



**US Army Corps
of Engineers®**
Engineer Research and
Development Center

Regional Sediment Management Program

Advancing Nearshore Berm Research, Guidance, and Tool Development

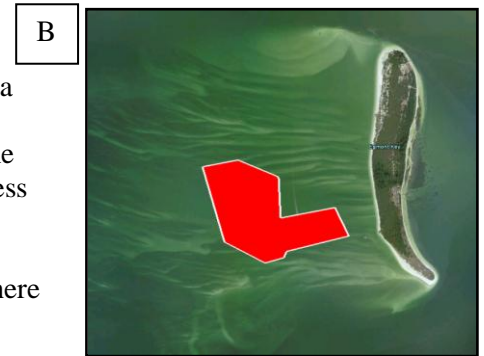
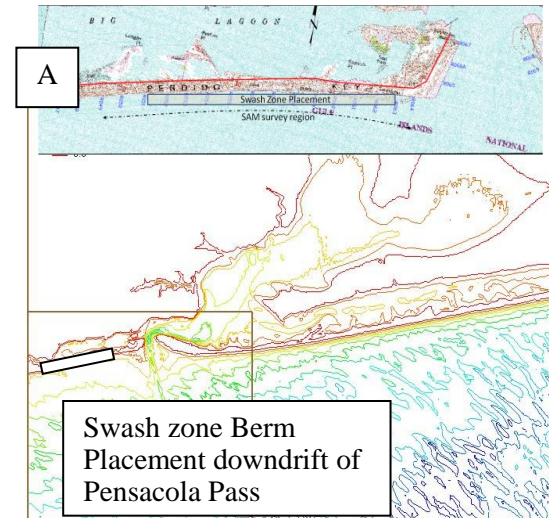
Description

The Regional Sediment Management (RSM) Program and the Coastal Inlets Research Program (CIRP) have joined efforts to monitor and study several nearshore berm placement sites located in Florida. The goal of this study is to develop improved guidance on nearshore berm placement by building off the detailed study provided from monitoring beach and nearshore morphologic change. Results from these studies will provide the necessary background for guidance on design and project performance, which can be utilized by the Districts doing work in the region of study, and to create a tool improve certainty in placement sites under temporal and spatial guidelines, and avoid rehandling of sediment that may re-enter the navigation channel.

Issue

Placement of dredged sediment in nearshore berms is a common practice associated with Operations & Management (O&M) of navigation channels within the Corps of Engineers. These placements are typically less costly and easier to construct, and are historically not studied in great detail due to their perceived limited impact on beaches or other highly mitigated areas. There is presently no compilation of documented berm placements and their evolution over time, nor is there project performance metrics with respect to long-term response is limited to internal knowledge. Results from these proposed studies will provide valuable information on nearshore berm design, consideration of hydraulic and sedimentologic controls, and frequency and location of placements.

The RSM project leverages funding from the CIRP with a three-fold purpose: (1) to conduct a detailed monitoring and analysis of each nearshore berm placement including dense survey coverage of the beach and nearshore morphology change, sedimentologic



A) Location of nearshore placement in the form of a “Swash-zone Berm” in Perdido Key, Pensacola, FL; B) Location of nearshore placement in the form of a shallow mound in Egmont Key, Tampa, FL; C) Bathymetric map of the Ft. Myers Nearshore Berm Placement in 2009.

characteristics of the surface and subsurface, long-term measurements of the nearshore wave climate, and a short-term hydrodynamic study, including, e.g., development and evolution of rip channels; (2) develop a simple calculation tool that takes into account the general controlling factors that define how a nearshore berm will behave, i.e. migration potential, in the cross-shore and alongshore; and (3) develop guidance documentation on nearshore berm design and implementation to District offices (out-year).

Expected Products

(1) Ft. Myers Nearshore Berm: Following the new nearshore placement over the 2009 template, monitoring will consist of detailed quarterly bathymetric surveys and sedimentologic data collection. A first year progress report will be the primary product of this year of analysis; (2) Pensacola Swash Zone Berm: Detailed bathymetric and hydrodynamic data collection and analysis. Beach and nearshore surveys will be collected semi-annually for the remaining 1.5 years of the proposed two-year study. The first year performance will be described in a CHETN, followed by the two-year Technical Report at the end of project monitoring in Winter 2014; (3) Egmont Key Nearshore Berm: Continued detailed bathymetric and hydrodynamic data collection and analysis. Beach and nearshore surveys on a bi-monthly basis for the first 6 months (Delayed placement to Jan-13), and semi-annually for the next 1.5 years of the two-year monitoring period; long-term deployment of one directional wave gage; and a short-term hydrodynamic study across the nearshore of Egmont Key; (4) Nearshore Berm Calculator: A simple calculation tool that takes into account the basic controlling factors/parameters that generally defines how a nearshore berm will behave, i.e. migration potential, in the cross-shore and alongshore; (5) Numerical Modeling: Analysis of hydrodynamics, sedimentologic, and resultant morphologic change at multiple monitoring sites; comparative analysis using a hydrodynamic/sediment transport numerical model. Product will be a journal paper discussing the behavior of RSM-CIRP monitored nearshore berm placements; (6) Publication of Technical Notes and Reports; preparation of Nearshore Berm Workshop; preparation of conference presentations and papers, & present results at annual RSM workshop.

Potential Users

Mobile District, Jacksonville District and other District offices that have need for guidance documentation and performance metrics of nearshore berm designs and their implementation.

Projected Benefits

More effective placement of dredged sediment in the natural form of a nearshore berm to nourish beaches and reduce loss of non-beach quality sand from the regional system; develop design guidance; develop performance metrics for use in Benefit-Cost Analysis; improve numerical model calculations for nearshore berm evolution.

Leveraging Opportunities

Leveraged Funding: Geomorphic Evolution Work Unit, Coastal Inlets Research Program; Mobile District; Jacksonville District.

Points of Contact

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Participating Partners

ERDC-Coastal and Hydraulic Laboratory; Mobile District; Jacksonville District