

VULNERABILITY OF GROUNDWATER TO AGRICULTURAL ACTIVITIES POLLUTION

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EXTENDED ABSTRACT

The natural subsurface environment can restrain in introduction of pollutants into groundwater and thus many vulnerability mapping techniques developed to evaluate the capacity of the subsurface environment to attenuate pollutants. The most appropriate approach for assessing agricultural sources of groundwater pollution should involve the combined consideration of pollutant characteristics, fertilizer application rates and practices, hydrological factors basic to vulnerability assessment and the usage of the groundwater resource. Vulnerability assessment should be periodically updated on the basis of new knowledge and data.

Nitrate concentration in groundwater resources has increased significantly in the developed world during the last decades. The intensive use of fertilizers and manure in agricultural management systems has increased the nitrate pollution of groundwater and have adverse effects on ecosystems and thereupon to human health. The use of models, which describe the mass transport of nitrogen and its transformation in the soil and groundwater, in the assessment of groundwater vulnerability has become a well established methodology. The representation of vulnerability can be designed with maps and GIS implementation. Different countries in Europe and the USA use different methods to estimate groundwater vulnerability. These methods produce different vulnerability maps which are not comparable as the key parameter and criteria underlying the elaboration of the each method, are not the same.

In this paper is represented an attempt to apply a modified method of DRASTIC model for the detection of groundwater vulnerability, the attenuation and retardation factors and leaching index, in assessing the leaching potential in an agricultural area near Strimonas river in prefecture of Serres, Greece.

Key words: Groundwater, nitrate, vulnerability, GIS, Northern Greece