

‘Like putting headlights on a car’

Pacific oysters gain from IOOS® data

About six years ago, production at some Pacific Northwest oyster hatcheries began declining at an alarming rate, posing severe economic impact and challenging a way of life held by shellfish growers for more than 130 years.

By 2008, the oyster harvest at Whiskey Creek, a major Oregon supplier to the majority of West Coast oyster farmers, plummeted 80 percent. At about the same time, corrosive, acidified seawater was hitting the shores of the Pacific.

Something had to be done. Oyster production accounts for more than \$84 million of the West Coast shellfish industry, which supports more than 3,000 jobs.

“When you see oyster shells dissolving in water, there’s a compelling need to know why,” says Bill Dewey of Taylor Shellfish Farms in Washington state.

Thanks to a \$500,000 federal investment in monitoring coastal seawater strengthened by data and observational information from the U.S. [Integrated Ocean Observing System](#) (IOOS®) and the [NOAA Ocean Acidification Program](#), oyster hatcheries on the verge of collapse just a few years ago are again major contributors to the \$111 million West Coast shellfish industry.

IOOS is a NOAA-led interagency and regional effort aimed at “knowing” — that is, characterizing, predicting and monitoring — coastal, ocean and Great Lakes environments. Real-time data from its network of offshore IOOS buoys act as an early warning system for shellfish hatcheries, signaling the approach of cold, acidified seawater one to two days before it arrives in the sensitive coastal waters where larvae are cultivated. The data help hatchery managers schedule production when water quality is good and avoid wasting valuable energy and other resources when water quality is poor.



IOOS partners in the Northwest Association of Networked Ocean Observing Systems (NANOOS) deployed this buoy in 2010 as part of a three-piece observing array to assess issues in the Northwest, including [ocean acidification](#), [hypoxia and harmful algal blooms](#), and [climate change](#). The coastal buoy will aid computer models that predict ocean and atmospheric conditions. Known as "Chá bã," the buoy is named for the Native American word (pronounced "chay buh") for "whale tail." (Photo courtesy of Dr. John Payne, Pacific Ocean Shelf Tracking Project.)

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Healthy Pacific Oysters (Photo courtesy of Taylor Shellfish Farms)

“Putting an IOOS buoy in the water is like putting headlights on a car. It lets us see changing water conditions in real time,” says Mark Wiegardt, co-owner of Whiskey Creek Shellfish Hatchery.

In the Pacific Northwest, the IOOS and monitoring efforts detected the acidification of seawater that was threatening shellfish and offered an approach to address it. Armed with better information about the ocean conditions that oysters can and cannot tolerate, Taylor Shellfish Farms was able to adapt its operations accordingly. Last year was its best year since 1989. Whiskey Creek also enjoyed substantial increases in its oyster harvest. In 2008, productivity for Whiskey Creek was at just 20 percent of its normal level; by 2010, it had risen to 70 percent.

Young oysters failing the ‘acid test’

As natural reservoirs for excess atmospheric carbon dioxide (CO₂), the world’s oceans absorb about 26 percent — about 22 million tons — of the human-generated greenhouse gas from the atmosphere each day.

All this excess CO₂ is manifesting a literal sea change. Rapidly increasing amounts of [CO₂ mixed with seawater forms carbonic acid](#) that depletes our oceans of a nutrient vital to building shells. Known as [ocean acidification](#), this process slows growth or even dissolves shells to the point where oyster larvae cannot survive. In fact, the chemistry of the ocean is changing at least 30 times faster than at any time during the 800,000 years prior to the industrial era.

Ocean acidification is an emerging global problem, particularly because shelled organisms like oysters are an essential nutrient throughout the entire marine food chain. As human food and a source of income, shellfish also sustain many millions of people worldwide. Keeping an eye on changing ocean conditions through buoy networks and other sophisticated observing systems is paramount.

“Monitoring is the key,” says Wiegardt. “It gives us hope for the future of the shellfish industry.”

Article URL: http://www.noaa.gov/features/01_economic/pacificoysters.html

To see how the ocean becomes more acidic, visit NOAA Pacific Marine Environmental Laboratory’s new website, www.pmel.noaa.gov/co2/story/Ocean+Acidification.