



Measuring groundwater - river interaction using ^{222}Rn tracer in karstic mediterranean environment. A case study: the Bussento river and the Policastro gulf system

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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 a number of karstic features. As a consequence, the catchment groundwater circulation is very complex: a conceptually based hydrogeological model is investigated as a supporting element in assessing hydrological water quantity and water quality, in a semi-distributed conceptually based framework, supported by field measurements collected within several seasonal campaigns. Even though the proposed approach has some similarity with a few well-known conceptually schemes, it is valuable because of the possibility to join all together hydraulic, hydrological and hydrogeological data to achieve reliable results. As a support for hydrological modelling tasks, a measurements campaign has been undertaken from July 2007 to January 2008 along the Bussento river and in some coastal locations of the Policastro gulf for the acquisition of data about the Rn^{222} concentration in the waters, using a RAD7 Wa-

ter Probe and a RAD7 H2O (Durrige Inc., U.S.A.). Besides radon concentration, more chemical and physical variables have been measured (pH, water temperature, dissolved oxygen, atmospheric pressure, water conductivity, water resistivity). The preliminary results enable us (i) to localize and to quantify the contributions of the groundwater along the riverbed; (ii) to localize and quantify, along the coast, the deep groundwater flow losses directed towards the Policastro gulf; (iii) to have an innovative methodology for the separation of the base-flow from the other flow components.