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Application of Geographic Information System (GIS) in Mapping Groundwater Quality in Uyo, Nigeria

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ABSTRACT

In recent years there has been serious concern on the deteriorating groundwater quality due to the activities of man. Geographic Information System (GIS), a high performance computer based tool is playing a critical role in water resource management and pollution study. In this work, the GIS software was used to analyze the effects of various data layers (topographic slope, groundwater table variation, soil porosity and land use activities) on the distribution of groundwater pollution in the Nigerian city of Uyo. Spatial variability map of different groundwater quality parameters were generated using interpolation operation in the software. A good correlation exists between some of the pollution indicators (total dissolved solids, TDS and conductivity, CN, 0.8; chloride and TDS, 0.17 as well as TDS and sulphate, 0.23). The results of spatial variability maps of different groundwater quality parameters indicate an increase in the percentages of pollution levels during the last five years. Cross operation was also used to explain the effects of various data layers viz. topographic slope, groundwater slope, depth to groundwater layer and land use activities on the distribution of groundwater pollution.

KEYWORDS

Groundwater, Pollution, Water Quality, GIS, Uyo Urban

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