ORIGIN OF REGRESSIVE-TRANSGRESSIVE SEQUENCES IN THE CLAIBORNE GROUP

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Origin of regressive - transgressive sequences within the Claiborne Group along the Texas and Louisiana coast have been variably attributed to eustatic sea level changes, autocyclic delta lobe switching, and changes in sediment sources. By using seismic, well logs, core data, sedimentological and stratigraphic principles, this project determines the sequence stratigraphic relationships within this Eocene group. System tracts, defined by flooding surfaces and sequence boundaries, are examined as defined by various sedimentary models. By understanding the sequence stratigraphic relationships within these formations, it is possible to advance our understanding of the regional changes in sea level along the Texas Gulf Coast as well as to highlight sedimentary relationships and models for this group.

The Claiborne Group in the Victoria, Jackson, Wharton, Colorado and Fort Bend counties area exhibits apparent features predicted by the Vail model for a changing sea-level. At least four major unconformity surfaces are recognized in seismic data acquired over this region of the Texas Gulf Coast from the San Marcos Arch to the Houston Embayment. Sequences beneath these unconformities have upwards of hundreds of meters of missing section. Seismic dip lines demonstrate that these surfaces have numerous onlapping and downlapping marine strata onto them. The surfaces can best be seen where the effects of salt or major growth faulting is not as significant as that encountered further to the east. Seismic data utilized includes 1990 vintage data 36 to 60 fold with offsets over 3,000 meters. Seismic vertical resolution is around 25 to 30 meters. Preliminary dating of the unconformities shows they occur within the Yegua, Cook Mountain, Sparta and Queen City Formations. Maximum flooding surfaces appear to onlap these surfaces. Three maximum flooding surfaces are recognized. Utilizing the chronology of Haq et al. (1987), these maximum flooding surfaces occur at base of Supercycle TA4 and the top of TA3. They appear to correlate to the third order cycles 4.1 at 38.8 mya, 3.6 at 40.0 mya, and 3.5 at 41.2 mya.

It appears there may be a relationship between a change in climate and the timing of one of these unconformity surfaces. The relation between worldwide oxygen isotope data is shown. While these sequence bounding surfaces may continue updip to the outcrop, seismic resolution prohibits tracing the thinning sequences updip. It appears that these unconformities are not evident on all seismic sections in the region. Whether this is due to variations in sediment supply and deposition, or seismic resolution is uncertain. These unconformity surfaces are most easily observed where the Claiborne Group expands over the rapidly subsiding Wilcox Group.