An INTIMATE Example: Into and out of the Younger Dryas at Lake Hämelsee, NW-Germany

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During the INTIMATE training school 2013 the Late Glacial lake Hämelsee has been revisited, enabling students to gain hands-on experience with state-of-the-art palaeo-environmental methods. Subsequent research was performed by training school participants during five international Short Term Scientific Missions (STSMs), with special focus on the transitions around the Younger Dryas and the onset of interstadial conditions. The research will result in a well-dated high resolution multi-proxy record of the climatic and palaeo-environmental changes during the Late Glacial, enabling a better understanding of the (environmental impact of) rapid climate transitions in NW-Europe.

Box 1. Chronology

The partially varved sequence (fig. 1) enables construction of an age-depth model at annual resolution. The floating varve chronology (Aritina Halicuc) will be anchored to an absolute timescale both by using several 14C dates on macro-remains (Katalin Hubay) and through dated tephra isochrons (Gwydion Jones; fig 2).

References:

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Box 2. Climate- and environment reconstruction techniques

Sedimentology
XRF-scans (Aritina Halicuc) and LOI measurements (Renée de Bruijn; fig. 1) are performed at high resolution for the entire Late Glacial section of the core.

Geochemistry
Lipid biomarkers (Ilaria Baneschi) and GDGTs (Johanna Menges) are used for climate reconstruction at the transitions around the Younger Dryas (fig. 1, A intervals).

Palaeo-ecology
Palaeo-ecological reconstructions are made based on chironomids (Tom Peters and Falko Tumer; fig 1, B intervals) and pollen (Falko Tumer, C intervals).

Figure 1. Loss on Ignition (LOI) of the composite core. Intervals studied in STSMs are indicated by lines under graph (see box 2).