

San Francisco Bay Coastal Management Program Assessment and Strategy



Prepared pursuant to the provisions of Section 309
of the federal Coastal Zone Management Act
for the Office of Ocean and Coastal Resource Management
National Ocean and Atmospheric Administration
U.S. Department of Commerce

by:

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San Francisco Bay Coastal Management Program
309 Assessment & Strategy

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SECTION I INTRODUCTION

Overview of the Section 309 Program

Section 309 of the Coastal Zone Management Act (CZMA), as amended in 1990 and 1996, establishes a voluntary coastal zone enhancement grant program to encourage Coastal Management Programs (CMPs) such as BCDC to develop innovative approaches to improving the following nine enhancement areas: (1) wetlands, (2) coastal hazards, (3) public access, (4) marine debris, (5) cumulative and secondary impacts, (6) special area management planning, (7) ocean/great lakes resources, (8) energy and government facility siting, and (9) aquaculture. Under the Section 309 program, the Secretary of Commerce is authorized to make awards to states and territories to develop and submit for federal approval program changes that support attainment of one or more enhancement area objectives.

To be eligible for Section 309 funding, CMPs must successfully complete an Assessment and Strategy for review and approval by the Office of Ocean and Coastal Resource Management (OCRM). The Assessment considers the extent to which problems and opportunities exist with regards to the enhancement area objectives and the effectiveness of current efforts to address those problems. The Assessment provides the factual basis for the CMP and OCRM to cooperatively determine priority needs for program improvement.

The Strategy is a comprehensive, multi-year statement that identifies program changes and implementation activities needed to address enhancement area objectives identified as high or medium priority in the Assessment. The Strategy is based on priority needs and information gaps identified in the Assessment and covers the 5-year period from fiscal year 2011 to fiscal year 2015.

Assessment and Strategy Development and Public Review Processes

This draft report is the culmination of a collaborative process to evaluate BCDC's CMP. The status of the coastal resources, extent of problems and opportunities, and the effectiveness of existing management efforts were characterized for seven of the nine enhancement areas. The priority needs and information gaps to address identified problems and opportunities were evaluated, and strategies that will result in programmatic changes leading to an improvement in each of the seven enhancement areas were developed. BCDC staff was actively involved in the development of the draft Assessment and Strategy, providing input both individually and in collaborative team meetings.

Public review and comment are critical to the success of any CMP, and BCDC is committed to incorporating the public's ideas and opinions to the greatest extent feasible into the Assessment and Strategy. A public review and comment process was held concurrent with the OCRM review of the draft report. Adequate notice was given to the public, a review and comment period was held from September 1 to 30, 2010, and the draft document was made available in hard copy at the BCDC office and digitally on the BCDC website. Additionally, a well-noticed public workshop on the draft Assessment and Strategy was held during the public comment period, and on October 7, 2010, prior to submittal of the final report to OCRM, the Commission held a public hearing on the Assessment and Strategy.

BCDC's Coastal Management Program

Through the McAteer-Petris Act of 1965, BCDC was granted authority by the state to plan and regulate activities and development in and around the Bay through policies adopted in the San Francisco Bay Plan (Bay Plan). The Suisun Marsh Preservation Act of 1977 expanded BCDC's permit jurisdiction over the 85,000-acre Suisun Marsh, the largest remaining wetland in California. Together, these two statutes formed the basis of the management program for the

San Francisco Bay Segment of the California Coastal Zone, which was approved by the U.S. Secretary of Commerce on February 16, 1977.

The Commission's enabling legislation focuses on limiting fill, increasing public access to and along the Bay, and assuring that sufficient land is available for high priority water-dependent uses. BCDC administers a regulatory program based on the standards of the Bay Plan, in which permits are required for Bay filling and dredging and for development along a shoreline band extending 100 feet inland from the Bay. The Commission's Bay jurisdiction includes specified waterways, managed wetlands, salt ponds, and all parts of the Bay that are subject to tidal action, including sloughs, marshlands, tidelands, and submerged lands.

The Bay Plan has dual mandates to (1) protect the Bay as a great natural resource for the benefit of present and future generations; and (2) develop the Bay and its shoreline to their highest potential with a minimum of fill. To achieve these mandates, the Bay Plan includes policies on fish and wildlife, water pollution, water surface area and volume, marshes and mudflats, fresh water inflow, dredging, water-related industries, ports, airports, recreation, public access, salt ponds, transportation, project appearance and design, and scenic views.

The Suisun Marsh Protection Plan (Marsh Plan) is another component of BCDC's management program. The Marsh Plan is a more specific application of the regional policies of the Bay Plan and supplements such policies to accommodate the unique characteristics of the Suisun Marsh. The Marsh Plan's objectives are to preserve and enhance the quality and diversity of the area's 85,000 acres of wetland habitat, and to ensure that uses of adjacent upland areas are compatible with marsh protection. The Commission maintains permit authority over development in the primary management area of the Suisun Marsh, which includes 89,000 acres of tidal marsh, managed wetlands, adjacent grasslands, and waterways. The Marsh Plan requires local governments to prepare and have certified by BCDC local protection plans for a secondary management area of the Suisun Marsh, which includes approximately 22,500 acres of significant buffer land (i.e., uplands surrounding the wetlands). The Commission retains appellate authority over local government decisions within the secondary management area.

In addition to the permit program, BCDC, with the support and cooperation of local governments, develops special area plans containing enforceable policies and use designations. Special area plans are adopted by the Commission as amendments to the Bay Plan, and by local governments as amendments to their general plans and zoning ordinances.

The 27-member Commission is composed of one member from each of the nine Bay Area county boards of supervisors; four elected officials representing area municipalities appointed by the Association of Bay Area Governments; five state representatives from the Business and Transportation Agency, Department of Finance, Resources Agency, State Lands Commission, and the San Francisco Regional Water Quality Control Board; two federal representatives of the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency; and seven members appointed from the public sector. The Commission holds regular meetings and is served by an Executive Director and a staff of approximately 40.

SECTION II

SUMMARY OF COMPLETED 309 EFFORTS

Below is a summary of the Commission's program changes and major accomplishments since 2006. The changes and accomplishments are classified by enhancement area and are separated into efforts identified as program enhancement strategies in the previous assessment (*San Francisco Bay Coastal Management Program Assessment and Strategy, May 2006*) and other major accomplishments that were not specifically identified in the previous assessment.

Wetlands

Program Enhancement Strategies Identified in the Previous Assessment

Managed Wetlands Policies (approved by OCRM on April 18, 2008). In 2007, final revisions were made to the managed wetlands findings, policies and map designations in the San Francisco Bay Plan (Bay Plan) and the Suisun Marsh Protection Plan (Marsh Plan). The revisions better reflect current knowledge, conditions and practices; improve consistency of policy language with the McAteer-Petris Act; and provide the Commission with additional guidance on evaluating proposed projects in managed wetlands.

Accomplishments

- Updated the managed wetlands findings, policies and map designations to better reflect current knowledge, conditions and practices.
- Revised policies to explicitly support the continued maintenance of existing uses and the public purchase of managed wetlands for habitat restoration and enhancement.
- Crafted a new policy to specifically address the unique issues associated with restoration, enhancement or conversion of managed wetlands.
- Amended the Bay Plan to be consistent with the McAteer-Petris Act in regards to the potential development of managed wetlands. In particular, revised terminology in the Bay Plan describing the amount of water surface area retained and public access to be provided if managed wetlands are proposed for development.
- Revised the Marsh Plan to improve consistency with the Bay Plan where it was possible and appropriate.
- Updated and expanded terminology used in the Marsh Plan to more concisely and accurately describe managed wetlands resource values, more fully describe the history and current use of private waterfowl hunting clubs, and reflect current management objectives and recreational uses of public lands.

Scientific Integration. Since its inception in 1965, the Commission has relied on a variety of approaches to integrate scientific information into its regulatory and policy decisions. This integration is increasingly difficult as definitive scientific information is not always available or cannot be accessed in time to meet regulatory deadlines. To address these challenges, efforts are ongoing to improve coordination and communication with the scientific community and to encourage scientific studies addressing important deficits or uncertainties in the understanding of Bay resources.

Accomplishments

- Completed a staff report entitled "A Strategy to Better Incorporate Scientific Information into the Commission's Regulatory and Policy Processes" that summarizes policies that guide the Commission's use of scientific information, the current practices for

integrating scientific information into regulatory and policy decisions, and options for expanding and improving these practices.

- As a member of the Long Term Management Strategy (LTMS), continued to promote a range of scientific and technical studies focused on Bay dredging and disposal management, including coordinating the first annual science symposium on uncertainties regarding dredging and disposal impacts.
- Joined the Landscape Conservation Cooperative (LCC) science partnership effort led by the U.S. Fish and Wildlife Service to help work towards an adaptive management framework to address landscape-scale stressors.
- Received funding for, and initiated, a number of scientific studies to advance the understanding of how Bay resources will respond to climate change impacts, specifically sea level rise.
- Hosted a forum for regional experts in policy, planning, science, and engineering on identifying research needed to improve our understanding of climate change in the Bay area. Discussion groups focused on the physical processes of the Bay, habitat conservation, shoreline development, and social science, legal and policy issues. Priority research needs regarding vulnerability to, projecting future impacts from, and effective adaptation strategies for climate change impacts were summarized in a “white paper.”
- Joined the Bay Area Ecosystems Climate Change Consortium (BAECC), a cooperative working group whose purpose is to identify and address climate change impacts on ecosystems by using science to inform adaptive management for long-term ecological and economic benefits.

Subtidal Habitats and Mineral Resources. Efforts to update findings, policies and map designations pertaining to subtidal areas are ongoing. The Commission continues to work on the San Francisco Subtidal Habitat Goals Project (Subtidal Goals Project). The Subtidal Goals Project is a collaborative interagency effort between BCDC, California Ocean Protection Council (OPC), California State Coastal Conservancy (SCC), National Oceanic and Atmospheric Administration (NOAA) and the San Francisco Estuary Partnership (SFEP) to establish a comprehensive and long-term vision for protecting, restoring, researching and managing the subtidal system in the Bay. Ultimately, revisions to the applicable findings and policies in the Bay Plan will be made based on the outcomes of the Subtidal Goals Project.

Accomplishments

- Completed a draft document that includes a series of recommendations to improve the management, science, and restoration of subtidal habitats.
- Held an open public comment period including two public meetings.
- Secured a Coastal Impact Assistance Program (CIAP) grant to study bay sediment processes and sediment management.
- Secured a California Sediment Management Workgroup (CSMW) grant to identify sources of sand and finer grain sediment in the Bay, and develop management strategies focused on coarse grain sediment.

Other Major Accomplishments

Former Hamilton Field Air Force Base Wetland Restoration and Enhancement

- Continued to work closely with the U.S. Army Corps of Engineers and the California Coastal Conservancy to restore 630 acres of diverse tidal and seasonal marsh while

capitalizing on a unique opportunity to demonstrate the beneficial reuse of over ten million cubic yards of clean dredged materials.

- Reached a major project milestone with the first placement of material dredged from Bay shipping channels and the Port of Oakland at the restoration site.

South Bay Salt Pond Restoration Project

- State and Federal agencies acquired 15,100 acres of former salt ponds in South San Francisco Bay in 2003, providing an opportunity for the largest tidal wetland restoration on the west coast of the United States. In support of this multi-disciplinary, multi-objective restoration project, a permit was issued and a consistency determination completed in 2008. The project is ongoing and will be implemented in a series of phases over several decades.

Napa Sonoma Salt Pond Restoration Project

- Completed a consistency determination and issued a permit in 2007 in support of the Napa Sonoma Marsh restoration project, one of the largest tidal restoration projects constructed to date in San Francisco Bay. Project goals include restoring and enhancing wetlands and transitional habitats on the Napa River to benefit wildlife species such as the salt marsh harvest mouse, the California clapper rail, and Chinook salmon, and providing wildlife-oriented public access including trails, picnic areas, wildlife viewing areas, and a hand-launch for non-motorized watercraft.

Improved restoration monitoring strategy

- Conducted a review of approved restoration projects to assess program effectiveness.
- Reviewed and summarized submitted restoration monitoring reports, and established a report log to better track monitoring efforts.
- Continued to refine restoration monitoring criteria to reflect changes in the understanding of how marshes evolve, to reflect cost concerns, and to better evaluate the success of restoration efforts.

Coastal Hazards

Program Enhancement Strategies Identified in the Previous Assessment

Global Climate Change. Efforts to evaluate and plan for climate change impacts on Bay and shoreline resources. These efforts are being supported by a multi-objective approach that includes identifying potential impacts of climate change on natural, cultural and economic resources; developing a mechanism to inform stakeholders about potential impacts; conducting public outreach and awareness efforts to create a forum through which impacts can be addressed; and revising applicable findings and policies in the Bay Plan.

Objective 1 – Identify Major Impacts of Climate Change

- To illustrate potential climate change impacts on the Bay, a series of inundation maps demonstrating the effect of projected sea level rise on Bay resources were produced. The maps show that more than 200 square miles of low-lying land along the shoreline is vulnerable to flooding.
- In 2008, a forum of scientists and agency staff was convened to discuss Bay-related climate change research needs and to develop a consensus on research priorities. During the forum regional experts in policy, planning, science, and engineering discussed the

information gaps and research needed on the vulnerability of the Bay system to climate change and on adaptation measures to address the identified vulnerabilities.

- In cooperation with the San Francisco Estuary Partnership (SFEP), succeeded in having the Bay designated a Climate Ready Estuaries pilot project. The Climate Ready Estuaries program is a partnership between U.S. Environmental Protection Agency (EPA) and the National Estuary Programs (NEPs) to address climate change in coastal areas. Assistance is being given towards developing a program to address climate change impacts in the Bay. To begin the process, BCDC in collaboration with its partners held a two-day expert elicitation for regional scientists to consider potential climate change impacts on shorebird communities and Bay sediment dynamics, and then identify possible adaptation strategies to mitigate the potential impacts.
- Received an EPA grant award through SFEP to conduct a multi-disciplinary study of the resilience of tidal wetlands to climate change. Working with the U.S. Geological Survey (USGS) and other consultants, the study is investigating sediment, erosion and wave processes to guide development of strategies to reduce the vulnerability and improve the adaptive capacity of tidal wetlands to sea level rise. The effort will result in an improved understanding of the wave attenuation and flood protection benefits of tidal wetlands; will develop analytical tools that can be used to assess the risks of coastal flooding; and will provide guidance to local decision makers regarding the role of tidal wetlands in maintaining a healthy Bay ecosystem and protecting the shoreline from increased flooding and erosion due to sea level rise.
- Through the LTMS Program Funds, BCDC targeted the funding of specific studies conducted by the USGS to inform development of a regional sediment management program. These include a fine grain provenance study and a sediment dynamics modeling effort funded by the U.S. Army Corps of Engineers, and a local tributary flux study funded directly by the LTMS program. Sedimentation is an essential factor in the creation, maintenance and growth of tidal marsh and tidal flat habitats. Understanding the sources and transport processes of sediment in the Bay is critical to ensuring that future sediment supplies are adequate to promote resiliency of the Bay to sea level rise.
- Applied for and received Coastal Impact Assistance Program (CIAP) grant funding to study the Head of Tide in Bay tributaries. Head of Tide is a zone that characterizes the upstream influence of the tides, and predicted sea level rise and the response of local watersheds to climate change will likely cause this zone to migrate inland. Because many shoreline cities are located at the Head of Tide of Bay tributaries, tools developed by this project will be critical to helping local and State agencies prepare for and manage migration of this zone.
- To take advantage of Holland's centuries of experience protecting low-lying areas from flooding, BCDC entered into a unique partnership with an alliance of Dutch consultants, universities and institutions. Using funding provided by the Dutch government, the partnership assessed sea level rise vulnerabilities in the Bay and offered ideas on how to best deal with the problems that will arise. The study's conclusions were presented at an international symposium in San Francisco.
- To better inform the region about the range of potential climate change impacts, work is ongoing to prepare an assessment of the vulnerability of the Bay Area to climate change and to identify potential adaptation measures in partnership with the California Energy Commission through the Public Interest Energy Research (PIER) program. The PIER has committed to fund work by UC Berkeley researchers to examine potential impacts and vulnerabilities in several sectors in the Bay Area, and to identify adaptation strategies to address them. Additional funding to expand the scope of this regional assessment effort to ensure it comprehensively considers all sectors will be sought in the future.

Objective 2 – Inform Regional and State Stakeholders about Potential Impacts

- Joined the regional Joint Policy Committee (JPC) in 2007, and became a voting member in 2009. The JPC is coordinating efforts of the four Bay Area regional agencies with responsibility for air quality, transportation, land use planning and Bay management to develop a regional climate change strategy.
- Accepted an invitation to become a partner in the San Francisco Business Council on Climate Change, a group that is advancing the goal of reducing greenhouse gas emissions in the Bay Area.
- In partnership with NOAA, the Danish International Development Assistance Program and the World Wildlife Fund, developed a curriculum for teaching coastal and marine resource managers and coastal hazard professionals from developing nations how to begin the process of developing strategies to address climate change. Staff has traveled to Vietnam, the Philippines, Indonesia and Ecuador to present this curriculum to coastal managers. The curriculum was then modified and presented to Bay Area local, state and federal land managers in a 5-day training on climate change adaptation planning.
- In partnership with the Association of Bay Area Governments, the San Francisco Bay National Estuarine Reserve and the Bay Area Air Quality Management District, held a well-attended local government forum where an approach was demonstrated for determining the areas and resources are vulnerable to the impacts of climate change.
- Joined with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) in sponsoring a regional conference entitled *Bay Area on the Move: Connecting Transportation, Land Use and Climate Protection*.

Objective 3 – Conduct a Public Outreach and Awareness Effort

- To encourage the broadest possible public involvement in the development of climate change policies, held four public hearings, a public workshop and three special workshops for local governments on climate change impacts.
- Partnered with NOAA to hold two all-day workshops on adaptation planning to address climate change impacts at the local level (September 2009).
- Presented a daylong adaptation planning workshop module at the Bay Area Air Quality Management District summit on climate change (May 2009)
- Using financial support provided by NOAA, sponsored an international design competition to generate innovative design solutions, effective ideas and strategies for adapting to the impacts of sea level rise along the San Francisco Bay shoreline. An international jury of experts selected six grand-prize winners from the 130 submissions received from 18 countries.
- Helped underwrite a feature article in the magazine Bay Nature describing the impact of climate change on the Bay Area ecosystem.
- BCDC's Executive Director and other staff made over 250 presentations to state and local government officials, public service organizations, and others about the likely impacts of sea level rise on the Bay Area and the need to develop adaptation strategies.

Objective 4 – Revise Applicable Findings and Policies in the Bay Plan

- To provide the legal underpinning needed to meet the challenges posed by climate change, succeeded in having state legislation enacted that directs the Commission to work with other agencies and organizations to develop a comprehensive climate change strategy for the Bay Area. The state legislation (AB 2094) gives explicit authority to

address climate change and sea level rise in planning work, and made the Commission a voting member of the JPC.

- As a major component of ongoing efforts to keep the Bay Plan up-to-date and based on the best scientific information, staff developed draft findings and policies on climate change and a background report that reflects the current state of knowledge regarding the potential impacts of sea level rise on the region. The background report, *Living With a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on the Shoreline*, identifies vulnerabilities in the Bay Area's economic and environmental systems, as well as the potential impacts of climate change on public health and safety.
- Based on the background report, proposed Bay Plan Amendment (No. 1-08) was developed and three public workshops were conducted. The staff published a revised preliminary recommendation on October 1, 2009, and the Commission held and closed a public hearing on the revised recommendation on November 5, 2009. The Commission then held a public workshop on staff's revised preliminary recommendation at its December 3, 2009 meeting. Since that time, the staff solicited additional public input, and prepared a revised preliminary recommendation. The Commission opened a public hearing on the revised preliminary recommendations on October 7, 2010 with the intention of coming to a decision on the amendment by December 2010.
- To support the efforts to address climate change in the Bay Plan, the Commission issued a legal report explaining how the public trust doctrine relates to strategies for addressing climate change and sea level rise.
- Working with sister agencies in the California Natural Resources Agency, helped formulate the ocean and coastal resources component of the California Climate Adaptation Strategy.

