Environmental changes in the Wehntal Valley in Northern Switzerland

Johannes Miocic[1], Ruth Drescher-Schneider[2], Hans Rudolf Graf[3], Marlu Kühn[4], Frank Preusser[1], Werner H. Schoch[5], Nigel Thew[6], Lucia Wick[4], and Heinz Furrer[7]

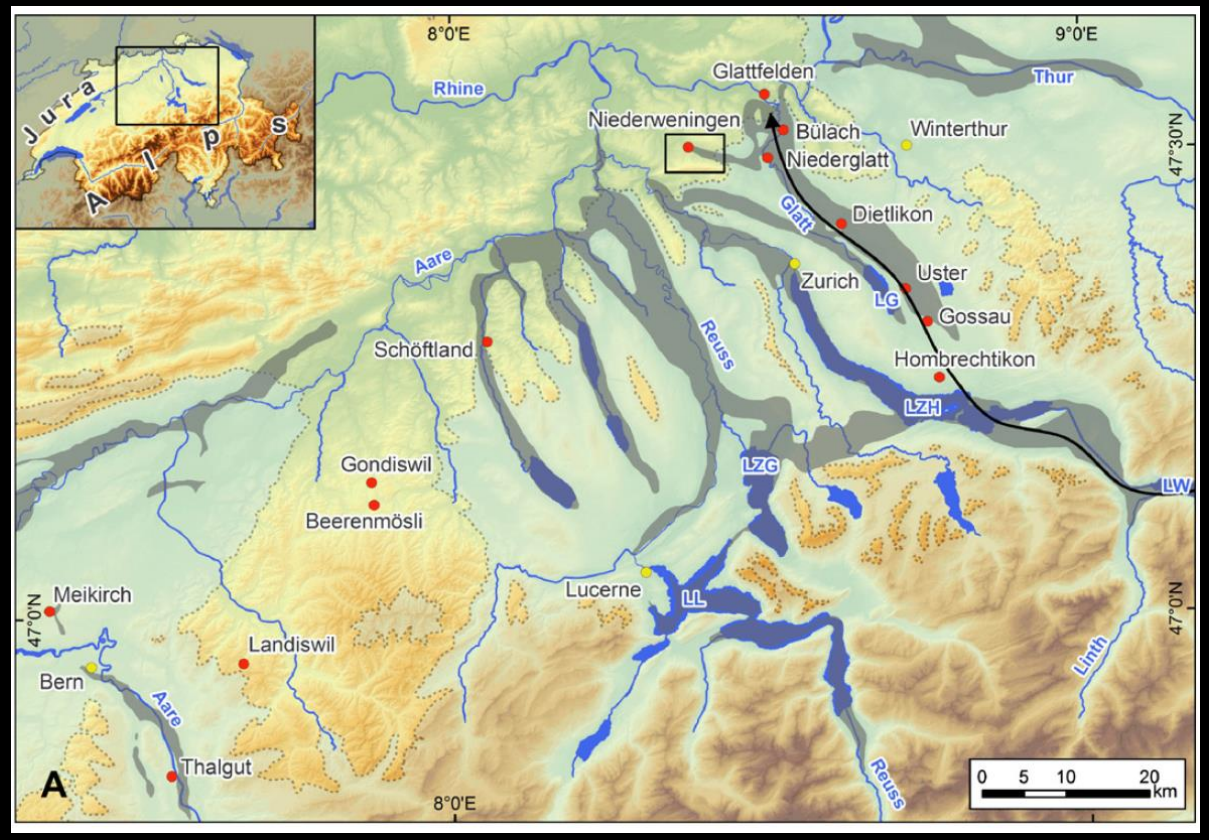
[1]Institute of Earth and Environmental Sciences, Albert-Ludwigs-Universität Freiburg, Albertstr. 23b, 79104 Freiburg, Germany, [2]Schilingsdorfer Straße 27, 8010 Kainbach bei Graz, Austria, [3]Dr. von Moos AG, Bachofnerstrasse 5, 8037 Zürich, Switzerland,[4]Integrative Prähistorische und Naturwissenschaftliche Archäologie, Universität Basel, 4055 Basel, Switzerland, [5]Labor für Quartaere Hoelzer/ Laboratory for Ancient Wood Research, Unterrütistrasse 17, 8135 Langnau a.A., Switzerland, [6]Rue Paul Bouvier 2, 2000 Neuchâtel, Switzerland, [7]Paläontologisches Institut und Museum Universität Zürich, 8006 Zürich, Switzerland

