

## Deep Water Carbonates, the Next Frontier Play?

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In the last ten years, the deep offshore petroleum exploration has mainly focused on clastic turbidites, notwithstanding the fact that at least half of the world hydrocarbon proven reserves are related to carbonate petroleum systems. As an example, the Eastern and Southeastern Gulf of Mexico remain undrilled for carbonates targets and yet this area probably constitutes a deep-water carbonate petroleum province.

Two main types of deep-water carbonate petroleum provinces can be considered:

- 1- Shallow to medium water depth carbonates re-sedimented in deep water (turbidites, basin carbonate breccia, olistolites). Steep-sided platforms dominated the Cuban and Florida margins or Mexico from the late Cretaceous up through Tertiary. Re-deposited slope carbonates were likely to be sourced from off-bank transport of neritic sediments which accumulated on the middle and upper slope settings. Periodic failure of the upper slope shed large volumes of sediment to the lower slope and basin settings.
- 2- Originally shallow water deposited carbonates which are mostly drowned isolated platforms (thermal or flexural subsidence). Tertiary carbonates of isolated drowned platform, such as those from the Philippines and the Far East, are the best known examples. Other similar geological objects are located in the Indian Arabian sea, offshore Nicaragua. Jurassic to Cretaceous plays, such as the deep water Cuban Exclusive Economic Zone or the Florida escarpment zone in offshore Louisiana, might represent targets with significant hydrocarbon potential.

Sizeable hydrocarbon discoveries have been made in these two environments (Aquila, in Italy and Malampaya, in the Philippines). Outcrop studies and integrated approaches have allowed the development of modified geological models for their settings. Recent advances in seismic imaging and carbonate diagenesis studies have also reduced the risk and costs of the exploration phases.

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