

## **SHALLOW HYDROCARBON MIGRATION AND SEAFLOOR SEEPAGE, OFFSHORE SAMAAN FIELD, SOUTHEASTERN TRINIDAD**

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### **ABSTRACT**

The Samaan area offshore Trinidad is characterized by hydrocarbon migration in the upper several thousand meters of strata. Numerous seep-related features, including seep mounds, evacuation craters and possible carbonate build-ups, create an irregular, sea-floor microtopography and are actively venting hydrocarbons into the water column.

Permeable and impermeable fault planes and strata combine to produce an overall stair-step, diagonal migration and convergence to near the crest of the Samaan anticlinal structure. Hydrocarbons migrate along permeable fault planes until they reach an impermeable portion of the plane. At these locations, hydrocarbons migrate through permeable beds until reaching a more permeable fault plane where they continue upward. This process is repeated until migration reaches the subcropping strata within the core of the anticline, at which time seepage breaches the thin Holocene sea-floor cover. Cross-stratal vertical migration to sites of macro seepage appears to be limited to the upper few meters of recent sediment.

Mounds and craters are present as individual features and as groups of features developed along linear trends associated with shallow faults. The areal extent of mounds and craters is controlled by position of the Samaan structural crest. Hydrocarbons are actively being vented into the water column along this narrow anticlinal axis.

A three-fold increase in earthquake activity during the past 4 years in contrast to the previous decade may be responsible for recent increases in shallow hydrocarbon migration across the basin. Relationships between seismic activity and hydrocarbon migration have been documented in other area of the world.