

Justification for Naming of “Woolsey Mound”

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A project was undertaken by geoscientists at Minerals Management Service (MMS) in the mid 1990's to locate and delineate seafloor features associated with naturally occurring oil and gas vents in the Gulf of Mexico using industry 3-D seismic data. One such feature was discovered in Mississippi Canyon Lease Area, Block 118. Submersible dives on the feature revealed that it is the easternmost occurrence of exposed gas hydrates in the Gulf of Mexico, and that the gas composition of the gas hydrates is quite unique from most other features studied. Geochemical studies of the hydrates and seep gases reveal an anomalously high level of propane (up to 15%).

Congress authorized the establishment of marine mineral research centers, including the Center for Marine Resources and Environmental Technology (CMRET) at the University of Mississippi to conduct applied research on marine mineral resources under the Marine Mineral Resources Research Act of 1996. Oversight of the CMRET was given to MMS in 1998 because of the agency's responsibility for mineral leasing on the OCS.

In October, 1999, a Gulf of Mexico Gas Hydrates Research Consortium was formed, largely through the efforts of Dr. James Robert (Bob) Woolsey, Director of the Center for Marine Resources and Environmental Technology (CMRET) and Mississippi Mineral Resources Institute (MMRI) at University of Mississippi. The participants include the foremost multidisciplinary experts from 17 academic institutes, four federal government agencies, and industry (listed below).

The gas hydrate mound in Mississippi Canyon Block 118 was selected by a committee of Consortium members and funding agency representatives as the location for a seafloor observatory.

The research consortium has been funded by MMS, as well as Department of Energy and National Oceanic and Atmospheric Administration. The seafloor observatory was begun and includes instruments for the long term monitoring of acoustics, seismology, seawater geochemistry, pore fluid geochemistry, oceanographic data, temperature, and geobiological processes. The goal is to monitor the formation and dissociation of gas hydrates and determine environmental influences on these processes over time, and to provide a better understanding of the dynamics of gas hydrates in the deep marine environment. To date, a variety of instrumentation has been installed at the site, and further installations are planned. Detailed multi-beam hydrographic surveys have been conducted over the area in a time lapse study of the seafloor at the site, and changes in hydrate morphology have been noted. The observatory effort continues at this time and has been approved for future funding.

The feature consists of three vent areas (clusters of craters), a Southeast, Northwest and Southwest. (See location below) The Southeast crater appears to be dormant at present; The Northwest crater has high hydrocarbon content in the sediment and appears somewhat active. The Southwest crater is the most active venting site, and has gas hydrate exposed at the seafloor. The active venting process may be shifting from the Southwest crater to the Northwest crater. The surface morphology at MC-118 is characterized by three main crater clusters (Figure 1). The clusters are 5 to 60 meters in diameter and within each, bathymetric relief as high as 7m is observed. The clusters are grouped into the SE, SW, and NW complexes based on the complexity of bathymetric relief and the presence of gas bubbles, hydrates outcrops, sulfide-oxidizing bacteria (e.g. Beggiatoa), authigenic carbonate rocks, other chemoautotrophic communities, or uncovered mud. The presence of these seafloor features allowed characterization of the relative upward fluid flux, as presented in Roberts and Carney (1997) and then modified by Lapham et al. (2008).

The hydrate system at MC-118 has been the subject of investigation for the better part of a decade through the GMHRC. Much of this research has been focused on the seafloor and shallow subsurface, and has resulted in the extensive documentation of surface hydrate and associated carbonate, seafloor morphology and spectral characteristics, benthic and microbial activity, fluid composition and flux at the seafloor, and shallow lithostratigraphy, all with an ultimate goal of establishing a long-term observatory. Included in the existing inventory of site survey data for MC-118 are: (1) high-resolution submarine video surveys (35 hours of video film plus 215 high resolution submarine pictures; 2004, 2006), (2) C&C Hugen AUV survey (swath bathymetry, side-scan sonar, chirp subbottom profiler) (2005 AUV survey), (3) high-frequency side-scan sonar and video mosaic survey (2007 NR1 survey), (4) 2006 Pseudo 3D SDR vertical incidence seismic survey (mound area only), (5) 2008 marine controlled-source electromagnetic (CSEM) survey to assess hydrate bulk properties, and (6) more than 60 shallow lithologic cores (0.05-10 m) taken throughout the MC-118 block, but especially within the SW salt dome mound region. More recently, these observations have been complemented with the analysis of an industrial 3-D seismic reflection survey (TGS-Nopec survey covering the entire MC-118 block) and integration of information from an industry well (ARCO-1) drilled within the block in 1989.

Dr. Woolsey was tragically killed in an automobile accident in July of 2008. His personal efforts and management skills made the consortium and this observatory happen, and it continues on today under the coordination of CMRET staff, and the dedication of the individual researchers.

Since Dr. Woolsey was instrumental in the creation of the seafloor observatory, participants in the consortium voted unanimously to propose the gas hydrate mound in Mississippi Canyon Block 118 be named in his honor.

A Cooperative Effort with Support/Participation From:

DEPARTMENT OF COMMERCE
National Oceanographic and Atmospheric Administration
National Undersea Research Program

DEPARTMENT OF DEFENSE
Naval Research Laboratory
Naval Oceanographic Office

DEPARTMENT OF ENERGY
Federal Energy Technology Center

DEPARTMENT OF INTERIOR
Minerals Management Service
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Georgia Institute of Technology
Florida State University
Louisiana State University
Mississippi State University
Texas A&M University
University of Georgia
University of Southern Mississippi
University of Texas, Austin
University of Victoria, British Columbia
Woods Hole Oceanographic Institution
Scripps Institute of Oceanography

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Location:

Location boundaries are provided in MMS Stipulation 9 for OCS Oil and Gas Lease Sale 198, which delineates a zone of no activity zone around the feature for the oil and gas lease holder. The area containing the instruments for the observatory is bounded on the south by the southern boundary of MC Block 118 ($28^{\circ} 50.667'$), the north by $28^{\circ} 52.667'$, the east by $88^{\circ} 28.333'$ and the west by $88^{\circ} 30.167'$.

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