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Karst groundwater resources assessment by application of the KARSYS approach - Plateau de Sault (France)

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In the framework of a multi-source funded project (French Water Agencies, French Councils, BRGM), karst groundwater resources of the Plateau de Sault (middle-eastern Pyrenees, Southern France) are being evaluated. These karst aquifers are little exploited but they are considered as a future potential groundwater resource to supply the area which is frequently exposed to summer droughts, and which will experience increasing periods of water scarcity in the coming decades. Indeed, a future deficit for drinking water is estimated around 15 000m³ per days in the surrounding region of the plateau. The first part of the project focused on a synthesis of all the existing geological, geomorphological and hydrogeological data, especially those that concern the two most significant karst flow-systems in this area: Fontestorbes and Font-Maure. This synthesis highlighted some lack of information, leading to additional field investigations (geophysics, hydrological monitoring, physicochemical campaigns, etc.). At this point, it was necessary to find a way to bring together all the previous and new information through a conceptual model of flow within the karst aquifer of the Plateau de Sault. The KARSYS approach has thus been selected and applied to provide a first explicit hydrogeological model of the main karst systems. Geomorphological forms and speleogenesis evidences are considered for establishing the inception and the speleogenetic models. These two models are then combined into a hydrogeological 3D model in order to provide clues on the probable conduits location. This hydrogeological 3D model of the Plateau de Sault will serve a decision-making support in order to improve groundwater management. It will also be used to identify where and which additional data should be collected to enhance our understanding of karst flows. Based on this model, future strategies concerning the exploitation and the protection of the aquifer resources may be tested and discussed.