Ocean Conservancy

The Nexus: Ocean Acidification News, Policy and Science

May 2017

Editor's note:

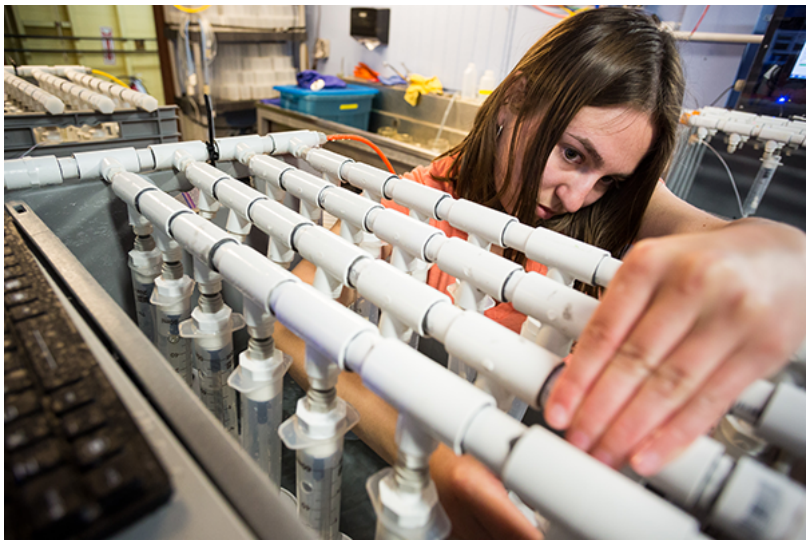
There's been a lot of news to follow this spring and we are happy to draw your attention to several items you may have missed! Read on for more on the federal budgeting process, regional activities and more.

Sarah Cooley, Ph.D., Ocean Acidification Program Director

Good news, but a fight lies ahead

Despite a headline-generating "skinny budget" proposal from the Trump administration that recommended drastic cuts in fiscal year (FY) 2018 for the earth sciences, Congress stood up for science in the FY17 budget, passed on May 1st. NOAA's OA Program was awarded **$10.5 million for FY17** – a $500,000 increase over the previous year. That's evidence that the OA community's hard work over the last few years of educating Congress on the benefits of OA funding is paying off. It's possible this additional funding will allow NOAA's OA Program to undertake some long-planned projects, like setting up the OA information exchange called for in **FOARAM**.

We are now turning our sights to the FY18 budget, expected to be developed in a long process scheduled to culminate in October. It's uncertain how earth science will fare in this next round of budgeting. Ocean champions are already **speaking out in favor of robust funding** for FY18. Senator Maria Cantwell (D-WA) said, "I am extremely concerned about the proposed elimination of the Pacific Coastal Salmon Recovery Fund, the Ocean Acidification Program, the NOAA estuary research program, the tsunami preparedness grant funding, the Sea Grant program and other severe cuts." But for now, FY17 funding will keep science moving forward another year. One way for you to **join the chorus** advocating for strong science funding is to text 'ocean' to 91990 to sign up for Ocean Conservancy's new mobile alerts, which let you know when there are opportunities to take action.



A research assistant conducts OA experiments at the NOAA Fisheries Mukilteo Research Station in Washington State. Copyright: Benj Drummond for Ocean Conservancy

OA wearing away at the brakes on breaking waves

Ocean acidification is one of many "erosional" processes that wear away at coral reefs and carbonate material. A USGS researcher, Dr. Kimberly Yates, recently **released a paper** containing evidence that erosional processes, including OA, sediment redistribution, etc. are wearing away at the coral reefs and carbonate sea floor materials surrounding Florida, Hawaii and other locations. The net effect is to lower the sea floor,

increasing apparent sea level rise. This also can change the dynamics of waves washing up on shore; without subsurface structure like coral reefs and sediments, wave energy has fewer things in place to dissipate it. This heightens risks to coastal communities that depend on the sea floor to “brake” breaking waves.

The research made **front page news** in Florida because of the stark implications for its coastal residents. Yates describes “South Florida [as] particularly vulnerable to sea level rise because the highest areas on land in the Florida Keys are only about six feet above sea level. So when you have incoming storm waves, everyday waves and coastal erosion, it’s much more concerning when you’re only living about six feet above sea level. Reefs are a key defense protecting us from ocean waves.”

