

**AAPG Annual Meeting
March 10-13, 2002
Houston, Texas**

Tucker F. Hentz¹, Hongliu Zeng², Lesli J. Wood² (1) Bureau of Economic Geology, Austin, TX (2) The University of Texas at Austin, Austin, TX

Sequence Stratigraphy and Hydrocarbon Distribution of Miocene Plays: A Case Study from Starfak and Tiger Shoal Fields, Offshore Louisiana

Recently published play atlases of the northern Gulf of Mexico classify reservoirs within broad groupings based on depositional style from gross stacking pattern (aggradational, progradational, retrogradational) and chronozone. This approach is necessary to aggregate basinally distributed reservoirs with broadly similar characteristics within a manageable organizational scheme. However, the details of the genetic stratal architecture, systems tracts, and pattern of hydrocarbon distribution of specific plays are rarely documented. Analysis of the high-frequency sequence stratigraphy of the siliciclastic strata in Starfak (Vermilion Area) and nearby Tiger Shoal (South Marsh Island) fields enables a closer look into the anatomy of several Miocene plays.

The 10,000-ft upper-lower through upper Miocene succession in the two fields comprises seven middle and upper Miocene plays, five progradational and two retrogradational. Primarily fourth-order on-shelf highstand and lowstand incised-valley sandstones form the framework of the progradational plays (2,000-6,000 ft). The much thinner (100-500 ft) and more localized retrogradational plays are successions of third-order lowstand (LST) and overlying transgressive (TST) systems tracts that collectively grade upward from thick fourth-order lowstand-wedge and incised-valley sandstones to thinner and finer grained strandplain/deltaic sandstones. Thick shales of third-order TST's and overlying highstand systems tracts form regional sealing units across the fields, significantly influencing hydrocarbon distribution. Hydrocarbons reside in fourth-order lowstand, transgressive, and highstand systems tracts in all plays within the two fields, although ~93% of total hydrocarbons have been produced from third-order LST's. Detailed sequence analysis clarifies the reservoir framework of these plays and enables a focused strategy of exploitation, particularly in mature fields.