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Influence of the Abrolhos Volcanic Complex (AVC) on the Tectono-sedimentary Evolution in the Central-South Portion of Espírito Santo Basin

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Introduction

The search for new accumulations of hydrocarbons needs continuous exploratory efforts, in order to create new geological models and lessen the risks associated with exploratory activities. The understanding of how the halokinesis act on the thin-skin strain distribution is attractive subjects for basin evolution. The comprehension of traps formation, migration and reservoir properties, associated with halokinesis are fascinating for future exploratory targets. The main goal of this work is the characterization and reporting of the halokinesis evolution in the south-central part of the Espírito Santo Basin.

Theory

Seismic, gravity and well data incorporated in geological section reconstruction were used in the integrated geological interpretation, allowing a better understanding of the AVC (Abrolhos Volcanic Complex) in the tectonic and sedimentary evolution of the area. Intensive halokinesis activity was registered from Albian time, in response to an earlier stretching phase that resulted in subsidence of the basin and the opening to the South Atlantic ocean. During the Early Cretaceous, clastics of the Rio Doce were introduced in the basin provoking new halokinesis trigger, generating an increment of sedimentary rates in the sub-basins. In other regions, the progradation of the clastic wedge contributed for the migration of the mother salt layer to the distal portions of the basin, suppressing the supply of salt. The main tectonic phase occurred in the Early Tertiary. The introduction of AVC occurred in this period, forming structural styles, typical of compressional tectonics, with thrust faults, pop-ups, folds, and salt canopies.

Conclusions

This new tectonic configuration in the area has changed the axis of main sedimentary depocenter that became controlled by the high structures generated by the compressional tectonics, and by the associate low, that began to receive syntectonic sediments. The associations of these characteristics of tectonic and sedimentary remobilization formed a new compartmentalization in the basin, such as: a. translation zone, b. Folded zone, c. Hangingwall thrust block zone. They are strongly connected to the emplacement of AVC. This new tectonic configuration has its formation directly related to the emplacement of AVC.