

COASTAL CONSERVANCY

Staff Recommendation
January 19, 2012

MONTEREY BAY SEA LEVEL RISE VULNERABILITY ASSESSMENT

Project No. 11-066-01
Project Manager: Rachel Couch

RECOMMENDED ACTION: Authorization to disburse up to \$100,000 to the Monterey Bay Sanctuary Foundation for a Monterey Bay shoreline sea level rise vulnerability study.

LOCATION: Monterey Bay, Santa Cruz and Monterey Counties

PROGRAM CATEGORY: Integrated Coastal and Marine Resources Protection

EXHIBITS

- Exhibit 1: [Project Location and Site Map](#)
 - Exhibit 2: [Coastal Regional Sediment Management Plan](#)
 - Exhibit 3: [Southern Monterey Bay Coastal Erosion Workgroup participant list](#)
 - Exhibit 4: [Project Letters](#)
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RESOLUTION AND FINDINGS:

Staff recommends that the State Coastal Conservancy adopt the following resolution pursuant to Section 31220 of the Public Resources Code:

“The State Coastal Conservancy hereby authorizes the disbursement of up to one hundred thousand dollars (\$100,000) to the Monterey Bay Sanctuary Foundation (MBSF) for preparation of a study to assess the vulnerability of Monterey Bay communities from potential future impacts of sea level rise, subject to the condition that prior to disbursement of funds, the MBSF shall submit the following for the review and approval of the Executive Officer of the Conservancy (Executive Officer):

1. A work program, including budget and schedule;
2. Evidence that MBSF has secured all of the remaining funds needed to complete the study.”

Staff further recommends that the Conservancy adopt the following findings:

“Based on the accompanying staff report and attached exhibits, the State Coastal Conservancy hereby finds that:

1. The proposed project is consistent with the current Project Selection Criteria and Guidelines.
 2. The proposed project is consistent with the purposes and objectives set forth in Chapter 5.5 of Division 21 the Public Resources Code (Section 31220) regarding enhancement of coastal resources.
 3. Monterey Bay Sanctuary Foundation is a non-profit organization existing under Section 501(c)(3) of the U.S. Internal Revenue Code, and whose purposes are consistent with Division 21 of the Public Resources Code.”
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PROJECT SUMMARY:

The proposed project would provide a \$100,000 grant to the Monterey Bay Sanctuary Foundation (MBSF) to work with local communities to assess the area’s vulnerability to potential future impacts of sea level rise in Monterey Bay.

Monterey Bay is an extremely valuable economic and environmental resource along California’s central coast.¹ A large portion of the Monterey Bay shoreline is currently experiencing coastal erosion which is expected to be exacerbated by accelerated sea level rise. In fact, the highest documented erosion rates in the state can be found along the southern Monterey Bay shoreline. Even without consideration of projected increases in sea level rise over the next 50 years, the coastal dunes of southern Monterey Bay between the Salinas River mouth and Wharf II in Monterey are eroding at rates between 1.0 and 6.0 ft/year.

All along the State’s shoreline, coastal erosion has led to increased pressure to protect both private homes and public infrastructure with various types of coastal protection structures such as seawalls and revetments, collectively referred to as coastal armoring. This erosion and attempts to mitigate it through armoring can result in permanent loss of beach and dune habitat and detrimental impacts to biological resources, local economies, recreation, and public safety. The potential threats to coastal structures and communities from coastal erosion, as well as potential cumulative environmental impacts of using coastal armoring structures to address it, has been of growing concern among the municipalities, regulatory agencies and other stakeholders within the Monterey Bay National Marine Sanctuary (the Sanctuary).

The proposed project will assess potential future impacts from sea level rise for the Monterey Bay region. The project will estimate the extent of future coastal erosion in Monterey Bay due to accelerated sea level and evaluate areas subjected to coastal flooding by inundation from wave action and/or storm surges. The project will update and refine existing Monterey Bay coastal hazard zones maps (erosion and flooding), utilizing the methodology developed for the Pacific Institute and Ocean Protection Council² (Revell, et al. in press) that formed the technical basis

¹Monterey Bay Marine Sanctuary is the largest marine sanctuary on the west coast covering 5,328 nmi². National Academy of Sciences *Marine Protected Areas: Tools for Sustaining Ocean Ecosystems* 156 (2001).

