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The Earthquake Sedimentary record of The Lake Hazar along the East Anatolian Fault in Turkey

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There are a few places in the world where sedimentary records have been studied looking at climate and tectonic interactions. In Turkey, after the destructive Izmit 1999 earthquake, a number of projects have focused on the North Anatolian strike-slip fault in Turkey using lacustrine and marine sedimentary records available in and around the Marmara Sea to further constrain Holocene climatic changes and the occurrence of past major earthquakes. A similar type of study was conducted along the poorly studied the East Anatolian Fault in South-Eastern Turkey using the sedimentary record of the Hazar Lake. The East Anatolian Fault is the conjugate of the North Anatolian Fault, and a major left-lateral strike-slip fault at the boundary between the Anatolian plate to the North and the Arabian Plate to the South. Like the North Anatolian Fault, it has a long historical record of $M \geq 7$ earthquakes. The Hazar Lake, in its central part, is considered as an extensional structure in between two major fault segments. The lake, which is 20 km long and 212 m deep, thus contains a unique chronostratigraphic sequence of the deformation occurring along this plate boundary. According to Cetin et al. 2003, the lake record could span the last 150 ka; this interpretation is confirmed by a new seismic survey and by the study of the first sediment cores collected in the lake in 2007. Our results show that the proximal lake basin is characterized by a continuous sedimentary sequence of ~80 m. The first five meters of lake sediments show series of thin distinct seismo-turbidites preserved between climatically induced sediments. A high resolution radiocarbon age modelling (one radiocarbon date every 200 yr) validate the continuity of the record, making this lake a new valuable high-resolution continental record for the south-east Anatolian region.

Reference:

Cetin H., Guneylia H., Mayerb L. 2003. Paleoseismology of the Palu–Lake Hazar segment of the East Anatolian Fault Zone, Turkey. *Tectonophysics*, volume 374, 3-4, 163-197.