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JWARP > Vol.3 No.12, December 2011

OPEN ACCESS

## Assessment of Aquifer Vulnerability Based on GIS and ARCGIS Methods: A Case Study of the Sana' a Basin (Yemen)

PDF (Size: 1924KB) PP. 845-855 DOI: 10.4236/jwarp.2011.312094

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### ABSTRACT

Groundwater is the main source of water in arid and semi-arid regions. Therefore, pollution of groundwater is a major issue because aquifers and the contained groundwater are inherently susceptible to contamination from wastewater and agricultural activities. Aquifer vulnerability has been assessed in the Sana' a basin using the DRASTIC method, based on a Geographic Information System (GIS). The DRASTIC model uses seven environmental parameters (Depth to water, net Recharge, Aquifer media, Soil media, Topography, Impact of vadose zone, and hydraulic Conductivity) to characterize the hydrogeological setting and evaluate aquifer vulnerability. A regional scale aquifer vulnerability map of the basin was prepared using overlay analysis with the aid of GIS. A DRASTIC vulnerability map, verified by data of nitrate in groundwater, shows that the defined areas are compatible with land-use data. It is concluded that 6.4% of the basin area is highly vulnerable and urgent pollution-preventions measures should be taken for every kind of relevant activity within the whole basin.

### KEYWORDS

Groundwater, Vulnerability, DRASTIC, GIS, Sana' a Basin

### Cite this paper

Y. Alwathaf and B. Mansouri, "Assessment of Aquifer Vulnerability Based on GIS and ARCGIS Methods: A Case Study of the Sana' a Basin (Yemen)," *Journal of Water Resource and Protection*, Vol. 3 No. 12, 2011, pp. 845-855. doi: 10.4236/jwarp.2011.312094.

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