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Can sea lab stay afloat?

Before they're strapped into the space shuttle and launched from the Kennedy Space Center at Cape Canaveral into a cold and unforgiving environment, many NASA astronauts head to UNCW to train in an equally challenging environment.

For several years the nation's space agency has been sending astronauts to "deep sea" school at UNCW to help prepare them for the rigors of space travel.

The training involves turning the future space explorers into "aquanauts" and placing them aboard the school's Florida-based undersea laboratory for a week or longer at a time.

But an ever-tightening fiscal noose could soon cost the University of North Carolina at Wilmington its window into the ocean – which also happens to be the only undersea research lab in the world. The loss of the facility would also jeopardize NASA training that would be hard to replicate anywhere else.

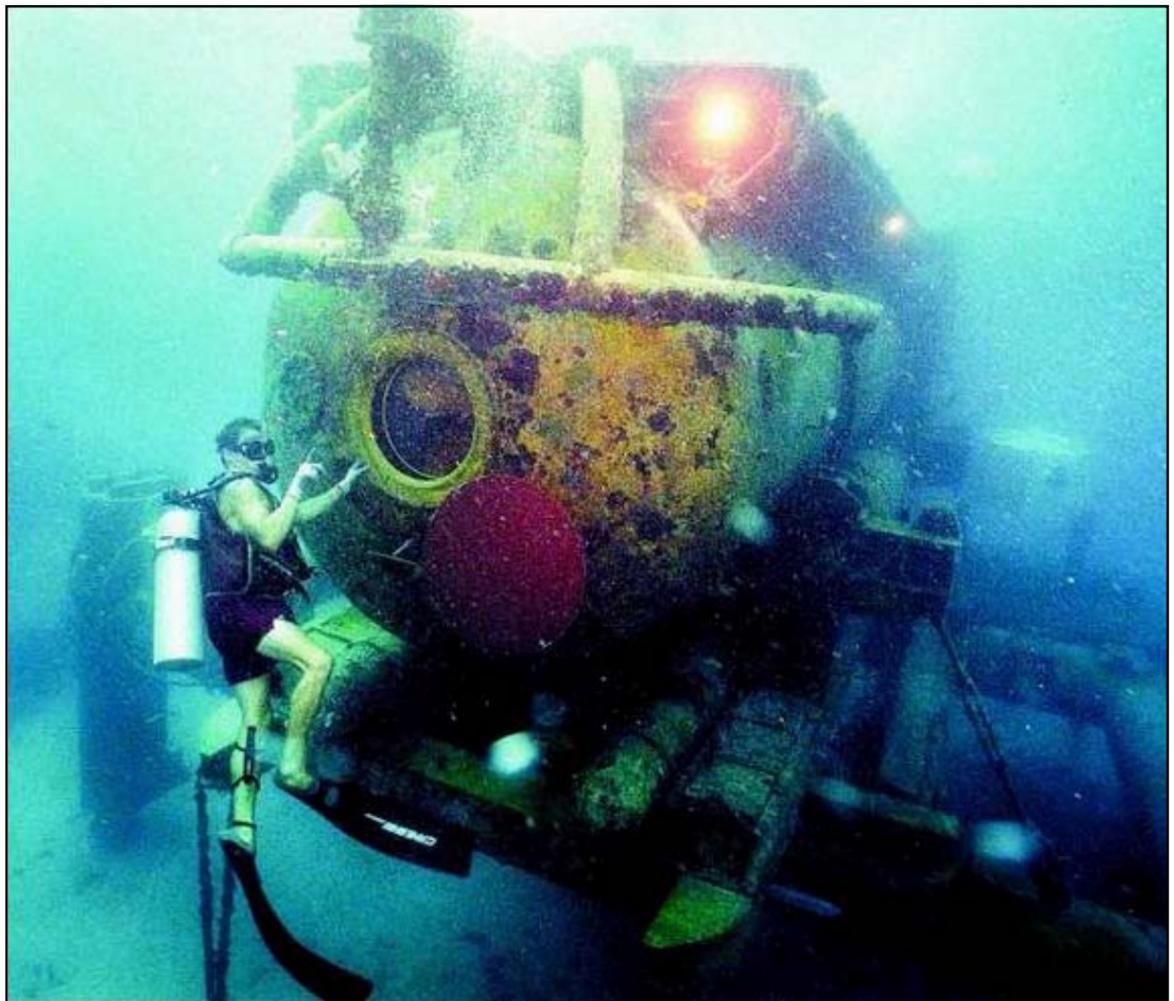
"This will be a watershed year for the National Undersea Research Program," said U.S. Rep. Mike McIntyre, D-N.C.

