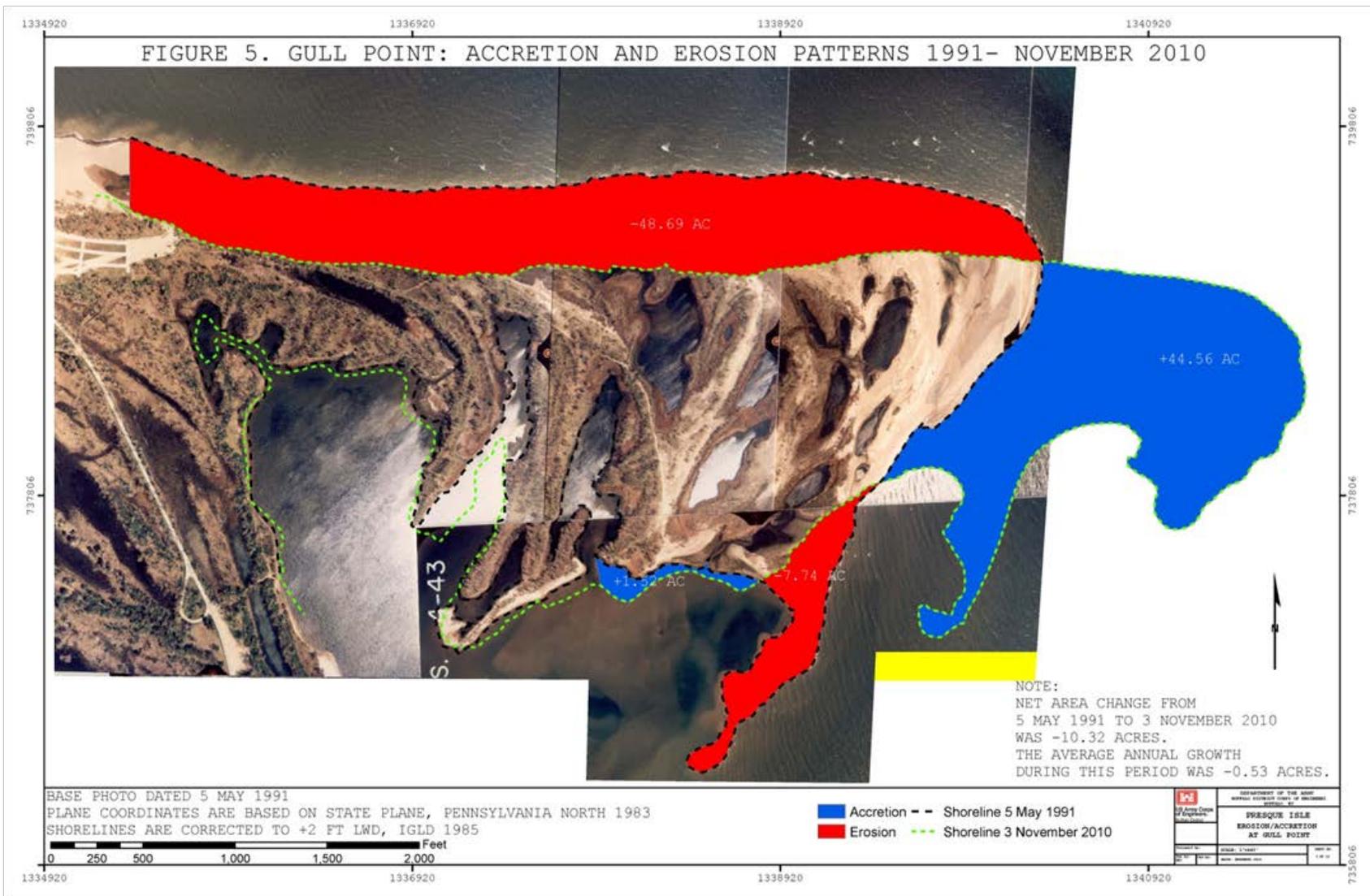
