

CALIFORNIA MASTER PLAN FOR COASTAL SEDIMENT MANAGEMENT

PROJECT WORKPLAN

California's beaches are extremely valuable natural resources that provide critical habitats for endangered species, irreplaceable recreational opportunities, protection for natural and man-made infrastructure, and \$15 billion in tourism-generated tax revenue annually. However, coastal beaches, wetlands and watersheds have been significantly affected by extensive human alteration of the natural flow of sediment to and along the coast. Watersheds no longer provide a sufficient supply of sediment to beaches, wetlands are often compromised due to too much or too little sedimentation, and beaches erode due to lack of sand. Historically, these issues have been addressed on a site-specific basis. The [California Coastal Sediment Management Workgroup](#) (CSMW), a federal, state and local government partnership that is chaired by the U.S. Army Corps of Engineers (USACE) and California Resources Agency, has found that piecemeal identification of problems and implementation of site-specific solutions do not effectively address these critical problems.

The California Coastal Sediment Management Master Plan (Master Plan) is a collaborative effort between federal, state, and local agencies and non-governmental organizations to evaluate California's coastal sediment management needs on a regional, system-wide basis. This integrated approach to sediment management will save federal, state and local funds by developing solutions to sediment problems that will provide lasting benefits and allow agencies to work together to leverage financial and intellectual resources. The Master Plan will provide planners and coastal managers with the information needed to develop approaches to these issues that generate the greatest environmental and economic benefits for the State of California.

Applications of the Master Plan by project planners and resource managers might include: identifying and prioritizing sediment-related projects; regulatory review; developing opportunistic sand programs; developing Environmental Impact Statements and Assessments; and assessing the cumulative impacts and benefits of sediment-related projects.

Project Goal

To identify and prioritize regional sediment management needs and opportunities along the California coast, and to make this information available to resource managers and the general public to assist in addressing coastal sediment management issues. Such issues may include coastal erosion, recreational opportunities, dredging and sediment flow through coastal watersheds.

Methods

The project goal will be achieved by gathering and analyzing existing data and information related to coastal sediment management; holding public meetings with local, regional, state and federal agencies and stakeholders to identify needs and opportunities; investigating and evaluating data and information for potential inclusion in web-based mapping and geographic information system products; increasing agency and project coordination; and proposing more consistent regulations, legislation and policies.

Geographic Scope

The Master Plan will be developed on a regional basis along the entire open coastline of California, with littoral cell boundaries defining the marine coastal regions and watersheds defining the terrestrial coastal regions (Figure 1). A littoral cell is a length of coastline along which the cycle of sediment erosion, transportation and deposition is essentially self-contained. Sediment primarily enters a littoral cell from rivers, which drain watersheds; one littoral cell might receive sediment from more than one watershed.

Staffing

<i>Project Manager</i>	contractor to be selected
<i>Steering Committee</i>	Kim Sterrett, CA Dept. of Boating and Waterways (DBW) Lesley Ewing, California Coastal Commission (CCC) Mark Johnsson, California Coastal Commission Neal Fishman, California State Coastal Conservancy (SCC) Susie Ming, U. S Army Corps of Engineers, Los Angeles (COE)
<i>Advisory Committee</i>	California Coastal Sediment Management Workgroup (CSMW) others to be determined

Work Products

1. Project web site.
2. Economic analysis of the costs and benefits associated with regional sediment management.
3. Analysis of the federal, state and local policies, regulations and procedures associated with regional sediment management.
4. List of relevant sediment management data sets and information for potential inclusion in a web site and geographic information system (GIS).
5. Regional sediment management GIS.
6. Internet Map Server (IMS) with decision-support tools.
7. Implementation strategy with prioritized list of regional sediment management needs and opportunities and recommendations for the perpetuation of regional project planning.
8. Template for developing opportunistic sand programs and other sand-related projects.
9. Contribution to U.S. Army Corps of Engineers (USACE) reconnaissance study (905b report and project management plan).

