The last 300 years of sedimentation in the Fuji Five Lakes: the impact of natural disasters with a special focus on earthquakes

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Within the framework of the QuakeRecNankai project, which focuses on the geological record of paleoearthquakes rupturing the Nankai-Suruga subduction zone, we sampled bottom sediments of the Fuji Five Lakes at the foot of Mount Fuji. In October 2014, we acquired 23 short gravity cores from Motosu, Sai, Kawaguchi and Yamanaka Lakes. We focus on investigating the sensitivity of each lake for recording natural hazards (storms, floods, volcanic eruptions, earthquakes). Recent natural hazards impacting the Fuji Five Lakes area are expected to be recorded as rapidly deposited layers within the background hemipelagic sediments. We seek to identify event deposits in the collected short cores based on visual identification combined with high resolution analyses, comprising geophysical and geochemical properties, grain size and X-ray images. We establish an age-depth model by combining radionuclide (^{14}C, ^{137}Cs, ^{210}Pb) dating with the identification of historical tephra layers, in particular the one deposited during the Hoei eruption (AD 1707) of Mount Fuji. The sedimentary events in each lake are compared to a historical catalogue of natural hazards in the Fuji Five Lakes area, including historical records of megathrust earthquakes rupturing the Nankai subduction zone and other earthquakes occurring along the inland active faults that produced significant shaking (MKS intensity >7) in the Fuji Five Lakes area. The preliminary sedimentary study highlights the high sensitivity of Motosu Lake compared to the very shallow Yamanaka and Kawaguchi Lakes, which we attribute to its specific geomorphology. Motosu Lake is characterized by a deep basin, surrounded by very steep slopes. The generation of earthquake triggered mass transport deposits/turbidites and the preservation of the deposits are favored due to the architecture of the basin. The Fuji lake sensitivity to megathrust events will be the target of a future coring campaign to retrieve a longer geological record.