



Staff Recommendation
February 16, 2021

Consideration of Authorization to Disburse Funds for Marine Protected Area (MPA) Long-Term Monitoring and Data Analysis in Support of the 2022 Adaptive Management Review

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RECOMMENDED ACTION: Authorization to disburse up to \$5,805,500 to support marine protected area (MPA) long-term monitoring and data analysis in support of the 2022 adaptive management review.

- 6.a. Up to \$5,305,500 to the Regents of the University of California San Diego/California Sea Grant to fund statewide academic research consortiums for continued ecological monitoring in 2021-2022, as described in 6.a.1- 6.a.4 below. Up to \$90,000 of this total will support Sea Grant's administration of these monitoring projects.
 - 6.a.1 Up to \$843,500 to the University of California (UC) Santa Cruz for rocky intertidal habitats;
 - 6.a.2 Up to \$1,835,500 to UC Santa Cruz for kelp forest/shallow rocky reef habitats;
 - 6.a.3 Up to \$1,735,500 to San Jose State University for deep rocky reef habitats;
 - 6.a.4 Up to \$801,000 to UC Santa Barbara for sandy beach/surf zone habitats;
- 6.b. Up to \$500,000 to the National Center for Ecological Analysis and Synthesis (NCEAS), based at UC Santa Barbara, to conduct analysis and synthesis of MPA monitoring data.

LOCATION: Statewide

STRATEGIC PLAN OBJECTIVE(S): Goal 3: Enhance Coastal and Marine Biodiversity; Target 3.3.1 and associated actions.

EXHIBITS:

Exhibit A: Letter(s) of Support

FINDINGS AND RESOLUTION:

Staff recommends that the Ocean Protection Council (OPC) adopt the following findings:

“Based on the accompanying staff report and attached exhibit(s), OPC hereby finds that:

- 1) The proposed projects are consistent with the purposes of Division 26.5 of the Public Resources Code, the Ocean Protection Act; and
- 2) The proposed projects are not ‘legal projects’ that trigger the California Environmental Quality Act (CEQA) pursuant to Public Resources Code section, section 15378.”

Staff further recommends that OPC adopt the following resolution pursuant to Sections 35500 *et seq.* of the Public Resources Code:

“OPC hereby approves the disbursement of up to \$5,805,500 to the following amounts to the following grantees to continue long-term marine protected area (MPA) monitoring projects and data synthesis and evaluation:

- Up to \$5,305,500 to the Regents of the University of California San Diego/California Sea Grant to fund statewide academic research consortiums for continued ecological monitoring in 2021-2022, as described below. Up to \$90,000 of this total will support Sea Grant’s administration of these monitoring projects.
 - Up to \$843,500 to the University of California (UC) Santa Cruz for rocky intertidal habitats
 - Up to \$1,835,500 to UC Santa Cruz for kelp forest/shallow rocky reef habitats
 - Up to \$1,735,500 to San Jose State University for deep rocky reef habitats
 - Up to \$801,000 to UC Santa Barbara for sandy beach/surf zone habitats
- Up to \$500,000 to the National Center for Ecological Analysis and Synthesis to conduct data synthesis and integrative analyses of MPA monitoring data.

This authorization is subject to the condition that prior to disbursement of funds, the grantees listed above shall submit for the review and approval of the Executive Director of the OPC detailed work plans, schedules, staff requirements, budgets, and the names of any contractors intended to be used to complete the projects, as well as discrete deliverables that can be produced in intervals to ensure the projects are on target for successful completion. All projects will be developed under a shared understanding of process, management and delivery.”

EXECUTIVE SUMMARY:

Staff recommends that OPC approve funding for continued ecological monitoring of California’s marine protected area (MPA) network in four key habitats: sandy beach/surf zone, rocky intertidal, kelp forest/shallow rocky reef, and deep rocky reef. Consistent with Target 3.1.1 of OPC’s [Strategic Plan](#)¹, this work will ensure continued data collection through the first decadal management review of California’s MPA network in 2022, and will

¹ [Strategic Plan to Protect California’s Coast & Ocean \(2020-2025\)](#)

minimize gaps in the long-term time series for MPA monitoring data. Building on previous funding from OPC, monitoring groups will continue to track priority ecological metrics (e.g. indicator species abundance, biomass, and diversity) both inside and outside MPAs. Additional support to California Sea Grant is recommended to continue the administration of the long-term monitoring projects.

