

## A Two-Pole Model for the Origin of the Gulf of Mexico Basin: Implications for Oceanic Crust Architecture and Louann Salt Distribution

Magnetic and gravity data are used to refine regional depth to basement interpretations to derive oceanic crust and microplate boundaries, and to constrain crustal restorations of the Gulf of Mexico Basin (GOMB). These data are the basis for a GOMB reconstruction that requires two poles of rotation.

During the initial rift phase of GOMB Triassic deformation, the combined Yucatan and South Florida blocks rotated 26 degrees counterclockwise about a pole at 28.8° N., -82.7° W. This departure produced up to 565 km of crustal extension in the western GOMB, and a 450 km southeasterly translation of the Yucatan/South Florida block along the Florida Elbow fault. Nonrigid reconstructions using this pole produce a +/-30 km misfit on the restored northern and southern GOMB margins.

The drift phase of GOMB origin involved departure of the Yucatan block from the South Florida block and a 36 degree counterclockwise rotation about a pole at 22.75° N., -83.72° W. The tight pre-drift fit between the Yucatan and Florida margins is constrained by a series of gravity and magnetic anomalies of similar frequency and amplitude on the opposing margins. Therefore no shear is required near the Florida Escarpment.

Magnetic data in the central GOMB show symmetric patterns that are interpreted as oceanic transform and ridge architecture. This architecture is kinematically consistent with the drift phase pole. Seismic interpretations of basement structure support the transform and ridge interpretations. This oceanic fabric influences autochthonous salt limits and thickness, which in turn have a major influence on GOMB deepwater structure and accommodation space.

### Biographical Sketch

BRUCE REITZ is a geologist responsible for regional evaluation

and lease acquisition in Conoco's offshore Gulf of Mexico (GOM) Deepwater Business Unit. He received a BS degree in 1978 from Wright State University and a MS degree from Kansas State in 1980. Bruce is an active member of AAPG, GSA, and SEG. Since joining Conoco in 1980 Bruce has held geoscience positions in development and exploration at technical, supervisory and staff levels. Bruce first began working in the GOMB in 1981 as an explorationist doing geological and geophysical analyses for prospect generation. He worked onshore and offshore in carbonate and clastic plays from Paleozoic to Pleistocene in age, and has been involved in regional evaluation and lease acquisition in the GOM offshore areas since 1994. Bruce's current interests involve petroleum system and risk analysis of Lower and Middle Miocene sediments, salt architecture and evolution, GOMB origin, and GIS utilization. He has developed GIS applications to create, manage, access and analyze Conoco's Deepwater GOM datasets. ■