Yates is featured in an upcoming film on ocean acidification in Florida. Subscribe to **Ocean Conservancy’s YouTube channel** to be the first to see Yates on the screen!

USGS researcher Kim Yates monitoring seawater chemistry in the Florida Keys. Copyright: Benj Drummond for Ocean Conservancy

Hawaii’s Members of Congress Stand up for Coral

While corals are threatened by multiple stressors such as acidification, policy makers are taking steps to support them. Last month, Senator Mazie Hirono (D-HI) and Representative Colleen Hanabusa (D-HI) introduced the **Coral Reef Sustainability through Innovation Act of 2017**. The legislation creates a way for individuals, government and the private sector to partner and develop innovative ways to protect coral reefs from ocean acidification and warming, via a prize competition supported by all 12 federal agencies on the U.S. Coral Reef Task Force. Public-private partnerships were key to finding out the cause and extent of the Pacific Northwest oyster industry’s production losses, which were found to be due to OA and it is our hope that this prize will help identify solutions for coral reefs in American waters.

Coral reefs like this one in the Florida Keys are under threat from OA. Copyright: Benj Drummond for Ocean Conservancy

OA makes for clumsy snails

We think **venomous snails that "hunt"** are pretty cool. In a scientific "tale of the weird," **researchers report** that venomous cone snails are less skilled hunters under OA. Cone snails generally live in warm, tropical waters, but some are even found off the coast of Southern California. Higher CO_2 conditions caused cone snails to wander around aimlessly instead of sneaking up on prey. Under these poor ocean conditions, they spent more energy and caught less prey. Both outcomes could have bad implications in the long run for these tiny hunters.

Can OA affect the ocean's nitrogen cycle?

In the ocean, it's hard to consider just one process separately from the others. Although OA chiefly is a product of carbon cycling, research suggests it may also indirectly impact the nitrogen cycle. Cyanobacteria in the ocean, microbes that capture nitrogen from the atmosphere and fix it into chemical forms useful for marine life, **may be less able to fix nitrogen** in a lower-pH ocean where iron, a required nutrient, is scarce. Previous experiments have yielded contradictory results that may have resulted from the different laboratory conditions in which the experiments were run. This new explanation could show why previous experiments have had divergent results. No matter what, it demonstrates how tightly coupled carbon and nitrogen cycles are in the ocean and a change in one could affect the other. This has global consequences – without fixed nitrogen, marine plants can't grow and capture carbon dioxide into their tissues. But too much fixed nitrogen favors bacteria over marine plants, reshuffling the ocean food web.

Bummer for bryozoans

You might know marine bryozoans by look but not by name – they're the clinging sea creatures that leave netlike skeletons stuck fast to kelp or macroalgae leaves, making them look frosted with sugar. But they're in the news this month. Marine bryozoans in the California current grow faster in warmer water, but **in laboratory experiments** their skeletons dissolved more quickly under OA. To keep up with a faster growth rate, these bryozoans substitute more magnesium into their calcium carbonate skeleton, which makes the skeletons more prone to dissolving. Under OA, bryozoans redirected energy to growing, but it wasn't enough to keep pace with OA-based dissolution. Scientists suggest that bryozoans may be a "canary in the coal mine" species in coastal California – extra sensitive to the impacts of warming and acidification.

Telling the Whiskey Creek Story

The "Whiskey Creek oyster story" is about as close to the origin story of ocean acidification in the United States as it gets. But telling the story of oyster hatcheries in the Pacific Northwest noticing a dramatic drop in the survival of baby shellfish in the late 2000s can be **complicated and impersonal**. In a **recent news segment**, scientists and industry not only tell how events unfurled, but also how they collaborated to find out the cause of the problem and to devise some short-term solutions that saved jobs and a business on a local level to a journalist and television audience. It's a good reminder about the value of NOAA's OA Program funding and how government investments spurred an incredible science-industry partnership that helped save this particular coastal community, its seafood culture and jobs all over the country, from restaurants that served oysters to fifth generation family businesses.

Ocean Conservancy's new website

Ocean Conservancy is pleased to unveil its new website where you can find more **OA program resources**: videos, fact sheets and **blogs**. You can also get to know our staff and learn more about some of the other issues we work on!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