



## **The Lateglacial and Holocene history of annually laminated Lake Tiefer See**

Martin Theuerkauf (1), Nadine Dräger (2), Reinhard Lampe (1), Sebastian Lorenz (1), Ulrike Kienel (2), Manuela Schult (1), Michał Słowiński (3), Sabine Wulf (2), Izabela Zawiska (3), and Achim Brauer (2)

(1) University of Greifswald, Institute of Geography and Geology, Physical Geography, Greifswald, Germany (martin.theuerkauf@uni-greifswald.de), (2) Helmholtz-Centre Potsdam - GFZ German Research Centre for Geosciences, Section 5.2: Climate Dynamics and Landscape Evolution, (3) Stanisław Leszczycki Institute of Geography and Spatial Organization Polish Academy of Sciences

Lake Tiefer See (N 53.59, E 12.53) is one of the rare lakes with a long sequence of annually laminated Holocene sediments in northern Central Europe. The lake is a valuable link between laminated lakes in more oceanic climates of the Eifel region and NW Germany and laminated lakes in the more continental climate of Poland. It thus provides great potential to study past climate, vegetation and human land use along that climate transition.

The sediments of Lake Tiefer See show repeated changes in varve quality and composition. To disentangle in how far these changes relate to either past climate change, lake water level fluctuations or to changes in the local environment caused by e.g. human activity, we studied 16 sediment cores taken mainly from the lake margin.

Almost all cores show interruptions in sedimentation namely during the mid-Holocene, suggesting that the lake water level has been lowered during this period. However, peat-gyttia alternations point at lake level fluctuations also during the early and late Holocene. Discontinuous sedimentation in cores from intermediate depth points at recurring slumping events. The pollen record additionally indicates prominent alternations in land use intensity throughout the late Holocene. By testing correlation between the hydrological changes, changes in land use intensity and changes in the sediment record we discuss effects of climate change and further factors on varve formation in Lake Tiefer See.

This study is a contribution to the Virtual Institute of Integrated Climate and Landscape Evolution Analysis –ICLEA– of the Helmholtz Association; grant number VH-VI-415.