Paleoearthquakes recorded in the Fuji Five Lakes during the last ca. 6000 years (Fuji Five Lakes, Japan)

Laura LAMAIR[1], Aurélia HUBERT-FERRARI[1], Shinya YAMAMOTO[2], Yusuke YOKOYAMA[3], Yosuke MIYAIRI[3], Ed GARRETT[5], Osamu FUJIWARA[7], Stephen OBROCHTA[8], Atsunori NAKAMURA[7], Marc DE BATIST[4], Vanessa M.A. HEYVAERT [4,5] and the QuakeRecNankai Team

QuakeRecNankai Team : Evelien Boes, Helmut Brückner, Eisuke Ono, Svenja Riedesel, Koen De Rycker, Yoshiki Sato, Jan Walstra.

[1] University of Liège, Department of Geography, Liège, Belgium
[2] Mount Fuji Research Institute, Yamanashi Prefectural Government, Yamanashi, Japan
[3] University of Tokyo, Atmosphere and Ocean Research Institute, Chiba, Japan
[4] Ghent University, Department of Geology, Ghent, Belgium
[5] Geological Survey of Belgium, Royal Belgian Institute of Natural Sciences, Brussels, Belgium
[6] Durham University, Department of Geography, Durham, UK
[7] National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan
[8] Akita University

In Japan, one pioneering lacustrine paleoseismological study was conducted in Lake Biwa in the 1990s. However, despite the high seismicity of Japan, the field of lacustrine paleoseismology did not expand. Paleoseismological studies were more focused on inland trenches and coastal records. The paleoseismological data obtained by that way covers the last ~6000 years but contains hiatuses. Using lacustrine sediment allows us to span the same time period and to have a continuous record. Here, we present the second lacustrine paleoseismological study conducted in Japan.

The Fuji Five Lakes are situated close to the triple junction, where the North American Plate, the Eurasian plate and the Philippine Sea Plate meet. Therefore, the region can be impacted by megathrust earthquakes generated along the Nankai-Suruga and the Sagami subduction zones. In addition, intraplate earthquake may affect the Fuji Five Lakes region. In the framework of the QuakeRecNankai project, we investigated two of the Fuji Five Lakes, Lake Motosu and Lake Sai.

Here, we present the paleoseismological record of Lake Motosu and Lake Sai over the last 6000 and 2000 years, respectively. The turbidites were identified based on geophysical (magnetic susceptibility, grainsize) and geochemical properties (XRD, XRF) as well as SEM analysis. The turbidites were dated by ^{210}Pb/^{137}Cs, ^{14}C dating and correlated with historical earthquakes. For prehistorical earthquakes (i.e., before the 6th century), they were correlated with geological evidences recorded along the Eastern Honshu coastline (i.e., tsunami deposits, coastal uplift, emerged ridge beaches). Over the last 6000 years, seismo-turbidites occurred with a mean recurrence time of 184±8 years. The near absence of large mass-transport deposits in the last 6000 years suggest that earthquake shaking mostly induced the remobilization of thin veneers of sediments in Lake Motosu. In Lake Sai, the earthquake

fingerprint differs from Lake Motosu. Over the last 1200 years, past earthquake shaking induced turbidites, delta collapse and liquefaction (sediment volcanoes).