simulated data I will demonstrate that many are based on weak, non-causal species-environment relationships that are confounded by the effects of often strong "nuisance" or secondary environmental gradients. As such, they lack statistical validity, have little predictive power, and produce reconstructions that are problematic and unreliable. I argue that to make progress palaeolimnologists must take a more critical approach as to which variables can be reconstructed and to validate models across multiple datasets and regions.

S09-P-13 Early Holocene environmental change in northeastern Fennoscandia

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The Holocene thermal maximum (HTM), a warming which is most pronounced in the Northern Hemisphere (NH) and with summer temperatures 1-2°C higher than today, is traditionally placed between 4000 and 7000 cal. yrs. BP while cooler climates are generally considered to have dominated the early Holocene. The high spatial variability of the HTM timing and magnitude is well acknowledged, however, high resolution multi-proxy studies with emphasis on this phenomenon are scarce in northeastern Fennoscandia. In this study, we focus on the early Holocene with the aim to quantify July temperatures and reconstruct environmental conditions such as trophic status and vegetation development directly after the deglaciation. An exceptionally long lake sediment core retrieved from Lake Loitsana, northeastern Finland, allows for the reconstruction to be conducted with a decadal resolution. The methods include biogeochemical data obtained through LOI, C/N and XRF (ITRAX core-scanner) measurements, plant macrofossil, diatom and chironomid analyses, lithological characteristics and AMS ^{14}C dating. A radiocarbon date performed on seeds of tree Betula indicates that the area was deglaciated before 10 700 cal. yrs. BP. Preliminary plant macrofossil and chironomid results suggest a peak in summer temperature during the early Holocene, a time when the NH summer insolation was at its highest. Aquatic macrofossil taxa, i.e. *Glyceria lithuanica*, indicate a mean July temperature of at least 15°C at 10 700 cal. yrs. BP, 3°C higher than present. The vegetation immediately after deglaciation appears to have responded rapidly to the summer insolation peak after the influence of the ice-sheet was diminished.

S09-P-14 Climate of northern Poland during the last 1000 years: Quantitative multi-proxy reconstructions with annual resolution based on varved lake sediments from Lake Żabińskie

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The recently established project CLIMPOL (Climate of northern Poland during the last 1000 years: Constraining the future with the past) aims at a quantitative reconstruction of climate change based on varved sediments from Lake Żabińskie in northeastern Poland. The project has been funded by the Polish-Swiss Research Program and is scheduled for the years 2011-2015. After establishing a precise chronology (varve counting, C-14, Pb-210, Cs-137), analyses will cover biological (chironomid head capsules, chrysophyte stomatocysts, diatoms,

pollen), stable C- and O-isotopic, sedimentological and geochemical proxies. Results will be calibrated with a modern training set of lakes (transfer function) and a calibration-in-time approach using long instrumental data series validated with early instrumental and documentary data.

Field investigations show that sediments of Lake Żabińskie fulfill two criteria which are crucial for an annually resolved reconstruction: (1) sediments from the deepest basin are continuously varved, and (2) high sedimentation rates allow subsampling procedures that provide sample material for all proxy parameters with annual resolution. The sediment record shows a varved structure of biogenic–calcareous gyttja along the entire length. This is confirmed by first results of high-resolution XRF scanning which shows excellent agreement of calcium peaks with the position of pale layers. Varve thickness varies along the core in the range of 2-18 mm with the last 1000 years being represented in the uppermost ca. 4 m of the retrieved sediment core.

At the current stage, samples covering the last 120 years are analyzed and compared with instrumental data series available.

S09-P-15 Pollen based quantitative climate reconstruction on the Tibetan Plateau: Challenges for large lakes

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The past climate on the Tibetan Plateau (TP) is of great importance for understanding of global climate processes and for predicting the future climate, leading to various climate reconstructions over the last decades. However, inferring quantitative climate information from large lakes is still challenging because of the influences by different pollen source areas. Here we present a fossil pollen record since the LGM from Lake Donggi Cona (northeastern TP). A new modern pollen data-set consisting of over 50 large lakes (with minimal lake radius of 750 m) from the arid/semi-arid regions in central Asia is also presented herein. The pollen source area of each modern lake was estimated according to Sugita's theoretical model. The modern climate data for each sampling sites were estimated by inverse distance weighting the grid climate data within individual pollen source areas, and then used for quantitatively reconstructing the past climate change.

The climate inferences from pollen records generally follow the assumption that past vegetation changes are primarily driven by climate changes, which needs further confirmation. Here, in order to identify the potential drivers of vegetation change on the TP, a high resolution (10~15 yr) late Holocene pollen record from Lake Kusai was analyzed. A moving-window Redundancy Analysis (RDA) based on parallel analyzed pollen and sedimentary proxies reveals multiple drivers for vegetation change, among which climate was not always the dominant factor. Additional Procrustes and ProTest analyses indicate that the human activities have possibly influenced the vegetation changes during the last centuries.

S09-P-16 Rare Diatom Taxa – setting a sense

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Several recent bio indicator programs in different European countries are using rare benthic diatom taxa (e.g., German's PHYLIB module: Quotient of Reference Species (RAQ)). The abundance of diatom data are calculated mostly based on the count