TDI-Brooks' R/V BROOKS McCALL Conducts AUV Operations in the Gulf of Mexico

June 2009

TDI-Brooks' Gulf of Mexico-based research vessel, the R/V BROOKS McCALL (BMCC), has conducted two AUV survey operations in the Gulf of Mexico so far in 2009.

DOFSubsea chartered the BMCC in the April/May time frame to test and deploy their Hugin 3000 AUV (see **Figure 1**). The system is recognized as the optimum platform for all serious deepwater seabed mapping, guaranteeing high quality data from any water depth down to 3,000 meters. The system has repeatedly proven to be the most efficient and economical platform for both route-surveys and surveys of larger areas, and has demonstrated its capabilities in operations ranging from the sub-Arctic region to equatorial waters.

Due to the unique acoustic control system, no umbilical is needed for controlling the real-time data collection and guiding of the platform, thus ensuring the same efficiency in 3,000 meters water as for the shallower areas.

DOFSubsea successfully tested and demonstrated the performance of their AUV system on the BMCC and then successfully conducted a project for a deep-water Gulf of Mexico operator.

Figure 1. DOFSubsea's AUV on the stern of the BMCC (a) and being test deployed dockside (b).

Starting June 15, the BMCC will conduct a 15-day multidisciplinary cruise with the Woods Hole Oceanographic Institution's (WHOI) AUV *Sentry*. The project, *Lophelia-II*, involves a multidisciplinary team of investigations directed by TDI-Brooks from Penn State, TAMU-CC, LSU and Temple universities as well as participation from C&C Technology, the USGS and NOAA. The project is funded by the US Minerals Management Services (MMS) with support from NOAA's Office of Exploration.

The *Lophelia-II* project involves exploration and research of the northern Gulf of Mexico deepwater natural and artificial hardbottom habitats with emphasis on coral communities. The

2009 component of the project builds on information obtained from the first *Lophelia-II* reconnaissance cruise in September 2008. This second reconnaissance cruise involves an intensive working cruise using the AUV *Sentry* to survey potential target areas of *Lophelia* (hard corals). Promising target areas will be returned to in August 2009 for more in-depth exploration using *Jason-II* from the NOAA ship RON BROWN. **Figure 2** shows the cruise track and site targets for this AUV *Sentry* cruise. The primary data to be collected includes multibeam, digital video and still photographic imagery, and CTD with DO and pH sensors. Other data streams from the AUV, such as vehicle attitude, acoustic data, and sonar imagery are recorded by networked computers in the control van.

