



WORKSHOP SUMMARY: SPATIAL AND ECOLOGICAL INSIGHTS FOR DECISION- MAKING ON CHANGING OCEAN CHEMISTRY

Hosted and facilitated by California Ocean Science Trust, a boundary organization committed to applying science to accelerate progress towards a healthy and productive ocean future.

10:00 am to 4:30 pm, August 27, 2019
East Bay Community Foundation, Oakland, CA

OVERVIEW

On August 27, 2019, the research team for the project “Geospatial Patterns and Species Impacts of Changing Ocean Chemistry on the West Coast” came together with managers, policymakers, and other experts from California, Oregon, and Washington State for a workshop to discuss science needs and management challenges related to interacting ocean stressors. Funded by the Lenfest Ocean Program in Spring 2019, this three-year project aims to:

- map and overlay areas of high stress on key species of economic, ecological, and cultural importance, including sea urchins, abalone, clams, and crabs; and
- work alongside managers, policymakers, shellfish aquaculture industry, and other potential end users to link results with decisions.

You can access all information about the project, including written materials [here](#).

Workshop Goals

The workshop aimed to ensure the trajectory for this newly funded research project aligns with decision-maker needs and is relevant to natural resource management and policy decisions at the state and regional levels across the U.S. West Coast. Throughout the day, participants engaged to:

1. Gather input to inform the three-year research project so that it may better align with decision-making across the West Coast.
2. Identify key decision points and opportunities to consider ocean acidification (OA) and other interacting stressors over the next three to five years; including current and potential management and policy actions, and funding initiatives at the state and federal levels.
3. Identify challenges and information needs for considering OA in existing mandates and frameworks.
4. Identify ways to engage throughout the project and what types of science products would be useful and when.

KEY DISCUSSION THEMES AND INPUT

It was of primary importance to the research team to foster two-way dialogue and seek input at the beginning of the project on how best to align with decision-maker needs. As the research team moves forward on the project, the Lenfest Ocean Program will collaborate with them on developing effective engagement with relevant audiences and communities. The workshop opened with a presentation on the research, drawn from a previously recorded webinar (watch [here](#)), and discussion about the project. Through the course of the day, several key themes and input emerged:

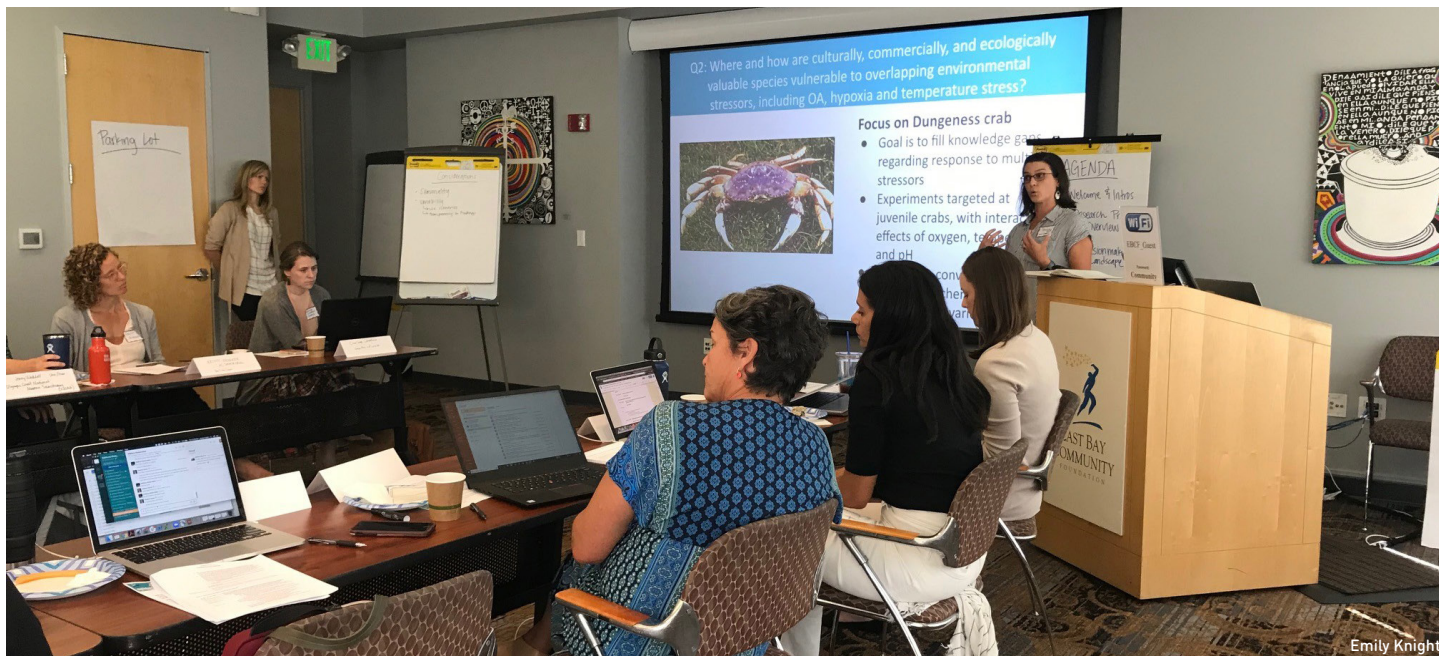
Continue to listen and engage. This project was designed and launched with end user feedback, which helped establish important relationships between the research team and decision-makers. However, management needs and corresponding decision points often evolve. Participants recommended finding venues and opportunities to keep the conversation (and mutual learning) going.

