Geophysical Research Abstracts
Vol. 18, EGU2016-191, 2016
EGU General Assembly 2016
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The Ecemiş Fault: A key element for accommodating uplift of the Central Anatolian Plateau's southern margin

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The Central Anatolian Plateau's southern margin is a major topographic feature whose development is linked to the complex evolution of the easternmost Mediterranean realm. Several recent studies have proposed a deep-seated mechanism responsible for the differential uplift of the plateau margin relative to the basins bordering the plateau. However, the structural elements that may have helped to accommodate differential uplift remain unclear. In this context, the northeast-southwest trending Ecemiş Fault of southern Turkey is a key structural feature. Whereas authors generally agree on the >60 km left-lateral strike-slip offset accommodated by the Ecemiş Fault since Eocene times, only recently has attention been focused on the latest activity of the fault. Field observations and seismic interpretations performed along the trace of the fault both onshore and offshore display Neogene and Quaternary deposits cut by discontinuities showing normal dip-slip offsets, possibly related to the uplift of the Central Anatolian Plateau southern margin. Nevertheless, the spatial discontinuity of these studies, covering apparently disconnected segments of the Ecemiş Fault, results in a major data-gap, preventing a complete reconstruction of the fault's recent activity.

Through a multidisciplinary approach based on field observations, evaluations of present and historical seismicity, geomorphological analysis, and structural analysis of new data collected during multiple field-campaigns, we i) delineate the transfer zone between the onshore and offshore segments of the Ecemiş Fault and ii) assess the kinematics of the fault's recent activity. Preliminary results show that the Ecemiş Fault played a major role in accommodating the differential uplift of the Central Anatolian Plateau southern margin, with the southwestern segment of the fault separating a topographically elevated region, located west of the fault, from the Adana and Cilicia basins, lying east of the fault.

Beyond its apparent role in the topographic evolution of the region, the Ecemiş Fault seems to have been the cause of a major earthquake striking the ancient city of Corycus (Mersin region) in the 4th century. Moreover, the present-day seismicity of southern Turkey shows the occurrence of frequent low-magnitude ($Mw < 3.0$) and rare $Mw > 5.0$ events whose epicenters are aligned along the trace of the fault. Historical and present-day seismicity data indicate that the area around the southwestern segment of the Ecemiş Fault is highly unstable and potentially capable of generating high- magnitude earthquakes, with major implications for the assessment of seismic hazards in southern Anatolia.