



## **Stratigraphy and structure of the northern Rioni Basin, Georgia**

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The Rioni Basin is foreland basin located at the Georgian margin of the Black Sea flanked by the two thrust-fold belts of the Greater Caucasus in the north and the Achara-Trialet belt in the south. Whereas the stratigraphy of the northern onshore Rioni basin has elements which are common with that of the offshore Shatsky Ridge, the southern onshore Rioni basin segment is both stratigraphically and structurally akin to the offshore Gurian folded belt in the Eastern Black Sea.

In the northern Rioni Basin, some 50 km SW of the main Greater Caucasus deformation front, the Tsaishi area has a highly arcuate salient of anticlinal structures with prominent surface expression. Structurally, all these surface anticlines are ramp anticlines with the thrusts detaching on Upper Jurassic evaporites forming a detachment folded belt.

Most of these anticlines have been explored by the petroleum industry in detail with a large number of wells and a grid of 2D reflection seismic lines. As the vintage seismic reflection sections were only available as hard-copies of the original ones, acquired and processed in 1988, they were scanned and georeferenced in a seismic data base and interpreted on a workstation. The integration of the numerous wells with the moderate to poor quality legacy seismic data allowed the systematic mapping of the major stratigraphic units, including the critical Upper Jurassic evaporites.

The most prominent surface anticlines in the study area are the Tsaishi and Senaki anticlines. Whereas the NW segment of the Tsaishi anticline is dominated by a SW-vergent thrust fault its continuation to the SE displays a curve in the anticlinal axis which suggests the reversal of the vergence to the NE, typical for a detachment folded belt. The digital elevation map (DEM) also displays hogbacks made up of Lower Miocene sandstones that are steeper on the NE flank. In contrast, the elongated Senaki anticline is a complex feature with left-stepping en échelon anticlinal and synclinal structural segments well documented by the surface geology map and by DEM data. The map-view character of these compressional elements is interpreted as the result of left-lateral neotectonic transpression along the SE margin of the Tsaishi salient.

Based on this work, the thin-skinned character of the leading edge of the Great Caucasus thrust-fold belt has been confirmed. Moreover, the segmented basement structure of the underlying regional Shatsky Ridge appears to be largely responsible for the map-view geometry of this detachment thrust-fold belt.