

EGU21-4009, updated on 17 Oct 2021

<https://doi.org/10.5194/egusphere-egu21-4009>

EGU General Assembly 2021

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## Proposal of a typology of karst systems functioning based on relevant indicators of karst springs hydrodynamics

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10% of the world's population is dependent on karst water resources for drinking water. Understanding the functioning of these complex and heterogeneous systems is therefore a major challenge for long term water resource management. Over the past century, different methods have been developed to analyse hydrological series, and subsequently characterize the functioning of karst systems. These methods can be considered as a preliminary step in the development and design of hydrological models of karst functioning for sustainable water resource management. Recent progress in analytical tools, as well as the emergence of data bases of discharge time series (e.g. the French SNO KARST database and the WoKaS database at global scale) allow reconsidering former typology of karst system hydrodynamic responses. Ten karst systems and associated spring discharge time series were considered for developing the typology. The systems are well-known with a high-quality monitoring and they cover a wide range of hydrological functioning, which ensure the relevance of the analyses. The methodology for the assessment and the development of the typology consisted in (i) the analysis of springs discharge time series according to four different methods, (ii) the selection or proposal of the most relevant indicators of karst systems hydrodynamics, and (iii) the interpretation of the information from these indicators based on principal component analysis and clustering techniques. A typology of karst systems accounting for 6 different classes is finally proposed, based on 3 aspects of functioning: the capacity of dynamic storage, the draining dynamic of the capacitive function and the variability of the hydrological functioning. The typology was applied to a wider dataset composed of spring discharge of 78 karst systems. The results show a relevant distribution of the systems among the different classes.