New tool displays West Coast ocean acidification data

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More acidic seawater is corrosive and contains less of the minerals that oysters need to build their shells. Credit: Marc Dewey / Taylor Shellfish

Increasing carbon dioxide in the air penetrates into the ocean and makes it more acidic, while robbing seawater of minerals that give shellfish their crunch. The West Coast is one of the first marine ecosystems to feel its effects.

A new tool doesn't alter that reality, but it does allow scientists to better understand what's happening and provide data to help the shellfish industry adapt to these changes.

The National Oceanic and Atmospheric Administration this week announced the launch of the IOOS (Integrated Ocean Observing System) Pacific Region Oean Acidification Data Portal, a go-to source for ocean acidification data along the West Coast. A University of Washington researcher led the collaborative effort.

"This makes valuable data more easily accessible, and it will increase our scientific understanding of how similar or different conditions are throughout the Pacific," said Jan Newton, an oceanographer at the UW Applied Physics Laboratory.

The tool offers real-time ocean chemistry data for the coast and some Pacific islands, and in protected bays at shellfish hatcheries in Washington, Oregon, Alaska and California.

Shellfish growers can use the data to decide when to grow larvae, when to set baby oysters out into the field, and when to draw the thousands of gallons of seawater they need to fill their tanks. They can also see when they might want to manipulate the chemistry of intake waters.

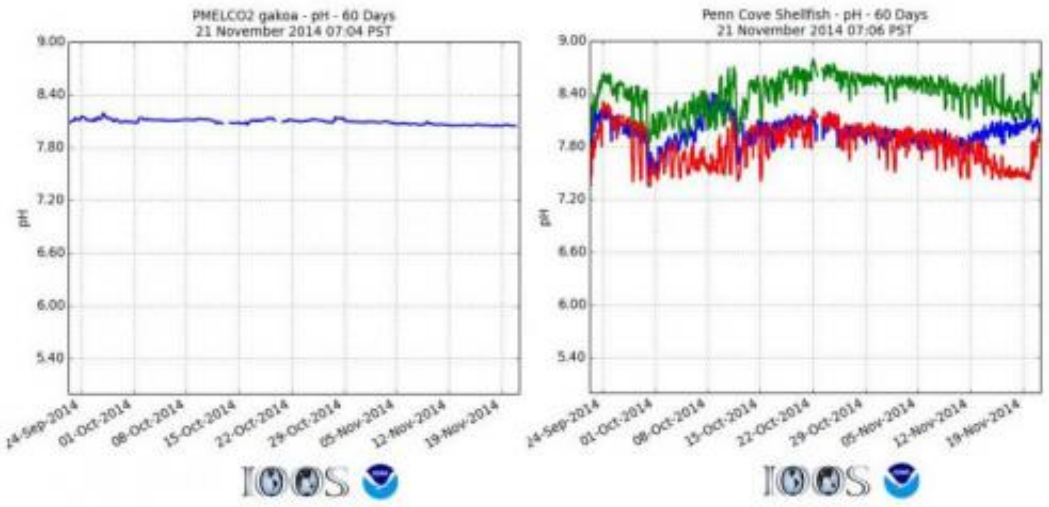
"For shellfish growers, having access to the data off their local site is important, but the oceanic data is an advanced warning system," Newton said.

This is a monitoring buoy in Dabob Bay, near a shellfish hatchery in Washington's Puget Sound. Credit: Rachel Vander Giessen / UW

The interactive portal is adapted from a tool launched in 2009 by the Northwest Association of Networked Ocean Observing Systems, or NANOOS. Newton directs the NOAA-funded center that acts as a clearinghouse for Washington and Oregon coastal observations on everything from boating conditions to toxic algal blooms.

In addition to compiling data from NANOOS and four other regional centers, the tool adds new sensors developed by UW alumnus Burke Hales, now a professor at Oregon State University. His device, nicknamed "the Burke-O-Lator," can detect the suitability of ocean waters to form aragonite - the specific form of calcium carbonate mineral that clams, mussels and oysters use to form their protective shells. Aragonite is one of the most soluble forms of calcium carbonate, and is particularly sensitive to changes in ocean chemistry.

The portal includes readings from Burke-O-Lators along the West Coast. The Oregon Legislature funded the first deployment at the Whiskey Creek Shellfish Hatchery. In the past year, the UW-based Washington Ocean Acidification Center was funded by the Washington Legislature to install Burke-O-Lators at a hatchery operated by Taylor Shellfish Farms in Puget Sound's Hood Canal and at a shellfish growing site in Willapa Bay. The federal government funded sensors this year at Alutiiq Pride Shellfish Hatchery in Alaska, Hog Island Oyster Co. in central California and Carlsbad Aquafarm in Southern California.



Open-ocean pH, on the left, is fairly stable but gradually dropping due to climate change. The pH in Puget Sound, right, is more variable, but is fed by the open-ocean water. The right shows three different depths. Credit: NOAA IOOS

Other monitoring sites incorporated in the data portal are at commercial shellfish beds, the Seattle Aquarium, big offshore buoys that record weather and ocean conditions, and solar-powered ocean sensors deployed by the UW in Hood Canal and other locations in Puget Sound. Also included are several moorings deployed by NOAA's Seattle-based

Pacific Marine Environmental Laboratory to measure ocean acidification in Hawaii, Alaska and California waters.

"All of us will continue to serve our data on our own regional portals, because that's very important to connect to your local communities," Newton said. "But in some cases you want to take a wider look at things."

Scientists at the UW and elsewhere will use the data to understand changes in the water chemistry. Three new postdoctoral research positions with the Washington Ocean Acidification Center will interpret the data and look for trends.

More information: www.ipacoa.org/

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