

## **The effect of groundwater supply on the hydrochemical diversity of flood plain lakes in the temperate climatic zone**

**KATARZYNA GLIŃSKA-LEWCZUK<sup>1</sup>, SZYMON KOBUS<sup>1</sup>,  
KRYSTIAN OBOLEWSKI<sup>1</sup> & JAROSŁAW CHORMAŃSKI<sup>2</sup>**

<sup>1</sup> *Department of Land Reclamation and Environmental Management, University of Warmia and Mazury in Olsztyn,  
Plac Łódzki 2, Poland  
[kaga@uwm.edu.pl](mailto:kaga@uwm.edu.pl)*

<sup>2</sup> *Division of Hydrology and Water Resources, Warsaw University of Life Sciences, Poland*

**Abstract** In this paper we investigate the spatial heterogeneity of chemical parameters within flood plain lakes with different ground and river water recharge intensities. We assumed that the direct influence of groundwater recharge is ultimately related to the vertical stratification of temperature and aeration of the whole water column. Accordingly, we seasonally monitored physical and chemical properties of 22 oxbow lakes in the postglacial river valleys of the Słupia, Drwęca and Łyna rivers of Poland. The results were compared with groundwater from transects of piezometers located near the oxbow lakes. The flood plain water bodies showed variability (both in vertical and spatial dimension) in temperature, aeration and specific conductivity, affected mainly by lateral connectivity to the river. The temperatures and oxygen contents declined with the increasing depth of water and distance to the river channel. The detected differences in vertical gradients of physico-chemical parameters within one reservoir, or a group of those, confirmed the evidence of groundwater recharge.

**Key words** oxbow lake; groundwater; hydrological connectivity; thermal gradient; aeration