Expand audiences. Thus far, the team has engaged managers at the state and federal levels, and stakeholders in the commercial fishing and shellfish aquaculture industries. Going forward, they aim to expand to additional audiences. For instance:

- Tribal communities in California, Oregon, and Washington State: Work with organizations such as the Northwest Indian Fisheries Commission and the West Coast Ocean Alliance to identify the right connections to effectively share project information. In addition, connect with liaisons to tribal communities in state agencies and policy programs.
- Additional state agencies: While the research team has already conversed with a variety of state agencies across the West Coast, they recognize the multi-jurisdictional challenge of changing ocean chemistry. Utilize bodies like the California Ocean Protection Council, the Oregon Coordinating Council on Ocean Acidification and Hypoxia, the Washington Marine Resources Advisory Council, the Federal Interagency Working Group on Ocean Acidification (chaired by the NOAA Ocean Acidification Program) that work across agencies to make new contacts for the project.
- Additional fishing and aquaculture industries: Researchers are in communication with nearshore aquaculture businesses in California and regional fisheries associations such as the Pacific Coast Federation of Fishermen's Associations. While the focus of the project is on clams, abalone, crabs, and sea urchins, the research team will share project information with other fisheries that may be vulnerable to or concerned about changing ocean chemistry. For example, the Pacific Coast Shellfish Growers Association, among others.
- Additional regional management jurisdictions: Researchers are already in conversation with the NOAA Office of Aquaculture in the West Coast Region and regional bodies such as the Pacific Coast Collaborative. There may be opportunities to also share information with entities such as the Pacific Fishery Management Council and the International Pacific Halibut Commission. Further engagement with such partners will depend on the extent that existing data covers federal waters (the project is state waters focused).

Consider additional species of management and stakeholder interest. With researchers aiming to produce maps that overlay interacting ocean stressors on to four groups of species (sea urchins, abalone, clams, and crabs), participants expressed interest in incorporating analyses specific to mussels, razor clams, and geoducks. Participants would also like to understand the responses of various ecosystems to changing ocean chemistry, such as submerged aquatic vegetation and state and federal protected areas and marine sanctuaries.

Visualize and tailor final products to decision-maker needs. As results from the project emerge, the researchers will produce peer reviewed publications. Working with the Lenfest Ocean Program, the researchers also intend to translate findings into products tailored to decision-maker and stakeholder needs, collaborate with managers on their use, make outcomes and products publicly available and share methods to allow expansion of this work.



Continue to coordinate with other research efforts. There are a number of complementary research efforts ongoing around the West Coast. The research team will continue coordinating with these efforts, including research supported by the [NOAA Ocean Acidification Program in the California Current](#); the [Washington Ocean Acidification Center](#); OPC-funded research via the [Proposition 84 Competitive Grants Program on ocean acidification and hypoxia](#); the Southern California Coastal Water Research Project [ocean acidification and hypoxia research program](#); efforts out of Oregon State University to understand impacts to coastal communities and their capacity to adapt; and the forthcoming OPC Science Advisory Team (OPC-SAT) Working Group on [Marine Protected Areas and Climate Resilience](#) (coordinated by Ocean Science Trust) to name a few. Further, each of the West Coast states have produced ocean acidification action plans (see links below) that articulate key science needs and are spurring new research and monitoring efforts across agencies and academic institutions.