Moored to the ocean's bottom in the 63-foot-deep crystal clear waters off Key Largo is Aquarius, a federally owned research capsule managed by UNCW.

What makes Aquarius unique and very useful for training space explorers is both its environment, which requires an extensive decompression procedure after extended stays, and its shape.

"The beauty of Aquarius is not only is it isolated, but very isolated, and it's an extreme environment," said NASA project manager Bill Todd. "It also allows the crew to go on a real mission in a real environment and work with real scientists doing real work, just like they would in the space station."

With about 400 square feet of liv-



STAR-NEWS FILE

In this image from 2000, Mike Smith, a research diver at UNCW, communicates using hand signals with aquanauts inside 'Aquarius,' an undersea laboratory off the Florida Keys.

Loss of 'Aquarius' would be felt from the ocean to the stars

ing and research space, the undersea lab is also similar in size to the International Space Station's living module.

This summer NASA will commence its latest mission to Aquarius, which will have four astronauts testing their personal limits while they test new communication methods and exercise equipment for long-duration space travel.

President Bush recently an-

nounced plans to return Americans to the moon and then to Mars within thirty years.

"The whole idea in going to the moon first is so they can get their feet wet on what it's like to live on another planetary body before going another six months out to Mars, and in a way that's what we're doing here 60-feet underwater," said Kelly Humphries, a NASA spokesman at the Johnson Space Center in

Houston.

But before the astronauts face the emptiness of deep space, scientists might have to battle the fiscal challenges inside the Washington Beltway.

Funding for the National Oceanic and Atmospheric Administration undersea research arm has been flat for years.

That budgetary pressure accelerated this fiscal year when the agency, known as the National Undersea Research Program (NURP), saw its funding drop from \$13.5 million to \$12 million.

Aquarius's annual NOAA budget is about \$1.3 million, which primarily covers operating and maintenance costs. Researchers, institutions and grants cover most of the mission expenses.

NURP Director Barbara Moore said the agency considered several options to cover the 2003-2004 fiscal year shortfall, including cutting funding to Aquarius and Alvin, NOAA's deep-sea submersible.

In the end, NURP was able to scrape by without closing any of its six regional research centers – including the one at UNCW, which supports undersea research from North Carolina to Texas – or discarding Aquarius or Alvin.

THE HISTORY OF AN UNDERSEA LABORATORY



Aquanaut Peggy Whitson works underwater near the 'Aquarius' laboratory off the Florida Keys

From the Caribbean to North Carolina to Florida, 'Aquarius' has done a lot of traveling for a fixed undersea laboratory:

1986: 'Aquarius' built by Victoria

Machine Works in Texas. Begins operations in St. Croix, U.S. Virgin Islands.

1989: Hurricane Hugo damages 'Aquarius.' Lab is removed and brought to Wilmington.

1992: Re-christened after an 18-month refurbishment. Deployed in Florida Keys National Marine Sanctuary off Key Largo.

1996: 'Aquarius' mothballed because of funding constraints.

1997: Funding restored; 'Aquarius' refurbished at Harbor Branch Oceanographic Institution in Florida.

