



## **Resolution of the California Ocean Protection Council on Ocean Acidification and Hypoxia**

**March 3, 2025**

WHEREAS, the California Ocean Protection Act mandates that the California Ocean Protection Council (OPC) coordinate and improve the protection of California’s ocean and coastal resources, and the Governor’s Ocean Action Plan directs the OPC to play a leadership role in managing and protecting California’s oceans, bays, estuaries and coastal wetlands, including integration of coastal water quality programs to increase their effectiveness;

WHEREAS, the California Ocean Protection Act declares, “The governance of ocean resources should be guided by principles of sustainability, ecosystem health, precaution, recognition of the interconnectedness between land and ocean, decisions informed by good science and improved understanding of coastal and ocean ecosystems, and public participation in decisionmaking”;

WHEREAS, the California Ocean Protection Act further directs OPC to support state agencies’ use and sharing of scientific and geospatial information for coastal- and ocean-relevant decisionmaking, including scientific and geospatial information regarding existing and predicted patterns of human activities, specifically for those that require the use of a precautionary approach.

WHEREAS, the precautionary principle recognizes that where the possibility of large or irreversible effect, scientific uncertainty should not prevent protective action;

WHEREAS, due primarily to global carbon dioxide emissions, with contributions from land-based sources, the ocean is acidifying and harming calcifying marine organisms, marine food webs, and marine ecosystems;

WHEREAS, anthropogenic nutrient inputs into the ocean and ocean warming are causing an increase in hypoxia (low dissolved oxygen levels) and impacting the survival and viable habitat of marine species and fisheries;

WHEREAS, the West Coast of North America, including California, will face the “earliest, most severe changes in ocean carbon chemistry,” according to the West Coast Ocean Acidification and Hypoxia Science Panel, which was comprised of leading scientists from California, Oregon, Washington, and British Columbia;

WHEREAS, California Assembly Bill 2139 (2016) authorized the OPC to develop an ocean acidification and hypoxia (OAH) science task force for decision making and, in addition to other actions, requires the OPC 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”;

WHEREAS, a key recommendation of the West Coast OAH Science Panel’s 2016 Report is reduction of local pollutant inputs that exacerbate OAH;

WHEREAS, the 2018 State of California Ocean Acidification Action Plan directs action to “Identify sources and reduce local water-borne and airborne pollution that can exacerbate coastal ocean acidification” as part of the Plan’s strategies to identify and prepare for a full range of risks and impacts, reduce the causes of ocean acidification, improve the resilience of vulnerable groups, and minimize harmful effects;

WHEREAS, the OPC’s “Strategic Plan to Protect California’s Coast and Ocean 2020 – 2025” Objective 1.2 directs OPC to minimize causes and impacts of OAH, including Target 1.2.1, “Based on the latest scientific research, advance adoption of regulations, as needed, establishing water quality objectives for ocean acidification and hypoxia that include, but are not limited to, publicly owned treatment works, stormwater, and non-point source pollution, by 2025, with scientific analysis of the relationship between nutrient inputs and acidification hot spots completed by 2022”;

WHEREAS, the California State Water Resources Control Board’s 2024 Strategic Work Plan includes Action 2.1.4 to “Develop an Ocean Plan amendment to add water quality objectives and a program of implementation to address ocean acidification, hypoxia, and the effects of anthropogenic sources of nutrients in ocean waters. Initiate investigation of feasibility of nutrient removal at wastewater treatment plants that discharge to the ocean,” which builds on prior Strategic Work Plans to advance OAH research and development of water quality objectives and which falls under the State Water Board’s priority to protect and restore watersheds, marine waters, and ecosystems;

WHEREAS, OPC has invested substantial state resources in the development of a Coupled Remote Ocean Monitoring System and Biogeochemical Elemental Cycling (ROMS-BEC) OAH model for the entire West Coast as impacted by the California Current System. In the Southern California Bight, this effort has demonstrated that coastal anthropogenic nutrients, mainly from wastewater treatment plant effluent, are driving significant changes in ocean chemistry (reduction of subsurface pH and oxygen) and these changes have the potential to cause vertical compression of viable ocean habitat for fish and shelled organisms;

WHEREAS, the 2024 Independent Peer Review of the ROMS-BEC affirmed that the model is capturing fundamental physical and biogeochemical processes in the Southern California Bight that are associated with OAH. The coupled modeling system has been validated and gone through a rigorous scientific peer review process. It can be used to address basic management questions about whether nutrient loads from treated wastewater discharges in the region have impacted the marine environment and ecosystem in the Southern California Bight and what the large-scale and first-order impacts are.

WHEREAS, the OPC has already begun to take actions, including ongoing research to evaluate OAH sources and impacts across the state, including the contribution of cross-border pollution in driving changes in ocean chemistry, and coordinated OAH monitoring across local, regional, state, and federal entities, that will inform OAH resilience and mitigation strategies statewide to address the impacts of all contributing sources;

NOW, THEREFORE, the California Ocean Protection Council hereby:

RESOLVES to take the following priority actions:

- **Invest in and advance monitoring and research:** Building upon previous investments, OPC will continue to fund projects that advance scientific understanding of OAH causes and impacts, identify and evaluate coastal pollutants contributing to OAH, and strengthen monitoring and observation systems statewide to further knowledge of current and future OAH conditions and inform nutrient management.
- **Support development of water quality objective(s) and program of implementation:** Based on the best available science, including observational monitoring and modeling data, and consistent with the precautionary principle, OPC supports the development of one or more water quality objectives and associated program of implementation by the State Water Resources Control Board to address OAH impacts to ensure the reasonable protection of California's coastal and ocean ecosystems and their beneficial uses. OPC supports and encourages a program of

implementation that addresses the anthropogenic causes of OAH within the State Water Resources Control Board's regulatory authority, including nutrient management actions as appropriate, and considers water recycling needs and energy demands.

- **Advance and inform nutrient management approaches:** OPC will encourage state agencies to seek early collaboration and information sharing with external stakeholders to increase understanding of effective nutrient interventions, inform and support improved management of land-based nutrients, and carefully invest public funds and prioritize nutrient management in publicly owned treatment works and other specified land-based sources of nutrients in state programs. This includes, but is not limited to, requesting information regarding nutrient management approaches and feasibility when providing funding to non-state entities, to the extent permissible by law.
- **Seek opportunities to advance multi-benefit infrastructure upgrades for water recycling:** OPC will work with stakeholders and government partners to identify and leverage funding opportunities to inform and support infrastructure upgrades for water recycling at publicly owned treatment works that also reduce nutrient inputs on coastal and ocean ecosystems and resulting impacts on OAH. Infrastructure upgrades can provide additional co-benefits in support of other state water quality and water supply priorities, such as advancing *California's Water Supply Strategy: Adapting to a Hotter, Drier Future* and enhancing local water supply, through water recycling infrastructure that incorporates appropriate nutrient management. OPC supports a collaborative approach to advance infrastructure upgrades and water recycling to ensure they are feasible, will meet water quality objectives, address aging infrastructure challenges, and advance OAH and nutrient remediation efforts to protect beneficial uses of California ocean waters that provide for California's coastal and ocean ecosystem.