

Degradation of coastal aquifers of the Adriatic and Ionian Sea: the framework of knowledge

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Keywords: carbonate aquifer, seawater intrusion, geodatabase, Mediterranean Sea.

The progressive population growth in coastal areas and the increasing groundwater discharge, together with peculiarities of karst coastal aquifers constitute a huge worldwide problem, particularly relevant for coastal aquifers of the Mediterranean basin (Tulipano et al., 2005).

Karst aquifers in coastal regions are well known to be highly vulnerable to the overexploitation of groundwater resources, both from water increasing demand than from decreasing aquifer recharge due to climate changes. The coastal carbonate aquifers of the Mediterranean Sea, in particular the Adriatic and Ionian coast that extend between western Greece and Italy up to the eastern coast of Sicily not only ensure the socio-economic development of the populations but feeds with spring waters valuable wetland environments with negative effects on ecosystems (Barrocu, 2003; Bonacci, 2014; Eftimi & Zojer, 2015; Polemio, 2016).

The aim of this study is to develop management and forecast tools to identify the best way to assure enduring availability of high quality groundwater, and conciliate irrigation and drinking water demands. A geodatabase, collecting information for all carbonate aquifers present along the Adriatic and Ionian coast, will be first created. At the core there is a Geographic Information System, in which are placed the spatial information regarding the geology of aquifers, hydrogeological and geochemical features, together with climatic conditions and specific information concerning past, present and future groundwater usage.

The availability of tools that allow the integrated analysis of local hydrogeological situations, in reference to the wider areas where they are located, allows numerous applications. The system, in fact, is not only aimed to archiving, querying and mapping, but also to operate spatial analysis and the implementation of calculation systems, to return the hydrogeological conceptual models, supporting both the management of groundwater resources and the knowledge for the protection of coastal environments, and groundwater in general.