The Oregon Coordinating Council on
Ocean Acidification and Hypoxia

Date: February 12th, 2019

To: The Honorable Michael Dembrow, Chair
Senate Committee on Environment and Natural Resources
Oregon State Legislature

Testimony by Co-Chairs of the Oregon Coordinating Council on
Ocean Acidification and Hypoxia
Dr. Jack Barth and Dr. Caren Braby

Good afternoon Chair Dembrow and members of the Committee,

As the Co-Chairs of the legislatively created Oregon Coordinating Council on Ocean Acidification and Hypoxia (or "OAH Council"), we appreciate the opportunity to provide you with comments on Senate Bill 260-1, which is implementing recommended priorities established in the OAH Council September 2018 report (https://www.oregonocean.info/index.php/ocean-acidification). In December 2018, we testified to this committee, describing the history of the OAH Council, the process we took in developing the recommendations contained in our September 2018 report, and how we established priorities for near-term actions. Today, we provide you with a description of how the projects outlined in SB260-1 relate to the OAH Council priorities to help inform your decision-making.

Background (as provided at December 12, 2018, hearing)
Oregon's coastal economies rely on our vibrant marine ecosystem. Our nearshore waters are home to sport and commercial fisheries, all of the State's mariculture operations, and contain critical nursery grounds for economically important species including rockfish, oysters, salmon, pink shrimp, Dungeness crab, and others.

Oregon is also among the first places in the world to observe direct impacts of ocean acidification and hypoxia (OAH), due to our unique geographic and oceanographic context, putting our fragile marine ecosystem at risk. When CO_2 is absorbed by seawater, chemical reactions occur that lower its pH (making the seawater more acidic), making it more difficult for shell-forming species to build shells and undermining the integrity of the food web. At the same time, oxygen-depletion is on the rise; Oregon has seen several seasons in a row with extended periods of hypoxia in our coastal waters. Ocean acidification and hypoxia are compounding stressors for a wide range of marine animals. Understanding and addressing intensifying OAH conditions here in Oregon is critical to our understanding of larger regional climate change impacts and addressing these impacts with carbon management strategies.

In 2017, the Oregon Legislature provided critical leadership in facing the challenges of OAH, by passing Senate Bill 1039, thus creating the Oregon OAH Council.

The OAH Council 2018 Recommendations and SB260-1
The OAH Council's September 2018 report identifies 7 actions that warrant immediate attention. To begin implementation of the OAH Council's 7 highest priority actions, SB260-1 describes projects for direct appropriation to ODFW and OSU, as well as to the Oregon Ocean Science Trust to distribute via

competitive grants, through requests for proposals (RFPs). These projects fall into three categories of actions, as laid out in the OAH Council report: a) monitoring, b) ecosystem resilience initiatives, and c) communications. In addition, there are two priority actions for which there are no specific appropriation recommendations at this time: d) coordination with CO_2 policy activities, and e) agency priorities. Appended to this testimony is a detailed description of the connection between the OAH Council recommended priorities and the projects in SB260-1. We have also noted the projects in SB260-1 that were originally recommended by the Oregon Shellfish Task Force (HB2209; 2015), which focused on many issues related to the OAH Council's recommended priorities.

Concluding Remarks

As Co-Chairs to Oregon's OAH Council, we have taken on the charges set forth in SB1039 with a sense of urgency and importance, knowing that we have the remarkable opportunity to help prepare for changes to Oregon's marine ecosystems brought on by ocean acidification and hypoxia. Our preparations now will help Oregon coastal communities and economies that rely on a healthy marine ecosystem. Throughout the OAH Council process, we have taken a thoughtful, collaborative, science-based approach to developing our recommendations and encouraging public input and participation.

The investment opportunities outlined in SB260-1 are meaningful and will make a difference in our understanding of OAH science, impacts and solutions.

Thank you for your consideration of these comments and we welcome any questions.

Sincerely,

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OAH Council website:
https://www.oregonocean.info/index.php/ocean-acidification

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Description of OAH Council recommended priorities and relationship to the projects listed in SB260-1

OAH Report Actions 1.1.a/c: Support and maintain Oregon's monitoring of OAH oceanographic metrics and biological response metrics.

