

**EARTH OBSERVATION AND GIS: INTEGRATION WITHIN A PROBABILISTIC APPROCH FOR
GOUNDWATER PROSPECTING IN ARID ZONE (Ighrem, Morocco).**

A. Er-Raji *, D. El Hadani*

**Centre Royal de Télédétection Spatiale (Maroc)*

Contact: er-raji@crts.gov.ma

Key words: Earth Observation, GIS, Groundwater

Abstract

This paper presents a part of the results of a TIGER project, which aims at developing, in the Souss-Massa hydraulic basin, an integrated approach including the exploitation of the satellite data, the pre-existing data and the Geographical Information Systems (GIS) as sources of information and tools of analysis within the water management process. The area of study (Ighrem region) is facing a critical situation with regards to potable water resources sustainability. This region has a discontinuous aquifer systems and week surface water contributions because of its arid climate. This area belongs to the Anti-Atlas Mountains considered as part of the Panafrican chain with complex and intensive deformations and a large lithological variability; witch makes more difficult the characterization of its hydrogeologic context. This paper aims at emphasizing the integration of multi-sensors earth observation data, the existing data and the field truth in order to contribute to the groundwater prospecting process. This allows us to produce details information from lineament and lithological mapping in order to better characterize the aquifer system. In particular, radar imagery had been used for mapping zones with high recharge potential. On the other hand, the integration of these information in a quantitative approach known as Weight of Evidence Modelling for combining evidence in support of an hypothesis. This method has been used based on key hydrogeologic predictors for groundwater prospecting: geology, geomorphology, hydrology and recharge potential. This enabled us to identify and locate the zones presenting high aquifer potentials. These zones are supposed to guide geophysical prospecting to better refine the location of productive drilling in the future.