Innovative Placement Techniques and Sediment Monitoring

Dredging Operations Environmental Research (DOER) Program

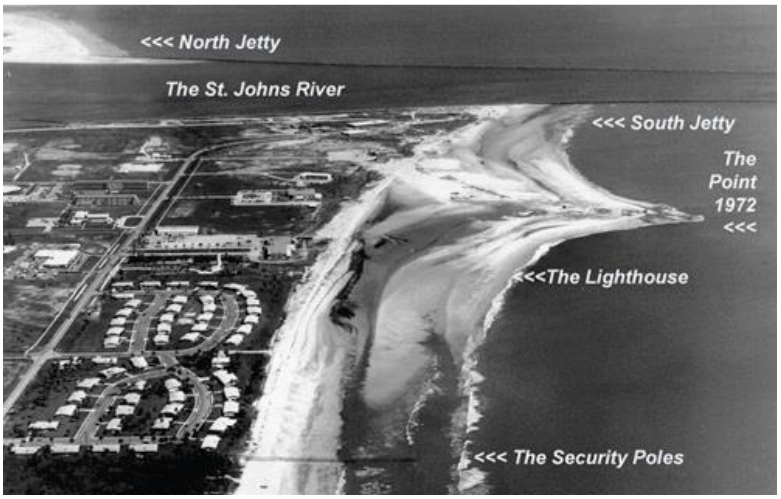
U.S. ARMY CORPS OF ENGINEERS BUILDING STRONG®

Focus Area

Innovation in Sediment Management - Innovative Construction and Operations Technologies

Problem

Sediment dredged from our coastal navigation channels is regularly placed in the nearshore to nourish the beach profile and keep the sediment in the littoral system. Numerous examples demonstrate that nearshore nourishment supports the beach profile, but the public and local stakeholders generally prefer readily observable subaerial placements. Common techniques to place sediment on the subaerial beach are more expensive than nearshore alternatives, so these projects generally require a cost-sharing partner to cover additional costs. An innovative construction technique is needed that cost effectively places sediment dredged from coastal navigation channels on the subaerial beach.



CSSZ Placement at Mayport, FL in 1972 (Hodgens et al., 2016)

Study Description

The cross-shore swash zone (CSSZ) placement technique is an innovative idea where the dredge's discharge pipe is placed in the swash zone and slowly maneuvered away from the land to create a shoreline perpendicular spit. This technique should use less equipment than traditional beach nourishment projects by omitting the containment baffles that are typically constructed on the subaerial beach. By placing the sediment in the swash zone without containment, the CSSZ placement technique will naturally spread some of the sediment across the beach profile, but it will also create a subaerial feature for the pubic to see. Cost effectiveness may be similar to placing sediment in the nearshore. By using waves to naturally transport the sediment, this placement strategy aligns natural and engineering processes using EWN principles. Chicago District (LRC) has an opportunity to build a CSSZ placement at the National Park Service's Portage Lakefront & Riverwalk, which provides a unique monitoring opportunity to study to the construction technique and the morphological evolution of the placement.

Products

This project will produce a journal manuscript describing the modeling, construction, and monitoring of this innovative nourishment technique. Results will also be presented in a conference presentation.

Summary

The public often prefers for dredged sediment to be placed on the subaerial beach where it can be visually observed. The cross-shore swash zone (CSSZ) placement technique is a cost effective placement technique where the dredge's discharge pipe is placed in the swash zone and slowly maneuvered away from the land to create a shoreline perpendicular spit. Chicago District (LRC) has an opportunity to build a CSSZ placement at the National Park Service's Portage Lakefront & Riverwalk, which provides a unique monitoring opportunity to study the construction technique and the morphological evolution of the placement.

Balancing operational and environmental initiatives and meeting complex challenges of dredging and dredged material placement in support of the navigation mission.

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