Public Access

Program Enhancement Strategies Identified in the Previous Assessment

Shoreline Landscape Guide. In 2007, an updated Shoreline Landscape Guide was completed to provide permit applicants, consultants and the public with specific guidance regarding shoreline plantings. The Commission's *Shoreline Plants: A Landscape Guide for the San Francisco Bay* (Shoreline Landscape Guide) promotes the use of suitable plantings in development projects along the Bay shoreline. The original guide, developed in 1984, lacked a comprehensive set of planting guidelines for the numerous shoreline settings found along the Bay. The new guide is a companion to two other key publications: *Shoreline Spaces: Public Access Design Guidelines for the San Francisco Bay* and *Shoreline Signs: Public Access Signage Guidelines*.

Accomplishments

- Completed an update to the Shoreline Landscape Guide that addressed three primary objectives for guiding planting along the Bay shoreline: improving habitat, improving the public access experience and stabilizing the shoreline.
- Developed an A-to-Z list of appropriate shoreline plants and suggested a series of plant palettes for specific landscapes, locations and needs.
- Placed a new emphasis on the use and benefit of native species.
- Provided additional resource information including suggested plant sources.

Other Major Accomplishments

Recreation Policy Revision (approved by OCRM on March 16, 2007)

- In 2006, final revisions were made to the recreation findings and policies in the Bay Plan. The updates, which apply to water-oriented recreation facilities including waterfront parks, beaches, marinas, launch ramps, fishing piers and regional trails, better reflect the effects of the Bay Area's changing demographics on the demand for recreation and changes in technology that have generated new ways of recreating on San Francisco Bay and along its shoreline.
- The revisions incorporated information from planning studies to address broad policy issues, including recreation trends and the compatibility of recreation and wildlife in waterfront parks and in wildlife refuges.
- Revisions included changes in boundaries, map notes and other designations for a number of waterfront park priority use and beach priority use areas.

San Francisco Bay Area Water Trail Plan

- As directed by state legislation passed in 2005, recommended policies, criteria and guidelines were developed detailing the appropriate location, design, operation and maintenance of the San Francisco Bay Area Water Trail Plan (Water Trail). The Water Trail is envisioned as a network of landing and launch sites that will allow non-motorized small boaters to take continuous, multi- or single-day trips on the Bay.
- Worked with a NOAA Coastal Management Fellow on a collaborative planning process to evaluate a variety of issues associated with the Water Trail, including ensuring that enough boat launch sites are available for point-to-point trips; facilitating extended stay trips; developing design criteria for launch sites; assessing environmental impacts; assessing safety/security issues; developing approaches for education and outreach; managing conflicting uses; and developing funding strategies.
- Completed a draft San Francisco Bay Area Water Trail Plan for submittal to the state Legislature.
- Continue to serve on the San Francisco Bay Area Water Trail Project Management Team, a cooperative effort of the State Coastal Conservancy, the San Francisco Bay Trail Project, the California Department of Boating and Waterways and BCDC.

Cumulative and Secondary Impacts

Program Enhancement Strategies Identified in the Previous Assessment

Fresh Water Inflow. The species composition and geomorphology of the Bay is affected by fresh water inflows, the largest source of which is the Delta. Involvement in Bay-Delta water and planning policies continues, along with interest in gathering new information about the role of fresh water in the Bay and the impacts of global climate change on fresh water supply.

Accomplishments

- Provided briefings and quarterly updates to the Commission on fresh water inflow and related planning and policy initiatives.
- Commented on draft plans and environmental documents related to Bay-Delta water and ecosystem planning efforts.
- Served on the Delta Vision governance work group, which proposed requiring the development of a Delta Plan to promote ecosystem restoration and water supply

reliability. The Delta Reform Act, which became law in 2009, required the development of a Delta Plan and the creation of the Delta Stewardship Council, which is responsible for developing the plan consistent with the federal CZMA of 1972.

Data and Geographic Information Systems. A long-term effort to create a comprehensive information retrieval and management system using a centralized database that is linked to a web-based GIS is underway. The data system will provide staff with a powerful tool to improve information retrieval regarding shoreline development and will enhance decision-making. The data system will also facilitate reporting on NOAA's annual and state-contextual performance measures. To help advance this effort, a major update of the existing web-based GIS decision support tool known as BayRAT (Bay Area Resource and Analysis Tool) was completed.

Accomplishments

- In 2009 a holistic update of BayRAT was completed resulting in a powerful web-based decision support tool that allows users to access a wide array of spatial data, complete various spatial analyses, and develop and publish maps.
- The updated BayRAT was designed for simple and efficient access to agency regulatory information, and is searchable by address and permit number.
- Additional spatial data, including permits, public access, priority use areas (ongoing) and the boundary of the Commission's jurisdiction (ongoing), was incorporated into the system and a rigorous quality control effort undertaken to ensure data accuracy.
- A training manual was developed and a hands-on training was given to increase staff capacity to integrate the tool into decision making processes.
- Applied for a federal Coastal Impact Assessment (CIAP) Grant to develop a new database structure for permit and enforcement (i.e., regulatory) information, using database software that is compatible with GIS.

Other Major Accomplishments

Oil Spill Management and Harbor Safety Improvements

- As Chair of the Harbor Safety Committee of the Bay Region, led the state effort following a collision of the container ship Cosco Busan with the San Francisco-Oakland Bay Bridge to assess and develop guidance to prevent future incidents. Working with the U.S. Coast Guard, other governmental agencies and the maritime industry, responded to a directive from the Governor of California to establish operational and navigational requirements to help avoid major oil spills in state waters. Findings and recommendations of the effort were referenced in the National Transportation Safety Board and U.S. Coast Guard investigation reports on the incident.
- Took a lead role in the development of Best Maritime Practices for safe vessel movement in San Francisco Bay. The U.S. Coast Guard, the State Office of Spill Prevention and Response, and members of the maritime industry have adopted the new guidance.
- In collaboration with the State Office of Spill Prevention and Response, led a multi-agency, multi-industry effort to develop the Potential Places of Refuge database for use by the U.S. Coast Guard Captain of the Port in determining appropriate mooring locations in San Francisco Bay for ships in distress.

Special Area Management Planning

Other Major Accomplishments

New Container Forecast with Seaport Advisory Committee

- Oversaw the first revision in twenty years of the container cargo growth forecast for the Bay Area. Managed the development of econometric and trade projections upon which the regional port land use designations are based.

Update to San Francisco Area Seaport Plan and Amendment of Port Priority Use Designation (approved by OCRM on June 1, 2007).

- The San Francisco Area Seaport Plan and the Bay Plan were amended to relocate 15 acres of port priority use land closer to the Port of Oakland marine terminals.

Amendment of San Francisco Waterfront Special Area Plan (waiting for OCRM approval)

- Amended the San Francisco Waterfront Special Area Plan (SFWSAP) to accommodate a new museum; seismically upgrade deteriorating pier substructure, bulkhead and shed buildings; provide public access and create an outdoor exhibit area highlighting the Bay.
- To realize the benefits of the project while ensuring that public benefits required by the SFWSAP are also implemented, the amendment allowed for a portion of required fill removal to be offset by the same or greater amount of fill removal in another location along the San Francisco waterfront.

Energy and Government Facility Program

Program Enhancement Strategies Identified in the Previous Assessment

Airport Planning. In 2008, the Federal Aviation Administration (FAA) awarded the Bay Area's Regional Airport Study \$565,000 to analyze alternatives for meeting projected air transportation demand in the region without developing new runways. This ongoing project, which is in partnership with the MTC and ABAG, includes an analysis of air traffic control technology, demand management strategies, redistribution of demand among the Bay Area's primary commercial airports, increasing commercial service at other airports in the region and in neighboring counties, and high speed rail. The FAA has called the Bay Area study innovative and it has generated interest around the country as a way to increase air transportation capacity in environments where new or expanded runways are infeasible.

Accomplishments

- Received funds from the FAA, the San Francisco International Airport, Oakland International Airport, San Jose International Airport and the MTC to conduct the Bay Area's Regional Airport Study. The structure of the study, which focuses on mobility and capacity and not on building new or expanding existing runways, has been called innovative and is serving as a national model.
- Conducted the Regional Airport Survey, which polled 2,000 likely Bay Area voters by phone and Internet to determine airport usage, and to gauge support for the potential strategies included in the study as well as support or opposition to building new runways or expanding existing runways.

- Identified stakeholders and helped create a task force to provide policy feedback on direction and findings of the study.
- Identified national experts in air traffic control technology and demand management to create working groups to assist with the technical aspects of the study.

Other Major Accomplishments

Saving the Bay Documentary

- To better acquaint the public with the San Francisco Bay, the Commission partnered with a local public television stations (KQED/KTEH) to produce the “Saving the Bay.” The exceedingly popular four-hour documentary narrated by Robert Redford traces the Bay from its geologic origins following the last Ice Age, through years of catastrophic exploitation, to the restoration efforts of today. The documentary has run on public television stations in the Bay Area and will be released around the country.

Ecosystem Based Management (EBM)

- A NOAA Coastal Management Fellow conducted an evaluation of how ecosystem-based approaches could be more broadly applied to managing the Bay. The two-year effort culminated in a report providing specific recommendations for how the Commission could transitioning to an EBM approach, including a discussion of governance obstacles that would need to be addressed.
- To test the feasibility of using an EBM approach to manage Bay resources, a marine spatial planning (MSP) pilot project was conducted in San Pablo Bay. The project demonstrated the MSP process, illustrated what a comprehensive ecosystem-based zoning effort may entail, and provided example MSP outcomes including alternative zoning scenarios and human use guidelines.

SECTION III ASSESSMENT

The following is an assessment of the extent to which problems and opportunities exist with regards to the enhancement area objectives, and the effectiveness of current efforts to address those problems. The Assessment provides the factual basis for the CMP and OCRM to cooperatively determine priority needs for program improvement.

Wetlands

Objectives

Protect, restore, or enhance the existing coastal wetlands base, or create new coastal wetlands.

Resource Characterization

This section describes the extent to which problems and opportunities exist with regard to the wetlands protection and restoration enhancement objectives.

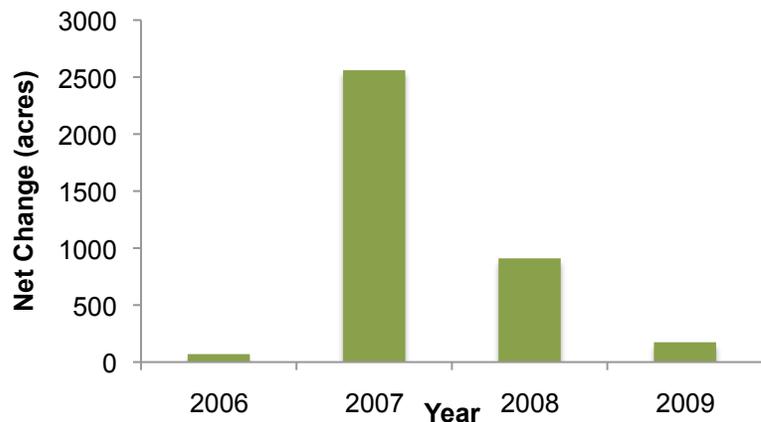
Table 1. Extent, status and trends of wetland habitat types in the coastal zone

Habitat Type ^a		Estimated Historic Extent ^a (acres ca. 1800)	Current Extent (acres ca. 1998) ^a	Direction of Change
Bay (deep, shallow and channel)		99,529	82,410	–
Tidal Baylands	Tidal flat	50,469	29,212	–
	Tidal marsh	189,931	40,191	–
	Lagoon	84	3,620	+
Diked Baylands	Diked wetland ^b	n/a	64,518	+
	Agricultural bayland	n/a	34,620	+
	Salt pond	1,594	34,455	+
Other Baylands		254	1,951	+
Undeveloped Bay fill		12	7,598	+
Developed Bay fill			262,397	+

^a from Goals Project, *Bayland Ecosystem Habitat Goals, 1999*

^b managed or unmanaged diked marsh

Figure 1. Net change in Bay surface area reported as acres created or restored, including salt ponds returned to tidal action, less the area of the Bay authorized to be filled by significant administrative permits and amendments.



Explanation of Extent, Status and Trends. It is estimated that 42% of the Bay's tidal flats and 79% of the tidal marshes were lost during the almost 200 year period between 1800 and the late-1980s¹. The conversion of tidal baylands for farming, salt production and urbanization is reflected as the increase in diked and filled baylands (see Table 1). Even with a considerable slow down in the conversion of tidal baylands in the mid-1900s, by the 1960s more than 40% of Bay had been diked off from tidal action.

The rampant filling and diking of the Bay spurred the creation of the Commission in 1965, and since that time efforts have been ongoing to not only reduce the loss and conversion of tidal baylands, but to increase the size of the Bay through restoration and enhancement. Over the last five years, there has been significant improvement in the amount of restored and enhanced wetlands, in part due to the returning of diked areas to tidal action. For example, in the South Bay² efforts are actively underway to restore 15,100 acres of salt ponds to tidal marsh and other valuable wildlife habitat; and in the North Bay³ efforts are ongoing to restore over 10,000 acres of former salt ponds, remnant slough and tidal marsh.

While the positive trend in protecting, restoring and enhancing Bay wetlands is expected to continue in the near-term, current estimates of climate change induced sea level rise are causing a re-evaluation of how best to move forward over the long-term. Tidal wetlands provide critical habitat for many species, protect the shoreline from flooding and erosive effects of storms, and provide a setting for surrounding communities to connect with the Bay ecosystem. Innovative strategies to improve the resiliency and adaptive capacity of wetlands will likely become increasingly important as accelerated rates of sea level rise threaten to outpace tidal marsh sedimentation rates, leading to marsh erosion and drowning.

Ongoing or Planned Efforts to Develop Monitoring Programs or Quantitative Measures. There are no plans to develop a monitoring program for this enhancement area since many partners working around the Bay, in particular the San Francisco Bay Joint Venture (www.sfbayjv.org) and the San Francisco Estuary Institute (www.sfei.org), are actively tracking wetland protection and restoration efforts.

Efforts to develop quantitative measures to aid in the protection, restoration and enhancement of coastal wetlands are ongoing and planned. Our ability to protect, restore and enhance coastal wetlands will be greatly challenged by climate change, and in particular sea level rise. To that end, BCDC has engaged in a number of collaborative scientific efforts to better understand how wetland processes, including sediment dynamics, wave climate, vegetative productivity and ecological communities, will respond to climate change. The ultimate goal is to identify quantitative measures that will help monitor the resiliency and adaptive capacity of the Bay's critical wetland systems.

¹ See Goals Project, *Bayland Ecosystem Habitat Goals*, 1999

² South Bay Salt Pond project (www.southbayrestoration.org)

³ Napa Sonoma Marsh Restoration project (www.napa-sonoma-marsh.org/index.html) and Sears Point Wetland and Watershed Restoration (www.sonomalandtrust.org)

Table 2. Direct and indirect threats to coastal wetlands, both natural and man-made

Type of Threat	Severity of Impacts ^a	Irreversibility
Erosion	High	High
Sea level rise	High	High
Habitat fragmentation	High	High
Pollution	High	Medium
Nuisance or exotic species	High	Medium
Freshwater input	High	Medium
Development/fill	High ^b	High
Alteration of hydrology	Medium	Medium
Channelization	Medium	Medium

^a the geographic scope of the impacts is region wide except for channelization which is limited to areas under the control of flood control and mosquito abatement districts

^b the severity of development/ fill is due to the impact of existing developments on water quality and the constraint shoreline development places on wetlands capacity to adapt to climate change (e.g., restriction of inland migration)

Table 3. Inventory of coastal habitat type mapping

Habitat Type	Mapped Inventory?	Type of Map
Tidal Marsh	Yes	Paper maps: SF Bay Plan, amended 2006 and 2007 Goals Project, <i>Bayland Ecosystem Habitat Goals</i> , 1999 GIS maps: SF Bay EcoAtlas Information System (www.sfei.org/ecoatlas/index.html)
Beach or dune habitat		
Nearshore (intertidal, subtidal submerged)		

Table 4. Trends in the restoration and protection of coastal habitat using funds from sources other than the Coastal Zone Management Program or the Coastal and Estuarine Land Conservation Program

Contextual Measure	Cumulative Acres for 2004-2010 ^a
Acres of coastal habitat (tidal baylands) restored or enhanced	10,080
Acres of coastal habitat (tidal baylands) protected through acquisition or easement	1,905

^a from the San Francisco Bay Joint Venture's Project Tracking System (www.sfbayjv.org)

Management Characterization

This section describes the effectiveness of management efforts addressing the problems and issues identified for the wetlands protection and restoration enhancement objectives.

Table 5. Wetlands management approaches employed (see Accomplishments section for a description of the effectiveness/outcome of each management change)

Wetlands Management Category	Management Employed	Significant Change Since Last Assessment	Reason ^a / Funding Source
Regulations, policies, and standards	Yes	Revised Managed Wetlands policy	Other / U.S. EPA
Permit compliance	Yes		
Assessment methodologies (health, function, extent)	Yes		
Restoration or enhancement programs	Yes		
Mitigation programs and policies	Yes		
Creation programs and policies	Yes		
Mapping, GIS, data analysis, information tracking systems	Yes	Updated web-based GIS decision support tool	Other / State General Fund
Special Area Management Plans	Yes		
Research and monitoring	Yes	Initiated study of tidal wetland resiliency to climate change Improved restoration monitoring strategy	Other / U.S. EPA Funds Other / State General Fund
Education and outreach	Yes	Held a local government climate change forum	309 Funded
Public infrastructure funding policies	No ^b		
Acquisition programs	No ^b		

^a other is a non-309 or CZM driven change

^b focus of partner agencies and organizations, e.g., the California Coastal Conservancy

Programmatic Plans to Guide Restoration of Specific Habitat Types. While BCDC does not have specific programmatic restoration plans, the Bay Plan and Marsh Plan include findings and policies relevant to habitat restoration, and specific criteria to evaluate the appropriateness of restoration projects are used by the Commission to approve, deny or condition permits.

Table 6. BCDC programmatic coastal habitats restoration plans

Habitat type	BCDC restoration plan	Date completed or substantially updated
Tidal Wetlands	No	
Beach and Dune	No	
Nearshore	No	

Other agencies and organizations have or are in process of developing restoration guidance, for example the Bayland Ecosystem Habitat Goals, published in 1999, identified restoration goals for specific Bay habitat types. Currently, BCDC is engaged in preliminary discussions with the State Coastal Conservancy and area scientists to initiate an update to the Goals Project to incorporate projected sea level rise impacts due to climate change. One important part of this effort will be to identify priority conservation and restoration areas where wetlands can be allowed to migrate inland as sea level rises. Additionally, BCDC is an active participant in the currently underway Subtidal Goals Project which is developing guidance for subtidal habitats; the California Coastal Conservancy and the Bay Institute published guidance for tidal wetland restoration in 2004 (Design Guidelines for Tidal Wetland Restoration in San Francisco Bay), and; the U.S. Fish and Wildlife Service released a draft California Tidal Marsh Recovery Plan in 2010.

