



## **Applicability of recession extraction approaches and recession analysis methods procedures to karstic springs**

Kubra Ozdemir Calli (1) and Andreas Hartmann (2)

(1) Wageningen University and Research, Hydrology and Quantitative Water Management, Wageningen, Netherlands (kubra.ozdemircalli@wur.nl), (2) University of Freiburg, Institute of Earth and Environmental Sciences, Friedrichstrasse, 79098 Freiburg, Germany

Recession analysis is a common method to characterize karstic aquifers and their discharge dynamics. Although this technique provides a crucial information on quantifying system hydrodynamic properties based on determining recession constants, the typically manual selection of recession curves is neither a practical technique to cover all candidate recession curves occurring during long spring discharge time series, nor it is allowing to extract the entire hydrological diversity of the recession behaviour.

In this study, automated recession analysis procedures, which are commonly used in streamflow recession curve analysis, were investigated for their applicability to extract candidate karst spring recession curves. Three recession extraction methods including Vogel Method, Brutsaert Method and Aksoy and Wittenberg Method are comparatively evaluated. In order to evaluate the methods' applicability for karst systems, independent data such as electrical conductivity, temperature and stable isotope, were used to identify recession times and their characteristics.

By applying our comparison to seven different karstic springs located on Austria, Germany and France, which show different hydrodynamic behaviours possible weakness of the recession procedures are determined. We finally provide directions on how recession analysis procedures for karst spring flow could be improved considering spring hydrochemical signatures.