

## STABLE ISOTOPES FOR CLIMPOL PROJECT - CLIMATE OF NORTHERN POLAND DURING THE LAST 1000 YEARS: CONSTRAINING THE FUTURE WITH THE PAST

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The period of the last 1000 years provides information about the changes that have occurred in European modern climate. This information is the key for understanding the natural variability of European climate and can be used to create a model of climate changes in the future.

North-eastern Poland is the one of the best locations for create a model of climate changes, because reflects the variability of winter temperature for the European land areas. The goals of the project are:

- (1) to produce a data set with 1000-years long, seasonally resolved (summer, winter) quantitative temperature series for northern Poland. This data set will be the first of its kind for Central/Eastern Europe and provide unprecedented information about regional natural forced and unforced climate variability and trends at interannual to centennial scales during warm (Medieval and the Present) and cold (Little Ice Age) periods in Poland;
- (2) use this information for scoring a variety of climate model experiments to constrain the likelihood of the currently still very broad range of projected future climate change trajectories, and thus reduce uncertainty for the future.

The comprehensive 1000 years long data set consists of: Chrysophytes, Chironomids, biogenic silica, sedimentary pigments, stable C and O isotopes









(authigenic calcite), diatoms, pollen. Technological innovations include the exploration of novel rapid, non-destructive and low-cost scanning techniques (reflectance spectroscopy and XRF) for quantitative analysis of lake sediments.

The two goals will be addressed in three Tasks:

Task 1: Calibration of biological and geochemical proxies from 50 modern lakes along a W-E transect in northern Poland that reflects a climate gradient.

Task 2: Quantitative winter/summer temperature reconstruction from lakes in NE Poland at annual and subdecadal resolution for the past 1000 years (based on Task 1) and validation with early instrumental and documentary data.

Task 3: Score existing climate model experiments and constrain future climate projections with our new regional dataset.

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