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Structural Controls on the Hydrocarbon Prospectivity of Blocks 25-29&36, offshore northern Cuba

Integration of new 3D seismic interpretations with a regional 2D seismic dataset has revealed the main structural controls upon hydrocarbon prospectivity in the deepwater north Cuban basin.

The plate tectonic evolution of the region can be simplified into three main phases. Firstly the carbonate-dominated Florida-Bahama passive margin developed during Jurassic-Cretaceous times. Secondly, during the late Cretaceous-Eocene, the Cuban volcanic arc converged and collised with the Florida-Bahama passive margin. Finally the infilling Cuban foredeep basin was subjected to late compression and erosion.

The evolution of the western and southern Florida-Bahama platform margin since mid-Cretaceous times has been defined using a regional 2D seismic dataset. This regional interpretation indicates that the platform margin to the west of Florida has remained static from Mid-Cretaceous Unconformity (MCU) to Neogene times forming a pronounced bathymetric escarpment. In the north Cuban offshore area, however, the platform margin has retreated northwards since Mid-Cretaceous times in response to loading by the Cuban thrust. It is observed that the well-defined MCU platform margin is consumed by the Cuban thrust belt in northern Cuba.

3D seismic data have been acquired over two zones in the study area. In one area the structural style is dominated by Mesozoic fault trends that have been extensionally reactivated during platform margin collapse. In the other, this pre-existing extensional framework has been strongly overprinted by oblique sinistral compression. Despite the large scale compressional regime, the majority of the small-scale, seismically-observed faults are extensional in nature and may potentially enhance reservoir performance.