# Hydrological investigation of the nonhomogeneous karstic catchment using stable isotopes

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Combination of stable isotopes measurements and more frequently used measurements such as rainfall or discharge data observations can be used to investigate hydrological characteristics of the nonhomogeneous catchments. For example, with stable isotopes flow paths of rainfall water to the river network can be determined and mean residence times can be estimated. Using only rainfall or discharge observation, this is a more complicated task. Further, combination of this data can be used for improving existing hydrological models usually based on some pre-defined conceptual assumptions.

As part of the research project entitled Modelling of Hydrologic Response of Nonhomogeneous Catchments stable isotopes (18O, 2H) are used for the determination of the hydrological control mechanisms, which regulate rainfall runoff in individual hydrologically homogeneous sub-areas (e.g. Karstic area). The study area of the project is the Ljubljanica River catchment in Slovenia that covers almost 2,000 km2, most of the area has karst hydrological characteristics. Furthermore, part of the catchment also has torrential properties, which results in complex, non-homogenous hydrological response of the catchment. More than 18 months of monthly rainfall sum measurements (18O and 2H were determined for these samples) at six different locations have been carried out and several surface runoff events have been measured using the automatic Manning sampler (18O and 2H were determined). Moreover, measurements of low flows are also periodically performed. The main results of the on-going project will be presented.