2008 Annual Report: Marine Operations

During 2008, WHOI made substantial progress on the construction of two new deep submergence vehicles for the National Deep Submergence Facility.

In preparation for its first science cruise, the autonomous underwater vehicle (AUV) *Sentry* underwent sea trials from the R/V *Oceanus* in April. Funded by grants from WHOI's Access to the Sea and Hollister funds, the engineering team conducted a series of eight dives to depths of more than 2,300 meters (7,546 feet) to test the vehicle and its new geophysical and oceanographic sensors. *Sentry* was then shipped to Seattle in August for its first scientific mission on board the R/V *Thompson* in support of the new Ocean Observatory Initiative. *Sentry* conducted six dives of average length 17 hours, and mapped 46 km^2 of seafloor at very high resolution. Over the next year or so, *Sentry* is expected to replace its predecessor, *ABE*, as the autonomous vehicle of the National Deep Submergence Facility.

The project to construct a new human-occupied vehicle with a depth capability of 6,500 meters (21,325 feet) to replace the HOV *Alvin* continues to evolve. The original plan included contracts for the design and fabrication of the personnel sphere to Southwest Marine Institute, and of the vehicle to Lockheed Martin Corporation. In January 2008, WHOI received a detailed cost estimate indicating that the total projected cost for the project had more than doubled. With several possible options of a way forward, WHOI recommended to its external advisory committee and the National Science Foundation that fabrication of the 6,500-meter-depth personnel sphere go ahead, but that construction of the vehicle be done at WHOI, with a two-phase approach to building the vehicle to reach the 6,500 meter depth goal. In June, the two hemispheres that will make the new, larger personnel sphere were successfully forged from large titanium disks. By the end of 2008, WHOI had submitted plans to the National Science Foundation to prepare for a preliminary design review for the first phase – installation of the completed personnel sphere, as well as new lithium ion batteries and syntactic foam rated for 6,500 meters, into *Alvin's* current frame.

This installation is currently scheduled for late 2010 when *Alvin* will return to Woods Hole for a major overhaul. *Alvin* will then continue to operate to its current depth of 4,500 meters (14,764 feet) until funds become available for the second phase of construction – upgrading the remaining components to attain 6,500 meters. The new, state-of-the-art, 6,500 meter vehicle will ultimately provide enhanced capabilities and new opportunities for the U.S. scientific community to reach and study 98% of the ocean floor.

—*Susan Humphris, Acting Vice President of Marine Facilities/OPS*

Last updated: August 26, 2009

Enlarge Image

Bosun Clindor Cacho admires a rainbow as the *Oceanus* prepares to dock at St. Thomas, U.S. Virgin Islands in November 2008, after a transit across the Atlantic. The ship, scientists, and crew were in the Caribbean to take measurements of the water-column—a conceptual slice, or column of the ocean from surface to bottom—using sensors and samplers: WHOI scientist Dave Fratantoni's ScanFish (a towed vehicle that samples while moving up and down in the water) and the Video Plankton Recorder. This research and the new ScanFish was funded by King Abdullah University of Science and Technology, part of a collaborative research agreement with WHOI. (Photo by Alexander Dorsk, Woods Hole Oceanographic Institution)

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