



Calculation of riparian evapotranspiration from diurnal rhythm of groundwater level and baseflow

Z. Gribovszki (1, 2), P. Kalicz (1), M. Kucsara (1), J. Szilágyi (2, 3)

(1) Institute of Geomatics and Civil Engineering, University of West Hungary, (2) Department of Hydraulic and Water Resources Engineering, Budapest University of Technology and Economics, Hungary, (3) School of Natural Resources, University of Nebraska, Lincoln, NE, USA. (zgribo@emk.nyme.hu, Phone: +36-99-518314)

Riparian vegetation has great influence on groundwater level and groundwater-sustained stream baseflow, therefore calculation of correct evapotranspiration values is very important, from the point of view of natural protection tasks and also from the point of view of utilization of water resources. Numerical hydrodynamic models demand exact groundwater evapotranspiration data also so as to calculate regional or local water balance.

Periodical fluctuation of hydrological features like diurnal patterns of groundwater and groundwater-sustained stream baseflow (in a riparian or a shallow groundwater environment) can be closely linked to water use by vegetation. A new technique was developed with two versions (empirical and hydraulic) to calculate riparian zone evapotranspiration rates from groundwater-level and from stream baseflow diurnal signal. The method was tested with hydro-meteorological data from the Hidegvíz Valley experimental catchment, located in the Sopron Hills region at the western border of Hungary.

Evapotranspiration rates of these new methods were compared with each other. The evapotranspiration rates calculated from the groundwater signal are typically higher than the ones obtainable from the baseflow signal with earlier well-known methods. With the application of the above mentioned new technique for baseflow signal analysis a similar magnitude of the ET rates can be calculated as from groundwater level

readings.

Keywords: evapotranspiration, diurnal pattern, groundwater, baseflow