Turbidite flow behavior and subsequent stratigraphy in confined to unconfined settings

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Mini-basin provinces produce enormous volumes of hydrocarbons. They also form supra-mobile substrate topography that controls how sediment volumes are transferred from shelf edges of ultimate sinks in the deep ocean. Increasing exploration and production in ever-deepening regions of the world's oceans warrant a revisit to many of these concepts of accommodation development, sediment generation, sediment movement, and ultimate geometry and distribution of resulting deposits. The main objective of this research to revisit the existing but limited and rather outdated models in mini-basin fill evolution, to create a broader understanding of the influence of local and regional tectonics on fill timing, architecture and sedimentology, especially as it applies to reservoir distribution in provinces of regional substrate variability. In this research a three-phase approach is adopted, and includes: (1) modeling physical models of flow behavior under conditions of varying topographic relief; (2) examining deep water fills in salt basins of the Gulf of Mexico undergoing active transition from low topographic relief to high topographic relief; and (3) examining deep water fills in salt basins undergoing extremely rapid subsidence, an example cited from offshore Morocco. An improved understanding of mini-basin formation will allow us to reduce risk while exploring deep-water regions that provide vital conventional energy resources for bridging the gap between today's energy needs and tomorrow's alternative-energy solutions.