



Vulnerability map of the Nebrodi Mts Area (Sicily)

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Abstract

The Nebrodi Mountains are located in Northern Sicily (Central Mediterranean). They are mainly constituted by Mesozoic-Tertiary terrigenous-clayey successions and subordinately from carbonatic and crystalline rocks, respectively of Mesozoic and pre-Triassic age. These successions represent among the inner tectonic units of the Sicilian chain.

In this area the human impact is very low, it is made up of the most important and largest wood areas of Sicily (about 50,000 hectares), the main elements are the very rich vegetation (endemic flora and fauna species) and the humid environments.

Aquifer vulnerability mapping is a tool that can be used to protect groundwater resources and their final use. The thematic map identifies areas where contamination of surface water is more or less likely to result in the contamination of groundwater.

In this study a groundwater vulnerability map was produced, the mapping method applied was the Homogeneous Area Zoning, based on the survey of hydrogeologic complexes, characteristics and settings (HCS), to be used in mountainous and hilly areas where a scarcity or lack of underground information is normal (basic method CNR-GNDCI: Civita, 1990, 1994; AA.VV., 1988).

Moreover the vulnerability map was integrated considering all the potential pollution sources considered as continuous danger points including even the points with occasional dangerousness.

GIS technology may provide greatly increased efficiency in data handling, analytical capability and display flexibility. GIS model has been developed for the aquifer system of the Nebrodi area.

It been used to integrate various data layers that are involved in the vulnerability assessment, as support of analysis and modelling of spatial and physical relationships of critical environmental variables and parameters and at the end to display of results in the form of maps.

references:

Civita M. (1990) - Legenda unificata per le carte della vulnerabilità all'inquinamento dei corpi idrici sotterranei/Unified legend for the aquifer pollution vulnerability maps. Quaderni di Tecniche di Protezione Ambientale, Sezione "Protezione delle Acque Sotterranee", Studi sulla vulnerabilità degli acquiferi, 1 (Appendice), Pitagora Editrice, Bologna.

Civita M. (1994) - Le carte della vulnerabilità degli acquiferi all'inquinamento: teoria e pratica. Quaderni di Tecniche di Protezione Ambientale, Sezione "Protezione delle Acque Sotterranee", 31, Pitagora Editrice, Bologna.