

West Coast Governors' Agreement on Ocean Health Regional Sediment Management Final Action Plan

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Sediment ACT

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WCGA Action Plan – Sediment Action 7.4

Issue

In September 2006, the Governors of Oregon, Washington and California signed the West Coast Governors' Agreement on Ocean Health. Under this agreement, the three states, by working together and consulting with federal agency leads and stakeholders, developed a bold set of actions to improve the health of our ocean and coastal resources. On July 29, 2008, the three states released a final Action Plan that outlines many activities on a range of issues.

Regional sediment management was identified as an important component of Priority Area 7: Foster Sustainable Economic Development in Coastal Communities. Action 7.4 asserts that the three states will:

Develop regional sediment management plans that increase beneficial use of sediment in an environmentally responsible manner to protect and maintain critical community economic and environmental infrastructure.

To coordinate efforts across the three states and achieve these objectives, the Regional Sediment Action Coordination Team (ACT) was established. This work plan identifies the process by which the regional sediment ACT will develop a tri-state strategy to fulfill the goals outlined in the WCGA Action Plan. The strategy will provide a framework to encourage development of RSM plans and projects throughout the states, and encourage policies and coordination to maximize implementation of RSM plans and projects by leveraging existing resources and expertise in the three states and the federal government. Specifically, the strategy will encourage/incentivize maximum beneficial use of sediment within the context of RSM, analyze and coordinate existing state policies, advocate for funding RSM activities throughout the three states.

It is also envisioned that this report will serve as an implementation plan and will provide a common West Coast voice to RSM efforts. This plan addresses and promotes the need for deeper understanding and development of efficient RSM plans in addition to advocating for the necessary funding for these activities.

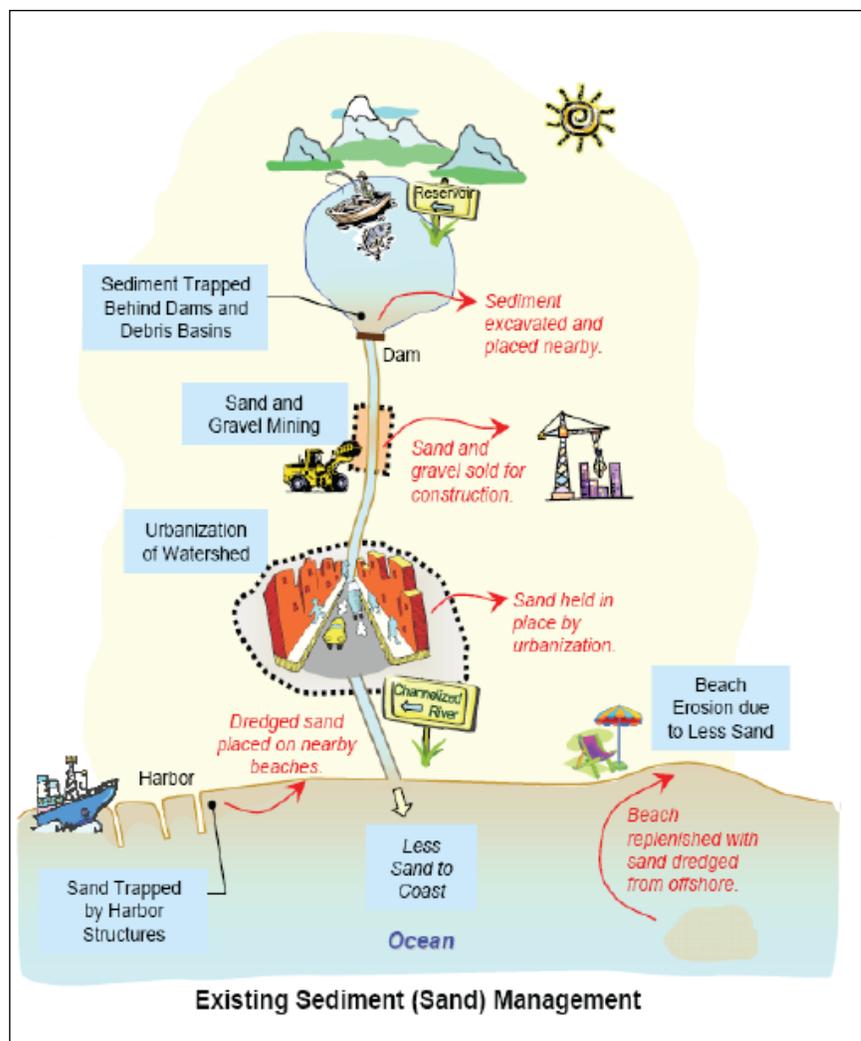
Vision

Develop regional sediment management (RSM) plans along the West Coast region to maximize beneficial use of sediment in an environmentally responsible manner in order to protect and maintain community character, infrastructure, economic development and environmental resources. State policies should acknowledge sediment is an important resource, not a waste product.

