

The USACE Regional Sediment Management (RSM) Program

Jeffrey P. Waters, Ph.D.

Coastal and Hydraulics Laboratory

U.S. Army Engineer Research and Development Center

Vicksburg, MS

Regional Sediment Management (RSM) is a systems-based approach for collaboratively addressing sediment related issues within a regional context. Historically, dredged sediment was placed in the most economical locations, which were often on the banks of rivers, or alongside the channel in rivers, bays and estuaries resulting in submerged features and island formations. More recently, environmental concerns over the effects of open water or unconfined placement resulted in sediment being placed in confined areas either upland or in the water. Along coastal inlets, sediment was disposed of in deeper offshore waters. These practices, new and old, do not necessarily consider the regional sediment transport processes and dynamics. For example, placing coastal sediments in deep water removed those sediments from the littoral zone where they may have been needed for sustaining beaches. The result may be an optimized, least –cost project (e.g., low maintenance cost) for the local area, but possibly not the best solution for the region. Regional sediment management is the practice of making the best local project decision within the context of a regional plan that maximizes regional benefits and/or reduces regional costs.

Managing sediment as a resource to benefit a region potentially lowers cost, allows use of natural processes to solve engineering problems, and improves the quality of the environment for projects and programs implemented by the U.S. Army Corps of Engineers. Under the RSM concept, sediment is considered a natural resource that provides environmental and economic benefits when it is managed effectively on a regional basis. It recognizes that the geomorphic region and its embedded ecosystems respond beyond the space and time scales of individual projects and the boundaries traditionally associated with projects, and that a proactive regional planning and engineering approach will produce significant national benefits. The development of strategic regional partnerships with stakeholders is a key to the success of RSM. This is because RSM activities and solutions will extend beyond the scope of a traditional Corps' projects and the Corps' current authorities and resources. Thus the Corps will be one of a number of stakeholder participants in developing solutions and allocating resources to implement RSM measures and actions.

In 2000, the Corps initiated a National RSM Demonstration Program. Initially, six Corps District offices were tasked with implementing regional sediment management concepts as part of their District projects. The program was originally designed as a series of coastal regional sediment management demonstrations, but the individual District offices have extended the range of their projects to include the entire watershed. In 2008, twenty-four District and six Division offices are actively engaged in the RSM program. The goals of the RSM program are:

- a. To improve sediment management practices within the Corps (as necessary).

- b. To highlight and document unique elements of RSM and provide guidance for future implementation of specific RSM actions where appropriate.
- c. To foster state and local partnerships for RSM, resulting in a unified vision, cost-sharing, and co-leadership of RSM actions.
- d. To engage cross-mission objectives of the Corps. (More projects will be designed and constructed with deliberate intent to achieve cross-mission benefits, e.g., storm risk reduction, navigation, and environmental restoration.)
- e. To define environmental and economic benefits associated with RSM.
- f. To improve decision-support technology for RSM (Conceptual, analytical and numerical models will have been adapted and improved to support RSM.)

RSM projects and activities are being conducted in the District and Division offices to achieve these goals. Some of these projects include:

- *Sediment Needs Assessment, Long Island, New York:* Dredging activities in inlets, creeks, and harbors are essential to regional navigation and the regional economy, yet dredging occurs primarily on a project-by project basis. Placement of suitable dredged material on adjacent shorelines plus beach fill from offshore and upland sources is an integral part of the local shoreline management, and like dredging, has traditionally been managed as individual projects. Opportunities for improved regional sediment management will rely on developing effective advance communication of sediment supplies from dredging activities and needs for sediment throughout the area.
- *RSM Demonstration at the Mouth of the Columbia River (MCR) Oregon-Washington:* The 100-year-old MCR jetties are susceptible to serious negative consequences arising from erosion of the ebb tidal shoals on which the jetties were originally built. As the tidal shoals recede, the water depth near the jetties gets deeper, more vigorous waves batter the jetties, the foundation of the jetties is scoured, and the jetties become unstable and unravel. Regional sediment management is being implemented to feed the inlet's morphology using dredged material, and letting nature do the work of dispersing the dredged material to supplement the sediment budget of the inlet and the adjacent nearshore coast.
- *Lower Snake River, Washington:* The planned Programmatic Sediment Management Plan will identify and evaluate ways to manage dredge material from the ports of Lewiston and Clarkston and sediment within the lower Snake River reservoirs, and will examine the sources and transport of this sediment. This study will determine the most effective ways to reduce sediment build-up, manage it once it reaches the reservoirs, and identify possible changes to structures and/or operations to reduce maintenance issues while still providing for all authorized purposes.

Traditional project management practices that focused solely on local sediment management actions have often produced adverse impacts because they may not have considered the regional sediment transport dynamics. Multiple, single-purpose sediment management actions undertaken in a region may dramatically alter the regional sediment transport dynamics. However, RSM strategies which recognize that sediment is a

resource and employ a systems-based approach can be implemented to effectively manage sediment for multiple objectives and long-term system sustainability. RSM promotes management of littoral, estuarine and riverine sediment within the boundaries of a physical system where sediment exchange occurs naturally. Therefore, the successful implementation of RSM strategies requires knowledge of regional sediment transport dynamics.