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Tectonic/Paleogeographic model for Oligocene Clastic Producing Trend, Central Range, Trinidad, and Implications for Neotectonics

Significant oil and gas have been discovered recently in Trinidad's Central Range trend. Reservoir comprises Oligocene conglomeratic sand, shale. The facies belt contradicts traditional concepts of mid-Tertiary Trinidadian paleogeography, because the Caribbean Plate/Prism then lay far to the west, and correlative facies belts to the south are shaly, lacking sandy channels (Navet/Cipero). A regional palinspastic synthesis of Trinidad's tectonic and stratigraphic development was completed in 2002 with support from T+T Ministry of Energy and PetroTrin. Concerning the Central Range Oligocene trend, coarse clastic sediments derive from the northwest and pre-date deformations associated with arrival of Caribbean Plate. Plate kinematic data document Cenozoic convergence between North America-South America, and seismic tomography of southern Caribbean (Hilst, 1990; PhD thesis, U. Utrecht, Netherlands) suggests an underthrust slab that is not Caribbean Plate. We propose Paleogene onset of slow, amagmatic subduction of Proto-Caribbean crust beneath South America, which caused kilometric uplift of the outer Cretaceous passive margin and produced a northerly source of clastics before arrival of Caribbean Plate. Field mapping in Central Range and Serranía Oriental (Venezuela) documents Paleogene unconformities, supporting outer marginal uplift. This model provides a mechanism for understanding/predicting the extent of the Oligocene clastic trend, but equally important are implications for other parts of Trinidadian petroleum systems, shown in a series of palinspastic paleogeographic maps. Finally, the model provides the structural template for understanding neotectonics, including basement thrusting and the negative gravity anomaly in Columbus Channel.