



Overlooked mercury pollution hotspot in the middle Europe and its close relationship to the Skalka Dam Reservoir in the Czech Republic

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Mercury belongs to the most toxic elements in the environment due to bioaccumulation of alkylated species in the food web, therefore at least in most countries all contaminated areas are carefully monitored and documented. However, that does not apply to the Kösseine-Röslau river system (Germany), hotspot heavily contaminated by Hg compounds from abandoned Chemical Factory Marktreidwitz. Although this pollution hotspot is being monitored by state enterprise Povodí Ohře (POH) since 1973, in scientific literature it is almost absent.

In this study, we are focusing on decades old ecological burden, which is still a threat to the entire catchment due to remobilization of polluted sediments. In selected places in the floodplains of the Kösseine and Röslau rivers the channel belt sediments were analysed, with maximal concentrations up to 200-300 mg/kg Hg, which corresponds to 4000-6000 of local enrichment factor. We calculated, that in 22 km long channel belt of the Kösseine-Röslau river system ca. 13 t Hg is deposited and due to laterally unstable channels, bank erosion is one of secondary pollution pathway. This assumption supports ca. 30 years' time series of suspended particulate matter (SPM) from the POH monitoring, which shows spatial and temporal variability, directly dependent on the hydrological regime. The contaminated SPM is further transported to the Skalka Dam Reservoir in the Czech Republic, where retention of major part of transported Hg occurs. However, thus accumulated mercury has a negative impact on the biota in the dam, which becomes another source of contamination. In piscivorous fishes can be found concentrations up to 6 mg/kg Hg, while the hygienic limit for human consumption is 0.5 mg/kg in fresh muscle. Although the outflow values from the Skalka Dam Reservoir varying between 2-10 mg/kg Hg are disturbing, the ongoing transfer of pollution is the real danger.

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