



CALIFORNIA OCEAN PROTECTION COUNCIL

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Item 4

Brief summary of projects under consideration by the Ocean Protection Council at the October 17, 2016 Council meeting

Please refer to the staff recommendations posted to the OPC website for additional details about the projects: <http://www.opc.ca.gov/2016/09/ocean-protection-council-meeting-monday-october-17-2016/>

I. CLIMATE CHANGE

Ocean Acidification and Hypoxia

- 4a: Advance integrated modelling of California's coastal ocean to inform ocean acidification and hypoxia policy
- 4b: Potential seagrass buffering of Humboldt Bay to ocean acidification and implication for aquaculture industry and hatchery and eelgrass managers
- 4c: Seagrasses' ability to ameliorate estuarine acidification
- 4d: Revision of Ocean Acidification and Hypoxia Water Quality Criteria
- 4e: MPA effectiveness and ecological responses in the face of changing ocean conditions
- 4f: Inventory of ocean acidification and hypoxia hotspots

Sea-level Rise

- 4g: SLR1: Develop Sea-level Rise and Coastal Hazard Maps for the Central Coast to Inform Climate Vulnerability Assessments, and Conduct Statewide Shoreline Change Rate Update & "Our Coast, Our Future" Online Viewer for the Central Coast
- 4h: OPC-Science Advisory Team (SAT) Working Group to Summarize Best Available Science on Sea-level Rise

Sediment Management

- 4i: CSM1: Planning Phase for the Pilot Surfer's Beach Restoration Project
- 4j: Assessment of Significant Sand Resources in Federal and State Waters

II. MPAs

- 4k: Marine Protected Areas Collaborative Network Small Grants Program
- 4l: Marine Protected Area Signage – Round 2

III. MARINE POLLUTION

- 4m: Ocean Protection Council Ocean Litter Strategy Update and Expansion
- 4n: Dungeness Crab Fishing Gear Working Group Coordination and Projects
- 4o: Creating an Unpackaged Community in the Bay Area

IV. SUSTAINABLE FISHERIES

- 4p: Guidance for Building and Using Socioeconomic Essential Fishery Information

I. CLIMATE CHANGE

Ocean Acidification and Hypoxia

4a: Advance integrated modelling of California's coastal ocean to inform ocean acidification and hypoxia policy (up to \$1,100,000)

The overarching goal of this project is to advance and enhance integrated modeling of the California Current System in order to understand the effects of ocean acidification and hypoxia on food webs and the nearshore environment, and quantify the extent to which local sources are exacerbating ocean acidification and hypoxia.

4b: Potential seagrass buffering of Humboldt Bay to ocean acidification and implication for aquaculture industry and hatchery and eelgrass managers (up to \$650,000)

The overarching goals of this project are to advance understanding of the dynamics of ocean acidification along the open coast of the California Current System and within Humboldt Bay; to establish a bay-wide eelgrass monitoring program within Humboldt Bay to ensure that significant changes in its distribution or abundance are detected; and to contribute insight valuable to the operation and development of aquaculture and the management of eelgrass in Humboldt Bay.

4c: Seagrasses' ability to ameliorate estuarine acidification (up to \$650,000)

The overarching goal of this project is to quantify seagrass effects on estuarine acidification in natural and restored seagrass beds across California, and to assess where seagrass restoration and conservation can be applied to ameliorate local ocean acidification.

4d: Revision of Ocean Acidification and Hypoxia Water Quality Criteria (up to \$400,000)

The overarching goal of this project is to initiate a revision of ocean acidification and hypoxia (OAH) water quality criteria. The project will fund two workshops, an academic advisory committee to plan and implement those workshops, and a post-doctoral scholar who will assist an academic advisory committee by preparing state of the science review documents prior to the workshops and the consensus products that develop from the workshops.