² PWA, 2009; California Coastal Erosion Response to Sea Level Rise - Analysis and Mapping, Prepared for the Pacific Institute with funding from the Ocean Protection Council. March 11, 2009, available at

for the 2009 study, *The Impacts of Sea Level Rise on the California Coast*. Current estimates and maps have relied on best available statewide datasets, which lack the resolution useful for local planning needs. The project will demonstrate a pilot project to meet the statewide need for a downscaled sea level rise vulnerability assessment methodology that can be used for local land use planning purposes in other regions. The project will assess future coastal hazard zones for multiple sea level rise scenarios and multiple planning horizons (e.g. 2030, 2050, and 2100).

Project guidance and technical input will be provided by the Southern Monterey Bay Coastal Erosion Workgroup (SMBCEW), which was formed by the Sanctuary to develop a regional shoreline management plan for the Southern Monterey Bay, including identification of potential site specific and sub-regional alternatives for addressing coastal erosion. SMBCEW includes representatives from a wide variety of public and private entities (see list of participants in Exhibit 3). For the purposes of this study, the SMBCEW will be expanded to include input from northern Monterey Bay (Santa Cruz County and surrounding cities). The SMBCEW has identified issues that will serve to frame not only the discussion of the southern portion of the Bay, but the entire regional effort.

The Monterey Bay Sanctuary Foundation (MBSF) was established in 1995 and focuses efforts on education, research, and resource protection of the Sanctuary. The MBSF collaborates with the National Marine Sanctuary Program and other ocean and coastal management agencies, acting as a fiscal sponsor to implement projects to aid in the understanding and protection of the Monterey Bay. MBSF is uniquely qualified to carry out the project, given its close affiliation with the Sanctuary.

Site Description: Monterey Bay is located on the central California coast, south of the San Francisco Bay, extending north to south from the City of Santa Cruz to the City of Monterey (Exhibit 1). The proposed work is focused on the coastline from Año Nuevo in Northern Santa Cruz County to Point Lobos in Monterey County, and includes a combination of dunes, inlets, and rocky seacliffs found along the shoreline. Monterey Bay is acclaimed worldwide for its natural beauty, diversity and abundance of plant communities and wildlife. It is part of NOAA's Monterey Bay National Marine Sanctuary (the Sanctuary), which was designated by U.S. Congress in 1992 in order to provide federal protection to this pristine and highly productive marine ecosystem.

Monterey Bay is located adjacent to two counties, Monterey and Santa Cruz. Together, these counties have a population in excess of 700,000. The vast majority of the population in these counties lives within ten miles of the coast. Tourism is a \$2 billion industry in the region, second only to agriculture. Monterey Bay, the Santa Cruz Mountains and the Pacific Coast Highway are the principal tourist draws to the region.

Although the Monterey Bay Sanctuary shoreline in general is not heavily developed, there are eight oceanfront facilities considered to be at high risk from erosion over the next fifty years that will require mitigation measures to be implemented to prevent their loss². One example of the erosion problem can be seen in the Monterey Interceptor, the pipeline that carries all of the raw sewage from the Monterey Peninsula to the treatment plant near the center of the Bay.

| <http://www.energy.ca.gov/publications/displayOneReport.php?pubNum=PWAOPC-1000-2009-013> (last visited on December 13, 2011).

Constructed partly with EPA Clean Water Act funds in the 1970s, portions of this critical infrastructure run below the beach and if undermined could result in a significant threat to marine resources and public welfare and safety. Other structures under threat from erosion include beachfront hotels, condominiums, private residences, parts of scenic Highway 1, and wastewater pump stations associated with the Monterey Interceptor.

