

Methods of Investigation of Seismoactive Structures of Georgia exemplified by Borjomi-Kazbegi fault.

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Three principal directions of active faults compatible with the dominant near N-S compressional stress can be distinguished in the region-WNW-ESE or W-E and NE-SW and NW-SE. The first group of structures having the so-called "Caucasian" strike is represented by compressional structures: reverse faults thrusts, and strongly-related deformed fault-propagation folds. In contrast to these faults, the transversal faults are also mainly compressional structures having somewhat considerable strike-slip component. NE-SW left-lateral strike-slip faults are the main seismoactive structures in SW Georgia.

The Caucasus region has long been considered as an example of indenture tectonics. The proposed Borjomi-Kazbegi sinistral fault is considered the western boundary of the actively indenting Arabian plate. However, an improved seismic network density has led to noting a lack of seismicity on the proposed Borjomi-Kazbegi fault. These new observations call into question the existence of the fault and, with it, the tectonic model of the region. To clarify this anomaly, geomorphologic, geologic, geophysical and geodetic field research was carried out on the proposed "Borjomi-Kazbegi fault". Since the "Borjomi-Kazbegi fault" is also proposed to be a major crustal structure, a multidisciplinary approach was utilized for this investigation. Precise GPS instrumentation was used to map multiple local topographic markers across the proposed line of the fault.

The complex investigation found no evidence for the existence of the fault. All topographic markers continued uninterrupted across the proposed "fault". Additionally, all geomorphologic structures showed no evidence of displacement.