



The study site monitoring of the Glincica river

M. Brilly, N. Smolar-Ōvanut, M. Toman, S. Rusjan
University of Ljubljana (mbrilly@fgg.uni-lj.si)

The impact of urbanisation on the hydrological cycle is complex and affects almost all-hydrological processes. The overall belief is that urbanisation alters the response of a watershed to rainfall, i. e. by increasing the volume and peak flow and flood risk downstream, decreasing low flows, by increased pollution and reduced stream corridor habitats. However, that is not always the case due to the complex nature of runoff processes involved and thus every case should be analysed carefully. In urban areas the concept of the watershed becomes more complex and difficult to define because the natural topography has been disturbed; the water may be drained through storm drains and in some cases it may be diverted by drains into other basins. Due to past regulations, urban watercourses are frequently considered only as an architectural element or as conduits for sewer and rainfall. In the area of Ljubljana watercourses Ljubljanka, GradaŹeica and the GlinŹeica are regulated in sterile channel cross sections with high concrete banks which separate the water bodies from surrounding urban areas.

The GlinŹeica watershed study site is equipped with weather stations, rainfall stations, two water stations with Doppler velocity meters and sample points for water quality measurement by multipurpose probe. The multipurpose probe measures dissolved oxygen, ammonium and nitrates concentration, pH, specific conductivity, depth, total dissolved solids and temperature. Measurements showed how vulnerable to pollution is the GlinŹeica creek due to typical urban flow regime with extremely low water flows and water content especially in the summer. The measurements have been conducted from July 2003.

Occurrence of a specific pollutant can often be inferred from phytobenthic algae, referred to as indicator organisms. Any environmental contamination is specific, as it depends on physical, chemical and biologic characteristics of waste waters. In general, it may be argued that rich species diversity, however poor in biomass, occurs in clean waters. Increased content of nutrients (presence of organic pollution) reduces

the number of species while tolerant species prevail and grow exuberantly.

Phytobenthic algae can be classified into different saprobic levels, depending on the pollution level at which they occur most frequently. These levels are: oligosaprobic, beta-mesosaprobic, alpha-mesosaprobic and polysaprobic. The species indicating unpolluted water belong to the oligosaprobic level while the species indicating polluted water are included in the polysaprobic level.

The sampling of phytobenthos was carried out in the Glinžèica watercourse at five sampling sites along the watercourse. On the day of sampling, the water level of Glinžèica was low.

The main aim of the present study is to collect the hydrological data and make an inventarisation of phytobenthos along the watercourse and investigate the saprobiological status of the Glinžèica Stream. The results are the basis for future work on ecological restoration of the Glinžèica Stream. Research is a part of URBEM (Urban River Basin Enhancement Methods) case study report. Additional data of monitoring process are also available on the webpage.