Staff further recommends that the Council approve an MPA monitoring data analysis and synthesis project. Long-term monitoring project teams are currently working to address MPA performance evaluation questions outlined in California's [MPA Monitoring Action Plan](#)²; however, these efforts are largely focused on individual habitats. This project will integrate datasets and analyses to address broader-scale MPA performance evaluation questions. This work will be guided by the MPA Monitoring Action Plan and the recommendations of the [Decadal Evaluation Working Group](#)³, and will be undertaken in close coordination with long-term MPA monitoring PIs.

These projects will identify data gaps within the current monitoring framework in the near-term to inform the decadal review, as well as provide recommendations for the future of MPA monitoring and performance evaluation beyond the 2022 review. Together, these efforts will provide the state with critical information on MPA performance that will inform adaptive management of California's MPAs into the future, helping to ensure a successful management review of the MPA network in 2022 and contributing to broader state priorities such as sustainable fisheries and climate resilience.

PROJECT SUMMARY:

Acknowledging the importance of California's marine resources to the state's economy and ecological systems, the California Legislature passed the Marine Life Protection Act (MLPA) in 1999. This legislation required the state to design and implement a network of MPAs to meet the following six goals:

1. Protect the natural diversity and abundance of marine life, and the structure, function and integrity of marine ecosystems.
2. Help sustain, conserve and protect marine life populations, including those of economic value, and rebuild those that are depleted.
3. Improve recreational, educational and study opportunities provided by marine ecosystems that are subject to minimal human disturbance, and to manage these uses in a manner consistent with protecting biodiversity.
4. Protect marine natural heritage, including protection of representative and unique marine life habitats in CA waters for their intrinsic values.
5. Ensure California's MPAs have clearly defined objectives, effective management measures and adequate enforcement and are based on sound scientific guidelines.
6. Ensure the State's MPAs are designed and managed, to the extent possible, as a network.

² <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=161748&inline>

³ https://opc.ca.gov/webmaster/ftp/pdf/agenda_items/20190523/Item3d_OPC-SAT-Working-Groups-focusing-on-MPA-Science-Needs_FINAL.pdf

Guided by these goals, California has established a globally significant MPA network that consists of 124 individual MPAs and spans the state's entire 1,100-mile coastline. Management of the statewide MPA network is guided by the [2016 Master Plan for Marine Protected Areas](#)⁴ (Master Plan), which establishes a decadal, network-wide management review cycle for MPAs. The first such review is currently scheduled for December 2022. This review will evaluate MPA performance against the six goals of the MLPA and will be informed by a variety of data and information streams including both baseline and long-term MPA monitoring.

To guide long-term MPA monitoring, CDFW has created an [MPA Monitoring Action Plan](#)⁵ (Action Plan) that lays out priority metrics, habitats, sites, and species to focus on for long-term monitoring. The Action Plan underwent a simultaneous peer review and public comment process during summer 2018 and was formally adopted by OPC and the California Fish and Game Commission (FGC) in fall 2018. In the spring of 2019, OPC funded [several long-term MPA monitoring projects](#)⁶ that are grounded in the Action Plan. These monitoring projects are currently underway, but some have concluded field-based data collection due to funding constraints. In an effort to minimize gaps in time series data and ensure that the 2022 review process is informed by best available science, staff recommends four of the habitat monitoring projects be extended to allow for data collection in 2021 and 2022. These four projects are described in more detail below.

