



## **Drought analysis using SPI index and its effects on groundwater resources in East of Kermanshah, Iran**

A. Shakiba, B. Mirbagheri, and A. Kheiri

Faculty of Earth sciences, Shahid Beheshti University, Tehran, Iran

Drought is universally acknowledged as a phenomenon associated with scarcity of water. Drought varies with regard to the time of occurrence, duration, intensity, and extent of the area affected from year to year. Ground water, which is found in aquifers below the surface of the Earth, is one of the Nation's most important natural resources. Droughts, seasonal variations in rainfall, and pumping affect the height of the underground water levels. The overall objective of this study is to apply a quantitative index namely SPI (Standardized Precipitation Index) to measure the drought conditions in the east region of Kermanshah, Iran during the last 30 years. To do this, different indices were considered to determine the drought conditions such as the longest period of drought, the number of months faced to drought and total drought magnitudes(DM).

To evaluate the likely effects of drought on groundwater resources, first the relationship between them was shown graphically and then the correlation was calculated. The results of the research indicated that, among all mentioned indices, total drought magnitudes is a better index showing the drought condition in the region. The results on drought effects on groundwater resources using the correlation coefficient also showed that the droughts will have significant effect on ground water discharge. An analysis of the distribution of droughts showed that for droughts with short periods, the deficit in the groundwater discharge is smaller than in the recharge. While for droughts with long periods, the deficit in the groundwater discharge is larger than in the recharge.

Key words: Drought Magnitude, SPI, Groundwater, Kermanshah