Project History: An increase in proposals over the last decade to build coastal armoring structures to protect private and public development under imminent threat has been a growing concern for the Sanctuary and California Coastal Commission (CCC) staff, as these structures can result in several detrimental impacts including: interfering with natural sediment transport processes which supply sand to our beaches; causing a phenomenon called passive erosion which will ultimately result in loss of public beach in front of the structure; obstructing public access, and causing alterations to biological communities. SMBCEW has been working since 2005 toward the development of a shoreline management plan to manage and mitigate the impacts of coastal erosion and adapt to the increased rates of sea level rise that are expected in the future due to climate change. The MBSF has been instrumental in supporting these efforts.

Coastal hazards related to sea level rise and climate change have been identified as an important component to the shoreline management plan by the City of Santa Cruz, City of Capitola, the City of Monterey and the SMBCEW. These agencies recognized that in order to develop useful climate adaptation plans and projects at the regional or local level, downscaled information and modeling for use in projecting future flood and erosion estimates is needed.³

The Conservancy was approached by the Sanctuary in 2009 with a request to fund the project. The Sanctuary initially planned to complete the vulnerability assessment for Southern Monterey Bay only. Matching funds were sought from local agencies in 2010 and secured in 2011. The project attracted the interest of communities with shoreline erosion issues in Santa Cruz County, and its scope was ultimately expanded to include the entire Monterey Bay.

PROJECT FINANCING

Coastal Conservancy	\$100,000
City of Capitola	\$20,000
Packard Foundation	<u>\$25,000</u>
Total Project Costs	\$145,000

The anticipated source of funds is an appropriation to the Conservancy from the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Proposition 84). Proposition 84 authorizes the use of these funds for the protection of beaches, bays and coastal waters and watersheds (Section 75060 of the Public Resources Code). Section 75060(b) specifically allocates funding to the Conservancy for expenditure pursuant to the Conservancy's enabling legislation, Division 21 of the Public Resources Code. The proposed project will protect coastal resources by assisting coastal communities to plan for and

³ A pilot study using models to show the economic impacts of coastal flooding and storm surge damage was done by an intern in 2008. Stephen Crook, *Estimating the Economic Impacts of Coastal Hazards and Climate Change in the Low Elevation Coastal Zone of the Monterey Bay*, available at: <http://www.mbari.org/education/internship/08interns/08papers/Crook.pdf> (last visited December 13, 2011).

adapt to the impacts of climate change. As discussed in the section below, the project is consistent with Chapter 5.5 of Division 21 of the Public Resources Code.

Matching funds for the project will be contributed by the City of Capitola and the Packard Foundation through the Natural Capital Project.⁴ In addition to these financial contributions, in-kind contributions in the form of staff resources of the grantee and partnering agencies will be extensive, through project review, provision of necessary data, and participation on the SMBCEW, which will serve in a technical advisory capacity. Agencies that will provide significant in-kind staff time contributions include: the Sanctuary, City of Capitola, County of Santa Cruz, City of Monterey, County of Monterey, CSU Monterey Bay, and the Association of Monterey Bay Area Governments.

CONSISTENCY WITH CONSERVANCY'S ENABLING LEGISLATION:

This project would be undertaken pursuant to Chapter 5.5 (Section 31220) of the Conservancy's enabling legislation, Division 21 of the Public Resources Code, regarding integrated coastal and marine resources protection. Section 31220(a) authorizes the Conservancy to undertake and award grants for projects that meet one or more criteria of Section 31220(b). Consistent with Section 31220(b), the proposed project aims to achieve the following objective: reduces the impact of population and economic pressures on coastal and marine resources and provides for projects and activities consistent with the Ocean Protection Act. Section 35650(J) of the Public Resources Code authorizes funding for adaptive management, planning, coordination, monitoring, research, and other necessary activities to minimize the adverse impacts of climate change, including, but not limited to, the effects of sea level rise.

Section 31220(c) requires that some projects funded under Section 31220 be consistent with the Integrated Watershed Management Program established under Section 30947, local watershed management plans, if available, and water quality control plans adopted by the State Water Resources Control Board and regional water quality control boards; and include a monitoring and evaluation component. As discussed in detail below under "Consistency with Local Watershed Management Plan/State Water Quality Control Plan," the proposed project is consistent with local and state watershed plans. In addition, the project includes a monitoring and evaluation component. Although not required by Section 31220(a) for this particular project, staff has notified the State Water Resources Control Board of the nature of the project and provided the opportunity for comment, input and review.

