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Comparison of Modern Intraslope Mini-Basins to Deep-Sea Fan Turbidite Systems in the Gulf of Mexico

The northern Gulf of Mexico (GOM) continental slope contains ponded mini-basins and bypass channels some of which extend part way down the slope (e.g. the Brazos/Trinity system), whereas others traverse the entire slope to feed deep-sea fans on Sigsbee Abyssal Plain (e.g. Bryant Fan). Outside the intraslope-basin province, the large Mississippi Canyon and Fan system extends unobstructed to the abyssal plain. The scale (<50 m relief and ~1 km width) and style (interplay of upstream incised and downstream leveed) of the intraslope-basin bypass channels are different from the large (~200 m relief and ~5 km width) and long leveed channels of inner Bryant (140 km) and Mississippi (350 km) fans. However the multiple stacked channel system of Bryant Fan leads to a single lobe (30 km length) in contrast to the 17 major channel complexes that feed Mississippi Fan lobes of 120-200 km length. In the intraslope basins, sand-rich ponded lobes occur in the fill and spill mini-basins that range from 5-18 km diameter in the Brazos system to 30 km in the Bryant Canyon pathway. Consequently, reservoir facies and mass transport deposits with widely variable scales and types characterize GOM turbidite systems. For example, massive ponded lobes of mini-basins and stacked channels of Bryant Fan, perhaps similar to GOM Miocene systems, should develop generally wide lateral and thick vertical continuity, whereas the limited sand splays (~5 km) of the Mississippi outer fan lobes should develop a more restricted lateral and vertical continuity.