Priority Needs and Information Gaps

Table 7. Major needs and gaps in wetlands protection, restoration and enhancement

Description of Need or Information Gap	Type	Level of Priority
Understanding of wetland resiliency to climate change impacts (e.g., sea level, salinity and temperature) based on a understanding of current bathymetry, topography, sediment budgets, substrate types, vegetative community, hydrology, wave environment and biological species composition	Data, capacity	High
Understanding of tidal wetland existing and historic sediment budgets, transport processes and sources; understanding how sediment processes responded to past climatic perturbations and how they will likely respond in the future	Data, capacity	High
Understanding how wetland ecosystems will respond to climate change (e.g., salinity, temperature and sea level rise), including changes in species interactions, sensitivity to invasive species, and shifts in species composition	Data, capacity	High
Role of tidal wetlands in future climate change adaptation strategies, including how to protect or improve wetland ecosystem services such as protecting shoreline communities from flooding and erosion	Policy, data	High
Methods to identify the most viable, high priority wetlands and adjacent upland transition zones that will be critical to the region's climate change strategy	Data, capacity	High
Increased Commission authority to address wetlands' climate change resiliency and adaptive capacity, including the protection of adjacent upland transition zones that will provide opportunity for the future inland migration of wetlands	Regulatory, policy, data	High
Consideration of whether Special Area Plans for specific shoreline areas would be useful tools to plan for the protection, restoration and enhancement of wetland systems in face of climate change impacts including sea level rise	Regulatory, policy, communication & outreach	High
Revised applicable findings, policies and map designations in the Bay Plan pertaining to subtidal areas based on information and recommendations of the Subtidal Habitat Goals final report	Regulatory, policy, capacity	High
Updated Baylands Ecosystems Habitat Goals Project based on best available science and new knowledge, including outcomes of the Subtidal Habitat Goals final report; revised applicable findings, policies and map designations in the Bay Plan as necessary	Regulatory, policy data, capacity	High
An integrated data retrieval and management system that includes information on voluntary and permitted wetland protection, restoration and enhancement efforts to help track required monitoring and allow for adaptive management	Capacity, training	Medium
Coordination and communication with other estuarine managers to improve information and capacity sharing as it relates to state-wide and regional habitat conservation efforts	Capacity, communication & outreach	Medium
Limited authority in the regulated 100-foot shoreline band to protect, enhance or restore wetlands, e.g., impacts of fill on threatened or endangered species upland refugia	Regulatory, policy	Medium

Enhancement Area Prioritization

The wetland enhancement area has a **HIGH** priority level for coastal zone funding. The HIGH priority level was given to this enhancement area because the protection, restoration and enhancement of wetlands is critical to preserving the social, economic and ecological functions of the Bay, including our ability to respond to climate change. Depending on resiliency and adaptive capacity, climate change is likely to impact a number of critical wetlands functions, including flood protection, water quality renovation (pollutant reduction), carbon sequestration, and the prevention of shoreline erosion through wave energy attenuation.

Two specific strategies have been developed to address the major needs and information gaps necessary to improve this enhancement area; however, the Coastal Hazards strategy for climate change will also address issues regarding wetlands.

Coastal Hazards

Objectives

Prevent or significantly reduce threats to life and property by eliminating development and redevelopment in high-hazard areas, managing development in other hazard areas, and anticipating and managing the effects of potential sea level rise.

Resource Characterization

This section describes the extent to which problems and opportunities exist with regard to the coastal hazards enhancement objectives.

Table 8. Risks⁴ from coastal hazards

Type of Hazard	General Level of Risk ^a	Basis of Risk or Source of Information
Flooding	High	FEMA, CalEMA, CA Energy Commission
Earthquakes	High	USGS, CA Geological Survey
Sea level rise and other climate change impacts	High	BCDC, CA Energy Commission
Coastal storms, including associated storm surge	High	NOAA
Land subsidence	Medium	USGS, CA Department of Water Resources, CA Department of Mines and Geology
Shoreline erosion	Medium	Peer-reviewed scientific literature, USGS
Tsunamis / seiche	Medium	NOAA

^a the geographic scope of coastal growth and development is region wide

Changes in Risk Since the Last Assessment. In general there has been little change in the level of coastal hazard risks since the last assessment. Our understanding of risks from sea level rise and other climate change impacts has been steadily increasing with more focused scientific study and increasing public and private sector interest. Also of note is that the risk of land subsidence has diminished from high to medium with a reduction in two common anthropogenic causes of subsidence: placement of heavy fill on Bay mud and extensive groundwater pumping. Areas that are subsiding are at a higher risk of inundation from sea level rise, and subsidence is continuing in many areas due to vertical motion along fault lines;

⁴ Risk as “the estimated impact that a hazard would have on people, services, facilities and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage.” *Understanding Your Risks: Identifying Hazards and Estimating Losses*. FEMA 386-2. August 2001.

decomposition of organic material particularly in managed wetlands and agricultural diked baylands that dry seasonally; and in tidal flats and marshes due to natural soil compaction.

Quantitative Risk Measures⁵ for High Risk Hazards. Quantitative risk measures have been developed by others for a number of high risk hazards, in particular geologic and flooding hazards. Hazards related to sea level rise and other climate change impacts have not yet been well quantified. Uncertainty and the lack of a complete understanding of the timing and extent of climate change impacts have made it difficult to develop reliable quantitative risk measures. Quantitative risk measures for climate change related impacts, such as sea level rise, will be critical to the development and evaluation of climate change adaptation strategies; therefore, efforts are currently planned to evaluate the means and methods of developing climate change risk assessments and quantitative risk measures.

Table 9. Inventory of coastal hazards mapped

Type of hazard	Mapped Inventory	Number of Communities	Date Completed or Substantially Updated
Flooding	Yes ^a	9 counties, 101 cities in region, 46 along the shoreline	2010
Earthquakes	Yes ^a		2010
Sea level rise and other climate change impacts	Yes	46 shoreline cities in the 9 county region	2008
Land subsidence	Yes ^b	Unknown	Various
Shoreline erosion (episodic / chronic)	Yes ^c	Unknown	Various
Coastal storms, including storm surge	Yes ^d	Unknown	Various
Tsunamis / seiche	Yes ^a	9 counties, 101 cities in region, 46 along the shoreline	2010
Landslides	Yes ^a		2010

^a mapping available from the Association of Bay Area Governments (ABAG) Local Hazard Mitigation Planning Program on-line at quake.abag.ca.gov/mitigation

^b limited mapping conducted by others including the Santa Clara Valley Water District, San Francisco Public Utility Control, and the Suisun Research Conservation District

^c limited mapping of shoreline erosion has been conducted by others including the USGS

^d limited mapping conducted by others including the Santa Clara Valley Water District, San Francisco Public Utility Commission, and the Alameda County Flood Control and Water District

Planned Actions to Create a Mapped Inventory of Applicable Coastal Hazards. In 2006, BCDC launched a public outreach campaign with maps depicting areas likely to be impacted by a one-meter sea level rise. In 2008, with funding from the California Energy Commission, maps demonstrating two sea level rise scenarios, 16 inches (predicted mid-century rise) and 55 inches (predicted end of century rise), were completed using topographic and hydrodynamic modeling data generated by the U.S. Geologic Survey. These maps, which depict the low-lying areas that are likely to be inundated due to sea level rise, are general planning maps that do not account for the presence or condition of existing shoreline protection, or for expected increases in storm related flood events (i.e., tsunamis) and wave activity. Efforts are underway to collect the data necessary to perform additional analysis and mapping that will help clarify potential climate change impacts on the Bay's social, economic and ecological systems.

⁵ Quantitative Risk Measure as defined by the mathematical function of the probability of an event and the consequences of that event.

Management Characterization

This section describes the effectiveness of management efforts addressing the problems and issues identified for the coastal hazards enhancement objectives.

Table 10. Coastal hazard management categories employed (see Accomplishments section for a description of the effectiveness/outcome of each management change)

Coastal Hazard Management Category	Management Employed	Significant Change Since Last Assessment	Reason ^a / Funding Source
Regulations, policies, and standards	Yes		
Permit compliance	Yes		
Building setbacks/restrictions ^b	Yes		
Repair/rebuilding restrictions	Yes		
Restriction of hard shoreline protection	Yes		
Promotion of alternative shoreline stabilization	Yes		
Renovation of shoreline protection structures	Yes		
Beach/dune protection (other than setbacks)	Yes		
Sediment management plans	Yes		
Climate change planning and adaptation strategies	Yes	Development of Bay Plan Climate Change policy amendments	Other / State General Fund
Hazards research and monitoring	Yes	Staff background report on climate change ^d	2006 A&S / 309 Funds
Hazards education and outreach	Yes	Development of climate change adaptation planning process and curriculum for local coastal managers	Other / State General Fund
Methodologies for determining setbacks	No		
Restrictions on publicly funded infrastructure	No		
Repetitive flood loss policies	No ^c		
Local hazards mitigation planning	No ^c		
Local post-disaster redevelopment plans	No ^c		
Real estate sales disclosure requirements	No ^c		
Special Area Management Plans	No ^c		

^a other is a non-309 or CZM driven change

^b building setback restrictions apply only if project requires Bay fill

^c these management categories are the focus of partner agencies and organizations

^d *Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on the Shoreline*, BCDC, 2009

Table 11. Communities in the Coastal Zone That Use Setbacks, Buffers or Land Use Policies to Direct Development Away from Areas Vulnerable to Coastal Hazards⁶

	Number
Communities required to develop and implement land use policies approved by the state through local comprehensive management plans to direct development away from hazardous areas	0
Communities that have approved state comprehensive management plans that contain land use policies to direct development away from hazardous areas	0

⁶ State law does not explicitly require setbacks or buffers to direct development away from hazardous areas within the San Francisco Bay segment of the California Coastal Zone. However, all the Bay Area communities have policies regarding development in flood zones.

Priority Needs and Information Gaps

Table 12. Major needs and gaps in addressing the coastal hazard enhancement area objectives

Description of Need or Information Gap	Type	Level of Priority
Findings and policies in Bay Plan and Marsh Plan that reflects our current understanding and knowledge of climate change	Policy	High
Limited authority to address climate change under current regulatory framework means that legislation is needed to empower, fund, and direct BCDC to prepare a sea level rise adaptation strategy for the Bay and Suisun Marsh	Regulatory, policy, data, communication & outreach	High
Detailed understanding of the adaptation strategies that will be most appropriate to reduce vulnerability and improve resiliency of Bay resources to climate change	Data, communication & outreach	High
Robust planning framework and tools to guide the development and implementation of multi-sector, multi-system climate change adaptation plans that consider the Bay's diverse natural, physical and built shoreline environments	Data, training, communication & outreach	High
Understanding of how social, governmental and legal systems are vulnerable to climate change in order to inform changes to social and policy systems needed to improve adaptation of human systems, the Bay and shoreline	Data, capacity, training, communication & outreach	High
Capacity to develop and implement plans that include multi-sector, multi-system strategies for climate change adaptation	Training, capacity	High
Capacity to develop and implement adaptive management processes that can be applied to climate change adaptation planning	Training, capacity	High
Data and decision-support tools, including geospatial tools, to assist with the development of climate change adaptation plans	Data, training, capacity	High
Monitoring to ensure permitted activities are constructed and maintained in a manner consistent with approved permit conditions intended to reduce the risk of coastal hazards	Capacity	Medium

Enhancement Area Prioritization

The coastal hazards enhancement area has a HIGH priority level for coastal zone funding. The HIGH priority level was given to this enhancement area because climate change will have a significant impact on the Bay's social, economic and ecological systems⁷. Climate change impacts such as warmer water temperatures, increased salinities, and inundation of low lying areas including tidal marshes due to sea level rise will have widespread impacts on the region. Climate change has the potential to disrupt the Bay Area's economy and will pose a significant threat to the Bay's ecology, including the potential recovery or protection of threatened and endangered species.

One comprehensive strategy has been proposed to address the major needs and information gaps necessary to improve this enhancement area.

⁷ A discussion of climate change impacts and vulnerabilities is included in the BCDC Draft Staff Report *Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on the Shoreline*, April 2009.

Public Access

Objectives

Attain increased opportunities for public access, taking into account current and future needs for coastal areas of recreational, historical, aesthetic, ecological, or cultural value.

Resource Characterization

This section describes the extent to which problems and opportunities exist with regard to the public access enhancement objectives.

Table 12. Threats and conflicts to creating and maintaining public access in the coastal zone

Type	Degree	Characterization of Impact on Public Access	Types of Access Affected
THREATS			
Natural disasters	High	The risk of seismic activity remains high	All
Sea level rise	High	14% of the region's waterfront parks and beach areas, and 57% of required shoreline public access are vulnerable to inundation from a 16 inch rise in sea level; 18% of parks and beaches and 87% of public access sites are vulnerable to inundation from a 55 inch rise in sea level ^a	Shoreline park, shoreline trail, boat ramps and launches
Lack of resources for maintenance/upkeep	High	Poorly maintained public access is becoming a greater threat as infrastructure ages and resources to improve or repair them are limited due to the economy	All
Erosion	Medium	The threat of erosion is site specific rather than region wide, with a trend towards more erosion in the North Central Bay than in other locations around the Bay	Shoreline park, shoreline trail, boat ramps and launches
Residential development	Low	The threat has been reduced by BCDC's authority to require permanent public access for developments that require Bay fill or are within the 100-foot shoreline band	Shoreline park or trail
Non-water dependent commercial or industrial waterfront uses	Low	The threat has been reduced by BCDC's designated priority use areas for water dependant use of the waterfront that limit non-water dependent uses	All
National security	High	Port and waterfront security has increased, often in conflict with shoreline public access	All
Ecological resources	Medium	Public access can conflict with ecological resources if it causes wildlife disturbance or habitat fragmentation; increased shoreline recreation could intensify the conflict	All
Small boat users	Medium	Conflicts that occur between motorized and non-motorized small boaters will increase as the SF Bay Water Trail is more fully developed and implemented	Public boat ramp, kayak/canoe launch
Encroachment on public lands	Medium	Encroachment typically causes minor conflicts with navigation or public access to the shoreline or public trust lands, e.g., non-permitted anchor-outs, and are not expected to increase in the region	All

^afrom *Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on the Shoreline*, April 2009

New or Emerging Issues That Will Affect Public Access. Climate change is one of the most critical emerging issues that will affect coastal public access. Rising sea levels, coastal flooding and an increase in waves and storm surge raise the potential that much of the current public access to Bay resources will be unusable for all or part of the year. Additionally, the need and desire to protect public infrastructure such as flood control structures and the transportation network from climate change impacts will be a strong driver in how the region adapts to a rising Bay. Balancing the protection of critical public infrastructure with the need to retain waterfront parks, beaches and coastal public access will pose a significant challenge.

Planned Actions to Collect Contextual Measure Information on Public Access. Information is not currently available to respond to the contextual measure survey question “is public access to the coast for recreation adequate or better,” nor do limited resources allow us to prepare, distribute and collate answers to such as survey. To provide a response to this contextual measure in the future we propose to communicate with partner agencies such as the National Park Service, State Parks, East Bay Regional Parks, Bay Open Space Council and State Coastal Conservancy to determine whether surveys of public access preferences are planning in the next five years. If a survey will be conducted, efforts will be made to assist the lead agency to ensure the contextual measure question is included, that the survey is available region wide, and that the number of responses provides some reasonable confidence in the results.

Demand for Coastal Public Access. BCDC currently has no formal process to periodically assess the public’s demand for coastal access, and limited resources preclude the development of such a process. In 2006, staff prepared a background study report to support proposed Bay Plan recreation policy revisions. The study report states that population growth is the most important driver of recreational demand, including shoreline oriented recreation. Since the Bay Area’s population is predicted to continue growing, the need for coastal public access is expected to continue increasing as well.

Table 13. Public access availability

Types of Public Access	Current Numbers (approximate)	Changes Since Last Assessment	Source of Data
Number of acres in the coastal zone available for public access			
Total acres in the coastal zone ^a	300,000 ^a		BCDC data
Acres available for public access	25,000 ^b	+18 acres ^c	<i>Recreation and San Francisco Bay</i> , BCDC Staff Report, 2006
Miles of shoreline available for public access			
Total miles of shoreline	1,000 miles ^c		BCDC data
Miles available for public access	300 miles ^d	+17 miles ^d	BCDC data
Number and acres of State/County/Local parks	650,000 acres in the nine-county Bay Area, 25,000 acres are waterfront park	Increase in acres of waterfront parks	<i>Recreation and San Francisco Bay</i> , BCDC Staff Report, 2006
Number of public beach or shoreline public access sites	700	+	<i>Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on the Shoreline</i> , 2009
Number of recreational boat (power or non-power) access sites	28,000 berths and moorings, 175 launches	unknown	<i>Recreation and San Francisco Bay</i> , BCDC Staff Report, 2006
Number of designated scenic vistas or overlook points	20	unknown	Bay Plan maps
Number of fishing access points (i.e. piers, jetties)	75		<i>Recreation and San Francisco Bay</i> , BCDC Staff Report, 2006
Number and miles of coastal trails/boardwalks	300 miles of SF Bay Trail (planned to be 500 miles)		San Francisco Bay Trail Project
Percent of access sites that are ADA compliant	unknown ^e		
Percent and total miles of public beaches with water quality monitoring and public closure notice programs	Weekly (April-Oct) for bay beaches with over 50,000 visitors annually, or where an adjacent storm drain flows in the summer	Improvement in beach testing with 2004 Healthy Beaches state law (AB 1876)	www.savesfbay.org/healthy-bay-beaches
Average number of beach mile days closed due to water quality ^f	45	59% reduction	State Water Control Board

^a approximate measurement of bay plus 100 foot shoreline band

^b on public and private land, excludes waterfront parks

^c estimated from the National Hydrography Database (NHD) coastline category

^d current number based on SF Bay Trail length, change between 2006 to 2009 based on regulatory permit requirements, source BCDC Annual Reports

^e the Bay Plan currently requires all public access to be barrier free

^f data for San Francisco, Marin, Napa, Sonoma, Contra Costa and Alameda Counties (including East Bay Regional Parks) from the State Water Resource Control Board *Beach Watch* program (beachwatch.waterboards.ca.gov/BeachWatch/cla_common/cla_login_bg.jsp)

Management Characterization

This section describes the effectiveness of management efforts to address the problems and issues identified for the public access enhancement objective.

Table 14. Public access management categories employed (see Accomplishments section for a description of the effectiveness/outcome of each management change)

Management Category	Management Employed	Significant Changes Since Last Assessment	Reason ^a / Funding Source
Statutory, regulatory, or legal system changes that affect public access	Yes	Recreation policy revision	Other / State General Fund
Comprehensive access management planning	Yes	Updated web-based GIS decision support tool SF Bay Water Trail	Other / State General Fund Other / NOAA CSC and State General Fund
Operation and maintenance programs	Yes		
Alternative funding sources or techniques	Yes		
Public access within waterfront redevelopment programs	Yes		
Public access education and outreach	Yes	New/updated Shoreline Landscape Guide	Other / State General Fund
Acquisition programs or policies	No ^b		
Beach water quality monitoring / pollution source identification and remediation	No ^b		

^a other is a non-309 or CZM driven change

^b focus of partner agencies and organizations, e.g., California Coastal Conservancy, California Coastal Commission, Save the Bay *Clean Bay Project* and Surf Rider Foundation SF Chapter beach cleanups

Guide to Public Access. The *Bay Shoreline Access webGuide* (baytrail.abag.ca.gov) is a publically available interactive map of shoreline recreational opportunities. The webGuide, developed by BCDC and the Association of Bay Area Governments (ABAG), is managed by the San Francisco Bay Trail Project. Other web-based public access resources are available from partners including East Bay Regional Parks, State Parks, State Coastal Conservancy, Golden Gate National Recreation Area, and the Bay Area Open Space Council.

Priority Needs and Information Gaps

Table 15. Major needs and gaps in addressing the public access enhancement area objectives

Description of Need or Information Gap	Type	Level of Priority
Understanding climate change impacts, including sea level rise, on coastal public access function, quality and continuity	Data, capacity	High
Information on measures to increase ADA compliance and accessibility to shoreline public access and the SF Bay Water Trail including best design practices for ADA accessibility	Data, capacity, policy	High
Understanding and methods to avoid or mitigate potential adverse impacts of recreation on wildlife	Data, communication & outreach	High
Understanding and methods to manage potential navigational, wildlife and security conflicts on the SF Bay Water Trail	Policy, data, communication & outreach	High
Assessment of the long-term viability of existing public access in light of changing political, economic, and environmental systems	Data, capacity	High
Monitoring to ensure required public access is constructed and maintained in a manner consistent with approved permit conditions	Capacity	High

Enhancement Area Prioritization

The public access enhancement area has a HIGH priority level for coastal zone funding. The HIGH priority level was given to this enhancement area due to the continued and growing need from a diverse public for coastal recreation, the uncertainty in the extent and timing of climate change impacts on public access, and the inherent conflict between protecting both coastal infrastructure and public access from the adverse impacts of climate change.

One specific strategy has been developed to address the major needs and information gaps necessary to improve this enhancement area; however, the Coastal Hazards strategy for climate change will also address issues regarding public access.

