



ROVARD – A New and Innovative Deployment Platform

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Goals

Develop a robust and adaptable platform for deploying instruments and arrays at the Woolsey Mound Seafloor Observatory in the Gulf of Mexico.

ROVARD: A REMOTELY OPERATED VEHICLE ASSISTED RECOVERY DEVICE

The need for a lander to provide local power and communications for widely dispersed arrays and sensors at the Seafloor Observatory has become more and more apparent as the evolving site characterization indicates the diverse nature of the site. The Woolsey Mound Seafloor Observatory is located at one of the most dynamic sites in the Gulf of Mexico. Perched atop a buried salt dome, a complex system of faults and fractures provides for the upward migration of deep reservoir fluids. Physical, chemical and microbial conditions in the shallow subsurface work on these fluids to produce carbonate rocks, gas hydrate deposits and the development of chemosynthetic communities (life forms not dependent on sunlight for photosynthesis) and secondary communities adapted to life in harsh environments (extremophiles). The distribution of these deposits and communities varies along and within the fracture zones. There is not one, centralized location where observatory components can be deployed as a coherent unit to fully monitor the conditions at the site. The ROVARD provides the next evolution of instrument deployment.

The ROVARD safely takes instruments to the sea floor, provides power and data management and, when the monitoring is complete, easily brings the instruments back to the surface for recovery. The Platform is relatively compact and inexpensive to assemble. Multiple units can be readily deployed at sites of greatest interest and configured with the most appropriate instruments for each site.

ROVARD ADVANCEMENTS

- A new deployment and recovery device
- Provides local power and communication for widely placed arrays and sensors at the Seafloor Observatory
- Accurately deployed on seafloor to within a few meters using USBL acoustic transponders
- Custom designed articulating arms allow for proper placement of instruments on the seafloor without damage

- Final placement of sensitive instruments with ROV if required
- A wide range of arrays and sensors are being adapted for use on this new platform including Chimney Sampler Arrays, Pore Fluid Arrays, bubble detectors (multibeam sonar) and current meters (ADCP)



Figure 1: Imagery acquired by Remotely Operated Vehicles of the ROVARD in operation on the sea floor at Woolsey Mound.

ROVARD DESIGN AND OPERATIONS

The MMRI shop made the first ROVARD to deploy a suite of geochemical sensors and arrays. The lander is built around the basic idea of the pop-up buoy where a weighted platform is set on the seafloor using a trawl winch and acoustic releases. A spool of lifting cable on the lander is attached to a series of floats which, in turn, are retained on the platform by a set of acoustic releases. To recover the lander, the releases are triggered and the floats bring the lifting cable to the surface. The trawl winch can then take up the lifting line and reel-in the lander, with appended arrays and observatory components, from the seafloor.

Collaborators

OER/NOAA (DoC) and STRC/NIUST at the University of Mississippi
BOEMRE (DoI)
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Figure 2: The ROVARD on the back deck of the R/V Pelican. Note recovery lift line spooled up in the center of the platform and the series of yellow glass floats that ascend through the water column once the acoustic releases are triggered.

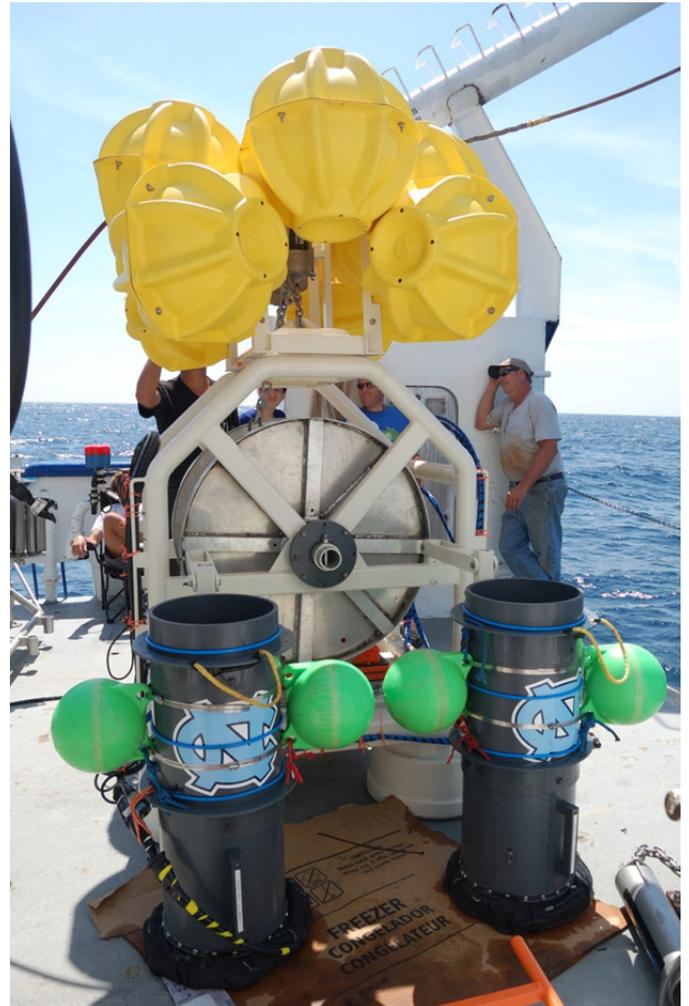


Figure 3: The ROVARD ready for deployment with a suite of instruments to investigate subsurface microbial activity, hydrate stability, seafloor gradients and chemical flux.