
The Southern Sector in the Sigsbee Basin: A Possible New Future Oil Province in the Gulf of Mexico

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ABSTRACT

The sector is located to the offshore north of Cuba between Campeche and Florida escarpments, both reflecting the paleotopography of the flooding carbonate margins during the Lower Cretaceous. It represents a deep channel at the northern intersection of the Yucatan and Florida straits and constitutes the most northwestern part of the Cuban Exclusive Economic Zone in the southeastern Gulf of Mexico.

The available information from the seismic data, legs 10 and 77 of the Deep Sea Drilling Program (DSDP) holes, bathymetric data, and other data of regional character are the basis of various tectonic-structural characteristics of whom can be mentioned:

- A zone of higher thickness of Meso-Cenozoic sediments in the Sigsbee Basin located at the northwestern and north-central areas.
- A peripheral zone with less thickness of sediments bordering to the previous one.
- The Yucatan Platform, located toward the western and southwestern parts, having a complex Mesozoic geological section where platform and basinal scenarios are present.
- Yucatan Platform–Sigsbee Basin transitional zone, in which talus breccias of middle-Upper Cretaceous strata are developed, of which direct evidence was appreciated in DSDP hole 536.
- The so-called “Central Basin,” characterized by the DSDP holes 535, 538, 538, and 540, and several seismic lines, in which the thicknesses of the Cenozoic rocks are mainly reduced due to the influence of current scouring; the Mesozoic section is a deepwater settlement.

Several sectors in the southeast part of the Sigsbee Basin can be identified according to the seismic image: the northern margin of the Cuban fold and thrust belt, the fore-land basin, the Pinar del Rio Knoll, the Catoche Tongue, the Campeche Escarpment, and the southeastern part of the proper Sigsbee Basin.

Solid asphalt-filled fractures and oil stains from core of the DSDP hole 535 as well as oil shows reported by PEMEX in several wells drilled in the Yucatan Platform and on surface of the sea by remote sensing show the existence of one or more active petroleum systems.