

REGIONAL SEDIMENT MANAGEMENT

Jack E. Davis¹ and Julie D. Rosati²

¹Research Hydraulic Engineer, U.S. Army Engineer Research and Development Center, Coastal and Hydraulics Laboratory (CEERD-HC-SE), Vicksburg, MS, Jack.E.Davis@erdc.usace.army.mil

²Research Hydraulic Engineer, U.S. Army Engineer Research and Development Center, Coastal and Hydraulics Laboratory (CEERD-HC-CI), Vicksburg, MS, Julie.D.Rosati@erdc.usace.army.mil

Regional sediment management fits our sediment management actions into the context of a regional plan. ***Sediment management actions*** are activities that affect the erosion (or removal), transport, and deposition of sediment. Common actions include dredging and placement; building structures that divert or trap sediment; and creating erosion protection for banks, shorelines, seabed, and channel bottoms. A ***Region*** is a defined space over which the sediment management actions will have a cumulative impact within the given period of interest and in regard to the objectives of the plan. The ***Plan*** is an accepted set of goals and objectives compiled by the region's stakeholders to be accomplished by the set of sediment management actions. The Plan's objectives can include physical, environmental, social, and political needs, and incorporate an understanding of the regional sediment system. The larger spatial and temporal frameworks of regional sediment management, as well as the range of disciplines required in most regional planning, result in numerous stakeholders with varied interests.

The U.S. Army Corps of Engineers' navigation mission is to maintain our Nation's waterborne transportation systems for movement of commerce, national security needs, and recreation. These systems include harbors, waterways, and channels. Channels are located in and along our coasts, bays, estuaries and rivers, and are dredged to maintain depths needed for safe passage of vessels. Sediment enters the channels from upland regions, agricultural lands, streams, and through erosion of bay and coastal beaches (Figure 1).

Historically, dredged sediment was placed in the most economical locations, which often were 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 put in confined areas both upland and aquatic. In dredging to maintain navigability of our coastal inlets, the sediment was put in deeper offshore waters. However, these practices (new and old) do not necessarily consider regional sediment issues. For example, taking coastal sediment to deep water removed it from the littoral zone where it may have been needed for sustaining beaches. The result may be an optimized, least-cost project (e.g. low channel 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 decisions within the context of a regional plan that maximizes regional benefits and/or reduces regional costs.

In 2000, the Corps initiated a National RSM Demonstration Program. Six Corps District offices were tasked with implementing regional sediment management concepts as a part of their District projects. The program was initially designed as a series of *coastal* regional sediment management demonstrations, but the individual District offices have extended the range of their projects up into their *river* systems. In 2003, District and Division offices that have one or more

RSM Demonstration projects are: Mobile, Jacksonville, Philadelphia, New York, Detroit, Los Angeles, and the Northwest Division (Portland and Seattle Districts). By implementing regional sediment management as a part of their business practices, each District has documented challenges encountered. These challenges have included how to use present technologies (tools and models) to predict regional consequences of local sediment management actions, the policy constraints within the existing organizational structure, and institutional hindrances. As challenges are noted, they are acted upon and resolved by the Corps Headquarters managers.

The National RSM Demonstration Program authority continues through 2005, with the ultimate goal to integrate regional sediment management throughout all Corps business practices. It is noteworthy that the National RSM Demonstration program has already reaped benefits for the Corps. New technology, shared knowledge via National and individual District workshops, and development of new business practices are some of the benefits already derived.

In 2002, a multi-year Research and Development (R&D) program for RSM began at the Corps' Engineer Research and Development Center's laboratories. This R&D program targets improving our fundamental knowledge of sediment management throughout the entire watershed, developing new capabilities for making field measurements, improving our design guidance for engineering solutions to regional problems, and upgrading our tools for modeling and predicting the response of engineering activities on both local and regional scales.

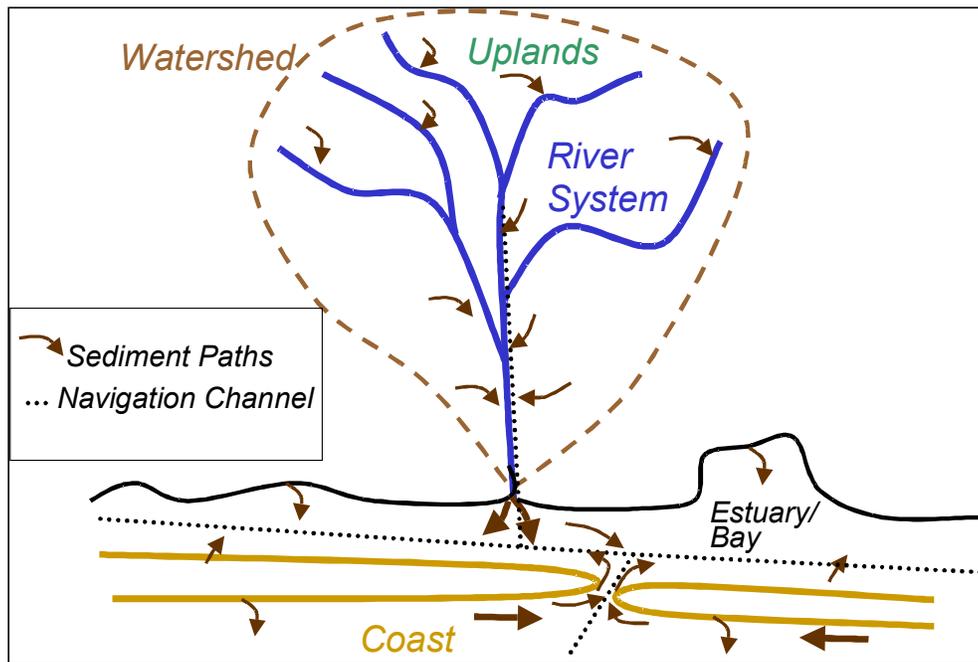


Fig. 1. Schematic of sediment transport within a regional system

The combination of the regional sediment management research initiative and the demonstration program has provided a deepened understanding of sediment management issues and creative solutions that seek a balance between human development activities and natural systems. The

aim is to improve knowledge of regional sediment management leading to more innovative and sustainable solutions for watersheds and our coasts and better synergy between the Corps and its stakeholders.