



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
**NATIONAL OCEAN SERVICE**  
**Monterey Bay National Marine Sanctuary**  
99 Pacific Street, Bldg 455a  
Monterey, CA 93940

October 5, 2016

Ocean Protection Council  
California Natural Resources Agency  
1416 Ninth St., Suite 1311  
Sacramento, CA 95814

Dear Council Members,

On behalf of Monterey Bay National Marine Sanctuary (MBNMS), I am pleased to support the proposal entitled “Citizen science: integrating subtidal ecological and global change monitoring” as submitted by Reef Check California (RCCA) and Dr. Kristy Kroeker, UC Santa Cruz. This proposal plans to increase our understanding of ocean acidification and hypoxic (OAH) events by coupling existing subtidal surveys at numerous sites throughout the state with sensors designed to capture environmental data such as pH, dissolved oxygen, and water temperature. This spatial and temporal coupling of environmental data with the ecological data collected by RCCA divers will provide key insights on whether global change in the form of OAH is interacting with regulated activities inside and outside of state-implemented MPAs that are nested within two Federal MPAs (Greater Farallones and Monterey Bay NMS).

The sanctuary mission is to understand and protect the coastal ecosystem and cultural resources found within sanctuaries. National Marine Sanctuaries were established for the purpose of resource protection, research, education and public use. The natural resources within west coast sanctuaries include extensive kelp forests, one of North America's largest underwater canyons and extensive rocky shores along hundreds of miles of coastline from the Olympic Peninsula to southern California. It is home to one of the most diverse marine ecosystems in the world, including 37 species of marine mammals, over 180 species of sea and shore birds, >500 species of fishes, and numerous invertebrates and algae. This remarkably productive marine environment is fringed by spectacular coastal scenery, including sandy beaches, rocky cliffs, rolling hills and steep mountains.

There are a variety of potential resource threats and opportunities within the sanctuary due to the sensitivity of habitats and species in the region, the long stretch of adjacent populated coastline, and the multiple uses of the marine environment. Sanctuary research and monitoring programs evaluate the status and health of marine species, habitats and ecosystems, provide critical information to resource managers, and coordinate activities with the array of world-class research institutions in the region. Resource protection programs use a variety of means to reduce or prevent detrimental human impacts, including collaborative planning efforts, regulations and permits, emergency response activities, enforcement and education. Key among these is partnering with local researchers to conduct both long-term monitoring and mechanistic studies to better

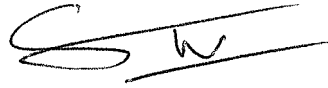


understand local and regional patterns and processes.

Dr. Kroeker (UCSC) and Dr. Jan Freiwald (RCCA) are highly qualified to undertake this project, and are uniquely positioned to ensure efficient use of resources and project success. This proposal builds upon the success of RCCA divers monitoring state MPAs and adds capacity to the existing monitoring framework. Capturing environmental data with long-term moorings and short-term, diver-equipped sensors provides context for observed patterns inside and outside of MPAs. Combing such data to the ongoing collection of ecological data promotes a more complete understanding of the local and regional dynamics that influence nearshore community structure and function, and both resistance and resilience to natural and anthropogenic-derived change.

On behalf of Monterey Bay National Marine Sanctuary, I fully and enthusiastically support funding of this proposal.

Sincerely,

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Steve Lonhart, Ph.D.





RESOURCES LEGACY FUND  
CREATIVE SOLUTIONS. LASTING RESULTS.

October 3, 2016

California Secretary for Natural Resources John Laird  
Members of the Ocean Protection Council  
California Natural Resources Agency  
1416 Ninth Street, Suite 1311  
Sacramento, CA 95814

**RE: Support for Reef Check California project - Citizen science: integrating subtidal ecological and global change monitoring**

Dear Secretary Laird and Members of the Ocean Protection Council:

Please accept this letter of support on behalf of Resources Legacy Fund (RLF) for Reef Check California's (RCCA) citizen science project integrating subtidal ecological and global change monitoring.

RLF has been a strong supporter of Reef Check's California program since its establishment in 2004. Over the past decade, RCCA has made significant contributions to the state's marine management goals including providing baseline data on California's marine protected area (MPA) network through an extensive statewide program of data collection both inside MPAs and at control sites.

RCCA works closely with the California Department of Fish and Wildlife, other state and federal agencies, and academic scientists from the University of California, California State University, and other institutions, to develop monitoring protocols that meet high scientific standards.

The project before you for consideration is a valuable opportunity to build on RCCA's existing monitoring efforts to help address science needs around the emerging threats of ocean acidification and hypoxia (OAH). Specifically, RLF supports the project's approach of co-location of OAH monitoring sites with MPAs, piloting low cost monitoring methodologies, and engaging citizen scientist as a way of both advancing cost-effective monitoring and promoting ocean stewardship.

