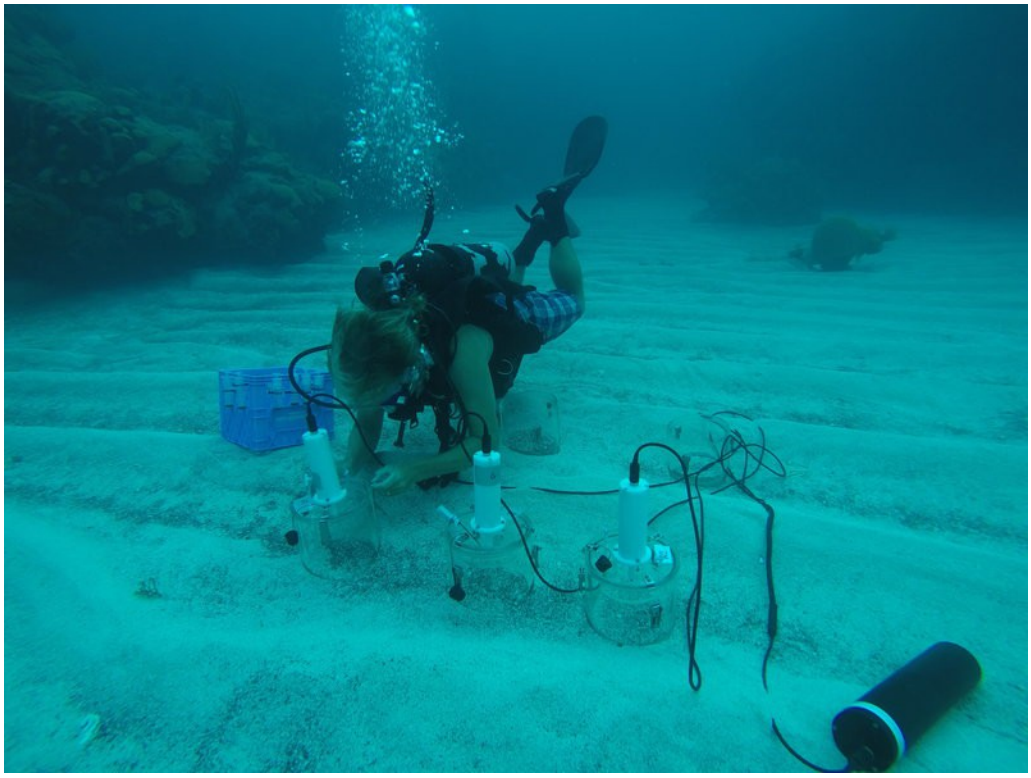
sdnews.com

San Diego Community News Group

BLAKE BUNCH Published - 03/09/18

http://sdnews.com/view/full_story/27550833/article-Ocean-acidity-killing-coral-reefs--Scripps-researchers-study-effects-of-fossil-fuels-on-ocean-floor?instance=most_popular1

Ocean acidity killing coral reefs: Scripps researchers study effects of fossil fuels on ocean floor



Scripps researcher Tyler Cyronak setting up test chambers in Bermuda. / SCRIPPS INSTITUTE OF OCEANOGRAPHY

slideshow

A recent study conducted by Australia's Southern Cross University, which involved the participation of two Scripps Institute of Oceanography scientists, found that within the next 30 years, sediments that serve as the backbone for coral reef systems will erode due to the increased ocean acidity.

The published study, "Coral reefs will transition to net dissolving before end of century," was published on Feb. 23 in Science, a scientific journal.

Scripps chemical oceanographers, Tyler Cyronak and Andreas Andersson, were co-authors of this work.

"Ocean acidification is caused by the burning of fossil fuels, which form carbon dioxide in our atmosphere, which, in turn, is released into our ocean's via rainfall," said Cyronak. "This changes the chemistry and, ultimately, the pH level of the water – becoming more acidic."

In turn, this makes it a problem for organisms that make calcium carbonate shells, such as coral, to create a foundation on which to thrive.

"Coral calcification is a biologically controlled process, whereas calcium carbonate dissolution in the sands is not," Cyronak added. "Our study showed that dissolution of coral sands is ten times more sensitive to ocean acidification than the process of coral calcification is. This could be because the corals are controlling how they build calcium carbonates skeletons with biological mechanisms."

"The sediments, which are comprised of calcium carbonate, are already eroding, but within the next few decades this loss will exceed the production of calcium carbonate," added Andersson. "In this context, erosion refers to the dissolution of the calcium carbonate rock into its individual components of dissolved calcium and carbonate ions in seawater; like when you add table salt into a glass of water."

For their study, the researchers placed chambers on the seafloor at five different locations throughout the Atlantic and Pacific oceans.

One chamber collected samples from Bermuda, while the rest were used in the Pacific in Hawaii, the Cook Islands, Tahiti and Heron Island.

The team is currently comparing their findings with lab simulations as well.

“We expose calcium carbonate sediments from different reefs around the world to different levels of CO2 and acidity levels while we simultaneously measure how fast they dissolve. We do this in custom made beakers under controlled temperature and CO2 conditions,” said Andersson.

So what can be done to counteract our effects on coral reef systems?

“At the global scale, we can slow down the use of fossil fuels and emissions of CO2 to reduce the rate of ocean warming and acidification,” said Andersson. “On the local scale, we can implement practices that promote a healthy reef, including sustainable fishing practices and good water quality. We can do this by preventing runoffs of nutrients, sediments, and waste products.”

With the team currently at work in the lab, knowing that there are people taking steps to reduce humanity’s impact on the environment is a relief to most. As stated previously, the next 30-plus years are crucial to counteract the effects of the ocean’s acidification.

Want to see video footage of Andersson and Cyronak at work on this study? Visit scripps.ucsd.edu, or view it on our website.