The NewsRoom
Date: March 10, 2005

Taking "Pictures" Below the Earth's Surface

Taking "Pictures" Below the Earth's Surface Finding oil and gas resources located miles beneath the ocean's floor may seem like trying to find a "needle in a haystack." However, advancing technology makes finding that needle a little easier. To determine whether the rock strata beneath the ocean floor may contain oil and gas resources that can be developed economically, geoscientists must interpret and integrate large volumes of geophysical, geological, petrophysical, and paleontological data. The interpretation of these data allows the geoscientist to create an image or "picture" of the subsurface, which is then used to determine whether an area has any potential for oil and gas resources.

The introduction of three-dimensional (3-D) seismic data has greatly improved the ability of geoscientists to obtain detailed information about the rich resources available beneath the ocean floor. The 3-D seismic data provide accurate images of the subsurface and cover large areas. Other geological data, such as that provided by electrical logs and paleontology, enhance the interpretation of the 3-D subsurface seismic image of an area of interest. When used together, each of the data types allows a clearer image of deep-sea subsurface structures and hydrocarbon potential to emerge.

To compile and interpret the massive quantity of data available from various sources, geoscientists use high-tech workstations comprising stand-alone or networked computers. These workstations use integrated geoscientific interpretation and reservoir simulation software to interpret and analyze 2- and 3-D seismic data. In addition, the workstations help to create geological and geophysical maps, construct cross-sections of buried rock formations, and manage the immense amount of data used. The Minerals Management Service (MMS) currently has 8 terabytes of seismic data stored on its computers.

The Agency is pursuing the acquisition of an immersive visualization center that will display geological and geophysical data three-dimensionally on projection walls in theater-like rooms. Geoscientists wearing 3-D glasses will be "immersed" in the display. Geoscience teams may then simultaneously view the data, making it easier for them to collaborate. Such collaboration provides quicker and more accurate interpretations and evaluations of potential subsurface hydrocarbon resources.

Using the numerous data types available and high-tech workstations in a collaborative environment, geoscientists from MMS and the oil and gas industry can more readily identify and evaluate what lies beneath the ocean floor and determine which areas may be economically profitable to develop. With these data and high-tech data analysis tools, the "haystack" becomes much smaller, the needle a bit larger, and the search much less costly.

MMS Ocean Science Journal

Relevant Web Sites:
MMS Main Website

Media Contacts:
Nicolette Nye
(703) 787-1011