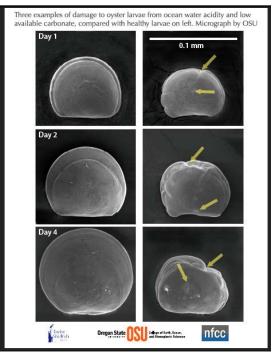# Regional Vulnerability Assessment: Ocean Acidification in the Pacific Northwest

Main Goals: Assess the vulnerability of stakeholders in the Pacific Northwest to ocean acidification (OA). We will identify adaptation pathways and associated costs, as well as barriers and limits to adaptation that can be overcome in order to avoid adverse consequences of OA to shellfish dependent people.

Background: OA is occurring with greater intensity in the Pacific Northwest than anywhere else in the world. OA is disrupting shellfish species' development, posing a threat to ecosystems and the economies that depend on them. Shellfish form the backbone of a $280 million annual industry in the region—across a chain of suppliers, hatcheries, growers, processors, distributors and vendors. Many indigenous peoples in the Pacific Northwest also place a special economic and cultural value on shellfish, and have done so for millennia. The region is both a harbinger of things to come for other coastlines that will ultimately face OA exposure, and a laboratory for innovation on successful adaptation investments and strategies. The lessons we learn here about OA vulnerability can serve as guideposts for other people and institutions facing these threats in coming decades.

Three examples of damage to oyster larvae from ocean water acidity and low available carbonate, compared with healthy larvae on left. Micrograph by OSU

Damage to oyster larvae from acidified water (right) compared to healthy larvae (left). Micrograph: OSU.

The rocky intertidal bays of the Pacific Northwest are at the global frontlines of ocean acidification. Photo: Brian Katz

Project Summary: Researchers and OA stakeholders at Oregon State University and the Pacific Shellfish Institute have partnered with NOAA to identify pathways for OA adaptation. The team will:

- Develop interactive mapping tools to enable public understanding of current and future OA exposure;
- Build bioeconomic models of shellfish aquaculture firms facing OA risk;
- Identify technological, institutional, legislative, financial and cultural barriers to OA adaptation;
- Identify feasible long-term pathways to OA adaptation;
- Evaluate the value of those pathways; and
- Develop behavioral models to predict the likelihood of users adopting feasible OA adaptation pathways.

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