

# **Hydrocarbon Provinces and Active Petroleum Systems in the Southern Caribbean: Basement Types, Sources, Reservoirs, and Key Exploratory Plays in the Area of Offshore Panama and the Colombian Caribbean Margin**

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## **Abstract**

We review seismic reflection and well evidence to assess the exploratory potential of two distinct hydrocarbon provinces: the Colombian basin and the offshore non-volcanic subduction margins of Colombia and Panama. In the deepwater Colombian basin, 0.5 m to 12 m thick intervals of organically-rich (total organic carbon (TOC) 2.5–11%) of Late Cretaceous pelagic rocks were deposited immediately above the top of CLIP and potentially over adjacent areas of oceanic crust. DSDP well reports describe a type II kerogen that is immature over the drilled structural highs in the Beata Ridge and Hess escarpment. Previous works have proposed this interval as the expression of the Oceanic Anoxic Event (OAE 3) of Coniacian-Santonian age. In this talk, we show evidence for the geographic extent of the depocenter linked to potentially thermogenic hydrocarbons on the subducting Caribbean plate in the deep waters of the Colombian basin including the probability of this system is present offshore north of Panama. The second hydrocarbon system also formed as part of the Caribbean subduction margin of Colombia but forms a much different belt of gas-prone basins that closely follows the shallow-water and coastal trend of the underlying Great Arc of the Caribbean. This system includes most of the major offshore discoveries in the past 40 years: the Chuchupa-Ballena gas fields in Colombia (6.9 TCF), the La Perla field in Venezuela (17 TCF), and the North Coast Marine Area (NCMA) of offshore northern Trinidad. Reservoirs in this gas belt range from Miocene sandstone and limestone (Chuchupa), Eocene-Oligocene shelf limestone (La Perla), and Pleistocene shelf sandstone (NCMA). Source rocks range from biogenic sources of Cenozoic age (Chuchupa), early Cenozoic mixed marine and terrestrial sources (La Perla), and biogenic sources of Late Cenozoic age (NCMA).