



Tectonics along a transect in the Northern Greater Caucasus in Russia: a structural cross-section

Vera Kalberguenova (1), Jon Mosar (1), Jérémiah Mauvilly (1), Nikolay Enna (2), and Vladimir Lavrishev (2)

(1) University of Fribourg, Earth Sciences, Department of Geosciences, Fribourg, Switzerland (jon.mosar@unifr.ch), (2) 3-Kavkazgeolsyemka, Fed. state Unitary geological enterprise; 4A Sadoviy alley, 357600 Yessentuki, Russia

The Greater Caucasus is an extensive highland culminating in the south of Russia at the crossroad of Europe and Asia. It is also the highest mountain belt in Europe with Mount Elbrus culminating at 5643m. The overall Caucasus region and specifically the Greater Caucasus are a part of the Alpine-Mediterranean-Himalayan belt. The Greater Caucasus orogen developed at the southern margin of the Scythian Platform, running from the northern part of the Black Sea Basin to the southern part of the Caspian Basin. The whole region is well known for its large oil and gas providences. The tectonic and geologic structure of the Greater Caucasus is due to the plate convergence of Eurasia and Arabia. Alpine orogenic processes started in early Tertiary, accelerated during the Plio-Pleistocene, and continue nowadays.

The studied area is located to the North of the Greater Caucasus including the territory of Stavropol High to the North and the slopes of Mount Elbrus to the South. This part of the foreland is uplifted between the Terek-Caspian foredeep to the east and the East Kuban Basin to the West. Sedimentary, metamorphic, and magmatic rocks of a wide range of ages (from the Precambrian until the Holocene) are exposed, and can be grouped into several formational megacomplexes. The structural heritage of the Pre-Mesozoic basement, strongly controls the subsequent palaeotectonic and tectonic development, as it does in main range of the Greater Caucasus.

The general objective of this project is to understand the tectonic evolution of the northern part of the Greater Caucasus mountain range from the Mesozoic palaeotectonic stages to the late Tertiary to present development of the orogen. We present structural cross-sections of the central Northern Greater Caucasus and its foreland based on field work and data, collected earlier by the collaborators of Rosgeology in Essentuki. We further describe the palaeotectonic evolution based on a regional subsidence analyses and data from drillholes.

Our regional subsidence analysis is integrated with our regional structural cross-sections, and combined with work on the Central and Southern Greater Caucasus from our group, to present a new 2D palaeotectonic reconstruction for the Mesozoic period. We can thus present a qualitative/semi-quantitative reconstruction of the paleotectonic setting of the northern margin of the Greater Caucasus Basin and the adjacent broader rift-shoulder area at the S rim of the Scythian plate. In the presented subsidence curves, constructed according of data of wells, we can discriminate three main periods of evolution for this region: 1 - Late Triassic-Early Jurassic thermal subsidence, 2 - Several subsidence and uplift events in Late Cretaceous - Middle Eocene, and 3 - Middle Eocene to present continuous flexural subsidence.