

**AAPG Annual Meeting
March 10-13, 2002
Houston, Texas**

Bruno C. Vendeville¹, Mark G. Rowan² (1) University of Texas at Austin, Austin, TX (2) Rowan Consulting, Inc, Boulder, CO

3-D Kinematics of Minibasins and Salt Ridges Remobilized by Late Contraction: Physical Models and Seismic Examples (SE Mississippi Canyon, Gulf of Mexico)

The southeastern Mississippi Canyon area of the northeastern Gulf of Mexico comprises subcircular minibasins bounded by a polygonal network of remnant Louann salt ridges. The ridges started growing during the Late Jurassic and eventually evolved into isolated passive diapirs. The base of most minibasins had grounded onto the base salt by the middle Miocene, with a few inverting to form turtle structures. Both minibasins and salt ridges/diapirs were then remobilized in a compressional regime near the slope toe during mid- to upper Miocene gravity spreading of the prograding clastic margin.

We used seismic data and physical models to determine how the preexisting minibasins and salt ridges affect the salt system's response to late contraction. In models, early formation of minibasins and salt ridges was triggered by differential overburden deposition. Late contraction was driven by increasing the regional tilt or applying tectonic compression. Results indicate that shortening is not accommodated by formation of a typical fold-and-thrust belt. Instead, shortening preferentially deforms the preexisting salt ridges and minibasin flanks and drives further diapirism and lateral salt extrusion. Contractual structures associated with this tectonic phase include symmetric or asymmetric rejuvenated diapirs, squeezed diapirs whose pinched-out stems serve as reverse faults, and detachment folds. Because the minibasins do not move in the exact same direction or by the same amount and because they can undergo rotation about a vertical axis, the relative movement between adjacent minibasins varies significantly and is accommodated by a linked network of contractional, strike-slip, and extensional structures formed above the salt ridges.