Bird, D. E., and Connors, C. D., 2013, **Possible deep Jurassic rift basin locations in the Gulf of Mexico: results of modeling gravity and seismic data** (abstract): Geological Society of America, South Central Section, 47th Annual Meeting, T7, 13-4.

It is well established that much of the modern salt tectonism in the northern Gulf of Mexico is associated with allochthonous salt that was originally sourced from middle Jurassic Louann salt basins. Regional interpretation of recently reimaged long-offset, long-record prestack depth-migrated seismic data constrains the geometry of major salt canopies and associated subsalt strata including the position of the earliest post-Louann section in many places. The depth image of basement structure can be enhanced by integrating potential fields data with seismic reflection data. High-resolution gravity data acquired in-tandem with the seismic data allow construction 2D gravity models along these interpreted regional seismic lines in an attempt to model full cross sections down to the upper mantle. The models included five sedimentary density layers consistent with typical depth-density functions for the Gulf of Mexico with densities increasing downward; two crystalline crust layers, and an upper mantle layer. Salt bodies defined by the seismic interpretation were assigned a constant salt density independent of depth. Because substantial relief exists in some of the deepwater fold belts, for Mesozoic strata thought to represent primarily carbonate rocks, a constant density was used and applied to these seismically defined layers. The models shown in this study are part of a basin-wide network of 2D gravity models that is internally consistent because the same density scheme is employed in all models. The gravity modeling results generally support the seismic interpretation except just inboard of the frontal canopies in central GoM, and near the Perdido fold belt in western GoM. In these areas a distinct long-wavelength gravity low exists that cannot be explained by typical GoM salt bodies. The wavelength of the anomaly indicates that it is produced by deep density contrasts, probably in or near the crystalline crust. Additionally, the location and geometry of this gravity low suggests that a low density source body, possibly associated with rift sediments or with both rift sediments and remnant autochthonous salt. We propose that this modeling supports the position of deep sub-basins that could represent Jurassic rift sediments and the former position of much of the salt that was later mobilized in the frontal canopies.