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Quantitative & Qualitative Geological Modeling of the Landana Deepwater Turbidite System, Block 14, Angola

The Landana complex is located in the central portion of Block 14 in the Lower Congo Basin, offshore Angola. A thick Miocene section is present and consists of turbidite systems in a mid-lower bathyal slope setting which is dominated by stacked channel and canyon complexes. High resolution 3D data and continued drilling, has led to the recognition that the reservoirs are complex and variable, and that modeling and management of the reservoirs need well-constrained quantitative & qualitative geologic models. The approach used to characterize the reservoirs relies upon integrating core and log analyses with 3D seismic mapping/attributes, and uses subsurface and Spanish outcrop analogue data to assist in predicting reservoir properties.

Well data was incorporated with 3D seismic to construct detailed maps and 3D geologic models for each channel system. Depositional models were developed to give a qualitative estimate of the sand distribution within the overall complex. The models are based on detailed development scale seismic mapping & characterization work which incorporated multiple 3D seismic datasets. Plan-view attribute extractions and 3D visualization of multiple 3D attribute cubes were particularly useful in the development of these models. To aid and refine the earth model building, high-resolution reservoir architectures from several types of slope setting submarine channels were investigated near Ainsa, Spain.

The results of these maps, earth and simulation models are used to gain a consensus within the Block 14 Association (ChevronTexaco, Sonangol P&P, TotalFinaElf, AGIP and Petrogal) on the OOIP and potential recovery for the reservoir system.