The Problem – Human Modifications Have Altered Processes and Impacted Uses

Humans have substantially altered natural sediment transport processes within coastal watersheds, reducing storm protection, habitat and recreation. Dams, built to control floods and store water, trap sediment in reservoirs. Sand and gravel are mined from stream systems for use in construction. Timbering, grading, and earth moving strip off vegetation and expose the watersheds to excessive erosion. Conversely, construction of channels, roads, and buildings hardens the watershed, which reduces erosion and leads to decreases in the amount of coarse sediment available for delivery via streams. Some coastal structures such as harbors, jetties, groins, and breakwaters alter movement of sediment along the shoreline while other coastal structures such as riprap and seawalls reduce the amount of sediment supplied directly to the shoreline through the reduction of bluff and cliff erosion. Human modifications to the coastal watersheds and shorelines of the West Coast have resulted in the following sediment-related problems:

- Beaches are undergoing accelerated erosion, reducing recreational opportunities, contributing to loss of habitat, and increasing the probability of storm damage along the coast.
- Coastal stream water quality has become impaired.
- Coastal wetlands and lagoons are experiencing either accelerated erosion or sedimentation.
- Sediment is being removed, trapped, redirected, modified, and polluted as it moves from the coastal watersheds to the shoreline and along the coast.
- Sand dredged from harbor channels are, in many instances, placed in locations that does not optimize the beneficial reuse of material.



- Sediment supply to the coast has been, and continues to be, reduced as a result of interruptions caused by dams and debris basins, mining of sand and gravel, artificially stabilizing the shoreline, and hardening of the coastal watersheds

Work Plan Deliverables

The Sediment ACT identified a number of outcomes as a product of its work. The following items are the deliverables associated with developing an overall regional sediment management plan strategy. In the event of limited or inadequate funding for this work plan, these deliverables will be prioritized, with an initial focus on the completion of developing efficient regional sediment management plans which will rely on developing workshops to share lessons learned and to compile existing information among the three states. The partnership of the three states and federal agencies is critical for this first step, to maximize the benefits of past successes, make the best use of available resources and to avoid redundancies in RSM plan development.

#	Work Plan Deliverable	Timeline	Resources and Funding Needed	Research/ Scientific Support
1	Advocate, write letters, and secure funding for RSM planning in federal budget, complemented when possible by other sources of funds.	Ongoing	<ul style="list-style-type: none"> • Identify needed funds for West Coast RSM efforts. • Existing Staff 	<ul style="list-style-type: none"> • Fill data/technology needs (LiDAR) from NOAA, USGS, other federal agencies, and among state partnerships.
2	Hold a workshop to share case studies to address developing RSM plans on innovative technologies and tools to address sediment management.	Fall 2010	<ul style="list-style-type: none"> • Existing Staff • New resources needed for workshop (\$30-50k) • Lessons learned study (\$25-30K) 	<ul style="list-style-type: none"> • Compile information for specific case studies
3	Develop a white paper examining the reliability and potential impacts of hard structures	Spring 2011	Hard Structure study: \$100-150k	<ul style="list-style-type: none"> • Assess risk and reliability of structures and consider their impact on the environment • Inventory groins, jetties and breakwaters along West Coast • Review case studies for hard structures with active regional sediment management planning efforts to examine
4	Seek improvements to the national dredging policy and other opportunities that support collaborative multi-state efforts to resolve conflict and establish sustainable regional sediment management plans	Ongoing	Existing Staff	n/a
5	Encourage Congress to augment funding for placement of dredged sediments in locations identified as most beneficial for RSM purposes	Ongoing	Existing Staff	n/a
6	Write a letter to advocate for revision of	Ongoing	Existing Staff	n/a