In conclusion, RLF supports Reef Check California's citizen science project integrating subtidal ecological and global change monitoring and we hope you will give it your full consideration.

Sincerely,

Kaitilin Gaffney  
Program Director  
Oceans, Coast and Fisheries Program

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October 7, 2016

John Laird, Secretary for Natural Resources  
Chair, California Ocean Protection Council  
1416 Ninth Street, Suite 1311  
Sacramento, CA 95814  
Via electronic submission to [COPCpublic@resources.ca.gov](mailto:COPCpublic@resources.ca.gov)

Dear Secretary Laird and Members of the Ocean Protection Council,

We write to express strong support for the suite of ocean acidification and hypoxia projects under consideration at the October 17<sup>th</sup> council meeting for funding from Proposition 84. These projects will help coordinate and facilitate research and action to address ocean acidification and hypoxia.

Our ocean absorbs approximately a third of the carbon dioxide produced by human activity, altering its chemistry and leading to ocean acidification (OA). In addition, many ocean areas become abnormally deficient in oxygen, a condition called hypoxia. OA and hypoxia affect our ocean in a range of ways that put ocean ecosystems and ocean-dependent industries at risk.

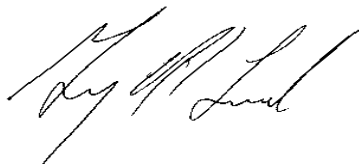
The West Coast Ocean Acidification and Hypoxia Science Panel (Panel) this year released a report concluding that OA and hypoxia will grow in intensity over time, particularly along the West Coast. The Panel outlined a number of recommendations to address these issues, and the California Legislature passed two bills (AB 2139, Williams, and SB 1363, Monning) that will implement several of the Panel's recommendations. The projects identified and recommended for funding here will help take the next step on furthering the Panel's recommendations.

The six recommended projects will advance these recommendations in several important areas, by improving our understanding of the role of seagrass in ameliorating OA, designing water quality criteria, providing improved modeling to understand and address the impacts of OA and hypoxia, and assessing the role and effectiveness of MPAs under ocean change. These investments will help inform effective policy and management of California's coasts and ocean in a time of global change.

We appreciate the remarkable work done to date by OPC, OST, the OST-SAT, other state agencies, the Legislature, and the Governor's office in recognizing the importance of this issue to the state, and in prioritizing it for action. The projects recommended for funding today will provide important

information to allow the state to continue to be a global leader in addressing the impending effects of climate change.

Very truly yours,

A handwritten signature in black ink, appearing to read "George H. Leonard". The signature is written in a cursive style with a large initial "G" and "L".

George H. Leonard  
Chief Scientist  
Ocean Conservancy



October 7, 2016

John Laird, Secretary for Natural Resources  
Chair, California Ocean Protection Council  
California Natural Resources Agency  
1416 Ninth Street, Suite 1311  
Sacramento, CA 95814

**RE: Action Item 4, Funding for Proposed Proposition 84 Projects**

Dear Secretary Laird and members of the Ocean Protection Council:

I am writing on behalf of NRDC in strong support of the Ocean Protection Council's (OPC) proposed use of Proposition 84 funds for a suite of projects that will advance the State's mandate to safeguard California's marine environment. NRDC enthusiastically supports OPC's use of Prop 84 funds to promote the health of California's ocean and marine biodiversity. In particular, NRDC would like to highlight the proposed Ocean Acidification and Hypoxia (OAH), Marine Protected Area (MPA), and Marine Debris projects as being of special interest to the organization.

If left unchecked and unmanaged, ocean acidification will profoundly impact marine species and ecosystems and the humans that depend on them. The six proposed OAH projects are an essential next step to implement the West Coast Ocean Acidification and Hypoxia Science Panel's (Panel) recommendations and will begin to provide the science needed to inform California's emerging OAH policies. On the West Coast, the shellfish aquaculture industry is already experiencing the impacts of OAH. As noted in the Panel's Major Findings, between 2005 and 2009 in the Pacific Northwest, oyster production declined 22%.<sup>1</sup> California's commercial and recreational fishing industries are also at risk of OAH, impacts to which could have profound economic and social ramifications—the commercial and recreational fishing industries generate \$25.7 billion in sales annually and generate 158,000 jobs annually.<sup>2</sup>

In spite of the threats ocean acidification and hypoxia pose, the development of a comprehensive policy around ocean acidification has been thwarted by its close relationship with climate change. By sharing the same principal cause—rising CO<sub>2</sub> emissions—ocean acidification is often assumed to be fully addressed by climate change policies. In convening the Panel and executing its recommendations, OPC has established California as a leader in proactively addressing the threats of OAH through science to address immediate OAH research needs that can then guide management decisions. The recent signing of AB 2129 and SB 1363 into law sends a clear mandate to OPC to administer the Ocean Acidification and Hypoxia Reduction Program and further demonstrates California's leadership in preparing for and ameliorating the impacts of OAH.

