

## **Paleoseismological record of the Hazar Lake along the East Anatolian Fault (Turkey)**

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The East Anatolian Fault (EAF) is a major left-lateral strike-slip fault accommodating with the conjugate North Anatolian Fault the westward extrusion of the Anatolian Plate away from the Arabia-Eurasia collision zone. The East Anatolian Fault ruptured over most of its length during the 19th century in a series of magnitude ~7 earthquakes. During the 20th century this fault was less active with only two events of magnitude greater than 6. This absence of large earthquakes has resulted in relatively little attention being paid to the East Anatolian Fault compared to the North Anatolian Fault, which has ruptured during the last century in several earthquakes of  $M_s \sim 7$ . To constrain the seismic history of the East Anatolian Fault in its central part, we focus on the Hazar Lake, occupying a 20 km long pull-apart basin. Short cores and long sedimentary cores were collected at different sites to retrieve a paleoseismological record. The sedimentary records were analyzed combining X-ray imagery, magnetic susceptibility, grain-size, loss-on-ignition and XRF measurements. The cores were correlated based on variations in magnetic susceptibility and Ca-content attributed to significant lake level changes. In addition small correlative coarse-grained sedimentary events regularly spaced are identified in all cores. These thin turbidites are inferred to be earthquake triggered based on (1) their occurrence at different sites that must be reached by different turbiditic flows; (2) their large-scale global impact on the lake sediments even at sites where no turbiditic deposit occurred. Each event can be composed of several coarse-grained sub-events of different magnitude with a time lapse in between greater than a week. The latter is revealed by the presence of bioturbation in particular by chironomids in individual thin sand layers. The different sub-events may be the expression of a complete earthquake sequence (i.e. main-shock, foreshocks and aftershocks) or of an earthquake sequence of large  $M > 6.5$  earthquake along the East-Anatolian Fault. The age of the events is inferred combining radiocarbon and radionuclide ( $^{137}\text{Cs}$  and  $^{210}\text{Pb}$ ) dating. The first four events would correspond to historical earthquakes occurring in 1874-75, in 1779-1789, 1513-1514, 1285. The event recurrence time is about 300 years.