	metrics used by the Office of Management and Budget (OMB) and US Army Corps for budgeting priorities to maximize the beneficial use of sediment			
7	Provide a comment letter on the Council for Environmental Quality's Proposed National Objectives, Principles and Standards for Water and Related Resources Implementation Studies as called for in the federal 2007 Water Resources Development Act	Ongoing	Existing Staff	n/a
8	Create regional partnerships to maximize efficiencies of dredging opportunities—such as sharing dredging equipment on West Coast	Ongoing	<ul style="list-style-type: none"> • Existing Staff • New partners 	n/a
9	The states will increase their partnerships with federal agencies to leverage resources to effectively address legacy pollutants	Ongoing	Additional funds needed	n/a
10	Develop white paper that reviews, analyzes and shares state policies, funding, and research regarding regional sediment management	Spring 2011	Additional funds needed	Will be identified

Definition of Regional Sediment Management (RSM):

Regional sediment management (RSM) is a system-based approach to optimally manage coastal sediment projects for regional benefits rather than only to solve site-specific problems. RSM recognizes that sand, cobble and fine sediments are important natural resources that are critical to the environmental health and economic vitality of the coastal zone from the watersheds to the offshore areas. Coastal geologists and engineers have demonstrated that any alteration of sediment transport within a region will likely impact, to some degree, the movement and availability of sand elsewhere within that region. This can result in either positive or negative impacts on coastal resources and development. Activities associated with our urbanizing society have resulted in sediment imbalances, such that too much sediment may exist in one location (e.g., harbor channels, inundated wetlands, dams) while adequate sediment may be lacking in other areas of the region (eroding beaches and wetlands). It is only through a comprehensive evaluation of sediment supply issues across the region that these sediment imbalances can be restored to equilibrium. RSM has emerged over the past few years as the approach most suited to address such sediment imbalances.

Fundamental to RSM is the understanding and knowledge about the interrelationships between inland, coastal and offshore sediments, and sediment pathways to and along the coast. The RSM approach provides opportunities to achieve greater effectiveness and efficiency of sediment use and movement by improving decision-making with a regional framework, leveraging resources, and forecasting the long-range implications of management actions.

What is an RSM Plan?

An RSM plan is a consensus based framework to implement the principles of RSM. As such, a typical RSM plan does the following:

- Identifies strategies on how to best manage sediment to address coastal erosion and excessive sediment problems within a region, including coastal watersheds and offshore areas;
- Summarizes existing knowledge on physical processes that affect sediment transport for a defined section of coastline;
- Emphasizes regional solutions involving beneficial use of sediment in an environmentally-benign manner to help restore or augment natural processes to the extent possible; and
- Identifies techniques that could facilitate the Plan's use in future management decisions.

Why RSM matters:

Managing sediment on a regional basis improves the environment, considers use of natural processes in resolving engineering problems, and potentially saves money. RSM plans help protect and enhance the nation's natural resources while supporting infrastructure protection and other economic needs of coastal communities. Some examples of the benefits of RSM include:

- Restoring, maintaining or enhancing fish and wildlife habitats;
- Nourishing beaches that are eroding due to reduced sediment transport from watersheds;
- Protecting critical coastal infrastructure at risk from global climate change and sea level rise;
- Enhancing recreational opportunities;
- Protecting and maintaining critical community economic and environmental infrastructure; and
- Mitigating effects of man-made coastal sediment traps that impede natural longshore or offshore transport of sediment.

Geographic area:

This plan pertains to the coastal zone as defined by each state. It covers the nearshore region of the entire West Coasts of Washington, Oregon and California, including most estuaries, but not entire watersheds throughout the three states.

Individual regional sediment management plans can determine the scale and geographic boundaries that make the most sense. However, they usually encompass shorelands and drainage basins which have a significant and direct effect on coastal waters. The size of the unit should be adequate to address such important coastal issues as erosion and sedimentation in the coastal estuaries, and to reflect the natural features and processes, including; extensive rainfall, steep slopes, and soil types, which characterize the coast. The individual RSM plan needs to be limited to a manageable geographic and jurisdictional region, so RSM boundaries often may not necessarily encompass entire watersheds.

Summary/Background:

Action 7.4 states: Develop regional sediment management plans to maximize beneficial use of sediment in an environmentally responsible manner to protect and maintain critical community economic and environmental infrastructure.