Marine Debris

Objectives

Reducing marine debris entering the nation's coastal and ocean environment by managing uses and activities that contribute to the entry of such debris.

Resource Characterization

This section describes the extent to which problems and opportunities exist with regards to the marine debris enhancement objectives.

Table 16. Impact and significance of marine debris⁸

Source of Marine Debris	Significance	Type of Impact	Significant Changes Since Last Assessment
Unauthorized live-aboard vessels and houseboats	High	Aesthetic, resource damage, water quality, user conflicts, navigational hazard	No
Derelict, abandoned or sunken vessels	High	Aesthetic, resource damage, user conflicts, navigational hazard	No
Derelict pile-supported structures	Medium	Aesthetic, user conflicts, navigational hazard	No
Trash from local watersheds	Medium	Aesthetic, resource damage, water quality, user conflicts, navigational hazard	Yes ^a

^a regulations in the Municipal Regional Stormwater Permit requires cities to reduce trash discharged to the Bay

Significant Changes in Sources and Emerging Issues. With continued poor economic conditions, both regionally and statewide, it is possible that the number of derelict vessels, unauthorized live-aboard vessels and houseboats, and derelict pile-supported structures will increase in the future. Additionally, as local and state government budgets continue to tighten, there may be a decrease in maintenance practices (e.g., storm drain cleanouts, street sweeping, and upkeep of parks and public areas) that currently reduce the land-based debris sources, which BCDC has very limited jurisdiction over.

⁸ BCDC has a limited marine debris program, however marine debris reduction programs of partner agencies including State and Regional Water Quality Control Boards, EPA and USACE specifically as they relate to improving and maintaining water quality at a level that protects the beneficial uses of the Bay are actively supported.

Management Characterization

This section describes the effectiveness of management efforts to address problems and issues identified for the marine debris enhancement objective.

Table 17. Marine debris management categories employed

Management Category	Management Employed	Significant Changes Since Last Assessment	Reason ^a / Funding Source
Regulations, policies, and standards	Yes		
Permit compliance	Yes		
Marine debris concerns in harbor, port, marine, & waste management plans	Yes		
Derelict vessel removal programs or policies	Yes	2009 Voluntary Vessel Turn-in state law (AB 166)	Other / State funds
Littering reduction programs	Yes		
Marine debris education & outreach	Yes ^b		
Recycling requirements	No ^c		
Wasteful packaging reduction programs	No ^c		
Fishing gear management programs	No ^c		
Post-storm related debris programs or policies	No ^c		
Research and monitoring	No ^c		

^a other is a non-309 or CZM driven change

^b required as a permit condition for waterfront-oriented uses such as marinas

^c these management categories are the focus of partner agencies and organizations

Priority Needs and Information Gaps

Table 18. Major needs and gaps in addressing the marine debris enhancement area objectives

Description of Need or Information Gap	Type	Level of Priority
Resources to support the enforcement of derelict vessels, derelict pile-supported structures, and unauthorized live-aboard vessels removal	Funding, capacity	High
Capacity to continue working with the U.S. Coast Guard sponsored Abandoned Vessel Task Force to improve derelict vessel enforcement and coordination of federal, state and local partners	Capacity	High
Improved understanding of the location, condition and ownership of derelict vessels and pile-supported structures, and unauthorized live-aboard vessels	Data, capacity	Medium

Enhancement Area Prioritization

The marine debris enhancement area has a MEDIUM priority level for coastal zone funding. The MEDIUM priority level was given to this enhancement area because BCDC has limited authority over marine debris; however, the issues regarding derelict vessels, derelict pile-supported structures and non-authorized live-aboard vessel have and will continue to present a significant threat to Bay resources including water quality, aesthetics and navigational safety.

One strategy has been developed to address the major needs and information gaps necessary to improve this enhancement area.

Cumulative And Secondary Impacts

Enhancement Objectives

Development and adoption of procedures to assess, consider, and control cumulative and secondary impacts (CSI) of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources.

Resource Characterization

This section describes the extent to which problems and opportunities exist with regards to the CSI enhancement objectives.

Table 19. Areas where rapid growth or land use changes require improved CSI management

Type of Growth or Land Use Change ^a	Rate of Growth/Change	Types of CSI
Increased maritime traffic, e.g., commercial, recreational (including cruise ships) and transportation uses	High	Loss of subtidal habitat due to dredging ports and channels; shoreline erosion from increased wake energy; conflicts with public access; wildlife disturbance; habitat fragmentation; introduction of invasive species
Conversion of former military bases to mixed use development	High	Permanent loss of coastal resources; loss of subtidal habitat due to dredging/disposal; wildlife disturbance; habitat fragmentation; shoreline erosion from increased vessel wakes; disturbance from required soil and water contaminant remediation
Shoreline development in low lying areas	Moderate	Permanent loss of coastal resources; reduced capacity to adapt to climate change impacts (e.g., sea level rise); conflicts with public access; wildlife disturbance; habitat fragmentation; introduction of invasive species
Diversion of fresh water for agricultural and urban land uses	Moderate	Reduced fresh water inflow to Bay may cause increased salinity; changes in species composition; increased vulnerability of sensitive species to climate change impacts; impingement and entrainment of aquatic species
Replacement or rehabilitation of aging public infrastructure, e.g. wastewater, stormwater, transportation and flood control structures	Moderate	Loss of coastal resources; reduced capacity to adapt to climate change impacts (e.g., sea level rise); conflicts with public access; wildlife disturbance

^a the geographic scope of coastal growth and development is region wide

Table 20. Sensitive resources that require protection from CSI

Sensitive resources	CSI threats description	Level of threat
Tidal and subtidal habitats	Direct disturbance due to dredging or fill; direct or indirect impacts on sediment sources and transport; development or shoreline protection with future capacity to adapt to climate change (e.g., inland migration as sea level rises)	High
Critical habitat for threatened and endangered wetland species, e.g., Clapper rail, salt marsh harvest mouse, salt marsh song sparrow, soft bird's-beak	Fragmentation or habitat loss of upland-wetland transitional zone, high marsh, or continuous marsh/mud interface; vulnerability of critical habitat to sea level rise; low resiliency of species subjected to a suite of stressors	High
Critical habitat for threatened and endangered aquatic species, e.g., Delta smelt, Longfin smelt, Green sturgeon, Pacific salmonids	Fragmentation or loss of habitat; loss of connection between tidal and subtidal habitats; vulnerability of critical habitat to sea level rise; limited resiliency of species already subject to a suite of stressors	High
Shoreline recreation areas	Reduced capacity to adapt to climate change (e.g., sea level rise) due to conflicts with new/existing development and shoreline protection structures	High
Coastal infrastructure	Replacement/rehabilitation of aging infrastructure may result in loss of shoreline access (visual and physical); reduced capacity to adapt to climate change impacts (e.g., sea level rise); impacts to air quality	High
Low-income shoreline communities ^a	Communities already subject to a suite of stressors (economic, environmental, social, cultural, etc) are less resilient to climate change impacts because of increased vulnerability and limited adaptive capacity	High

^a area where 30% or more households earn less than 200% of the national poverty threshold

Management Characterization

This section describes the effectiveness of management efforts to address problems and issues identified for the CSI enhancement objectives.

Table 21. CSI management categories employed (see Accomplishments section for a description of the effectiveness/outcome of each management change)

Management Category	Management Employed	Significant Changes Since Last Assessment	Reason ^a / Funding Source
Regulations, policies, and standards	Yes		
Permit compliance	Yes		
Guidance	Yes	Oil spill management and harbor safety program improvements and plan updates	Other / OSPR
Research, assessment, monitoring	Yes		
Mapping, GIS, data analysis, information tracking systems	Yes	Updated web-based GIS decision support tool	Other / State General Funds
Regional partnerships	Yes	Joined the regional Joint Policy Committee in 2007, and became a voting member in 2009	Other / State General Funds
Education and outreach	Yes	Local Government Assistance Program activities	Other / State General Funds
Management plans	Yes ^b		

^a other is a non-309 or CZM driven change

^b the Commission works with federal, state and local partners in the Long Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region (LTMS) to manage dredging and disposal

Priority Needs and Information Gaps

Table 22. Major needs and gaps in addressing the CSI enhancement area objectives

Description of Need or Information Gap	Type	Level of Priority
Tools to better evaluate and address cumulative impacts of permitted activities including Bay fill, shoreline public access, shoreline protection, and dredging/disposal	Policy, data, training capacity	High
Regional sediment management policies and practices based on a scientifically supported understanding of Bay sediment transport systems and budgets	Policy, data, capacity	High
A clear understanding of how climate change will affect Bay systems, and an integrated regional strategy to address the potentially complicated suite of impacts	Policy, data, capacity, communication & outreach	High
New information on water surface area and volume including a recognition of impacts of climate change and tidal wetland restoration efforts incorporated into Bay Plan findings, policies and guidance	Policy, data	High
Develop and implement a comprehensive information management and retrieval system to input, store manage and access permit data and other historical information	Training, capacity	High
Updated findings and policies to support the Subtidal Habitat Goals Project's comprehensive and long-term vision for research, restoration and management of subtidal habitats based on information and recommendations of the final Subtidal Goals report	Policy, data	High
Updated Baylands Ecosystems Habitat Goals Project with best available science and new knowledge, including outcomes of the Subtidal Habitat Goals final report, and revised applicable findings, policies and map designations in the Bay Plan as necessary	Regulatory, policy data, capacity	High
Improved understanding of the role of fresh water inflow on Bay systems, and the effective strategies to monitor and manage changes in fresh water inflow due to land use and climate changes	Policy, data	High
Use of an ecosystem-based management approach to integrate ecological, social and economic goals (rather than species-specific or single sector goals) to better understand and manage CSIs as they relate to Marine Protected Areas, marine spatial planning, integration of watershed planning, and climate change impacts	Policy, data, training, capacity	High
Strong regional collaboration and improved interaction among agencies to address the challenges of CSI including the impacts of climate change	Capacity, communication & outreach	Medium
Understanding of CSI from increased marine traffic, and best methods to balance the need to increased traffic with the protection of sensitive Bay resources	Policy, data, capacity	Medium
Understanding of CSI on sensitive species and critical habitats due to land use and climate changes, e.g., wildlife disturbance, increased pressure from invasive species, shifts in species and habitat composition	Data, capacity, communication & outreach	Medium

Enhancement Area Prioritization

The CSI enhancement area has a HIGH priority level for coastal zone funding. The HIGH priority level was given to this enhancement area because CSIs can affect the conservation or development of any significant resource, and are critical to the management of a complex resource such as the Bay. Additionally, there is a significant potential for both direct and unintended CSIs on Bay systems as strategies to respond to climate change emerge. The resiliency of various systems and sectors to climate change impacts will depend in part on their exposure to existing stressors. Sensitive resources that are already subject to a wide range of stresses will have to be carefully evaluated and managed to protect them from detrimental climate change related impacts.

Seven strategies have been developed to address the major needs and information gaps necessary to improve this enhancement area. Additionally, the Coastal Hazards strategy for climate change will also address issues regarding Cumulative and Secondary Impacts.

Special Area Management Planning

Objectives

Prepare and implement special area management plans⁹ for important coastal areas.

Resource Characterization

This section describes the extent to which problems and opportunities exist with regards to the special area management planning enhancement objectives.

Table 23. Areas subject to use conflicts that can be addressed through special area management plans (SAMPs)

Major Conflicts ^a	Type
Multi-sector adaptation response to climate change, including sea level rise	Emerging
Developments in low lying areas that lack integrated shoreline protection strategies	Long-standing

^a the geographic scope of coastal growth and development is region wide

Management Characterization

Effectiveness of management efforts to address problems and issues identified for the special area management planning enhancement objectives. BCDC's special area management planning efforts result in Special Area Plans (SAPs). Currently, BCDC has SAPs for six specific areas (Benicia, Richardson's Bay, South Richmond Shoreline, White Slough, San Francisco Waterfront, and the Suisun Marsh) and one for a specific sector (the Seaport Plan).

⁹ The Coastal Zone Management Act (CZMA) defines a Special Area Management Plan (SAMP) as "a comprehensive plan providing for natural resource protection and reasonable coastal-dependent economic growth containing a detailed and comprehensive statement of policies; standards and criteria to guide public and private uses of lands and waters; and mechanisms for timely implementation in specific geographic areas within the coastal zone. In addition, SAMPs provide for increased specificity in protecting natural resources, reasonable coastal-dependent economic growth, improved protection of life and property in hazardous areas, including those areas likely to be affected by land subsidence, sea level rise, or fluctuating water levels of the Great Lakes, and improved predictability in governmental decision making."

Table 24. Special Area Plans under development, completed or revised since last assessment (see Accomplishments section for a description of the effectiveness/outcome of each management change)

Special Area Plan	Status	Date Approved or Revised	Significant Changes Since Last Assessment	Reason ^a / Funding Source
Seaport Plan	Revised	June 1, 2007	Incorporated new container forecast information	
Suisun Marsh Plan	Revised	April 18, 2008	Updated and expanded managed wetlands findings and policies, improved consistency with Bay Plan	
San Francisco Waterfront	Revised	Waiting for approval	Allowed a portion of required fill removal to be offset by fill removal in another location to accommodate a new children's museum	Other / Exploratorium Museum and Port of San Francisco

^a other is a non-309 or CZM driven change

Priority Needs and Information Gaps

Table 25. Major needs and gaps in addressing the SAMP enhancement area objectives

Description of Need or Information Gap	Type	Level of Priority
Public input on a variety of issues currently impacting the land managed by the Port of San Francisco and regulated by the policies of the San Francisco Waterfront Special Area Plan (e.g., fill removal, public access, public plazas, changes in land use, deterioration of historic resources and Port facilities, preservation of historic resources and sea level rise)	Regulatory, policy, data	High
Evaluation of Special Area Plans as an appropriate tool for future climate change adaptation planning and governance, incorporation of flexible policy and adaptive management approaches	Regulatory, policy, data, communication & outreach	High
Updated Suisun Marsh Plan and the Local Protection Program to incorporate current best management practices for plant, fish and wildlife conservation, to reflect changes in local land use plans and policies, and to consider climate change impacts	Regulatory, policy, data, capacity, communication & outreach	High
Updated Seaport Plan to include ongoing changes in the marine cargo shipping industry and incorporate consideration for climate change impacts including sea level rise	Regulatory, policy, data, capacity	Medium
Improved coordination with Air Quality Management District to incorporate findings and policies into the Seaport Plan that support regional air quality goals	Regulatory, policy, data, capacity	Medium
Revised existing Special Area Plans to improve consistency with Bay Plan in regards to minor amendments and revisions	Regulatory, policy, capacity	Medium

Enhancement Area Prioritization

The special area management planning enhancement area has a MEDIUM priority level for coastal zone funding. The MEDIUM priority level was given to this enhancement area because many of the resource planning and protection issues in the Bay Area are occurring at a region wide scale. Planning for climate change adaptation may be more appropriate at a sub-regional scale, and therefore the special area management planning enhancement area could be of greater importance in the near future.

One strategy has been developed to address the major needs and information gaps necessary to improve this enhancement area.

Energy & Government Facility Siting

Objectives

Adoption of procedures and enforceable policies to help facilitate the siting of energy facilities and energy-related activities, and government facilities and activities, that may be of greater than local significance.

Resource Characterization

This section describes the extent to which problems and opportunities exist with regards to the energy and government facility siting enhancement objectives.

Table 26. Types of energy facilities in the coastal zone

Type of Energy Facility	Existing	Proposed (current or past)	Interest	Significant Changes Since Last Assessment
Electric transmission cables	X		X	X
Landfill methane	X	X		
Oil and gas	X	X		X
Pipelines	X	X		
Solar	X	X		
Current (ocean, lake, river)			X	
LNG		X		
Ocean thermal energy conversion (OTEC)				
Tidal			X	
Wave			X	
Wind		X	X	

Significant Change in Type or Number of Energy Facilities. The most significant change in energy facilities in the coastal zone is the closure of the Hunter’s Point power plant, an oil and gas facility with once-through cooling, and a new trans-Bay electric transmission cable. These changes did not give rise to a need for new policies; however it may be important in the near future to consider if the shoreline areas currently designated for water-related industrial uses, including petroleum related facilities, is appropriate.

Energy Capacity and Demand. The California Energy Commission is the state's primary energy policy and planning agency. Information about state energy capacity and demand can be found at www.energy.ca.gov.

Alternative Energy Development Programs. The California Energy Commission is the state's primary energy policy and planning agency. Information about alternative energy development programs can be found at www.energy.ca.gov.

Significant Change in Type or Number of Government Facilities. There has been an ongoing reduction in the number of government military facilities in the coastal zone since the previous assessment. With the closure of military bases and fleet and industrial supply areas, former government facilities have been, or are in the process of being converted to other uses, such as public parks or mixed use developments.

While the type and number of regional airports has not changed since the last assessment, the pressure has increased on these shoreline government facilities to expand their capacity to accommodate future predicted increases in air traffic.

Management Characterization

This section describes the effectiveness of management efforts to address problems and issues identified for the energy and government facility siting enhancement objectives.

Policies Specifically Related to Energy Facilities. BCDC works cooperatively with the California Energy Commission (CEC) who has the exclusive power to “certify,” in lieu of any State or local government permit, all power plant projects in the State. BCDC pursuant to state law identifies for the CEC sites within the Commission’s jurisdiction that are suitable or unsuitable for proposed energy facilities. Where a facility is proposed within BCDC’s jurisdiction, CEC is required to include provisions in project approvals to satisfy the Commission’s laws and policies unless the CEC specifically finds the recommended provisions would result in greater adverse effect on the environment or that it would not be feasible.

Table 27. Energy and government facility siting management categories employed

Management Category	Management Employed	Significant Changes Since Last Assessment	Reason ^a / Funding Source
Regulations, policies, and standards	Yes		
Permit compliance	Yes		
Program guidance	Yes		
Comprehensive siting plan (including SAMPs)	Yes		
Mapping or GIS	Yes		
Research, assessment or monitoring	Yes		
Education and outreach	Yes		

^a other is a non-309 or CZM driven change

Priority Needs and Information Gaps

Table 28. Major needs and gaps in addressing the energy and government facility siting enhancement area objectives

Description of Need or Information Gap	Type	Level of Priority
Inclusion of information about projected energy supply and demand in water-related industry findings and policies to ensure adequate acreage is available on the shoreline for petroleum related facilities	Policy, data	High
Understanding of alternative energy (e.g., wind, wave, tide) opportunities in the Bay Area, their costs and benefits, and potential impacts on Bay resources, e.g., how impacts to sensitive habitats and wildlife could be avoided or minimized	Data, capacity	High
Strategy to improve regional airport capacity to accommodate projected increases in air traffic	Policy, data, communication	High

Enhancement Area Prioritization

The energy and government facility siting enhancement area has MEDIUM priority level for coastal zone funding. The MEDIUM priority level was given to this enhancement area because of the limited jurisdiction over energy facility siting, and because the potential for new government facility siting is low. Regional efforts are focused on redevelopment, realignment, or reuse of government facilities, including closed military bases and the regional airports.

One strategy has been developed to address the major needs and information gaps necessary to improve this enhancement area.

Aquaculture

Objectives

Adoption of procedures and policies to evaluate and facilitate the siting of public and private aquaculture facilities in the coastal zone, to help formulate, administer, and implement strategic plans for marine aquaculture.

Enhancement Area Prioritization

Due to contamination and lingering water quality issues there has not been and are unlikely to be marine aquaculture facilities in San Francisco Bay. Due to these issues the LOW ranking of the aquaculture enhancement area has not changed since the previous assessment.

Ocean Resources

Objectives

Planning for the use of ocean resources.

Enhancement Area Prioritization

BCDC has no jurisdiction over this enhancement area; therefore the LOW ranking of the ocean resource enhancement area has not changed since the previous assessment. There is, however, a region-wide interest in improving the understanding of the sediment dynamics between the Bay and the outer coast.

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SECTION IV

STRATEGY

The following is a comprehensive, multi-year strategy that identifies program changes and implementation activities needed to address enhancement area objectives identified as high or medium priority in the Assessment. The Strategy is based on the needs identified in the Assessment and covers the 5-year period from fiscal year 2011 to fiscal year 2015.

