

Paving a path for the shellfish industry to adapt to ocean acidification

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Shellfish growers in the Pacific Northwest have been feeling the impacts of ocean acidification for nearly a decade now and are concerned about how to keep their businesses thriving in the face of this change. Some have moved their operations to places as far flung as Hawaii. Others who operate hatcheries are ensuring their baby oysters are no longer exposed to corrosive waters by essentially putting antacid into their hatchery waters when elevated carbon dioxide waters upwell onto the coast. Scientists at Oregon State University (OSU) and at the Pacific Shellfish Institute (PSI) just started work on a project to make it easier for the shellfish industry and other stakeholders to identify potential pathways for adaptation to ocean acidification. Natural and social scientists are pooling their expertise to create tools to map which shellfish species and growing locations are most vulnerable to acidification, evaluate economic impact of ocean acidification, quantify the costs of potential adaptations, and evaluate the options most likely to succeed in avoiding adverse consequences.

[Dr. David Wrathall](#), a geographer with OSU's College of Earth, Ocean, and Atmospheric Science (CEOAS), is leading this work and has a keen interest in the impacts of climate change on human communities, and their livelihoods. "Climate change will have negative consequences for jobs. The key variable to reducing harmful consequences is our capacity to adapt," he shares. The team is interested in evaluating the costs and

barriers to adaptation in order to identify strategies that are most likely to succeed. [Dr. George Waldbusser](#), an oceanographer also at the CEOAS, has been working for years to understand how shellfish, like oysters and mussels, respond to changes in ocean chemistry. He is looking forward to connecting the biological research he has been conducting to the human dimensions of this change. “This is an opportunity for us to learn how industry members are adapting and to provide them with planning tools to assess the best way to deal with acidification,” he explains.

With close to \$300,000 in funding from NOAA’s [Ocean Acidification Program](#), this team will get a sense of which shellfish operations are at highest risk to ocean acidification by identifying where mussels and oysters growing areas coincide with hot-spots of OA hazards along the Pacific Northwest coast. Wrathall explains that this mapping exercise will give them a sense of where the shellfish industry might be most affected by ocean acidification, when they will feel the effects, and how much is at stake.

Then researchers will really hone in on the “who” to understand what shellfish operations exist in these high risk regions, which shellfish are species being cultivated, the cultivation methods used, and any adaptation measures already in place. With this information in hand, the group can then assess the value each operation would gain in adapting by looking at challenges, feasibility, costs, and benefits of making a change to the operation.

Ocean chemistry conditions in the Pacific Northwest today are equivalent to what they will be in other parts of the country far in the future, and has served as an incubator for innovation in understanding and adapting to OA. Dr. Wrathall sees this region serving “as an analog for future changes that will eventually affect the rest of the world.” The novel approach applied in this new project will not only provide shellfish farmers in the Pacific Northwest with the tools they

need now, but will also develop a tool set that other people around the globe can use to identify successful adaptation pathways.

Those wanting to learn more can read the [project summary and main goals](#) of the research.

Oregon State University, 2017. [Press release](#).