The states will continue progress on regional sediment planning efforts, considering and minimizing potential environmental impacts of sediment uses. The states will partner with the appropriate entities including US Army Corps of Engineers; US EPA; other relevant local, state and federal agencies; and other interested parties to advance regional sediment management efforts to maximize beneficial uses of sediment throughout the three states.

These plans are to be consistent and coordinated where appropriate, and build upon existing federal, state and local efforts on regional implementation of sediment management policies. Examples include: US Commission on Ocean Policy, Washington's Ocean Action Plan, California Ocean Action Plan, California Sediment Management Working Group, Lower Columbia Solutions Group, The Association of Monterey Bay Area Governments (AMBAG), and the San Francisco Long Term Management Strategy (LTMS).

Climate change will likely have significant impacts on sediment management. Increased storm frequency and sea level rise are all important issues that must be considered in management decisions. The sediment ACT will coordinate with the climate change ACT to incorporate findings from their National Academies Study on sea level rise into RSM planning efforts.

As a management method, RSM:

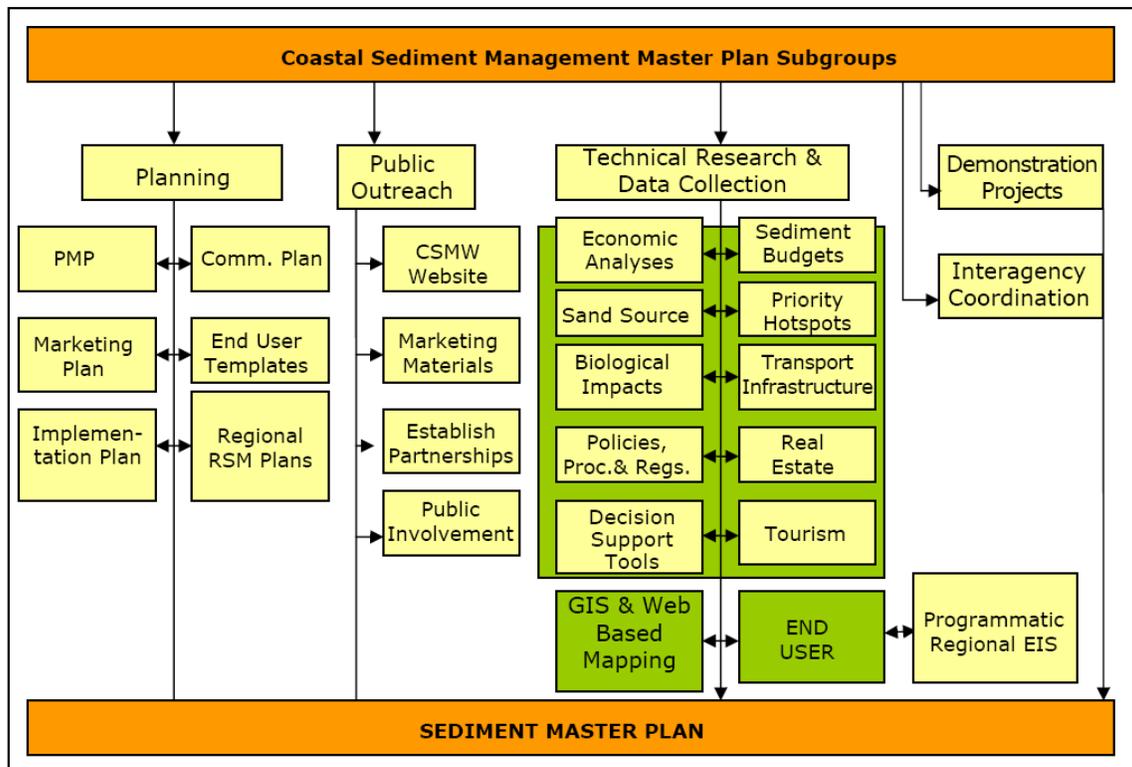
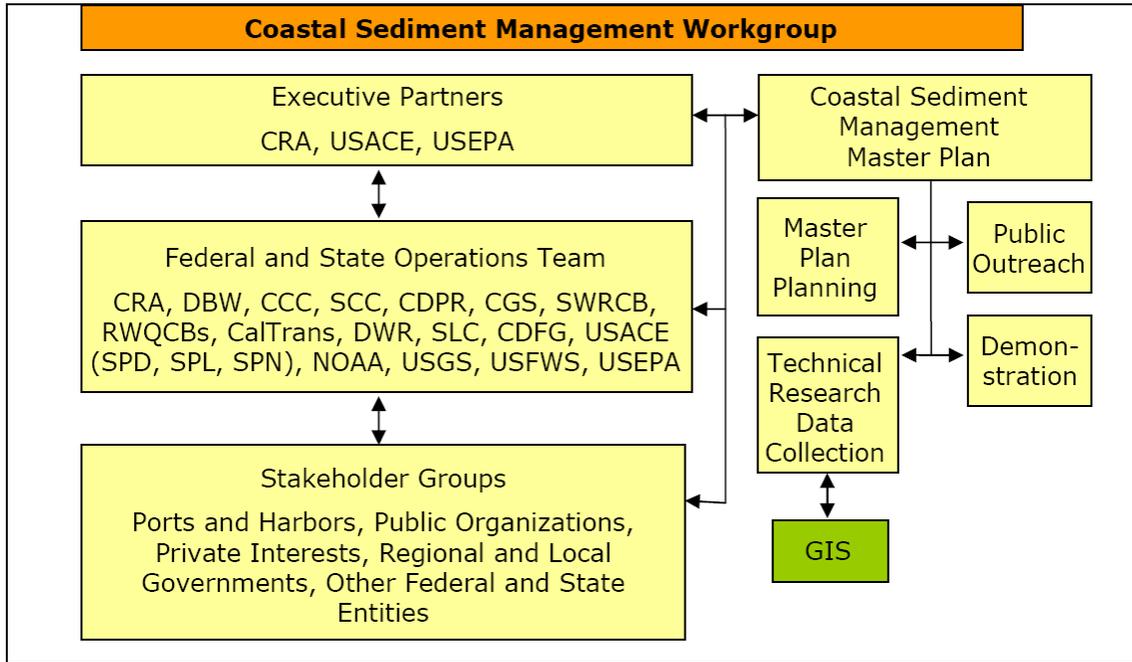
- Includes the entire environment, from the watershed to the sea
- Accounts for the effect of human activities on sediment processes in streams, lakes, bays, and oceans
- Addresses sediment management issues within the context of local constraints and opportunities
- Accounts for the issues of legacy pollutants and contaminated sediments and should identify where certain hotspots are located
- Maximizes beneficial use of sediment

