

General information

Name of navigation or waterborne transport infrastructure project	Deer Island Restoration/Beneficial Use of Dredge Material
Country	USA
Project location (nearest town or city)	Biloxi, MS
Key project objectives	The Biloxi Harbor Navigation Project was federally authorized by the U.S. Congress in 1966. It provides a 12-ft deep navigation channel to support barge and vessel traffic into and out of commercial and industrial facilities, most notably a coal facility in Biloxi Harbor. Dredged material from this project was used beneficially at Deer Island to restore marsh, create habitat for terrestrial and aquatic species, and provide a more resilient shoreline for future storm events.
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Position	Lead Project Engineer for Civil Works
Organisation	US Army Corps of Engineers, Mobile District

Project data

Characteristics of environment	
	Coastal
	Urban
	Temperate
	Protected areas
Key project dates	
Project is in the planning phase. Date project planning started	pre-2000
Project has consents/approvals. Date approval was obtained	December 2000
Project construction started. Date construction started	August 2010
Date project will be completed	Est Compl - Sep 13

Type of project

New construction or development

Maintenance program or initiative

Waterway

Aquatic relocation/disposal of dredged material

Beneficial use of dredged material

Brief description

The intent of the Deer Island Restoration/Beneficial Use of Dredge Material Project was to (1) restore Deer Island and (2) create long term disposal capacity for material dredged from the nearby Biloxi Harbor Navigation Project. Deer Island is a 3.5-mile long spindle-shaped island located adjacent to the navigation project and just off the coast of Biloxi, Mississippi. Though much of Deer Island endured through catastrophic storm events over the last century including Hurricanes Camille, Ivan, and Katrina, the storms destroyed forested areas, significantly eroded the sandy shoreline, and left elevations too low to support marsh vegetation. The Deer Island Restoration Project included the filling of a breach in the west end of the island, the restoration of the southern shoreline, and strategic vegetation plantings. Approximately 1.95 million cubic yards of hydraulically-dredged material from a nearby borrow site were utilized to fill the west end breach and restore the southern shoreline. Over 300,000 plants were planted on the island and, currently, another 325,000 plants are being planted. Importantly, the project included the construction of a 1 million cubic yard capacity lagoon specifically designed for the beneficial use placement of fine-grained dredged material from Federally-authorized navigation channels. Approximately 170,000 cubic yards of dredged material from the Biloxi Harbor Navigation Project were placed in the lagoon in October 2011. The principles and practices used for the Deer Island Restoration Project provide significant environmental benefits for the region, as well as protection for the City of Biloxi from storm events, recreation opportunities for people, and hard-to-come-by economically feasible and environmentally acceptable beneficial use opportunities for dredged material.

Indicative size

More than 10 million US\$

Working with Nature philosophy

Were steps taken to understand the environment before any work was started on the development of the design of the project?

Yes

Yes - Extensive studies were performed by State & Federal agencies which led to an understanding of the evolution of the island and its role in the estuarine ecosystem and the management of risks to populated areas.

Were stakeholders or potential partners involved from the very beginning in the initial process of identifying potential options or solutions and agreeing on a preferred option (i.e. instead of being consulted on already defined options)?

Yes

Yes - Collaborative partnerships were developed early in the project among the Federal and State regulatory agencies, elected officials, non-governmental organizations, and the general public, thus developing a sense of ownership among all the partners. Consideration for the diverse needs of the community, i.e. habitat, water quality, safety, recreation, and the economy, formed the basis for the conceptual design.

Was a solution identified which provided a clear 'win-win'?

Yes

Yes - In addition to traditional environmental benefits such as habitat for sea turtles and various shorebird species, the project was designed and constructed to provide economic benefits through (1) the creation of beneficial use areas for cost-effective dredge material placement and (2) the reduction of wave energy and associated damages along the mainland coast of Biloxi, MS in Harrison County. The project also provides numerous recreational benefits for beach-goers and bird-watchers.

Was the project designed to work with and make use of natural processes (e.g. 'letting nature do the work')?

Yes

Did the project include benefits for nature or other environmental enhancements beyond what was legally required?

Yes

Yes - The project provides for the long-term establishment of emergent wetlands and resilience of the maritime forest, which is home to bald eagles and other coastal birds. There is no legal demand to restore Deer Island. The beneficial use of dredge material is not a legal federal demand but is encouraged to the maximum extent possible.

Did the project follow, in order, the steps described in the Working with Nature Position Paper?

Yes

Yes - The plan was developed in partnership with environmental organizations, local elected officials, and regulatory agencies. Coordination and cooperation were essential elements of the project success.

Reasons/motivation for taking this approach

The Deer Island Restoration Project is an environmental restoration project that considered the needs of the area and helped to foster the MDMR vision for a resilient coast including consideration of the people, the economy, the environment, and the vast heritage of the coast. The project has provided for the creation of over 200 acres of restored habitat that benefits several life history stages of migratory and resident avian species and provides nursery habitat for several fish species while simultaneously providing recreational opportunities for people. The project utilized local resources, and a soft engineering approach through sunken geotubes and an intensive native planting effort, to increase the resiliency of the restored island. Importantly, the project has provided critical capacity for the placement of fine-grained dredged sediments from the Biloxi Harbor Navigation Project for beneficial use. The Deer Island Restoration Project serves as a positive example of what can be achieved through the application of these concepts and practices. The future use of dredged material as a resource for environmental improvements, by the USACE and others, will be aided by the innovative design and construction approach taken by the USACE Mobile District and the satisfaction of the project stakeholders with the project outcomes.

Cost implications

Costs were lower than the conventional approach to this type of project (i.e. cost savings were made)

Initial construction costs of the project were slightly higher due to the installation of geotubes in the west-end breach. However, long-term maintenance costs to repair the breach from future storms will be reduced. Additionally, the project provides for low cost disposal options for maintenance material dredged from the adjacent portions of the Biloxi Harbor Navigation Project (i.e. the Biloxi Lateral and East Access Navigation Channels). Further details provided below.

Additional funds were provided from third parties

No

Extra costs compared to conventional approach

Costs were not marginally or significantly higher than a conventional approach to this type of project

Other cost implications	Dredge material from the Biloxi Harbor Navigation Project can be placed in the beneficial use lagoon on Deer Island instead of traditional open water placement areas. Often times, the dredge is placed off-line on a reduced pay status due to the spill barge's inability to handle rougher sea conditions. Having a placement area on Deer Island avoids the need to use the spill barge, which allows the dredge to continue pumping and ultimately increases efficiency and reduces project costs.
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Did existing legislation help or hinder your application of the Working with Nature philosophy?

The approach adopted helped to meet legal obligations	Yes - Federal legislation following Hurricane Katrina relaxed rules mandating NED benefits and incremental analysis with positive benefit:cost ratios. This enabled the project to be approached from a purely environmental standpoint.
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What was done did not exceed legal requirements

No problems were experienced with existing legislation	No
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The approach was not taken despite legal requirements

Legal requirements did not prevent the Working with Nature philosophy being applied	No
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Further information

Further information on the project is provided at the following link:
http://el.ercd.usace.army.mil/ewn/Case_Studies.html