



Hydrological response of karst systems to large-scale climate variability for different catchments of the French karst observatory network

INSU/CNRS SNO KARST

Nicolas Massei (1), David Labat (2), Hervé Jourde (3), Nicolas Lecoq (1), and Naomi Mazzilli (4)

(1) Normandie Univ, UNIROUEN, UNICAEN, CNRS, M2C, 76000 Rouen, France (nicolas.massei@univ-rouen.fr, nicolas.lecoq@univ-rouen.fr), (2) Géosciences Environnement Toulouse – Université de Toulouse (david.labat@get.omp.eu), (3) Université Montpellier, Laboratoire HydroSciences Montpellier, France (herve.jourde@umontpellier.fr), (4) UAPV, UMR1114 EMMAH, F-84914 Avignon, France (naomi.mazzilli@univ-avignon.fr)

The french karst observatory network SNO KARST is a national initiative from the National Institute for Earth Sciences and Astronomy (INSU) of the National Center for Scientific Research (CNRS). It is also part of the new french research infrastructure for the observation of the critical zone OZCAR. SNO KARST is composed by several karst sites distributed over conterminous France which are located in different physiographic and climatic contexts (Mediterranean, Pyrenean, Jura mountain, western and northwestern shore near the Atlantic or the English Channel). This allows the scientific community to develop advanced research and experiments dedicated to improve understanding of the hydrological functioning of karst catchments. Here we used several sites of SNO KARST in order to assess the hydrological response of karst catchments to long-term variation of large-scale atmospheric circulation. Using NCEP reanalysis products and karst discharge, we analyzed the links between large-scale circulation and karst water resources variability. As karst hydrosystems are highly heterogeneous media, they behave differently across different time-scales : we explore the large-scale/local-scale relationships according to time-scales using a wavelet multiresolution approach of both karst hydrological variables and large-scale climate fields such as sea level pressure (SLP). The different wavelet components of karst discharge in response to the corresponding wavelet component of climate fields are either 1) compared to physico-chemical/geochemical responses at karst springs, or 2) interpreted in terms of hydrological functioning by comparing discharge wavelet components to internal components obtained from precipitation/discharge models using the KARSTMOD conceptual modeling platform of SNO KARST.