The NewsRoom
Date: March 10, 2005

The Outer Continental Shelf: Geologic Mysteries

The Outer Continental Shelf (OCS) abounds with rich and varied biological, chemical, and geological natural resources. The oil and gas resources located on the OCS are particularly important to the Nation's energy future. The unique geology of the surface and subsurface has made the OCS a prolific area for hydrocarbon resources in North America, producing almost 29% of the oil and 25% of the natural gas in the U.S.

The area known as the OCS runs from approximately 3 miles from a State's coastline to about 200 nautical miles from shore. Generally, the continental shelf runs in a gentle slope from the beach to approximately 600 feet of water depth. The continental slope is a relatively steep feature that begins where the shelf leaves off (600 ft up to 10,000 ft). The continental rise begins at the end of the slope and is an apron of sediment between the slope and the abyssal plain, a relatively flat seafloor.

Hydrocarbons (oil and gas) are formed when organic matter such as plant material and animal remains settles to the bottom of a body of water and becomes buried by sediment. Through millions of years, heat and pressure from natural processes are applied. Over time, oil and gas are formed as the organic material is broken down.

However, hydrocarbons do not remain where they were deposited. They begin to migrate upwards through porous rocks that serve as pathways. The hydrocarbons continue to rise until they are trapped in pockets between two strata or layers, one porous or permeable and the other impermeable. Gas, being lighter, is usually at the top of the trap, heavier oil is next, and at the bottom is water.

Traps form when rocks fold into structural highs by tectonic plate activity, or when faults move layers of rock where porous rock, such as sandstone or limestone, presses against impermeable rock such as shale. The trap must be sealed by impermeable layers to prevent oil and gas from escaping and it must also have enough space for oil and gas to accumulate.

The Nation's energy potential may not rest entirely on conventional hydrocarbon resources. Scientists are now studying the possibility that a unique and puzzling frozen "ice" crystal may hold the key to future energy resources. Gas hydrates form when methane gas and water are subjected to pressurization and extremely cold temperatures. When mixed with sediments on the sea bottom, gas hydrates form thick layers or mounds. Discovering a method to transport the gas from these formations to the surface is key to their potential use.

As new reservoirs are discovered and new forms of energy explored, the responsible stewardship of the OCS remains a vital part of our National interest. The Minerals Management Service continues to study and evaluate the rich geologic mysteries existing there.

MMS Ocean Science Journal

Relevant Web Site:
MMS Main Website

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