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{Use of isotopic tracers for the study of the interaction of surface water and groundwater in a karst environment.}

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Groundwater and surface water resources management represents a present key issue, both in the hydrogeological and the hydrological fields. An integrated approach, accounting for hydrogeological, hydrological, geochemical and biological features can be a valuable tool, being fundamental in karstic landscape because of the great system variability and because of the frequently complex anthropic interaction.

In this study we focus on a particular case study, the Bussento river basin, located in the Campania region, Southern Italy, which is well known to hydrogeology and geomorphology scientists for its karstic features, as summit highland with dolines and poljes, lowland with blind valleys, disappearing streams into sinkholes and cave systems. The catchment groundwater circulation is very complex and frequently groundwater inflows from the outside of the hydrological watershed and groundwater outflows toward surrounding drainage systems occur. We aim at propose a validation of a conceptual hydro-geological model (Guida D. et al., 1980; Iaccarino G., et al., 1986; e Guida D. et al.,1988, Guida D. et al., 2005) and to this purpose a measurements campaign, of about one year, has been undertaken along the Bussento for the acquisition of data about the Rn222 concentration in the waters, using a Rad7 water probe and a Rad7H2O (Durridge Inc., South Australia). Besides radon concentration, more chemical and physical variables have been measured, such as pH, water temperature, dissolved oxygen, atmospheric pressure, water conductivity, water resistivity. The preliminary results enable us to consider this as an useful methodology for the localization of the contributions of the groundwaters, diffused along the riverbed, and for their proportional assessment compared with the superficial back return flow. This program will allow at the end of the investigation to have an innovative methodology for the separation of quick, delayed, return flows from the base-flow, due to groundwater contributions as a function of groundwater recharge and hydrological and geomorphological river bed dynamics.