



Vulnerability of the karstic aquifers: the example of the Castelluccio hydrogeological system in Southern Italy

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The mountain region of Basilicata, southern Italy, is rich of good quality groundwater mainly flowing within large carbonate hydro-structures. One such example is represented by the Castelluccio karstic aquifer system, characterized by peculiar hydrogeological and hydrodynamic features. This aquifer formed by limestone and dolomitic limestone showing different degrees of fissuring and, in places, karstic features. Its conspicuous groundwater flows with mean discharges of about 500 l/s and outpurs from several scattered springs, most of which are not adequately exploited or they remain even uncollected. The main spring is located at San Giovanni di Castelluccio and it is represented by some resurgences outpuring along an important high-angle fault plane, which places side by side the high-permeability fissured limestones and the low-permeability fluvial-lacustrine sandy-to-muddy deposits, so generating a typical fault-spring case. In the present research, the integrated analysis of geological, geomorphological, hydrological, hydrogeological and geochemical data allowed to evaluate the hydrodynamic condition and the vulnerability to pollution of the aquifer system. In a second phase, all data will be implemented by GIS thus assuring a good representation of the spatial variability of environmental phenomenon.