

## **Environmental impacts of the mid-Holocene climate transition in N Poland: trends and events in varved lake sediments**

This project investigates the impact of climate changes on lake environments in Northern Poland. Therefore, information from the past recorded in geological archives will be utilised to trace landscape evolution in the Pomeranian lakelands for several thousand years. The sediments records from two adjacent lakes, Czechowskie and Głęboćek are unique archives because their deposits are annually laminated which allows reconstructions even at seasonal resolution. For the investigation we will apply a unique set of complementary methods to first construct a robust age model for the sediments, and, second provide geochemical and pollen data. Detailed microscopic analyses of the sediments will provide precise information of changes in sediment deposition in response to changes in the lacustrine system and the surroundings of the lakes. The study time interval for this project is from 6500 to 2000 years, starting from the warmest period of our present interglacial, the Holocene Thermal Maximum, and covering the transition into the so-called neoglaciation. It is known that after the Holocene Thermal Maximum climate gradually became cooler and wetter because of changes in the Earth's orbit around the sun. This cooling culminated in the expansion of glaciers in the Alps and other regions worldwide but was interrupted by several centennial of particularly cold oscillations probably caused by periods of weak solar irradiation and/or other still unknown reasons. The main research questions of the project are to understand how the lake and its surroundings responded to climate change. More specifically, we want to find out differences of environment response to climate cooling or warming and how long it took for the environment to adapt to different climatic state. In addition to the climatic evolution, human communities first appeared in the region during the study time interval and increasingly modified the landscape through developing land-use practises. The project will investigate the interplay between climatic and human factors for landscape evolution. Furthermore, the study will contribute to broader palaeoecological knowledge by providing high-resolution data from a climatically sensitive region, which remains underrepresented in existing Central European reconstructions. Knowledge of the heritage of our landscapes and the understanding of the causes and processes of change is valuable for assessing the responsiveness of landscape to future changes and developing measure of adaptation to expected changes.