Background: Quaternary deposits in the glacially overdeepend trough of the Wehntal Valley record glacial and interglacial conditions from the Beringen Glaciation (MIS 6) through to the Holocene, including the famous „mammoth peat“.

Motivation: Improving the understanding of the complex infill history of the overdeepened through and climate related environmental changes in the Swiss Alpine Foreland.

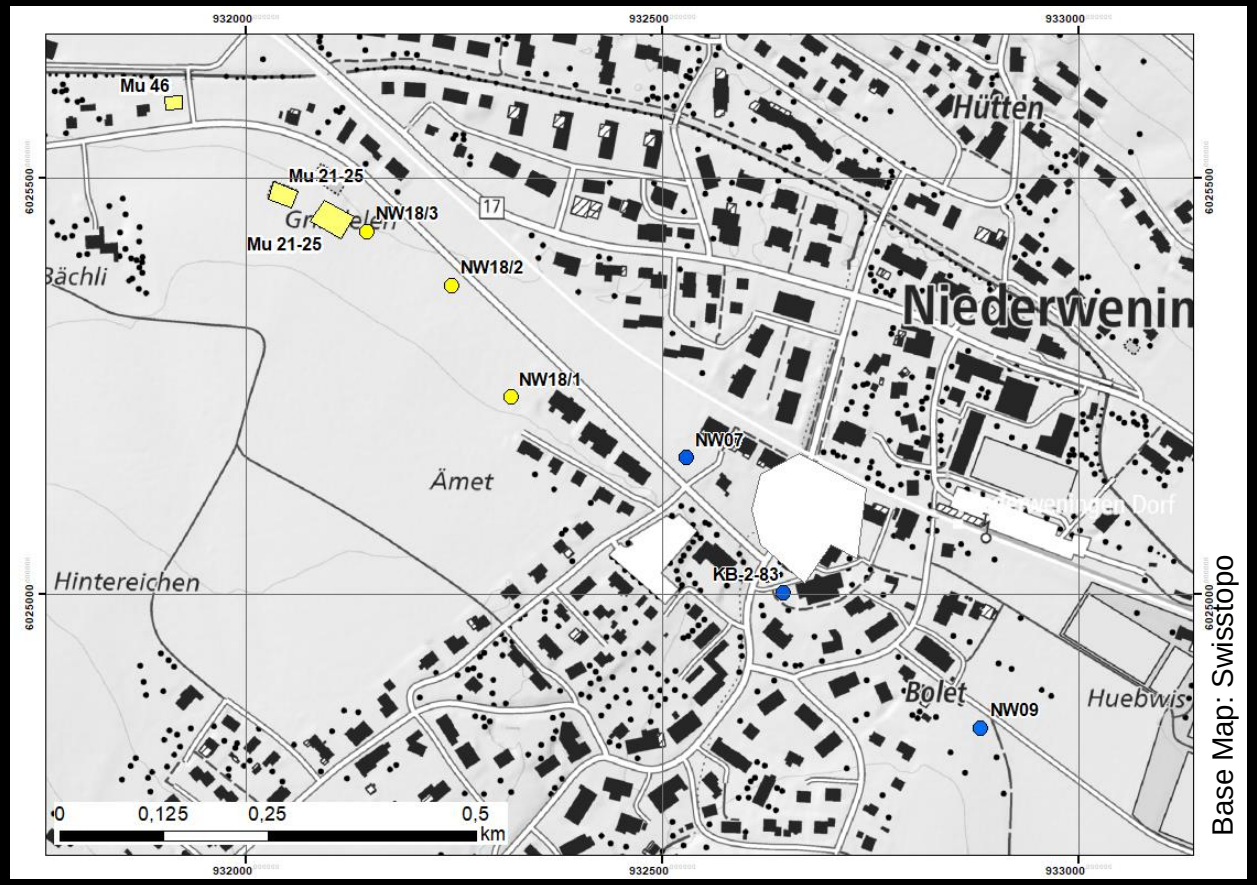
Summary: Preliminary results of detailed investigations of two drill cores indicate a transition from a series of laminated silts to a several meter-thick succession of organic silts, tufaceous silts and peat layers. The former are typical of a proglacial lake environment during cold climate while later are characteristic of near shore and shore conditions during a relatively warm period of fluctuating climate.