Wetlands

Issue Areas

The proposed strategy or implementation activities will support the following priority enhancement area(s):

- | | |
|--|--|
| <input checked="" type="checkbox"/> Wetlands | <input type="checkbox"/> Cumulative and Secondary Impacts |
| <input type="checkbox"/> Coastal Hazards | <input type="checkbox"/> Special Area Management Planning |
| <input type="checkbox"/> Public Access | <input type="checkbox"/> Energy and Government Facility Siting |
| <input type="checkbox"/> Marine Debris | |

Program Change Description

The proposed strategy will result in, or implement, the following program changes:

- New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding
- New or revised guidelines, procedures and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government and other agencies that will result in meaningful improvements in coastal resource management
- New or revised Special Area Management Plans (SAMP) or plans for Areas of Particular Concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs

Strategy #1 - Subtidal Habitat Goals

The current Bay Plan findings and policies regarding subtidal habitat were drafted in 2002. This strategy addresses the need to update the Bay Plan findings and policies to reflect current status and trends, address emerging issues and incorporate new information gathered by the collaborative interagency Subtidal Habitat Goals Project.

Needs and Gaps Addressed. Over the past several decades, resource agencies and environmental groups have made enormous efforts to improve the San Francisco Bay ecosystem by restoring and protecting wetlands at the Bay's edge, streams and riparian areas throughout its watersheds, and, more recently, upland open spaces. For a number of reasons, these efforts have not, to date, considered the subtidal resources that are intrinsically connected to the mudflats, wetlands, creeks, and uplands. Until very recently the habitat beneath the Bay's surface was mostly "out of sight, out of mind," and there was no clear consensus on protecting and restoring the subtidal areas, which are a clearly a critical part of the Bay ecosystem.

One stumbling block is that the agencies with authority for managing the estuary lack sufficient information about subtidal habitats. Although there is a tremendous amount of scientific information about the Bay, little of it is useful in guiding decisions about specific proposals for development or restoration as they relate to subtidal habitats. Subtidal habitats are usually invisible in the Bay's turbid waters, and most sampling methods do not provide

detailed information on the location, extent and condition of the different habitats. Furthermore, relatively little research has been conducted on the ecosystem services provided by each habitat, the threats they face, how they will respond to environmental change, or the best methods to protect and enhance them.

To help identify and address these data needs and knowledge gaps, a collaborative interagency effort between BCDC, California Ocean Protection Council, California State Coastal Conservancy, National Oceanic and Atmospheric Administration and the San Francisco Estuary Partnership is underway. The goal of this effort, known as the San Francisco Bay Subtidal Habitat Goals Project, is to establish a comprehensive and long-term vision for protecting, restoring, researching, and managing the subtidal habitats in the Bay.

This project will culminate in the publication of the Subtidal Habitat Goals Report, expected to be completed in 2010, which will provide resource managers, regulatory agencies, environmental groups, researchers, industry, and other interested parties with the basic information needed to plan conservation, restoration, research, and management activities related to subtidal habitats. Revision of the Bay Plan findings and policies related to subtidal habitats based on recommendations in the report will help ensure that BCDC addresses to the greatest extent possible the wetlands enhancement area objectives.

Benefits to Coastal Management. It is anticipated that this strategy will result in stronger, more up-to-date findings and policies on subtidal habitats that will serve to better protect Bay resources while allowing reasonable water and shoreline dependent economic growth.

Likelihood of Success. It is likely that this strategy will result in a program change since BCDC staff has been involved in the San Francisco Bay Subtidal Habitat Goals Project for several years and the Commission has included an update of the Bay Plan findings and policies as a priority objective in their FY 2011 Strategic Plan.

Strategy Work Plan - Subtidal Habitat Goals

Total Years: 2

Total Budget: \$250,000

Final Outcomes and Products: Revised findings and policies

Year(s)	Activities	Milestones/Outcomes	309 Budget	Other Funds
FY'11	Revise Bay Plan findings and policies on Subtidal Habitats	Draft background report and preliminary recommendations for revisions to Bay Plan findings, policies, and map designations based on Subtidal Habitat Goals report (produced by others)	\$75,000	\$50,000
		Stakeholders engagement and public input on draft background report and preliminary recommendations, draft revised report and recommendations as necessary		
FY'12		Final, revised background report, findings and policies for Bay Plan revision submitted to the Commission for public hearing and vote	\$125,000	\$0

Fiscal Needs. In addition to 309 funds, the strategy will be supported by State General Funds, and if necessary, local, state, federal or private foundation grant funds.

Technical Needs. BCDC will work with local, state and federal governments, academia, regional authorities, the regulated community, partner agencies and organizations to ensure that changes to the Bay Plan are scientifically sound and based on best available information and knowledge.

Strategy #2 - Revise Bayland Ecosystem Habitat Goals

The goal of this strategy is to revise the *Bayland Ecosystem Habitat Goals* (Goals Project) to integrate climate change considerations, including sea level rise, to acknowledge that watershed processes are inextricably linked to bayland processes, and to renew the region's consensus on bayland protection and restoration. The Goals Project, released in 1999, articulated a vision for revitalizing the baylands of San Francisco Bay because they are critical to sustaining healthy fish and wildlife populations. The project also made recommendations for the type, amount and distribution of baylands needed to maintain healthy ecological communities, and provided a flexible vision for restoration that was translated into tangible actions outlined in the San Francisco Estuary Partnership's *Comprehensive Conservation and Management Plan*.

The Goals Project was exceptional in that it acknowledged that preservation of historic and future baylands cannot be achieved in a piece-meal fashion; rather, a regional consensus among scientists, resource managers and local communities is necessary. Project participants also understood that periodic revisions of the vision and goals would be necessary to stay up-to-date with new scientific findings and knowledge. This strategy will address the priority need of revisiting the regional consensus on bayland habitat goals to integrate climate change impacts including sea level rise, and to consider the potential impacts of watershed processes. The revisions, which will result in a new Baylands Goals report, will help ensure that future restoration and enhancement efforts are conceived, planned and implemented in the context of the regional vision for the complex and dynamic estuary and bayland system. The revised goals will also provide a preliminary roadmap for improving bayland resiliency to sea level rise. Rising seas will inundate some existing baylands; therefore, priority conservation areas where baylands could be allowed to migrate inland will be identified in the revised goals report.

Needs and Gaps Addressed. In the decade since the Goals Project was originally released, over 75 projects have been initiated to restore baylands along the fringes of San Pablo Bay, South Bay, Suisun Marsh, and throughout the Sacramento-San Joaquin Delta, and more than 67,000 acres have either already been restored or planned for restoration. These projects range in size from just a few to over 15,000 acres (e.g., South Bay salt ponds), and represent a significant community investment in baylands preservation. Climate change may jeopardize this investment unless a conscious and proactive effort is undertaken to examine the vulnerability of baylands to climate change; evaluate sensitivity of baylands to sea level rise based on available projections of sediment and water supplies, pollution, flooding, and natural habitat conservation; and, develop revised goals for managing baylands that include climate change adaptation strategies.

Increasingly, there is scientific evidence demonstrating that bayland health is affected by conditions beyond the immediate shoreline, including the condition of contributing drainage areas (i.e., the local watershed). The potential impacts of watershed condition on bayland health, and the recognition that continued urban development of watersheds is occurring, are two very good reasons to engage stakeholders in a discussion of how to factor watershed processes into the vision for baylands preservation. Wetland restoration efforts underway across the region may be threatened by changes in local watershed condition, not only from land use and development but also from climate change impacts on fluvial processes (i.e., water and sediment regimes). Watershed processes and their effects on baylands will be thoroughly examined in an ongoing, collaborative regional effort, the Regional Sediment Management Strategy. The information and knowledge generated by this effort can be used to incorporate ecosystem processes into the revised goals to the greatest extent feasible given the complexity of the undertaking, the quality of available information, and the capability of scientists and managers to link watershed changes and processes to baylands health.

Benefits to Coastal Management. The newly revised Baylands Goals report will benefit coastal managers by providing up-to-date and forward-looking goals for the preservation and restoration of baylands to ensure individual efforts result in larger cumulative successes. The revision will improve the quality of information available to land managers, developers, resource agencies and the public so that managing shoreline development and baylands restoration will best achieve wetland protection, restoration and enhancement goals.

Likelihood of Success. This strategy has a strong likelihood of success. Participants in the development of the original Goals Project explicitly called for periodic revisions, even in light of the considerable time and resources required. Additionally, BCDC has demonstrated tremendous success in helping to convene collaborative scientific efforts that lead to regional consensus. Staff played a leadership role in crafting the original Goals Project, which got underway in 1995 with more than one hundred participants representing federal, state, and local agencies, academia and the private sector. Once completed, BCDC used the Goals Project conclusions to amend the Bay Plan tidal marshes, tidal flats, fish, wildlife and other aquatic organisms findings and policies, and add a subtidal habitats finding and policy section.

Additionally, there is wide support among the scientific community to revise the Goals Project. At a recent expert elicitation convened by the U.S. EPA under the auspices of the Climate Ready Estuaries Program, scientists unanimously agreed that strategies to improve baylands capacity to adapt to climate change are necessary, and that a revised Goals Project would be an appropriate means to advance this objective. With the emerging regional consensus and interest in updating the Goals Project, this strategy is likely to result in a successful revision to Bay Plan policies and findings that will improve the wetland enhancement area.

Strategy Work Plan - Revise Bayland Ecosystem Habitat Goals

Total Years: 2

Total Budget: \$750,000

Final Outcomes and Products: Revised findings, policies and map designations

Year(s)	Activities	Milestones/Outcomes	309 Budget	Other Funds
FY'11	Revise and expand Goals Project and produce a new Baylands Goals report	Develop revised and expanded goals for managing baylands including climate change impacts on preservation and restoration	\$50,000	\$150,000
FY'12		Assessment with regional stakeholders whether to incorporate EBM approaches and/or watershed processes, and if warranted, modification of the revised and expanded goals	\$75,000	\$125,000
FY'12		Produce Baylands Goals report	\$50,000	\$150,000
FY'13	Integrate conclusions and recommendations of revised Baylands Goals into Bay Plan findings and policies	Draft background report and preliminary recommendations to integrate revisions into Bay Plan findings, policies and maps	\$50,000	\$50,000
		Final, revised background report, findings and policies, and maps submitted to the Commission for public hearing and vote	\$50,000	\$0

Fiscal Needs. In addition to 309 funds, the strategy will be supported by State General Funds, partners such as the State Coastal Conservancy, and if necessary, local, state, federal or private foundation grant funds.

Technical Needs. BCDC will work with the scientific community, resource managers, local governments, regional authorities, partner agencies and organizations, and stakeholders to ensure that revisions are technically sound and based on best available information.

Coastal Hazards

Issue Areas

The proposed strategy or implementation activities will support the following priority enhancement area(s):

- | | |
|---|--|
| <input type="checkbox"/> Wetlands | <input type="checkbox"/> Cumulative and Secondary Impacts |
| <input checked="" type="checkbox"/> Coastal Hazards | <input type="checkbox"/> Special Area Management Planning |
| <input type="checkbox"/> Public Access | <input type="checkbox"/> Energy and Government Facility Siting |
| <input type="checkbox"/> Marine Debris | |

Program Change Description

The proposed strategy will result in, or implement, the following program changes:

- New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/ understanding
- New or revised guidelines, procedures and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government and other agencies that will result in meaningful improvements in coastal resource management
- New or revised Special Area Management Plans (SAMP) or plans for Areas of Particular Concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs

Strategy #1 - Climate Change

The following strategy addresses priority needs and information gaps identified in the Coastal Hazards enhancement area assessment with regards to sea level rise and climate change. Climate change has the potential to dramatically alter the Bay Area, in part due to the critical economic, social and ecological resources located along the shoreline. Planning for the unavoidable changes to the Bay and shoreline from climate change has been, and will continue to be, at the forefront of the region's coastal management efforts.

Climate change planning requires a comprehensive approach that is both risk- and science-based, and evolves over time as our understanding of impacts, vulnerabilities, mitigation and adaptation improves. In the near-term, efforts to respond to climate change require characterizing near and long-term risks; developing and implementing a suite of strategies to reduce risks; and improving capacity and governance to adapt to a changing bay and shoreline. Due to the uncertainty in the timing and extent of climate change impacts, the region's response will need to be flexible and iterative, if it is to be successful.

Needs and Gaps Addressed. Driven by new and growing information about the Bay Area's risk from climate change, a vulnerability assessment, *Living With A Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on the Shoreline*, was prepared by BCDC in 2008. Using projected sea level rise of 16 inches by mid-century and 55 inches by the end of the century¹⁰, the assessment evaluated the potential impacts of a rising bay and increased flooding on key systems in both the natural and built environment.

The *Living with a Rising Bay* vulnerability assessment concluded that accelerated sea level rise has the potential to significantly impact bay resources, with 180,000 acres of shoreline vulnerable to flooding by mid-century and 213,000 acres by the end of the century. This will put

¹⁰ See *Living With A Rising Bay*, p. 15-20, for a complete explanation of sea level rise and scenario selection

an estimated 270,000 Bay Area residents at risk of flooding by the end of the century, which is 98 percent more than are at risk today. In areas where lives and property are not directly at risk, cumulative and secondary impacts of a rising bay are likely to affect public health, economic security and quality of life.

To address climate risks and vulnerabilities, such as those identified in *Living with a Rising Bay*, the region needs a suite of flexible, yet comprehensive mitigation and adaptation strategies. Developing these strategies will require growing the understanding of climate change risks and vulnerabilities; close coordination with regional partners, stakeholders and authorities; support from the public; and coastal management program changes to guide efforts to reduce climate risk, improve resiliency and promote adaptive responses.

Detailed below is a strategy to begin the process of developing a regional response to climate change. The strategy has five core programmatic areas: research, communication, capacity, governance and policy. Together, these core programs will improve the region's ability to understand and proactively respond to climate change, and in particular sea level rise. Many of the goals and objectives identified for the core program are cross-cutting so that successes in one area will advance another. It is this synergy that gives the entire strategy strength, and will ultimately lead to its overall success.

Actions and outcomes to advance core program goals and objectives were developed and are included below. These actions and outcomes will serve to guide the implementation of the overall strategy. Flexibility in how and when various elements of the strategy are implemented is critical because our understanding of climate change impacts, risks and vulnerabilities, and the region's capacity to adapt will continue to grow exponentially over the next decade. Specific projects addressing priority actions and outcomes with the greatest likelihood of immediate success that are most likely to result in improvements to the Coastal Hazards enhancement area were selected for inclusion in the workplan, schedule and budget.

Benefits to Coastal Management. It is anticipated that this strategy will result in advancing the region's understanding, interest and capacity to adapt to the impacts of climate change.

Likelihood of Success. It is likely that this strategy will result in a program change since the potential impacts from climate change on the region will be great, and the cost of inaction will be high. The State of California has been actively engaged in the issues of climate change, and the region has been very active in initiating climate change mitigation and adaptation planning. In concert with those efforts, the region's interest in climate change adaptation planning is growing. The comprehensive climate change strategy described below has a high likelihood of success as it grows out of ongoing efforts to understand climate change, inform the region about climate risks, and take proactive measures to address climate change through flexible, risk- and science-based policies and procedures.

Strategy Work Plan - Climate Change

Total Years: 5

Total Budget: \$5 million

Final Outcomes and Products: Revised programs and policies, authorities and guidance; new or revised Special Area Plans

Climate Change Core Program: Research

- I. **Research Goal:** Promote research to improve our understanding of climate change impacts, adaptation, and the integration of mitigation and adaptation planning
- II. **Research Objectives**
 - Advance research on climate change impacts and adaptation strategies

- Continue to build relationships and partnerships with the scientific research community to advance climate change science and study
- Regularly update research needs, including data needs and desired outcomes, to ensure that research supports the climate strategy goals and objectives

III. Research Actions & Outcomes

(1) Research Climate Change Impacts

- Work with the scientific community to develop and implement studies that evaluate the impacts of climate change, including sea level rise, on ecological, social, government and legal systems to better understand regional risks
- Support climate change impacts research that will result in tangible benefits to the region's climate change planning efforts by helping connect researchers to funding sources

(2) Research Climate Change Adaptation

- Work with the scientific community to develop and evaluate adaptation measures that manage risk, reduce vulnerability, improve the region's resiliency and adaptive capacity, and are consistent with, or help advance, mitigation goals
- Actively support climate change adaptation research that investigates how to integrate adaptation of the natural and built environments
- Support climate change adaptation research that will result in tangible benefits to the region's climate change planning efforts by helping connect researchers to funding sources

(3) Build Relationships with Research Community

- Strengthen relationships with the scientific community and enhance internal science capacity by activating a Science and Technical Advisory Committee that will help guide science-based climate change decision making
- Promote the creation of a "climate change research clearinghouse" that would improve communication both within the scientific community and between coastal managers and the scientific community

(4) Update Coastal Management Research Needs

- Participate in research symposia and summits that bring together regional experts in climate change, economics, sustainable communities, and ecology
- Create and periodically update a critical research needs document that reflects current needs and gaps in regards to climate change planning efforts

(5) Integrate Research into Coastal Management.

