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EFFECT OF HYDROLOGICAL CONNECTIVITY ON PHYSICO-CHEMICAL PROPERTIES OF BOTTOM SEDIMENTS OF FLOODPLAIN LAKES – A CASE STUDY OF THE ŁYNA RIVER, NORTHERN POLAND

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Abstract

The investigation of bottom sediments in oxbow lakes was conducted in the free-flowing, meandering section of the Łyna River in N Poland. Seven oxbow lakes, differed by a degree of hydrological connectivity with the river channel, were chosen for the present study. In samples taken from 21 sediment profiles, particle size distribution, pH, bulk density, $CaCO_3$, organic matter, total organic carbon as well as total forms of N, P, K, Ca, Na, Mg, Mn and Fe were determined. The gradient of decreasing exchange of water between a floodplain lake and the river channel influenced the decrease in sand fraction and the increase in organic matter content. At the water inflow into the semi-lotic and lotic oxbow lakes, the decrease in transporting strength of the river occurred particularly favorable for mineral matter accumulation. A significant decrease in majority of nutrients and macroelements was noted along with vertical sediment profiles of each oxbow. Our results showed floodplain lakes have ability to remediate water quality by trapping catchment-derived substances. Thus, they play an important role in the purification of flowing waters.

Key words: bottom sediments, hydrological connectivity, lentic ecosystems, nutrients, organic matter, oxbow lakes, wetlands

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