



**INFORMATIONAL ITEM**

**TO:** California Ocean Protection Council  
**FROM:** Jenn Phillips, Policy Advisor, and Sara Briley, Sea Grant Fellow  
**DATE:** January 31, 2017  
**RE:** Update on Assembly Bill No. 2139 Implementation

**Implementation of Assembly Bill No. 2139**

In September 2016, [Assembly Bill No. 2139, Williams](#) (AB 2139) was signed by Governor Brown. AB 2139 directs the Ocean Protection Council (OPC), within its role of ensuring that California maintains healthy, resilient, and productive ocean and coastal ecosystems, to take specific and significant actions to address ocean acidification and hypoxia (OAH). Specifically, the bill authorizes OPC, subject to the availability of funding, to: a) develop an ocean acidification and hypoxia science task force to ensure that OPC decision-making is supported by the best available science; b) require OPC to take specified actions to address ocean acidification and hypoxia; and c) adopt recommendations for further actions to address ocean acidification and hypoxia at the first meeting of the year, starting in 2018. OPC has taken significant actions to address ocean acidification in the past year. This informational item serves as an update on progress made by OPC staff and collaborators on the specific actions highlighted in AB 2139.

**A. Ocean Acidification and Hypoxia Science Task Force**

AB 2139 authorizes OPC, subject to the availability of funding, to develop an ocean acidification and hypoxia task force “to ensure that decision-making is supported by the best available science.” In 2017, OPC tasked Ocean Science Trust with convening and managing the Task Force, which will be composed of OPC Science Advisory Team (OPC-SAT) members and additional experts. The Task Force will serve as a responsive advisory body that will provide ongoing scientific guidance to the OPC to inform continued actions on ocean acidification and hypoxia in California and along the West Coast. Specifically, the Task Force will provide a technical forum for two-way engagement between scientists and decision-makers, serve as a gateway to the broader OAH science community to provide sound science advice to the OPC, and identify follow-up projects that will fill key OAH knowledge gaps in California. The Task Force will provide science advice to OPC in the form of quarterly webinars, annual workshops and ad hoc requests from OPC for advising or scientific input. The Task Force will be chaired by Dr. Steve Weisberg, Southern California Coastal Water Research Project (SCCWRP), and Dr. Francis Chan, Oregon State University, who together will lead a diverse team of six additional interdisciplinary scientists that will be publicly announced at the January 31, 2018 OPC meeting. The charter for

the Task Force can be accessed here: <http://www.oceansciencetrust.org/wp-content/uploads/2018/01/OAH-Task-Force-Charter-January-2018.pdf>

**B. Progress on Specific Actions Outlined in AB 2139**

**i. Integrated Modeling to Answer Key Management Questions Regarding OAH**

Since 2013, OPC has been funding scientists at the [University of California, Los Angeles](#) to perform integrated modeling of California’s coastal ocean to inform OAH-related policy. This effort directly relates to the AB 2139 recommendation to “develop, refine, and integrate predictive models that identify the relative contributions of global and local drivers of ocean acidification and hypoxia in California waters.” As of the January 2018 OPC meeting, progress on the following modeling efforts has been made: the development of the coupled atmospheric-physical-biogeochemical model is complete; the scientists are working to create nearshore simulations at higher resolutions to increase precision of scenarios; work is in the nascent stage to link to ecosystem models that can predict effects of OAH on nearshore marine reserves and commercial and recreational fisheries; preliminary model validation is complete; more rigorous validation is occurring in Southern California and San Francisco Coast, where costs of nutrient management demand high confidence in model skill; and the researchers are beginning to transmit these findings to coastal zone managers and help them explore the implications for marine resource management and pollution control.

Given that eight major publicly owned treatment works (POTW) outfalls in San Francisco Bay and Southern California Bight represent 50% of total nutrient export to the California Coast, the model may have applications for local pollution management as we determine how this nutrient loading exacerbates OAH. Additionally, model output can help identify OAH hotspots along the California coast and has a tremendous amount of spatial and temporal information that can help prioritize management responses. OPC’s contribution to this effort and the project at-large, which is also supported by the National Oceanic and Atmospheric Administration through fall 2018, is expected to be completed in summer 2019.

