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National Regional Sediment Management Program Mobile District (SAM): Identification of Potential Beneficial Use (BU) Opportunities for Wetland Sites Associated with O&M Projects

Description

The Mobile District has the responsibility for maintaining federally authorized navigation projects within its jurisdiction. Historically, much of the material removed from the from navigation channels is either placed in the ODMDS, open-water sites, or confined disposal facilities (CDFs) which in many cases are nearing capacity. Shorelines within Mobile Bay and surrounding water bodies have experienced significant changes from natural processes and anthropogenic activities. Winds, waves, tides, currents, and extremes of each resulting from tropical cyclones and winter storms, as well as sediment input, transport variations, and sea level changes, have led to alterations in shoreline position. Coastal land loss resulting from these natural processes and human activities poses a serious problem to not only property owners and infrastructure, but also nearshore and coastal habitats such as intertidal, beach, and dune environments, as well as the ecological communities and wildlife that inhabit them.

Issue/Challenge To Address

Evaluation of wetland areas coupled with the design of dredged material placement techniques that focus placement to directly benefit wetlands would be beneficial towards increasing dredged material placement capacity for navigation maintenance operations. It is feasible that beneficial use in wetlands may demonstrate a semi-permanent sink for dredged material that increases estuary sustainability by keeping sediment in the estuary as well as placing the material in a manner that prevents transport of sediment back into navigation channels.

This study will investigate opportunities and develop a strategy to beneficially use dredged material from maintenance of navigation channels to restore wetlands in areas exhibiting significant shoreline change. Taking advantage of such opportunities will help restore wetlands and promote the retention of sediment within natural sediment systems while providing placement alternatives of dredged material and wetland functions. Specific goals include:

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- Integration and leveraging of ongoing research
- Determination of parameters for selection of wetlands BU sites in the Mobile Delta
- Utilization/development of tools for screening of potential BU sites
- Leverage ongoing agency partnership to identify potential demonstration sites
- Evaluation of technical methodologies and limitations

It is anticipated that future follow-on activities would include implementing a demonstration project. Monitoring of the demo is necessary to document the behavior of the placed material and associated environmental benefits. Such information would be useful in refining models/tools by identifying what parameters are most useful in planning BU for wetlands.

Successes Lessons Learned

Building on successes of Mobile District's RSM implementation strategies such as re-establishing open-bay dredge material placement options that retains sediment in the natural system, will be beneficial toward identifying methodologies to implement beneficial use opportunities associated with enhancing and restoring surrounding wetlands. The project offers substantial opportunities to document and build on Federal, state, local, non-profit, and academia collaborative efforts with different missions and purposes.

The project offers substantial opportunities to document and build on Federal, state, local, non-profit, and academia collaborative efforts with different missions and purposes. The RSM approach for beneficially using dredged material to enhance and restore wetlands in vicinity of navigation projects provides the ability to coordinate and collaborate; integrate numerous tools, technology, and data; leverage funding; and enhance partnerships. Knowledge from this effort can be used by other Districts towards evaluating economic and ecological benefits of wetlands and similar ecological systems when dealing with maintenance activities.

Projected Benefits Cost Savings Value Added

With limited long term available capacity projected out past 20 years in the existing CDFs as well as limited available land for CDFs in the vicinity of the upper Mobile Harbor; finding viable beneficial use opportunities today that provides cost effective means to maintain capacity within existing sites is critical. Combining this need with the goal to enhance wetland habitat may provide not only long term cost savings to the Navigation business line but also provide habitat benefits within an Environmental Protection Agency's designated Gulf Coast Ecological Management site that represents unique habitats for fish, wildlife and other natural resources of particular significance.

Expected Products

- A Wetland Selection Criteria for BU

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- Recent (<100 y) chronologies in potential wetland BU sites to include accretion and accumulation rates from field data
- Validation and hindcast of Marsh Equilibrium Model (MEM) runs
- Evaluation of placement strategies and frequencies using the Marsh Equilibrium Model with TLP (MEM-TLP)
- Evaluation of placement technological methodologies and limitations.
- Meeting with Agencies to Identify a Demo Project
- Attend annual RSM IPR and workshop
- RSM web article on field data collection
- Technical Note – BU of Dredged Material in Upper Mobile Bay Wetlands

Stakeholders/Users

All efforts involving the selection of potential sites and placement strategies will be coordinated through the various support agencies consisting of representatives from the following agencies: Alabama Port Authority, Alabama Department of Conservation and Natural Resources, Alabama Department of Environmental Management, Environmental Protection Agency – Mobile Bay National Estuary Program, National Marine Fisheries Service, United States Fish and Wildlife Service and Dauphin Island Sea Lab.

Leveraging Opportunities

There are multiple opportunities to leverage on past in-house data and tools from the Mobile Harbor General Reevaluation Study to include use of successfully completed field data collection in the delta (flow, suspended sediment fluxes and wetland mapping) and developed model for 3-D hydrodynamics, sediment transport, and water quality within the bay and lower delta system. In addition to leveraging on past efforts future Mobile Harbor Navigation Operations and Maintenance activities would provide opportunities to leverage manpower and equipment for field work. Other opportunities include leveraging resources with the Mobile Bay National Estuary Research Program's Mobile Tensaw Delta Watershed Management Plan initiatives, the University of Alabama's active field work and research in suspended particulate and heavy metal fluxes being conducted in the Mobile River Basin and Mobile Bay as well as longer term leveraging on tool advancements with the NOAA's Ocean Service, and National Centers for Coastal Ocean Science, Ecological Effects of Sea Level Rise Program (EESLR).

Points of Contact

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Participating Partners

Interagency groups which consists of local, State and Federal agencies including academia and other non-government organizations.