

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

Yvan Caballero, Laïla Zerouali, Sandra Lanini, Jean-Baptiste Charlier, Enora Lucas, Laurent Cadilhac, Christian Pagé

## **► To cite this version:**

Yvan Caballero, Laïla Zerouali, Sandra Lanini, Jean-Baptiste Charlier, Enora Lucas, et al.. A simple but robust assessment of present and future karst systems recharge. To what extent does it helps water managers for future water management?. Eurokarst 2016, Sep 2016, Neuchatel, Switzerland. 2016. <hal-01310730>

**HAL Id: hal-01310730**

**<https://hal-brgm.archives-ouvertes.fr/hal-01310730>**

Submitted on 3 May 2016

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

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

Caballero Y.\*<sup>1</sup>, Zerouali, L.<sup>1</sup>, Lanini S.<sup>1</sup>, Charlier J.B.<sup>1</sup>, Lucas E.<sup>1</sup>, Cadilhac L.<sup>2</sup>, Pagé C.<sup>3</sup>

\*corresponding author: [y.caballero@brgm.fr](mailto:y.caballero@brgm.fr)

1 – Brgm, French Geological Survey, D3E/NRE, Montpellier, France

2 – Rhone-Mediterranean & Corsica Water Agency, Lyon, France

3 – CERFACS (Centre Européen de Recherche et de Formation Avancée en Calcul Scientifique), Toulouse, France

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 km<sup>2</sup>) 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.