The title (العنوان):

Vulnerability of a Tunisian Coastal Aquifer to Seawater Intrusion: Insights from the GALDIT Model

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Abstract : The Korba region in northwestern Tunisia has a coastal aquifer that is impacted by intensive irrigation, urban expansion, and sensitivity to SWI. We assessed the vulnerability extent of Korba's GW to SWI. We utilized a parametric model for GW vulnerability assessment, the GALDIT, which considers six parameters to determine SWI effects. The GALDIT map has four rating categories (≥7.5, 7.5–5, 5–2.5, and <2.5), representing very high, high, moderate, and low vulnerability, respectively. Most of the region was found to be highly vulnerable (44.2% of the surface area), followed by areas characterized by very high (20.3%) and moderate (19.3%) vulnerability. Only 16.2% was found to have low vulnerability. A parameter sensitivity analysis showed that distance from shore and depth of GW represent the determining factors for SWI with variation index values of 24.12 and 18.02%, respectively. Inland advancement of seawater is causing GW salinity to rise, as indicated by a strong Pearson correlation coefficient of 0.75 between SWI indices and the electrical conductivity. Suitable areas for artificial recharge were mainly distributed in the alluvial plains, with a total area of 32.85 km^2. Inhibiting SWI requires about 11.31 MCM of artificial recharge in the two most suitable recharge zones in the region.

Key words : Groundwater (GW) vulnerability index; GALDIT index ; Parameters Sensitivity ; Artificial recharge; Seawater intrusion (SWI); Korba aquifer

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