ALIGNING WITH DECISIONS

There are multiple decision points across management agencies where this information may intersect. At the policy level, each state has acknowledged the multi-jurisdictional nature of addressing changing ocean chemistry by providing policy guidance and resources via:

- [California Ocean Acidification Action Plan](#), California Ocean Protection Council
- [Oregon Ocean Acidification & Hypoxia Action Plan](#), Oregon Coordinating Council on Ocean Acidification & Hypoxia
- [Addendum to Ocean Acidification: From Knowledge to Action](#), Washington Marine Resources Advisory Council

At the workshop, participants worked together to develop tables of forthcoming decision processes at the state and regional levels that may benefit from this research. **These tables are not comprehensive.** They represent what was discussed at the workshop only. The purpose was to provide a starting point for the research team, the Lenfest Ocean Program, and others to further explore the policy and management landscape for OAH going forward.

Table 1

STATE FOUR-YEAR DECISION POINTS TIMELINE

Color code: Washington (blue), Oregon (purple), California (green)

2019	2020	2021	2022
<p>WA Department of Fish & Wildlife adopted climate action policy (2017) and formed climate action team (2019).</p> <p>WA agencies staffed up on OA.</p> <p>Governor’s Office is planning the budget & policies related to OA action plan implementation (fall 2019).</p> <p>As part its Action Plan OR aims to work on related agency regulations and mandates.</p> <p>OR released their 2018/2020 Clean Water Act 303d listing for public review.</p> <p>CA Coastal Commission to release Strategic Plan for public review, which incorporates OA.</p> <p>CA to update the Marine Life Management Act Master Plan and Fishery Management Plans (fish 2019, inverts 2020).</p>	<p>Governor’s Office biennial budget and policy development to happen in the fall of 2020.</p> <p>OR marine reserves: Process for reviewing and planning regulations.</p> <p>OR Climate Adaptation Plan: 2020 update to inform state climate planning.</p> <p>Part three of updating the OR Territorial Seas Plan.</p> <p>Incorporate policies to address OAH in the Rocky Habitat Management Strategy.</p> <p>Working group to review CA’s MPA network (2020-2022).</p> <p>CA State Water Boards is considering evaluating data around OAH and if existing standards in the Ocean Plan are appropriate for this assessment.</p> <p>OPC-SAT (Ocean Science Trust) Climate and MPAs working group (spring 2020).</p> <p>OAH Science Task Force to evaluate monitoring gaps & recommendations (2020).</p>	<p>Develop Wastewater General Permit for Puget Sound (2021 – 2023).</p>	<p>Review: Marine Reserves Program review (2023).</p> <p>Prepare supporting data for offshore discharge permit decisions (2023).</p> <p>Management Review: 10 years of the statewide network of MPAs.</p>

Table 2

ONGOING STATE SCIENCE AND MANAGEMENT EFFORTS

Continuous activities or those that go beyond the timeline above

Jurisdiction	Entity	Initiative or Process
California	State Water Boards	<ul style="list-style-type: none"> Develop indicator species to monitor potential impacts. 5- to 10-year process to develop and consider water quality standards for OAH.
California	Coastal Commission	<ul style="list-style-type: none"> Permitting is a continuous activity, with potential to explore where OAH intersects with impact and mitigation. Restoration permitting (also continuous).
California	Natural Resources Agency	<ul style="list-style-type: none"> Climate Adaptation Assessments and Strategies.
Washington State	Department of Natural Resources	<ul style="list-style-type: none"> Update reserves and protected areas (continuous). Annual co-management decisions with tribal communities on harvest. Funding decisions for coastal restoration (continuous, when funds are available).
Washington State	Interagency	<ul style="list-style-type: none"> Marine Spatial Planning Process.

