Geophysical Research Abstracts
Vol. 18, EGU2016-14537-1, 2016
EGU General Assembly 2016


# Late Glacial and Holocene environmental history of Wielkopolska region (western Poland) recorded in sediments of Strzeszyńskie Lake and Kierskie Lake

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The growing amount of publications concerning reconstructions of Late Glacial and Holocene environment based on analysis of lake sediments gives us robust insight into general patterns of that record. However, it is still challenging to decipher processes and events that occurred on local scale, as they record may be strongly affected by the type, catchment, size and depth of a lake. Therefore in the present study we focus on application of sedimentological and geochemical methods in order to reveal environmental history from two neighbouring lakes located within city of Poznań, Wielkopolska (western Poland). The lake sediments analysis cover Late Glacial and Holocene in case of smaller Strzeszyńskie Lake (SL) and the last 8 ka in deeper Kierskie Lake (KL).

The study is based on two 8.5 (SL) and 14 (KL) m long sediment cores, which were described and analyzed in thin sections and on smear slides. The relative chemical composition variations within the cores were measured using an X-ray fluorescence (XRF). Moreover, the cores were measured for magnetic susceptibility and sampled for pollen analysis. The chronology has been established by a AMS 14C dating of bulk samples of lake sediments. To assess the reservoir effect, selected samples were analyzed for soluble and residual carbon fractions.

Our results suggest the onset of authigenic sedimentation in SL in Allerød. The sediments from this period are characterized by high organic matter and low carbonate content. This trend changed into opposite at the beginning of the Younger Dryas, while at its termination sediments again became more organic. The transition to Holocene is marked by spread of Betula forest, gradual increase in magnetic susceptibility and Ca content together with decreasing organic matter and clastic input. During Preboreal and Boreal period the relatively stable conditions was noted. Then, ca. 8.5 ka BP, sharp decrease in magnetic susceptibility occurred coincided with deciduous forest development in the catchment and more organic sedimentation. The middle Holocene is marked by low log(Fe/S) values and presence of undisturbed laminations in KL sediments. A distinct peak in magnetic susceptibility was noted for SL sediments at ca. 5.3 ka BP, which is the time of nearby (ca. 6 km) Morasko iron meteorite impact. The late Holocene is characterized by high and increasing contribution of NAP vegetation that coincide with changes in geochemistry in both lakes. The comparison between SL and KL record show that smaller catchment and surface area of the former result in a sediments recording more subtle changes in the external forces. However, due to bigger water depth, the sedimentary record in KL is more sensitive to record reduce water oxygenation conditions. Our results presents one of a very few records from the western Poland that covers whole period from Late Glacial to late Holocene. Furthermore, we show that the verification of the record from one lake by the parallel analysis of sediments from the nearby one, can significantly improve inferring about environmental history.

The work was supported by National Science Center (Poland), grant no. 2013/09/B/ST10/01666.