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A simple but robust assessment of present and future karst systems recharge. To what extent does it help water managers for future water management?

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Karst systems constitute aquifers in which infiltration and groundwater flows are generally complex processes and are characterized by a limited knowledge in terms of geometry and structure. Nonetheless, they often represent interesting groundwater resources, which interest for will likely increase in the future, thanks to their strong infiltration and storage capacity, in a broad context of future higher water scarcity.

The karst systems of the French Jura Mountains (Doubs and Loue basins, i.e. about 5000 km²) eastern France, are complex systems where estimating the groundwater resource is challenging. As a consequence, they are probably not exploited in line with their potential resource. Moreover, water managers of the region lack of information for future strategy building in the context of climate change. We propose a simple but robust estimation of groundwater recharge of such systems using a multi-method approach at the system scale combined to a gridded water budget approach at the regional scale. The combination of both approaches allows providing recharge time series at the systems scale, homogeneous recharge maps at the regional scale and uncertainty estimation associated to the calculation methods. Applying several climate scenarios provide a way to explore the future situation. As a conclusion, how water managers can handle this information and use it for future water management planning will be discussed.