

The groundwater in the southern Iraqi plateau is one of the important resources invested in agricultural activity, thus it requires studying and discovering of such water reservoirs through the latest scientific methods. This study aim to identify the most important scientific evidences utilized in the groundwater detection, to understand the factors affecting the existence of that water and to find out appropriate techniques implemented in the search of it, such as the use of spectral indices, geomorphological and hydrological evidences within the study area, calculating the volume of surface runoff and determining the spatial suitability for the presence of groundwater.

The evidences that help in groundwater detection had been studied by applying remote sensing techniques to the satellites data of (the Japanese satellite aster, the American satellite Landsat 8, and the European satellite sentinel) to extract the land cover classification and indices (plant, water, soil moisture, soil dryness).The digital elevation image (DEM, SRTM) had been adopted to extract the topographical analysis and detection of valleys and floods which have a great importance in gathering the surface water which, in turn, is submerged into the ground, the tool (Hydrology) had been also used to derive basins and to make a complete hydrological analysis of the valleys in the study area.

In this study, the volume of surface runoff was calculated based on the (scs-cn) equation by calculating the surface runoff volume equations that depend on the land cover classification map and the hydrological soil map taken from the soil texture in the area. The spatial suitability of the areas that are most likely feeds the groundwater was determined through the adoption of the (ArcGIS) program to make an overlay of the area's maps represented by (geological structures, classification of land cover directed by texture, hydrological soils, rate of slope and surface water network).

Among the most important results in this study is the possibility of adopting remote sensing techniques as a preliminary evidence for the presence, study, analysis and monitoring of groundwater in large areas. The study showed that the use of digital elevation image (SRTM) is better for producing maps of topographic analysis, while the image (DEM) gave more accurate maps in hydrological