The primary goal of the recommended MPA analysis and synthesis project is to perform analyses that address critical MPA performance evaluation questions, guided by the Action Plan and the recommendations of two OPC Science Advisory Team Working Groups, and working in close coordination with long-term MPA monitoring PIs. Beginning in 2019, OPC and CDFW have supported two Working Groups of the OPC SAT: (1) 2022 MPA Management Review Scientific Guidance and (2) MPAs and Climate Resilience Science Synthesis and Data Needs. The goal of the 2022 MPA Working Group is to translate the goals of the MLPA into scientifically tractable questions and associated analytical approaches, building on the Action Plan (in particular Appendix B). The aim of the Climate and MPAs Working Group is to assess the role of MPAs in providing climate resilience. The recommendations of both Working Groups are anticipated by Spring 2021, with key findings being shared with OPC at this February meeting. The Working Group reports will provide a strong foundation for NCEAS to identify relevant data sources, develop an analysis plan, prioritize analyses to be addressed, conduct analyses, and develop products for inclusion in the 2022 review. The project will also collaborate with an MPA communications contractor to develop appropriate messaging, written materials, talking points, and visuals to share with stakeholders and decision-makers.

The extension of long-term monitoring projects in key habitats is critical to inform and evaluate MPA network performance, particularly in light of the decadal review. The integrative analysis across habitats, systems, and the MPA network will provide essential

⁴ <https://wildlife.ca.gov/Conservation/Marine/MPAs/Master-Plan>

⁵ <https://wildlife.ca.gov/Conservation/Marine/MPAs/Management/Monitoring/Action-Plan>

⁶ www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20190523/Item3a_MPA_Longterm_Monitoring_Projects_FINAL.pdf

synthesis of varying data streams and provide the best science-based understanding of MPA performance. These projects will continue OPC's support for the long-term success of California's MPAs and will ensure that the state is prepared for the MPA network's first management review in 2022 and beyond. Individual project summaries follow below.

Project Timeline (for all projects)

February 2021 - March 2023

Projects 6.a.1 - 6.a.4: \$5,305,500 to Regents of the University of California San Diego, California Sea Grant to fund statewide academic research consortiums for continued habitat-based ecological monitoring priorities for 2021-2022

Background

California's MPA monitoring program supports a partnership-based approach to leverage existing capacity and collect data statewide. Staff is recommending that additional funding for ecological monitoring be awarded to statewide research consortiums of PIs from multiple institutions or organizations, organized around the following important coastal and marine habitat types: rocky intertidal, sandy beach/surf zone, kelp forest/shallow rocky reef (0-30 meters depth), and deep rocky reef (> 30 meters depth). Monitoring teams for each of the following two-year projects will collect data at Tier I MPA sites⁷ and associated reference sites for two field seasons (2021 and 2022), unless otherwise specified, as well as Tier II and III MPA sites as capacity and budget permit. Staff also recommends that the habitat monitoring teams be funded at a level similar to previously awarded amounts⁸ for the upcoming 2021 field season, with a reduced budget for sampling in 2022. The reduced sampling effort in 2022 will be informed by 2021 field season results and will allow for critical ongoing data collection while future long-term monitoring priorities are identified. For the purposes of this staff recommendation, "biological data," "environmental data," and "human use data" should be interpreted to mean data collected to address the priority measures and metrics listed in the Action Plan. Examples of such data include organism counts, organism sizes, pH/dissolved oxygen measurements, etc.

In July 2018, California Sea Grant was selected to administer a competitive process to solicit and fund MPA monitoring and data analysis projects. In May 2019, OPC approved the selection of seven long-term MPA monitoring projects that are grounded in the state's MPA Monitoring Action Plan and were selected through a competitive grant process administered by California Sea Grant. A subset of these long-term monitoring projects have concluded field-based data collection. By extending the previously funded grant with California Sea Grant, monitoring programs can continue to collect critical data during the 2021-2022 field seasons.

