Why does Younger Dryas arouse so much interest? The Late Glacial period and in particular the Younger Dryas has become a natural laboratory for verifying numerous research hypotheses. The Younger Dryas lasted from approx. **12,800 to 11,680 years BP** and was characterized by a general rapid **decrease in air temperature by about 2 to 6°C around the globe** launching a series of new processes such as continental ice sheet advancement adaptation of vegetation migration and affected transformation and slope processes, etc. Such cooling during the Younger Dryas (YD) globally disturbed the warming trend of that time - deglaciation. Fast-paced cooling in the history of the earth was most often associated with the slowdown of the **Atlantic Meridional Overturning Circulation (AMOC)** caused by the discharge of ice water from the melting of ice cover. There would be nothing worrying in these processes if the research results from Western Europe, where **according to high resolution data from indicator plant species, the summer temperature was probably 1-2°C higher during the YD.** As a consequence, during the YD there could have been an increase in climate continentalism, which was characterized by a significant winter and spring cooling and a short growing season. This warming may have been caused by blocking the cold winds over Fennoscandia. The research problem to be solved in this project concerns the summer temperature variability during the YD. The study will also focus on the Allerod-Younger Dryas-Preboreal transition (**changing environmental conditions**) as a crucial period for modeling future climate change. This study is particularly significant - as in the context of current anthropogenic global warming - we will attempt to answer the question: **can similar changes take place in our times?**

The main aim of this project is to trace in detail the succession of climatic conditions and environmental feedbacks in Eastern Poland in order to examine the process of environmental changes and relations occurring in the Late Glacial. The applicants plan to implement a series of innovative methods to conduct the proposed research. For reconstructing lake ecosystem responses a high temporal resolution of 5-10 years resolution of *Chironomidae* and stable isotopic analysis of fossil chironomidae **$\delta^{13}C$, $\delta^{15}N$, $\delta^{18}O$, $\delta^{2}H$ from Chironomidae head capsule**, connected with **geochemical data (μ-XRF scanning**), will be applied to abrupt climatic and environmental changes during climatic events around the YD. A high-resolution paleoecological study of the sediment cores will take advantage of a novel and successful approach combining **microfacies analyses on thin sections** with a high-resolution **μ-XRF scanning**. High-resolution depth-age modelling will be based on the **AMS ^{14}C dating**. It is planned to execute the **Cryptotephra analysis.** Within the ***ClimHead*** project, we will attempt to verify hypotheses concerning warm summer in the cold YD period and then develop a synthetic concept about the pattern, relation and feedback during the rapid climatic shifts occurring in the Late Glacial periods over Central Europe.