Item 5a

ACTION ITEM

Staff Recommendation
October 25, 2018

State of California Ocean Acidification Action

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RECOMMENDED ACTION: Staff recommends that the Ocean Protection Council adopt the following resolution pursuant to Sections 35500 et seq. of the Public Resources Code:

"The California Ocean Protection Council hereby adopts the State of California Ocean Acidification Action Plan (Exhibit A) to help state agencies, as well as the private sector and the scientific community, take tractable and strategic actions and make targeted investments to anticipate, reduce, mitigate, and adapt to the impacts of ocean acidification."

STRATEGIC PLAN OBJECTIVE(S): Climate Change, Science-Based Decision-Making

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EXHIBITS

Exhibit A: State of California Ocean Acidification Action Plan

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SUMMARY:
The State of California Ocean Acidification Action Plan (Action Plan) fulfills one of California's obligations to the International Alliance to Combat Ocean Acidification (OA Alliance), is consistent with the OA Alliance's goals, and may serve as a model for other jurisdictions seeking to undertake concrete actions to better understand, mitigate, and adapt to ocean acidification (OA). The Action Plan provides a roadmap to take tractable and strategic actions and make targeted investments to reduce and prepare for the impacts of OA. This Action Plan, while focused largely on mitigation and management actions for ocean and coastal systems, lays the groundwork for future actions that look beyond OA as solely an ocean issue.

Vision and Strategies of the Action Plan
Designed for integration into public agency operations and to inform decisions made by members of the private sector and scientific community, the Action Plan includes a 10-year

vision for addressing ocean acidification and a series of pragmatic actions to work towards that vision. The State of California's 10-year vision for action to address ocean acidification highlights three broader themes for implementation as of the year 2028:

- Mobilizing state government
- Advancing actions
- Advancing science

These broader themes are called out and reinforced in more detail within each of the Action Plan's strategies and supporting actions, which form the organizing framework. The Action Plan lays out six strategies and related actions to identify and prepare for a full range of risks and impacts, reduce the causes of OA, improve the resilience of vulnerable groups, and minimize harmful effects. For each strategy, the Plan explains the underlying rationale, provides a five-year plan and goals, and identifies a set of specific tractable actions that will need to be translated into operational steps by state agencies. Among the strategies and actions are:

- Prepare for a full range of OA risk and impacts
    - Conduct a statewide vulnerability assessment
    - Make targeted investments in monitoring to inform decision making
- Activate responsible elements of state government
    - Integrate OA into state policies, planning and operations
- Reduce the pollution that causes OA
    - Identify and reduce local water-borne and airborne pollution that exacerbates OA
    - Develop technical tools
- Deploy living systems to slow OA and store carbon
    - Restore and enhance seagrass meadows, kelp forests and salt marshes
    - Evaluate and advance aquaculture approaches that can help
- Build resilience of affected communities, industries and interests
    - Establish a statewide advisory group
    - Advance resilience of shellfish aquaculture industry and fisheries industry
- Engage beyond state borders

Although focused on California's needs and opportunities, these strategies and actions are cast within a regional, national, and international context, to help achieve state goals, advance global efforts and collaboration, and help other jurisdictions move forward on this challenging problem. This Action Plan has laid out a course of action that, when it is successfully implemented, will fundamentally alter how Californians view and address OA. The state will have the political will and knowledge to take effective action to reduce OA causes, to improve the resilience of vulnerable groups, and to manage marine resources in new ways that minimize harmful social and environmental impacts while bolstering resilience. To be effective, these improvements must address OA within the context of the changing climate, escalating and shifting human uses, and other changes that are significantly altering California's coastal and ocean environments and ecosystems.

BACKGROUND:

Ocean acidification is a complex, but actionable threat to California's coast and oceans that requires a sustained, multi-pronged approach to both mitigate acidification at a local and statewide scale, as well as manage the resulting disruptions. Global emissions of carbon dioxide (CO2) since the start of the industrial revolution have been driving not only changes to the Earth's climate, but also fundamental shifts to the chemistry of the world's oceans. The oceans are acidifying because they are absorbing a significant share of the CO2 released primarily by the burning of fossil fuels and changing land uses. OA is progressing rapidly, with average surface acidity of the world's oceans expected to double from that of preindustrial levels by the end of this century. Of particular concern to California, scientists expect the west coast of North America to experience some of the earliest and most severe changes, because the wind-driven upwelling that fuels the region's high productivity also will bring increasingly acidified waters to the surface.

OA is part of a system of interacting stressors facing marine ecosystems along the California coast, challenging the ability of California natural resource managers to meet their goals and vision for a healthy, functioning ocean and coast. OA will have important effects on marine animals and plants that can translate into impacts on coastal and marine fisheries, ecosystems, food webs, and the benefits they deliver to society, including California's ocean-based economy valued at approximately $45 billion annually.

California and the OA Alliance

Today, California is actively participating in a groundswell of international action on OA, and climate change more broadly. Ocean acidification is fundamentally a shared global water pollution problem driven largely by absorption of global CO_2 emissions. The effectiveness of global and regional efforts to reduce CO_2 emissions will play a large role in determining how much the oceans acidify and the environmental and social disruption that results. In 2016, the state became one of the founding members of the International Alliance to Combat Ocean Acidification (OA Alliance), an international network of more than 60 governments and organizations that have joined together to elevate the visibility of OA in public discourse and policy development and to push for the inclusion of strong ocean protection provisions in international climate agreements. This Action Plan fulfills one of California's obligations to the OA Alliance, is consistent with the OA Alliance's goals, and may serve as a model for other jurisdictions seeking to undertake concrete actions to better understand, mitigate, and adapt to OA.

