

## **Assessment of groundwater vulnerability to pollution in Barrax, Albacete, Spain**

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### **Abstract**

**In the present paper an integrated approach is considered, with the use of the Generic and Agricultural DRASTIC models as well as GIS, to assess groundwater vulnerability in the agricultural area of Barrax, in the province of Albacete, in Spain. Seven parameters, namely Depth to water, net Recharge, Aquifer media, Soil media, Topography, Impact of vadose zone media, and hydraulic Conductivity of the aquifer have been considered as weighted layers to enable an accurate groundwater risk mapping. The results of the Generic Drastic model indicate very low vulnerability to contamination for Barrax groundwater due to limited urban and industrial development in the wider area. However, agricultural activities impose pressure to groundwater resources and the results of the Agricultural Drastic model show that 5.41% of the study area is characterized by very high, 3.54% by high, 32.73% by medium, 49.45% by low, and the remaining 8.86% by no vulnerability to groundwater contamination. The distribution of nitrates concentration in groundwater in the area under study is very well correlated with the Agricultural DRASTIC vulnerability index. This study demonstrates that the integrated approach followed enables the assessment of groundwater vulnerability in agricultural areas, provides new opportunities for predicting groundwater contamination at different spatial scales and categories reflecting the environmental quality and therefore is very helpful for policy makers for the design and selection of preventive and remedial measures.**

### **INTRODUCTION**

The assessment of groundwater vulnerability in agricultural areas by screening potential sources of hazards is an extremely important tool for policy makers and regional authorities before undertaking preventive or remedial measures (Komnitsas et al., 2015). Based on the assumption that the physical environment may provide some degree of aquifer protection against contaminants entering groundwater, it is anticipated that some