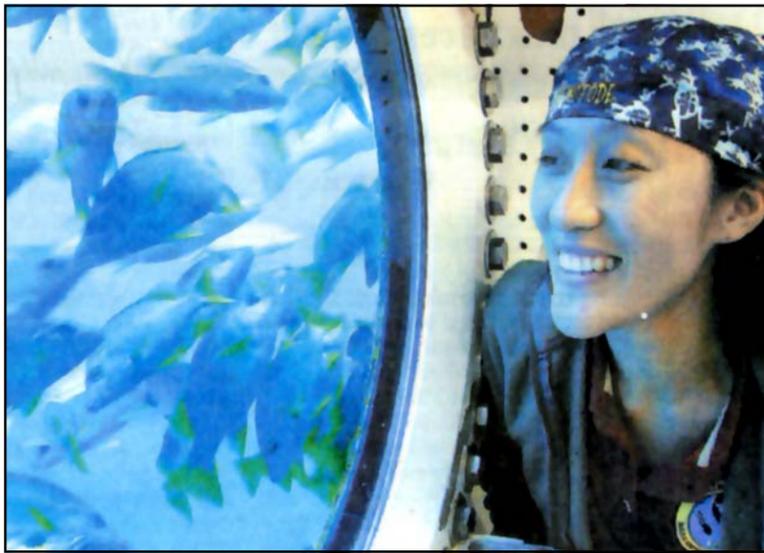
1998: Redeployed to marine sanctuary.

2001: First NASA mission to 'Aquarius'

2004: After surviving another round of funding cuts, seven missions planned



STAFF ART | STEVEN PIPES



NASA
NASA scientist Emma Huang, an aquanaut who was aboard the 'Aquarius' with a research team, watches a school of marine fish on the other side of the undersea laboratory's viewing port.

But Ms. Moore said the agency can't continue to operate as normal on a budget that doesn't even keep up with inflation on the years its not losing funding.

With President Bush only allocating \$11 million for NURP in his proposed 2005-06 fiscal year budget, which starts Oct 1, that day of reckoning could come sooner rather than later.

"I think some hard decisions would have to be made," Ms. Moore said if Congress can't secure additional funding for the program this summer.

Steven Miller, director of UNCW's National Undersea Research Center, said Aquarius couldn't operate without the federal support.

"Without that funding, the program is pretty much dead in the water," he said from Key Largo.

Officials admit that Aquarius, which was built in 1986 but has been refurbished twice since its launch, is getting a bit long in the tooth.

But Dr. Miller said there are advantages to longevity.

"The fact we've been here in the Florida Keys for so long makes it an even more valuable as a research site, a long-term database that's unmatched anywhere else in the world," he said.

While training astronauts might be some of the more exotic missions undertaken at the lab, Aquarius's more mundane research has been just as fruitful.

Researchers said the lab is a force multiplier, allowing them to do in a few days what could take several weeks using a surface ship.

Mark Hay, a marine biologist with the Georgia Institute of Technology, spent 10 days in Aquarius last fall researching how herbivorous fish and other plant-eating critters affect seaweed growth on and around coral reefs.

"Our project required a lot of bot-

tom time, and with Aquarius we could spend nine hours a day at the depths we needed to be at versus a few hours using a surface vessel," he said. "It provided an exceptional opportunity for us to see what goes on down there because we were out there so much."

Other scientists have used Aquarius to study fish populations and long-term studies on the health of coral reefs.

The underwater lab also has proven a boon for UNCW.

"Having the world's only undersea laboratory as an extension of your program is great for our researchers and students and good exposure for our institution," said Mark Lanier, assistant to UNCW Chancellor Rosemary DePaolo.

The presence of Aquarius also has allowed UNCW's Center for Marine Science to attract world-leading researchers.

That, in turn, allows its students to

learn from some of the top scientists in their fields.

Having UNCW's name splashed around the world thanks to Aquarius, most recently in a National Geographic article, doesn't hurt either, Mr. Lanier added.

But with an administration that has made the military and national security its fiscal priorities and a deficit spiraling out of control, money for ancillary programs like science and the arts is becoming harder to come by.

Rep. McIntyre said even though funds are tight, Aquarius is too important to let go.

Calling it a national asset, he said the underwater lab offers a unique platform to learn about part of our planet that we know very little about.

"It's not like it's just a parochial project for our small area of the coast," Rep. McIntyre said. "The research that's done there has a national and international impact."



STAR-NEWS FILE
 In this image from 2000, Jay Styron, oceanographic field operations manager for UNCW's 'Aquarius,' communicates with a support boat 60 feet above him.

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