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EFFECT OF RIVER SUPPLY ON THE DISTRIBUTION OF MACROELEMENTS IN THE SEDIMENTS OF A RETENTION RESERVOIR – A CASE STUDY OF ŁOJE RESERVOIR

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Abstract

The aim of the studies was to evaluate the influence of the 30-year operation of a small retention reservoir fed with water from a forest-agricultural catchment area on the contents of selected mineral elements substances in bottom deposits. The studies were carried out in the Łoje dam reservoir (N 53°7'28'', E 20°48'20''), supplied by the regulated Łojówka stream. Deposit samples were collected in four transects perpendicular to the reservoir axis in the center of riverine and lacustrine zones and two transects in the transitional zone. In the sediment samples, the following parameters were determined: dry matter content, pH (in H₂O) and the concentrations of organic matter, organic carbon, total nitrogen, total phosphorus, potassium, calcium, sodium, magnesium, iron, sulfur, chlorides, copper, manganese and zinc. Changes in the reservoir were evaluated with the use of geochemical indicators (C:N, Fe:Ca, Fe:Mn, Cu:Zn, Ca:Mg). The results showed the highest content of organic matter and its components (N_{tot}, P_{tot}, Ca, Na and Mg) in deposits sampled along the course of the main water stream flowing through the reservoir. In deposits sampled from the reservoir's riverine and transitional zones, the predominant macroelement was Ca, and in samples from the lacustrine zone – Fe. On average, the content of the analyzed macroelements in deposits sampled from various zones created the following descending order: Ca > S > N_{tot} > Fe > Mg > K > P_{tot} > Na. Our results indicate that the accumulated deposits had been formed in shallow waters and that organic matter originated mainly from macrophytes and higher plants rich in cellulose.

Key words: bottom deposits, macroelements, small retention reservoirs, water reservoir

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