

CALIBRATING AND RECONSTRUCTING THE CLIMATE OF NE POLAND FROM VARVED LAKE ŻABIŃSKIE, MASURIAN LAKE LAND

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We reconstruct quantitative annually resolved seasonal (winter and summer) temperatures from well-dated varved Lake Żabińskie in the Masurian Lakeland (54°07'54."N; 21°59'01.1"E) of NE Poland (see Abstract by Tylmann et al.). The goal of the project is to establish annually resolved time series of quantitative climate variables for the last Millennium. Our multi-proxy data set contains biological proxies (chironomids and chrysophyte stomatocysts) and biogeochemical proxies (TOC, TIC, biSi, sedimentary pigments) which were subsampled from the same sediment core to achieve maximum consistency within the proxy data set.

For the proxy-climate calibration we combine data from a new training set and develop temperature Transfer Functions for the biological proxies. The training set consists of 50 lakes across Poland. These were equipped with sediment traps and thermistors, and samples for surface sediments and hydrochemical parameters were taken. The biological and biochemical proxies in Lake Żabińskie are also calibrated to meteorological data AD during the calibration period AD 1885 - 2011 (Calibration-in-time approach). Homogenized series of early instrumental data since AD 1777 are used for the validation of the proxy-based reconstructions. The temperature reconstruction for the last Millennium is work in progress.

In this presentation we place particular emphasis on sediment proxy series that are acquired with hyperspectral imaging, a novel non-destructive method that allows the identification of sedimentary photopigments (total chlorins) and clay minerals at very high resolution (40 µm). Both proxies might be sensitive to climate variables also in Lake Żabińskie.