History of OA and the West Coast

The devastating failure of oyster hatcheries in the Pacific Northwest between 2006 and 2009 signaled the first OA-related warning sign in our region and led to the establishment of a Blue Ribbon Task Force and a landmark OA action plan for the State of Washington. Research and observations since then have shown widespread shell corrosion among certain zooplankton and sensitivity of many shellfish to acidifying conditions and suggest that commercially valuable fisheries along the West Coast could be at risk.

The scientific foundation for this Action Plan was laid by California's prompt response to the oyster hatchery failures in the Pacific Northwest. In collaboration with Oregon, Washington, and British Columbia, California spearheaded the West Coast Ocean Acidification and Hypoxia Science Panel (Panel) – a multi-disciplinary regional effort to synthesize the state of knowledge and identify potential management options.

OA Legislation in California

Following release of the Panel's findings in 2016, the California State Legislature passed two related bills – Assembly Bill 2139 and Senate Bill 1363 – that charged the Ocean Protection Council (OPC) to test potential OA mitigation methods, be responsive to the Panel's recommendations, and ensure the state continues to receive the best available scientific advice through establishment of a science task force.

- *Assembly Bill No. 2139, Williams. Ocean Protection Council: ocean acidification and hypoxia (2016).* This bill authorizes the California Ocean Protection Council (OPC) to develop an ocean acidification and hypoxia science task force to ensure that council decision-making is supported by the best available science. It also requires OPC to take specified actions to address OA and hypoxia and adopt recommendations for further actions that may be taken. In response to AB 2139, OPC called for the creation of the California OAH Science Task Force.
- *Senate Bill No. 1363, Monning. Ocean Protection Council: Ocean Acidification and Hypoxia Reduction Program (2016).* This bill requires OPC, in consultation with the State Coastal Conservancy and other relevant entities, to establish and administer the Ocean Acidification and Hypoxia Reduction Program, and proposes authorization of funding for grants or loans for projects or activities that further public purposes consistent with the Ocean Acidification and Hypoxia Reduction Program.

Consultation and Review Processes that Informed the Action Plan

The Action Plan's development was informed by the ideas and advice of more than 70 people from across the aquaculture and fisheries industries, state and national governments, private philanthropy, and the scientific community. Most were consulted through phone or in-person interviews that solicited their views about the plan's 10-year vision, specific tractable actions to include in the plan, and how to ensure the plan's adoption and successful implementation.

California's newly convened Ocean Acidification and Hypoxia Science Task Force provided scientific and technical input to the draft plan development and developed the supporting science plan. The initial draft of the Action Plan was reviewed for scientific feasibility by the OAH Science Task Force and for policy feasibility by a group of policy experts. There was a 30-day public comment period on the public comment draft of the Action Plan; OPC staff incorporated public comment that fit within the scope and bounds of this Action Plan and the role of the California Ocean Protection Council. Additionally, helpful insights and concepts from parallel efforts in other jurisdictions and guidance developed by the OA Alliance were adapted for application to the California context.

OA Within the Context of Other Environmental Changes
The pace and intensity of OA along the California coast varies from place to place and over time, in part because the acidification caused by the absorption of CO_2 emissions is superimposed upon naturally occurring pH variation caused by upwelling and the delivery of freshwater by rivers and streams. Also, locally generated pollution may amplify and speed OA in areas where nutrients and organic carbon from runoff and ocean discharges cause excessive algal growth and the breakdown of carbon-containing materials by bacteria.

OA is just one of many significant environmental changes now occurring along the California coast, and it will act in combination with these other processes. Climate change is altering temperature and precipitation patterns and oceanographic processes. Larger and more intense regions of low oxygen (hypoxia) are occurring in some areas. Sea level is rising and coastal communities are responding by relocating and protecting infrastructure. Human uses and inputs to the oceans also are shifting, driven by population and land use change, shifting fisheries, and new uses of the oceans for food, energy, recreation, and habitation.

Some of the actions identified in this Action Plan focus specifically on OA, particularly those seeking to elevate attention to OA among policy-makers, managers, and affected interests or to reduce the causes of OA. Other actions, such as those related assessing risks and adapting to OA or managing biological resources affected by OA, address OA within the context of other ongoing environmental changes, because the effects of OA cannot be considered or managed separately. In many cases, the strategies and actions undertaken to deal with OA will aid in addressing other key challenges, such coping with coastal hazards and adapting to climate change.

CONSISTENCY WITH CALIFORNIA OCEAN PROTECTION ACT:
The proposed action is consistent with the California Ocean Protection Act (Division 26.5 of the Public Resources Code). Section 35615(a) specifically directs the Council to coordinate activities of state agencies to improve the effectiveness of state efforts to protect ocean resources and establish policies to coordinate the collection of scientific data related to the ocean. It is also consistent with Section 35615(5) which directs the Council to transmit the results of research and investigations to state agencies to provide information for policy decisions.

The California Ocean Acidification Action Plan will reduce threats to coastal and ocean ecosystems and improve water quality by providing a roadmap for tractable and strategic actions to help us understand, reduce, mitigate, and adapt to ocean acidification.

CONSISTENCY WITH THE OPC'S STRATEGIC PLAN:
The Action Plan implements Focal Area A: Science-based decision making and Focal Area B: Climate change. Specifically, the Guidance provides a framework to ensure that decisions are based on the best available science. The Action Plan also lays out a vision, strategies, and actions that will help safeguard California’s communities, habitats and critical infrastructure.