

The Eocene Santos Basin (Brazil): Sequence Stratigraphy Interpretation and 3D Stratigraphic Modelling

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The Eocene sediments of the Santos basin (Brazil) were deposited in a typical passive margin setting. A detailed sequence stratigraphy interpretation was carried out at a regional scale based on well and seismic data. The succession of unconformities and transgressive surfaces, and the evolution through time of the offlap-break testified to changes in the sediment supply, eustatic sea level and subsidence. Two depositional sequences were recognized but they differ from the classical depositional sequence model because of local influences. Lowstand wedge (LSW), transgressive-highstand system tracts (TST-HST), and basin floor turbidites (BFT) were recognized. LSW presents a complex sigmoid-oblique progradational internal reflection configuration. TST-HST exhibit a sheet external form with a parallel to gently divergent internal reflection patterns. BFT displays chaotic, reflection-free and sub-parallel internal reflection patterns. Its geometry was constrained by the depositional low associated with salt tectonics. It is similar to basin floor fan but turbidite sedimentation started during sea level rise and persisted during sea level fall, and canyons or incised valleys are not obvious at the shelf.

This sequence Stratigraphic interpretation was then combined to a 3D stratigraphic model, based on a reconstruction of geological processes such as subsidence, eustasy and sediment transport. Different geological scenario has been tested by simulations, which allowed us to reproduce turbidites deposition and sequence stacking pattern.