Evaluation of Reservoir Characteristics and Production Predictability of Fourth-Order Sequences and Systems Tracts in the Miocene of Offshore Louisiana

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Based on a sequence stratigraphic interpretation in the Miocene of offshore Louisiana an assessment of reservoir performance and characteristics was conducted. Two fields in the shallow offshore Louisiana, Tiger Shoal and Starfak, provided a dataset of well logs, paleontological information, seismic and sidewall core data, which were analyzed regarding their position in the fourth-order sequence stratigraphic framework. Supported by a facies interpretation of the producing intervals, the production performance of the systems tracts was scrutinized and ranked.

The porosity and permeability evaluation of the systems tracts shows clear differences for each subunit of a fourth-order sequence. The lowstand systems tracts have the highest porosity and permeability values, followed by highstand and finally transgressive systems tracts. A comparison to third-order sequences does not show the same clear trends. The production performance of fourth-order systems tracts, which was measured in monthly production per foot of perforation, assigns the highest values to highstand systems tracts almost equal to lowstand. The ranking of the cumulative production of the systems tracts, based on their facies, proves that the best producers are facies that lie in either lowstand or highstand systems tracts. The entire data amount can be searched in a database that was established during this study. Several output formats allow for each systems tract to predict porosity, permeability, and partly production behavior with a certain error bar.