

# Addressing Climate Change San Francisco Bay

**A Proposal for the 2009 NOAA Coastal Management Fellowship Program**



**Addressing Climate Change: San Francisco Bay**  
2009 NOAA Coastal Management Fellowship Program Application  
San Francisco Bay Conservation and Development Commission  
October 21, 2008

Submitted by:

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## **I. Background / Introduction**

San Francisco Bay (the Bay) is the largest estuary on the Pacific Coast and one of the world's great natural resources. The marshes and mudflats along the shoreline of the Bay are sources of food and shelter for a wide variety of fish and wildlife. Hundreds of thousands of birds migrating between the Arctic and South America—fully 50 percent of the birds using the Pacific flyway—rest and feed on the Bay. Over a million birds visit the Bay each year. The Bay supports over 130 species of fish, including salmon and other anadromous fish, which spend most of their lives in the ocean but return to fresh water to reproduce. Harbor seals, gulls, sea bass, geese, and thousands of other species of fish, plants, mammals, reptiles, and birds thrive in the San Francisco Bay estuary.

The Bay makes many contributions to human welfare. The Bay's thousand miles of shoreline provide stunning settings for diverse communities and offer spectacular views of the Bay's scenic splendors. The Bay's unparalleled beauty is the basis of the region's tourist industry, which attracts millions of visitors from around the world. Fish, whether caught in the Bay or harvested from the ocean after spending part of their lives in the Bay, provide food, recreation and an economic livelihood for many. The Bay also provides one of the world's great natural harbors. The Bay is the fifth largest U.S. port in crude oil handling and the fourth largest container port. The goods shipped to, from, and through Bay ports add to the Nation's economic well-being and cultural richness. The Bay and its shoreline support oil refineries, water transit, wastewater treatment plants, salt-producing ponds, recreational marinas, recreational fisheries and one remaining commercial fishery.

The San Francisco Bay Conservation and Development Commission (BCDC) is a regional state agency with permit authority over work in the Bay and along the shoreline, and has prepared a comprehensive Bay Plan with policies to guide its consideration of proposed projects. BCDC is also the Coastal Zone Management Agency for the San Francisco Bay segment of the California coastal zone. The California Coastal Commission (CCC) is the coastal management agency for the rest of the California coast.

BCDC was established in 1965 to stop rampant filling of the Bay and to expand public access to the shoreline. The Bay is now bigger than when BCDC was created and there is extensive public access to and use of the shoreline, while large-scale ecosystem restoration is underway to restore the Bay's historic tidal marshes.

However, sea level rise and the other climate change impacts of global warming, pose a dire threat to the Bay ecosystem as well as to shoreline development. BCDC has prepared maps of the impact of a one meter rise in sea level (see above), that show that major portions of the Bay's shoreline, including the San Francisco Financial District, San Francisco and Oakland international airports, and much of Silicon Valley would be inundated. The Bay's tidal marsh and tidal flats would also likely be inundated, because the sediment supply to the Bay is increasingly limited. In addition, much of the shoreline has been hardened and limits wetlands from migrating landward. Sea level rise and the other impacts of climate change, such as salinity and temperature changes will cause fundamental changes to the Bay's natural resources, which are already under stress from pollution, freshwater diversions, and other impacts of urbanization.

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BCDC has determined that a comprehensive new program is needed to enable the region to adapt to climate change. Recognizing the need for a new approach, BCDC recently had state legislation enacted that authorizes BCDC to plan for and work with other agencies to address climate change adaptation. Because many agencies and governments are starting to focus on the issue of climate change, coordination is critical to avoid duplication and ensure synergies are provided by the various efforts. BCDC has a proven track record at collaborative partnerships and, as described below, is already working with a variety of agencies on climate change issues. Since most land-use regulation is done at the local level, BCDC believes that it is critical to work with local governments to inform them regarding these looming challenges, determine their planning needs, and provide them with planning tools to address adaptation and create resilient communities.