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<sup>1</sup> Chan, F., Boehm, A.B., Barth, J.A., Chornesky, E.A., Dickson, A.G., Feely, R.A., Hales, B., Hill, T.M., Hofmann, G., Ianson, D., Klinger, T., Largier, J., Newton, J., Pedersen, T.F., Somero, G.N., Sutula, M., Wakefield, W.W., Waldbusser, G.G., Weisberg, S.B., and Whiteman, E.A. The West Coast Ocean Acidification and Hypoxia Science Panel: Major Findings, Recommendations, and Actions. California Ocean Science Trust, Oakland, California, USA. April 2016.

<sup>2</sup> Id.

While we support funding for all six OAH projects, the following three are of special interest to NRDC:

- *4a: Advance integrated modelling of California's coastal ocean to inform ocean acidification and hypoxia policy.* Increasing the utility of OA models through a more site-specific focus will serve as an essential tool to improve our understanding of the variabilities of OAH and could eventually improve forecasting capabilities to protect the State's fisheries.
- *Project 4e: MPA effectiveness and ecological responses in the face of changing ocean conditions.* NRDC was heavily involved in the creation of the State's landmark MPA network and is committed to safeguarding the network's integrity and vitality. Learning the role that MPAs can play in building resilience to the impacts of changing ocean conditions could provide some of the foundational science needed to better understand the value of MPAs in California, nationally, and internationally. This knowledge could inform MPA design in the future. Separate but related to this work is understanding how OAH will affect the State's MPAs and then managing them accordingly.
- *4f: Inventory of Ocean Acidification and Hypoxia Hotspots.* In partnership with academics and NOAA scientists, NRDC has also advanced a methodology for assessing social vulnerability to OA. As OPC and OST undertake this initial inventory, NRDC urges the organizations to integrate social vulnerability into its statewide OAH inventory. Understanding which regions are particularly vulnerable to OAH impacts will enable the state to prioritize regional needs and provide target adaptation measures.

While California leads the nation in setting targets for renewable energy and emissions reductions, existing climate policies, as currently written, will not adequately address the threat ocean acidification poses to California's marine resources, which are key components of its social fabric and economy. Adaptation strategies for ocean acidification will be very different from those associated with the impacts of climate change. The proposed OAH projects and further implementation of the Panel's recommendations will provide the foundation for scientifically based policy that will enable California to adapt and prepare for the impacts of OAH. We urge you to support funding for the proposed OAH projects as a crucial next step to implement the Panel's recommendations.

We are also writing to express our strong support for using Prop 84 funds to support the two initiatives targeted at strengthening California's MPA network. NRDC has played a crucial role in the implementation of the Marine Life Protection Act (MLPA), and we remain deeply committed to the success of the MPA network going forward. We agree with OPC that outreach, education, and enforcement are fundamental to the ongoing success of California's MPA network and the protection of California's valuable marine resources. The MPA Collaboratives play a vital role in educating communities about California's MPAs, including outreach messaging, educational guidelines, and enforcement protocols. Strengthening the work of the Collaboratives through a Collaborative network small grants program (proposed project 4k) will be an important step in strengthening implementation of the MPA network. Similarly, funding a second round of MPA signage (proposed project 4l) would greatly enhance public awareness of the MPA network and is a key step in ensuring compliance with MPA requirements. Just as the public benefits from interpretive signs in the State's terrestrial parks, so will the public benefit from learning about their coastal and offshore resources.

Finally, tackling marine pollution is one of the most daunting challenges natural resource managers confront in conserving ocean health. NRDC congratulates OPC for their wide ranging and substantial investment in addressing marine debris in California. Updating the 2008 Ocean Litter Strategy Update, Dungeness Crab Fishing Gear Working Group, and Creating an Unpackaged Community in the Bay Area are solution-oriented projects that will address some of the most pressing marine pollution issues in California.

We thank OPC for its strategic approach to leveraging Prop 84 funds to secure the health of California's ocean environment and encourage OPC to act on staff recommendations. Funding the proposed projects with Prop 84 funds will help OPC address key ocean threats, and poise California to lead with cutting edge research and policies to protect its publicly-held marine resources.

We thank you for the opportunity to comment.

Sincerely,

A handwritten signature in black ink, appearing to read "Elizabeth Murdock". The signature is fluid and cursive, with a long horizontal stroke at the end.

Elizabeth Murdock  
Director, Pacific Ocean Initiative  
Natural Resources Defense Council