

## **Study of salinization and pollution of the coastal aquifer of Chott Meriem, Sahel of Sousse, Tunisia**

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Groundwater resources salinization and pollution is one the most widespread processes that degrades water quality and endangers future water exploitation. The problem is intensified in coastal aquifers where human activities result in accelerating water quality deterioration in particularly in arid and semi-arid regions. The high salinity encountered can also have other origins, natural or anthropic, such as dissolution of halite and gypsum, concentration by evaporation, etc. In the Sahel region, N Tunisia, near the seaside, the water quantity and quality are major problems. The Chott Meriem coastal aquifer system is no exception. It is located in a coastal saline wetland along the Mediterranean Sea in the surroundings of the city of Sousse. This water resource is mainly characterized by presenting poor quality groundwaters with high salinity content, in comparison with surrounding aquifers. In this study, the distinction between the different mechanisms of salinization, in order to reconstitute the origin of groundwater mineralization, were applied. Among the geochemical criteria, that can help to identify seawater intrusion as opposed to other sources of salinity in coastal zones, various ionic ratios can be used such as Na/Cl, Br/Cl, Ca/Mg, as well as the isotopic signatures of <sup>18</sup>O, <sup>2</sup>H. The Chott Meriem aquifer system consists of a main reservoir: a shallow, with thickness between 30 and 60 m, consisting of the Mio-Pliocene sandstone formations, with interbedded gypsum lenses (Segui formation). This shallow groundwater aquifer has a flow direction from inland towards the coast (SW - NE). Different methods using geochemistry (ions Na<sup>+</sup>/Cl<sup>-</sup>, Br<sup>-</sup>/Cl<sup>-</sup>, Ca<sup>2+</sup>/Cl<sup>-</sup>, B<sup>-</sup>/Cl<sup>-</sup>) and isotopes (<sup>18</sup>O, <sup>2</sup>H) are compared with the hydrodynamic information and salinity map for identifying the main processes involved in the increase in mineralization. Along the coast, and resulting from the groundwater overexploitation, the irrigation development that induces the soil leaching is the major reason for the mineralization increase is identified, but is not the only cause of the qualitative degradation, the salinity of the groundwater is also caused by dissolution of evaporate rocks (gypsum and halite minerals) in the aquifer. There is no indication of presence of water enriched in <sup>18</sup>O and <sup>2</sup>H and indicating a mixing with seawater.