Geophysical Research Abstracts, Vol. 9, 02812, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-02812

SEASONAL IMPACT OF ALGAE ON THE VELOCITY OF THE GLINŠ

M. Padežnik, M. Brilly, L. Štravs, A. Vidmar, S. Rusjan

University of Ljubljana, Faculty of Civil and Geodetic Engineering, Chair of Hydrology and Hydraulic Engineering, Jamova 2, SI-1000 Ljubljana, Slovenia (srusjan@fgg.uni-lj.si)

The Glinščica stream has its source under the northeastern slopes of Toško čelo and at Podutik passes into the plain area of the Ljubljana Plain. The topography of the basin is comprised of a hilly area to the east and west and a plain area that spreads out in the southern part. The relief of the Glinščica drainage basin is versatile, comprising hilly headwater areas as well as plains. The precipitation watershed area of the Glinscica comprises 17.4 km2. The position of the runoff within the urban area is determined by the removal of rainfall water by way of a sewage system, thus the orographic barrier fails to coincide with the Glinščica drainage. The total drainage area of the Glinscica up to its outlet into the Gradaščica is somewhat bigger and comprises 19.3 km2 of the catchment area. There are an estimated 38 % of urban areas, that is 6.6 km2. The lowland areas of the river are extensively urbanised. The river has been extensively modified for flood protection through consolidation of the banks and river bed with concrete plates. A monitoring site with an ultrasonic Doppler instrument for measuring water velocity, depth and temperature of water was set up. In the two-year period more than ten high flow events were recorded. Instrument measures water velocity by using the doppler principle, which relies on suspended particles or small air bubbles in the water to reflect the ultrasonic detector signal. Water depth is gauged by a hydrostatic pressure sensor, referenced to atomospheric pressure through the vented power and signal cable. Recorded water velocity was modelled as a function of recorded water depth and the presence or absence of the vegetation in the river cross section. M5 machine learning method as implemented in the WEKA environment was used to generate model and regression trees of the recorded flow velocity. The obtained results clearly reflect the physical characteristics of the gauging station's cross section. Significant impact of algae in the summer season was also observed; measured water

velocity is approximately 20% lower at the time of low flow conditions.