About the Grantee

⁷ The Action Plan prioritizes long-term MPA monitoring sites by identifying tiers: required (Tier I), secondary (Tier II), and tertiary (Tier III). These [monitoring priority tiers](#), which are based on best available science, will enable efficient data collection by researchers while still allowing for a broad evaluation of network performance by CDFW

⁸ www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20190523/Item3a_MPA_Longterm_Monitoring_Projects_FINAL.pdf

California Sea Grant has an established, highly respected process for evaluating, prioritizing, and administering research grants related to coastal and ocean resources and has a proven track record of supporting state agencies' research efforts. California Sea Grant is experienced at managing large contracts and grants, has excellent knowledge of and familiarity with the state's scientific community, and has successfully managed other solicitation and award efforts on behalf of OPC.

Project 6.a.1: \$843,500 to UC Santa Cruz for rocky intertidal habitat monitoring

Background

California's rocky intertidal habitats are highly biodiverse, hosting a variety of ecologically and economically important plants and animals. The rocky intertidal also provides significant recreational, cultural, and economic value to the people of California, including California's tribes. However, rocky intertidal habitats are also seriously threatened by a variety of local and regional anthropogenic disturbances, including overexploitation, pollution, habitat destruction, and invasive species; they are also particularly susceptible to climate related impacts. These disturbances are especially concerning given the extreme rarity of rocky intertidal habitat in California (less than 5 square kilometers total statewide). Because of these concerns, rocky intertidal habitats were targeted for protection in the Marine Life Protection Act Master Plan and are listed as a priority in the Action Plan.

Project Summary

Specific objectives include:

- Collect additional biological and environmental data in Tier I MPAs and at associated reference sites, according to standardized protocols established by the Multi-Agency Rocky Intertidal Network (MARINe), which has been monitoring rocky intertidal habitats on the U.S. west coast since the 1980s. Conduct analyses using both historical and new data to assess individual MPA effects as well as network-wide effects in intertidal communities.

About the Grantee

This project is a collaboration between UC Santa Cruz (lead institution), MARINe, UC Santa Barbara, Cal Poly Pomona, Cal State Fullerton, and the National Park Service. This team has several decades of experience conducting research in rocky intertidal systems both in California and around the world; the PIs are global leaders in designing, implementing, and managing long-term rocky intertidal monitoring programs.

Project 6.a.2: \$1,835,500 to UC Santa Cruz for kelp forest/shallow reef habitat monitoring

Background:

Kelp forests and shallow rocky reefs (0-30 meters depth) represent some of California's most iconic nearshore marine ecosystems. They support ecologically, economically, and culturally important native species. They also provide valuable ecosystem services to millions of Californians, including tourism and nearshore recreational and commercial fisheries. For these reasons, kelp forest and shallow rocky reef habitats were targeted for protection in the Marine Life Protection Act Master Plan and are listed as a priority in the MPA Monitoring Action Plan. Continued monitoring of kelp forest ecosystems is especially important to the state given the recent dramatic declines in both bull kelp (*Nereocystis luetkeana*) on California's north coast, and giant kelp (*Macrocystis pyrifera*) on California's central and south coasts, which have resulted in significant adverse ecological and economic impacts.

Project Summary:

This project will accomplish the following objectives:

- Collect biological data via SCUBA transect surveys in Tier I MPAs and at associated reference sites, according to standardized protocols established by the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO), a long-term ecosystem-based scientific monitoring program involving marine scientists from four U.S. west coast universities, as well as Reef Check California (RCCA), a citizen science program that trains volunteer SCUBA divers to collect biological data. Conduct integrative analyses using historical and new data to assess trends in kelp forest and shallow rock communities

About the Grantee:

This project is a collaboration between UC Santa Cruz (lead institution), UC Santa Barbara, UC Los Angeles, PISCO, RCCA, the Vantuna Research Group/Occidental College, the Monterey Bay Aquarium Research Institute, and Humboldt State University. This project team includes researchers with significant experience in kelp forest research, including long-term monitoring. This group has been involved with California's MPA network since the passage of the Marine Life Protection Act in 1999 and includes experts in related disciplines (remote sensing, ocean acidification/hypoxia, and citizen science) to further enhance the scope of data collection and analysis.

