



Assessing Hydrocarbon Potential in the Mundaú Sub-Basin: Cretaceous Turbidites in Deepwater Settings

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Abstract

Recent discoveries in the African Equatorial Margin (specifically Liberia, Ivory Coast, and Ghana), Gulf of Guinea, Guiana, and Suriname have sparked interest in the Brazilian Equatorial Margin basins, which share a similar origin and geotectonic context related to the South Atlantic rifting. While there are similarities, such as the potential presence of a common Cenomanian-Turonian (or Aptian-Turonian) source rock, there are distinctions between the Brazilian Equatorial Margin basins and these homologous basins. For example, the sedimentary infill in the Suriname and Guiana basins was deposited on the Guiana Shield, located at the triple junction between Africa, North America, and South America. They also lie to the west of the Demerara Plateau. On the other hand, the Equatorial Margin Basins of Brazil are located to the east of it. The deepwater regions of the Brazilian Equatorial Margin present an opportunity for Upper Cretaceous turbidite exploration and this work focuses on the Ceará Basin. This basin consists of four sub-basins with distinct depositional and deformational histories. To date, exploration efforts primarily focused on the Mundaú sub-basin. This study utilized recent 3D seismic data to interpret seismic horizons associated with a regressive supersequence within the Ubarana Formation in the Mundaú sub-basin. Minimum amplitudes (maximum negative amplitudes) were used to distinguish potential sandy bodies (like turbidites) from the finer sedimentary background. Spectral decomposition attributes aided in identifying paleochannels, which could be related to the steep continental margin slope during the rifting phase. The analysis identified large erosional paleochannels within the 3D seismic dataset. Future studies will investigate distal regions using regional 2D seismic lines to identify downdip turbidite lobes or other potential reservoirs associated with these paleochannels. The objective is to identify potential exploration targets like those in the homologous basins.

Keywords: Mundaú Sub-basin, Ceará Basin, Paleochannels, Seismic Interpretation, Cretaceous turbidites, deepwater exploration, Petroleum System, Turbidites