

PLIO-PLEISTOCENE DEPOCENTER DISTRIBUTION AND SHELF BREAK PROGRADATION, NORTHWEST OFFSHORE LOUISIANA

Rong Li and Joel S. Watkins
Department of Geophysics
Texas A&M University
College Station, Texas 77843

ABSTRACT

Interpretation of 4000 line miles of seismic data, covering an area between 91° 60'W to 94° 00'W longitude and 28° 00'N to 29° 00'N latitude, reveals the sedimentation patterns underneath the continental shelf. Seven Plio-Pleistocene paleohorizons were mapped using the first occurrence paleotops: *Trimosina A*, *Hyalinea balthica*, *Angulogerina B*, *Lenticulina 1*, *Globoquadrina altispira*, *Buliminella 1* and *Textularia X*.

The sediment distribution in this area is controlled by different structural features. Between 93°W and 93°40'W, three East-West trending fault zones are the most pronounced structural features. The master fault is located between 28°20'N and 28°30'N and extends about 60 miles in the downdip direction. It controls sediment distribution for the interval from Lent 1 to Trim A. The expansion index approaches 5. The fault toe merges with a broad shale uplift near the Trim A and Hyal B shelf edge. Largest depocenters from Ang B to Lent 1 are located on the downthrown side of this fault. The second fault zone trend is located between 27°50'N and 28°10'N. The maximum thickness in the Hyal B - Trim A interval occurs at the downthrown side of this fault. The third fault trend is located between 28°30'N and 28°40'N. This fault is much smaller than the first fault zone and it mainly controls depocenters from Lent 1 to Glob Alt. Salt diapirism was active during this interval. A series of salt spines occur in the region between 93°W and 92°W. Large scale growth faults did not develop here. Maximum sediment deposition occurs in interdiapiric basins as a result of the salt withdrawal. This region contrasts with the region between 93°W and 93°40'W, which is dominated by salt anticlines and salt sheets, and where large growth faults are well developed. Around 92°W, another large growth fault with a long glide plane is observed with a depocenter on its downthrown side.

The distribution of depocenters of different periods coincides with the trends of prograding paleoshelf edges and growth fault trends related to failure at shelf edges. A portion of Trim A paleoshelf edge is controlled by a landward fault zone. Hyal B and Ang B paleoshelf edges are related to the fault trend between 27°50'N and 28°10'N. Both this fault trend and the second fault trend control the location of Lent 1 paleoshelf edge. The Bulli 1 paleoshelf edge is along a belt of salt diapirs.

Thickest Plio-Pleistocene depocenters are in middle shelf - lower slope environments. Depocenters from Trim A to Lent 1 are in an outer shelf environment; and Glob Alt - Tex X are in upper slope environments.