

Chemical variability of water and sediment over time and along a mountain river subjected to natural and human impact



We studied the variability of physico-chemical parameters in water, and heavy metal contents in water and sediment over time and along the Carpathian Biała Tarnowska River (southern Poland) and related them to catchment geology, human impact and the effect of barriers as a side aspect. The river water was well oxygenated, had pH 7.7–9.5 and was characterised by low and average flow. Temperature, pH and dissolved oxygen did not change significantly, while the contents of major ions, NO_3^- , NH_4^+ , Mn and Fe increased gradually along the river. The major ion contents were negatively, and nitrate, Mn, and Fe positively, correlated with the flow. We recognise correlations between nitrate, Fe and Mn to be good indicators of soil erosion processes in the catchment. River sediment was unpolluted by most of the studied metals (slightly polluted by Ni and Cd). The differences in the values of some parameters (pH and NH_4^+ , PO_4^{3-} , HCO_3^- , Mn, Cd and Pb concentrations) in the water, and heavy metals in the sediment upstream and downstream of some of the barriers were determined. Spatiotemporal changes in the values of studied parameters and

the results of statistical calculation indicate the impact of human activity in the catchment basin (land use, wastewater) on the water chemistry.

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