The overdeepend glacial trough of Niederweningen



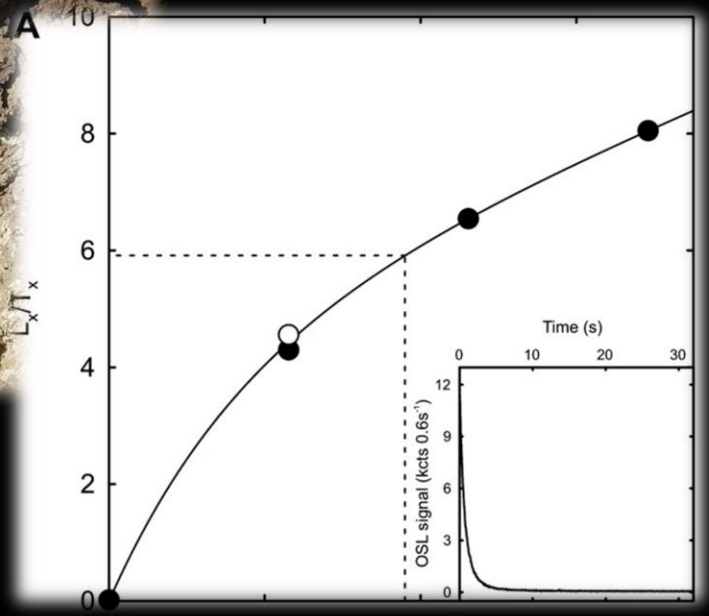
Above: Overview of the Swiss Alpine Foreland showing the approximate locations of overdeepend troughs (grey areas) and the study area of the Wehntal Valley (Niederweningen, black box). From Dehnert et al., 2012, QSR.

Below: Map illustrating the location of the three research drillings of this study (NW18/1, NW18/2, NW18/3) and analysed excavations (Mu21-25) in yellow. Older research drillings are shown in blue.