- Incorporate actionable scientific findings into policies, guidance and actions

Climate Change Core Program: Communication

I. **Communication Goal.** Develop a climate change communication strategy that inspires the region to act

II. Communication Objectives

- Build regional understanding of climate change and its likely impacts
- Increase public support for climate change mitigation and adaptation
- Engage the public in planning for climate change

III. Communication Actions & Outcomes

(1) Develop a Communication Strategy

- Review past and present communication strategies within and outside the region to generate ideas and gather "lessons learned"

- Identify ongoing regional communication strategies that could integrate adaptation into their message, e.g., One Bay Area
 - Identify feasible and cost-effective communication avenues or outlets, including regional meetings, newsletters, websites, radio programs, social media, etc.
- (2) **Communicate to Different Audiences**
- Develop different communication strategies for different audiences (e.g., local governments, community organizations, non-profits, regional partners, state and federal agencies, permit applicants, the general public) depending on their needs, capacity and understanding and acceptance of climate change
 - Ensure communication flows in both directions, from the bottom up (local-to-regional-to-state-to-federal) and from the top down (from federal to local)
- (3) **Communicate Effectively**
- Translate climate science, federal and state laws and policies, and other climate related guidance into a format easily used and assimilated by local governments, permittees, land managers and other climate change information consumers including lay audiences
 - Identify positive and effective ways to communicate (inspire not lecture)
 - Honestly communicate trade-offs
 - Listen to concerns and adjust message and strategies accordingly
- (4) **Engage the public in a manner that increases awareness**
- Develop and deliver a clear message about how climate change mitigation and adaptation can improve communities in other ways
 - Present the latest findings on adaptation and climate change to the public
 - Find ambassadors in each community to translate and disseminate information to make it more meaningful

Climate Change Core Program: Capacity

I. **Capacity Goal.** Build the region’s institutional capacity to effectively adapt to climate change in a coordinated and collaborative manner

II. **Capacity Objectives**

- Provide resources such as planning tools, assessment guidance and training to improve internal and external capacity to address climate change
- Leverage existing efforts and interests to advance climate change planning
- Support the creation of a regional resource center of climate change information, tools and expertise

III. **Capacity Actions & Outcomes**

(1) **Provide Resources**

- Develop guidance for permit applicants on assessing risk from climate change accelerated sea level rise on proposed Bay or shoreline projects
- Develop guidance and provide training to staff and commissioners and others on evaluating and addressing sea level rise related risks in project reviews, permit decisions and CEQA/NEPA documents
- Improve internal capacity to review and respond to permit applications that propose to manage climate change risks and impacts by (i) recruiting and maintaining at least one member of the Engineering Criteria Review Board (ECRB) with expertise in coastal engineering, coastal geomorphology or hydrology/hydraulics, (ii) maintaining an on-call consultant(s) to assist with the review of permit applications as needed in regards to climate change risk and impact management, and (iii) training staff

- Conduct outreach and education for local governments to build awareness and improve understanding of climate change trends and impacts, vulnerability and risk assessment methods, adaptation options, and how to effectively communicate climate change impacts and adaptation to their local community
 - Provide information, training and direct assistance to local decision-makers, planners and resource managers on processes, tools and other resources that support adaptation planning at various geographic scales across the region
- (2) **Leverage Existing Efforts**
- Identify existing (non-climate change) planning initiatives that already, or could easily incorporate, reducing or managing risks from climate change, and work with partners to promote and expand these efforts
 - Identify opportunities for coordination of climate change planning initiatives and work to establish and maintain effective collaborations
- (3) **Climate change Resource Center**
- Evaluate existing resource centers or clearinghouses (e.g., NSF decision-support center, Pacific Council's risk management group, NOAA CSC, ABAG Quake) to determine how and if a climate change resource center would benefit the region
 - Actively recruit a host, e.g., Climate Bay Area or One Bay Area, to create and maintain a climate change resource center that provides up-to-date, effective and practical information, data, tools, maps, etc. to the region

Climate Change Core Program: Governance

- I. **Governance Goal.** Improve governance to promote effective climate change adaptation planning and action
- II. **Governance Objectives**
- Obtain authority through legislative action to develop a sea level rise adaptation strategy for the Bay and Suisun Marsh
 - Increase coordination among local, regional, state and federal authorities to strengthen climate change mitigation and adaptation planning in the Bay Area
 - Incorporate an understanding of ecosystem and watershed processes into shoreline area management and climate change adaptation planning
- III. **Governance Actions & Outcomes**
- (1) **Prepare Legislation**
- Provide to the Commission for consideration draft language for state legislation to empower, fund and direct the preparation of a sea level rise adaptation strategy for the San Francisco Bay and the Suisun Marsh
 - Work with legislators, the Commission, the regulated community and other interests to enact legislation empowering the Commission to develop a collaborative regional seal level rise adaptation strategy
- (2) **Increase Coordination**
- Strengthen partnerships with local, regional and state agencies and organizations working on climate change adaptation
 - Work with the Joint Policy Committee (JPC) to integrate adaptation planning into ongoing mitigation planning efforts
 - Provide input on climate change planning initiatives within the region to ensure efforts are consistent with the State Adaptation Strategy and other relevant state and federal law and policy
 - Analyze and address potential conflicts among regulations and guidance of federal, state, regional and local agencies with respect to sea level rise and climate change adaptation

- Work with the Suisun Marsh Charter Group, the Delta Stewardship Council and others to identify potential governance overlaps and develop coordinated management approaches that promote consistent climate change adaptation planning and implementation in the Suisun Marsh
- (3) **New governance Structure**
- Develop new and effective models of shoreline areas governance that consider watershed processes and sub-ecosystems of the Bay to more holistically address the impacts of climate change
 - Develop a governance structure that is flexible and responsive in order to facilitate the timely integration of new information, changes in key climate indicators, scientific research and adaptive management outcomes

Climate Change Core Program: Policy

- I. **Policy Goal.** Develop and implement climate change adaptation policies in coordination with regional partners and stakeholders
- II. **Policy Objectives**
- Update findings and policies to reflect current understanding of climate change
 - Coordinate with partners to develop policy for a regional climate change strategy
 - Promote inclusion of climate change adaptation in the region’s Sustainable Communities Strategy (one of the region’s state-required mitigation strategies)
- III. **Policy Actions & Outcomes**
- (1) **Revise Findings and Policies**
- Provide for Commission consideration updated Bay Plan findings and policies addressing climate change consistent with current McAtteer-Petris Act authority
 - Incorporate findings and policies addressing climate change consistent with current McAtteer-Petris Act authority into updates of Special Area Plans, the San Francisco Bay Seaport Plan, and the Commission’s Public Access, Signage and Landscape Guidelines, if and when they occur
 - Work with the Suisun Marsh Charter Group, the Delta Stewardship Council and others to update the Suisun Marsh Preservation Plan to incorporate findings and policies addressing climate change consistent with current McAtteer-Petris Act authority
- (2) **Coordinate with Partners**
- Work with regional partners (in particular the JPC) and stakeholders to develop and implement policies that support a regional strategy for climate change adaptation in the Bay Area that also advances mitigation goals
- (3) **Regional Strategy**
- Participate in the development and implementation of the regional Sustainable Community Strategy, focused on climate change mitigation, and promote the inclusion of climate change adaptation into the overall strategy
- (4) **New policy Framework**
- Develop a policy creation and revision framework that facilitates the timely integration of new information, changes in key climate indicators, scientific research and adaptive management outcomes

Year(s)	Activities	Milestones/Outcomes	309 Budget	Other Funds
FY'11-'12	Promote research to improve our understanding of climate change impacts, mitigation and adaptation	Better understanding of potential climate change impacts, including sea level rise, on the region	\$100,000	\$300,000
FY'12-'14		Development and evaluation of climate adaptation measures that integrate the natural and built environment	\$250,000	\$350,000
FY'11-'13	Develop a climate change communication strategy that inspires the region to act	Better regional understanding and awareness of climate risks and responses	\$100,000	\$350,000
FY'11-'12		Effective communication tools to educate and inform different audiences, including permit applicants and local governments	\$100,000	\$250,000
FY'11-'15		Public engagement in climate change planning efforts	\$100,000	\$150,000
FY'11-'12	Build the region's institutional capacity to effectively adapt to climate change in a coordinated and collaborative manner	Improved internal capacity to evaluate and address risk from climate change in project reviews and permit decisions	\$50,000	\$50,000
FY'11-'12		Guidance for permit applicants on how to assess the risk of climate change, including sea level rise and storm activity, on proposed projects	\$50,000	\$50,000
FY'11-'15		Information, training and direct assistance provided to local decision makers to support climate change adaptation planning across the region	\$200,000	\$300,000
FY'11-'13	Improve governance to promote effective climate change adaptation planning and action	Integration of adaptation planning into the region's mitigation planning in coordination with partners, e.g., the JPC	\$100,000	\$200,000
FY'12-'13		Draft language for state legislation to enable the development of a sea level rise adaptation strategy for the Bay and Suisun Marsh	\$100,000	\$400,000
FY'14-'15		Shoreline management area governance models that consider watersheds and sub-ecosystems in addressing climate risks and vulnerabilities	\$250,000	\$500,000
FY'11	Develop and implement climate change adaptation policies in coordination with regional partners and stakeholders	New and revised Bay Plan findings and policies that reflect current understanding of climate change	\$50,000	\$200,000
FY'12-'13		Implementation of policies that support a regional climate change adaptation strategy that advances mitigation goals	\$250,000	\$200,000

Fiscal Needs. In addition to 309 funds, the strategy will be supported by State General Funds, partner resources, and if necessary, local, state, federal or private foundation grant funds.

Technical Needs. BCDC will work with local governments, regional authorities, partner agencies and organizations, and the scientific community to ensure that the comprehensive strategy is technically sound and based on best available information and knowledge.

Projects of Special Merit. Projects of Special Merit (PSMs) will likely be pursued to support the climate change strategy. In particular, PSMs of high priority over the next five years will include developing and test adaptation planning tools and processes that can be applied across a variety of sectors and biogeographic scales; assessing vulnerability and increasing resiliency to climate change impacts at regional, subregional and community scales; and developing new policies and governance structures that are science- and risk-based, and will allow for a flexible, timely response to new knowledge and information.

Public Access

Issue Areas

The proposed strategy or implementation activities will support the following priority enhancement area(s):

- | | |
|---|--|
| <input type="checkbox"/> Wetlands | <input type="checkbox"/> Cumulative and Secondary Impacts |
| <input type="checkbox"/> Coastal Hazards | <input type="checkbox"/> Special Area Management Planning |
| <input checked="" type="checkbox"/> Public Access | <input type="checkbox"/> Energy and Government Facility Siting |
| <input type="checkbox"/> Marine Debris | |

Program Change Description

The proposed strategy will result in, or implement, the following program changes:

- New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding
- New or revised guidelines, procedures and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government and other agencies that will result in meaningful improvements in coastal resource management
- New or revised Special Area Management Plans (SAMP) or plans for Areas of Particular Concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs

Strategy #1 - Public Access for Persons with Disabilities

The goal of this strategy is to improve public access to coastal resources by clarifying the existing Bay Plan policy regarding “barrier free access,” and the Commission’s responsibilities under state and federal disability laws such as the Americans with Disabilities Act and the Unruh Civil Rights Act.

Needs and Gaps Addressed. Over the past several years, increasing attention has been focused on how BCDC permits can ensure that persons with disabilities have access to public boat docks, trails and other public facilities along the Bay shoreline. Bay Plan Public Access Policy No. 6 provides that public access improvements “should be designed and built to encourage diverse Bay-related activities and movement to and along the shoreline, should permit barrier free access for the physically handicapped to the maximum extent feasible, should include an ongoing maintenance program, and should be identified with appropriate signs.” In 2008, the State Attorney General’s Office provided a written opinion on the Commission’s responsibilities under state and federal disability laws concluding that the permittee, not the Commission, bears the legal responsibility for assuring that each project it permits complies with federal and state disability laws. However, the opinion also noted that Bay Plan requires “barrier free access for the physically handicapped to the maximum feasible extent,” and neither the McAteer-Petris Act nor the Bay Plan describes what constitutes “maximum feasible” and “barrier free.” The opinion therefore concluded that the Commission must implement “barrier free access” for persons with disabilities under the Bay Plan, lacks its own standards, and may consider existing state and federal regulations as guidance absent its own policies.

To improve public access to coastal resources, a revision of pertinent Bay Plan findings and policies should be updated to eliminate outmoded language such as “physically handicapped,” and to clarify the ambiguous requirements of “barrier free” and “maximum feasible extent.”

The revised findings and policies should clarify an accessibility standard either explicitly or in reference to a standard created by another state or federal agency, and how the standard should be applied when conditioning permits.

Benefits to Coastal Management. The revised public access policy will benefit both permit applicants and the public by clarifying standards for providing, designing, constructing and maintaining public access for persons with disabilities.

Likelihood of Success. It is likely that this strategy will result in a program change since it is expected to receive support from the public, and the Commission has included an update of the pertinent Bay Plan findings and policies as a priority objective in their FY 2011 Strategic Plan.

Strategy Work Plan - Public Access for Persons with Disabilities

Total Years: 2

Total Budget: \$125,000

Final Outcomes and Products: Revised findings and policies

Year(s)	Activities	Milestones/Outcomes	309 Budget	Other Funds
FY'12	Develop recommended program changes for public access for persons with disabilities	Draft background report and preliminary recommendations for policy revision	\$25,000	\$25,000
FY'13	Circulate draft report and preliminary recommendations to partner agencies, organizations and stakeholders for review	Revised draft background report and preliminary recommendations	\$25,000	\$0
FY'13	Finalize background report and recommendations based on input from partner agencies, organizations and stakeholders	Final, revised background report and policy submitted to the Commission for public hearing and vote	\$50,000	\$0

Fiscal Needs. In addition to 309 funds, the strategy will be supported by State General Funds, and if necessary, state, federal or private foundation grant funds.

Technical Needs. BCDC will work with partner agencies and organizations, interested stakeholders, and the general public to ensure that programmatic changes are technical sound and are based on best available information and knowledge.

Marine Debris

Issue Areas

The proposed strategy or implementation activities will support the following priority enhancement area(s):

- | | |
|---|--|
| <input type="checkbox"/> Wetlands | <input type="checkbox"/> Cumulative and Secondary Impacts |
| <input type="checkbox"/> Coastal Hazards | <input type="checkbox"/> Special Area Management Planning |
| <input type="checkbox"/> Public Access | <input type="checkbox"/> Energy and Government Facility Siting |
| <input checked="" type="checkbox"/> Marine Debris | |

Program Change Description

The proposed strategy will result in, or implement, the following program changes:

- New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/ understanding
- New or revised guidelines, procedures and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government and other agencies that will result in meaningful improvements in coastal resource management
- New or revised Special Area Management Plans (SAMP) or plans for Areas of Particular Concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs

Strategy # 1 - Derelict Vessel and Unauthorized Live-aboard Vessel Monitoring and Removal

The goal of this strategy is to promoting the adoption and implementation of policies at the local level that will advance efforts to decrease marine debris in the Bay by reducing the number of derelict vessels and unauthorized live-aboard vessels. New procedures, guidance and processes to simplify the enforcement of policies that result in removal of derelict vessels will almost immediately improve the health and vitality of Bay resources, including native eelgrass beds and benthic habitats that support a diversity of fish and aquatic invertebrates. Removal will also greatly benefit public safety and welfare by eliminating navigational hazards and improving water quality. Decreasing the number of unauthorized live-aboard vessels will reduce the pollution directly entering the Bay due to the discharge of untreated sewage, grey water, trash oil, and other pollutants.

To achieve the goal of decreasing marine debris region wide, tools are necessary that will quickly and efficiently provide access to the location, condition and ownership of derelict vessels and unauthorized live-aboard vessels. Therefore, working with partners, a regional database and maps will be created and maintained for use by local, state and federal agencies with authority to address derelict vessels and unauthorized live-aboard vessels. To sustain this effort over the long-term requires improved coordination of enforcement authorities, which can be achieved by the active and ongoing participation of all partners, including BCDC, in the Abandoned Vessel Task Force sponsored by the U.S. Coast Guard.

In addition to actively support, assist and coordinating with the authorities that enforce the removal of derelict vessels and unauthorized live-aboard vessels., funding will be sought to improve compliance with the policies of the Richardson's Bay Special Area Plan that call for the removal of derelict vessels. This effort will be undertaken in collaboration with the local authority, the Richardson's Bay Regional Agency (RBRA). As resources allow, the goal will be to seek funding to remove at least 40 derelict vessels from the Bay. This effort will support the

development of guidance, policies and enforcement strategies that will be shared region wide to improve the capacity of other authorities to address the long-standing issue of derelict vessels and unauthorized live-aboard vessels.

Needs and Gaps Addressed. To date, there has neither been the capacity nor the resources to comprehensively survey and monitor the location, condition and ownership status of region's derelict vessels or unauthorized live-aboard vessels. This information is critical for active and effective enforcement of vessel abandonment and mooring policies, and must be kept current if an effective management program is to be implemented region wide.

Effective enforcement policies to reduce derelict vessels and unauthorized live-aboard vessels have not been adopted region wide. The Solano County Sherriff Department's Marine Patrol Division has been a leader in implementing an ordinance that clearly defines the terms under which vessels may or may not be moored. This enforceable ordinance has allowed the County to rid itself of abandoned and illegally moored vessels. While Solano County's efforts have resulted in the adoption of similar ordinances by several neighboring jurisdictions, its efficacy demonstrates that all Bay and Delta Counties should consider a similar program. To improve the number of counties with an enforceable ordinance and active management program, funding is necessary to develop and promote to the region a model ordinance that can be adopted by local jurisdictions. Additionally, guidance will likely be required on tailoring and implementation the ordinance at the local level.

Benefits to Coastal Management. Abandoned, deteriorating and unauthorized vessels adversely impact Bay resources and their removal can have significant and nearly immediate benefits to critical habitats and species. These vessels can be a source of oil and other pollutants, impairing water quality, impacting wildlife and posing a human health risk. They can decrease public use of intertidal and subtidal habitats, can adversely affect the aesthetics and local economy of an area, and can pose a significant navigational hazard, particularly in inclement weather. Resources provided through this strategy will improve the region's capacity to decrease marine debris by improving management tools, policies, and implementation strategies. Additionally, if time and resources allow, a project to remove derelict vessels from Richardson's Bay will not only have the immediate positive benefit of improving Bay habitat, it will serve to build public support and awareness of marine debris, and will hopefully lead to regional engagement in similar removal efforts.

Likelihood of Success. It is likely that this strategy will result in a program change since there is a local ordinance that has been successful and is a model that can be built on, and there is ongoing coordination among the various authorities responsible for navigation, pollution reduction and resource protection. Resources from the agencies and organizations responsible for or interested in reducing the number of derelict vessels and unauthorized live-aboard vessels, include the California Department of Boating and Waterways, the United States Coast Guard, the United States Army Corps of Engineers, the State Lands Commission, the Delta Commission, the Regional Water Quality Control Board, the Richardson's Bay Regional Agency, the Integrated Waste Management Board and the marine patrol units from affected local law enforcement agencies such as Solano County and Contra Costa County, will be brought to bear to ensure success of this strategy. With the support and active participation of these and other partners dedicated to improving conditions in the Bay the strategy will be well received throughout the region.

Strategy Work Plan - Derelict and Unauthorized Live-aboard Vessel Monitoring and Removal

Total Years: 5

Total Budget: \$500,000

Final Outcomes and Products: Revised guidance, procedures, improved capacity and resources to decrease marine debris through enforceable policies and active management

Year(s)	Activities	Milestones/Outcomes	309 Budget	Other Funds
FY'12	Work with partners to identify the location, condition and ownership of derelict vessels and unauthorized live-aboard vessels	Regional database and maps that are updated regularly	\$25,000	\$50,000
FY'11-'15	Coordinate enforcement efforts	Ongoing participation of BCDC in U.S. Coast Guard sponsored Abandoned Vessel Task Force	\$0	\$50,000
FY'13 -'14	Derelict vessel removal project in Richardson's Bay	Removal of approximately 40 derelict vessels in coordination with RBRA	\$0	\$200,000
FY'13	Develop a mooring model ordinance in collaboration with regional partners that could be modified and adopted by local authorities	Model ordinance language, implementation guidance and procedures to reduce unauthorized moorings	\$75,000	\$50,000
FY'14	Region wide outreach to promote adoption of enforceable ordinance to reduce derelict vessels and unauthorized live-aboard vessels	Increase in the number of counties with an enforceable mooring ordinance	\$25,000	\$25,000

Fiscal Needs. In addition to 309 funds, the strategy will be supported by State General Funds, state and local funds, and in-kind services from the Richardson's Bay Regional Agency.

Technical Needs. BCDC will work with partner agencies and organizations to ensure that the program change is technically sound and based on best available information and data.

Cumulative and Secondary Impacts

Issue Areas

The proposed strategies or implementation activities will support the following priority enhancement area(s):

- | | |
|--|--|
| <input type="checkbox"/> Wetlands | <input checked="" type="checkbox"/> Cumulative and Secondary Impacts |
| <input type="checkbox"/> Coastal Hazards | <input type="checkbox"/> Special Area Management Planning |
| <input type="checkbox"/> Public Access | <input type="checkbox"/> Energy and Government Facility Siting |
| <input type="checkbox"/> Marine Debris | |

Program Change Description

The proposed strategy will result in, or implement, the following program changes:

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- New or revised guidelines, procedures and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government and other agencies that will result in meaningful improvements in coastal resource management
- New or revised Special Area Management Plans (SAMP) or plans for Areas of Particular Concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs

Strategy #1 - Regional Sediment Management

This strategy will help advance ongoing research efforts to improve the understanding of Bay sediments, and will result in the development of a new, Regional Sediment Management plan for the San Francisco Bay. The new plan will take a system-wide approach to managing a wide range of activities, including flood protection, watershed management, habitat restoration (rivers, wetlands, beaches and subtidal habitats), dredging and aggregate mining. This approach will serve to sustain existing shorelines; manage erosional areas; mitigate storm and sea level rise impacts; promote healthy riparian, wetland, beach and subtidal habitats; allow for the responsible use of Bay resources; and protect sensitive species and the built environment.

Needs and Gaps Addressed. San Francisco Bay is a complex geomorphic and hydrodynamic system. Nearly forty percent of California drains to the Bay, supplying the fresh water and sediment critical to the health and vitality of ecological systems spanning from the western delta to the outer coast. Impacts to the Bay from a changing climate and a decreasing supply of sediment from the Sacramento and San Joaquin Delta are expected to be significant, and may include shoreline erosion, loss of wetlands and beaches, and changes in subtidal habitats.