CONSISTENCY WITH CONSERVANCY'S 2007 STRATEGIC PLAN GOAL(S) & OBJECTIVE(S):

Consistent with **Goal 6, Objective G** of the Conservancy's 2007 Strategic Plan, the proposed project will assist in the development of a regional approach to the management of shoreline erosion and sediment management for the Monterey Bay region.

4 For information about the Natural Capital Projects see: <http://www.naturalcapitalproject.org/about.html> (last visited on December 19, 2011).

CONSISTENCY WITH CONSERVANCY'S PROJECT SELECTION CRITERIA & GUIDELINES:

The proposed project is consistent with the current Conservancy's Project Selection Criteria and Guidelines in the following respects:

Required Criteria

1. **Promotion of the Conservancy's statutory programs and purposes:** See the "Consistency with Conservancy's Enabling Legislation" section above.
2. **Consistency with purposes of the funding source:** See the "Project Financing" section above.
3. **Support of the public:** The project has the support of state and elected officials including Congressman Sam Farr, State Senators Sam Blakeslee and Joe Simitian, Assemblymember Bill Monning, and numerous local jurisdictions, including the City of Capitola, City of Monterey, City of Santa Cruz, academic institutions, and environmental groups (Exhibit 4).
4. **Location:** The proposed project would be located within the coastal zone of Santa Cruz and Monterey Counties.
5. **Need:** While the MBSF has obtained in-kind commitments and matching funds from public agencies and partnering organizations, Conservancy assistance is critical to enable the vulnerability assessment to move forward.
6. **Greater-than-local interest:** The environmental and economic resources of Monterey Bay are of statewide importance. In addition, the project will serve to demonstrate a method for downscaling sea level rise vulnerability assessment information so that it can be used by local planners in the project region and as a model throughout California.
7. **Sea level rise vulnerability:** The project will create a methodology and products (including geographic information system data layers and maps) estimating a range of projected future hazard zones along the Monterey Bay shoreline. This information will be used by future projects in this region and the resulting methodology can be transferred to other regions needing to conduct downscaled sea level rise vulnerability assessments.

Additional Criteria

8. **Urgency:** This project is urgently needed to provide local jurisdictions with a path forward in planning for sea level rise. The current statewide projections of sea level rise and coastal erosion are based on best available statewide data and were expressly not intended for use by local planners.
9. **Leverage:** See the "Project Financing" section above.
10. **Innovation:** This project will move the science forward for conducting sea level rise vulnerability assessments at the regional level and provide a regional model for other governments poised to do sea level rise planning studies. It also relies on a unique collaborative approach incorporating input from local municipalities, infrastructure managers, resource management agencies, scientific researchers and technical experts.

11. **Readiness:** The MBSF has demonstrated that it has the expertise, local public support, and administrative capability necessary to commence the project in 2012.
12. **Cooperation:** The project is supported by the SMBCEW comprised of approximately 20 federal state and local agencies and jurisdictions, academic institutions, NGOs and private interests in the region. The SMBCEW will be expanded to include other local jurisdictions and technical experts in Santa Cruz County to provide review and input to the project.

CONSISTENCY WITH LOCAL COASTAL PROGRAM POLICIES:

The proposed project is consistent with the certified Local Coastal Program of Monterey County. The Monterey County Local Coastal Program is composed of four LUPs, including the unincorporated section of southern Monterey Bay between the City of Marina northern boundary and Moss Landing, which is part of the North County LUP. Section 2.1 of the North County LUP describing resource management issues, states that the LUP's policies "are intended to protect the vast resources of this area through sensitive and responsive land use, development, and conservation". Specifically, the key policy in Section 2.3.1 states, "The environmentally sensitive habitats of North County are unique, limited, and fragile resources of statewide significance, important to the enrichment of present and future generations of county residents and visitors; accordingly, they shall be protected, maintained, and, where possible, enhanced and restored." General Policy 1 of Section 2.4.2 states that, "further alteration of natural shoreline processes including drainage, erosion, water circulation, and sand transport, shall be limited to protection of public beaches, existing significant structures, coastal dependent development, and the public health and safety." The project will provide tools, data and maps to help local agencies plan for potential impacts of sea level rise to the Monterey Bay shoreline, especially those related to flooding and erosion hazard risks.