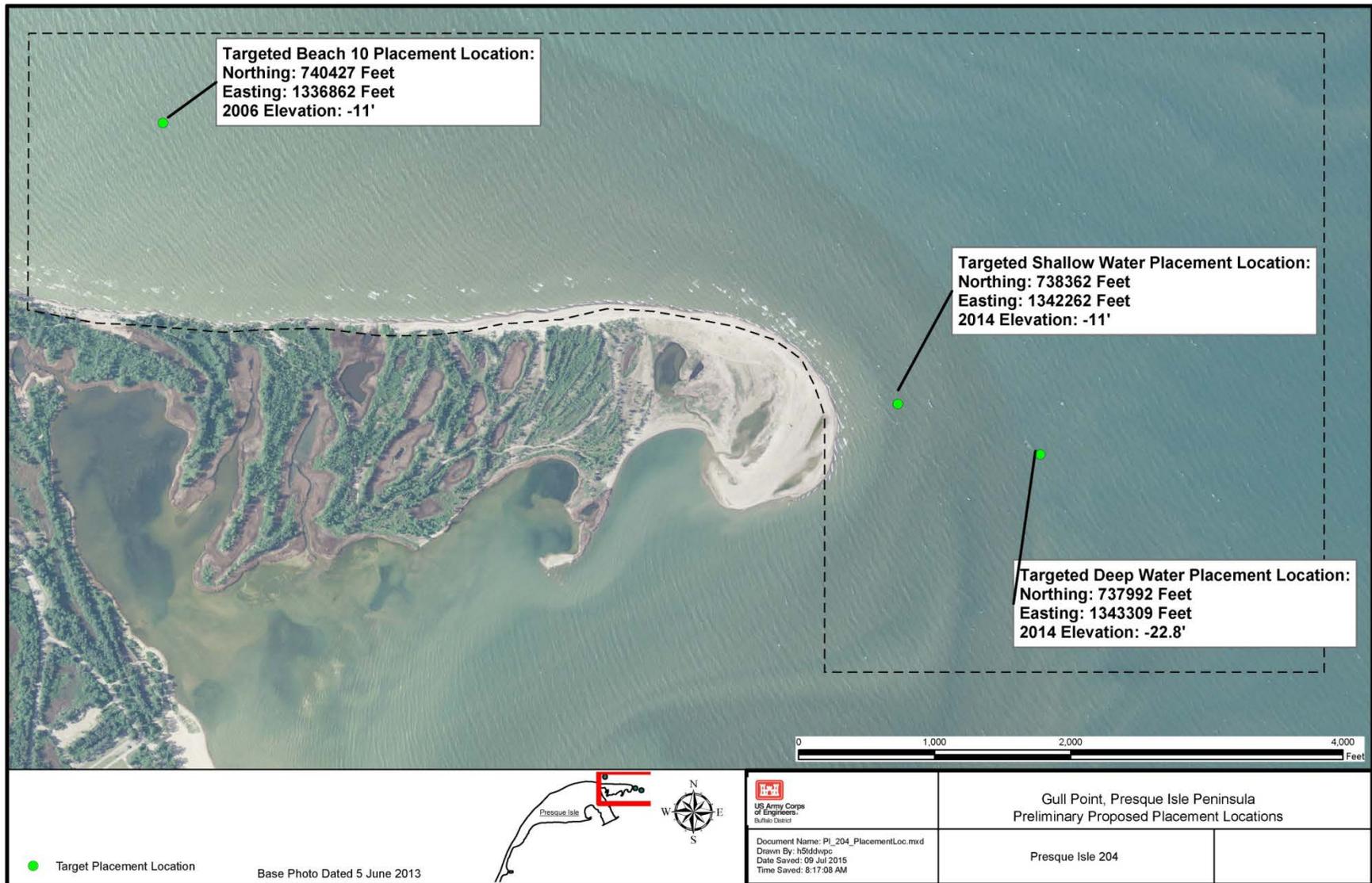