Table 3

ONGOING FEDERAL AND REGIONAL SCIENCE AND MANAGEMENT EFFORTS

Entity	Initiative or Process
West Coast Ocean Alliance	<ul style="list-style-type: none"> • West Coast Regional Ocean Data Portal is developing an Ocean Health Condition Report. • Annual Meetings (current meeting Dec 2019).
Pacific Fishery Management Council	<ul style="list-style-type: none"> • Fishery Management Plans (depending on species of interest). • Fishery Ecosystem Plan. • Annual Ecosystem Reports. • Climate and Communities Initiative.
NOAA Aquaculture	<ul style="list-style-type: none"> • Data can be pulled in year-round.
National Marine Sanctuaries (NMS)	<ul style="list-style-type: none"> • Condition Reports and Management Plans every 5 - 10 years (timelines vary by Sanctuary): <ul style="list-style-type: none"> • Olympic Coast NMS: Aim to have a draft Condition Report by Sept 2020 followed by management planning in 2021. • Cordell Bank NMS: To start the Condition Report in 2020. • Greater Farallones NMS: To start Condition Report in 2021. • National Marine Sanctuaries also have a permitting process for activities within Sanctuary bounds (which collectively cover 15,300 square miles of ocean on the West Coast).
Olympic Coast National Marine Sanctuary	<ul style="list-style-type: none"> • Designated a Sentinel Site for Ocean Acidification by NOAA, which can help to shore up support for continued ocean monitoring and OAH research in the region.
Coastal Zone Management Program	<ul style="list-style-type: none"> • Federal consistency decisions within each state and permitting decision.

ENGAGEMENT GOING FORWARD

The research team aims to center their communication on the intersection between people and their environment to not only illuminate where and when resources are at risk but to spark meaningful dialogue about solutions. The workshop concluded with input on written materials and potential venues to share information including cultivating a web presence, newsletter, additional one-on-one meetings, webinars, and more.

Finally, the workshop provided a unique opportunity for decision-makers across the three West Coast states to connect with researchers and others. Discussions throughout the day catalyzed network expansion and sparked relationships that could be useful in developing solutions. The research team and the Lenfest Ocean Program will draw on this network going forward. As an immediate next step, the Lenfest Ocean Program will develop an engagement plan to support the research team in identifying new audiences and prioritizing outreach activities to carry out in the future.

WORKSHOP PARTICIPANTS

Research Team

- Tessa Hill, University of California, Davis
- Kristy Kroeker, University of California, Santa Cruz
- Ana Spalding, Oregon State University

Supporting Staff and Facilitators

- Hayley Carter, California Ocean Science Trust
- Jessica Kauzer, California Ocean Science Trust
- Emily Knight, Lenfest Ocean Program
- Bryn Power, California Ocean Science Trust

Participants

- Debbie Aseltine-Neilson, California Department of Fish and Wildlife
- Whitney Berry, California Ocean Protection Council
- Deanna Caracciolo, Oregon Department of Land Conservation and Development
- Rich Childers, Washington Department of Fish and Wildlife
- Kirsten Feifel, Washington Department of Natural Resource
- Lauren Garske-Garcia, California Coastal Commission
- Jen Hennessey, Washington Governor's Office
- Julie Johnson, California State Water Resources Control Board
- Esther Kennedy, University of California, Davis
- Justine Kimball, California Ocean Protection Council
- Corey Niles, Washington Department of Fish and Wildlife
- Dale Norton, Washington Department of Ecology
- Martha Sutula, Southern California Coastal Water Research Project
- Jenny Waddell, Olympic Coast National Marine Sanctuary
- Katherine Walsh, California State Water Resources Control Board
- Melissa Ward, University of California, Davis
- Charlotte Whitefield, Oregon Department of Fish and Wildlife
- Diane Windham, NOAA West Coast Regional Office

Contact

For any questions, please contact Tessa Hill, University of California, Davis, at [tmhill@ucdavis.edu](mailto:tmill@ucdavis.edu), or Emily Knight, Manager, Lenfest Ocean Program, at eknight@lenfestocean.org.

901 E Street NW, **E** info@lenfestocean.org lenfestocean.org
Washington DC 20004 **P** 202.540.6389

Lenfest Ocean Program was established in 2004 by the Lenfest Foundation and is managed by The Pew Charitable Trusts

SUPPORTING SCIENCE
AND COMMUNICATING
RESULTS.