

MANAGING SEDIMENTS IN THE WATERSHED: LINKING DREDGED MATERIAL AND WATERSHED PLANNING

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ABSTRACT

The annual dredging of several hundred million cubic yards of sediment is essential for the maintenance of the United States' navigation system. Historically, dredged material management has focused on site-specific solutions to address sedimentation of port channels and berths, and waterways on which US commerce and military depend. At the same time, water resource projects that are designed to remedy local sediment problems may sometimes create even larger problems some distance away. Excessive sediment in rivers, reservoirs, and estuaries may contribute to high turbidity, loss of flood-carrying capacity, and sediment deposition in navigable waterways. In other locations, a shortage of sediment causes coastal erosion, streambank erosion, and wetland loss.

The National Dredging Team (NDT), a federal interagency group established to promote consistency and information exchange on dredging issues, recognizes that dredged material and sediment management planning often occur outside the context of watershed management plans. In recognition of the need for greater coordination among dredged material managers and watershed stakeholders, the NDT held a national conference in 2006 on dredged material management in the watershed to bring together these stakeholders to identify current roles, activities, areas of technical and planning overlap, and gaps in knowledge and management of sediment in the watershed. Using a watershed approach in development of dredged material management plans (DMMP) and including early communication and coordinated planning among federal and state dredged material regulators, watershed planners, and other interested parties can ensure that sources of sediment (and sources of contamination carried by sediment) are addressed, the broadest range of beneficial use and disposal alternatives for dredged material is evaluated, and adequate funding for dredged material reuse or disposal is secured. DMMP planners should be linked with upstream watershed planning efforts to ensure that watershed plans include consideration of downstream impacts of sediments, i.e., the potential of sediment to become material to be dredged downstream. EPA and the Army Corps of Engineers are working together to identify next steps to integrate DMMP with other watershed planning efforts.

Key Words: Sediment, National Dredging Team, coordination, planning, beneficial use

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INTRODUCTION

Sediment overloading from land and stream erosion causes significant environmental and economic challenges. The United States annually spends about \$800 million on dredging sediment from locations where too much has been deposited. Excessive sediment in rivers, reservoirs, and estuaries may contribute to high turbidity, loss of flood-carrying capacity, sediment deposition in navigable waterways, and violation of water quality standards. At other locations within the same systems, however, a shortage of sediment may cause coastal erosion, streambank erosion, and wetland loss.

Dredged material and sediment management planning often occurs outside the context of watershed management plans. Resource projects that are designed to remedy local sediment problems may result in even larger problems in the future and/or at some distance from the original project. Additionally, watershed management planning may fail to consider dredged material and sediment system considerations, such as the competing demands that may exist regarding sediment or the possibility of using it beneficially. Increasing coordination and communication among these stakeholders may present opportunities to strengthen port productivity through open and safe navigable channels, to improve flood and storm reduction efforts, and to improve water quality.

Effective dredged material planning and sediment management require open and early communication among federal and state dredged material regulators, watershed managers, and other interested parties so that: (1) sources and fates of sediment (and sources of contamination carried by sediment) can be addressed; (2) the broadest range of disposal alternatives for dredged material, with an emphasis on beneficial use, can be evaluated; and (3) adequate funding for dredged material use or disposal can be secured.

SEDIMENT MANAGEMENT IN THE WATERSHED

Watershed management focuses on coordinated activities to protect or restore water quality or quantity within a hydrologically defined area (i.e., an area of land that drains to a common body of water like a lake, river, wetland or estuary). Sediment management focuses on actions affecting erosion, recovery, transport or deposition of sediment. It commonly includes dredging and placement, structures that divert or trap sediment, and erosion protection for banks and shorelines. Dredged material planning usually occurs through Dredged Material Management Plans (DMMPs) developed by the Army Corps of Engineers for specific dredging projects.

Although sediment management and watershed management planning often occur separately, they share similar goals. Both seek to control upstream erosion and pollution, which may improve downstream water quality, reduce the need for dredging, and improve downstream sediment quality. Recognition of sediment as a resource can benefit both sediment and watershed managers. Beneficial use utilizes dredged sediments as resource materials in productive ways, such as wetland restoration or shore protection, and can reduce the amount of material that requires disposal or is removed from the system.

Coordinating watershed and sediment/dredged material management can result in economic and ecological benefits. Coordinated planning may decrease the need for dredging and dredged material sites. It can increase leveraging of funds and cross-program sharing of technical and regulatory capabilities, while also resulting in more efficient permitting for dredging projects. Coordinated planning could potentially help reduce contaminants entering the system, as well as reduce soil loss and waterbody siltation. Better coordination would also result in increased beneficial use of dredged material and increased protection of natural resources.

A watershed approach can be used as part of a coordinating process for focusing on priority water resource problems. EPA's Office of Wetlands, Oceans, and Watersheds promotes the following elements of a watershed approach:

- Focus on hydrologically defined areas.
- Involvement of all stakeholders.
- Use of iterative planning to address priority water resource goals.
- Use of an integrated set of tools and programs (e.g., integration through partnerships such as TMDLs and non-point source funds).

Engaging all stakeholders in a watershed approach can lead to a more comprehensive planning framework for resource management.