Work Elements for Developing the Work Products

1. Manage Project

Contract \$175,000 (time and expenses not to exceed)

- Tasks* A. Develop the contract Scopes of Work, solicit proposals, select contractors and manage the other contracts associated with the project (POC: Kim Sterrett, DBW)
- Workshop Facilitator
 - Policies, Regulations and Procedures Analyst
 - Economics Analyst
 - GIS Developer

- IMS Developer
 - USACE 905 (b) Report
- B. Develop and maintain a web site for use throughout the project. The project web site will be hosted by the Dept. of Boating and Waterways; all web site content will be vetted by the Steering Committee prior to posting (POC: Lesley Ewing, CCC). Web site content to include:
- Project contacts
 - Project proposal
 - Project workplan
 - Workshop locations, participants, notes, report and summary
 - Subscription instructions for list server (see Element 2.c)
 - Contact lists for regional managers and others involved in sediment management
 - Results of policies, regulations and procedures analysis
 - Results of economic analysis of regional sediment management
 - List of data sets and information identified
 - Glossary of terms
 - Map server for GIS data (in conjunction with IMS contractor)
 - Project updates
- C. Participate in public meetings and workshops with the Workshop Facilitator (see Element 2). Regularly distribute project updates to the list server subscribers.
- D. Assist the GIS and IMS Developers (see Elements 5 and 6) with developing a GIS and designing an IMS (POC: Mark Johnsson, CCC)
- E. Develop an Implementation Strategy (see Element 7)
- F. Work with the USACE to assist in the development of a 905 (b) Report for USACE funding of the implementation phase of the Master Plan (see Element 8; POC: Susie Ming, USACE Los Angeles District)
- G. Participate in the Coastal Sediment Management Workgroup (CSMW) and update the Workgroup on the progress of the Master Plan development (POC: Bob Sloane, USACE South Pacific Division)
- H. Coordinate with other federal, state and local programs that overlap the goals of and/or data development for the Master Plan. These include the federal National Shoreline Study, the NOAA California Ocean Planning System, the Southern California Wetlands Recovery Project and the Southern California Coastal Water Research Program.
- I. Work with the Steering Committee and CSMW to expand the membership of the Advisory Committee and create a Technical Advisory Committee. Potential member agencies include: USACE Regulatory Division; California Dept. of Finance Economic Research Division, US EPA Watershed Division, California Dept. of Conservation, and the U.S. Geological Survey.

2. Hold Meetings and Workshops to Solicit Agency and Public Input

Contract \$60,000 (fixed sum).

Tasks A. *Month 1:* Prepare for meetings/workshops (Contractor, with input and supervision from the Project Manager, Steering and Advisory Committees).

- Develop a standard presentation describing the Master Plan and the project to develop the Plan.
 - Identify agencies (public works, flood control, regulatory, resource protection, etc.) and stakeholders in each open coastal watershed.
 - Establish the appropriate number and distribution of agency meetings and public workshops. There are 27 major littoral cells and 37 major watersheds along the coast, so regions, for the purposes of the public workshops, will have to be defined broadly.
 - Set up agency meetings and public workshops throughout the state coastal region (i.e., find and confirm locations, send invitations and announcements, all other meeting logistics). Public workshops are to be timed to geographically coincide with agency meetings. Public workshops also should be timed to coincide with meetings for the Coastal Sediment Management Workgroup and the Resources Agency Coastal Erosion Planning and Response Policy.
 - Develop and distribute a pre-meeting questionnaire for agency meetings (e.g., perceived problems and solutions/opportunities, available and needed data and information types; policies, regulations, and procedures for dealing with sediment transport, disposal and dredging). The questionnaire should be based and expand on the Southern California Wetlands Recovery Project Regional Watershed Planning Assessment Questionnaire.
 - Develop and distribute (with questionnaire, see above) a plan to encourage local and state governmental agencies to participate in the development and implementation of the Master Plan. Encouragement aids might include: continued or increased state funding for projects; the development of general permits for opportunistic sand programs; and assistance with long-term planning requirements.
- B. *Months 2 - 3*: Hold agency meetings and public workshops (Contractor, with support from the Project Manager and Steering Committee whenever time and staff permit).
- Conduct agency meetings and facilitate public workshops throughout the state coastal region.
 - Compile and format workshop notes and summaries for posting to the web site.
- C. *Month 4*: Prepare and present a final report (Contractor).
- Prepare a report with results of the agency meetings and regional workshops, including descriptions of issues and opportunities.
 - Distill issues and opportunities into a mappable format.
 - Prepare a presentation of the results, then meet with state agency representatives and CSMW to present and discuss the issues and opportunities identified through the meetings and workshops.
 - Set up one or more electronic list servers from contacts made during the workshop process for project updates and discussions.
- D. *End of Master Plan Project*: Hold follow-up workshops (Contractor and Project Manager).

