

Abstract

In this thesis, water quality and the assessment of anthropogenic pollution in the sediments of the middle course of the Elbe River oxbow lakes Kozelská and Vrt' were studied. It is widely accepted that the oxbow lakes are extremely significant ecosystems, However, a large amount of contaminated material may deposit in these lakes. The pollution probably comes from industrial sources of contamination from the second half of the 20th century. In addition, the oxbow lakes show the development of the riverbed, and contribute to the stability of the river ecosystem.

The research of Lake Kozelská was chosen especially to its proximity to the chemical factory Spolana in Neratovice, which used to be the biggest source of pollution of the Elbe River.

The research included bathymetric measurements, regular observations of hydrological regime, monthly analysis of chemical and physical parameters of water in the period from December 2016 to November 2017, and marginally microscopic analyses of phytoplankton and zooplankton species too. The next part of this research included grain analysis and determination of metal and arsenic concentrations in the sediment fraction of 20 μ m using Aqua Regia leaching and total decomposition as well.

Concerning water quality assessment, these lakes were characterized by higher contents of N-NO₃. Water in Lake Kozelská and Vrt' contained the highest concentration of N-NH₄ among the compared oxbow lakes in the middle course of the Elbe River. Concerning plankton analysis, species occurring in eutrophic reservoirs were found there.

From the point of view of sediment contamination in the surveyed cut lakes, the highest concentrations of measured elements were determined mainly in Lake Kozelská, which confirmed the hypothesis of the spread of industrial contamination from nearby sources of pollution (Spolana, as in Neratovice) probably also upstream during floods, as reported, for example, in 2002. On the contrary, the sediments of Lake Vrt' lake were less contaminated probably due to the impact of the Jizera River, which could dilute the pollution.

Generally, the highest level of contamination was determined in cases of silver and cadmium in the sediments of most of the selected oxbow lakes of the Elbe River. As the research confirmed, at majority of localities in the middle course of the Elbe River, the contaminated sediments of the oxbow lakes represent old anthropogenic loads, which can be remobilized during floods, and this material can represent a secondary source of pollution.