RSM plans throughout a region should consider:

- Characterizing the types of sediment, issues, and actions (e.g. rivers, beaches, harbors)
- Watershed planning such as how to ensure sediment reaches the coast
- Habitat management including fisheries issues and maintaining adequate sediment for habitats with rising sea-levels
- Mitigation measures to reduce impacts of projects
- To be successful, local support (stakeholders, local governments and local communities) for an RSM plans is critical.

Examples of RSM planning frameworks and components:

The following flowcharts from the California Coastal Sediment Management Workgroup (1) shows the organizational structure and is provided as an example of the interagency participation that will be part of most RSM efforts and (2) shows many of the topics that have been included in RSM efforts in California, thus demonstrating that RSM can address a broad array of topics and concerns.



Other similar planning efforts involve similar groups and activities. For example, the Lower Columbia Solutions Group is a group established by the governors of Oregon and Washington and comprised up of local, federal and state entities and governments, ports, fishermen, non-profit organizations, regional entities, and other concerned stakeholders. The LCSG is providing the leadership and high level support for the bi-state RSM efforts on the Columbia River. The more technical work on the two RSM projects is being accomplished by a smaller and more technically oriented collaborative work groups. The RSM efforts at the Mouth of the Columbia River are aimed at resolving long-term conflicts over the beneficial use of the material dredged annually to keep the Mouth of the Columbia River open to river traffic. The stakeholders are engaged in an effort to assure that the sediment is used beneficially without adverse effects on safety, environmental and natural resource values. The effort includes important studies of the sediment transport and modeling of disposal methods. Environmental and natural resource effects studies are an essential component to the project. The larger Regional Sediment Management efforts will include the MCR plan as a component, but will also look at beneficial use of channel dredging sediments from the Mouth upstream to Bonneville Dam. Opportunities for habitat restoration and enhancement are expected to be important components of this effort. Both MCR and the broader RSM planning will involve stakeholder groups guided by technical experts in a facilitated collaborative process.

