

## **Lithologic Effects on the Quality of Water in the Oued Innaouen Watershed (Upstream of the Idrissi Dam, NE of Morocco)**

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In order to define the anomaly of salinity in the Oued Innaouen watershed (upstream from the Idriss First dam), the hydrochemical approach is used and three areas are identified and described. According to spatial variations of some hydrochemical parameters in these identified areas, we noted their close relation to the geologic features and to the climatic cycle's variations. High sulphate contents are located in the north part of the basin. The high chloride concentrations are measured during flood periods. The marl outcrops of Miocene the Middle-Atlas situated in the south west parts of the basin are leached by streams draining the dense hydrographical network. These variations of hydrochemical parameters depend also on the relative abundance of tributaries on both sides of the Innaouen oued. Their respective chemical contributions are very different: (i) northern-side tributaries, which mainly leach gypsum rocks of the Miocene period which increase the mineralization of the Oued Innaouen waters flowing toward the Idriss I Dam; (ii) the low salinity of water observed in the biggest part of the south portion of the watershed is due to dilution by waters from the both southern side tributaries and Liassic limestone springs which derived from snowmelt and the leaching of the high Palaeozoic massif.

The high concentration of strontium in water can be explained mainly by the dissolution of Celestine ( $\text{SrSO}_4$ ) which is bound to the gypsum. The variation of Strontium contents in groundwater confirms the evaporitic origin of the anomalies in the north part of the basin. Furthermore, this element contributes to well distinguish between the different contributions (Middle-Atlas Miocene, Prerif Miocene, Middle- Atlas Palaeozoic and Middle Atlas Liassic and Triassic).

Key word: Innaouen oued, evaporitic, water quality.