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The Paleogeographic and Hydrocarbon Setting of Trinidad, Jurassic to Present

A palinspastic synthesis of Trinidad's tectonostratigraphic development was completed in 2002 with support from Trinidad-Tobago Ministry of Energy and PetroTrin. We present tectonic maps for all stages of development since Jurassic but concentrate on Tertiary structural and basin evolution within the South Caribbean plate boundary. The recently discovered Oligocene Central Range trend comprising conglomeratic sands and shale is the manifestation of Paleogene underthrusting of Proto-Caribbean crust beneath South America, giving rise to an outer erosional high prior to arrival from the west of Caribbean Plate and Prism. Trinidad then came into the Caribbean foredeep in Late Oligocene, and oblique Prism-continent collision ensued through late Middle Miocene, culminating in development of the Serranía del Interior-Naparima thrustbelt, and emplacement of the Northern Range as a major fault-bend fold at the back of the belt. From 12-4 Ma, Caribbean-SoAm motion was partitioned and transtensional: most strike-slip occurred at North Coast Fault Zone, while extension and subsidence occurred to the south, where Orinoco deltaic sediments prograded E-ward across much of Trinidad. Transpression returned at 4Ma, driving basement-involved wrenching and renewed uplift of Central Range and thrusting at Southern Range. Very little strike-slip has occurred at North Coast Fault since 4Ma, shifting instead to the Central Range and Point Radix trends. This late and ongoing deformation is responsible for late, rapid Columbus Basin subsidence and negative gravity anomaly. Paleogeographic history of Trinidad-East Venezuela is depicted in palinspastic paleogeographic maps supported by seismic data, highlighting implications for oil and gas.