

Master thesis on “Potentially Toxic Trace Elements (PTTEs) profiles in the varved sediments of the Faulenseemoos.”

The Faulenseemoos is a bog in the Bernese Oberland which has just recently been placed under protection due to its "utmost scientific importance". Scientific history was written there when in 1944, Max Welten, a professor of botany at the University of Bern, achieved a global first as a researcher by quantifying the annual input of pollen grains in sediments using the varves. These seasonally layered deposits are very rare in natural archives such as lakes and formed here when the bog was still a lake. Preserved in these varves are proxies such as pollen, diatoms and insect remains, as well as elements and stable isotopes that provide information about the history of vegetation, about plants, animals and water quality, they provide data on temperatures and precipitation, and they tell us about the intensity and type of agriculture practised by our ancestors. The laminated sediments span over about 5000 years, from ca. 8000 to 3000 years ago, covering the Neolithic and Bronze Age, when farming was introduced and became gradually more intensive. Using PTTEs (commonly known as heavy metals) as proxies, one can also retrace the economic development and pollution history of a catchment, sometimes even global trends can be preserved in these natural archives, such as the use and ban of leaded gasoline or global mercury pollution.

We propose here a collaborative Master thesis project between the groups of Prof. Willy Tinner ([Paleoecology, IPS](#)) and of Prof. Adrien Mestrot ([Soil Science, GIUB](#)). The sampling and dating will be supervised by Prof. Tinner at IPS while the extraction and analysis of PTTEs in the varves will be supervised by Prof. Mestrot and will take place in the [cLAB](#) of the GIUB. The discussion of the results will be done jointly. If needed to better assess the economic development and pollution history, the intensity of agriculture will be reconstructed by high-resolution palynological approaches on the same cores in a second Master thesis.

We are specifically looking for a 60 ECTS Master student in Climate Sciences, Geography or Ecology and Evolution who has taken laboratory courses. If interested please send an email to adrien.mestrot@unibe.ch or willy.tinner@unibe.ch