OA ALLIANCE International Alliance to Combat Ocean Acidification

Pacific Coast COLLABORATIVE

Ocean Conservancy®

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Models for Ocean-Climate Action

Along the Pacific Coast of North America

Governments around the globe are increasingly committed to integrating ocean-related mitigation and adaptation measures into their climate policies through Nationally Determined Contributions, Adaptation Communications, and other mechanisms. On the Pacific Coast of North America, state and provincial governments are experiencing firsthand the local impacts of climate change, and have been implementing a series of policies to help address them. This document outlines the challenges that the members of the Pacific Coast Collaborative—which includes Washington, California, Oregon, and British Columbia—are facing. It also outlines the steps we have taken in response to them, so that others can learn from and build on our experience.

Our Changing Ocean

Our ocean is essential for sustaining jobs, supporting coastal economies and cultures, and feeding billions of people. Due to combustion of fossil fuels, the ocean has absorbed large amounts of carbon dioxide and excess heat. This has resulted in increasing acidification combined with other climate change impacts, such as warmer temperatures and reduced oxygen levels. Already, climate change is causing significant, adverse impacts on fisheries, aquaculture, and marine ecosystems.

In addition, impacts on the ocean will dramatically worsen in the future without urgent and significant climate action, as highlighted in the 2019 IPCC Special Report on the Ocean and Cryosphere in a Changing Climate.

What's Happening Along the Pacific Coast of North America?

Climate change's impacts on the ocean are already being felt in our region. In the Pacific Northwest of the United States, ocean acidification resulted in the death of baby oysters in hatcheries and significantly disrupted the shellfish aquaculture industry. Acidified conditions make it difficult for organisms to build and maintain their shells. Low-oxygen conditions are also on the rise, leading to extended periods of hypoxia, stressing a wide range of marine animals from crabs to fish.

In 2014 and 2015, our region also experienced a massive marine heatwave covering more than 3.5 million square miles from Mexico to Alaska, an area larger than the contiguous United States. Ocean temperatures increased more than 3 degrees Celsius and triggered the largest toxic algal bloom ever recorded in the region. The resulting closure of commercial crab fisheries and recreational razor clam fisheries up and down the coast cost our communities hundreds of millions of dollars. Toxins also poisoned hundreds of sea lions and were detected in stranded marine mammals.

Key Management Tools: Examples from the West Coast of North America

Given the growing impacts and rising costs of inaction, the States of California, Oregon, and Washington and the Province of British Columbia are working together to bring global attention to climate impacts on the ocean, to dramatically increase urgency and ambition, and to take action. Collectively and individually our West Coast governments are addressing the causes of ocean acidification and changing ocean conditions while increasing the resilience of coastal communities to reduce current and future impacts.

Coordinated Regional Science and Monitoring

Coordinated regional science and monitoring aids our governments in understanding the regional trends and impacts of changing ocean conditions on our communities and ecosystems. It helps us answer our shared management questions about ocean acidification and changing ocean conditions and informs actions that reduce impacts, improve resilience, and support adaptive management. Efforts include:

- **West Coast Ocean Acidification and Hypoxia Science Panel**

  The panel synthesized scientific understanding and recommended a series of local and regional strategies for addressing the challenge, such as coordinated investments in regional monitoring to create a basis for evaluating actions.

- **West Coast Ocean Acidification and Hypoxia Assets Inventory**

  The inventory describes monitoring efforts across the region that can help capture trends in ocean acidification and hypoxia and identify impacts to key species and ecosystems. Completed in 2018 in partnership with academia and state, provincial, and federal governments, it sets the stage for a collaborative region-wide gap analysis that will inform additional priorities and strategic monitoring investments.

Regional Leadership and Response

Regional leadership and response by our governments helps us leverage expertise and resources, raise greater awareness, build broader partnerships, and coordinate our actions. Examples include:

The International Alliance to Combat Ocean Acidification

In December 2016, our West Coast governments formed and launched the International Alliance to Combat Ocean Acidification, or OA Alliance, to respond to a subnational call for climate and ocean leadership unleashed by the Paris Agreement, and to advance the influence of existing state and regional collaboration on an international scale.