- Through regional workshops, revisit agencies and public stakeholders to report results of the project, discuss the implementation strategy, and educate participants about the web site (i.e., find and confirm locations, send invitations and announcements, all other meeting logistics).

3. Analyze Sediment-Related Policies, Regulations and Procedures

Contract \$40,000 (fixed sum).

- Tasks*
- A. Research current state and federal policies, regulations and procedures (PRPs) related to sediment transportation, disposal, and dredging (POC: Neal Fishman, SCC):
 - Develop a list of PRPs.
 - Compile copies of the PRPs.
 - Summarize findings and identify administrative impediments to supplying clean sand (a component of sediment) to the coast.
 - Identify competing interests for sand.
 - B. For those local, county, and regional areas with sediment-related problems and opportunities (as identified through Work Element 2), research current local, county, and regional PRPs related to sediment transportation, disposal, and dredging (POC: Neal Fishman, SCC):
 - Develop a list of PRPs.
 - Compile copies of the PRPs.
 - Summarize findings and identify administrative impediments to supplying sand to the coast.
 - C. Prepare a final report and present the results in a GIS-compatible format.

4. Develop Economic Analysis Template

Contract \$35,000 (fixed sum)

- Tasks*
- A. Identify and describe the economic elements related to sediment extraction/dredging, disposal and transportation along the coast of California. While each coastal watershed might not contain all of the elements identified through this task, the list of elements should include all elements that might be found in coastal watersheds (POC: Kim Sterrett, DBW). Elements might include:
 - income from in-stream sand and gravel mining revenues
 - income from beach-related tourism and recreation
 - income related to water reservoirs/dams
 - costs of sediment disposal
 - costs of sediment transportation
 - costs of sediment separation
 - costs of beach nourishment
 - costs of dredging sediment from ports and harbors
 - costs of clearing sediment from debris basins
 - B. Assess the public and private monetary costs and benefits of each element. Identify competing interests for sand.

- C. Prepare a final report that summarizes findings and recommends actions (for individual elements) based on those findings. Prepare results for inclusion on the web site, in the GIS and in the Implementation Strategy.

5. Develop Regional Sediment Management GIS

Contract \$100,000 (time and expenses not to exceed; includes necessary hardware and software).

- Tasks**
- A. Prepare for collecting data and information (Contractor and Project Manager, with input from Advisory Committee and IMS contractor; POC: Mark Johnsson, CCC).
- Identify the data and information types and attributes to be collected (see attached list). The draft list will be used during the agency and public workshop process (see Work Element 2.B).
 - Obtain approval of the list of data and information types from the advisory committee.
 - Establish data quality and format standards for each data type.
 - Establish metadata and error analysis standards and procedures.
 - Write a Technical Memorandum based on the results of this task.
- B. Collect data and information (Contractor).
- Search for, evaluate, and compile data into a GIS. Coordinate with existing data compilation efforts (such as the Southern California Wetlands Recovery Project, the Resources Agency Legacy project and the NOAA CalOPIS project).
 - Prepare FGDC-compliant metadata and error analysis documentation.
 - Create a CERES-compatible metadata catalogue and upload it to CERES (www.ceres.ca.gov).
- C. Prioritize data gaps (Project Manager and GIS Contractor).
- If necessary, identify and prioritize significant data gaps.
 - Evaluate opportunities to fill significant data gaps.

6. Develop Management and Planning Tools and Internet Map Server

Contract \$200,000 (fixed sum; includes necessary hardware and software)

- Tasks**
- A. Work with DBW Information Technology staff to establish DBW as the IMS host (POC: Kim Sterrett, DBW).
- B. Develop decision-support tools (Contractor, in consultation with the Project Manager; POC: Mark Johnsson, CCC).
- Work with Project Manager and Advisory Committee to design decision-support tools. These will be "buttons" that non-GIS users can "press" on the web interface to ask certain questions of the data, such as, "In this watershed, which beaches are good target nourishment beaches for my particular source of sand?"
- C. Develop Internet Map Server (Contractor; POC: Mark Johnsson, CCC).
- To include complete user help guides and a tutorial.
 - To include full development documentation and procedures for updating the server.

