Editorial

Impact Of Urban Drainage On Receiving Water Body

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This Mini-Hot Topic on "Impact of urban drainage on receiving water body" presents a series of articles in which the authors describe some of the most serious effects of urbanization on the aquatic environment. Urbanization is a process of spatial growth of urban areas and transfer of human population from rural to urban areas. While at the beginning of 20th century only 10% of the world´s population lived in urban centres, in 2006 it was already 50% of population [1]. The percentage of urban population in developed countries is even higher and reaches 97% in Belgium, 90% in Australia and 82% in the USA. [2]. The impact of urbanization on the environment is typically growing faster than the rate of urban population growth, because advances in communication and the increased desire for personal green space often promote decentralization and urban sprawl [2-4]. Forest and rural land obtain residential, municipal and commercial uses as the human population and its demand for land increase [2, 5, 6]. The land use have been considered particular near surface water bodies, causing a deep impact on the soil and aquatic environment [7]. The other effects of increasing urbanization include chemical pollution of small streams and urban reservoirs, and changes of hydrological and morphological conditions due to impact of urban drainage.

The current definition of the urban drainage system purpose is to drain safely and quickly all types of waste water (e.g., from households, industry), water flowing from impervious surfaces and infiltrated water from urban areas into waste water treatment plants (WWTP) [5]. The purpose of the urban drainage is to provide sanitary and ecological safety for human population living in urban areas. The urban drainage system consists of sewer system, waste water treatment plant and the receiving water body, usually river, creek or reservoir. The combined sewerage is the oldest type of sewer system and drains both waste water and the surface runoff incl. infiltrated water to the WWTP. The other type called "storm water drain" operates only during rain events and drains only the surface runoff. The combined sewer operates continuously; during dry period all waste water goes to the WWTP, but during rain events a part of the diluted waste waters overflows to the recipient. Combined sewer overflows satisfactorily treat the technical and economical limitation of sewerage and WWTP operation; however, they are important source of pollution and cause a hydraulic stress for the aquatic biota.

The operation of urban drainage systems cause the following problems related to protection of the recipients [7-9]:

- Quick drainage of surface runoff from impervious surfaces increases the natural discharge in small creeks.
- The rapidly drained surface runoff cannot recharge the groundwater.
- Rain and snowmelt events increase the pollution of recipients.
- The diluted waste water diminishes the efficiency of WWTP.
- Biological diversity of the aquatic community decreases.

The complex understanding of the urban drainage effects on recipients is crucial for sustainable protection and restoration of aquatic systems. There is an urgent need for a design of new urban drainage systems which would include not only protection of human population, but also protection of the environment from anthropogenic activities. The purpose of this journal issue is therefore to demonstrate the interactions between urban drainage and recipients within the entire urban drainage system.

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