



Carbon and oxygen isotope record in carbonate sediments of Lake Wigry (NE Poland)

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Lake Wigry is situated on the border which separates two geographical regions of NE Poland - Eastern Suwalki Lake District and Augustowska Plain. The Suwalki Lake District is characterised by young glacial landscape shaped during Baltic Glaciation. Together with 41 lakes in its vicinity, Lake Wigry forms Wigry National Park. Lake Wigry is one of the biggest and deepest lakes in Poland. It is a mesotrophic lake, consisting of few main basins connected by straights, which together with bays and islands divide the lake waters into few different regions. The Lake Wigry sedimentation environment has predominantly carbonate character, and the sediments comprise carbonate gyttja containing about 70% of CaCO_3 in silt and clay fractions. The presentation will focus on isotopic investigations of carbonate sedimentation carried out for the southern part of the lake. Since now many interdisciplinary studies have been conducted, especially a 5.26 m long core (called WZS/03), reaching the beginning of lake sedimentation, was recovered from the Slupianska Bay site in 2003. The previous study of the core include lithological and palaeobiological analyses (palynology, Cladocera, diatoms). The results of palaeobiological analysis allowed distinguishing of local assemblage zones and reconstruction of environmental conditions in Lake Wigry and its surroundings from the Late Glacial up to the present time. Radiocarbon dating and statistical tools were used to build a calendar age-depth model for the core. The presented study includes determination of stable carbon and oxygen ratios as well as radiocarbon measurements in contemporary carbonates and in the core subjected

earlier to palaeoenvironmental studies. Thanks to that the isotope results can be compared directly to the climate record and phases of Lake Wigry development and show good correlation with other palaeo data. However, comparison of the results with other local and global records such as GISP2 ice core demonstrated poor synchronisation of Younger Dryas/Holocene boundary, clearly recorded in $\delta^{18}\text{O}$ record of WZS/03 core. The problem can be solved by recalculation of age-depth model, which especially for the bottom part of the core was quite contestable. The covariance of $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ was also tested, and show two distinguishable tendencies, which indicate major change in sedimentation environment ca. 8000 BC, which is undoubtedly correlated with other palaeo zonations. Present-day isotopic study covers measurements of stable C and/or O ratios and ^{14}C in water, DIC and carbonates deposited on short-living submerged plants. In the light of information about contemporary sedimentation pattern and weather records the potential of the temperature reconstruction on the basis of oxygen isotope data will be discussed.