7. Develop Implementation Strategy for Master Plan

- Contract** To be developed as part of the project management contract with considerable input from Steering and Advisory Committees
- Tasks**
- A. Devise a prioritization scheme for ranking opportunities both within a region and between regions. Scheme should be based on information in the GIS database, existing USACE, State of California and other projects, and local support for opportunities (identified through regional workshops).
 - B. Prepare a Master Plan that includes the following:
 - prioritized list of sediment-related problems and opportunities in littoral cells and associated watersheds;
 - ways (legislative and/or procedural) to integrate regional sediment management into watershed planning, the California Environmental Quality Act and permitting processes, based on results of the regional workshops and meetings, Policy and Economic Analyses, and ongoing coordination with interested stakeholders;
 - recommendations for specific ways to use regional sediment management as a basis for decision-making;
 - roles for federal, state and local stakeholders in regional sediment management.
 - C. Hold follow-up workshops (Workshop Contractor and Project Manager).
 - See Work Element 2.E.

8. Support for USACE 905(b) Report and Project Management Plan

- Contract** \$50,000 (fixed sum)
- Tasks** The contracted dollars will be used to support the development of a USACE 905(b) report and project management plan (PMP), which meets the requirements of the USACE reconnaissance phase (ReCon) of project development. This ReCon will, in turn, support the development of regional sediment management opportunities (i.e. individual projects) identified in the Master Plan Implementation Strategy (POC: Susie Ming, USACE).

Summary of Project Contracts

Element 1: Project management	\$175,000
Element 2: Workshop management	\$60,000
Element 3: Policy analysis	\$40,000
Element 4: Economic analysis	\$35,000
Element 5: GIS development	\$100,000
Element 6: IMS and decision support tools development	\$200,000
Element 8: Support for USACE 905(b) and PMP development	\$50,000
Contingency (data collection, contract extensions)	<u>\$140,000</u>
PROJECT TOTAL	\$800,000

Project Timeline

Work Elements ↓ month →	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Manage Project													
1a. Manage other contracts	X	X	X	X	X	X	X	X	X	X	X	X	X
1b. Develop Web Site	X	X	X	X	X	X	X	X	X	X	X	X	
1c. Participate in meetings/workshops			X	X								X	
1d. Support GIS/IMS development	X	X	X	X	X	X	X	X	X	X	X	X	
1e. Develop Implementation Strategy								X	X	X	X	X	
1f-i. Coordinate with other programs and the Corps	X	X	X	X	X	X	X	X	X	X	X	X	X
2. Meetings and Workshops													
2a. Prepare for meetings/workshops		X											
2b. Hold meetings/workshops			X	X									
2c. Prepare and present final report					X								
d. Hold follow-up workshops												X	
3. PRP Analysis													
3a. Research state and federal PRPs		X	X										
3b. Research appropriate local PRPs				X	X								
3c. Prepare final report						X							
4. Economics Analysis													
4a. Identify elements							X						
4b. Assess costs and benefits of elements								X	X				
4c. Prepare final report										X			
5. Develop GIS													
5a. Prepare for data collection		X											
5b. Collect data		X	X										
5c. Prioritize data gaps			X	X	X	X	X	X					
6. Develop Tools and IMS													
6a. Establish host for IMS		X											
6b. Develop tools		X	X	X	X								
6c. Develop IMS				X	X	X	X	X	X	X	X	X	X
7. Implementation Strategy													
7a. Devise prioritization scheme								X	X				
7b. Prepare implementation strategy									X	X	X	X	
7c. Hold follow-up workshops												X	
8. Support Corps ReCon	X	X	X	X	X	X	X	X	X	X	X	X	X