Over the course of the last century and a half, the watersheds of the Bay and its tributaries have been modified by mining in the Sierras, diking and reclaiming wetlands, channelizing and damming rivers, and construction of water control structures. These activities have also permanently changed the “sediment-sheds,” that is, the land that contributes sediment to the Bay and its tributaries. The largest known impact to the Bay sediment supply was from hydraulic mining during the gold rush. Mining activities in the Sierras washed millions of cubic yards of sediment downstream, creating an even shallower Bay with vast mudflats. Over time, this sediment has slowly worked its way through the system, and no similar human-induced large sources of sediment are entering the Bay. Additionally, over the last century, dams and water control structures built on Bay tributaries have been trapping sediment; development has altered the water and sediment balance of rivers and creeks; flood control channels, which

require periodic dredging, have been created to protect low-lying areas; and the development of ports and marinas require dredging to maintain channels for safe navigation. Climate change impacts such as sea level rise and altered temperatures and precipitation patterns, are predicted to further affect the supply of fresh water and sediment to the Bay.

To effectively deal with the additive effects of changes to the climate, watershed, and sediment supply, a science-based, comprehensive management approach is needed. This strategy addresses the need for this approach through the development of a Regional Sediment Management plan for the San Francisco Bay. The plan will be based on new knowledge and understanding of sediment budgets, contributions of local tributaries, and sediment transport dynamics gathered by a regional sediment management science program effort.

Benefits to Coastal Management. It is anticipated that increased knowledge and data developed through the regional sediment management science strategy and the plan itself would vastly improve sediment management, as the current knowledge on Bay sediment processes is limited. It would ensure a continued strong foundation of science-based decision making, and would create some economies of scale as new ways of managing sediment are developed that would likely be more efficient in connecting areas of need with areas of excess. It would also support sustainable watershed, floodplain and wetland management, and will be critical in regional climate change planning, particularly in regards to the capacity of shorelines, wetlands and beaches to adapt to sea level rise.

Likelihood of Success. It is likely that this strategy will result in a program change. BCDC has a long history of engaging in collaborative management, particularly in the area of sediment management through the highly successful Long Term Management Strategy for Placement of Dredged Sediment in the Bay Area (LTMS) Program. The LTMS enjoys a large and active stakeholder group that includes both industry and the environmental advocacy community. Further, BCDC staff has begun outreach on this new program to the scientific community, restoration community, flood protection managers and agency staff, and has been met with welcome enthusiasm. Therefore, while success will require substantial collaboration, support is already growing for this strategy.

Strategy Work Plan - Regional Sediment Management

Total Years: 5

Total Budget: \$1.4 million

Final Outcomes and Products: Revised findings and policies, programs, guidance, mapping and modeling

Year(s)	Activities	Milestones/Outcomes	309 Budget	Other Funds
FY'11-'13	Conduct research and analysis of sediment supply and demand, erosional/depositional areas, and shorelines and sediment flux into and out of the Bay	Research strategy established, funding sources identified, applications for funding submitted, targeted research to answer management questions funded	\$125,000	\$525,000
FY'12-'14	Collaborate with partners in watershed management, flood protection, habitat restoration, dredging, and aggregate supply to develop a new sediment management plan	Partners identified, working groups established, and a draft Regional Sediment Management plan developed	\$225,000	\$375,000
FY'15	Revise Bay Plan findings and policies on sediment management	Regional Sediment Management Plan, findings and policies submitted to the Commission for public hearing and vote	\$125,000	\$25,000

Fiscal Need. In addition to 309 funds, this strategy will be supported by state general funds and additional grants from state, federal or private grant funds. Specifically, a Coastal Impact Assistance Grant of \$170,000 has been awarded to assist with both the science and management strategy development. In addition, the California Sediment Work Group (CSMW) has awarded \$195,000 to the U.S. Geological Survey (USGS) to identify sources of sand and finer grain sediment in the Bay. It is anticipated that the CSMW will provide approximately \$100,000 for the development of management strategies focused on coarse grain sediment. Lastly, the LTMS Program has committed approximately \$250,000 to study sediment fluxes at two local Bay tributaries in an effort to further understand how local tributaries may supplement the reduced sediment supply from the Delta. More funding will be needed for this effort to support predictive modeling for other tributaries in the Bay.

Other related research efforts are also underway. These include an Environmental Protection Agency (EPA) funded study of the Corte Madera watershed that will include wave, flood and sediment modeling efforts, and a NOAA/USGS effort to acquire a LIDAR topographic survey of the Bay shoreline and outer coasts. These data will be leveraged to investigate erosional and depositional shoreline in the Bay, and will contribute to regional sediment management science data needs.

Technical Needs. BCDC will continue to work with the USGS, local scientists and engage partner agencies and organizations to seek and obtain updates, trainings, and technical assistance as necessary to ensure that staff is able to carry out this proposed strategy, and that the plan is technically sound and based on best available information and knowledge.

Strategy #2 - Comprehensive Information Management and Retrieval Project

The following strategy addresses priority needs and information gaps identified in the Cumulative and Secondary Impacts enhancement area assessment. The goal of the strategy is to improve the effectiveness of BCDC's coastal zone management program by providing reliable and convenient access to important data, and to expedite dissemination of information to state and federal agencies, local governments, decision makers, the regulated community, and the general public. The strategy also improves the resiliency of BCDC as a coastal zone management agency by creating electronic copies of vital historical records necessary for disaster recovery and continuity of government planning.

Needs and Gaps Addressed. As the field of coastal management nears its half-century mark, it is becoming increasingly critical that the cumulative impacts of past decisions are reflected in future decisions regarding coastal activities. With over 40 years of permitted coastal development, new approaches for analysis of past actions and new tools are necessary. Furthermore, as the first generation of coastal managers nears retirement age, institutional knowledge will depart with them.

BCDC has been issuing permits for development projects in and along San Francisco Bay since 1965. These permit files represent the most complete and authoritative record of over 45 years of Bay and shoreline development around the San Francisco Bay. These data, which exist nowhere else, are an important resource that should be stored into a centralized database. The existing system for accessing these data is labor intensive, outdated and woefully inadequate to assess, track and manage the high volume of projects and permits and the detail associated with each project. The outdated functionality of the system hampers the ability of BCDC to efficiently manage its important regulatory and planning functions and vital historical records.

In an effort to build BCDC's capacity to manage the Bay more effectively, a web-based GIS (Geographic Information Systems) was developed that provides staff access to geospatial data, including most of BCDC's historical permits, on their desktop computers. Though staff now have access to a digital record of BCDC's historic permits through an easy to use GIS interface, the

geospatial permit dataset does not contain any information about the permits beyond location, permittee name, and a very brief project description. The next step is to develop a database that contains all of the critical information in permits, consistency determinations and enforcement cases that can be linked to the desktop GIS system. In addition, there are oversized plans, and various reports associated with many permits that need to be captured digitally and archived for redundancy and future reference.

A comprehensive information management and retrieval system that uses a centralized database linked to BCDC's existing web-based GIS would be a powerful tool to improve work flow and productivity. The system would provide staff with the ability to access all necessary permit information as well as natural resource and land use data through the geographic interface. This fully integrated system would enable staff to better accomplish their day-to-day work reviewing permit applications; resolving enforcement investigations; responding to public inquiry calls, requests for public records, and e-discovery requests; and undertaking research for important policy update projects. In addition, the system would provide redundancy that can be relied upon in the event of a disaster that could compromise hard copy records, and would enable the more efficient use of office space as digitally captured hard copy records are moved off site.

Benefits to Coastal Management. The strategy will improve coastal management by: (1) providing reliable and convenient access to critical data needed for core coastal management programs (permits, local coastal programs, enforcement); (2) allowing staff to track permit condition compliance and identify and resolve enforcement investigations more efficiently; (3) expediting dissemination of information to state and federal agencies, local governments, decision makers, the regulated community, and the general public; and (4) providing a means to access mission-critical information in the event of a disaster which could destroy the only historical copy of permit information in existence. The system will be flexible enough that additional information, such as data to track OCRM-required performance measures, can be incorporated. Lastly, the system will provide the means in the future for more accurate and standardized permit applications (in digital format), thus streamlining the permit application process and likely reducing the permit processing time.

Likelihood of Success. BCDC is fully committed to completing this strategy. The development of a comprehensive information management system is a priority objective in the Commission's 2010 strategic plan. This project is likely to be successful over the long term, especially if regular annual funding is available, and phased approach is taken to ensure all electronic needs are met.

Strategy Work Plan - Comprehensive Information Management and Retrieval Project

Total Years: 4

Total Budget: \$910,000

Final Outcomes and Products: Comprehensive information management and retrieval system, new and revised guidance and procedures

Year(s)	Activities	Milestones/outcomes	309 Budget	Other Funds
FY'11	Develop a comprehensive plan to digitize records, integrate databases, and provide electronic access to users	Comprehensive, phased project work plan	\$0	\$45,000
FY'11	Identify affected records for each phase. Prioritize phases. Review and purge hard copy records of obsolete, irrelevant and unnecessary information to minimize data capture of useless data.	Prioritized phases, identified records, purged files	\$0	\$30,000
FY'11	Develop and refine a new database compatible with GIS, develop Quality Assurance/Quality Control (QA/QC) policies and processes	Database, QA/QC policies and processes	\$0	\$100,000
FY'12	Enter historical information, scan documents, and administer QA/QC	Complete accurate digital record of projects	\$100,000	\$300,000
FY'12	Integrate the completed project database and scanned project documents with the web-based GIS, administer QA/QC	Integrated system for managing and retrieving digital data	\$25,000	\$125,000
FY'13	Transition to digital permit application and tracking, including web-based application forms and procedures, develop policies and processes to increase electronic collaboration among staff, define protocols for centralized storage of information, and develop remote access procedures	Internet-based forms and procedures for permit applicants, policies for creating and sharing digital products	\$100,000	\$50,000
FY'14	Train staff and develop policies/procedures for maintaining and updating the system	Current and maintainable system	\$35,000	\$0

Fiscal Needs. The total cost for the Comprehensive Information Management and Retrieval Project Strategy is estimated to be close to one million dollars. It is assumed that 309 funding will not be sufficient to carry out the entirety of the proposed strategy. BCDC has applied for and received a federal Coastal Impact Assessment Program (CIAP) grant to fund a contractor to develop and refine a new database to capture permit and enforcement (i.e., regulatory) information. The project was included in California’s CIAP Final Plan, which was approved by the Minerals Management Service (MMS), thus allowing BCDC to apply directly for funds for the database component of this project. However, the funds have not yet been released to BCDC and there is some question as to whether the full amount of the grant will be allocated. In addition, BCDC has applied for additional CZMA funds specifically to input historical data into the database. At this point, it is unknown whether BCDC will receive that grant. Finally, BCDC will continue to actively seek additional state and federal funds to support this strategy.

Technical Needs. BCDC will work with staff, Commission members, private consultants, and as appropriate regional partner, local governments, and interested stakeholders to ensure the strategy is technically sound, based on best available technology, and will serve the diverse needs of those that will use and benefit from the system.

Strategy #3 - Ecosystem-based Management and Marine Spatial Planning

The goal of this strategy is to integrate ecosystem-based management (EBM) and Marine Spatial Planning (MSP) into BCDC's programs, policies and practices. Specific objectives for this strategy are based on a two-year study completed in 2009 by a NOAA Coastal Management Fellow, culminating in the report "*Acclimating to a new Bay Area: Ecosystem-based Approaches to Management for the San Francisco Bay*" (www.bcdc.ca.gov/publications/EBM_Report.pdf). The following key recommendations were included in the report:

1. Undertake a study of BCDC and Bay Area governance by: (1) initiating a public-private partnership and an interagency collaborative effort with Bay Area agencies and academic institutions to articulate explicit ecosystem services management goals and develop a standardized suite of EBM guidelines to achieve the goals, and (2) investigating the structural reorganization of the San Francisco Bay Plan according to ecoregions, which are place-based management areas linking Bay habitats from the subtidal to the upland, with associated enforceable and advisory policies.
2. Undertake further study of marine spatial planning (MSP) in preparation for potential state and federal comprehensive marine zoning by initiating a research, data acquisition, and mapping effort of San Francisco Bay's current and future human uses, de facto zones, and submerged habitats.
3. Increase active partnership with integrated watershed management programs to advance land-to-sea planning, including collection of scientific data required to support these efforts.
4. Undertake a comprehensive, quantitative evaluation of the cumulative impacts of the Bay Area's human uses and activities on the Bay's habitats through an analytical framework such as that developed by the National Center for Ecological Analysis and Synthesis (NCEAS), University of California Santa Barbara.
5. Increase active partnerships with regional ocean observing programs to ensure that a strong foundation of science is informing planning and policy decisions about regional and local sea level rise, ocean acidification, and other climate change impacts.
6. Create and provide training opportunities for staff on the latest and most relevant EBM tools and technologies (e.g. GIS, habitat conservation tools, sea level rise visualization tools, ecosystem service tradeoff analysis tools, marine protected area optimization tools, etc.) and pursue the hiring of an individual with the technical skills to use and teach these new tools.

Needs and Gaps Addressed. To maintain a healthy, productive and resilient Bay it is necessary to improve the understanding and management of cumulative and secondary impacts of growth and development on sensitive resources such as tidal and subtidal habitats, critical habitats for threatened and endangered species, shoreline recreation areas, coastal resources and low-income shoreline communities. Protecting sensitive resources from current as well as future threats, for example due to the impacts of climate change, requires an integrated approach rather than one focused on single species or sector.

Ecosystem-based management (EBM) is a broad, yet integrative approach that can be used to understand and manage cumulative and secondary impacts. In general, EBM includes: (1) a suite of *ecosystem principles* such as place-based management, adaptive management, long-term planning, collaborative partnerships, cumulative impact management, ocean observing, monitoring and review; (2) overarching *core elements* such as marine spatial planning and integrated watershed management; and (3) *tools* such as GIS, habitat conservation tools, sea level rise visualization tools, ecosystem service tradeoff tools, and cumulative impact frameworks. Together, these principles, elements and tools constitute a powerful means for managers and decision-makers to reduce cumulative and secondary impacts.

Although individual components of EBM are currently employed by coastal managers including BCDC, a more comprehensive use of EBM principles and practices, as well as

implementation of newer approaches such as Marine Spatial Planning, integrated watershed management, land-to-sea planning, and cumulative impact assessments, will improve capacity to address emerging issues and future threats. There are, however, several governance issues that constrain BCDC's ability to implement EBM. Addressing these governance issues is key to the successful EBM implementation, and ultimately improved management of cumulative and secondary impacts. Issues that need to be addressed include an authority and jurisdiction generally limited to the Bay plus a 100-foot shoreline band; the traditional, sectoral nature of the San Francisco Bay Plan; and a permit-by-permit regulatory framework.

Benefits to Coastal Management. It is anticipated that an increased knowledge and understanding of EBM principles, elements and tools, in particular MSP, will encourage its broader use; ensure a continued strong foundation of science-based decision making; support a movement towards explicitly managing for ecosystem services; and aid in the development of sound regional sustainability policies. Additionally, it is anticipated that EBM will be critical in meeting the challenges of regional climate change planning. For example, EBM can help ensure that collaborative interagency efforts are framed in a manner that will result in clearly articulated and measurable multi-sector and multi-system goals.

Likelihood of Success. It is likely that this strategy will result in a program change. BCDC has a long history of engaging in collaborative management to ensure success in meeting the mandate of reducing Bay fill and increasing public's access. Additionally, BCDC's laws and policies are progressive in nature and include principles that embody EBM such as long-term planning; protection of ecosystem structure, process, and function; place-based management; monitoring and review; a strong foundation of science; and collaborative governance.

Ecosystem-based Management and Marine Spatial Planning Strategy Work Plan

Total Years: 4

Total Budget: \$600,000

Final Outcomes and Products: Revised programs and policies, data and maps, staff capacity.

Year(s)	Activities	Milestones/Outcomes	Budget	Other Funds
FY'12	Research/acquire data and create maps to support future MSP efforts, aid in establishing marine protected areas, or zones, as part of the implementation of the CA Marine Life Protection Act	Dataset and maps demonstrating current and potential use conflicts that could be resolved by MSP	\$50,000	\$50,000
FY'13		Example zoning scenarios for one or more Bay to reduce use conflicts and improve CSI management	\$50,000	\$50,000
FY'13	Explore opportunities to integrate EBM principles, elements and tools into programs and policies and identify governance barriers and possible solutions to those barriers	Draft staff report and draft preliminary recommendations for integrating EBM into programs and policies	\$75,000	\$75,000
FY'14		Final, revised staff report and final, revised recommendations for integrating EBM into programs and policies submitted to the Commission for a public hearing and vote	\$75,000	\$75,000
FY'14-'15	Train staff on the latest and most relevant EBM tools and technologies	Increased staff capacity to use EBM principles and tools to improve decision-making and reduce cumulative and secondary impacts	\$75,000	\$25,000

Fiscal Needs. In addition to 309 funds, the strategy will be supported by State General Funds, and if necessary, state, federal or private foundation grant funds.

Technical Needs. EBM, and in particular MSP, are management approaches that continue to evolve, with many new and emerging tools and technologies in development. To stay current,

BCDC will engage partner agencies and organizations to seek and obtain updates, trainings, and technical assistance as necessary to ensure that staff is able to carry out this proposed strategy.

Other Strategies. The following two strategies address priority needs and information gaps identified in the Cumulative and Secondary Impacts (CSI) enhancement area assessment. Because these strategies are less likely to be achieved in the next five years due to limited staff resources or uncertain political, social and economic forces, they have not been detailed to the same degree as the priority strategies that were selected for workplan, schedule and budget development.

Strategy #4 - Water Surface Area and Volume Bay Plan Policy Revision

The circulation of dissolved oxygen in the Bay depends on a complex system of interdependent variables including water surface area and volume, water circulation, tidal energy, fresh water inflow, bathymetry and water pollution. Changes in these variables, especially the Bay's surface area and volume, are expected as climate change begins to impact the region. The amount of dissolved oxygen in the Bay could decrease if accelerated sea level rise due to climate change causes tidal flats, which are highly effective oxygenation areas, to become inundated. Conversely, the amount of dissolved oxygen could increase if currently diked wetlands are returned to tidal action by restoration projects that are either planned or currently underway.

To reduce the cumulative and secondary impacts of changes in water surface area and volume on the amount of dissolved oxygen in the Bay, the Water Surface Area and Volume findings and policies should be revised to: (1) incorporate new information about the important relationships between water surface area and volume, water circulation, fresh water inflow, bathymetry, and water pollution (2) recognize the potential impacts of climate change on the chemical and hydrological functions of water surface area and volume; and (3) provide clear policy guidance on the recommended water surface areas and volumes to be achieved through Bay restoration efforts.

Strategy #5 - Fresh Water Inflow Bay Plan Policy Revision

The amount of fresh water entering the Bay affects both species composition and sediment budgets. Fresh water from the Delta, the most significant source to the Bay, mixes with salt water entering through the Golden Gate. The relationship between the amount of fresh and salt water is responsible, in part, for the composition and diversity of species in and around the Bay, and is important in maintaining salinity gradients that support healthy wetland systems, including Suisun Marsh, the largest remaining contiguous marsh in the western U.S. Fresh water inflows also transport sediment into the Bay, which is critical to sustaining tidal marshes and flats. Upstream diversions of fresh water for agricultural and residential uses reduce the inflow of fresh water, which can cause increased salinities, and restrict the amount of sediment reaching the Bay, which can be detrimental to tidal marshes.

In addition, recent scientific research on climate change has suggested there will be significant impacts on California's supply of fresh water due to earlier Sierra Nevada snowmelt and changes in the amount of precipitation falling as snow. With the majority of the state's water needs served by the Sierra Nevada watershed, global warming may result in significant changes in the amount and timing of fresh water that reaches the Bay.

To reduce the cumulative and secondary impacts of changes in fresh water inflow, policies in the Bay Plan should be evaluated and updated as necessary to incorporate new information about (1) the importance of fresh water in the Bay; (2) the potential impacts of fresh water diversions; (3) the impacts of climate change on fresh water supply; and (4) recent decisions and initiatives affecting the Delta region.

