

Reconstruction of Burial History of Strata in the North Louisiana Salt Basin Area

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ABSTRACT

The burial history of the North Louisiana Salt Basin area is directly linked to the tectonic and depositional histories of the basin that are, in turn, closely related to the evolution of the Gulf of Mexico. Ten regional cross sections consisting of 141 key wells, structural and isopach maps, and selected seismic lines are the basis for this interpretation. The burial history for the stratigraphic section represented in each well used for the cross sections was determined using BasinMod 1D[®] software.

The total thickness of the sediment column was corrected for compaction. Major unconformities associated with uplifts and erosional events were recognized in Jurassic through Tertiary strata. In the Sabine Uplift area, the amount of section eroded ranges from 200 to 600 ft, and the erosion occurred during the early Late Cretaceous (mid-Cenomanian). In the North Louisiana Salt Basin, stratal erosion also primarily occurred during the early Late Cretaceous, and the amount of erosion decreases basinward, and increases from west to east in the basin. The maximum section eroded is estimated to be about 3,000 ft. In the Monroe Uplift area, it is estimated that a maximum of 7,200 ft of section was eroded during the early Late Cretaceous, post-Eagle Ford and post-Austin time.

The burial history modeling for the North Louisiana Salt Basin is consistent with the rift-related geohistory of the region. The sediment accumulation rates were greatest during the Jurassic and decreased progressively from the Jurassic to Early Tertiary. Tectonic subsidence was the significant component of the total subsidence, and accounts for approximately 42-52% of the basin fill. The tectonic subsidence rates were greatest during the Jurassic and 50-60% of the total tectonic subsidence occurred within 22 million years.