



Carbonate aquifer systems: fault-controlled groundwater flow and vulnerability

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In the Mediterranean area, groundwater from carbonate aquifers is an important drinking water resource, which is, however, particularly vulnerable to contamination. The Castelluccio area (Region of Basilicata) represents one of the most important carbonate aquifer system in southern Italy. This aquifer formed in limestone and dolomitic limestone shows different degrees of fissuring and, in places, karstic features. The considerable groundwater flows with mean discharges of about 500 l/s and outpurs from several scattered springs. 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, several structural surveys integrated with hydrological, hydrogeological and geochemical data we analyse to a) evaluate the influences of the principal structures elements to groundwater flow; and b) define the conceptual hydrogeological model and the intrinsic vulnerability to pollution of the aquifer system.