



## **Impact of dam reservoirs on pollutant transport through a river system: Ohre River, Czech Republic**

Martin Faměra (1,2), Michal Hošek (1,3), Tomáš Matys Grygar (1,3), Ondřej Kielar (2), Ondřej Bábek (2), Lucie Majerová (3,4)

(1) Institute of Inorganic Chemistry AS CR, v.v.i., LEGA, LEGA, Řež, Czech Republic, (2) Faculty of Science, Palacký University Olomouc, Czech Republic, (3) Faculty of Environment, J. E. Purkyně University in Ústí nad Labem, the Czech Republic, (4) The Czech Environmental Inspectorate, Ústí nad Labem, Czech Republic

The dam reservoirs, mostly planned as the main flood protection measure, play both positive and negative roles in fluvial environment. Recently most research reports on environmental pollution tend to address potentially negative impacts such as an obstacle of nutrient transport and change in erosion/deposition pattern downstream. The aim our project is to judge the role of the reservoirs in several Czech rivers with contrasting pollution status. The risk element concentration in the Ohre River sediments and suspended particulates was impacted by historical (16th-20th century) activities, in particular heavy metal mining and processing. To characterise the role of reservoirs on that river, it was necessary to evaluate current and historical concentrations of pollutants, i.e. current suspended and bedload sediment, historical floodplain deposits, and dam reservoir sedimentary cores. The Skalka Dam was constructed downstream from a confluence of the Ohre River with its tributary the Kossein River heavily polluted by Hg producing and processing factory in Germany. We found considerable decrease (several times) in Hg concentrations in both suspended particulates and bottom sediments along the dam reservoir. The outflow concentration of Hg was strongly seasonally modulated showing an unexpected complexity in pollutant retention, which will be further studied.

The Nechranice Dam was constructed downstream from several historical ore mining regions (Cu, Pb, Sn, U, mining peak in 16th century) in the middle river reach, where heritage pollution has partly been retained in channel bars and is still remobilised from those temporary sinks. The long pollution history caused that it is hardly possible to establish a geochemical background functions for the Ohre River sediments and it is necessary to work with a ambient background concept. The concentrations of Pb and Zn in the Nechranice Dam bottom sediments are comparable with the maximal concentrations in pre-dam (historical) sediments downstream in the lower river reach. The Pb concentrations in the current river sediments downstream from the dam are about half of those in the dam reservoir bottom.

In the Ohre River system, the reservoirs thus seem to play a beneficial role by preventing downstream pollution transport from areas impacted long before environmental policy has been applied.