



Assessment of Lake Sediment Sensitivity to Earthquakes and Climate Cycles along the North Anatolian Fault

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Lake sediments are quiet-water environments particularly sensitive to continental climate variations. Over thousand of years, the main sediment components (organic, mineral and biogenic) reflect precipitation, temperatures, winds or even solar variations. High resolution lake records constitute also powerful chronometer for tracking perturbation in their environments like earthquakes. For example, in Turkey, lakes may be used to reconstruct the chronology of past earthquakes in a given area. Here, we present the first results obtained within the framework of an EU-project focusing on the seismic cycles on the North Anatolian Fault (NAF) (“ Understanding the irregularity of seismic cycles: A case study in Turkey ”). The NAF is a major strike slip fault along which a series of earthquakes of magnitude > 7 occurred in a westward propagating sequence since 1939. Six target lakes are located on or next to the active fault strand on a west-east transect east of Istanbul (i.e. Yenicaga, Ladik, Boraboy, Zinav, Gollukoy, Asagitepecik). One meter long gravity cores were taken on each of those accumulation zones formed by pull-apart basins, or shallow natural lakes. First of all, we provide a first bathymetric map of the lakes that have never been studied. The lacustrine environments of each lake is characterized by high resolution elemental analyzes from the short gravity cores. The following major elements: Si, Al, Fe, Mn, Mg, Ca, Na, K, P, Ti. are analyzed at high resolution (100 to 500 μm). The bulk density measurements (p-wave, gamma density, electric resistivity) are compared in order to detect seismoturbidites that could be correlated to the known historic earthquake sequence. These sedimentological analyses provide a first issue on the climate and tectonic control of lakes located along the NAF.