Quick Assessment of Wind-Waves for the Mordecai Island, New Jersey Vicinity

Response Summary:

The USACE Philadelphia District is requesting assistance for a relatively quick wave assessment for the Mordecai Island, New Jersey vicinity. Mordecai Island is located west of Long Beach Island near Beach Haven Borough, New Jersey and adjacent to the New Jersey Intracoastal Waterway (NJIWW). Over the last five years, the Engineering Research and Development Center's (ERDC) Coastal and Hydraulics Laboratory (CHL) and the Environmental Laboratory (EL) have assisted the Philadelphia District with various aspects of the Mordecai Island Ecosystem Restoration Feasibility Study as well as the innovative placement/island creation project using NJ Intracoastal Waterway (NJIWW) dredged material. The island is also the focal point of many innovative restoration projects conducted by the Mordecai Land Trust. Monitoring of the projects is ongoing by USACE, the Mordecai Land Trust and most recently by NOAA's NCCOS group.

The entire coastline of Mordecai Island has suffered from erosion; however, the western edge, adjacent to the Federal NJIWW navigation channel, has receded at a more substantial rate on the order of 3 - 6 ft. per year. Over the past 100 years, half the island has been lost through erosion. If nothing is done to protect the island, the erosion will continue and a highly valuable habitat, including a nesting colony of state-threatened black skimmers, will be at risk. The primary causes of the significant and continuous erosion along the western shoreline of Mordecai Island are waves from the bay, with a very large fetch, and wakes from vessels using the adjacent Intracoastal Waterway. A better understanding of the local wave environment will help the Project Delivery Team evaluate features for reducing wave energy to protect this now critical environment and manage beneficial use placement areas.

Period of Performance:

10/22/18 – 11/2/18

Benefits of the Response to the USACE Dredging/Navigation Program:

The goals of the Mordecai Island Ecosystem Restoration Feasibility Study are to protect the island from erosion by stabilizing the eroding shoreline and restoring lost habitat. Wave modeling is needed to help the Project Delivery Team screen measures and evaluate alternatives. Specifically, a modeled understanding of the wave regime at the site will help the PDT determine the location and sizing of selected features to break the wave energy, and will inform the selection of the most cost effective alternative. In addition to the array of alternatives being developed in the Mordecai Island Feasibility study, wave modeling is needed to help understand, manage, and protect the existing beneficial use placement areas and inform future placement operations.

Deliverable:

Wave model files, modeling results, and assistance with interpretation and application through a conference call, a letter report, and technology demonstration

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