

Ecohydrological survey of streams in urban and suburban landscape. Case study of the Vinoř Brook.

Abstract

This thesis deals with a ecohydrological survey of the Vinoř Brook which was seriously environmentally burdened in the 90s of the 20th century. The ecological status is determined by the assessment of runoff regime, surface water quality, sediment contamination and ecomorphological survey. Data was compiled by the field survey and measurements. Discharges were measured by the hydrometric propeller. The water quality was determined based on the analysis of physico-chemical parameters. The most problematic are compounds of nitrogen. The highest concentration of nitrate and ammonia nitrogen was measured on the upper stream of the Vinoř Brook in the profile No. 1. This profile is influenced by the outlet of the sewage wastewater treatment plant in Kbely. In order to find the old anthropogenic pollution of bottom sediments with heavy metals and arsenic in the vicinity of Biologický pond, sediments from this location were sampled and content of each element was determined by ICP OES method. Subsequently a comparative analysis was made with previous surveys. The observed concentrations of heavy metals and arsenic in sediments in the vicinity of the Biologický pond show that, compared to pollution in the past there was a significant reduction of toxic metals in the sediments. The content of Cd in bottom sediments still highly exceeds the natural background concentrations in sediment. Ecomorphological status was assessed using the EcoRivHab method (Matoušková, 2003). In terms of overall ecomorphological status in the Vinoř Brook basin dominate medium modified reaches. The reason is the land use of the floodplain, which is considerably transformed by built-up area.

Keywords: urban streams, impervious surfaces, water quality, pollution of sediments, heavy metals, ecomorphological assessment