BCDC has assembled an in-house climate team with an inter-disciplinary membership to carry out the agency's adaptation planning efforts. The team will complete a policy background report in late 2008 to support a first round of BCDC Bay Plan policy amendments to address climate change. The Commission will vote on the policies in the spring of 2009. BCDC's climate team recently worked with Bay Area scientists and agency staff to identify critical climate change related research needs, and summarized the conclusions in a research-needs white paper, which feeds into the state's research strategy for addressing climate change in the coastal sector. The United States Environmental Protection Agency (USEPA) has designated San Francisco Bay as one of six pilot Climate Ready Estuaries (CRE), and is working with BCDC and the San Francisco Bay Estuary Project to prepare a vulnerability assessment and an adaptation plan for the estuary to address key ecological vulnerabilities that the Bay will face as a result of climate change. In partnership with the CCC, the State Coastal Conservancy, the California Ocean Protection Council and the State Resources Agency, BCDC is helping prepare a state adaptation strategy for the coastal sector of California. BCDC is also working with other partners to address climate change adaptation, most notable of which is a partnership with the Dutch to work together on strategies for adaptation.

## **II. Goals and Objectives**

The goal of the project is to promote planning for adaptation to climate change for San Francisco Bay and the California coast through enhancing coordination among agencies and recommending ways to optimize management of the Bay, while providing protection of the Bay's ecosystem. The specific objectives of the Project are to:

- Gather information and data regarding strategies for adaptation to climate change, particularly for use by local governments.
- Participate in adaptation planning for the Bay and the California coast.
- Prepare outreach materials for local governments regarding climate change vulnerability assessments and adaptation planning.
- Help organize and update information for a regional web-portal for local governments to address adaptation planning

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A successful project will result in an analysis of and recommendations for specific tools to implement adaptation planning for climate change impacts to San Francisco Bay.

**III. Milestones and Outcomes**

<b>Task</b>	<b>Timing</b>
Fellowship Begins	August 3, 2009
Orientation Period	August 3, 2009 – October 5, 2009
<i>Detailed Workplan</i>	October 5, 2009
Research and Data Gathering Period	October 5, 2009 – July 1, 2010
Preliminary content list for regional partnership website	January 15, 2010
<i>First Report on research</i>	March 15, 2009
<i>Second Report on research</i>	July 1, 2010
Coordination / Liaison Role	October 5, 2009 – June 6, 2011
<i>Host/Facilitate Meetings/Forums</i>	To Be Determined
Analysis	July 5, 2010 – Dec 31, 2010
<i>Conduct Interviews, Host Meetings</i>	To Be Determined
Develop Recommendations	January 1, 2011 – June 6, 2011
<i>Report on Recommendations</i>	June 6, 2011
Dissemination of Report/Briefings	June 6, 2011 – August 3, 2011

Specific anticipated outcomes of benefit to the State CZMA program include:

- Research on climate change adaptation actions
- Recommendations for how to better coordinate BCDC and Coastal Commission efforts to organize a climate change response.
- Enhanced coordination among multiple local, state and federal agencies, nonprofit organizations and user groups with interests in the management of San Francisco Bay
- Production and dissemination of tools for local governments to use in responding to sea level rise and climate change.

Specific anticipated outcomes of benefit to the Fellow include:

- Become familiar with of coastal management in San Francisco Bay
- Improve oral and written communication skills

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- Interact with the major local, state and federal agencies, nonprofit organizations, industry, and other user groups with interests in the management of San Francisco Bay
- Develop expertise on climate change impacts on the Bay and coastal management tools for adaptation
- Develop skills in serving as a liaison for multiple, major planning processes
- Play a significant role in advancing fundamental changes in the way San Francisco Bay is managed

#### **IV. Project Description**

The following provides an outline of the major tasks to be undertaken as part of the project. Please note that the Fellow will be responsible for developing a workplan that will describe in more detail how the following tasks will be accomplished.

