

## Tsunami susceptibility analysis around Swiss Lakes

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### Context

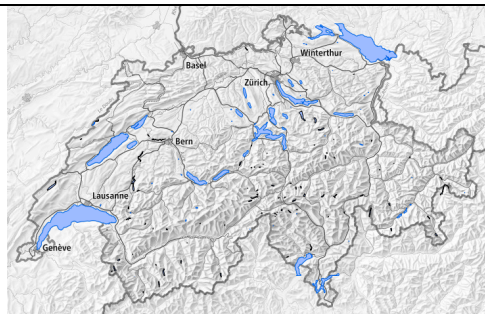
Rockfall in Lake Lauerz (Schwyz), sublacustrine mass-movements triggered by earthquakes in Lake Lucerne (Strasser et al., 2011) or even a cascading event from earthquake to sublacustrine landslide for Lake Geneva (Kremer et al., 2014) caused lacustrine tsunamis above meter-size waves. These lakes display various sizes and geometries as well as different surroundings. What about other Lakes in Switzerland? Are they susceptible to be affected by tsunamis because of the proximity to instable zones, seismic sources or their sedimentological setting? If yes, then how far could the tsunami go inland?

### Objectives and Methods

The aim of this master is to define the susceptibility of Swiss lakes to be affected by a tsunami and the susceptibility of the coastal areas to be flooded. For doing so, the study will focus on the geological context around the lake to identify potential triggering sources of tsunami, such as fault lines, instable areas, earthquakes. It will also consider the lake geometry and the slope gradient of the bathymetry, and when available, its sediment infill, and finally consider surrounding areas to define areas that could be flooded following a tsunami. This investigation will be carried out for main lakes in Switzerland, using all available data, such as satellite images (Theilen-Willige, 2009), digital elevation models, bathymetry models, geological maps, earthquake catalogs etc. **As this study depends on spatial data analyses, a strong interest in geomatics is a prerequisite.**

### Literature

Kremer K., Hilbe M., Simpson G., Decrouy L., Wildi W., Girardclos S., 2015, Reconstructing 4000 years of mass movement and tsunami history in a deep peri-Alpine lake (Lake Geneva, France-Switzerland), *Sedimentology*, 62, 1305-1327  
 Kremer K., Marillier F., Hilbe M., Simpson G., Dupuy D., Yrro B.J.F., Rachoud-Schneider A.-M., Corboud P., Bellwald B., Wildi W., Girardclos S., 2014, Lake dwellers occupation gap in Lake Geneva (France-Switzerland) possibly explained by an earthquake-mass movement-tsunami event during Early Bronze Age, *Earth and Planetary Science Letters*, 285, 28-39  
 Strasser, M., Hilbe, M., Anselmetti, F.S. (2011). Mapping basin-wide subaquatic slope failure susceptibility as a tool to assess regional seismic and tsunami hazards, *Marine Geophysical Researches*, 32: 331-347  
 Theilen-Willige B., 2009, Tsunami hazard assessment in the northern aegean sea, *Science of Tsunami hazards*, vol. 27, 1, 17p.



<https://map.geo.admin.ch>

### Sites WEB

<http://cms.unige.ch/sciences/terre/research/Groups/limnogeology/limno.php>

[http://cms.unige.ch/sciences/terre/research/Groups/surface\\_dynamics/surface\\_dynamics.php](http://cms.unige.ch/sciences/terre/research/Groups/surface_dynamics/surface_dynamics.php)

[http://cms.unige.ch/sciences/terre/research/Groups/physical\\_volcanology/physical%20volcanology.php](http://cms.unige.ch/sciences/terre/research/Groups/physical_volcanology/physical%20volcanology.php)

### Choice of orientation :

2) Sedimentary, Environmental and Reservoir Geology / 3) Geological Risks