



Evaluation of Strategic and Direct Placement to Feed Mudflats and Marshes

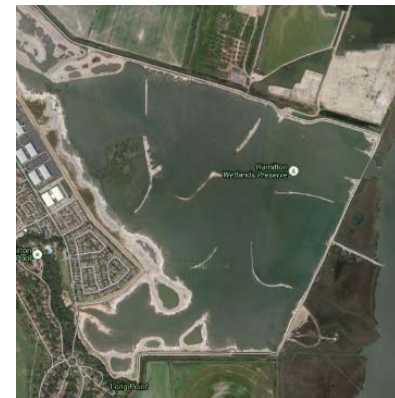
Dredging Operations Environmental Research (DOER) Program

U.S. ARMY CORPS OF ENGINEERS

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Problem

USACE is re-evaluating management of dredged material to increase beneficial uses. Limited upland and open water disposal site capacity, efforts to improve regional sediment management, and the need to support near-channel habitat and flood protection resources through sediment nourishment are driving the move to beneficially use dredged material in the nearshore. Beneficial use includes the application of dredged sediment to nourish nearby mudflats and marshes to mitigate the negative effects of sea level rise and erosion caused by storms and navigation activity (waves and currents). Most dredged materials available to protect and support nourishment of mudflats and marshes are mixtures of sand, silt and clay called fine-grained sediment (FGS). Unfortunately, data related to FGS applications for feeding mudflats and marshes are limited. This dearth of data reduces the number of projects approved for this type of beneficial use because outcome is unknown and introduction of dredged sediment may include risk to existing habitat. In addition, lack of data reduces ability to design projects that will deliver maximum benefits (sediment accretion) while minimizing risk to resources. Data are required that can inform improved design of these projects and provide stakeholders/regulators with evidence that these projects can be successfully executed.



Study Description

This research task will develop data sets that improve our understanding of sediment processes and fate when placed directly on mudflats and marshes or placed strategically near mudflats and marshes. The purpose of these placements is to provide sediment to these resources, inducing accretion and mitigating land loss. Strategic placement is the placement at a nearby location with the expectation that hydrodynamic forces (waves and currents) will perform the heavy lifting required to move sediments into the mudflats and marshes. Data will be collected and analyzed for one direct and one strategic placement site. Data collection will include hydrodynamic and atmospheric conditions, sediment morphology evolution over time, sediment fate, and quantification of site-specific FGS processes (erosion potential, consolidation and settling). Data will be used to develop guidance that improves our ability to design successful direct and strategic placement projects. Data will also be used to develop guidance on obtaining regulatory approval for such projects through demonstration that these placements can provide benefits while minimizing risk to existing environmental resources.

Products

Products include data sets that improve our ability to design direct and strategic placement projects using FGS. These data sets will be used to develop analytical methods and guidance required to optimize design of FGS placement projects for feeding mudflats and marshes. Through collaboration with District partners, guidance needed to improve communication of plans to stakeholder and regulators will be developed. These documents will outline appropriate steps for addressing challenges to the design, regulatory approval, stakeholder outreach, and implementation aspects for strategic placement projects.

Summary

Understanding sediment processes after placement of fine grained dredged material on or near mudflats and marshes is key to successful application of these methods for rebuilding valuable habitat and flood protection value provided by these resources. Data are limited on application of dredged FGS to protect and nourish mudflats and marshes. If properly applied, dredged material can provide these benefits with minimal interruption to existing habitat. The lack of data demonstrating the benefits of fine grained dredged material for supporting mudflats and marshes has limited appropriate design and regulatory approval of these projects. Design of new projects presently includes large uncertainties resulting in part from the limited monitoring and analysis of previous projects. Comprehensive data sets from selected ongoing projects for the fate of dredged FGS at direct and strategic placement sites implemented to feed mudflats and marshes will support stakeholder outreach and the regulatory approval processes required to obtain project approval and will improve the design/success of these projects.



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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