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"Gheorghe Asachi" Technical University of Iasi, Romania

STUDY OF THE SPATIAL VARIABILITY OF NITRATES USING THE GEOSTATISTICAL METHOD AND INVERSE DISTANCE WEIGHTED ON THE AIN OUSSARA PLAIN, CENTRAL ALGERIA

Miloud Koussa

Department of Civil and Hydraulic Engineering, University Center of Mila, Mila Center 43000, Algeria
E-mail: koussamiloud@gmail.com; Phone: +213663953334

Abstract

The Ain Oussera plain is largely dependent on groundwater as the main source of drinking, agricultural and industrial water due to the scarcity of surface water resources. Excessive use of groundwater and intensive use of fertilizers in agricultural practices have resulted in high levels of certain constituents, including nitrates. This has led to the depletion of groundwater reserves and the deterioration of groundwater quality. Spatial interpolation is one of the tools used to manage water resources. The aim of this study is to investigate the spatial distribution of nitrates within a Geographic Information System (GIS) framework based on deterministic methods (IDW) and geostatistics (Ordinary Kriging) using variography to study the spatial structure of the variables studied. The results showed that the IDW interpolation method produced a smoother map. The Root Mean Square Standardized (RMSS) between predicted and measured concentrations for all wells was determined to be 0.983 using the ordinary kriging interpolation method and 1.621 using the IDW interpolation method, an experimental variogram is fitted to an exponential type with a correlation coefficient of 0.83. Therefore, it can be concluded that the ordinary kriging method is the most effective in accurately predicting nitrate concentrations in the Ain Oussera Plain.

Key words: Ain Oussera Plain, IDW, Kriging, Nitrates

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