Special Area Management Plans

Issue Areas

The proposed strategy or implementation activities will support the following priority enhancement area(s):

- | | |
|--|--|
| <input type="checkbox"/> Wetlands | <input type="checkbox"/> Cumulative and Secondary Impacts |
| <input type="checkbox"/> Coastal Hazards | <input checked="" type="checkbox"/> Special Area Management Planning |
| <input type="checkbox"/> Public Access | <input type="checkbox"/> Energy and Government Facility Siting |
| <input type="checkbox"/> Marine Debris | |

Program Change Description

The proposed strategy will result in, or implement, the following program changes:

- New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding
- New or revised guidelines, procedures and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government and other agencies that will result in meaningful improvements in coastal resource management
- New or revised Special Area Management Plans (SAMP) or plans for Areas of Particular Concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs

Strategy #1 - Special Area Plan Updates and Revisions

The goal of this strategy is to improve, update or revise BCDC's Special Area Plans (SAPs) to incorporate new information, reconcile overlapping jurisdictions, incorporate considerations of climate change impacts including sea level rise, and improve consistency with the Bay Plan.

Needs and Gaps Addressed. This strategy addresses the need to periodically update SAPs so they reflect current status and trends, address emerging issues, and reflect best available information. Maintaining up-to-date SAPs helps to improve the coordination of policy development and land use planning for the Bay and shoreline with actions of local jurisdictions and other authorities.

Seaport Planning and Cargo Monitoring. The Seaport Plan is a regionwide plan that guides decision-making regarding marine terminals and port priority use designations. Periodic revision of the Seaport Plan to incorporate updated cargo forecasts and to address changes in marine terminal and transportation facilities operations is necessary if the plan is to remain current. The last major plan revision in 2003 incorporated bulk cargo throughput projected through 2020. Since 2003 there have been fairly significant changes in the marine cargo shipping industry, and an increased understanding that future impacts of sea level rise on the seaports should be addressed sooner rather than later. Revision of the Seaport Plan will address these changes, and will include: (1) up-to-date forecasts for individual cargo modes; (2) modifications, as needed, to port priority use area designations to address changes in marine terminal and transportation facility operations; and (3) considerations of impacts of accelerated sea level rise on marine terminals and transportation facility development and continued operation.

Suisun Marsh Planning. The Suisun Marsh is protected through shared authority with local governments. The Suisun Marsh Protection Plan (Marsh Plan), administered by BCDC, protects a primary management area comprised of tidal marsh, managed wetlands, adjacent grasslands, and waterways; while the Local Protection Program (LPP) protects a secondary management area comprised of significant upland buffer lands. The Marsh Plan and the LPP are in need of revision to incorporate current best management practices for plant, fish and wildlife conservation; to reflect changes in local land use plans and policies; and to consider climate change impacts including sea level rise and salinity changes. Additionally, duck club management plans, which are included in the Suisun Resource Conservation District's component of the LPP, are in need of updating to improve consistency with state and federal law and to incorporate best management practices to improve resource conservation. Lastly, any management efforts in the Suisun Marsh will need to be coordinated the new Delta Stewardship Council, which also has jurisdiction over the Suisun Marsh.

San Francisco Waterfront Special Area Plan. The San Francisco Waterfront Special Area Plan facilitates non-maritime, maritime, commercial and recreational shoreline development along the San Francisco waterfront. The plan, which was developed cooperatively with the City and County of San Francisco and the Port of San Francisco, does not adequately address a variety of issues currently impacting the land managed by the Port of San Francisco and regulated by the policies of the plan. To better understand if and how the plan should be revised, BCDC will collaborate with the Port of San Francisco in a public process to receive input on issues including fill removal; public access and plazas; changes in land use; preservation of historic resources and Port facilities; and sea level rise. These efforts will likely result in the need to revise the plan to better address these issues, and to ensure the continued protection and use of the San Francisco Waterfront.

Benefits to Coastal Management. It is anticipated that this strategy will result in stronger, more up-to-date SAPs that will serve to improve natural resource protection while allowing reasonable water and shoreline dependant economic growth.

Likelihood of Success. It is likely that this strategy will result in a program change since it is expected to receive wide support from the local governments and authorities that may be affected by the proposed revisions and updates.

Strategy Work Plan - Special Area Plan Revisions

Total Years: 5

Total Budget: \$875,000

Final Outcomes and Products: Revised programs and policies, updated maps and priority use area designations

Year(s)	Activities	Milestones/Outcomes	309 Budget	Other Funds
FY'11	Revised Suisun Marsh Protection Plan and updated Solano County Local Protection Program	Draft background report and preliminary recommendations for revisions to Marsh Plan findings, policies, and map designations	\$0	\$125,000
FY'12		Final, revised background report, findings and policies, and map designations for Marsh Plan submitted to the Commission for public hearing and vote	\$75,000	\$50,000
FY'11	Revised San Francisco Waterfront Special Area Plan	Public input on a variety of issues gathered in coordination with the Port of San Francisco	\$0	\$25,000
FY'11		Draft background report and preliminary recommendations for revisions to findings, policies and map designations	\$0	\$125,000
FY'12		Final, revised background report, findings and policies, and map designations submitted to the Commission for public hearing and vote	\$75,000	\$0
FY'13	Revise Seaport Plan	Updated marine cargo forecasts, modified port priority use designations to addressed changes in the marine shipping industry, consideration for sea level rise impacts on marine terminal development and operation	\$25,000	\$0
FY'13		Draft background report and preliminary recommendations for revisions to findings, policies and port priority use area designations	\$75,000	\$50,000
FY'14		Final, revised background report, findings and policies, and port priority use area designations submitted to the Commission for public hearing and vote	\$50,000	\$0
FY'14	Revise SAPs to improve consistency with the Bay Plan	Draft recommended revisions to SAPs findings and policies to address inconsistencies with the Bay Plan	\$50,000	\$50,000
FY'14-'15		Final, revised findings and policies submitted to the Commission for public hearing and vote	\$50,000	\$50,000

Fiscal Needs. In addition to 309 funds, the strategy will be supported by State General Funds, and if necessary, local, state, federal or private foundation grant funds.

Technical Needs. BCDC will work with local governments, regional authorities, partner agencies and organizations to ensure that changes to the SAPs are technically sound and based on best available information and knowledge.

Energy and Government Facility Siting

Issue Areas

The proposed strategy or implementation activities will support the following priority enhancement area(s):

- | | |
|--|---|
| <input type="checkbox"/> Wetlands | <input type="checkbox"/> Cumulative and Secondary Impacts |
| <input type="checkbox"/> Coastal Hazards | <input type="checkbox"/> Special Area Management Planning |
| <input type="checkbox"/> Public Access | <input checked="" type="checkbox"/> Energy and Government Facility Siting |
| <input type="checkbox"/> Marine Debris | |

Program Change Description

The proposed strategy will result in, or implement, the following program changes:

- New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/ understanding
- New or revised guidelines, procedures and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government and other agencies that will result in meaningful improvements in coastal resource management
- New or revised Special Area Management Plans (SAMP) or plans for Areas of Particular Concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs

Strategy #1 - Water Related Industry Policy Revisions

The goal of this strategy is to improve BCDC's water-related industry findings, policies and priority use area designations. Most of the water-related industry priority use area designations in the Bay Plan are for petroleum facilities that require a shoreline location. Working with partners such as California Energy Commission (CEC) and the State Lands Commission to assess the specific need for petroleum infrastructure expansion or reduction in the Bay Area, revisions to the Bay Plan can be crafted that both support this important industry and protect Bay resources.

Needs and Gaps Addressed. Future changes in energy supply and demand may affect the import of petroleum into the San Francisco Bay, either increasing or decreasing the need for shoreline petroleum refinement facilities. To ensure the appropriate amount of acreage is available on the shoreline for petroleum related facilities and that critical Bay resources are protected, policy revisions that incorporate information about projected energy supply and demand are necessary. Input from partner agencies and stakeholders will be sought during the policy revisions in order to develop a strong framework for decision-making, and relevant information gathered during the process will be of added benefit as a supplement to the CEC's 2007 Integrated Energy Report.

Benefits to Coastal Management. It is anticipated that this strategy will result in a stronger decision-making framework for water-related industry, and in particular for the siting of petroleum related facilities. Additionally, it will ensure that water-related industry priority use areas are of the appropriate size and location to support projected changes in the need for and activities of petroleum related facilities while continuing to protect Bay resources.

Likelihood of Success. It is likely that this strategy will result in a program change since it is expected to receive wide support from the petroleum industry and local governments.

Strategy Work Plan - Water Related Industry Policy Revisions

Total Years: 2

Total Budget: \$300,000

Final Outcomes and Products: Revised programs and policies, updated priority use area designation maps

Year(s)	Activities	Milestones/Outcomes	309 Budget	Other Funds
FY'14	Working with an Advisory Committee with representatives from the public and private sector develop recommended program changes for water-related industry	Draft background report and preliminary recommendations for revisions to findings, policies and priority use area designations	\$125,000	\$25,000
FY'15	Circulate draft report and preliminary recommendations to partner agencies, organizations and stakeholders for review and comment	Revised draft background report and preliminary recommendations for revisions to findings, policies and priority use area designations	\$50,000	
FY'15	Finalize background report and recommendations based on input from Advisory Committee, partners and stakeholders	Final, revised background report, findings and policies, and priority use area designations submitted to the Commission for public hearing and vote	\$75,000	\$25,000

Fiscal Needs. In addition to 309 funds, the strategy will be supported by State General Funds, and if necessary, state, federal or private foundation grant funds.

Technical Needs. BCDC will work with partner agencies and organizations such as the CEC and State Lands Commission to form an Advisory Committee with representatives from the public and private sector. The Advisory Committee will help ensure that programmatic changes are technical sound and are based on best available information and knowledge.

All Enhancement Areas

Issue Areas

The proposed strategy or implementation activities will support the following priority enhancement area(s):

- Wetlands
- Coastal Hazards
- Public Access
- Marine Debris
- Cumulative and Secondary Impacts
- Special Area Management Planning
- Energy and Government Facility Siting

Program Change Description

The proposed strategy will result in, or implement, the following program changes:

- New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/ understanding
- New or revised guidelines, procedures and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government and other agencies that will result in meaningful improvements in coastal resource management
- New or revised Special Area Management Plans (SAMP) or plans for Areas of Particular Concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs

Strategy #1 - Revision of the San Francisco Bay Conservation and Development Commission's Coastal Management Program

The goal of this strategy is to conduct a technical revision of the San Francisco Bay Conservation and Development Commission's Coastal Management Program to ensure it is up-to-date and current in language and references, and to improve the ease in which federal and federally permitted activities currently outside of federally approved coastal zone are reviewed.

Needs and Gaps Addressed. The San Francisco Bay Conservation and Development Commission's Coastal Management Program (CMP) was approved by the Secretary of Commerce in 1978. The Program consists of a description of the CMP including the San Francisco Bay Plan, Suisun Marsh Protection Plan, the requirements established by the Office of Ocean and Coastal Resource Management (formerly, Office of Coastal Zone Management) under the federal Coastal Zone Management Act of 1972 (CZMA), and updates to the Commission's laws and policies.

Since the CMP was initially approved many of the laws and policies governing the program have changed. To ensure that the Commission can protect the Bay and shoreline, and meet the coastal management program enhancement area objectives, a technical revision of the CMP to improve consistency of language and ensure all information and references in the program are up-to-date and current is both necessary and long overdue.

Moreover, the Commission's jurisdiction in the Bay (i.e., the federally approved coastal zone), which is based on the mean high tide line (MHTL), is projected to change significantly as the impacts of climate change are felt in the region. Climate projections for the Bay Area suggest that sea level may rise between 15-55 inches by the year 2100. Sea level rise will result in an expansion of the coastal zone due to a landward migration of MHTL, and will therefore affect the review of permits and plans under state law. The expanded coastal zone will also affect the Commission's authority to review federal and federally permitted activities under the federal consistency provisions of the CZMA. Of immediate concern is how the Commission can

regulate, or at least influence, activities currently outside of the coastal zone that are likely to come under the Commission's jurisdiction as a result of accelerated sea level rise or that have significant effects on the volume and quality of water entering San Francisco Bay. NOAA's recent evaluation of the California Coastal Management Program included a recommendation for BCDC to consider a jurisdictional expansion in order to better address sea level rise¹¹.

Under the CZMA the Commission has the authority to conduct consistency reviews of federal or federally permitted activities that occur outside of the coastal zone that affect the land or water uses or natural resources within its jurisdiction. To exercise this authority the Commission must undertake the time-consuming and burdensome process of securing permission to review individual non-coastal zone project that satisfies the CZMA's jurisdictional standard from the National Oceanic and Atmospheric Administration (NOAA)¹². Alternatively, the Commission can eliminate the need for this cumbersome, case-by-case seeking of permission to exercise this authority by seeking NOAA approval to designate a specific geographic area beyond the current coastal zone where consistency reviews may be conducted.

To improve the Commission's ability to meet the coastal management program enhancement area objectives and improve the protection of the Bay and shoreline, an amendment of the federally approved CMP to designate a geographic area outside of the current coastal zone where consistency reviews are conducted is necessary. The geographic area outside of the current coastal zone would consist of the watershed of all surface watercourses that flow into San Francisco Bay (with the exception of any area that lies to the east of the easternmost extent of the area of jurisdiction as specified in the state enabling legislation), and will include, but not be limited to, the area projected to be inundated by the year 2100 due to climate change accelerated sea level rise.

Benefits to Coastal Management. This strategy will improve the Commission's coastal management program by ensuring it is current with all new laws and policies, and by allowing for the review of federal or federally permitted activities that currently lie outside of the coastal zone that have a potential to significantly impact the Bay and its shoreline. The regulation, or at least the ability to influence, these activities provides an opportunity to ensure that the coastal management enhancement area objectives are addressed to the greatest extent practical in all areas that influence the Bay.

Likelihood of Success. This strategy has a high likelihood of success because it is both necessary and feasible.

¹¹ Program Suggestion: The BCDC should explore a possible expansion of its jurisdictional boundaries in recognition of the increase in size of SF Bay and the reflects of climate change on the Bay, and how that may affect BCDC's planning, regulatory and public access functions and mandates. OCRM Final Evaluation Findings, California Coastal Management Program, for the period from March 2005 to December 2008, p. 50.

¹² A requirement of NOAA implementing regulations adopted in 2000.

Strategy Work Plan - Revision of San Francisco Bay CMP

Total Years: 2

Total Budget: \$450,000

Final Outcomes and Products: Revised policy

Year(s)	Activities	Milestones/Outcomes	309 Budget	Other Funds
FY'13	Update references in CMP	CMP reviewed and references to law and policy updated	\$75,000	\$50,000
FY'13	Identify geographic area outside of current coastal zone where federal and federally permitted activities may be reviewed	Geographic area outside of current coastal zone mapped and described	\$50,000	\$25,000
FY'14	Revise CMP to include the geographic area outside of current coastal zone where federal and federally permitted activities may be reviewed	Draft CMP language to extend the area included in federal consistency review	\$75,000	\$75,000
FY'14	Adoption of updated and revised CMP	Final CMP update and revisions submitted to the Commission for public hearing and vote	\$50,000	\$50,000

Fiscal Needs. In addition to 309 funds, the strategy will be supported by State General Funds, and if necessary, state, federal or private foundation grant funds.

Technical Needs. BCDC has the technical capacity to successful conduct this strategy.

Strategy #2 - Science Program

The goal of this strategy is to develop a science program to enhance BCDC’s internal science capacity, advance science-based partnerships, and better integrate science into permits, policies and practices.

Needs and Gaps Addressed. As a coastal management agency with regulatory authority over the San Francisco Bay, the use of science is a critical component of BCDC’s policy processes. In 1986, BCDC established a Scientific and Technical Advisory Committee (STAC), composed of various technical and scientific experts, primarily from other agencies, who were available individually on an as-needed basis to provide advice to the staff on various scientific and technical topics. Over time, more formal, interagency agreements or other collaborative processes have replaced most of the informal agency support and interactions provided by the STAC. The net result has been a significant decline in STAC activity over the years.

In addition to, or in lieu of, the formally established STAC, BCDC staff has increasingly engaged interested parties and experts on an as-needed basis in specific planning projects, permit applications and scientific and technical inquiries. For example, draft staff background reports that form the basis for staff recommendations to the Commission on proposed amendments to the Bay Plan are typically reviewed by subject-specific experts to ensure the factual and scientific basis of the policy recommendations are correct. In addition, small advisory committees have been formed on a case-by-case basis to provide focused input on specific policy, technical or scientific issues or questions.

Over the years, the Commission has adopted policies in the Bay Plan that call for improved scientific and technical information to reduce uncertainty and support better informed policy and regulatory decision-making. In 2007, staff briefed the Commission on a range of strategies to better integrate scientific information into its permit and policy decisions, and in 2009 the Commission directed staff specifically to revitalize the STAC to better achieve the following

goals: (1) actively advise and assist the Commission on a variety of issues and topics; (2) be sufficiently broad in membership to integrate many interests and sources of information; (3) have a flexible structure to respond to the various needs of the Commission; and (4) allow subcommittees to focus on specific issues.

To successfully revitalize the STAC and advance the integration of science in BCDC’s work, a comprehensive science program is needed. A BCDC science program would include a program manager, who would be responsible for developing, coordinating and implementing a strategic plan. The strategic plan would include the critical components of a science program, including activating and managing the STAC; building and maintaining relationships with outside technical and scientific experts and science institutions; collaborating with outside agencies and organizations on developing grant proposals to advance BCDC’s science needs, and; providing in house assistance as necessary for review of permit applications, grant proposals, and planning documents.

Benefits to Coastal Management. This strategy will improve the Commissions coastal management program by ensuring that new and emerging scientific facts and findings, as well as sound technical information, is integrated into staff and Commission permit, policy and regulatory decision making to the greatest extent practical.

Likelihood of Success. This strategy has a high likelihood of success because it is necessary and feasible, and has been included as a priority objective in the Commission’s Strategic Plan.

Strategy Work Plan – Science Program

Total Years: 2

Total Budget: \$100,000

Final Outcomes and Products: Revised procedures and guidance

Year(s)	Activities	Milestones/Outcomes	309 Budget	Other Funds
FY’12	Develop Science Program	Designate staff member or hire a Science Program Manager	\$25,000	\$25,000
FY’13		Develop and implement a Science Program Strategic Plan including revitalization of the STAC	\$50,000	\$0

5-Year Budget Summary by Strategy

Priority	Enhancement Area	Strategy	Potential Funding Source (\$)									
			FY'11		FY'12		FY'13		FY'14		FY'15	
			309	Other	309	Other	309	Other	309	Other	309	Other
1	Coastal Hazards	Climate Change / Adaptation Policies		200K	175K	100K	125K	100K				
2	Coastal Hazards	Climate Change / Improve Governance		100K	50K	300K	150K	200K	125K	250K	125K	250K
3	Wetlands	Bayland Goals	50K	150K	125K	275K	100K	50K				
4	Wetlands	Subtidal Habitat Goals	75K	50K	125K							
5	Public Access	Public Access for Persons with Disabilities			25K	25K	75K					
6	Cumulative & Secondary Impacts	Regional Sediment Management Strategy		300K	100K	375K	125K	150K	125K	75K	125K	25K
7	Special Area Management Plans	Special Area Plan Revisions		275K	125K	50K	100K	50K	100K	50K	50K	50K
8	Coastal Hazards	Climate Change / Institutional Capacity	50K	150K	50K	150K		100K	100K		100K	
9	Coastal Hazards	Climate Change / Communication Strategy	50K	325K	100K	275K	50K	150K	50K		50K	
10	Coastal Hazards	Climate Change / Promote Research	50K	150K	50K	350K	125K	75K	125	75		
11	All	SF Bay Coastal Management Program Update					125K	75K	125K	125K		
12	Marine Debris	Derelict and Unauthorized Live-aboard Vessels		10K	25K	60K	75K	160K	25K	135K		10K
13	Cumulative & Secondary Impacts	Comprehensive Information Management System		175K	125K	425K	100K	50K	35K			
14	Energy & Government Facility Siting	Water Related Industry							125K	25K	125K	25K
15	Cumulative & Secondary Impacts	EBM / MSP			50K	50K	125K	125K	75K	100K	75K	
16	All	Science Program			25K	25K	50K					
Total Funding by Year			275K	1,185K	1,125K	2,435K	1,250K	1,285K	1,010K	875K	650K	360K