Characterization of the Spread of Fine-Grained Sediment for Beneficial Use of Dredged Material

Dredging Operations Environmental Research (DOER) Program

U.S. ARMY CORPS OF ENGINEERS BUILDING STRONG®

Focus Area

Sediment and Dredging Processes

Problem

Figure 1. Previous FG-BUDM Placement

In 2023, the US Army Corps of Engineers (USACE) established a goal to beneficially utilize 70% of the sediment it dredges by the year 2030. Currently, over 50% of the material being dredged by USACE is fine grained sediment (FGS). Therefore, a need exists to evaluate potential for using dredged FGS in beneficial use projects. Near-marsh, shallow-water strategic placement of sediment dredged from navigation channels is a promising method for BU of FGS by increasing marsh and tidal flat accretion as well as providing erosion protection to marsh edges. However, applications of FGS in BU projects are often limited due to concerns over the dispersive nature of the sediments and if placed FGS is likely to impact nearby channels or other resources.

Study Description

This study seeks to build upon recent research that has demonstrated the stability of placed FGS due to its cohesive nature. A combination field and laboratory-based tests of the dredged material will be conducted to enhance past experiments and identify dispersion and spreading potential of placed material. The laboratory-based testing was conducted utilizing ERDC's Modular Military Tilting Flume monitoring the spread of FGS at various degrees of tilt. A field-based study is scheduled to be in collaboration with the Philadelphia District (NAP) in February FY26. The field-based study will also be conducted to monitor the spread of FGS during and after BUDM placement. Data from the study will be used to enhance research needs on FG-BUDM practices with focusing on a combination of sediment properties, hydrodynamic conditions, and geomorphic features of the placement area.

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

De'Arius Christmas & Nathan Madsen
Coastal and Hydraulics Laboratory • Dearius.J.Christmas@usace.army.mil

December 2025

Products

The research provided by this study would aide USACE by providing results and answering some uncertainties about nearshore placement of FGS for BUDM opportunities. By enhancing the understanding of FGS dispersion, the study could lead to increasing BU practices across the enterprise that result in healthy and resilient ecosystems. Lastly, a ERDC TR and a journal article containing the findings from both the laboratory- and field-based study will be published.

Summary

The purpose of this effort is to enhance the knowledge of FGS placement for BU practices by conducting both a laboratory- and field-based study. The findings of this study will be utilized to enhance research needs on FG-BUDM practices. The effort will include the collaboration with the Philadelphia District, The Wetlands Institute, and in-house program teams.

Research Products

Product Type	Product Title
TN	Beneficial use of Coastal Hydraulic Laboratory's Tilt Table: Conducting Tilting Observation Demands with Precision

De'Arius Christmas & Nathan Madsen
Coastal and Hydraulics Laboratory • Dearius.J.Christmas@usace.army.mil