

**AAPG Annual Meeting  
March 10-13, 2002  
Houston, Texas**

Kathleen O. Horkowitz<sup>1</sup>, James A. Thomson<sup>1</sup>, Andrew W. Hill<sup>1</sup> (1) BP, Houston, TX

## **Characterizing Turbidite Depositional Elements in the Deepwater Gulf of Mexico with High-Resolution AUV Seabed Imagery and High-resolution 3D Seismic**

Geohazard site investigation studies are carried out at several scales to evaluate seabed conditions and shallow subsurface geohazards for deepwater exploration and development projects. Deepwater depositional elements mapped during site investigation studies are useful analogs for continually developing play models.

Detailed seismic stratigraphic evaluations of the shallow subsurface are now a standard part of geohazard site investigation and well planning for deepwater GOM. A driving factor responsible for this is the need to reduce drilling hazard risks associated with shallow gas and shallow water flow (SWF) from overpressured sands. Seismic stratigraphic evaluations are used to delineate potential sand packages and assess sand continuity for single well or multi-well programs. An ancillary benefit of the geohazard site investigation is the array of deepwater depositional elements that have been mapped at depths less than 5000 ft. below the seafloor.

Three scales of seismic data are typically used to characterize the seafloor and shallow subsurface. Surface and near-surface features in the upper 300 feet of sediment are characterized by swath bathymetry, side scan sonar, and subbottom profiles; the shallow subsurface interval from seafloor to 5000 feet below the seafloor is best imaged with high resolution 2D and 3D seismic; the overburden from 5000 feet below seafloor to reservoir levels requires conventional 2D and 3D seismic data.

A series of case studies are presented from the Mississippi Canyon and Garden Banks protraction areas to illustrate different elements of recent turbidite fan systems in the deepwater GOM including depositional lobes, leveed-channels, erosional channels, slump blocks and slump scars.