



Aquifer Vulnerability maps and climate change

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The aquifer vulnerability maps to contamination are used worldwide by environmental agencies and water-resource managers with the aim of preserving the water resources and of evaluating the most suitable areas where to locate new settlements.

In the parametric methods, more used to assess the groundwater contamination vulnerability, e.g. the DRASTIC and the AVI methods, an important role is played by the protective capacity of cover layers to the introduction and transport of contaminants into the aquifer. Therefore, these methods point out the importance of the "Depth to water" parameter, which represents, where the aquifer is unconfined, the depth of the piezometric level and, where the aquifer is confined, the top of the aquifer.

This parameter is rarely variable in confined aquifers and in deep unconfined aquifers, as karst aquifers, where the piezometric oscillations are low, compared with the depth of the water table. On the contrary, in shallow aquifers of flat areas, where in addition a large number of human activities are practiced and the contamination risk is high, the piezometric level varies suddenly with the rainfall, and it is very sensitive to drought periods and climatic changes. This affects noticeably the "Depth to water" parameter and consequently the vulnerability maps (e.g. 3 m of piezometric lowering can produce a change in the DRASTIC index from 10 to 7...).

To validate this hypothesis, the DRASTIC and AVI methods have been applied on a shallow aquifer located in a flat area in Campania (Italy,) considering data corresponding to an average rainfall period and to a drought period.