4e: MPA effectiveness and ecological responses in the face of changing ocean conditions (up to \$310,000)

This project would contribute to interpreting the effectiveness of the MPA network in California, as well as assess how MPAs build resilience to ocean acidification through using the citizen science framework established by Reef Check California (RCCA) to:

- 1) Co-locate high resolution monitoring of OAH with ongoing ecological monitoring efforts to allow better interpretation of MPA effectiveness and ecological responses to global change;
- 2) Assess the scales at which low-cost 'snapshots' of ocean temperatures and dissolved oxygen characterize more permanent differences among sites and regions;
- 3) Engage local citizen scientists in ongoing efforts to monitor OAH in California.

This project will add a global change research component to RCCA's ecological monitoring inside and outside of MPAs along the California coast at multiple spatial and temporal scales.

4f: Inventory of Ocean Acidification and Hypoxia Hotspots (up to \$75,000)

The overarching goal of this project is to conduct an inventory of ocean acidification and hypoxia (OAH) "hotspots" to target vulnerable species and ecosystems for management and policy action. This work will visualize the spatial dimensions of OAH hotspots along our coast, and overlay that on species and ecosystems of management concern in order to assist decision-makers and managers in identifying priority areas and/or species for management intervention.

Sea-level Rise

4g: Develop Sea-level Rise and Coastal Hazard Maps for the Central Coast to Inform Climate Vulnerability Assessments, and Conduct Statewide Shoreline Change Rate Update (\$up to 800,000) and “Our Coast, Our Future” Online Viewer for the Central Coast (up to \$150,000)

The goal of the USGS’s Coastal Storm Modeling System (CoSMoS) is to produce maps that show coastal flooding under different sea-level rise, storm, and shoreline change scenarios in order to deliver a single robust and consistent methodology and set of products for assessing coastal vulnerability to climate change across the entire outer coast of California, including all coastal embayments and harbors. The CoSMoS model has been completed for north-central California, the San Francisco Bay, and will be completed for southern California by the end of 2016. The gaps that remain for statewide CoSMoS coverage are the central coast (from Pt. Conception to Half Moon Bay), and northern California (north of Pt. Arena). CNRA contributed to funding the CoSMoS model for southern California, as well as funded 4 out of 40 total CoSMoS scenarios for the central coast through the 4th Climate Change Assessment. This project would complete the funding gap for the central coast (from Pt. Conception to Half Moon Bay, including populated areas such as Santa Cruz and Monterey), and would make the CoSMoS model available and applicable to central coast cities and counties that are conducting sea level rise vulnerability assessments and adaptation plans through Local Coastal Program (LCP) updates. This project would also update erosion rates (long term and short term) through supporting USGS to interpret LIDAR¹ topographic data – from 2015-2016 El Nino impacts. These erosion rates will feed into sea level rise vulnerability assessments that cities and counties are conducting. USGS would use the 2016 LIDAR flight to determine state-wide shoreline and cliff retreat due to this 2015-2016 El Nino, as well as update short and long-term shoreline and cliff retreat rates based on all the data collected in the last century.

The “Our Coast, Our Future” (OCOF) web tool is a collaborative, user-driven project that provides coastal resources managers and planners locally relevant, online maps and tools – based off of the CoSMoS model – to help understand, visualize, and anticipate vulnerabilities to sea level rise and storms. This project would build off of the CoSMoS model for the Central Coast by funding the development of the associated OCOF web tool for the Central Coast, which allows users to easily and intuitively interact with a complex dataset and up to 40 sea level rise and storm scenarios. In addition, the OCOF tool allows users to compare different sea level rise scenarios, which enables users to partition the impacts from sea level rise, storms and determine the different magnitudes of each. This project will also include extensive outreach and stakeholder engagement; this drives localized corrections, improved tool usability features and design enhancements. By using this adaptive development process, the OCOF tool builds regional and local buy-in from the user community. The sophisticated OCOF web tool will directly support the implementation of federal and state-supported climate change guidance as well as coastal vulnerability assessments, such as Local Coastal Program (LCP) updates in Central California.

