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Sequence Stratigraphic Framework and Depositional Variations of Miocene Lowstand Systems Tracts, South Louisiana

Miocene reservoirs within transgressive and highstand systems tracts account for a large portion of the historical production in South Louisiana. The remaining exploration potential for deep untested objectives lies within Miocene lowstand systems tracts that have not been widely exploited to date. This complex and highly variable section is contained within 22 major depositional sequences deposited from 21.9 to 7 million years ago. Regional well-log, seismic, and biostratigraphic correlation and mapping defines the sequence stratigraphic framework of Louisiana's coastal zone.

The lowstand plays form a series of strike-oriented expansion trends that decrease in age from west to east. Throughout the Miocene section, separate major expansion zones comprising fault-bounded sets of blocks are characterized by a distinct lowstand chronostratigraphy. Within onshore and state water areas, 14 sequences contain regionally correlative lowstand systems tract components. Sandstone-rich lowstand facies are most well developed in intra-slope basins where paleobathymetric confinement and accommodation were greatest.

Step-wise seaward progradation of the shelf-slope break characterizes the early Miocene section where deposition took place during a period of overall sea-level rise. Seaward progradation of the shelf-slope break was less regular during the middle Miocene when deposition became dominated by a period of overall sea-level fall. Late Miocene lowstand deposits are best developed in the offshore trend. Within individual cycles, the position and trend of the shelf-slope break was strongly controlled by both syndepositional fault movement and salt withdrawal. Sustained subsidence in major withdrawal basins trapped lowstand deposits of multiple cycles and locally impeded progradation of the shelf-slope break.