



OCEAN SCIENCE

## U.S. Budget Cuts Threaten to Sink Undersea Research Fleet

A U.S. government program that provides ocean researchers with access to submersibles and a sea-floor observatory may be doomed to Davy Jones's locker by fiscal belt-tightening—unless Congress steps in to save it. Last week, researchers began to plead their case, asking lawmakers to reject an Obama Administration plan to eliminate the \$4 million National Undersea Research Program (NURP), which is run by the National Oceanic and Atmospheric Administration (NOAA). NURP has survived similar near-death experiences in the past, but researchers fear this year's battle could mark the end of the 32-year-old program.

NURP is “a vital and irreplaceable” part of NOAA's grants program for university researchers and should be restored, marine biologist Shirley Pomponi of Florida Atlantic University's Harbor Branch Oceanographic Institute in Fort Pierce told a subpanel of the House Committee on Appropriations on 22 March.

NOAA created NURP in 1980, on the advice of the National Research Council, to forge partnerships between the agency and academia and take advantage of advances in deep-diving capabilities, says Andrew Shepard, a benthic ecologist at the University of South Florida (USF), Tampa, and executive director of the Gulf of Mexico University Research Collaborative. The program has funded more than 500 projects since 2000, including some 1000 submersible dives and 53,000 SCUBA dives, according to government statistics. NURP efforts have included studying the explosive formation

of Hawaii's newest island, Lo'ihī volcano, as well as collecting decades' worth of data on shallow-water coral reefs.

NURP's budget has declined sharply over the years, from a high of \$18 million to about \$10 million in 2006. But the program is still one of the top three sources of funding for deep-sea science in the United States, says Lisa Levin, a deep-sea biologist at the Scripps Institution of Oceanography in San Diego, California. (The other two are NOAA's Office of Exploration and the National Science Foundation.) “It was never a large amount of money, but I've taken a lot of students to sea through NURP funding,” she says.

In addition to supporting scientific brains, NURP also funds academia's undersea brawn, including two out of the three human-operated research submersibles operated by U.S. universities. (The exception is the celebrated Alvin submarine, run by Woods Hole Oceanographic Institution in Massachusetts.) NURP-supported assets also include remotely operated vehicles (ROVs) that are tethered to ships and robotic autonomous underwater vehicles. The program also funds investigators to work at NOAA's Aquarius Reef Base, an underwater laboratory that sits in 18 meters of water 5.5 kilometers off the coast of Key Largo, Florida.

NURP's elimination could be especially problematic for one of its West Coast regional centers, the Hawaii Undersea Research Laboratory (HURL) at the University of Hawaii, Honolulu. NURP has traditionally covered the costs of operating HURL's two human-

**Threatened habitat.** NOAA's Aquarius Reef Base off Florida could host its last scientific team in July if Congress doesn't reinstate funds for NURP, which supports the underwater laboratory.

piloted submersibles, Pisces IV and V, and officials were counting on the program to also support a recently purchased \$2 million ROV. If NURP is shut down, “we'll lose two of the three submersibles,” predicts Bruce Robison, a deep-sea ecologist with the Monterey Bay Aquarium Research Institute in Moss Landing, California. Losing NOAA funding for the subs will make it harder for U.S. researchers to get a firsthand, three-dimensional view of the deep sea, he says. In contrast, using cameras mounted on ROVs to observe marine environments “is like looking with one eye through a pipe.”

Losing the expertise to run these vehicles is equally worrisome, says HURL Director John Wiltshire, who specializes in offshore energy and mineral resources. “It takes us 5 years to train a good sub pilot, and these people will be snapped up by the oil industry in a month,” he says.

It is less clear what will happen to NURP-funded assets if the program is defunded, although NOAA officials say they plan to get rid of Aquarius Reef Base, the Pisces V submersible, and other vehicles by the end of fiscal year 2013. But NURP-supported scientists should be able to find replacement funds elsewhere, NOAA officials say. “NOAA had to curtail even some important programs, particularly where other avenues of funding might be pursued,” wrote NOAA spokesperson Scott Smullen in an e-mail. “NURP is one of those programs.”

This isn't the first time the White House has eliminated NURP funding from its annual budget request. But in the past, political champions in Congress, including senators from coastal states, have successfully argued to reinstate the funds. This year could be different, given that some of those members of Congress have retired or died, according to NURP advocates. “We just don't have that political clout anymore,” says USF's Shepard.

In some ways, NURP is a victim of its own success, Shepard says. NOAA is now using technologies that NURP helped develop, and the agency has benefited from the specialized workers NURP has helped train. “It's like someone looked at [NURP] and said: ‘Congratulations, we don't need you anymore.’” NURP's fate will be decided later this year, as Congress shapes the 2013 budget.

—JANE J. LEE