



Sediment Sorting During the Dredging and Placement Process

Description

The objective of this study is to quantify changes in sediment characteristics (i.e., grain size, sorting) and the degree, timing, and variability of sediment sorting during dredging and placement operations to determine the extent of potential sediment coarsening to better inform sediment compatibility analyses and subsequent management of sediment resources. The implications of the study are significant at a national level as the results are likely to increase beneficial use opportunities for dredged material and increase the volume of material available from offshore borrow areas which will provide value to the Navigation (NAV) program and reduce lifecycle costs to both NAV and Flood Risk Management (FRM) projects. This study builds on previous RSM, Dredging Operation and Environmental Research (DOER), BOEM, and Jacksonville District efforts and will result in the development of innovative and robust sediment sampling methodologies and lessons learned focusing on management of sediment resources with an ultimate goal of increasing allowable silt content in borrow and beneficial use sites.



Issue/Challenge To Address

Current state regulations generally include restrictions based on sediment characteristics which require that source material (e.g., navigation channel, inlet complex, offshore borrow area) matches the sediment characteristics at a placement site (e.g., beach, nearshore). If USACE is able to quantify coarsening associated with the dredging process, we can estimate the final grain size characteristics which could allow for use of siltier source materials to be placed on coastal FRM projects or other beneficial use areas. While the concept is relatively straight forward, quantifying changes in sediment grain size distribution through the dredging and placement process is relatively complex. Methods and techniques to collect representative sediment samples and produce statistically significant results are limited. This study will take a comprehensive approach to developing and validating the methods and techniques required to assess sediment dynamics associated with the dredging and placement process and will serve as a model that could be implemented throughout USACE.

Successes Lessons Learned

FDEP agreed to modify sediment grain size restrictions (% silt content) for a Tampa Bay study and support USACE efforts to study grain size variability and the potential implications to coastal resources management related to USACE NAV and FRM projects. Numerous lessons learned from the Tampa Bay project will be incorporated into this study including sampling methodology and analysis to ensure statistical significance of results.



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Expected Products

- Coordination with BOEM
- Annotated Bibliography with Conceptual Model
- Technical note and reports

Stakeholders/Users

Stakeholder participation includes BOEM, dredging industry, and USACE districts. Additional stakeholders such as the National Oceanic and Atmospheric Administration (NOAA) and state regulatory agencies may be included in the study once field sites are determined.

Projected Benefits Value Added

The project will provide significant value to the RSM, NAV, and FRM programs. Results may 1) increase placement opportunities for siltier material which may reduce dredging/placement costs, ease capacity limitations, and provide lifecycle cost savings and 2) increase borrow source areas and available source volumes. Beach quality sand sources are extremely limited and beneficially using material from NAV projects and locating borrow sources close to coastal shorelines could provide substantial value for decades.

Leveraging Opportunities

ERDC and the SAD RSM-RCX are participating in a two year Interagency Agreement (IA) with BOEM to assess the extent of sediment sorting during the dredging and placement process to better inform sediment compatibility analyses for placement of dredged material.

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