Monday, March 20, 2006

Westchase Hilton • 9999 Westheimer
Social 5:30 p.m., Dinner 6:30 p.m.

Cost: $25 Preregistered members; $30 non-members & walk-ups

The HGS prefers that you make your reservations on-line through the HGS website at www.hgs.org. If you have no Internet access, you can e-mail reservations@hgs.org, or call the office at 713-463-9476. (include your name, e-mail address, meeting you are attending, phone number and membership ID#).

International Explorationists Dinner Meeting

by ***Lorena Moscardelli***
UT Jackson School of Geosciences
Austin TX

Mass Transport Complexes in Offshore Trinidad and Worldwide Analogs

Mass transport complexes form a significant component of the stratigraphic fill in ancient and modern deep-water basins worldwide. One such basin, the deep marine margin of eastern offshore Trinidad, situated along the obliquely converging boundary of the Caribbean and South American plates and proximal to the mouth of the Orinoco River, is characterized by catastrophic shelf margin processes, intrusive and extrusive mobile shales, active tectonics and prolific migration and sequestration of hydrocarbons. Major structural elements that characterize the deep-water slope regions of this area include

- large transpression fault zones (i.e., Darien Ridge, Central Range, Los Bajos) along which mobile shale walls are extruded,
- fault-cored anticlinal structures overlain by extrusive seafloor mud volcanoes,
- shallow-rooted sediment bypass grabens near the shelf break, and
- normal regional and counter-regional faults.

A mega-merged, 10,000-sq. km. 3D seismic survey reveals several erosional surfaces that form the boundaries of enormous mass transport complexes (MTCs). The data shows numerous episodes of MTC development, characterized by chaotic, mounded seismic facies and fan-like geometry. Their extent (6700 sq. km) and thicknesses (up to 250 m) are strongly influenced by seafloor topography. These systems show run-out distances from the source area of 60 to 100 km. Depositional architecture identified with these units include huge lateral erosional edges, linear basal scours and side-wall failures. Mud volcanoes buffer deposition and produce sediment shadows on their downdip side; these depositional remnants are potential stratigraphic traps. MTCs are believed to be produced by failures initiated by sediment accumulation and oversteepening of the slope, tectonic movement, high-frequency sea level fluctuations and/or possibly hydrate destabilization and dissolution.

Several architectural elements documented in the MTCs in offshore Trinidad have been identified and described in similar settings around the world. Basal scours are common in MTCs located in the continental margins of offshore Brunei, offshore eastern Borneo (Indonesia) and the Monterey channel-mouth lobe in offshore California. Side-wall failures or syndepositional faults have been described in outcrop studies in the Jackfork Formation, Ouachita Mountains, of Arkansas. Equivalent "imbricate slices" have also been reproduced in laboratory gravity transport experiments. All these well-documented case studies are used as potential analogs in the deep marine settings of offshore Trinidad. The objective of this research is to better understand the role that MTCs play in forming continental margins around the world and the effect that they have on fluid flow and reservoir development within deep water basins. ■

Biographical Sketch

Lorena Moscardelli graduated from the Central University of Venezuela in 2000. After graduation she worked as an explorationist in the national oil company of her home country. In 2003, she entered the Jackson School of Geosciences at The University of Texas at Austin to pursue a PhD degree in geological sciences. She is currently working as a graduate research assistant at the Bureau of Economic Geology, where she has been conducting research in the southeastern part of the Caribbean under the supervision of Dr. Lesli Wood. Her career goal is to become a geologist specializing in stratigraphy and seismic interpretation.

Currently, she is particularly interested in the application of new quantitative seismic geomorphology techniques in shallow and deep water deposits, and she wants to evaluate the impact of this new technique in reservoir modeling and development. She has obtained several grants and scholarships including the 2004 L. Austin Weeks Grant from the AAPG Foundation, the Thomas R. Banks Memorial Scholarship from the San Antonio Area Foundation in 2004, an Outstanding Student Paper Award from the Hydrology Section of the AGU in 2004 and a Graduate Student Research Grant from the GSA in 2005.