

Comprehensive Regional Drought Assessment Index

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Abstract : Drought is an inevitable part of the earth's climate. It occurs regularly with no clear warning and without recognizing borders. In addition, its impact is cumulative and not immediately discernible. Iran is located in a semi-arid region where droughts occur periodically as natural hazard. Standardized Precipitation Index (SPI), Surface Water Supply Index (SWSI), and Palmer Drought Severity Index (PDSI) are three well-known indices which describe drought severity; each has its own advantages and disadvantages and can be used for specific types of drought. These indices take into account some factors such as precipitation, reservoir storage and discharge, temperature, and potential evapotranspiration in determining drought severity. In this paper, first all three indices are calculated in Aharchay river watershed located in northwestern part of Iran in East Azarbaijan province. Next, based on two other important parameters which are groundwater level and solar radiation, two new indices are defined. Finally, considering all five aforementioned indices, a combined drought index (CDI) is presented and calculated for the region. This combined index is based on all the meteorological, hydrological, and agricultural features of the region. The results show that the most severe drought condition in Aharchay watershed happened in Jun, 2004. The result of this study can be used for monitoring drought and prepare for the drought mitigation planning.

Keywords : drought, GIS, intensity index, regional assessment, variation maps

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