

DESIGN AND CONSTRUCTION OF A LIVING SHORELINE PROJECT ALONG THE GULF COAST

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The Hancock County Marsh Living Shoreline Project (project) was developed as an NRDA Early Restoration project. NRDA Early Restoration projects are intended to accelerate meaningful restoration of injured natural resources, and their services, resulting from the Deepwater Horizon oil spill. The Mississippi Department of Environmental Quality and National Oceanic and Atmospheric Administration (the federal and co-implementing trustee) worked cooperatively to develop a project along the Hancock County, Mississippi, shoreline. This project would partially offset injuries by preserving and protecting existing marsh and providing for increased secondary productivity. Currently, it is the largest restoration project to be designed and constructed in Mississippi.

The project consists of three restoration components:

- A total of 5.9 miles of living shoreline will be constructed at two locations, from Pearl River to Heron Bay and from St. Joseph's Point to Bolan Bayou. By dampening the wave energy, the breakwater will help reduce shoreline erosion, protect the coastal preserve, and re-establish habitat that was once present in the region.
- A total of 46 acres of marsh will be constructed with beneficial use (BU) dredged material to protect and restore marsh areas that have experienced historical erosion.
- A total of 46 acres of subtidal reef have been constructed in Heron Bay to enhance habitat conditions and increase secondary productivity in the area.

The project's purpose is to preserve and protect existing habitat while providing areas of secondary shellfish productivity.

The selected alternative was a result of detailed geotechnical, wind-wave, and current analyses (including hydrodynamic modeling of the Gulf Coast of Mississippi) to locate and design the segmented breakwater, subtidal reef, and marsh components of the project. This project used traditional coastal engineering analyses of wave conditions and erosive forces. The analysis was used to design natural features, as well as a low-relief stone breakwater, to reduce shoreline erosion by dampening wave and current energy. The structures were also designed to optimize circulation while re-establishing critical shellfish habitat.

The project was divided into five construction phases. Phase 1: Pearl River to Heron Bay Living Shoreline (see Figures 1 and 2) and Phase 4: Heron Bay Subtidal Reef

have already been constructed. Phases 2 and 3 of the breakwater are currently in construction and are intended to be completed in 2018. Phase 5: Marsh Restoration is intended to be constructed at a later date.

This presentation will focus on the engineering analyses that were performed during design of the project, as well as the three phases of construction for the 5.9-mile-long living shoreline. Challenges encountered during the design and permitting processes and how they were overcome will also be presented.



Figure 1 - Aerial Photo of Phase 1



Figure 2 - Phase 1 Living Shoreline Breakwater