Goals of the implementation plan:

- Improve interstate coordination and consistency with respect to beneficial use of suitable sediments.
- Encourage a framework to proactively address issues related to contaminated sediments and legacy pollutants, with the goals of removing barriers to actions necessary for viable port and harbor activities (such as the dredging of berths and navigation channels) while preventing resource damages that can occur from release of these contaminants and pollutants to the marine or terrestrial environment.
- Encourage pro-active placement of available suitable sediments in locations that improve or maximize the value of these sediments for coastal recreation, habitat protection or community character.
- Develop sustainable funding mechanisms to support RSM activities.
- Ensure regionally consistent interpretation of federal laws and regulations for placement of dredged material in the coastal zone including the territorial sea that encourages maximum beneficial use.

Other WCGA workgroup coordination links:

The sediment ACT will work with the other ACTs within the larger context of the WCGA effort as part of a plan to develop regional sediment management plans that are effective and leverage existing resources. As part of this strategy, the ACT will reach out to the groups below and others as needed:

Climate Change ACT

- Sea level rise relates to all of the actions/categories as it influences coastal sediment processes and, therefore, the management of sediment over the longterm.
- Bathymetric and topographic mapping efforts. This information will support planning for climate change impacts such as sea-level rise, as well as development of sediment management plans.
 - Expand coastal wave buoy and other coastal processes data (e.g. the Army Corps of Engineers' network, NOAA weather buoys, and other ocean observing networks) to provide complete coverage of the tri-state coastline. Combined monitoring of waves and coastal elevations is needed to understand and forecast sediment transport and shoreline change.
- Maintenance of habitat
- Maintenance of recreational opportunities.
- Questions regarding how to plan for future locations of land water interface in light of climate change considerations, such as coastal navigation and shifting ecosystems.

Sustainable Coastal Communities ACT

- Work together on overlapping issues, especially on harbor and coastal recreation issues.

Seafloor Mapping ACT

- Bathymetric mapping efforts will provide information needed for developing and implementing effective RSM plans.

TASK ONE

Encourage development of RSM plans and projects throughout the states

- Encourage/incentivize maximum beneficial use of sediment within the context of RSM
 - Develop and advocate for coastal engineering projects and studies to nourish beaches while protecting the marine environment.
 - Develop and support completion of RSM-support tools and studies, such as the Sand Compatibility and Opportunistic Use Program (SCOUP) and Coastal Sediments Benefit Analysis Tool.
 - Develop and maintain tri-state data sharing opportunities, such as the Coastal Sediment References Database.
- Identify and secure adequate funding for RSM planning efforts such as current planning efforts (Lower Columbia River Solutions Group and California Sediment Management Workgroup).
- Fill data/technology needs and share tools for RSM planning:
 - Perform repetitious topographic and bathymetric surveys with sufficient frequency to detect and analyze trends and changes, including Light Detection and Ranging LiDAR. (LiDAR is a remote sensing system, which uses scattered light to produce location and elevation data (or maps) to define the surface of the earth).
 - Acquire, store and manage data with open access for research and coastal management efforts.
 - Develop data products that result in better coastal management decisions.
 - Develop quick-response, data acquisition capability through development of West Coast data acquisition, storage and management centers.

TASK ONE DELIVERABLES

1.1: Advocate, write letters, and secure funding for RSM planning in federal budget, complemented when possible by other sources of funds.

- Identify needed funds for West Coast RSM efforts.
- Fill data/technology needs and share tools for RSM planning. Identify current sediment budget information and encourage funding of additional information for sediment budgets (LiDAR) from NOAA, USGS, other federal agencies, and among state partnerships.

1.2: Hold a workshop to share case studies to address developing RSM plans on innovative technologies and tools to address sediment management:

- Compile information for specific case studies (funding, partnerships, governance, and technical).
- Share lessons learned with specially commissioned white papers, targeted website(s) and/or focused workshop(s).

1.3: Develop a white paper to examine the reliability and potential impacts of coastal and navigation structures, such as groins, jetties and breakwaters, and examine their relationship in effective regional sediment management. This effort would be an inventory and analysis of existing old structures. Such an analysis would require that a qualified engineer undertake site visits to assess the risk and reliability of structures, assess their impact on the environment, review old reports and plans for the structures, look for subsequent additions and modifications that might have been done in the field, and prepare a report on how well the structures are functioning. This would be a significant undertaking for the shorelines of the three states due to the numbers, variety and differences in functionality of these types of coastal and navigation structures.

