Geophysical Research Abstracts, Vol. 8, 09746, 2006
SRef-ID: 1607-7962/gra/EGU06-A-09746

Rethinking the Tectonic Model of the Caucasus: An Investigation of the Southern Section of the Proposed Borjomi-Kazbegi Fault

T. O'Connor (1), E. Szymanski (1), M. Krasovec (2), S. Adamia (3)

(1) Department of Geology and Geophysics, Boston College, Chestnut Hill, MA, USA, (2) New England Research, White River Junction, VT, USA, (3) Tbilisi State University, Tbilisi, Republic of Georgia

The Caucasus region has long been considered to be an example of indenture tectonics. The proposed Borjomi-Kazbegi sinistral fault is considered the western boundary of the actively indenting wedge. However, an improved seismic network density has led to recent unpublished observations noting a lack of seismicity on the proposed Borjomi-Kazbegi fault.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, geologic and geophysical field research on the southern segment of the proposed Borjomi-Kazbegi fault was performed in the summer of 2005. Since the Borjomi-Kazbegi fault is also proposed to be a major crustal structure, a multi-disciplinary approach was utilized for this investigation. The southern section of the Borjomi-Kazbegi fault is part of the Adjara-Trialeti fold-thrust belt, composed of volcanic and sedimentary rocks of Early Eocene age and younger. Large-scale geologic maps of the Borjomi area show no sinistral displacement of the Early and Middle Eocene sediments. Precise GPS instrumentation was used to map multiple local geologic marker beds across the proposed line of the fault. These marker beds include lithologic contacts, structural folds, quaternary lava deposits and several sills. All localized marker beds continue uninterrupted across the proposed fault zone; when combined with the regional data they suggest that the proposed fault does not exist in the Borjomi region. Data from the gravimetric and magnetic surveys of the southern portion of the study area show no discontinuity across the proposed fault line. In addition, the gravimetric data collected during the summer of 2005 agrees with the results of a gravity survey carried out during the Soviet period. The Soviet data covers a greater portion of the lesser

Caucasus, and also shows no evidence of a major strike slip fault in the region. Currently, the field observations support a model that suggests active shortening in the Borjomi region is accommodated predominantly by thrust faulting.