**ii. Revision of Ocean Acidification and Hypoxia Water Quality Criteria**

In October 2016, OPC approved funding to the [Southern California Coastal Water Research Project \(SCCWRP\)](#) to initiate a process for revising water quality criteria to address ocean acidification and hypoxia. This directly meets AB 2139 recommendations to “work with other agencies to coordinate and ensure that criteria and standards for coastal water health to address ocean acidification and hypoxia are developed and informed by the best available science.” As a key starting point to this larger effort, SCCWRP is developing scientific consensus on thresholds of OA measurement parameters protective against low oxygen, acidification, and altered temperature for three focal taxa representing different California marine habitats. This effort was identified as a key next step at a meeting hosted

by Stanford’s Center for Ocean Solutions (COS), the Stanford Woods Institute for the Environment, OPC, and SCCWRP, entitled [“Ocean Acidification: Setting Water Quality Goals: Uncommon Dialogue.”](#) Thresholds are needed to interpret monitoring data and model output, and to clarify what chemical and biological parameters should be measured and at what precision. Such thresholds will provide a consistent framework for communicating to managers, policy makers, and the public on OA status, trends and drivers. This work is the precursor to water quality goal policy development, an explicit recommendation of the West Coast Ocean Acidification and Hypoxia Science Panel (2016). This work will continue throughout 2018 during which OPC staff will work with the State Water Resource Control Board (SWRCB) and other relevant entities on ocean acidification as called out in SWRCB [2017 Climate Change Resolution](#).

**iii. Inventory of Ocean Acidification and Hypoxia Hotspots**

To accomplish the AB 2139 recommendation to “develop a comprehensive inventory of areas in California vulnerable to ocean acidification and hypoxia,” OPC approved funding to [California Ocean Science Trust \(OST\)](#) to conduct an inventory of OAH “hotspots” to target vulnerable species and ecosystems for management and policy action. OST will conduct this inventory and visualization of the spatial coverage of OAH “hotspots” along the California coast and overlay vulnerable marine species and ecosystems for management and policy action. This project will provide the scientific foundation for managers and state agencies to protect and conserve ocean resources, with a focus on impacts to California fisheries and coastal communities. By understanding the severity of ocean acidification at local and regional scales and targeting areas that are particularly vulnerable to ocean acidification, managers and agencies will be able to rely on robust science to make policy and management decisions. Decision support tools and visualizations, as well as science communication products, will be made available throughout 2018.

**iv. International Alliance to Combat Ocean Acidification (OA Alliance)**

AB 2139 recommends the OPC to “facilitate agreements with other national, state, and regional governments and private entities to establish and advance joint priorities for ocean acidification and hypoxia research.” California, with OPC as its representative, is one of the founding members of the International Alliance to Combat Ocean Acidification (OA Alliance; [oaalliance.org](#)). The Pacific Coast Collaborative (PCC) launched the OA Alliance in 2016 to serve as an international network of governments and organizations that together address ocean acidification and other threats from changing ocean conditions.

The OA Alliance is working to organize individual efforts into a coherent movement to elevate the visibility and importance of ocean acidification in public discourse and policy development and is pushing for inclusion of strong ocean protection provisions in international climate agreements and other relevant frameworks. The OA Alliance has successfully and proactively worked with other international ocean initiatives, the United

Nations Sustainable Development Goals office, United Nations Framework Convention on Climate Change (UNFCCC) Secretariat and COP23 Presidency, national governments, and other OA Alliance members to elevate and advance the issue of ocean health and acidification within the UNFCCC process and other international frameworks and convenings. Because of these efforts, the OA Alliance was invited to join the Ocean Pathway Partnership Initiative which was announced at COP23 on November 16, 2017 by Fiji, the COP23 President. The Fijian government, working with the UNFCCC Secretariat, is committed to advancing and building ocean issues and ocean risks into the UNFCCC process by 2019 and looked to the OA Alliance for actions that can be taken to adapt to and mitigate climate change impacts on the oceans.

**v. Gaps between OAH Monitoring and Management Needs**

AB 2139 charges OPC to “identify gaps between the monitoring of ocean acidification and hypoxia and management needs, and the actions necessary to address these gaps.” OPC has been very active on this recommendation and has advanced the completion of a West Coast-wide inventory of monitoring assets that can be used to assess gaps between monitoring and management needs and advance innovative research projects to fill in known monitoring gaps.