4h: OPC-Science Advisory Team (SAT) Working Group to Summarize Best Available Science on Sea-level Rise (up to \$250,000)

This project would support an OPC-Scientific Advisory Team (SAT) Working Group to summarize the best available science on sea-level rise, including recent ice melt research, to inform a 2017 update to the State of California Sea-level Rise Guidance Document. The SAT Working Group will coordinate with a Policy Advisory Group to develop recommendations for an update to the sea-level rise projections. Secondly, the SAT Working Group will develop a synthesis of the best available science to serve as an appendix to the Guidance Document. The sea-level rise projections in the current Guidance Document are based on the 2012 NRC report (which is based on scientific publications through 2010, and thus is representative of the best available science through 2010), which does include ice melt research;

¹ LIDAR: “light detection and ranging”, a remote sensing method that uses light to measure variable distances to Earth in order to generate 3-dimensional information about the shape of the Earth and its surface characteristics

however, it does not include recent ice melt research completed since that time. The Working Group will likely include ice melt scientists, extreme statistics experts, population dynamics experts, experts on decision-making under uncertainty, experts in sea-level rise probability distributions, as well as other identified experts.

Coastal Sediment Management

4i: Planning Phase for the Pilot Surfer's Beach Restoration Project (up to \$75,000)

The grant funding would be used to partially fund the Planning Phase of the Pilot Surfer's Beach Restoration Project (Project) being proposed by the San Mateo County Harbor District (District). The Project will address the significantly accelerated coastal erosion rates that have occurred on the bluffs and beaches adjacent to Pillar Point Harbor as a result of the construction of the East Breakwater approximately 55 years ago. Specifically, the proposed Project will address impaired public beach access/recreational impacts and damages to Highway 1 from coastal storms and erosion at Surfer's Beach. The proposed Project involves the placement of an estimated 75,000 cubic yards of sand on the beach. The sand will be acquired from a large deposit of sediment that has been trapped inside the East Breakwater of Pillar Point Harbor.

4j: Assessment of Significant Sand Resources in Federal and State Waters (up to \$256,000)

The OPC would fund the USGS to review and synthesize existing geological data and conduct surveys and sampling to map sand and gravel resources in marine settings in federal and state waters offshore California. These study areas could potentially provide sand resources to nearby "Beach Erosion Concern Areas" as identified by the California Coastal Sediment Management Workgroup's Beach Erosion Assessment Survey (CSMW, 2010) and California Regional Sediment Management Plans. The three study areas are: 1) San Francisco open coast, 2) Orange County coast, and 3) San Diego County coast.

The objective of this Sand Resource Assessment is to produce maps with the locations, thicknesses, and sediment grain-size information of sand and gravel deposits. Maps will be constructed using a combination of new and existing information, including high-resolution bathymetry, seafloor characteristics derived from side-scan sonar, sub-bottom geophysical surveys, seafloor sediment grab samples, and sediment cores. The USGS will conduct new surveys and coring to fill gaps in existing data.

It is important to note that, continental shelf sand resources may be utilized to rebuild beaches and assist coastal recovery from acute events such as El Nino-related storms as well as chronic erosion from currents, wave activity, tides, sea-level rise and human interventions that have impeded natural sediment transport along the coast. These sand resources may exist within either federal or California state jurisdiction, and several sand deposits may extend across these jurisdictional boundaries.

MPAs

4k: Marine Protected Areas Collaborative Network Small Grants Program (up to \$294,000)

Literature identifies social capital as a key element in the success of MPAs worldwide. In California, the 14 local Collaboratives have the potential to continue to build and expand stewardship of the network but currently have no long term funding. This project would help create a charter for the Collaboratives and support a small grant program that is administered in one funding cycle, funding local Collaboratives through small grants of up to \$10,000. Creating a charter will help formalize the partnership between the Collaborative Network and the state. The small grants may fund projects similar to the following: create non-tear waterproof maps that show local MPA boundaries and regulations for anglers; MPA locally focused educational video to be distributed to hotels and conference center to run on one of their loop screens; MPA ambassadors program where staff from whale watching, kayak and other marine recreational business attend a short training on MPAs and commit to sharing what they have learned with customers and displaying an MPA ambassador sticker in their windows; development of MPA app that shows you in real time where you are in relation to the boundary and teaches you about

MPAs. The Collaboratives further OPC goals by creating county-wide consistency in outreach messaging, educational guidelines, and enforcement protocols, reviewed and approved by California Department of Fish and Wildlife (CDFW).

