

Classification, Lithologic Calibration, and Stratigraphic Succession of Seismic Facies from Intraslope Basins, Deep Water Gulf of Mexico

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The succession of seismic facies in Gulf of Mexico (GOM) intraslope basins reflects interplay of a variety of deep-water depositional processes and evolution of accommodation space on the slope. This interplay of slope depositional processes results in a transition from an early, sand-prone ponded basin-fill succession (ponded facies assemblage) to a later shale-prone, slope-bypass succession (bypass facies assemblage).

Convergent-baselapping facies, in combination with localized chaotic and draping facies, dominate the ponded facies assemblage. Stratigraphic relationships among these three units illustrate how fill-and-spill depositional processes occur within intraslope basins. These basins typically have thick, high net-to-gross sands. Convergent-thinning facies with widespread chaotic and draping facies dominate the bypass facies assemblage. These units represent filling of different types of slope accommodation space. These spaces fill as progradational delta fronts build beyond critical angles and collapse. Sediments tend to be sand lean because the slope angles are too high to allow turbidite fan deposition. Sands are generally associated with channels or localized, thin ponded fans.

The transition from "ponded" to "bypass" facies assemblages can be sharp or gradational over hundreds of meters. Nearly synchronous transitions throughout upper- to mid-slope basins suggest that increased sediment supply resulting from a long term sea-level fall, and capture of large drainage areas by the Mississippi River are the primary controls on development of this large-scale stratigraphic architecture.