- Inventory groins, jetties and breakwaters along West Coast and amount of information available on how they interact with sediment processes.
- Select a few case studies for hard structures with active regional sediment management planning efforts to examine in detail for the white paper.

TASK ONE CHART

Deliverable No.	Deliverable	Lead	Timeline	Resources (needed or existing)
1.1	Advocate to secure funding for RSM efforts	Three states NGOs	Ongoing and as needed	Existing staff
1.2	Compile information to share lessons learned	Army Corps	Spring 2010	Existing Staff
1.2	Hold a workshop to share case studies	<ul style="list-style-type: none"> • Sea Grant • CA Dept of Boating and Waterways 	Fall 2010	New resources needed for workshop (\$30-50k?)
1.2	Develop a white paper or website on lessons learned	Army Corps	Spring 2011	New Resources \$25-50k
1.3	Develop a white paper on hard structures	Army Corps	Spring 2011	New Resources \$100-150k

TASK TWO:

Encourage policies and coordination to maximize implementation of RSM plans and projects

Policy Issues

1. Examine federal policies to facilitate beneficial uses and regional sediment management (e.g. national dredging policies and sediment placement issues). Develop, coordinate and prioritize tri-state policy responses for consistent and reinforced advocacy to Congress and federal agencies on the needed changes.
2. Analyze and coordinate existing state policies:
 - Regional Water Quality Control Board's policies
 - Coastal Zone Management Act implementation
 - Identify opportunities for interpretation and application between the tri-state region in various state requirements
 - Identify and recommend lessons learned that can benefit the three states' RSM efforts and, as appropriate, provide consistency across the states

TASK TWO DELIVERABLES

2.1: Seek improvements to the national dredging policy and other opportunities that support collaborative multi-state efforts to resolve conflict and establish sustainable regional sediment management plans.

2.2: Encourage Congress to augment funding for placement of dredged sediments in locations identified as most beneficial for RSM purposes, (i.e., fund the revised section 204 of Water Resources Development Act (WRDA) of 2007 that authorizes funding for RSM projects).

- Change cost sharing formula.
- Encourage Congress to authorize and appropriate funds to support West Coast RSM efforts. (i.e., fund revised sections of 204 WRDA 2007 that authorizes RSM projects and planning).

2.3: Write a letter to advocate for revision of metrics used by the Office of Management and Budget (OMB) and US Army Corps for budgeting priorities to maximize the beneficial use of sediment.

2.4: Provide a comment letter on the Council for Environmental Quality's Proposed National Objectives, Principles and Standards for Water and Related Resources Implementation Studies as called for in the federal 2007 Water Resources Development Act.

- Review and share policy responses among states

- Develop shared or coordinated response which advocates for the use of regional economic criteria in Army Corps' and other federal agency funding decisions

2.5: Create regional partnerships to maximize efficiencies of dredging opportunities—such as sharing dredging equipment on West Coast.

- EX: Use tri-state partnership to encourage cooperation between states and ports, find some way to cooperate on acquisition and availability of basic infrastructure.

2.6: The states will increase their partnerships with federal agencies to leverage resources to effectively address legacy pollutants, such as mercury in San Francisco Bay from the gold rush era, or toxics (including now banned substances such as DDT) remaining in the Columbia River.

2.7: Develop white paper that reviews, analyzes and shares state policies, funding, and research regarding regional sediment management. Develop shared or coordinated approaches, as appropriate. This paper will identify funding for research on sediment characteristics including:

- Grain size of sediment
- Organic content or smell
- Angularity

TASK TWO CHART

Number	Deliverable	Lead	Timeline	Resources (needed or existing)
2.1	Seek improvements to the national dredging policy and other opportunities.	Sediment group	Monitor and ongoing	Existing Staff
2.2	Encourage Congress to augment funding for placement of dredged sediments in locations identified as most beneficial for RSM purposes.	Tri-state leads	As part of appropriations process: monitor and engage annually throughout federal budget process.	Existing Staff
2.3	Write a letter to OMB and Corps concerning budget metrics.	<ul style="list-style-type: none"> • Sediment group • Executive Committee 	Ongoing	Existing Staff
2.4	Provide a comment letter on the Council for Environmental Quality's Proposed National Objectives, Principles and Standards for Water and Related Resources Implementation Studies	Sediment Group	Monitor and Ongoing	Existing Staff
2.5	Create regional partnerships to maximize efficiencies of dredging opportunities– such as sharing dredging equipment on West Coast.	<ul style="list-style-type: none"> • Sediment Group • NGOs 	Ongoing	Existing Port groups
2.6	The states will also partner with federal agencies to leverage resources to effectively address legacy pollutants.	Army Corps, L. A. District	Spring 2011	Needed
2.7	Develop white paper identifying funding for research needs	Sediment Group	Spring 2010	Existing Staff
2.7	Review, analyze & share state policies.	Sediment Group	Spring 2010	Additional (there will be a need for research, once identified)

