Washington Ocean Acidification Center

The Washington Ocean Acidification Center serves the entire state from its base in the College of the Environment at the University of Washington.

The Center was established by the Washington State Legislature following the recommendation of the Blue Ribbon Panel on Ocean Acidification. Created in 2013, the Center connects researchers, policymakers, industry and others across Washington to advance the science of ocean acidification and provide a foundation for proactive strategies and policies to protect marine ecosystems and the people connected to them. The Center is a member of the University of Washington's EarthLab, which aims to accelerate and focus expertise to address large-scale environmental challenges, making a positive impact on people's lives and livelihoods.

How does ocean acidification affect Washington state?

The Puget Sound and our Pacific Northwest marine waters are particularly vulnerable to ocean acidification because of our location combined with other global, natural and human-driven factors. These factors include:

- The amount of global carbon dioxide in our atmosphere.
- Upwelling of nutrient-rich—and often corrosive—waters off of our coast.
- High rates of plankton growth that ultimately reduce the oxygen content of local waters.
- Human activities causing runoff of nutrients and other pollutants from our watersheds and cities into Puget Sound and coastal waters.
- Industrial emissions of acidic gases other than carbon dioxide.

In isolation, any one of these factors may not tip the balance—but when added together they make our waters more susceptible to ocean acidification.

Washington Ocean Acidification Center Action Plan

Since its creation in 2013, the Washington Ocean Acidification Center has been charged by the State Legislature to lead the state in priority areas of ocean acidification research:

- Working with partners, establish an **expanded and sustained ocean acidification monitoring network** to measure trends in local acidification conditions and related biological responses. This monitoring will allow detection of local acidification conditions and increase our scientific understanding of local species responses.

- As part of the monitoring network, ensure continued **water quality monitoring at six shellfish hatcheries and rearing areas** to enable real-time management of hatcheries under changing pH conditions. The monitoring data have enabled hatchery operators to avoid drawing corrosive water into the hatcheries and rearing areas.
- Establish and refine the **ability to make short-term forecasts of corrosive conditions** for application to shellfish hatcheries, growing areas and other areas of concern. A real-time online tool has been developed that is accessible to shellfish growers and managers to track acidification on a scale of days to weeks, giving them time to change or adjust their hatcheries' operation.
- Conduct **laboratory studies** to assess the direct causes and effects of ocean acidification, alone and in combination with other stressors, on Washington's species and ecosystems. The studies are focused on determining the biological responses of species of ecological, economic and cultural significance, to a full suite of stressors to which they are exposed, and will help estimate the genetic potential of these species to adapt to ocean acidification.

Currently, live output from the forecast model "LiveOcean" and the real-time monitoring data from shellfish growers and many monitoring partners are available through the Northwest Association of Networked Ocean Observing Systems (NANOOS) at www.nanoos.org through the data portal NVS. Several publications are available to date from experimental and field observations.

The Washington Ocean Acidification Center approach is to:

- bring a regional focus to research priorities and serve as a regional hub for research endeavors,
- train the next generation of scientists, managers and decision-makers to face the challenges posed by ocean acidification,
- use a distributed network model of organization to join the expertise of UW scientists with that of other regional academic institutions, agencies and organizations, and
- engage with industry representatives, state, local, federal and tribal policy makers, and public opinion makers through specific activities and through the formation of an advisory board and a science advisory team, both of which will be used to help guide the activities of the Center.

The Center strengthens its work—both in terms of scientific rigor and application to real-world scenarios—through partnerships with federal, tribal, state and local governments, industry, regional colleges and universities and others. Many productive partnerships and collaborations already exist and more are emerging as we work to address this issue.

For more information, see: https://environment.uw.edu/research/major-initiatives/ocean-acidification/washington-ocean-acidification-center/

The Center is co-directed by Terrie Klinger (Marine and Environmental Affairs; tklinger@uw.edu) and Jan Newton (Applied Physics Laboratory, Oceanography; janewton@uw.edu).