

Sandstone provenance and reservoir quality prediction in the Eastern Black Sea

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Reservoir quality prediction is a key issue in the Black Sea. Early exploration models used the South Caspian palaeo-Volga analogue to highlight the possible input of large-volumes of quartz-rich, potential reservoir-quality sands from the Russian Platform into the Eastern Black Sea during the Cenozoic, for example, via fluvial systems such as the palaeo-Don. Fieldwork in the Greater Caucasus and Crimea sampled over 100 Cenozoic to modern sandstones and sands in order to assess spatial and temporal variations in sediment composition along the northern margin of the Eastern Black Sea. Sandstone compositions vary from quartz arenites with porosities $\geq 25\%$ to lithic arenites dominated by sedimentary or volcanic rock fragments with no reservoir potential. Conventional and single species heavy mineral geochemical analysis and SHRIMP U/Pb zircon age dating was carried out to constrain the provenance of these sediments. These results, when combined with field-based facies and palaeocurrent observations, and more regional evidence for the timing and amount of uplift of the western Greater Caucasus, enables a number of sediment dispersal systems entering the basin to be identified. The likely quality and volume of sand that these supplied can be ranked, and thus individual exploration targets in the offshore can be either prioritised or downgraded.