OA Alliance members commit to take individual actions that address the environmental and economic threat posed by ocean acidification within their region, recognizing the need to urgently reduce carbon dioxide emissions and to take other measures that reduce ocean stressors and improve resilience.

Early on, nations such as Fiji, Chile, New Zealand, France, and Sweden joined us. Today, we have over 80 members committed to addressing ocean acidification and elevating the importance of including the ocean in climate discussions and policy frameworks.

High-Profile Events to Elevate the Ocean-Climate Connection

California hosted the Global Climate Action Summit in September 2018. It set a global example by calling on all sectors of society to achieve ocean-related climate goals as vital steps toward realizing the Paris Agreement. Our governments and the OA Alliance played a major role in connecting climate and ocean issues and advancing action.

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Action Area	British Columbia (BC)	California (CA)	Oregon (OR)	Washington (WA)	For example* *Additional details and examples are available from each jurisdiction.
Reducing root causes	✓	✓	✓	✓	▸ Implementing policies designed to reduce carbon emissions, such as 100% clean electricity mandates (WA and CA), low-carbon or clean fuel standards (OR, CA, BC), electrifying transportation (BC, WA, CA), and improving efficiency of buildings (BC, WA, OR, CA). ▸ Assessing and reducing human sources of nutrients such as through the Puget Sound Nutrient Reduction Project (WA) and modeling the effect of nutrient loading on ocean acidification (CA). ▸ Promoting adoption of clean technologies and greenhouse gas reductions in the maritime sector including fisheries, seafood processing and aquaculture (BC), ferries (WA, BC), and sulfur emissions reductions and idling limits (CA).
Increasing scientific knowledge	✓	✓	✓	✓	▸ Baynes Sound Environmental Intelligence Collaboration (BaSEIC) to monitor ocean acidification chemistry where farmed oysters are grown (BC). ▸ Improving monitoring networks with new instruments and parameters and use of strategic reference sites such as marine protected areas (CA, OR, WA). ▸ Investing in a wide range of scientific research and coordination (CA, WA), such as the Washington Ocean Acidification Center.
Increasing adaptation and resilience	✓	✓	✓	✓	▸ Monitoring and forecasting of ocean acidification conditions, which has allowed shellfish hatcheries to adjust the pH of the water to improve survival of baby shellfish (OR and WA). ▸ Developing more resistant broodstock (BC, OR, WA) such as the Ocean Acidification: Shellfish Industry Seed Supply partnership in BC and the Molluscan Broodstock Program in OR. ▸ Evaluating the role of seagrass and kelp in ameliorating or buffering against local ocean acidification conditions through a variety of research activities and pilot projects (WA, CA, OR). ▸ Developing regulatory flexibility into fisheries that are affected by changing climate and ocean conditions (e.g. crab gutting to mitigate harmful algal bloom outbreaks in OR).
Increasing awareness	✓	✓	✓	✓	▸ Participating in a wide range of events and delivering outreach materials and presentations to a variety of audiences and media (all). Examples include Oregon's OAH Coordinating Council and Washington's Marine Resource Advisory Council. ▸ Local aquarium exhibits and programs incorporate ocean acidification and K-12 materials are available for teachers (WA, OR, CA). ▸ California created a program that will include funding for grants and loans for projects or activities that further public purposes consistent with the OAH Reduction Program.
Building sustained support	✓	✓	✓	✓	▸ Founded the OA Alliance. ▸ Created and advanced the Ocean-Climate Action Agenda at the 2018 Global Climate Action Summit. ▸ OA Action Plans adopted by OR (2019), CA (2018) and WA (2017, 2012). ▸ Developing a climate preparedness and adaptation strategy that includes ocean and coastal impacts (2020) and implementing marine plans for 4 coastal areas (BC). ▸ Passed state legislation on policies and/or funding to address ocean acidification (WA, OR, CA).