



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

## Dredging Operations Environmental Research (DOER) Program

U.S. ARMY CORPS OF ENGINEERS

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### Focus Area

Sediment and Dredging Processes

### Problem

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.



Figure 1. Placement of mud berm along the marsh edge at Gull Island, NJ

### Study Description

This study seeks to build upon recent research that has demonstrated the stability of placed FGS due to its cohesive nature. The goals of this study are to identify collaborators at multiple districts with projects involving the placement of FGS. A combination of field and laboratory-based tests of the dredged material will be conducted to determine physical properties of the material that can be used to estimate the spread of the dredged material following placement based on local geographic and hydrodynamic conditions. A field-based study will also be conducted to monitor the spread of FGS during and after placement. Data from the study will be used to create the FGS spread calculator, a tool that will predict the dispersion of placed material based on a combination of sediment properties, hydrodynamic conditions, and geomorphic features of the placement area.

### Products

The research provided by this study would aide USACE by providing guidelines and answering some uncertainties about nearshore placement of FGS for BUDM opportunities. By furthering the understanding of FGS dispersion and providing a dispersion calculator, the study could lead to increasing BU practices across the enterprise that result in healthy and resilient ecosystems. Lastly, 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 further 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 in the development of a dispersion calculator and guidelines for the placement of FGS for BU. The effort will include the collaboration of multiple districts.



*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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