Submission code: 589K0YLJ8K

See this and other abstracts on our website: https://home.sbgf.org.br/Pages/resumos.php

Petrophysical Analysis of Upper Cretaceous Turbidites in the Foz do Amazonas Basin, Brazilian Equatorial Margin.

Márcio Eduardo Fonseca Paulino (Federal University of Ceara), Ian Cerdeira (Federal University of Ceará), Karen Leopoldino Oliveira (Federal University of Ceará)

Petrophysical Analysis of Upper Cretaceous Turbidites in the Foz do Amazonas Basin, Brazilian Equatorial Margin.

Introduction

The Brazilian Equatorial Margin has gained prominence in recent years due to the growing exploratory interest, largely driven by significant hydrocarbon discoveries in neighboring countries such as Guyana and Suriname. Within this regional context, the Foz do Amazonas Basin stands out as a promising frontier for hydrocarbon exploration, particularly in Upper Cretaceous turbidite deposits. These deposits, linked to deep-water depositional systems, have proven relevant in exploratory models successfully applied in other basins of the Equatorial Atlantic. Despite its geological potential, the Foz do Amazonas Basin remains underexplored, presenting challenges related to the understanding of petroleum systems and the characterization of its reservoir units. In this scenario, petrophysical analyses become essential for evaluating the quality of turbidite sandstones, supporting future exploratory strategies, and helping to reduce geological uncertainties.

Method and/or Theory

The research was developed through the integrated analysis of well data provided by the ANP, which underwent a rigorous refinement process to increase the reliability of the interpretations. These data include geophysical logs that are essential for evaluating the physical properties of rock formations. Based on this information, it was possible to identify and assess reservoir zones associated with Upper Cretaceous turbidite deposits in the Foz do Amazonas Basin, considering their petrophysical properties and regional stratigraphic behavior. The petrophysical characterization involved the determination of parameters such as porosity, shale volume (Vsh), and indicators of hydrocarbon presence, aiming to provide a detailed view of the quality and potential of the basin's reservoirs. The analysis was carried out using the Interactive Petrophysics software, which enabled efficient data processing, integration of different types of geophysical logs, and clear visualization of the results. The study was conducted in a graphical and digital environment, supported by stratigraphic charts and technical references specific to the Foz do Amazonas Basin, which guided the interpretations and helped contextualize the results within the available geological knowledge.

Results and Conclusions

Based on the results, it was possible to identify a major transgressive-regressive cycle, with a progressive increase in sandy layers toward the Maastrichtian, apparently deposited in a lowstand systems tract. This trend suggests the progradation of depositional systems over time, likely influenced by relative sea-level variations and sediment supply. In contrast, the Upper Albian packages showed higher shale content, suggesting a depositional environment associated with a transgressive systems tract, commonly linked to increased accommodation space and finer sediment deposition. Overall, the analyzed sandstones presented porosity values ranging from 15% to 28%, with low shale content, indicating good reservoir quality in specific sections. Despite the limitations imposed by the scarcity of available data, it was possible to define the stratigraphic framework of the Upper Cretaceous and establish consistent petrophysical correlations between the units, contributing to the reduction of exploratory uncertainties in the deep-water areas of the Foz do Amazonas Basin.