



## **The Dragonja river experimental watershed**

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The Dragonja river basin is situated on the border between Slovenia and Croatia. Due to political and social circumstances and poorly managed agriculture in the past, the catchment area has been depopulated in the past decades, leaving the forests to develop in the abandoned agricultural fields. The changes in land use changed the hydrology of the catchment a great deal. The Dragonja watershed was chosen as an experimental watershed, since it is interesting because of the intensive natural reforestation in the last decades, which has caused a decrease in minimal and maximal flows. At the same time no noticeable climate (precipitation and temperature) changes have been perceived. The main intention of the project (experimental watershed) is to figure out the impact of changed land use on the water balance of the entire watershed and to determine the hydromorfological changes of the river basin.

Precise measurements in the last few years were the basis for cooperative scientific work between the Vrije Universiteit from Amsterdam and the University of Ljubljana, which resulted in several PhD Theses, Master Theses and scientific articles. At the same time the experimental watershed provided support to the teaching and studying process. Until now, many students from Amsterdam (VUA), Ljubljana (UL) and Freiburg (UF) have performed their field work and organized workshops on the subject of the catchment.

Measurements included rainfall measurements (ONSET Rain gauge) in several locations (Labor (2x), Marezige, Kocjančiči, Sirči, Rokava, Boršt, and Stara Vala). We also established research plots in the forest where we analysed the forest hydrological cycle. Precipitation above the canopy, throughfall and stemflow in each plot were measured. Rainfall above the canopy was measured with a tipping bucket rain gauges and with totalisators (manual gauges) for control. Throughfall was measured with two

steel gutters in combination with ten manual gauges in each plot, which were emptied and moved randomly every time. Stemflow was measured on two most typical species in each plot. Litter was collected regularly in 10 baskets for LAI (Leaf Area Index) estimation. For the same purpose and at the same points, hemispherical photographs of canopies were taken and three series of measurements of photosynthetically active radiation (PAR) were made.

For the needs of studying the processes of soil erosion and sediment transport in the Dragonja experimental catchment we measured discharge of the Dragonja river and took sediment samples (ISCO) in the Rokava catchment (the biggest tributary in the upper part of the Dragonja catchment). Part of the research in the Dragonja experimental watershed deals with the development of a new synthesis method of assessing the hydromorphological status of river corridors based on state analysis of the Dragonja river. The bases of the new method were time effectiveness of data gathering and accuracy of the method. Prior to the practical research implementation, a concept of a rapid transect data gathering was designed. Additionally, an extensive hydromorphological record sheet was elaborated, including a combined list of hydromorphological variables.

The conclusions of this project will improve the current understanding of hydrological processes, conditions and interaction between water, soil, deciduous forest and climate in the representative watershed of the Dragonja river.