Project 6.a.3: \$1,735,500 to San Jose State University for deep rocky reef habitat monitoring

Background

Deep rocky reef habitats (> 30 meters depth) represent at least 75% of all marine habitats in California state waters by area. Deep rocky banks and outcroppings, underwater pinnacles, and submarine canyons support a high diversity of ecologically and economically important fish and invertebrate species, including many species that CDFW has determined are likely to benefit from MPA establishment. These habitats also experience a much greater likelihood of habitat alteration than nearshore habitats due to the heavy use of trawls, longlines, and gillnets in deep water. However, despite the prevalence of these habitats, their ecological and economic importance, and their

threatened nature, little is known about them due to the difficulties associated with sampling in deeper water.

Project Summary:

This project will accomplish the following objectives:

- Conduct ROV and drop camera surveys to collect biological data in Tier I MPAs and associated reference sites.
- Synthesize analyses of historical data with analyses of newly collected data to provide a comprehensive assessment of deep rocky reef ecosystem health across the MPA network.

About the Grantee

This project is a collaboration between San Jose State University (lead institution), California State University Monterey Bay, Humboldt State University, UC Santa Barbara, and Marine Applied Research and Exploration. The PIs on this project are experts in the design, monitoring, and evaluation of California’s MPAs. They bring over 100 years of cumulative experience sampling in deepwater habitats both in California and around the world.

Project 6.a.4: \$801,000 to UC Santa Barbara for sandy beach/surf zone habitat monitoring

Background:

Sandy beaches and their associated surf zones are significant components of California’s coastline. These habitats host a variety of native species, including fishes, invertebrates, and birds. Sandy beaches are also ecologically linked to offshore habitats, especially kelp forests and shallow rocky reefs. Finally, these habitats are heavily used by millions of Californians each year for recreation. Therefore, although soft-bottom habitats were not prioritized for monitoring in the Action Plan, sandy beaches and surf zones are important systems for the state to consider in long-term MPA monitoring and adaptive management of the MPA network.

Project Summary:

Specific objectives include:

- Conduct standardized transect surveys at beaches inside Tier I MPA sites and associated reference sites to collect key biological and environmental data, including the following:
 - Abundance, species composition, and size structure of birds, macrophyte wrack, and surf zone fishes
 - Physical characteristics of beach and surf zone habitats
 - Human uses, including shore-based fishing

About the Grantee

This project is a collaboration between UC Santa Barbara (lead institution), the Greater Farallones Association Beach Watch Group, Humboldt State University, Point Blue

Conservation Science, and San Jose State University. This research team includes 13 highly qualified PIs and affiliated researchers who have extensive experience leading active field research programs focused on sandy beach and surf zone habitats, as well as prior experience with MPA baseline monitoring in these systems.

Project 6.b: \$500,000 to the National Center for Ecological Synthesis and Analysis to conduct data synthesis and integrative analyses of MPA monitoring data

Background

Significant investment has been made on behalf of the state to implement and support both baseline and long-term monitoring efforts statewide. To best assist the Fish and Game Commission, California Department of Fish and Wildlife and OPC for the upcoming 2022 MPA network management review, analyses are needed to integrate baseline and long-term datasets, explicitly incorporate influencing factors (e.g. climate change) into MPA performance evaluation, and address network evaluation questions not currently being addressed by monitoring groups or the state.

Project Summary

This project will integrate existing analyses and perform new analyses as needed to provide answers to MPA performance evaluation questions outlined in Appendix B of the Action Plan and refined by the Decadal Evaluation Working Group (DEWG), a working group of the OPC Science Advisory Team. In support of adaptive management, the project will also evaluate and provide updated recommendations to the MPA design criteria established during the creation of the MPA network. This project will also coordinate with state MPA program staff and an MPA communications contractor to help develop products for the 2022 MPA management review.

Specific objectives include:

- Identify patterns and trends emerging from existing data streams and analytical products, including baseline and long-term MPA monitoring projects.
 - Integrate across habitats
 - Integrate across the statewide network
 - Integrate across social-ecological systems
- Incorporate influencing factors (e.g. climate change, environmental conditions, historical fishing pressure) into analyses related to MPA performance evaluation.
- Explore MPA performance evaluation questions that are not currently being addressed, but for which sufficient data exist to conduct analyses.
- Evaluate MPA design criteria using best available science and cutting-edge analytical approaches.

