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Stratigraphic Evolution of the Magnolia Field and Surrounding Area, Garden Banks Blocks 783 and 784, Deepwater Gulf of Mexico

The Magnolia Field is located along the southern edge of the Titan Mini-Basin where multiple deep-water reservoir sands encounter a series of down-to-the-basin and antithetic faults adjacent to salt. Reservoirs are of Miocene, Pliocene and Pleistocene age. Sand body geometry is related to the interplay between structural movement and sediment input, both of which occur at various temporal and geographical scales. These sand bodies have been placed into a sequence stratigraphic framework. Sequence boundaries have been picked at the base of sand-prone intervals observed on well and 3-D seismic data. Nannofossil and foraminiferal abundance and diversity data suggest that true maximum flooding surfaces are rarely recorded. They are likely truncated by super adjacent erosional surfaces associated with overlying lowstands where resedimented microfossils are conspicuous.

As observed in other central GOM intraslope basins, Magnolia can be subdivided into ponded, transitional, and bypass depositional phases. The ponded phase extends from the Miocene to the Plio-Pleistocene boundary and consists primarily of sheet sands that thin or onlap against salt. The Pliocene depositional axis is oriented from West to East. Stratigraphic architecture changes dramatically across an erosional sequence boundary separating the ponded Pliocene fill from the lower Pleistocene transitional fill. This marks a time when an exit point formed to the south and the depositional axis changed to a North - South orientation. A typical lower Pleistocene sequence comprises sheet sands at the base, overlain first by erosional, amalgamated channels, and then by constructional channels and mudstone corresponding to the abandonment phase of deposition.