



# Assessing Wetland Functions

## *Construction, Monitoring, and Data Analysis of a Nearshore Mixed-Sediment Mound, Mobile Bay Entrance, Alabama (ERDC TR-02-XX)*

**ISSUE:** Sediment is a resource in natural systems and needs to be managed as such. The nearshore placement of sediment is a management option that can provide both environmental and economic benefits to the Nation. However, before sediment is placed in the nearshore, the ultimate fate of the sediment should be considered, and its environmental effects known. To advance our skill in both of these areas, the field study reported here collected information to investigate both the fate and effects of the nearshore placement of sediment.

**RESEARCH OBJECTIVE:** The objective was to construct and monitor a mixed-sediment mound in the nearshore environment to document the fate of this type of sediment and to provide data to improve our numerical models on the prediction of fate of sediment containing large amounts of fine and/or cohesive material.

**SUMMARY:** A mixed-sediment dredge material mound was constructed in 9.2 m (30 ft) of water offshore of Mobile Bay Entrance, AL, on the southwest side of the ebb shoal. Dredge material consisted of cohesive, fine-grained sediment from the Mobile River, placed over native fine sand. Monitoring consisted of multibeam bathymetries and sediment samples, as well as wave and current data. Numerical modeling of wave transformation and modeling of sediment geotechnical properties for erodability provided process data. The cohesive nature of the dredge material

resulted in little change in material distribution over the 1-year monitoring period. Bulk properties and erosion rate studies showed high concentrations of manganese and smectite, resulting in high critical shear stresses and decreased erosion rates. Given this cohesive nature of the sediments and the low magnitude in measures and hindcast waves and currents, it appears that storm-induced changes are needed to affect significant sediment transport and change in the depositional patterns of the mixed-sediment mound at Mobile Bay Entrance.

**AVAILABILITY OF REPORT:** The report is available at the following Web site: <http://www.wes.army.mil/el/wetlands/wlpubs.html>. The report is also available on Interlibrary Loan Service from the U.S. Army Engineer Research and Development Center (ERDC) Research Library, telephone (601) 634-2355, or the following Web site: <http://libweb.wes.army.mil/index.htm>. Individuals should arrange for Interlibrary Loan Service either through the library of their business concerns or through the interlibrary loan services of their local libraries. To purchase a copy, call the National Technical Information Service (NTIS) at 1-800-553-6847 or (703) 605-6000, or visit the following Web site: <http://www.ntis.gov/>. For help in identifying a title for sale call 1-800-553-6847. NTIS report numbers may also be requested from the ERDC librarians.

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