About the Grantee

The National Center for Ecological Analysis and Synthesis (NCEAS) is an independent research affiliate of the University of California Santa Barbara. NCEAS applies a solutions-oriented approach through synthesizing existing data sources, facilitating scientific

collaborations among researchers with diverse expertise, and advancing transparent science that is accessible to both the scientific community and the greater public.

Project Timeline

February 2021 - March 2023

PROJECT FINANCING:

Staff recommends that the Ocean Protection Council (OPC) authorize encumbrance of up to \$5,805,000 to grantees listed above to conduct the projects summarized above.

Ocean Protection Council	\$5,805,500
Regents of the University of California San Diego, California Sea Grant	\$5,305,500
<ul style="list-style-type: none"> • <i>Regents of the UC San Diego, California Sea Grant - administrative costs</i> 	\$90,000
<ul style="list-style-type: none"> • <i>UC Santa Cruz – rocky intertidal habitat monitoring</i> 	\$843,500
<ul style="list-style-type: none"> • <i>UC Santa Cruz – kelp forest/shallow rocky reef habitat monitoring</i> 	\$1,835,500
<ul style="list-style-type: none"> • <i>San Jose State University – deep rocky reef habitat monitoring</i> 	\$1,735,500
<ul style="list-style-type: none"> • <i>UC Santa Barbara – sandy beach/surf zone habitat monitoring</i> 	\$801,000
National Center for Ecological Synthesis and Analysis - data synthesis and integrative analyses of MPA monitoring data	\$500,000
TOTAL	\$5,805,500

Funding for these projects aggregates funds from three sources designated to support continued MPA monitoring and analyses. The anticipated source of funds will be:

- FY 19/20 MPA General Fund - \$450,000
- FY 20/21 MPA General Fund - \$811,885.50
- FY 21/22 MPA General Fund - \$2,050,000
- FY 20/21 OTC - \$1,246,807.25
- FY 18/19 Prop 68, Ch. 9 - \$1,246,807.25

General Fund Appropriation. In 2015, the California state legislature allocated a \$2.5 million annual General Fund appropriation to the Secretary for Natural Resources to support the Statewide MPA Monitoring Program. The monitoring and analysis projects are consistent with the goals of the state’s MPA monitoring program by continuing monitoring efforts and subsequent data analyses.

Once-Through Cooling Interim Mitigation funds. These funds are derived from payments made by power plants still using OTC technology as mitigation until they come into

compliance as mandated by the State Water Resources Control Board's Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling. This project aligns with OTC Policy since MPAs have the potential to offset some negative ecological impacts caused by OTC systems.

Proposition 68, Chapter 9 funds. These funds are reserved for projects that “conserve, protect, and restore marine wildlife and healthy ocean and coastal ecosystems with a focus on the state’s system of marine protected areas and sustainable fisheries”. These recommended projects directly contribute to conserving California’s marine resources, specifically within MPAs, by collecting and analyzing monitoring data to support adaptive management.

CONSISTENCY WITH THE OPC'S STRATEGIC PLAN:

These projects implement Objective 3.1: Protect and Restore Coastal and Marine Ecosystems. Specifically, by supporting one of the core components of the Statewide MPA Monitoring Program, this project will address two key action items under Objective 3.1: 1) Fund and manage statewide ecological and socioeconomic monitoring of the MPA network in preparation for the ten-year MPA management review in 2022, and 2) With partners, identify and fund cost-effective strategies to continue MPA monitoring beyond 2022.

COMPLIANCE WITH THE CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA):

The proposed project is categorically exempt from review under the California Environmental Quality Act (“CEQA”) pursuant to 14 Cal. Code of Regulations Section 15306 because the project involves only data collection, research and resource evaluation activities that will not result in a serious or major disturbance to an environmental resource.