



## **Contamination risk of the Alburni karst aquifer (Southern Italy)**

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The Alburni massif (1742 m a.s.l.) stretches NW-SE, about 23 km long and 9-10 km wide, covering 246 km<sup>2</sup> with an average elevation of about 940 m a.s.l.. This massif, with more than 500 caves, is the most important karst area of southern Italy, the drainage network is not continuous, and there are several endoreic basins and large zones without superficial drainage but with many sinkholes and dolines.

The areas of concentrated infiltration are represented by little graben located on the plateau, especially in the central sector, feeding one or more ponors that show high discharges, in coincidence with heavy rainfall.

The karstic channels (> 100), well explored in the past, directly communicate with the above mentioned infiltration areas. The most important ones are well hierarchised and with a wide extension. Some of them feed an important spring (1m<sup>3</sup>/s) with a very short transit time; others instead communicate directly with the basal water table related to other springs ( $Q > 3 \text{ m}^3/\text{s}$ ).

Some ponors are just above the basal water table and located in urbanized areas; for years in the past a ponor has been transferring directly pollutants into the aquifer.

The contamination vulnerability map shows that the prevalent vulnerability degrees are high and very high, due to the widespread karstification of the area and to the presence, on the plateau, of large vegetated areas with gentle slopes favouring fast infiltration.

Interpreting the information on the map in the light of land use, development planning and groundwater protection, the Alburni karst area requires great care regarding the

location of the potential contamination sources.

Therefore, it is important the knowledge of the human impact on the area and, consequently, of the contamination risk of the aquifer of the Alburni karst area. The adopted groundwater contamination risk assessment method follows the approach of previous studies, optimised by developing new analytical procedures using a GIS, to construct and overlay thematic maps. The following three main layers have been created to assess the groundwater contamination

- the vulnerability map;
- the hazard map;
- the value map.

The final map shows interesting results, especially regarding the contamination due to the contents in metals and trace elements in breeding residues, and stresses the need for the GIS to test and improve on the groundwater contamination risk assessment methods.