

Impacts of drought on water quality: the case of aquifers in eastern Algeria

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Abstract The studied area is located in the extreme part of Algeria. It is limited to the north by the Mediterranean Sea and the desert in the south. This position confers a variation of the climatic mode, a Mediterranean climate in the north and arid in the south, resulting in a very important fall of precipitation, ranging from 1200 mm/year in the north, to 300 mm/year in the south. The hydrographic network is very dense; very important wadis (Seybouse, Mellague, Medjerda, Kebir-Are, Kebir-West) cross this area, which implies important contributions (solid and liquid). Water of aquifers is often fed by these rivers. During its displacement water acquires a certain mineralization. The studies carried out showed that this mineralization increased during recent years, thus translating the influence of the climatic factors on water quality. To explain the origin of this salinity we were interested in the climatic variations and particularly in dryness which affected the area in recent years, due to a considerable fall in the infiltrations being translated in the north by an imbalance of the interface of fresh water and salted water, generating a salinity of water. In the south the dryness accelerated water salinity. To highlight this impact several approaches were used: Statistical tool using the PCA, gives an outline on the elements at the origin of observed salinity; STUYFZAND method, based primarily on chlorides, can determine various classes of salinity; and the thermodynamic tool shows the influence of certain minerals on water salinity. The compilation of all the results enables us to conclude that the observed salinity in various zones remains influenced by the dryness.

Key words salinity; Algeria; PCA; thermodynamics; STUYFZAND