

PETROLEUM SYSTEM OF NORTHERN BAKU ARCHIPELAGO, SOUTH CASPIAN BASIN, AZERBAIJAN

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Even though the South Caspian Basin is the oldest continuously producing area in the world, its petroleum system is not completely understood. In order to better define the petroleum system we studied a portion of the basin which contains both prolific hydrocarbon accumulations and barren structures.

A preliminary geological model was combined with results of extensive geochemical analyses to provide the initial input into a 3D basin simulator. Iterative comparisons of simulation results with the observed distribution of hydrocarbons led to refinements of the geological model and resulted in a better constrained characterization of the petroleum system.

Geochemical fingerprinting indicates that oil and gas in the area originated from one type of source rock, deposited in a clastic marine environment. Thermal modeling narrowed the possible source rock to the lower part of the Oligocene-lower Miocene Maykop Formation. Two major episodes of petroleum generation and expulsion were identified. They coincide with periods of rapid sedimentation over the last 5 million years. Existence of barren structures adjacent to structures containing petroleum accumulations is due to local variations in the rate of subsidence combined with small differences in the timing of development of structural traps.