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Canopy interception variability in changing climate

Péter Kalicz, András Herceg, Balázs Kisfaludi, Péter Csáki, and Zoltán Gribovszki
University of West Hungary, Institute of Geomatics and Civil Engineering, Hydrology, Sopron, Hungary (kalicz.peter@nyme.hu)

Tree canopies play a rather important role in forest hydrology. They intercept significant amounts of precipitation and evaporate back into the atmosphere during and after precipitation event. This process determines the net intake of forest soils and so important factor of hydrological processes in forested catchments. Average amount of interception loss is determined by the storage capacity of tree canopies and the rainfall distribution.

Canopy storage capacity depends on several factors. It shows strong correlation with the leaf area index (LAI). Some equations are available to quantify this dependence. LAI shows significant variability both spatial and temporal scale. There are several methods to derive LAI from remote sensed data which helps to follow changes of it. In this study MODIS sensor based LAI time series are used to estimate changes of the storage capacity.

Rainfall distribution derived from the FORESEE database which is developed for climate change related impact studies in the Carpathian Basin. It contains observation based precipitation data for the past and uses bias correction method for the climate projections.

In this study a site based estimation is outworked for the Sopron Hills area. Sopron Hills is located at the eastern foothills of the Alps in Hungary. The study site, namely Hidegvíz Valley experimental catchment, is located in the central valley of the Sopron Hills. Long-term interception measurements are available in several forest sites in Hidegvíz Valley. With the combination of the ground based observations, MODIS LAI datasets a simple function is developed to describe the average yearly variations in canopy storage. Interception measurements and the CREMAP evapotranspiration data help to calibrate a simple interception loss equation based on Merriam's work. Based on these equation and the FORESEE bias corrected precipitation data an estimation is outworked for better understanding of the feedback of forest crown on hydrological cycle.

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