



Evolution Of The Hatay Graben, Southern Turkey: Evidence From Morphology And Structural Data

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In this study, we investigated the Hatay Graben by using geological mapping, palaeostress measurements and morphometric analyses. The Hatay region, southeastern Turkey, is located on a tectonically active region. Main active tectonic elements in this region are the Dead Sea Fault (DSF), the East Anatolian Fault (EAF) and the Cyprus Arc. Eastern and western part of the EAF and the northern segment of the DSF form a triple junction in the north of the region. Another triple junction is formed by northern and southern segments of the DSF and Hatay-Samandağ fault that links this junction to Cyprus arc. The area between the Antakya (ancient city of Antioch on Orontes) and the Samandağ in the Mediterranean coast is a NE-trending depression, the Hatay Graben, developed under the tectonic control of the left lateral and oblique normal Hatay-Samandağ fault. Stress inversion results of the fault planes indicate that σ_3 direction (extension direction) is nearly uniform in the graben and orientated at a high angle to the graben margins. The Hatay Graben is bounded by the Amanos Mountains in the northwest and by the Habib-i Neccar mountains in the southeast. The Orontes River drains the Amik Plain (former Amik lake) to the Mediterranean through the Hatay Graben. The graben has an asymmetric structure, including a gentle north-western margin and a fault bounded steep southeastern margin. This asymmetric structure of the graben caused southeasternward shifting of the Orontes River. Detailed mapping of the Hatay Graben showed that the graben started to open probably during the Pliocene as a result of Hatay-Samandağ system, while marine and river terraces within the graben and the Mediterranean coasts indicate that this system is still active. The Hatay region was affected by many devastating earthquakes during the historical period, while only small and moderate (reaching up to $M=5.7$) earthquakes occurred in the region during the instrumental period. Some of these earthquakes were probably produced by segments of the Hatay-Samandağ fault.