**Orientation.** The first stage of the Fellowship will involve orientation to BCDC's staff, laws and policies, and the major issues facing management of San Francisco Bay, particularly in light of climate change. The fellow will (1) attend weekly BCDC staff meetings and twice-monthly BCDC Commission meetings, and (2) attend California Coastal Commission (CCC) climate team meetings.

During the orientation period, the Fellow will also be integrated into BCDC's and the CCC's climate change programs. The Fellow will be a member of BCDC's climate team, which includes planners, permit analysts, legal staff and other technical staff. The Fellow's mentors, Steven Goldbeck and Sara Polgar, will ensure that the Fellow is exposed to all of BCDC's staff research and planning work on climate change. The Fellow will review and attend meetings on the various climate change initiatives. Principal among these are BCDC's adaptation planning for the Bay and the climate change work of the Joint Policy Committee (JPC).

During the orientation period, the Fellow will also work with the mentors to develop a detailed workplan to accomplish the objectives of the project. Climate change planning is such a rapidly evolving field that the Fellow's work program may best be focused at the outset of the program on the most critical issues and initiatives facing the Bay.

**Background Research and Needs Assessment.** The Fellow will undertake research regarding climate change impacts and adaptation strategies relating to the Bay. The Fellow will review existing literature (including journal articles and white papers) and conduct interviews with BCDC and CCC staff, staff of other agencies and organizations, and other technical experts. The purpose of this research exercise is to familiarize the fellow with the latest scientific, policy and management information available that has application to the Bay. The research effort will also explore adaptation and management strategies developed elsewhere and their potential application or relevance in the Bay. The Fellow will also conduct a survey of local jurisdictions, including counties, cities, water districts, flood control districts and others to assess their needs for climate change adaptation planning.

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**Coordination / Liaison.** The Fellow will play a key role in identifying and helping coordinate the efforts of BCDC and CCC agencies and other organizations involved in climate change response. The Fellow will be expected to work closely and cooperatively with the climate change Fellow at the CCC on this aspect of the project. Some of the key agencies/projects include:

- (1) Ensuring that both the BCDC and CCC are aware of each other's activities and are working cooperatively, wherever possible, to organize a coordinated response to climate change on the California coastal zone;
- (2) Assisting inter-agency coordination for refinement and implementation of the State Adaptation Strategy;
- (3) Working with the Estuary Project and USEPA on next steps regarding the Climate Ready Estuaries adaptation plan;
- (4) Coordinating with the JPC (described below) on climate change activities and;
- (5) Supporting local governments' efforts to plan for and address climate change on the Bay and shoreline within their jurisdictions;

Coordination may include organizing meetings, workshops, and/or forums to share information and discuss opportunities for a collaborative approach to integrating management tools for climate change response into the various efforts and projects.

**Analysis.** Based on the results of the Fellow's work and data collection, and with guidance and support from the mentors, the BCDC climate team and other technical advisors, the Fellow will assess the scientific, policy and regulatory issues affecting adaptation to sea level rise and climate change, in San Francisco Bay. The Fellow will synthesize this research into a report that prepares an approach for developing local government assistance materials for dissemination on the website and at several training forums with local government officials. Because there are multiple areas of study regarding climate change, and the fact that the field is changing rapidly, the analysis will be structured around those factors that are deemed by the mentors, the Fellow and BCDC's climate team to be the most beneficial to BCDC's adaptation planning efforts.

**Recommendations.** Based on the results of the analysis, the Fellow will be responsible for developing a set of recommendations for (1) ensuring better coordination between BCDC and the CCC on climate change adaptation efforts; and (2) measures to better equip and organize local governments to respond to climate change impacts to their shorelines. The Fellow may also be involved in the climate team's recommendations for changes to BCDC's laws, policies and/or practices needed for a comprehensive climate change adaptation approach, including recommendations on climate change adaptation tools, and recommendations to promote the integration of the various efforts of local, state, regional and federal agencies. The Fellow will be responsible for presenting his/her recommendations to BCDC staff and the Commission, as well as to other agencies and organizations, if appropriate.

