

## **SEQUENCE AND SEISMIC STRATIGRAPHY OF THE BOSSIER PLAY (TITHONIAN), WESTERN EAST TEXAS BASIN \***

by George D. Klein

Sequence and seismic stratigraphic analysis of well logs and 2-D seismic lines from Freestone, Leon, Houston, Madison, Robertson and Limestone Counties, TX, demonstrates that the Bossier Formation of the Western East Texas basin can be subdivided into two recognizable sequences separated by a major sequence boundary (SB-2). Similarly, the Bossier Formation is also bracketed by a basal (SB-1) and upper (SB-3) sequence boundary separating it from the Cotton Valley Lime below, and the Cotton Valley Sand above, respectively.

In seismic sections, the SB-2 boundary in the middle of the Bossier Formation was identified by tracing mounded basal reflectors, and sigmoid signatures representing basin floor and slope fans. This boundary was correlated onto the shelf below stacked deltas. In well log sections, basin floor fan log signatures can be traced laterally into slope fan and stacked delta log facies. These basin floor and slope fans represent a lowstand systems tract, whereas the Lower Bossier represents a transgressive systems tract and the upper Bossier represents a prograding complex.

Burial history analysis suggests that the Lower Bossier accumulated during a time of rapid mechanical subsidence when the East Texas basin was underfilled. A drop in sea level associated with the SB-2 boundary represents a major climate shift from tropical to cooler conditions favoring rapid influx of sands from the ancestral Mississippi, Ouachita and Red River Systems. These sands developed inner shelf prograding deltaic packages, outer shelf and incised valley fill stacked deltas, and basin submarine fan systems. The stacked deltas and basin fan sand systems all represent prospective gas plays.

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