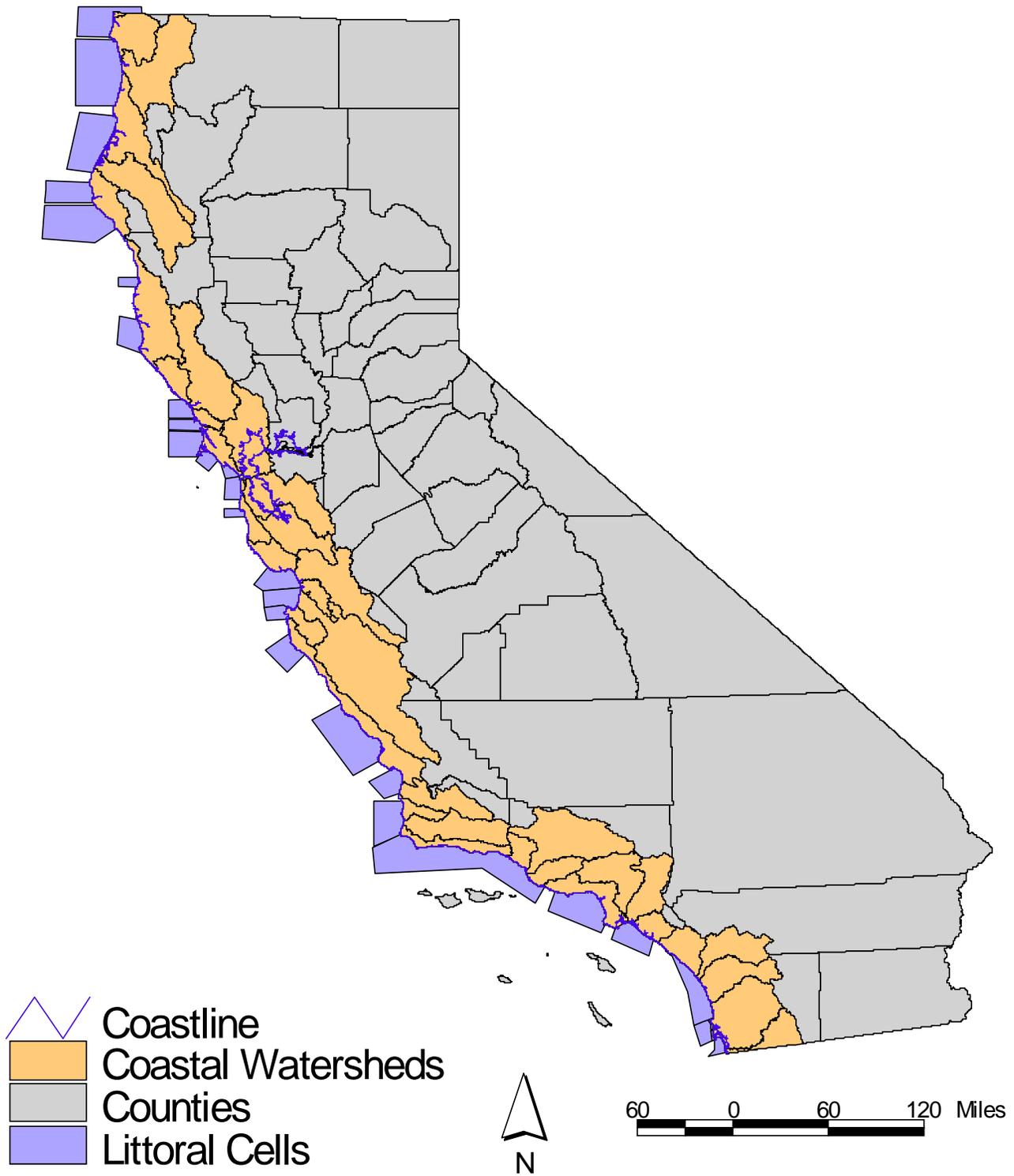


Figure 1: California Coastal Watersheds and Littoral Cells

Proposed Data Types

What information do we need in order to manage sediments successfully on a regional basis? This is a preliminary list of data types that have been identified and described by the Advisory Committee. This list will be refined as the project develops.

shapefile (geographic representation of what we're mapping)	shape	scale range	attributes	priority
beaches (coast_status)	polylineM		Featurename	primary
			feature (rocky, beach-straight, beach-pocket,)	
			%sand/%fines	
			degree of sediment sorting	
			sand shape	
			littoral cutoff diameter (mm)	
			beach ownership	
			managing agency of beach	
			long-term beach width status (eroding, stable, accreting)	
			vulnerability to storm damage	
			\$ benefit of nourishment	
			# of annual beach recreational users	
			# of annual beach tourists	
			hyperlink to equilibrium beach profile	
sand sinks	polygon		Featurename	primary
			ownership	
			Rate of accumulation (c.y./yr)	
sand sources	polygon		Featurename	primary
			%sand/%fines	
			ownership	
			type1 (actual, possible)	
			volume (c.y.)	
			rate of discharge (c.y./yr)	
littoral processes	polygon		Featurename (littoral cell name)	primary
			Net direction of transport (cardinal)	
			Winter direction of transport (cardinal)	
			Summer direction of transport (cardinal)	
			Potential rate of transport (c.y./yr)	
			Actual rate of transport (c.y./yr)	
			Closure depth (feet below MLLW)	
			seasonal onshore-offshore flux (c.y./yr)	
			total littoral cell sediment volume (cy)	