Initiated within the PCC subcommittee on ocean acidification, the **Ocean Acidification and Hypoxia Monitoring Task Force** aims to improve OAH monitoring capacity along the West Coast of the United States and British Columbia through jointly building an integrated monitoring network aimed to address management needs. As the California representative and co-chair of the Task Force, OPC staff have been working with other Task Force members to build a comprehensive inventory of monitoring assets along the West Coast of the United States, in coordination with relevant federal, state, and academic entities. Since early 2017, OPC has taken the lead on compiling information on monitoring programs of chemical, physical, and biological measures in California, as other task force members have done the same for Oregon, Washington, British Columbia and Alaska. Between August and December 2017, OPC has worked closely with members of the monitoring community to make sure California’s monitoring programs are accurately and completely represented in the inventory. Inventories from Oregon, Washington, British Columbia and Alaska also have, or will, go under a similar level of review. After review, the inventories from each state/province will be integrated and mapped to produce a single West Coast monitoring inventory to better visualize and understand current monitoring capacity on the West Coast. Later this year, the full monitoring Task Force will bring together state and federal policymakers and scientists to evaluate the existing inventory of monitoring efforts to identify and attempt to fill critical gaps in OAH monitoring along the West Coast.

OPC has also made progress towards this recommendation by funding projects that explicitly address gaps between monitoring and management needs. One such project is

led by Reef Check California (RCCA) Director Dr. Jan Freiwald and Dr. Kristy Kroeker at the University of California, Santa Cruz. Their project, "[MPA effectiveness and ecological responses in the face of changing ocean conditions](#)", will integrate subtidal ecological and global climate change monitoring to test marine protected areas' (MPAs) resilience to ocean acidification. Current monitoring of nearshore OAH is limited to a few locations with significant resources or at intertidal sites near academic marine labs. This project aims to fill in some of the spatial gaps in monitoring coverage by installing additional sensors in places where OAH monitoring is currently limited. By integrating these sensors at several of Reef Check's extensive series of monitoring sites, this project will also address the management need of assessing the effectiveness of MPAs in increasing ecosystem resiliency to environmental stressors. This fall, the team installed six sensors along the California coast: two on the North Coast, two on the Central Coast, one on the South Coast and one on Catalina Island. These sensors continuously monitor pH and dissolved oxygen and will remain deployed underwater throughout 2018. In addition, the researchers deployed or will soon deploy over 50 temperature loggers and oxygen sensors at Reef Check sites across the coast, allowing us to understand and assess how these more inexpensive sensors can accurately capture the environmental conditions of our ocean.

**C. Yearly Recommended Actions**

AB 2139 directs OPC to "adopt recommendations for further actions that may be undertaken to address ocean acidification and hypoxia" at its first meeting of the year beginning January 1, 2018, and annually thereafter. Staff are recommending funding to support the development of a California Ocean Acidification Action Plan as part of California's commitment to the International Alliance to Combat Ocean Acidification (see [Action Item 6](#)).

**D. Additional Actions**

OPC has also been making significant progress in implementing additional recommendations from the West Coast Ocean Acidification and Hypoxia Panel as well as resulting legislation, [Senate Bill No. 1363, Monning](#) (SB 1363). Under SB 1363, OPC, in consultation with the State Coastal Conservancy and other relevant entities, is tasked with administering an OA reduction program that focuses on conservation or restoration of submerged aquatic vegetation for the purposes of removing carbon from surrounding waters. To begin implementation of SB 1363 and to prioritize next steps for California, the OPC tasked OST with convening a [working group of the Ocean Protection Council Science Advisory Team \(OPC-SAT\)](#) in early 2017. The working group focused on synthesizing emerging research and findings on the capacity of seagrass and macroalgae to provide short term OA amelioration in field settings. By January 30, 2018, the working group will release their final report and present key findings and next steps from the report at the California [State Assembly Select Committee on Coastal Protection and Access to Natural Resources](#), chaired by Assemblymember Mark Stone, on February 6 from 2-4 PM. Co-chairs of the working group, Karina Nielsen and Jay Stachowicz, will be joined by representatives of OPC, the State Coastal Conservancy, The Nature Conservancy, University of California, Davis,

and California State University, Northridge at the hearing to highlight efforts underway in California to better understand the contribution of submerged aquatic vegetation to minimizing acidic conditions.