



Crustal Interpretation by Gravity, Magnetics, and Seismic Data over the Gulf of Mexico

John Bain¹, Jason Kegel², and Cian O'Reilly²

¹Bain Geophysical Services Inc., 12335 Kingsride Ln., Ste. 136, Houston, Texas 77024

²TGS, 10451 Clay Rd., Houston, Texas 77041

EXTENDED ABSTRACT

Thick salt limited the ability of early 2D seismic to effectively image deep structure (basement, syn-rift basins, early stages of oceanic opening) of the Gulf of Mexico (GOM). Potential field studies were more effective at imaging deep structure but assembling a suite of gravity and magnetic data over the entire U.S. Gulf of Mexico (USGOM) took nearly 40 years and involved many different acquisition systems and vintages. Conversely, a similar density of coverage in the Mexican GOM (MGOM) was acquired in less than 2 years. With the 2015 opening of the MGOM to international exploration, TGS acquired a dense grid of ship-borne 2D seismic, gravity and magnetic surveys (Gigante) over the entire MGOM. TGS and Bain Geophysical Services (BainGeo) have teamed up to create the “Gigante Crustal Study” covering offshore Mexico and the regional Gulf of Mexico. This work combines the Gigante survey data with public domain data sets to give coverage over the entire GOM. We present here some of the results of this work, which better illustrate the deep crustal structure of the GOM. The results also provide a detailed conjugate analogue to better understand the pre-salt sediments and crustal architecture in the USGOM. Furthermore, the implications of the new interpretations and models provide insights that could help elucidate the early evolution of the GOM.

...