barriers to longshore transport	polygon		Featurename	primary
			feature (breakwater, groin, jetty, headland, submarine canyon, etc.)	
			effect (permeable, restrictive, complete)	
barriers to fluvial transport	point		Featurename	primary
			feature (dam, debris basin, stream channel, etc.)	
			effect (permeable, restrictive, complete)	
			ownership	
			original reservoir capacity (c.y.)	
			remaining reservoir capacity (c.y.)	
sand mining operations	point		Featurename	primary
			extraction rate (c.y./yr)	
			type (current, planned)	
			% sand at site	
gravel mining operations	point		Featurename	primary
			extraction rate (c.y./yr)	
			type (current, planned)	
			% sand at site	
watershed boundaries	polygon		Featurename	primary
political boundaries	polygon		Featurename	primary
			Jurisdiction (city, county, region, coastal zone, park, flood control district, LCP, port/harbor, official watershed group, Ghad, USACOE District, EPA District, etc.)	
			Contact (person/phone#/email)	
			Regulation (related to sediment extraction, transportation and disposal)	
			population within boundary	
nearshore substrate	polygon		substrate type (sand, gravel, high-relief reef, low-relief reef, exposed bedrock platform)	primary
			%sand/%fines (for sand substrate)	
			uncontaminated/contaminated	
nearshore habitats	polygon		habitat type	primary
			density of resource	
			tolerance to burial/turbidity	
			persistence	
endangered/threatened species	point		species	primary

			threatened?	
			endangered?	
Projects	polygon		ProjectName	primary
			lead agency	
			when the project occurred	
			purpose/goals	
			web site link	
Rivers and Streams	polyline		FeatureName	primary
			Impaired?	
			Nature of Impairment	
			TMDL value	
			hydrologic n value	
			stream condition/aggrading, stable, degrading	
			stream bed type	
			stream erosion rate	
			measured rate of river discharge (c.y./yr)	
			modeled rate of river discharge (c.y./yr)	
			sediment profile of river discharge (%fine, %sand, %gravel; composition)	
Water bodies	polygon		FeatureName	primary
			feature (lake, wetland, etc.)	
			Impaired?	
			Nature of Impairment	
Digital Nautical Chart	image		georeferenced TIFF	primary
Digital Orthophoto Quads	image	1:40k	compressed image	primary
Digital Elevation Model	polygon		contour elevation (m)	secondary
armor	polylineM		type (seawall, revetment, etc.)	secondary
			length	
			height	
			date of construction	
bluffs	polylineM		stratigraphic units	secondary
			lithology of layers	
			degree of jointing	
			degree of induration	
			rate of retreat (m/yr)	
			method of rate calculation (end point, root mean squared, linear regression, etc.)	
			time span of rate calculation (YYYY-YYYY)	
Landslides	polygon	1:24k	category	secondary
bathymetric and	points		date of survey	secondary

topographic survey data				
			accuracy of survey	
			type of survey	
beach profile transects	polyline		0,0 monument code	secondary
			date of survey	
			hyperlink to beach profile plots	
Beach Access Site	point		access information	secondary
			Coastal Access Guide attributes	
living marine resources	point		e.g. benthic infauna, recreationally and commercially important fish and invertebrate species, ecologically important species, seabirds, marine mammals, etc	secondary
			abundance of the resource	
Land Use	polygon		type of use/zoning (park, commercial, industrial, residential, protected)	secondary
			land owner	
			land value	
compressed orthorectified aerial photography	image			tertiary
dredged material records	polygon		dredge event	tertiary
			removal site	
			dredge material volume	
			placement site	
			dredge contractor	
			contract costs	
Beach Nourishment History	point		nourishment site	tertiary
			placement volume	
			nourishment proponent	
			cost of project	
			reference	
transportation infrastructure	polyline		road condition	tertiary
			road thickness	
outfall pipes	line		depth	tertiary
			owner	
model-generated sediment impact zones	polygon	1:12k	associated beach	tertiary
			model used	
			model input values	
Sites of historical/archaeological significance	point	1:24k	Featurename	tertiary

Wave climate	polygon		wave data	tertiary
Wind climate	polygon		wind data	tertiary
Site photos	image		hyperlink to digital photo of site	tertiary
			date of photo	
			photographer	
			reason photo was taken	