4l: Marine Protected Area Signage – Round 2 (up to \$350,000)

In 2014, 199 regulatory and educational MPA signs were designed, sited, permitted and installed throughout the state, and a gap analysis was performed that identified 190 priority locations for additional signs that mark entry points to MPAs and detail the associated regulations for the MPA. Lack of posted regulations makes it nearly impossible to prosecute violators successfully and misses the opportunity to educate the public about the MPA network. This project would install 190 MPA signs across the state.

MARINE POLLUTION

4m: Ocean Protection Council Ocean Litter Strategy Update and Expansion (up to \$20,000):

OPC is working with NOAA Marine Debris Program (NOAA) staff to update and expand the OPC Strategy to Reduce and Prevent Ocean Litter (Strategy), which is a 2008 document that outlines priorities for the State on marine debris and plastic pollution. The update and expansion process for this document is intended to be driven by stakeholder input and inclusive of the broad range of viewpoints and potential solutions to ocean litter. The process is intended to include stakeholders from industry, conservation organizations, researchers, local government, state government, and federal government. This project would fund the Regents of the University of California, San Diego (California Sea Grant) to conduct the initial phase of this process, which includes, working with OPC staff and other interested parties prepare a discussion draft of the update, and holding a workshop to receive stakeholder input on the draft Strategy. NOAA will fund the second phase of this process which includes incorporating revisions, finalizing the Strategy and bringing together stakeholders and agencies to commit to implementing identified actions by a specified timeframe.

4n: Dungeness Crab Fishing Gear Working Group Coordination and Projects (up to \$200,000):

To gain a better understanding of the problem of increasing whale entanglements in Dungeness crab fishing gear off California, the OPC and other agencies convened the Dungeness Crab Fishing Gear Working Group (Working Group). OPC funding for this project would go to The Nature Conservancy to support expansion of ongoing whale disentanglement trainings for commercial and recreational fishermen, survey flights that can efficiently record gear and fishing effort distribution, innovative uses of enhanced reporting technologies such as electronic monitoring programs to determine crab gear distribution and density, pilot projects to research a range of gear modifications, assessments of the impacts of voluntary measures taken by the fleet, and facilitation and coordination of expanded Working Group meetings.

4o: Creating an Unpackaged Community in the Bay Area (up to \$400,000):

Single-use disposable packaging makes up a large proportion of the trash found in waterways and the ocean. In response to the high levels of packaging litter, the Clean Water Fund created the ReThink Disposable program (which won the 2015 Governor's Economic and Environmental Leadership Award) to demonstrate to businesses how to save money and reduce their reliance on disposable items at the same time. This project would fund Clean Water Fund to focus the ReThink Disposable program in one local jurisdiction to create a model community where: 80 to 100 local food businesses would become ReThink Disposable certified, a significant number of corporate campuses would change their model to reduce the use of targeted disposable items by 40-50%, and local government purchasing would follow ReThink Disposable's best practices. Public engagement would be a key part of this project to increase the visibility of the program and encourage other communities to adopt the ReThink Disposable model for their own use.

SUSTAINABLE FISHERIES

4p: Guidance for Building and Using Socioeconomic Essential Fishery Information (up to \$45,000)

This proposed project has the potential to improve the management of California's fisheries. This work will provide guidance on how to incorporate socioeconomic considerations into fisheries management. Specifically, this project will develop guidance for CDFW regarding the key questions and information needs that should be considered in managing California fisheries, the collection, synthesis and analysis of pertinent socioeconomic data, and the integration of this information into the fishery management decision process. This guidance would be used by CDFW to inform its development of the MLMA Master Plan Amendment.