

Forecasting and mitigation of flooding in a Mediterranean karstic watershed

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Abstract Extreme rainfall on Mediterranean karstic watersheds can lead to flash floods that may cause serious human and material losses. The anticipation of these events and the risk management during flood events are at the core of society and financial stakes. Karstic aquifers should also be considered as valuable groundwater resources. An active management of these aquifers may allow for an optimal use of water resources, while regulating the influence of the karst during flood risk periods. This study was carried out in the framework of the “Multiple-Use Management of the Mediterranean Karstic Aquifer of the Lez River” project. It aimed at identifying the impact of the anthropic management of the water resource and floods under the present and future climate on the catchment. This project led to building a graphical method (toolbox for flood management presented as an abacus) for (i) a better understanding of the evolution of the water volume of the karstic system, the river discharge and the propagation of floods through constructed infrastructure of the river in urban areas, (ii) real-time flood forecasting, and (iii) analysing the impact of climate projections and active management scenarios with respect to the water in the karstic system as well as with respect to the flooding areas. The use of active management is thus shown to increase the availability of water resources while reducing flood risks.

Key words flood forecasting; active management of water resource; karstic system; climate change; Lez