

Spatial distribution and mobility of elements in river water and river bed sediments from eastern Serbia

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The aim of this study was to determine spatial distribution and mobility of elements in river water and river bed sediments (<180 μm) that were affected by mining and metallurgical activities in Bor and Majdanpek mining areas in eastern Serbia. Geochemical survey was conducted in 2015 and 2016. Total number of sampling points was ~200, with average sampling density of 1 sample per 45 km^2 . Variations of background, threshold and anomalous values of element concentrations were estimated by using histograms and cumulative probability diagrams. Spatial distribution was visualized by using geochemical maps (Fig. 1). Mobility of elements in river water was determined by using geochemical maps of dissolved and particulate forms of elements in river water. Results showed that river water and river bed sediments were greatly and moderately contaminated downstream from Bor and Majdanpek mining areas, respectively. Neutralization of acidic river water occurred after the mixing with bicarbonate-rich natural water of Timok River (250 mg/L HCO_3^-). After the neutralization, Al, Fe, Cu, As and Pb were transported mainly in particulate form, and Mn, Ni, Zn and Cd were transported mainly in dissolved form by water of Timok River toward Danube River.

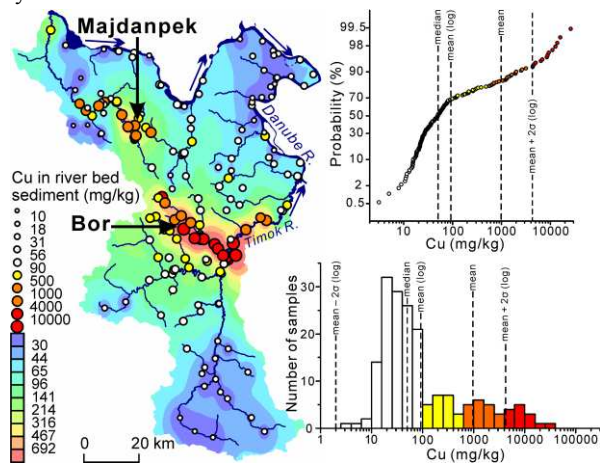


Fig. 1. Geochemical map, cumulative probability diagram and histogram of Cu in river bed sediment from eastern Serbia.