MMS Technical Announcement

U.S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Region

July 2001

Improved Geohazards and Benthic Habitat Evaluations:
Digital Acoustic Data with Ground Truth Calibrations

OCS Study MMS 2001-050

The Minerals Management Service (MMS), Gulf of Mexico OCS Region, announces the availability of a new study report, *Improved Geohazards and Benthic Habitat Evaluations: Digital Acoustic Data with Ground Truth Calibrations.*

The objective of this study is to apply state-of-the-art digital acoustic data, both high-resolution seismic and lower resolution, but deeper penetrating, 3D-seismic, as well as side-scan-sonar data, for developing a conceptual framework and reliable criteria for identification of seafloor features and areas that are the products of hydrocarbon venting-seepage. Within this overall aim of the study, a parallel purpose is to understand better how to interpret the presence or absence of chemosynthetic communities from standard high-resolution acoustic data collected for geohazards evaluation and 3D-seismic surface amplitude data.

During the course of this project, detailed datasets were collected on 29 features of the northern Gulf of Mexico upper continental slope (<1,000-m water depth). A shallow subsurface acoustic wipeout zone on high-resolution seismic represented each one of these sites. In addition to high-resolution seismic, side-scan sonar, 3D-seismic, and direct seafloor verification, datasets were analyzed for each feature and a synthesis of feature characteristics was derived. Utilization of 3D-seismic surface amplitude and phase data provides a powerful additional element for interpreting seafloor geology and, to some extent, biology when used in conjunction with good quality high-resolution seismic and side-scan-sonar data. Areas of continental slope seafloor impacted by hydrocarbon venting and seepage are nearly always represented on high-resolution seismic profiles as acoustic wipeout zones. Through an appraisal of the variability of seafloor features within areas characterized by acoustic wipe-out zones plus fluid and gas expulsion, feature types can be conveniently grouped into those that are the result of rapid delivery of fluids and gases at one end of the spectrum to those that are the result of slow seepage on the other. Mud-prone features such as mud vents, mudflows, and mud volcanoes do not generally support complex chemosynthetic communities, and hydrocarbons reaching the seafloor are only slightly biodegraded. Mineral-prone features such as mounded carbonates, hardgrounds, or barite-carbonate-encrusted areas also do not support densely populated and complex chemosynthetic communities. The quality of interpretation of seafloor geology using remotely sensed acoustic data is dependent on a wide variety of variables, including frequency and firing rate of the source, towing configuration, filtering, and recording-data storage modes. This program has led to an improved understanding of hydrocarbon seep/vent-related phenomena on the Louisiana-Texas continental slope by helping clarify the relationships between rate of delivery of fluids and gases to the seafloor and geologic as well as biologic response.

For more information about this study or the Environmental Studies Program in general, contact the Environmental Sciences Section (MS 5430), 1201 Elmwood Park Boulevard, New Orleans, Louisiana 70123-2394, telephone (504) 736-2752.

You can obtain copies of the report from the Minerals Management Service, Gulf of Mexico OCS Region, at a charge of $10.00 by referencing OCS Study MMS 2001-050. You will be able to obtain this report also from the National Technical Information Service in the near future. Here are the addresses. You may also inspect copies at selected Federal Depository Libraries.

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Telephone requests may be placed at
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MMS is the Federal Agency in the U.S. Department of the Interior that manages the Nation's oil, natural gas and other mineral resources on the Outer Continental Shelf in Federal offshore waters. The Agency also collects, accounts for, and disburses mineral revenues from Federal and Indian leases. These collections totaled nearly $8 billion last year and more than $110 billion since the Agency was created in 1982. Annually, nearly $1 billion from those revenues go into the Land and Water Conservation Fund for the acquisition and development of state and Federal park and recreation lands.

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MMS's Website Address: **http://www.mms.gov**

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