

Expanding a network of ocean-based CO₂ monitors

Jessica Leber, E&E reporter - (Monday, August 24, 2009)



The National Oceanic and Atmospheric Administration is expanding an instrument network that will enable more extensive monitoring of when and where the ocean absorbs carbon dioxide from the atmosphere.

Oceans soak up about a quarter of the CO₂ that humans now emit.

That's enough carbon to every year fill up coal-carrying railroad cars that circle the Earth about 13 times, according to Chris Sabine, an oceanographer at NOAA's Pacific Marine Environmental Laboratory.

But climate change itself may change the ocean's ability to act as a carbon sponge.

"We need to understand what's going on with the oceans to know if that's going to change," Sabine explained. Changing ocean temperatures, circulation patterns and wind patterns could all alter the system.

Sabine has deployed 18 moorings fitted with sensors that measure ocean and atmospheric CO₂ levels in the Pacific and Atlantic Oceans. Over the next few years, he wants to have a global network of 50 or 60, he said. The measurements will contribute to NOAA's growing climate observation system, he said.

So far, however, there has been one thing slowing him down: He has had to make each himself. "Basically, I can't make them fast enough for my needs," Sabine said. He also was unable to sell the technology to many other outside researchers who have been interested.

That issue has now been solved. Battelle, a nonprofit independent research and development firm, recently began manufacturing the high-tech devices in a facility in Dublin, Ohio.

Keep track of your favorite body of water

Its first run of 20 has already sold out. Spencer Pugh, Battelle's manager for the product, foresees selling a few hundred more to NOAA and to outside scientists eager to get a better handle on the ocean's response to rising greenhouse gases.

Sabine is sending his first two instruments from Battelle to the open, equatorial Pacific Ocean and to Australia's Great Barrier Reef.

The technology was first developed in the 1990s by scientists at the Monterey Bay Aquarium Research Institute and was transferred to NOAA for deployment. Both organizations partnered with Battelle to develop the commercial instrument, which can operate unattended on a battery for up to a year and sends real-time data back to shore via satellite.

"Someone can deploy it in their favorite body of water and remotely keep track of what's happening there," said Pugh. That ability to do that, he said, would help researchers track major changes in CO₂ levels over weeks or days.

Typically, ocean carbon monitoring is done aboard scientific or commercial ships, Sabine said. Tracking changes over time would have to wait until a ship returns to the area, which misses many shorter-term trends.

Eventually, Sabine plans to add one more instrument to his moorings that will also allow a more complete picture of how the ocean is acidifying as it takes up more CO₂. Acidification is already threatening coral reefs and other shell-building marine species.

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