



From ice-marginal to distal, sediment sequence from filling up a fjord-like glacial lake in the Aare Valley (CH) about 220'000 years ago

Michael A. Schwenk, Dimitri Bandou, Patrick Schläfli, Guilhem A. Douillet, and Fritz Schlunegger
Universität Bern, Insitut für Geologie, Geowissenschaften, Switzerland (michael.schwenk@geo.unibe.ch)

Repeated glacier advances affected the Swiss Plateau during the Quaternary. Deeply carved valleys, where the bedrock surface is located far below the current drainage level, are a prominent feature on the Swiss Plateau. How and when the glaciers lead to the formation of so-called overdeepenings is still a matter of debate.

Different studies show that overdeepenings in the Bern area contain thick and widespread lacustrine deposits of pre-Eemian age (Preusser & Schlüchter, 2004; Preusser et al., 2005). A coherent geological model of this complex setting is missing. Likely, glaciers carved into pre-existing overdeepening fills and repeatedly dug large troughs. Furthermore, access to the sedimentary record is limited. Outcrops containing sediments of the last glaciation are scarce and isolated. Access to older sediments is almost entirely limited to excavations and drillings.

Nevertheless, the overdeepenings served as local sedimentary traps while and after they were covered by ice during different glaciations. Hence, these troughs are prone to preserve a coherent sediment succession of a glaciation cycle in an ideal case, and they are therefore worth studying.

In this study, we attempt to resolve the local stratigraphic framework of pre-Eemian lacustrine deposits in the Bern area. In February 2019, we will conduct a ca. 200 m deep scientific drilling in order to link it to existing investigations aided by publicly available drill log data. We will study the lithofacies and use relative and absolute dating methods (palynology, luminescence dating, U-Th dating) to determine the development of a lake throughout a pre-Eemian glacial cycle. Preliminary OSL results of the lacustrine sediments yield a minimum age of 220 ka. This study will provide new insights into the timing, extent and impact of this glaciation as well as its climatic conditions.

References

- Preusser, F., Drescher-Schneider, R., Fiebig, M., Schlüchter, C., 2005. Re-interpretation of the Meikirch pollen record, Swiss Alpine Foreland, and implications for Middle Pleistocene chronostratigraphy. *J. Quat. Sci.* 20, 607–620
- Preusser, F., Schlüchter, C., 2004. Dates from an important early Late Pleistocene ice advance in the Aare valley, Switzerland. *Eclogae Geol. Helv.* 97, 245–253