A critical first step to effective collaboration in water resources management is for relevant stakeholders to recognize and better understand each others' roles, programs, perspectives, and interests. This can help overcome technical and institutional challenges that can otherwise hinder system approaches to resource management. In recognition of the need to support such collaboration and communication, the National Dredging Team (NDT) and the Subcommittee on Integrated Management of Ocean Resources (SIMOR) held a "Conference on Managing Sediments in the Watershed: Bringing Dredged Material and Watershed Managers Together" in August 2006.

The NDT was established in 1995 to implement the National Dredging Policy, to promote national and regional consistency on dredging issues, and to provide a mechanism for issue resolution and information exchange among federal, state, and local agencies and stakeholders. The NDT is a federal interagency group composed of agency managers, decision makers, and technical experts. It is a priority action of the NDT to ensure, in coordination with existing Regional Dredging Teams and Local Planning/Project Groups, that sediment management is accomplished in the context of watershed management, and that watershed management plans incorporate both private and federal dredging. For more information, go to www.epa.gov/owow/oceans/ndt/.

SIMOR is a member of the ocean governance structure established under the US Ocean Action Plan to facilitate coordinated ocean policies and actions. SIMOR focuses on implementing ocean, coastal, and Great Lakes management actions that will benefit from interagency coordination. SIMOR's work is designed to complement the efforts of individual Departments and Agencies, as well as other interagency groups. Through its work plan priorities, SIMOR recognizes the importance of building on existing regional collaborations to share best practices and lessons learned in dredging and sediment management. For more information, go to ocean.ceq.gov/about/simor.html.

The conference provided a unique opportunity for dialogue among a diverse array of over 200 stakeholders who do not often have the chance to meet and coordinate, but who all share a concern for sediment and water resource management. The conference was designed as a forum to promote communication and to support future collaboration on this topic. Participants at the conference represented a range of sediment management perspectives, including those of federal, state, and local agencies; port authorities; dredging contractors; academia; and watershed groups. Primary among the conference goals was a focus on encouraging further collaboration, particularly at the regional and watershed levels, by highlighting and introducing the various stakeholders and their interconnectivity.

A variety of themes were identified by participants throughout the conference. These included:

- Better coordination.
- Broader community (public, watershed, sediment) contacts and education to address downstream problems through upstream activities.
- Importance of watersheds in sediment planning.
- Importance of Regional Dredging Teams, National Dredging Team, Regional Sediment Management, and beneficial use of dredged material.
- Better efforts to promote benefits of sediment to watershed communities.
- Increased outreach to watershed communities by dredged material/sediment managers.

Discussions covered a wide range of topics and perspectives. Topics discussed can be broken down into four preliminary categories: collaboration, strategic planning, economic analysis, and legislation and funding.

This conference is a first step to strengthen collaboration and coordination on these issues among various stakeholders. Emphasis was placed on the development of regional plans, and networking across disciplines and agencies. It is intended that an action plan for sediment management in the watershed will be developed from the discussions held and recommendations made by conference participants.

There are many challenges (technical and institutional) to this type of approach, and examples of long-term, comprehensive, system-wide planning are limited. However, increased coordination, better communication, and comprehensive planning takes stakeholders beyond local, project specific (i.e., sediment or water quality) remedies

to and provides greater opportunities to strengthen port productivity through open and safe navigable channels, improve flood and storm reduction efforts, and improve water quality.

CONCLUSIONS

Open communication among dredged material, sediment, and watershed managers is essential for resource management at all stages of planning and implementation. Planning for many dredging and dredged material placement projects occur on a project (or, in some cases, a multiple dredging project) level, while current watershed planning efforts are more likely to focus on water quality. Participants at the 2006 Sediments in the Watershed Conference recognized the need to shift from a project or single topic focus to a broader, system-wide approach that places sediment management in the context of the watershed.

Application of a watershed approach can benefit both watershed and sediment managers through a more comprehensive planning framework that places dredged material within the broader watershed scale while recognizing the relationship of the sediment system impacts to the watershed. A watershed approach to sediment management could:

- Consider the regional sediment system, including factors such as sediment sources and sinks, and factors that influence its quantity, transport, quality and temporal variability.
- Recognize sediment as part of a hydrologic system, and use regional sediment systems as a context for planning and management strategies.
- Engage partners to identify sediment concerns, opportunities for coordination, and management measures that balance objectives and leverage resources.
- Use regional sediment and adaptive management strategies to guide decisions that address long-term resource goals, such as maintaining navigable waterways, achieving water quality and habitat management objectives, and reducing potential for flood and storm damage.
- Use an integrated set of tools and programs to evaluate sediment needs and the utilization of all sediment resources from uplands to coastal zone.

In discussing a watershed approach to sediment management, conference participants identified potential actions and challenges within four preliminary categories: collaboration, strategic planning, economic analysis, and legislation and funding. Further exploration and discussion of these topics is needed at both the regional and national levels. The conference discussions and recommendations are currently being reviewed. This information will be made available in mid-2007, and will include next steps to move the conference concepts to actual dredged material and watershed plans.

For additional information on the NDT and SIMOR “Conference on Managing Sediments in the Watershed: Bringing Dredged Material and Watershed Managers Together,” please visit: www.epa.gov/owow/oceans/ndt/managingsediments.html.