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Predicting Reservoir Performance Through Sequence Stratigraphy - a Viable Approach?

Reservoir performance has been suggested as being related to a unit's position within an overall framework of sequences and systems tracts. Continuing research on two mature fields, Starfak and Tiger Shoal offshore Louisiana, assessed the relationship between production behavior and systems tract character in the Miocene reservoirs of the shallow shelf. Existing results of this unconventional approach could be refined and allow a new look at the reservoir and production performance of fourth order systems tracts, based on a sequence stratigraphic network, established during previous work.

The available data volume includes several decades of production data, various geophysical logs of 155 wells, sidewall core and special core analysis, providing the information on hydrocarbon distribution and type, reservoir lithology and facies, porosity, permeability and production characteristics. These variables serve as basis for the production estimation process, verified by a database with a query-setup. Illustrated with examples while valuing all available information, a search for specific systems tracts and their future production potential can be conducted.

The data analysis proves that the fourth-order systems tracts (highstand, transgressive and lowstand) across the two fields show statistically significant differences in permeability and porosity. Results indicate that each producing zone has an individual signature, leading to the average characterization of the systems tracts and contributing to gross future output prediction. The applicability of this data-based predictive model is currently restricted to the present dataset, but can be extended with appropriate adjustments to other areas.