



Separation of Sand and Fine Sediment during Navigation Dredging Operations

Description

This research aims to improve sediment compatibility assessments for beach and nearshore placement of navigation dredging projects. The research will quantify the removal of fine sediment from dredged material by various dredging processes, yielding a better estimate of fines content delivered to the beach or nearshore and fate of the fines released to the water column. This research will support expansion of RSM practices of beach and nearshore placement of dredged material from navigation projects.



Sampling from the hopper to determine fines content of the loaded dredged material

Issue/Challenge To Address

State Regulations often require that the compatibility of sediments to be placed on the beach and the nearshore environment meet specific sediment compatibility factors, fine sediment (<63 um) content, sediment color, and other factors. Most typically, the assessment of sediment compatibility is made on the sediment to be dredged without consideration of the fine sediment losses associated with the dredging process. Better understanding of the separation of fine sediment and sand will support increased application of sandy dredged material removed from navigation channels for nearshore and beach placement, offering potential benefits of reducing navigation dredging and flood risk management costs and will increase utilization of our limited sand resources in the coastal zone.

Successes Lessons Learned

Recent research for offshore borrow areas suggests that hopper dredging overflow and pumpout removes 60-90% of fine sediment contained in offshore borrow areas, significantly reducing the fine content of the sand delivered to the beach. This initiative aims to extend the methods of the prior research to navigation dredging applications, which in many cases contains higher fractions of fine-grained sediment than are considered for offshore mining and beach placement.

Projected Benefits Cost Savings Value Added

Research findings could expand the beneficial use of sandy dredged material from coastal inlets resulting in keeping sand in the littoral system and improved efficiency and cost savings of O&M dredging and FRM missions.



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Expected Products

- Technical Report documenting the fine sediment reduction during navigation dredging with a trailing suction hopper dredger.
- Conference paper and presentation
- RSM webinar

Stakeholders/Users

USACE Districts and state departments of environmental protection, fish and wildlife will apply the findings of the research to justify decisions of beneficial use of dredged material in the coastal zone.

Leveraging Opportunities

RSM, BOEM, and SAJ have funded prior research to develop and deploy field sampling and analysis methods to define the fine-sediment losses associated with hopper dredging and pumpout for offshore borrow areas. BOEM and SAJ are continuing with phase 2 of this research topic for offshore borrow sites. The research spans multiple research program and agency domains and involves data collection from many different projects having a variety of sediment types and dredging operations. Consequently, cross-program and cross-agency leveraging of resources and funding are appropriate and necessary.

Points of Contact

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Participating Partners

TBD.