

OCEAN-CLIMATE

Ocean Acidification: Climate Change Impacts on the Marine Environment

Impact

Understanding of climate change impacts on the ocean may lead to policies that better protect marine life

Anyone who has had fish as pets knows that changes in pH levels can destroy life in an aquarium. The same is true in the ocean. About one-third of carbon emissions generated by human activities has been absorbed by the world's oceans. And at a current uptake rate of 22 million tons a day, ocean absorption of carbon dioxide is lowering the pH, causing what is known as "ocean acidification." Scientists at OAR's Pacific Marine Environmental

Laboratory (PMEL) are at work understanding this phenomenon. In field studies along the west coast of North America between Canada and Mexico, the PMEL team along with a large number of international collaborators found, for the first time, corrosive water caused by the ocean's absorption of carbon dioxide (CO₂) now exists on the continental shelf of western North America.

Ocean acidification has serious implications for marine life. By the end of this century, many of the ocean's creatures dependent on calcium to form their protective "shells" could be seriously impacted. Among them are marine algae and free-swimming zooplankton that serve as food for larger species. Fish larvae survival is also reduced, likely affecting commercial fisheries for years to come. Researchers at OAR's Atlantic Oceanographic and Meteorological Laboratory have recently shown that coral reefs in the naturally acidic eastern tropical Pacific are becoming "unglued" as a result of the lack of cements that bind individual coral skeleton and larger reef structures. This makes reefs in high CO₂ waters more susceptible to erosion.

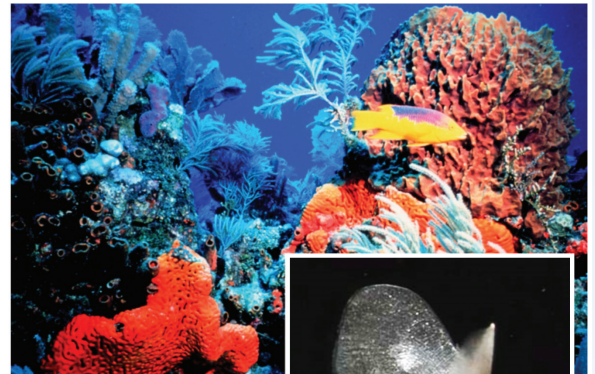
NOAA deployed the first buoy dedicated to monitoring ocean acidification in 2006

In their quest to continuously monitor and assess the impact of rising CO₂ on the world's oceans, PMEL and partners have launched the first system specifically designed to monitor ocean acidification in the Gulf of Alaska. The buoy is part of a National Science Foundation project awarded to oceanographers at PMEL and the University of Washington in Seattle, in collaboration with Fisheries and Oceans Canada and the Institute of Ocean Sciences in Sidney, British Columbia.

Images, top to bottom: Part of the largest coral reef in the continental United States along Florida's coast; a free-swimming pteropod with a calcium carbonate shell; OAR scientist Christopher Sabine on a field study in the Southern Ocean aboard the NOAA Ship Ronald H. Brown.

"It's just been an absolute time bomb that's gone off both in the scientific community and, ultimately, in our public policymaking."

Rep. Jay Inslee (D-Wash.) talking about ocean acidification in The Washington Post in 2006



International scientists found "acidified" water on the continental shelf from Canada to Mexico.

Learn More:

www.pmel.noaa.gov/co2/
www.aoml.noaa.gov/ocd/gcc/co2research