Traces of the last earthquake sequence (1939-1944) along NAF from lacustrine sediments

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Sedimentology of lakes located in seismically active regions record earthquakes as well as climate. For this reason, understanding the influences of earthquakes is vital to obtain more reliable paleoclimate records, and paleoseismic records too. Lacustrine environments have frequently been investigated for traces of past earthquakes in different places of the world such as; Chile, Dead Sea and Switzerland. Most of these studies investigate earthquake-induced deformations within lake sediments (e.g. mass-wasting events or in-situ soft sediment deformations). However, earthquakes may have other (indirect?) effects that can not be observed in terms of physical deformation. For example, an earthquake-induced landslide in catchment may increase sediment influx to the lake, or faulting within the lake may shift lake level leading changes in biological and chemical properties of the lake. Since these kinds of variations in sediments are under the control of climate as well, it gets highly difficult to distinguish between the sources of variations. Within the scope of an EC-Marie Curie Excellence Grant Project entitled "Understanding the irregularity of seismic cycles: a case study in Turkey", approximately one-meter long gravity cores were studied from four shallow lakes (Yenicaga, Ladik, Boraboy and Golukoy) located near/on the North Anatolian Fault. Four destructive earthquakes took place along the NAF in 1939 (Ms=7.9), 1942 (Ms=7.1), 1943 (Ms=7.3) and 1944 (Ms=7.6). Because of its well-known timing, this earthquake series provides good opportunity to trace its effects on the lakes concerned. For all lakes, sediment echo sounder system (Subbottom Profiler) did not provide good quality seismic data because of high gas content in the sediments. On the other hand, no in-situ soft sediment deformation is observed on the collected cores. For this reason, we focused on physical, mineralogical and geochemical proxies. Measurements reflecting the physical properties of the sediment include magnetic susceptibility, water content, bulk density, electrical resistivity, p-wave velocity. Mineralogical and geochemical properties are constrained using X-ray diffraction, X-ray fluorescence, loss-on-ignition, total organic/ inorganic carbon, atomic carbon/nitrogen, and organic carbon isotope ratios. Age-depth model was constructed using ^{210}Pb radionuclide activity and ^{137}Cs artificial radionuclide profiles. This study improved our understanding to differentiate seismic and climatic events in recent lacustrine sediments.