KNOWLEDGE GAPS

Gaps in knowledge/future research needs:

Case studies with relevance to RSM implementation by the three states includes:

- Developing Sediment Budgets and associated monitoring of them.
- Determining the influence of hard structures, such as jetties and breakwaters on current sediment transport patterns and other RSM concerns, and conduct an analysis of long-term reliability of structures with respect to both RSM and their intended purpose.
- Determining how sea level rise and other climate change impacts will impact sediment management efforts.
- Researching possible environmental impacts from various placement methods (e.g. nearshore thin-layer dredge soil disposal).

Technical needs with relevance to RSM implementation by the three states include:

- Additional data and information on onshore and alongshore sediment transport models to validate efficacy of nearshore placement strategies intended to minimize erosion.
- Research on potential adaptive management measures that can be effectively integrated into monitoring programs for beneficial use disposal sites.
- Additional research and data on the environmental and natural resource functions and values for proposed beneficial use disposal sites included with an RSM Plan.

General Needs

The states have shared needs related to sediment management, including:

- Increasing agency staff participation
- Conducting research on planning needs, securing funding for RSM planning and projects, understanding reliability of older hard structures (jetties, breakwaters), and conducting beach nourishment demonstrations.
- Improving information sharing: through such means as RSM atlases, Information Management Systems (IMS) efforts, tri-state workshops and meetings, and websites for public outreach, etc.

Stakeholders

The list of stakeholders (anyone affected by and/or interested in the project) for regional sediment management is extensive. This is because RSM helps to facilitate maintenance of coastal ports and channels that are critical to local economies and also enhances important resources including beaches, coastal shorelines and wetlands. By recognizing and demonstrating a synergy between sustainable economic development and environmental, recreational and aesthetic benefits, RSM benefits nearly everyone along the coast. Some of the stakeholders include:

- Local Municipalities in OR, CA, and WA
- Ports
- Fishing industries (fishermen, shellfish aquaculture, and processing plants)
- Shipping industries including tug and tow companies

- Bar pilots
- Citizens/coastal landowners
- Tribes
- Surfers
- Recreational boaters and beach go-ers
- Environmental NGOs
- Other federal or state agencies (e.g. NOAA, USGS, USFWS, state land agencies, fish and wildlife agencies, coastal programs)
- Coastal businesses, especially those reliant on ports, such as agriculture

Appendix

National Oceanic Atmospheric: NOAA

<http://www.noaa.gov/>

U.S. Army Corps of Engineers: ACOE

<http://www.wes.army.mil/rsm/>

U.S. Environmental Protection Agency: USEPA

<http://www.epa.gov/beaches/>

<http://www.epa.gov/OWOW/oceans/ndt/>

California Natural Resources Agency

<http://www.resources.ca.gov/>

California Coastal Commission: CCC

<http://www.cold.ca.gov/>

California Department of Boating and Waterways: DBW

<http://www.dbw.ca.gov/>

Association of Monterey Bay Area Governments (AMBAG):

<http://www.ambag.org/>

Beach Erosion Authority for Clean Oceans and Nourishment (BEACON),

<http://www.beacon.ca.gov>

California Sediment Management Workgroup

<http://dbw.ca.gov/csmw/default.aspx>

Lower Columbia Solutions Group

http://www.lowercolumbiasolutions.org/index.php?option=com_content&task=category§ionid=5&id=27&Itemid=39

Northern Gulf of Mexico RSM:

<http://rsm.sam.usace.army.mil/>

San Diego Association of Governments (SANDAG),

<http://www.sandag.cog.ca.us/index.asp?projectid=330&fuseaction=projects.detail>

Snake River, (Oregon and Washington):

<http://www.nww.usace.army.mil/psmp/>

Southwest Washington Coastal Erosion Study:

<http://www.ecy.wa.gov/programs/sea/swces/index.htm>