Figure 2: Gull Point Accretion and Erosion Patterns 1991 – 2010



**Figure 3: Proposed beneficial use of dredge material placement locations**

three locations. A specific amount of tracer particles manufactured to mimic characteristics of the dredge material (size gradation, density, hardness, shape, and fall speed within the water column) will be deployed at each location. Two methods for deploying the tracer particles are being considered. The first method is to deploy the tracers with a set volume of dredged material. Deploying the tracer with dredge material will provide more accurate sediment transport information related to placement of dredge material in the nearshore environment. Deployment of the tracers with the sediment requires certain environmental permits, for which USACE is currently pursuing. If permits do not allow that measure, tracers will be deployed at the three locations without the dredged material. Repeated sediment sampling will be performed at the placement areas and surrounding area to track the dispersal of the released tracer material. Because of the way the particles are manufactured and analyzed, it is possible to detect very low levels of tracer in each sediment sample (1 part per billion), enabling tracking of the tracer after significant “dispersion” by waves and currents (Moritz et al. 2014). Analysis of the spatial and temporal distribution of recovered tracer particles indicates the spatial extent of tracer sediment transport during the data collection time-frame.

Microplastic pollution has been an environmental concern in the Great Lakes since the 1970’s. Microplastics are small pieces of plastic – typically less than 5 millimeters in size and form in a variety of ways. Sources of microplastic include: breakdown of larger plastics in the environment; washing clothes made of synthetic fibers releasing microplastics into the sewage systems; paint, construction materials, and personal care products containing microplastic compounds which eventually make their way into nearby waterbodies. A range of organisms with differing feeding strategies including mussels, barnacles, amphipods, lugworms, fish and seabirds are capable of ingesting microplastic debris (Thompson et al. 2004, Brown et al. 2007). Recent work has shown that ingested particles of microplastic can accumulate in the gut of mussels and can translocate into their circulatory-system where they can persist for over 48 days. This work also showed that smaller particles had a greater potential to accumulate in the tissues (Brown et al. 2008).

The silt and sand tracer particles being proposed for this sediment transport study are manufactured by Environmental Tracing Systems Ltd (ETS) and are ‘filled-polymer’ particles designed to be negatively buoyant and behave like natural silica silt and sand. The tracer particles are comprised of the following: 78% by weight of a naturally occurring mineral Barium Sulphate; 3% by weight fluorescent pigment (solid solution of fluorescent dye); 14% polymer by weight; remaining 5% by weight includes a surfactant (ETS 2015). The scope of the proposed tracer study will require the release of approximately 1500 lbs of tracer particles, of which 210 lbs is comprised of polymers. ETS states that the tracer particles they manufacture are environmentally benign and inert, and the polymer represents a small percentage of the total particle and is designed to remain intact and have been shown to pass through in mussel pseudofaeces over days. ETS also states their particles do not have harmful additives present and given the physical structure, chemical composition and low polymer percentage, are very unlikely to absorb persistent organic pollutants and if they do, may possibly take them out of the water column and be buried in the sediment. Lastly, ETS states that based upon the current literature there appears to be little or no environmental risk from the sediment tracers released, particularly at the concentrations and dilutions ETS are using given they are dense, filled-polymer particles.

Dredged material with tracer would be placed by scow at the three locations. Approximately 1,500 to 4,500 cubic yards (1-3 scows) of material will be placed at each location. The proposed schedule for placement of the material is during the 2016 dredging season which typically starts in June. In order to avoid any disturbance to piping plover or its designated critical habitat, placement will occur after the piping plover's breeding season from April 1 – June 30. The tracer monitoring program will take place over the course of one year, starting at the time of sediment placement.

In addition to the tracer monitoring program, a turbidity and beach sand monitoring program will be conducted to determine if the nearshore placement of fine sediments results in adverse impacts to nearshore water quality and/or sand composition along the shoreline, especially in the swash zone where piping plover foraging is known to occur. Turbidity monitoring was conducted from July – October 2015 and is scheduled to be conducted from May – October 2016. The data collected prior to placement of dredge material (proposed for July 2016) will represent baseline levels of turbidity that occurs in the vicinity of the proposed placement areas. This data will be compared to the turbidity data collected after placement of dredge material to determine if this activity increases turbidity in the nearshore environment. Similarly, sand within the swash zone will be sampled before and after placement of the dredge material to determine if sand composition in this zone is influenced by the project.

Information gathered during this study will aid in determining if the dredge material can effectively be used to nourish and potentially accelerate the growth of the distal end of the peninsula without causing adverse environmental impacts. If the study demonstrates that dredged sediment can be effectively used in this manner without adverse environmental impacts, it is likely that some fraction of dredge material from the Erie Federal Navigation Channel in future dredging seasons could be designated for use at one or more of these offshore placement locations. This modification in the operation and maintenance dredging may result in cost savings to the Federal and state agencies and help provide benefits to regional sediment management objectives.

#### **4 IMPACT ASSESSMENT**

To evaluate the potential effects of the proposed project on the natural and human environment, the Buffalo District is preparing an Environmental Assessment and Section 404(b)(1) Evaluation, in compliance with the National Environmental Policy Act of 1969, and Clean Water Act of 1977, respectively. In addition, the with and without project (No Action) conditions will be assessed in relation to several parameters including the following social, economic and environmental categories:

- Fish and Wildlife Resources
- Water Quality
- Dredged Material Management
- Geology and Soils
- Contaminated Materials
- Air Quality
- Noise
- Recreation
- Historic Properties
- Property Values and Tax Revenues
- Employment
- Community Cohesion and Growth
- Transportation
- Public Facilities and Services
- Aesthetics
- Environmental Justice

## 5 PUBLIC PARTICIPATION AND INTERAGENCY COORDINATION

Throughout the scoping process, stakeholders and interested parties will continue to be invited to provide comments on the proposed study. Interested parties are welcome to contact USACE-Buffalo District to discuss their views and recommendations regarding this study.

