

June 20, 2005

IODP EXPEDITION 308: GULF OF MEXICO HYDROGEOLOGY SITE U1321 SUMMARY

Hole U1321A Latitude: 27°, 16.5398' N, Longitude: 94°, 23.9370' W
Water depth: 1451.5 m

IODP Site U1321 is located on the southern portion of the Brazos-Trinity Basin IV within a section of basin turbidites that is underlain by a thicker section of hemipelagic mud. Hole U1321A was drilled as a dedicated logging-while-drilling (LWD) and measurement while drilling (MWD) hole to better correlate lithostratigraphic units, and individual sand layers across the SSW margin of Brazos-Trinity Basin IV, and document the lateral change in petrophysical properties of the fan units above reflector R40.

The LWD data indicate a shallow series of interbedded sand and mud facies that correspond to Lithostratigraphic Unit II in Hole U1320B. Porosity decreases with depth from 80 % to 45% at an approximate depth of 34 mbsf indicating rapid compaction and potential fluid expulsion in the shallow section. From 35 to 60 mbsf, porosity increases to 85% corresponding to a clean sand unit that is also clearly defined in the gamma ray, resistivity, and density logs. Most of the units identified in the logs seem to be thinning with respect to the units identified in Hole U1320B.

Resistivity images of the borehole show apparent breakouts at the bottom of the hole with an E-W orientation, similar to what was observed at Site U1320. These breakouts indicate a N-S maximum stress direction that could be attributed to high input of siliciclastic material derived from river plumes, turbidity currents, and/or slump deposits from the basin flanks. The resistivity images are also characterized by series of thin alternating resistive and conductive laminations that may represent variations in silt content. Steep features at the bottom of the hole have been identified as potential slump deposits or faulted blocks.

MWD/LWD operations at Site U1321 achieved two main objectives. First, the data acquired will make bed to bed correlation between Sites U1319 and U1320 possible. This will be very valuable for the study of sandy turbidites. Then, Site U1321 was also the first IODP site drilled with MWD/LWD tools prior to coring. This first experience in the normally pressured Brazos Trinity Basin IV was an excellent exercise in preparation of MWD/LWD drilling at the Ursa Basin.