Rapid Assessment of BUDM Alternatives for Coastal Wetlands

Dredging Operations Environmental Research (DOER) Program

U.S. ARMY CORPS OF ENGINEERS BUILDING STRONG®

Focus Area

Sediment and Dredging Processes

Problem

General guidance and rules-of-thumb for strategic placement near coastal wetlands are elusive, largely due to the complexity and interactions between tides, basin geometry, vegetation, and available sediment. Presently, strategic placement is undertaken with either expensive, site-specific numerical modeling or limited-scale pilot studies coupled with monitoring. To increase the scope and effectiveness of beneficial use in dredged material management, science-based guidance and accessible predictive tools are required.

Study Description

The project will develop a tool that generates an effectiveness rating for specific BUDM practices over an array of coastal wetland conditions. This rating will be based on geomorphic simulations of idealized wetlands and BUDM practices representing landscape and environmental conditions spanning the U.S. coastline. This development will assist district end users in narrowing BUDM candidates for a given site.

Products

The primary products of this research are a rapid prediction tool and a validated marsh evolution model. The rapid prediction tool will be applied for screening initial BUDM alternatives. This may be sufficient for small or simple projects. Beyond the screening level, district engineers and scientists could apply the validated marsh morphology model to further evaluate specific design alternatives. This project will provide guidance, best practices, and examples for applying the geomorphic model to represent specific site conditions and BUDM variations. The research findings will be transferred to practice through training workshops and communicated to the technical community through ERDC Technical Reports, conference proceedings, and a peer-reviewed journal article.

Summary

To expand beneficial use of fine-grained dredged sediment, the USACE must develop innovative, science-based, and cost-effective practices for sediment placement near coastal marshes. This research will develop a rapid assessment tool for evaluation of BUDM techniques near coastal marshes. This tool will be based on thousands of pre-computed marsh morphology simulations to allow managers to identify suitable BUDM techniques for the targeted environment. The rapid assessment tool will help practitioners to identify effective alternatives for expanding beneficial use of coastal dredged sediment, saving $10M+ per year in dredging cost while increasing ecosystem, flood, and storm reduction benefits.

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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Research Products

Product Type	Product Title

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