## 6 COMPLIANCE WITH ENVIRONMENTAL PROTECTION STATUTES

Numerous environmental laws and executive orders influence and guide water resources planning, development, and management within the USACE Civil Works program. Table 1 presents a comprehensive list of environmental protection statutes, executive orders, etc. that are normally considered. Therefore, an additional goal of this scoping process is to consult with appropriate agencies and other interested parties pertaining to resources protected by these mandates. The dissemination of this scoping information initiates applicable coordination and consultation requirements required under their provisions.

Some important Federal environmental protection statutes that will be addressed include:

- *National Environmental Policy Act (NEPA)*. In accordance with 33 Code of Federal Regulations (CFR) 203 (Procedures for Implementing NEPA), USACE-Buffalo District will assess the potential environmental effects of the project alternatives on the quality of the human environment. Using a systematic and interdisciplinary approach, an assessment will be made of the potential environmental impacts for each plan as determined by comparing the with- and without-project conditions. The impact assessment process will determine if an Environmental Impact Statement is required, or if an Environmental Assessment and Finding of No Significant Impact is appropriate.
- *Clean Water Act*. The USACE - Buffalo District will evaluate the discharge in accordance with the Clean Water Act Section 404(b)(1) Guidelines. Water quality and related information used in this evaluation will provide documentation to demonstrate that the recommended plan is in compliance with this Act. A Section 404(a) Public Notice will be circulated in the future and an opportunity to request a public hearing will be afforded to all potentially affected parties. Section 401 Water Quality Certification for the discharge will also be requested from the Pennsylvania Department of Environmental Protection (PADEP).
- *Coastal Zone Management Act*. The Act requires that Federal activities be consistent with the enforceable policies of the Pennsylvania Coastal Management Program. A Federal consistency determination will be submitted to the PADEP for their concurrence.
- *Endangered Species Act*. In order to avoid any disturbance to the federally listed endangered piping plover or its designated critical habitat, placement will occur after the piping plover's breeding season from April 1 – June 30. Additionally, in accordance with Section 7 of this Act, the USACE is requesting information from the U.S. Fish and Wildlife Service (USFWS) on any listed or proposed species or designated or proposed

critical habitat that may be present in the project area. If this consultation with USFWS identifies any such species or critical habitat, then the USACE will conduct a biological assessment to determine the proposed project's effect on these species or critical habitat.

- *Fish and Wildlife Coordination Act.* The USACE is coordinating this study with the USFWS. The USACE will collaborate with the USFWS to identify fish and wildlife concerns, identify relevant information on the study area, obtain their views concerning the significance of fish and wildlife resources and anticipated project impacts, and identify those resources which need to be evaluated in the study. Full consideration will be given to their comments and recommendations resulting from this coordination.
- *National Historic Preservation Act.* Under Section 106 of this Act, this scoping process also initiates consultation with the National Park Service, State Historic Preservation Office, potentially interested Indian nations, local historic preservation organizations and others likely to have knowledge of, or concern with, historic properties that may be present within the study's Areas of Potential Effect (APE). The APE is outlined in Figure 3 with a black dashed line. Initial review of the study areas has determined that there are no properties listed, or likely eligible for listing, on the National Register of Historic Properties or the Pennsylvania Register of Historic Properties within the APE's for this study.

