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Post 30 ma Sequence Stratigraphy, Northeastern Gulf of Mexico

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Abstract

Twenty sequence boundaries (30 ma to 1.7 ma) identified by He et al. (1994) in the Main Pass area have been extended westward to the Mississippi delta, in order to fully document the geological history and further investigate the roles of local geological controls, i.e., sediment supply, faulting and sediment loading. All sequences consist of highstand and lowstand tracts. Transgressive systems tracts are resolved seismically. Isochron maps of sequences T to A reveal that depocenters are not uniformly distributed, which indicates one of the major rivers (Mississippi and Mobile) supplied more sediment than the other in certain time periods.

A total of six depositional episodes have been documented after 30 ma in the study area. From 30 to 25.5 ma, sedimentation rate was low and deposition occurred landward of the lower Cretaceous shelf margin. 2) Sedimentation rate increased slightly from 25.5 to 15.5 ma, and deposition occurred both landward and seaward of the lower Cretaceous shelf margin. 3) From 15.5 to 10.5 ma more deposition filled the deeper part of the basin, seaward of the lower Cretaceous shelf margin. 4) Uniform southward progradation and migration of depocenters occurred between 10.5 and 5.5 ma. 5). After 5.5 ma, depocenters migrated eastward and progradation increased in the east. 6) Early lowstand deposits moved from a basinal to slope setting after 3.8 ma, and reflection patterns changed from oblique to sigmoid; sedimentation rate dramatically increased. Observations to date indicate sediment supply played the dominant role in the sequence architecture.