## **V. Fellow Mentoring**

The BCDC Coastal Fellow will be mentored by Steven Goldbeck, Deputy Director for Climate Change and Legislation, and Sara Polgar, Coastal Planner. By providing a co-mentorship, the Coastal Fellow will have opportunities to learn about both the planning and implementation for climate change. The Coastal Fellow will also gain experience in regional planning for climate change and how those plans would be implemented on a project specific level. BCDC has an interdisciplinary staff climate team who will also be able to work closely with the Coastal Fellow.

Steve Goldbeck oversees the staff climate change program and has been working at BCDC for over two decades. Steve has developed and implemented major policy initiatives, including the interagency Long Term Management Strategy for Placement of Dredged Material in the San Francisco Bay Region, landscape scale wetlands restoration and written state legislation. Sara Polgar is responsible for outreach to local governments regarding climate change and has herself been a NOAA fellow, developing a Water Trail plan for the Bay.

The Coastal Fellow will be welcomed at the staff level in BCDC's offices and will interact with the Commission staff as a colleague and an integral part of the staff's climate team. The Coastal Fellow will also be expected to meet with other agency representatives to gain an understanding of the different resource and regulatory functions and issues affecting the Bay. In addition, developing an understanding of the industrial use of the Bay will likely require meeting with industry representatives. During the beginning stages of the project, the mentors will likely attend meetings with the Coastal Fellow, but as the work progresses, more independent work will be expected. The mentors will be available to provide training, guidance, and professional contacts as needed during the life of the fellowship.

## **VI. Project Partners**

San Francisco Bay is managed by a number of agencies, including federal, state, and local organizations. BCDC is partnering with multiple agencies to address climate change and the Fellow will be working with many of them.

**California Coastal Commission (CCC).** The CCC will be a key partner for the climate change work, and the BCDC fellow will work closely with the CCC fellow on climate change issues, particularly on providing tools and outreach to local government regarding climate change. This will provide an invaluable opportunity to work with and gain the perspective of both of California's coastal management agencies.

**United States Environmental Protection Agency (USEPA).** Currently, the Commission and the San Francisco Estuary Project are working with USEPA on a Climate Ready Estuaries pilot program for the Bay. This is intended to provide a model for how the nation's estuaries should assess vulnerability and prepare adaptation plans. The fellow will help participate in the CRE as it finalizes an adaptation plan for the Bay and considers next steps.



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**State of California Ocean Protection Council (OPC) and Coastal Conservancy.** The OPC provides policy guidance for protection and management of the California coast and ocean, and has taken a lead role for preparing the coastal sector of the state adaptation strategy. The Conservancy is actively working towards habitat restoration for San Francisco Bay, funding and overseeing projects in areas beyond the Bay edge, and up into the watershed and is refocusing its efforts in light of climate change impacts.

**Joint Policy Committee.** the JPC is a joint effort of the Association of Bay Area Governments, the Metropolitan Transportation Commission, the Bay Area Air Quality Management District, and BCDC to coordinate planning in the region and better align the activities of the member agencies. The Fellow will be working with the JPC on improving and maintaining the web site for climate change adaptation planning tools.

#### **VII. Cost Share Description**

The San Francisco Bay Conservation and Development Commission will provide the required annual \$7,500 cash match through BCDC's regular annual budget, provided from the state of California's general fund. In addition, BCDC will provide in-kind services including office space, computer equipment, telephone, supplies, training, and mentoring.

#### **VIII. Thematic Area**

The proposed project addresses many of the thematic areas, but is most focused on thematic area "e," *Projects that provide economic, social science, and spatial data and tools, or support collaborative efforts to support the following:* and the specific following category of climate change adaptation.

The Fellow's work will also help improve decision-makers understanding of resilience concepts and applications (thematic area "c"), promote ecosystem-based management as a key approach to addressing resilience and planning for climate change (thematic area "g"), as well as other thematic areas.