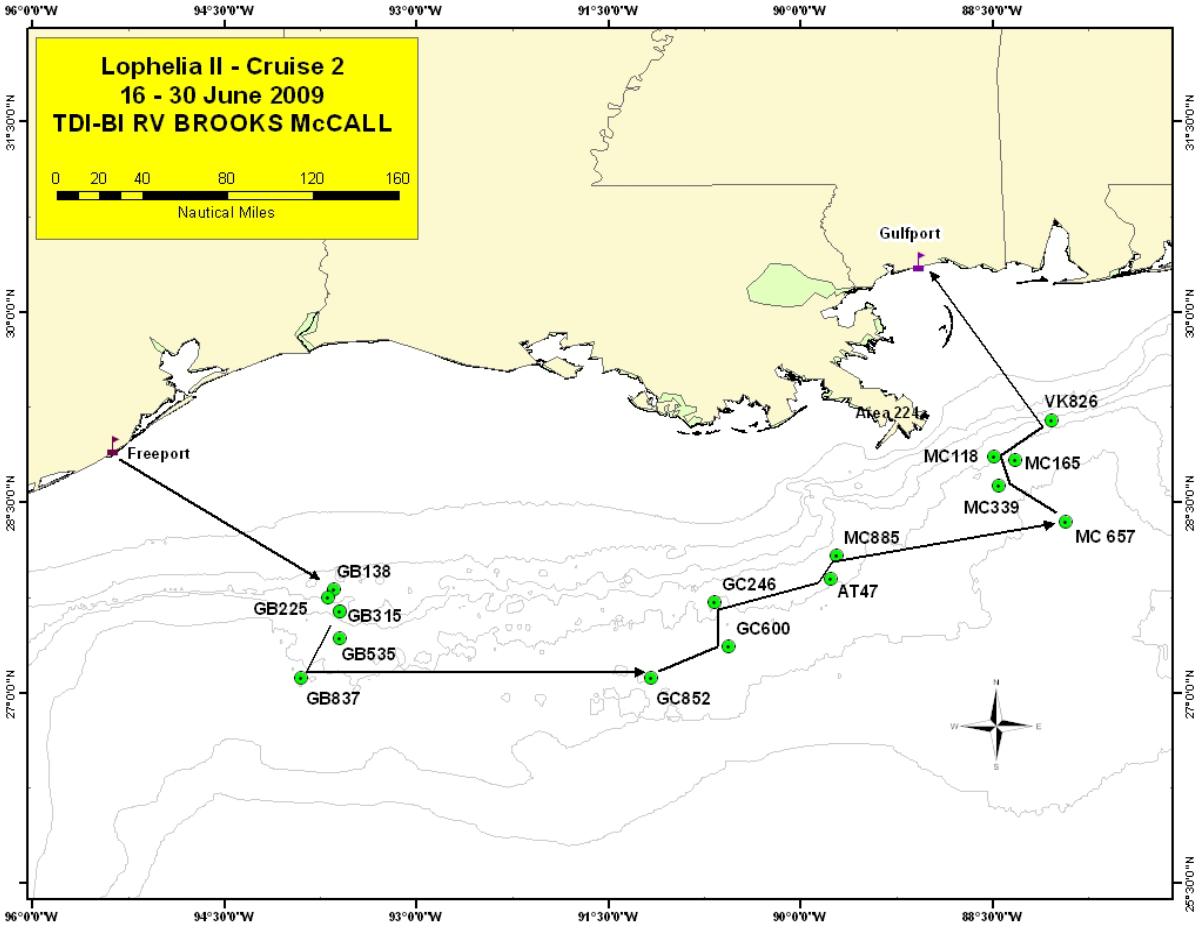

Figure 2. Site locations where the AUV *Sentry* will be deployed from the BMCC in June 2009 for a MMS deep-water Lophelia-II study of reefs and wrecks.

Sentry is designed to supplement the *Alvin* HOV by providing long-term surveys of deep areas to keep primary deep submersible exploration vehicles from doing survey work. The new hydrodynamic shape of *Sentry* allows it to easily survey ridgelines. It is equipped with a CT sensor, 250 meter swath-width multi-beam, dual magnetometers and a PHINS navigational system. *Sentry* has a speed of approximately 1 meter / second and can survey up to 15 square kilometers per dive. It has a depth capability of 4,500 meters (see **Figure 3**).

National Deep Submergence Facility www.whoi.edu/marops/vehicles

Sentry

Overview

The autonomous underwater vehicle (AUV), *Sentry*, is following in the wake of its predecessor, *ABE*, as a fully autonomous underwater vehicle capable of exploring the deep ocean up to 4,500 meters (14,764 feet). *Sentry* was built to capitalize on *ABE*s assets and with a more hydrodynamic shape it is capable of greater ascent and descent speeds resulting in an economy of power in rough terrain and greater area covered.

Sentry carries a superior science sensor suite and enjoys an increased science payload enabling it to be used for both mid-water and near-seabed oceanographic investigations. *Sentry* produces bathymetric and magnetic maps of the seafloor and is capable of taking digital bottom photographs in a variety of deep-sea terrains such as mid-ocean ridges, deep-sea vents, and cold seeps at ocean margins.

Like *ABE* before it, *Sentry* can be used to quantify hydrothermal fluxes, but *Sentry* is also capable of a much wider range of oceanographic applications. A further advantage is that *Sentry* can be used as a stand alone vehicle or in tandem with *Alvin* or an ROV to increase the efficiency of deep-submergence investigations.

Note: For cruise planning purposes and specific application details, nothing beats direct communication with NDSF. For more information please contact:
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Figure 3. AUV *Sentry* will be deployed on the BMCC in June 2009 for a MMS deep-water Lophelia-II study of reefs and wrecks.