- **SB260-1, Section 1.1**: $100,000 (RFP) for intertidal OAH monitoring at Oregon marine reserves
  - Project intent: Critical expansion of Oregon's *intertidal* monitoring sites of OAH trends; capitalize on Oregon existing investment in marine reserves as scientific reference sites, by co-locating new OAH monitoring sites at marine reserves.
- **SB260-1, Section 1.2**: $300,000 (RFP) for subtidal OAH monitoring at Oregon marine reserves
  - Project intent: Critical expansion of Oregon's *subtidal* monitoring sites of OAH trends; capitalize on Oregon existing investment in marine reserves as scientific reference sites, by co-locating new OAH monitoring sites at marine reserves.
- **SB260-1, Section 1.3**: $100,000 (RFP) for OAH monitoring at Yaquina Bay
  - Project intent: Yaquina Bay is one of the 4 most important estuaries in Oregon, both ecologically and economically. This project would establish OAH monitoring in Yaquina Bay.
- **SB260-1, Section 2.1**: $420,000 (ODFW; STF) to be expended for the shellfish and estuarine assessment of coastal Oregon project (SEACOR).
  - Project intent: This small team assesses Oregon estuaries approximately once every 10-12 years. This project expands the team to increase the frequency of assessments, so that trends in shellfish and eelgrass will be captured more frequently.
- **SB260-1, Section 3.2**: $100,000 (OSU) to be expended to support the work of the Cooperative Institute for Marine Resources Studies in augmentation of sampling along the Newport Hydrographic Line in order to support research on OAH.
  - Project intent:
- **SB260-1, Section 3.3**: $100,000 (OSU; STF) to be expended to support the work of the College of Earth, Ocean, and Atmospheric Sciences in monitoring for ocean acidification using Burke-O-Lator systems.
  - Project intent: Support further deployment of climate-grade Burke-O-Lator system(s) at key sites along Oregon's coast.

OAH Report Actions 3.2.a/b: Support new initiatives to promote natural ecosystem resilience.

- **SB260-1, Section 1.4**: $140,000 (RFP; STF) for ecosystem modeling of submerged aquatic vegetation
  - Project intent: Ecosystem modeling will help identify resiliency goals for Oregon's estuaries.
- **SB260-1, Section 1.5**: $25,000 (RFP; STF) develop recommendations, through workshops or seminars, for maximizing abundance of wild shellfish, cultured shellfish and submerged aquatic vegetation in estuaries in Oregon.
  - Project intent: Convene an eelgrass summit; develop recommendations on how best to promote both ecological and economic resilience.

- **SB260-1, Section 1.6**: $150,000 (RFP; STF) to develop best management practices for conducting shellfish cultivation in a manner that protects or promotes estuarine health.
    - Project intent: To conduct cooperative research to develop and document best management practices for commercial mariculture to also achieve eelgrass and estuary resilience.
- **SB260-1, Section 1.7**: $180,000 (RFP; STF) to fund a study on the life cycle impacts of OAH on shellfish species that are of importance to Oregon.
    - Project intent: Fund research on wild and cultured shellfish species and OAH impacts; increase our understanding including reproduction, recruitment, location of source populations, and connectivity.
- **SB260-1, Section 2.2**: $50,000 (ODFW; STF) to be expended to conduct estuary mapping of for long-term documentation of OAH impacts.
    - Project intent: Map native Olympia oyster beds for long-term monitoring and protection to promote this OAH-resilient species.
- **SB260-1, Section 3.1**: $170,000 (OSU; STF) to be expended to support the Molluscan Broodstock Program (MBP) at the Hatfield Marine Science Center in conjunction with the Whiskey Creek Shellfish Hatchery (WCSH).
    - Project intent: Support to MBP to restore native populations and promote commercial cultivation of the native Olympia oyster. Enhance ecosystem resilience to OAH and associated stresses.

OAH Report Action 4.2.a: Keep legislators and policy-makers up-to-date on the science, impacts of and solutions for OAH.

- **SB260-1, Section 1.8**: $65,000 (RFP; STF) to develop a communications plan and strategy for outreach and education on ocean acidification and hypoxia impacts, science and solutions.
    - Project intent: Develop communications materials on the science, impacts and solutions for OAH that will be useful in policy decision-making.

No-cost recommended priorities of the OAH Council, not included in SB260-1:

- **OAH Report Action 2.1.b**: Incorporate OAH into CO_2 management and mitigation discussions in the state.
    - **Intent of Action:** OAH Council recommendation intended to be considered in policy decision-making across Oregon state government.

- **OAH Report Action 5.1.a**: Develop high-level policy guidance for the state's government agencies on prioritizing OAH in agency workload.
    - **Intent of Action:** OAH Council recommendation intended to be considered in policy decision-making and agency strategic decisions (e.g. strategic planning) across Oregon state government.

Acronyms Used

OAH Ocean Acidification and Hypoxia
ODFW Oregon Department of Fish and Wildlife
OSU Oregon State University
RFP Request for proposals; competitive grants to be administered by the Oregon Ocean Science Trust.
STF Shellfish Task Force; created by Oregon legislature (HB2209, 2015) and convened during the 2015-2017 biennium to provide recommendations on a shellfish initiative, including wild and cultured stocks of bivalve shellfish, and their habitats.