

A SEA-FLOOR MONITORING STATION IN THE NORTHERN GULF OF MEXICO

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Abstract

A program is in place to establish a remote, multisensor monitoring station at a selected location within the hydrate stability zone of the northern Gulf of Mexico. It evolved from a project funded by MMS to conceptualize technologies and design systems for studying the sea floor in the deep Gulf of Mexico. The program is now a cooperative effort with support and/or participation from 5 governmental agencies, 15 academic institutions and 6 private companies.

The purpose of the program is to provide an observatory for long-term investigations of the hydrocarbon system that operates near the sea floor within the hydrate stability zone. In particular, studies could be carried out to:

- develop understanding of sea-floor stability relationships,
 - model hazardous geologic conditions,
 - establish a data base useful for future gas hydrates production,
 - study associated chemosynthetic communities for drug discovery,
- and - provide environmental data related to global climate change.

The monitoring station will comprise a variety of systems operating more-or-less continuously. Data will be transmitted via optic fiber to a production platform and then telemetered to shore. The heart of the monitoring station will be a net of vertical arrays of sensors. The upper 200m of each array will be 16 hydrophones plus positioning devices in the water column for tracking sounds and observing shallow geologic structure. The lower 10m of each will be a sea-floor probe with various sensors including a three-component accelerometer for detecting seismic events.

A site will be selected and calibrated physically, chemically and biologically. After determining a 3-D seismoacoustic model of the site, the noise of passing ships will be used to monitor acoustic properties. If the monitoring does not match the model, the site has changed. The site would then be re-calibrated to determine what has changed.

Until a site is selected, systems are being tested in Mississippi Canyon Blocks 798/842 where leases have reverted to MMS and the process of obtaining permits is simplified. It is expected that the net of vertical arrays, the heart of the monitoring station, will become operational during 2006. Peripheral systems will come on line when possible.