



Static modeling: Case study of the Pletmos basin, offshore South Africa.

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The Pletmos basin forms part of a series of divergent basins which formed along the southern margin of the South African coastline. The Pletmos basin covers an area of 18 000km² and is filled with Synrift I, Synrift II and post rift Cretaceous sediments. This study illustrates and predicts spatial variations in the geological model away from wells and the occurrence of reservoir heterogeneity. The studied interval is late Berriasian to early Valanginian synrift shallow marine unit, an important reservoir interval that was targeted during the exploration for hydrocarbons in the southern region of the Pletmos basin. Results were achieved by generating a conceptual static model as a predictive tool that encompasses integration between lithological elements, porosity and permeability distributions which are often further affected by complex structural systems. Comparing the results of these elements contributes to the understanding of the stratigraphic, petrophysical and structural framework of the basin. Facies and petrophysical analyses were conducted and sampling values from the well logs were extrapolated into the 3D grid. Incorporating the sequential Gaussian algorithm ensured that all of the available data was honored to the highest extent in generating the realizations to display the heterogeneity. The reservoirs were sub divided into two major zones, viz: zone A and zone B. Each reservoir interval contained a percentage of shale/clay of about 45% -50%. Small scaled reservoir heterogeneity has been construed to the influence of the depositional patterns of the sediments. Large scaled reservoir heterogeneity has been identified, due to the lateral extent of the claystones which is widely distributed throughout the study area.