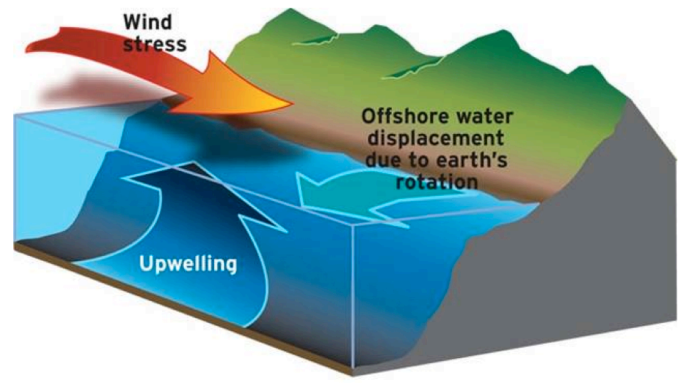


# OCEAN ACIDIFICATION IN OREGON

Ocean acidification is a decrease in ocean pH caused primarily by CO<sub>2</sub> absorbed from the atmosphere. Acidification threatens a range of marine organisms, including commercially and ecologically valuable species such as oysters. Scientists and industry have started to see acidification's effects on nearshore ecosystems, risking billions of dollars in losses for coastal communities.

In Oregon, coastal upwelling brings deep, cold water with low pH and low oxygen close to the surface. In fact, our coastal waters have the same pH levels predicted for the open ocean in the year 2100. This allows research in Oregon waters to provide a unique window into the future. Although pH naturally fluctuates on daily and seasonal cycles, the overall trend will be a decrease in the pH of Oregon coastal waters as atmospheric CO<sub>2</sub> levels continue to climb.



## ACIDIFICATION AND SHELLFISH

In shellfish, early life stages appear most susceptible to acidification because they have thinner shells and are generally more sensitive to environmental stress. For example, the free-swimming larval stage of an oyster's life lasts about three weeks and is generally the bottleneck to becoming a successful, reproducing adult. Acidification of coastal waters, along with changes in other factors such as temperature and salinity, will likely shorten the favorable windows of opportunity that larval oysters have to make it through this key life stage. This has clear implications for shellfish industries.



## WHISKEY CREEK HATCHERY

In 2005, larval oysters mysteriously began dying at the Whiskey Creek Hatchery, resulting in losses of as much as 85% of total yield. At the brink of economic failure in 2009, the hatchery worked with OSU researchers to discover that acidified seawater pumped in from Netarts Bay was to blame. With continuing help from OSU scientists, the hatchery is now able to monitor their intake and avoid pumping when the waters are most acidic. Hatchery yields have recovered enough that the owners can now consider exporting their oysters overseas. However, as background pH continues to drop, this adaptation strategy may no longer be economically feasible.

## WHAT CAN WE DO?

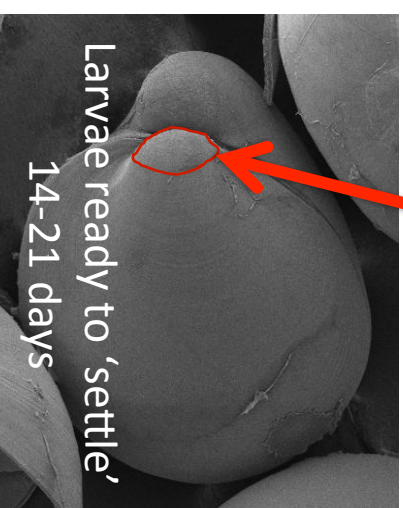
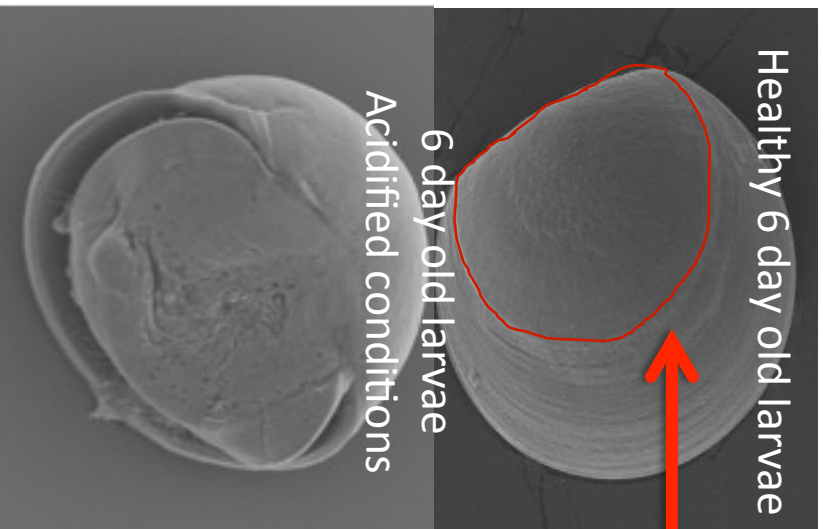
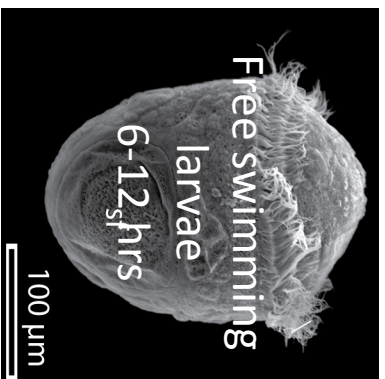
Although atmospheric CO<sub>2</sub> will continue to rise, at-risk communities and industry can ratchet down the contributions from other drivers of coastal pH - such as stormwater, local atmospheric deposition and agricultural runoff. Thoughtful land-use planning, in concert with existing local, state and federal authorities, may offer low-cost mitigation of the risks that acidification poses to coastal economies.

## FOR MORE INFORMATION

Burke Hales, OSU: [bhales@coas.oregonstate.edu](mailto:bhales@coas.oregonstate.edu)

George Waldbusser, OSU: [waldbuss@coas.oregonstate.edu](mailto:waldbuss@coas.oregonstate.edu)

Heather Reiff, COMPASS: [hreiff@COMPASSonline.org](mailto:hreiff@COMPASSonline.org)



Size at 24 hrs



## Pacific Oyster Life Cycle

