S09-04 Lake selection and design of a training set to develop climate transfer functions for biological proxies in Polish lakes

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Transfer Functions based on modern training sets are well established and powerful tools in quantitative paleolimnology and environmental/climate reconstructions. However it is increasingly recognized that the selection of lakes and the design of the Transfer Function is most critical and may bias the results.

Here we show how we selected lakes out of a data base with physical and chemical parameters of lakes in northern Poland to develop a Training Set for quantitative environment/proxy relationships and, ultimately to reconstruct quantitative seasonally resolved temperatures and precipitation from Chrysophyte stomatocysts, chironomids, diatoms and stable C and O isotopes in Lake Żabińskie (lowland NE Poland) for the past 1000 years (Project CLIMPOL: 'Climate of northern Poland during the last 1000 years: Constraining the future with the past'). In this context, Poland has been recognized as one of the best places to study European temperature variability since explains up to 86% of the variance of winter temperatures. Lakes included in the training set were chosen among 2913 lakes from NE Poland. Using univariate and multivariate outlier detection techniques, we removed lakes without available water chemistry data, with extreme values (morphology, physical and chemical parameters), and/or lakes close to big cities and the coast. From the remaining 1247 lakes we selected 50 lakes for the final training set using stratified balanced sampling with ten equidistant blocks along longitude (in Poland a proxy for the temperature gradient) and other environmental variables. Lakes are below 250 m.a.s.l., deeper than 6 m, and slightly basic (pH ranging 6.5-9). The lakes are located along a W-E mean annual temperature gradient of 6-8.5°C and N-S precipitation gradient between 650-550 mm year−1. For Training Set development, sediment traps and thermistors were deployed in these lakes.

S09-05 The limits and limitations of datasets for palaeoclimatic reconstruction: nonmarine ostracod problems and solutions

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The calibration of ostracod species as palaeoclimate proxies utilises living ostracod distributional datasets in combination with modern climate datasets. Small regional datasets of geographical distribution collected during relatively short time intervals may be internally consistent in terms of sampling methods, taxonomy and positional accuracy, but often fall short of capturing the full climatic ranges of taxa. Geographically more extensive, literature-based datasets are more likely to encompass species' distributions in climate space but, since they represent collections by many people over many years, are prone to taxonomic inconsistency as well as poor locational precision and accuracy, and may even represent distributions blurred by shifts in response to contemporary climate change. Regional climatic datasets, too, span different time intervals. The inability to match climate data exactly to the interval during which distributional data were collected weakens an underlying assumption of palaeoclimate proxy methods: that species' distributions are in something approximating to equilibrium with climate. We explore some implications of these issues with reference to large regional nonmarine ostracod databases for Europe and North America. We suggest that the accuracy of ostracod proxy methods for palaeotemperature reconstruction may be improved by utilising (1) OMEGA (Ostracod Metadatabase of Environmental and Geographical Attributes), a global metadatabase under development that will facilitate the capture of the full climatic ranges of species, and (2) the