

The Petroleum Geology of Central America

Carlos A. Dengo, ExxonMobil Exploration, P.O. Box 4778, Houston, TX 77210-4778,
carlos.a.dengo@exxonmobil.com

Central America is located between two world-class petroleum systems; southeastern Mexico and northern South America. However, only the Peten Basin in Guatemala has yielded modest commercial hydrocarbon discoveries. These poor results are inherent in the geologic history of the region, which is generally detrimental to the generation and accumulation of hydrocarbons. The genesis of most Central American basins is underpinned by a complex and active tectonic history related to transcurrent and convergent plate margins and the development of a regional volcanic arc with the associated fore-arc and back-arc basins. Overprinting of structural styles, basin inversion, and active faulting degrade trap and seal integrity. Volcanic-derived sediments and high rates of sedimentation, common especially in the southern portion of the region, dilute source rock richness and destroy reservoir quality. Central American basins have experienced two distinct tectonic phases that control hydrocarbon play elements. The first is a Jurassic-Cretaceous rifting and subsequent passive margin associated with the breakup between North and South America. This phase is recorded in the basins located on the North America Plate (e.g., Peten Basin). Elsewhere all basins are located on the Caribbean Plate and the majority have a Pacific affinity, originating in the Mesozoic. Although less prospective than the Peten Basin, some of these basins contain Cretaceous and Tertiary source rocks which are thin and discontinuous. The remaining undiscovered hydrocarbon potential of Central America is most likely small.
