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Characterization of the State of Pollution by Nitrates in the Groundwater in Arid Zones Case of Eloued District (South-East of Algeria)

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Abstract : This study aims to assess sensitivity to nitrate pollution and monitor the temporal evolution of nitrate contents in groundwater using statistical models and map their spatial distribution. The nitrate levels observed in the waters of the town of El-Oued differ from one aquifer to another. Indeed, the waters of the Quaternary aquifer are the richest in nitrates, with average annual contents varying from 6 mg/l to 85 mg/l, for an average of 37 mg/l. These levels are higher than the WHO standard (50 mg/l) for drinking water. At the water level of the Terminal Complex (CT) aquifer, the annual average nitrate levels vary from 14 mg/l to 37 mg/l, with an average of 18 mg/l. In the Terminal Complex, excessive nitrate levels are observed in the central localities of the study area. The spatial distribution of nitrates in the waters of the Quaternary aquifer shows that the majority of the catchment points of this aquifer are subject to nitrate pollution. This study shows that in the waters of the Terminal Complex aquifer, nitrate pollution evolves in two major areas. The first focus is South-North, following the direction of underground flow. The second is West-East, progressing towards the East zone. The temporal distribution of nitrate contents in the water of the Terminal Complex aquifer in the city of El-Oued showed that for decades, nitrate contents have suffered a decline after an increase. This evolution of nitrate levels is linked to demographic growth and the rapid urbanization of the city of El-Oued.

Keywords : anthropogenic activities, groundwater, nitrates, pollution, arid zones city of El-Oued, Algeria
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