

## **Seismic Geomorphology of Pliocene-Age Leveed Channels in the Southern Atwater Fold Belt and Implications for Timing of Salt Emplacement**

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The structures along the Atwater Fold belt form important deep water hydrocarbon traps in the northern Gulf of Mexico. The purpose of this study is to map and quantify the morphology, sedimentology and architecture of early Pliocene-age basin floor fan systems outboard of the Poseidon Minibasin, located along the Atwater deep water fold belt (mid-Miocene to Pliocene). The data set includes ~2200 km sq. of 3D seismic data, along with information from several wells. Logs show these deposits to be several hundred feet thick, sharp-based, coarse-grained fining up cycles composed of sandy basin floor fans, mass transport complexes and levee channels.

Biostratigraphic data from surrounding wells suggest that the largest leveed channel system is ~ early Pliocene in age, developing in five main stages from narrow channel incision, widening through lateral incision, straightening, and finally flooding and infilling. The channel system is ~20,000 feet across and ~ 1,400 feet deep, with well-developed levees ranging from 700 up to 1300 feet at their highest point extending ~19000 feet away from the channel. This system is underlain by a ~700 foot thick mass transport complex and overlain by still younger Pliocene-age low sinuosity leveed channel systems. Both of these systems appear to have been sourced by large submarine drainages, originating from a well fed slope and shelf edge system with deep water channel pathways uninhibited by salt wall inflation at the time of deposition. The implication being that major salt thrusting along the southern edge of the Atwater fold belt post-dated the early Pliocene.