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0.1 Study and prevention of groundwater contamination in a sample coastal area

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The deep groundwater contamination risk map of a sample coastal area between Taranto to the North and P.Cesareo to the South on the Lower Ionian coast of Italy was produced. The aims of the research are to assess the intrinsic vulnerability, obtained using SINTACS method, and to compare these results with the evidences got by observations in situ. Geographical Information System (GIS) played an important role for constructing and overlaying thematic maps, integrating data related to the geological studies with the antrophic

factors of degradation.

The area has been chosen for their peculiar geological and hydrogeological features. The basement of the region is of Mesozoic carbonate rocks, accommodating deep groundwater, covered by lower-middle Pleistocene deposits, resulting from the sedimentary cycle of the Bradanic foredeep. These deposits are surmounted in succession by terraced bioclastic marine deposits, constituting superficial aquifer, Holocene continental deposits and recent continental deposits. The morphology is characterised by a broad plain, slightly sloping towards the sea, in many places marked by natural and/or man-made channels which form the drainage network. The coastal belt is one of the most beautiful of the Ionian gulf because of the existence of humid zones, dune bars and lagoon areas. Furthermore, the area is interested by spring phenomena. In the last few years it is registered a gradual and constant fall in the volume of underground waters available in the main water-structures of the region; this is consequent to the overexploitation of groundwater resources through excessive extraction.

The use of GIS in the domain of prevention and mitigation of natural catastrophes is a priority task for a correct environmental planning. Several surveys have been performed for a detailed geological

characterisation of the surface and of the subsoil; an example of a GIS hydrogeological database has been designed using these data.

The obtained results show interesting aspects and the need to test and to improve the groundwater contamination risk assessment methods. An efficient barrier to effective risk reduction is in designing different hazard scenarios, that are to be assessed and to be mapped, and in providing disaster managers.