**Table 1: Federal Environmental Protection Laws, Orders, and Policies**

## 1. PUBLIC LAWS

- a. American Folklife Preservation Act, P.L. 94-201; 20 U.S.C. 2101, *et seq.*
- b. Anadromous Fish Conservation Act, P.L. 89-304; 16 U.S.C. 757, *et seq.*
- c. Antiquities Act of 1906, P.L. 59-209; 16 U.S.C. 431, *et seq.*
- d. Archaeological and Historic Preservation Act, P.L. 93-291; 16 U.S.C. 469, *et seq.* (Also known as the Reservoir Salvage Act of 1960, as amended; P.L. 93-291, as amended; the Moss-Bennett Act; and the Preservation of Historic and Archaeological Data Act of 1974.)
- e. Bald Eagle Protection Act; 16 U.S.C. 668.
- f. Clean Air Act, as amended; P.L. 91-604; 42 U.S.C. 1857h-7, *et seq.*
- g. Clean Water Act, P.L. 92-500; 33 U.S.C. 1251, *et seq.* (Also known as the Federal Water Pollution Control Act; and P.L. 92-500, as amended.)
- h. Coastal Zone Management Act of 1972, as amended, P.L. 92-583; 16 U.S.C. 1451, *et seq.*
- i. Endangered Species Act of 1973, as amended, P.L. 93-205; 16 U.S.C. 1531, *et seq.*
- j. Estuary Protection Act, P.L. 90-454; 16 U.S.C. 1221, *et seq.*
- k. Federal Environmental Pesticide Control Act, P.L. 92-516; 7 U.S.C. 136.
- l. Federal Water Project Recreation Act, as amended, P.L. 89-72; 16 U.S.C. 460-1(12), *et seq.*
- m. Fish and Wildlife Coordination Act of 1958, as amended, P.L. 85-624; 16 U.S.C. 661, *et seq.*
- n. Historic Sites Act of 1935, as amended, P.L. 74-292; 16 U.S.C. 461, *et seq.*
- o. Land and Water Conservation Fund Act, P.L. 88-578; 16 U.S.C. 460/-460/-11, *et seq.*
- p. Migratory Bird Conservation Act of 1928; 16 U.S.C. 715.
- q. Migratory Bird Treaty Act of 1918; 16 U.S.C. 703, *et seq.*
- r. National Environmental Policy Act of 1969, as amended, P.L. 91-190; 42 U.S.C. 4321, *et seq.*
- s. National Historic Preservation Act of 1966, as amended, P.L. 89-655; 16 U.S.C. 470a, *et seq.*
- t. Native American Religious Freedom Act, P.L. 95-341; 42 U.S.C. 1996, *et seq.*
- u. Resource Conservation and Recovery Act of 1976, P.L. 94-580; 7 U.S.C. 1010, *et seq.*
- v. River and Harbor Act of 1899, 33 U.S.C. 403, *et seq.* (also known as the Refuse Act of 1899)
- w. Toxic Substances Control Act, P.L. 94-469; 15 U.S.C. 2601, *et seq.*

- x. Watershed Protection and Flood Prevention Act, as amended, P.L. 83-566; 16 U.S.C. 1001, *et seq.*
- y. Wild and Scenic Rivers Act, as amended, P.L. 90-542; 16 U.S.C. 1271, *et seq.*

## 2. EXECUTIVE ORDERS

- a. Executive Order 11593, Protection and Enhancement of the Cultural Environment. May 13, 1979 (36 FR 8921; May 15, 1971)
- b. Executive Order 11988, Floodplain Management. May 24, 1977 (42 FR 26951; May 25, 1977)
- c. Executive Order 11990, Protection of Wetlands. May 24, 1977 (42 FR 26961; May 25, 1977)
- d. Executive Order 11514, Protection and Enhancement of Environmental Quality, March 5, 1970, as amended by Executive Order, 11991, May 24, 1977
- e. Executive Order 12088, Federal Compliance with Pollution Control Standards, October 13, 1978
- f. Executive Order 12372, Intergovernmental Review of Federal Programs, July 14, 1982
- g. Executive Order 12856, Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements, August 3, 1993
- h. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994
- i. Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

## 3. OTHER FEDERAL POLICIES

- a. Council on Environmental Quality Memorandum of August 11, 1980: Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act
- b. Council on Environmental Quality Memorandum of August 10, 1980: Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the National Inventory
- c. Migratory Bird Treaties and other international agreements listed in the Endangered Species Act of 1973, as amended, Section 2(a)(4)

## 7 REQUEST FOR COMMENTS

Interested parties are encouraged to contact USACE - Buffalo District with their comments and recommendations regarding the Beneficial Use of Dredge Material Demonstration Study. Please review the study information and send your comments or recommendations to the following email address or mail address:

[PresqueIsle204@usace.army.mil](mailto:PresqueIsle204@usace.army.mil)

or

U.S. Army Corps of Engineers, Buffalo District  
Environmental Analysis Team  
1776 Niagara Street  
Buffalo, NY 14207-3199  
ATTN: Environmental Analysis – Presque Isle 204

## 8 REFERENCES

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