Methodology

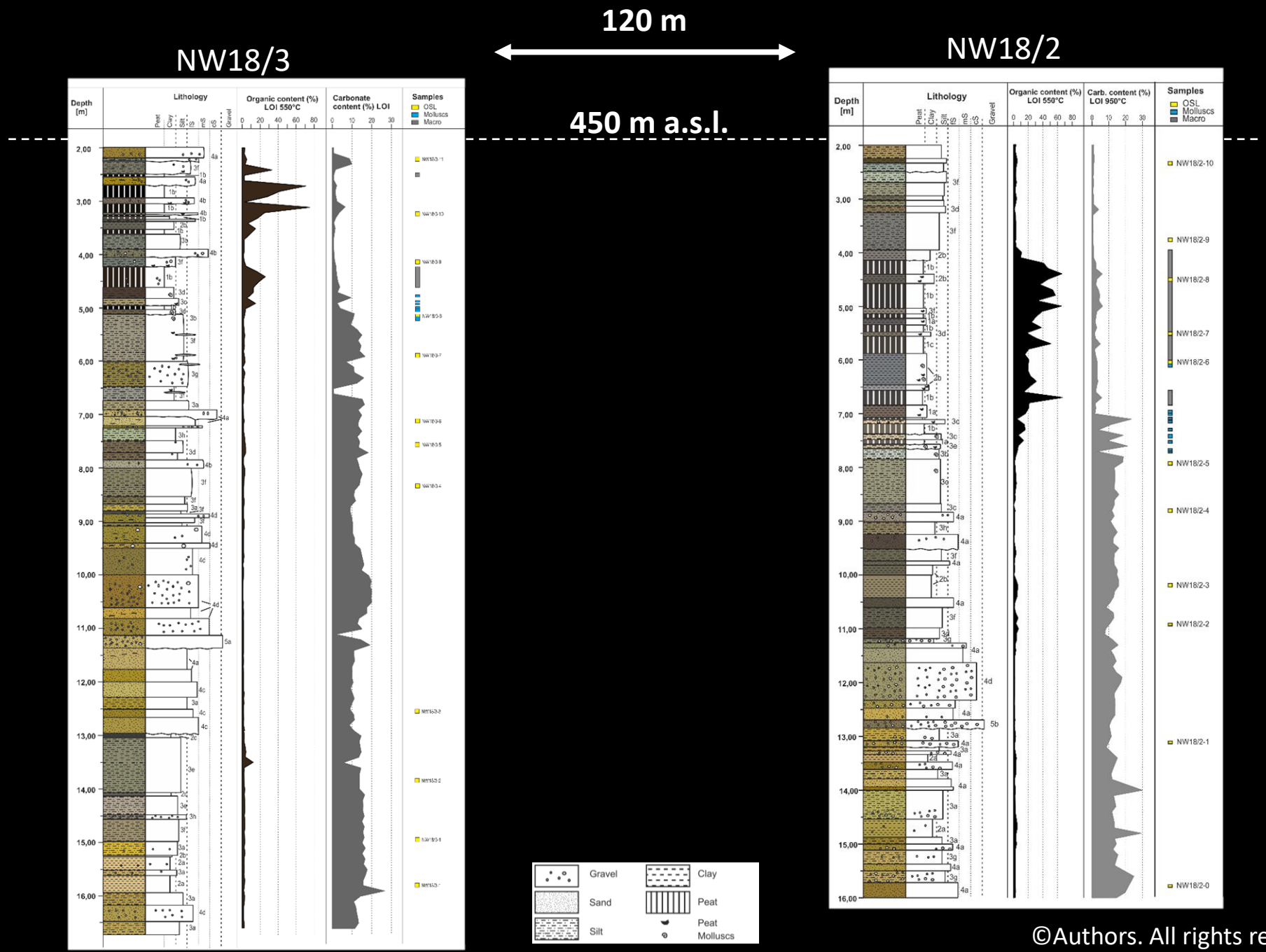
- Sedimentology
- Geochemistry
- Paleobotany
  - Pollen
  - Wood and plant macroremains
- Malacology
- Luminescence dating



First results

Correlation of the upper sections is difficult due to erosive surfaces within the peat layers.

Gravel rich sandy layers (9-11.5 m) in core NW18/3 likely correspond to the gravels and sands below 11 m depth in core NW18/2.



Outlook

- Integration of all data will allow for a detailed reconstruction of the infill history of the overdeepend trough

- OSL ages will allow for better correlation between cores

- Paleobotany and malacology results will enable detailed environmental reconstructions of the organic rich layers

Artistic landscape reconstruction of the Wehntal at around 110ka, which is a possible timeframe for the peat deposits found in this study. View towards south-east, property of the Mammut-museum Niederweningen (www.mammutmuseum.ch).