The proposed project is also consistent with the certified Local Coastal Program of Santa Cruz County. Objective 2.23 pertaining to land use conservation of coastal land resources calls for ensuring "balanced utilization and conservation of coastal zone resources, taking into account the social and economic needs of the people of Santa Cruz County." Objective 5.2 pertaining to riparian corridors and wetlands calls for the preservation, protection, restoration of all riparian corridors and wetlands for the protection of wildlife and aquatic habitat, water quality, erosion control, open space, aesthetic and recreational values and the conveyance and storage of flood waters. Objective 5.3 addressing aquatic and marine habitats calls for identification, preservation and restoration of aquatic and marine habitats, maximization of scientific research and education which emphasizes comprehensive and coordinated management consistent with the mission of the Sanctuary, and facilitation of multiple use and recreation opportunities compatible with resource protection. The results of this study will be immediately useable and useful for land use planning and conservation of coastal and marine resources in the region.

CONSISTENCY WITH LOCAL WATERSHED MANAGEMENT PLAN/ STATE WATER QUALITY CONTROL PLAN:

Projects undertaken pursuant to Chapter 5.5 of Public Resources Code Division 21 (Section 31220) must be consistent with local watershed management plans, if available, and with water quality control plans, adopted by the state and regional water boards.

The Water Quality Control Plan for the Central Coastal Basin adopted by the Regional Water Quality Control Board designates several beneficial use objectives for Monterey Bay. Information gathered for the project will lead to the protection of coastal and wetland habitats, thereby furthering the following designated beneficial uses for the Bay: marine habitat, warm and cold fresh water habitat, wildlife habitat; rare, threatened or endangered species; preservation of biological habitats of special significance; estuarine habitat; migration of aquatic organisms; and spawning habitat.

The project is also consistent with the 2008 Coastal Regional Sediment Management Plan for the Southern Monterey Bay (CRSMP). The CRSMP provides baseline information and a subset of regional recommendations for sediment management that address sediment imbalances aggravating coastal erosion. The CRSMP focuses primarily on sand management and mitigation of shoreline erosion, and forms part of the solution to broader shoreline and coastal zone management challenges. The project will provide much needed information and maps that will be amended to the current CRSMP.

Four separate Integrated Regional Water Management Plans cover the Monterey Bay region: Northern Santa Cruz County, Pajaro Watershed, Greater Monterey County, and Monterey Peninsula, Carmel Bay, and Southern Monterey Bay. The proposed project will provide useable information to all of these plans, given the state requirement that plans and projects funded under the Proposition 84 funding round consider climate change impacts.

The project is also consistent with the *Coastal Armoring Action Plan* (CAAP), which is part of the Monterey Bay National Marine Sanctuary, *Final Management Plan*. Strategy CA-1 of the CAAP calls for identifying existing information and data gaps and compiling and producing necessary scientific data and evaluation tools. Activities 1.1-1.3 call for production of MBNMS-wide maps and database for use as planning and permit review tools, compilation and analysis of ecological and socioeconomic data, incorporation of data into State programs, specifically the State's *Coastal Sediment Management Master Plan*. The project will provide the necessary technical analysis needed to estimate future erosion rates and facilitate site level and regional planning for the effects of projected sea level rise in the Monterey Bay region.

COMPLIANCE WITH CEQA:

The proposed project is statutorily exempt from the California Environmental Quality Act (CEQA), pursuant to Chapter 14 of the California Code of Regulations Section 15262. Consistent with Section 15262, the project will only involve preparation of feasibility or planning documents, specifically a vulnerability assessment, and will consider environmental factors. Upon approval, staff will file a Notice of Exemption for this project.