OCEANGATE MIAMI-DADE ARTIFICIAL REEFS EXPEDITION

Expedition Report

Sept. 5, 2012
Explorers Club Flag #75

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Flag Report – Flag #75 – The Antipodes Expedition

Reef Survey Latitude: 25.8 N, Longitude: 80.1 W Depth: 244M

On Sept. 5, 2012, Explorers Club Flag #75 descended to a depth of 244M below the surface of the Atlantic Ocean off Virginia Key, Florida at an approximate latitude of 25.8 north, longitude 80.1 west, approximately 4.5 nautical miles east-southeast of Miami Beach. The goal of this flag expedition was to gather data about unidentified object, which had been located by NOAA side-scan sonar as part of a seafloor-mapping project. The expedition was done aboard the manned submersible Antipodes, which served as a platform for gathering video, photographs and sonar data in an effort to identify the objects and provide baseline measurements of flora and fauna.

Antipodes is the flagship submersible of OceanGate Inc., which was founded in 2009. The primary goal was to provide manned submersible solutions to the challenges associated with deep-sea exploration, research, and commercial enterprise. The focus is providing access to the oceans while remaining dedicated to the study of the sustainable use of marine ecosystems and the natural resources within them.

Utilized for deep-water expeditions, Antipodes is certified by the American Bureau of Shipping (ABS), and is the only 5-person submersible that fully and legally complies with the United States Coast Guard’s regulatory requirements. Antipodes comfortably accommodates a crew of 4, plus a pilot, and boasts twin 147-cm hemispherical acrylic domes, which provide exceptional views for direct observation and filming in an environment isolated from surface conditions. It is equipped with Teledyne BlueView Technologies’ 3D scanning sonar system to map and document shipwrecks, as well as observe and record marine life and underwater habitats.

Flag Expedition 75

Part of the appeal of exploring the artificial reefs off Miami was rooted in their history. Their construction began in the 1920s, when an abandoned vessel was intentionally sunk offshore to create a new fishing ground. Over the half century that followed, dozens of other vessels and artificial reef materials were sunk off the coast, leading Miami-Dade County to take the lead in organizing reef restoration and enhancement over a 35-nautical mile coastline in the late 1980s. Since that time, the county has overseen the development of 11 inshore and 17 offshore reefs, incorporating the deployment of almost 50 additional large vessels, two retired oil platforms, cast concrete materials and limestone, an airplane, and several surplus Army tanks. Today the artificial reef program, which is now administered by the county’s Department of Regulatory and Economic Resources (RER) is the largest in the nation, including more than 90 acres of marine habitat. Still,
local scientists admit they know very little about these deep-water habitats, primarily owing to their depth.

**Antipodes**’ on-board survey equipment includes:

- BlueView 2D imaging sonar
- BlueView 3D micro-bathymetry devices
- Lighting options, including LED and halogen systems
- Temperature and depth profilers

**Antipodes** has conducted 19 dives on nine artificial reefs, with the average dive lasting 2:21 hrs and reaching an average depth of 85 meters, the deepest dive of the Explorers Club flag expedition -- being to 244 meters. **Antipodes**’ crewmembers have logged a total of almost 3,400 man-hours on these dives.
Mission Objectives:
The RER program has focused on habitat restoration and enhancement, as well as managing the development of benthic organisms and fish.

1. Health of Artificially constructed deep-water reefs:
Primary objective in diving the artificial reefs was to provide a visual assessment of the health of the habitats. The missions provided documented visual evidence of habitat quality through the extensive production of still and video images taken in almost 42 hours of diving on the reefs, providing this data to RER on a timely basis following each dive.
2. Sonar Imaging
Providing extensive sonar imaging records of the dive sites, utilizing the BlueView 2D forward looking sonars -- with both 45- and 130-degree fields of view -- to create high-quality images of the wrecks and other structures that constitute the artificial reefs.

3. Micro-Bathymetry
The (MB) sonar system was used to produce ultra-high resolution 3D data of the structures

The nine sites visited by *Antipodes* and her crew included several known wrecks, including the *Spirit of Hemingway* and *Mary Star of the Sea*, though some of the dives yielded surprises. One site, explored because it had shown up as an unknown anomaly on a NOAA side-scan sonar survey of the seafloor off Key Biscayne, yielded the wreck of a WWII-era Marine fighter plane.
The US Navy subsequently identified this plane as a Grumman F6F Hellcat. Initial sonar scans of the plane site had displayed a 30-meter-long target, which led the OceanGate team to assume it was a sunken vessel. However, during the initial dive to the site on June 29, the sonar technology on OceanGate’s *Antipodes* submersible produced the first-ever close-range underwater scans of the distinctive Hellcat at depth of more than 70 meters. Since the initial dive, the OceanGate team has returned for additional observation and data collection on nine more missions, including a long-duration dive of eight hours.

OceanGate has since donated its collection of photographs, videos, and technical scans of the Hellcat to the Naval History & Heritage Command in Washington, D.C.

Locating the Hellcat was only one of several discoveries which have perfectly illustrated the value of the ongoing exploration of the Miami-Dade artificial reefs. For example, while marine researchers were aware that the lionfish was an increasingly invasive species in South Florida waters, the extensive prevalence of the fish as noted during OceanGate dives, even at depths as great as 70 meters, has pointed to the need for an ongoing investigation of the species and its effects on the
local marine habitat. The Hellcat and lionfish, considered together, offer evidence of the value of a submersible like *Antipodes*, which is best suited for investigating at depths of 45-150 meters, the so-called “forgotten zone.”

OceanGate is still evaluating the data from its dives on the Miami-Dade artificial reefs, and will publish its findings in a report as a preliminary to a peer-reviewed publication.