



New Structural styles in the Deep Columbus Basin: Observations from 3D Nodal Seismic Data

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The Columbus Basin is a foredeep basin, between the Caribbean Plate deformation front to North and South American continent to South. The major tectonic regime does from extension – strike slip – compression as you move from West to East. The continued interaction of the leading edge of the Caribbean plate with the extended continental crust of South America expresses itself in a series of (younging to the Southeast) anticlinal folds that trend NE to SW, set up in the overlying Plio-Pleistocene sediments.

Deep imaging in the Columbus basin, (Dolphin/Barracuda areas) has been challenged due to attenuation of seismic signal within the thick, rapidly deposited Plio-Pleistocene Orinoco deltaic succession, making the deep cores of these anticlinal structures poorly understood.

An OBN dataset that straddles the edge of the shelf system (beyond the Deltaic shelf depocenter, on the transition from extensional to shear dominated tectonics) offers insight to the early nature and relative position of these anticlinal trends and gives a clue to the distribution of the Regional Growth fault system controlling deposition in the youngest section of the basin.

Observations including fold tightening and synclinal inversion sitting below the shallow anticlinal structures offer a key to the likely early nature of the deeper systems.

Fluidized mud escape (in some cases to seabed) within overall dilated zones are also noted on trend with the Deeper water Transpressional highs with mud cored characteristics.

Seismic Structural interpretation, and map-based techniques give insight into the interplay of accommodation and deposition as well as the changing nature of dominant structural regime as a function of inherited dip/strike. Observations from near Cretaceous levels to seabed are investigated, which have an impact on trap style and syn-depositional accommodation in the uncalibrated section.

Significant image uncertainty remains an issue in this deeper seismic picture upon which these observations are established.