Lophelia II 2009: Deepwater Coral Expeditions: Reefs and Wrecks

NOAA Ship Ronald H. Brown and Jason II (ROV)

NOAA ship *Ronald H. Brown* participated in the third installment of an exciting and dynamic multi-year project to locate unusual life-forms; specifically, the deep-sea coral, *Lophelia pertusa*. The four-year project was sponsored by the NOAA office of Ocean Exploration and Research (OER) and the U.S. Minerals Management Service (MMS), a division of the *Department of the Interior*. New areas in the Gulf of Mexico were explored in search of coral communities in order to develop the tools to better predict the habitat of these corals and to understand why they occur in such unique ecosystems.

The NOAA Ship *Ronald H. Brown* is a world-class atmospheric and oceanographic research platform. Its substantial maneuverability and dynamic positioning system render the *Brown* uniquely suited to the deployment of deep submersibles like the *Jason/Medea*. This remotely operated vehicle (ROV) system was designed by the Woods Hole Oceanographic Institution's deep Submergence Laboratory for scientific investigation of the deep-ocean and seafloor.

Together, the Brown and Jason offer wide area survey capabilities with precision multi-sensory and sampling platforms.

Officers and Crew of the NOAA Ship Ronald H. Brown-

"I want to take this opportunity to thank you all for everything you have done to make this expedition a resounding success. In my estimation we have met 100% of our goals. We dived in every area we needed to visit, had abundant bottom time for the great sites we discovered, were successful in every deployment and completed all tasks scheduled for the sea floor and lab. I greatly appreciate the fact that you all came through like professionals with patience and a smile.

The deck crew was especially important to our work and all of you have been great to work with. The extra around the clock help on Jason launches and recoveries allowed us to fully utilize this expensive asset 24 hours a day.

The officers and bridge crew have also excelled both professionally as navigators, ship handlers and science interface. I really can't stress enough how satisfying it has been to be working with an entire ship that not only tolerated the flexibility in operations that true exploration and deep sea work requires, but seemed to take it in stride and take pride in the successes we achieved together.

Thanks again to you all. I look forward to sailing with you again next year."

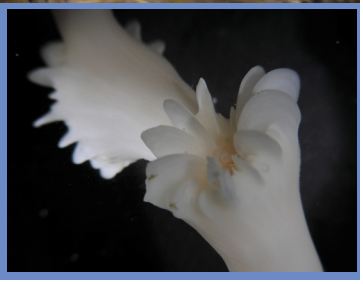
- Chuck Fisher
Professor of Biology, Chief Scientist
Lophelia II, Leg 1

In search of artifacts

A team of archeologists and other scientists boarded the *Ron Brown* at sea in the Gulf of Mexico on September 5. Their mission was to thoroughly document five historic deepwater shipwrecks. Four of these wrecks date from the Nineteenth Century. The artifacts pictured above are a compass with the compass card still intact from a 19th Century sailing vessel; water filter from a copper-clad sailing vessel discovered in the Viosca Knoll dive site; and a ship's bell recovered from the "Green Lantern Wreck", an unidentified shipwreck dating to the Mid-Nineteenth Century.

Both *Medea* and *Jason* have been designed to be superior real time optical imaging platforms with high quality cameras and lighting. The vehicles work together to provide lighting for each other in a fashion not commonly available in other submersible systems.

Scleractinian coral *Lophelia pertusa* (above) **and close-up** (right) **of the calyx with polyp retracted** *(Image courtesy of I. MacDonald and E. Cordes)*



Deep Water Corals: Exploration and Discovery

At each dive site the Jason team and scientists found an amazing variety of deep-sea corals, including stony corals (Scleractinia), such as *Lophelia pertusa*; soft corals (*Octocorallia*), including gorgonian sea fans and bamboo corals; blackcorals (*Antipatharia*) and hydrocorals (*Stylasteridae*). These corals are animals in the phylum Cnidaria which includes jellyfishes and anemones' but the corals have either calcium carbonate or horn like skeletons.

At one particular dive site, the abundance of live hard corals intermixed with living hydrocarbon seep animals was staggering. The other known occurrences of *Lophelia* at relatively active seep sites consisted of mainly dead coral structure with a few live polyps at least a few meters away from any tubeworms. This site contained luxuriant *Lophelia* thickets growing directly over and among robust tubeworm aggregations and in some cases indicate that the corals settle and flourish at seep sites while they are still relatively active and may provide additional insights into the corals use of seep primary production.

Jason-A key Team Member

Once Jason is in the water, it takes 3 people to operate - a Pilot who "flies" the ROV, an Engineer who monitors all the systems, and a Navigator who positions the *Ronald H. Brown* so that Medea and Jason can operate in the desired area. The Jason crew operates the ROV from inside a control van on the *RHB* Fantail *(see image, above and right)*