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Aquarius mission studies how upwelling impacts Florida's coral reefs

Key Largo, Florida – A mix of veteran and first-time aquanauts began their ten-day underwater mission on Monday to study economically important coral reefs in the Florida Keys National Marine Sanctuary. The team, led by seven-time aquanaut Dr. James Leichter, Scripps Institute of Oceanography, will study an important underwater process called upwelling, where cold and nutrient-rich water from the deeper ocean moves up onto the reef in dramatic pulses, sometimes dropping water temperatures from a warm and toasty 85 degrees to a chilly 68 degrees or less - in a matter of minutes!

Surprisingly, this “underwater weather” largely goes unnoticed because it happens mostly in water deeper than 60 feet, though on occasion it can be detected shallow and as far north as Daytona, where headlines were made last summer when water temperatures dropped to the 60s and 70s. The purpose of Dr. Leichter’s Aquarius mission is to understand how upwelling affects the condition of coral reefs in Florida. Upwelling is a natural process that affects water quality and nutrient delivery to the reef, which is highly relevant to evaluating whether or not sewage pollution on the reefs is a significant problem.

Owned by the National Oceanic and Atmospheric Administration (NOAA) and operated by the University of North Carolina at Wilmington, Aquarius is a unique national asset – it is the only undersea research platform of its kind in the world. It rests 63 feet underwater and 3.5 miles offshore at Conch Reef in the Florida Keys. Aquarius "aquanauts" live and work on the seafloor for extended periods using a special diving technique called saturation diving.

Dr. Leichter is joined by scientists and veteran aquanauts Dr. Dale Stokes, also from Scripps, Dr. Stephen Wing, from the University of Otago, Dunedin New Zealand, and first-time aquanaut Adeline Coyac, a field instructor with the Marine Resource Development Foundation. UNCW habitat technicians Mark Hulsbeck and Hal Letts will operate the underwater laboratory for the ten-day mission. Surface-based support for every Aquarius mission is provided by staff from UNCW.

Putting the mission in context, Dr. Leichter explained, “If you could take a slice of the ocean and see it in three dimensions, from the surface to say 1000 feet deep, you would be amazed at how things like temperature, dissolved nutrients, currents, and life itself, changes as you go from shallow to deep. And the changes are sometimes all mixed up and not easily explained by just looking at the slice. Physical and biological oceanographers spend much of their time trying to understand all the variable properties in the ocean, how they change with depth, over time, how they affect what lives in the ocean, and ultimately how this affects everything from the fish we eat to our climate and weather.”

Commenting on the mission, UNCW Director, Dr. Steven Miller noted, "Dr. Leichter really takes advantage of what Aquarius has to offer. His team is always among the leaders in using all their available bottom time working out on the reef, they push the envelope in terms of technology that drives their experiments, and they also take time for educational events." Aquarius manager Jim Buckley added, “This is mission number 78 for Aquarius, which makes it the second longest running underwater habitat program ever, first longest if you consider how long we’ve kept Aquarius running in it’s current deployment. The longest running habitat program in terms of total number of missions was Hydrolab, which was also owned by NOAA.”

During each Aquarius mission, anyone with Internet access can watch live web cameras, read expedition journals from the aquanauts, view project summaries and pictures, and much more at the NURC/UNCW Aquarius website: www.uncw.edu/aquarius.