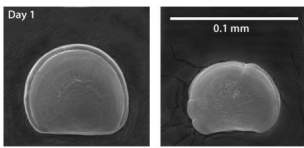


OSU Study Explains How Even A Little Ocean Acidification Can Kill Baby Oysters

Posted by Joan Russow
Friday, 12 July 2013 11:46 -

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June 12, 2013 --



Courtesy of George Waldbusser and Elizabeth Brunner of Oregon State University

This image shows 1-day old Pacific oyster larvae from the same parents, raised by the Taylors Shellfish Hatchery in natural waters of Dabob Bay, Wash. The larvae on the left were reared in favorable carbonate chemistry; on the right in unfavorable chemistry.

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Researchers at Oregon State University have been studying why more acidic ocean water is wiping out oyster larvae at hatcheries in the Northwest.

High levels of carbon dioxide can make water acidic enough to corrode oyster shells, and that's a major concern scientists have about oceans absorbing higher levels of carbon dioxide from the atmosphere.

But oyster larvae at shellfish hatcheries in the Northwest have been dying even when the water around them isn't fully corrosive, according to OSU marine biologist George Waldbusser. He led a new study to find out why.

The study, published in the journal [Geophysical Research Letters](#), found that even water that isn't acidic enough to dissolve oyster shells can kill baby oysters by zapping the energy reserves they need to build their first shell and feeding organ.

Waldbusser says acidic water adds stress during a time when the baby oysters are already in

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a "death race."

"In that first window of time they need to build this initial shell," he said. "They have limited food availability because they're running on the egg reserves, and until they finish building that shell they really can't feed. It becomes a death race of sorts. Can the oyster build its shell quickly enough to allow its feeding mechanisms to develop before it runs out of energy from the egg?"

Waldbusser and other researchers worked with Whiskey Creek Shellfish Hatchery in Netarts Bay to learn more about how oyster larvae fare in more and less acidic water. They knew from previous research that if the larvae were exposed to water with high carbon dioxide levels during the first two days of their development, the whole cohort produced less larvae. Waldbusser said the new research helps explain why that happens.

"That process of making the shell requires a significant amount of energy relative to the energy they have available from the egg," he said. "It's sort of a neonatal nutrition problem. They have a stress during their development period, and that stress puts a strain on their energy budget. And there seems to be little ability for them to recover from that."

Water with high enough carbon dioxide will corrode oyster shells to some degree, he said. But even if water is only only near corrosive, but not corrosive, it can still end up killing oyster larvae.

"They need to make a whole lot of shell really quickly, and that's energetically expensive," said Waldbusser. "The more corrosive the water is, the more energy it needs to do that, and the less energy that's available for growth and development of other things."

The good news they found, said Waldbusser, is that oyster hatcheries can correct for acidic water by adding calcium carbonate. Of course, the same isn't true for wild oysters in the ocean.

"We can't buffer the entire ocean," he said. "But if these things do hold, there are only short windows of time where corrosive water is really important. So, if spawning happens to occur at

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a good time, that might be enough to get them through. On the flip side, even before we get to projected levels of 100 years from now, if the spawning happens to occur during a period of time when other processes are elevating the CO₂ in some way, that's going to affect the reproduction rate as well."

[Ocean acidification](#)

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