

PRESENTATION

The assessment of aquifer vulnerability to contamination by surface sources is a topic of discussion between geologists and hydrogeologists due to the qualitative aspects involved in most parametric methods. The Workshop on Aquifer Vulnerability and Risk, AVR-03, held in Salamanca, Mexico, in late May 2003, offered opportunities for groundwater people to present, discuss, and analyze new approaches and experiences in this field of modern hydrogeology. This issue of *Geofísica Internacional* presents a selection of papers from the workshop.

The main objective of the Workshop was to address a multidisciplinary, international forum of scientists, stakeholders, and decision makers with experience in groundwater vulnerability and contamination issues. We discussed and evaluated various methodologies of vulnerability and risk assessment to demonstrate how those methodologies can help in understanding and prevention and remediation of groundwater pollution. Vulnerability zoning can identify areas at risk and help design groundwater monitoring networks. Vulnerability assessment can provide criteria for the protection of wells and catchment areas.

Aquifer vulnerability assessment is becoming more quantitative. Users are adapting new techniques of data acquisition, management and processing. Vulnerability thematic maps are being generated by means of Geographic Information Systems. In this way, vulnerability mapping can be easily incorporated in territorial ordering and urban planning.

Features like faults, fractures, water bodies and riverbeds are being incorporated in most assessment methods. Water pipeline and sewage leaks, green areas, and recharge alter the vulnerability of urban aquifers. There are interesting alternatives for karst regions. Some researchers are considering seawater intrusion. The role of soils in contaminant retardation is being incorporated in methods such as SINTACS.

Alternatives of validation and verification are being reviewed. If a pollution source is located in a vulnerable area, solutes coming from it may be present in the local aquifers. Vulnerability has its own dynamic constraints, mainly watertable evolution. Early vulnerability evaluations did not mention the dynamic character of vulnerability. Incorporation of mathematical models of flow and solute transport in vulnerability assessments will facilitate the analysis of temporal and spatial evolution.

Aquifer vulnerability is not a new field in the hydrogeological sciences. It may sometimes be seen more like a technique than a methodology. Vulnerability assessment is not a common research line in most groundwater groups; yet the versatility of thematic maps requires attention to its creation. Countries like Italy have adopted and developed such programs after the 80's.

The editors of this issue wish to thank all anonymous reviewers for their patience, understanding and collaboration.

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