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Marine Life on a Warming Planet

Since the beginning of the industrial era, humans have pumped increasing amounts of carbon dioxide into the atmosphere. This has led not only to a warmer climate but also to significant changes in the chemistry of the oceans, which have long acted as a sink for carbon emissions but are being asked to absorb more than they can handle. The result is ocean acidification: increasingly corrosive seawater that has already ruined many coral reefs and over time could threaten the entire marine food chain.

The State of Washington is now trying to tackle the problem in new and inventive ways. It has good reason to worry. Its economically important aquaculture industry specializes in shellfish, especially oysters. Shellfish are highly vulnerable to increased acidity, which kills them by preventing them from creating or maintaining their shells. Washington's coastal waters are also polluted by urban and farm runoff, as well as an unusual regional threat: wind patterns that cause the upwelling of deep, nutrient-rich ocean currents loaded with carbon dioxide.

The state's plan — an offshoot of the [National Shellfish Initiative](#) created by the National Oceanic and Atmospheric Administration in 2011 — acknowledges that the only long-term solution to acidification is for the world to reduce industrial emissions of carbon dioxide, allowing the ocean to reach a less acidic equilibrium. But because this is not likely to happen any time soon, Washington has decided to try to “buy time” for itself and, in doing so, provide valuable lessons for other parts of the world.

The first step will be to monitor ocean acidity with greater breadth and accuracy and to create an acidity budget — an assessment of just how much acidity is contributed by whom. Next it will seek to reduce carbon pollution from land-based sources, including agricultural and urban runoff. There will also be practical, site-based steps to offset carbon, like planting sea grasses (which themselves are endangered globally) in shellfish hatcheries. And there will be an extensive campaign to educate the public, business leaders and policy makers about the risks of increasing acidification.

Gov. Christine Gregoire has set aside \$3.3 million to begin the effort (much more will be required down the line), and the National Oceanic and Atmospheric Administration will help with its laboratories. But what's important here is not the money. In a sense, the state has committed itself to becoming an aquatic laboratory. If it succeeds, it will help its own aquaculture industry and inspire other regions and countries to find practical responses for the oceans and their aquatic life as a whole.

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