



Drought assessment based on real-time drought index

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ABSTRACT

The continuous increase in water demand is primarily caused by the explosive population growth rate due to urbanization and industrialization, and thus, is accelerated in both agricultural and residential parts. Drought adversely affects the quality of life and the whole economic situation of the country, and therefore, an accurate assessment of the incidence of water shortage is required. The existing researches for calculating drought indices do not consider the water demand and the water supply from irrigation facilities, streams, and water storages; thus, existing hydrological drought indices have many limitations in determining actual drought situations in the country. Only water supply without water demand is considered on the existing hydrological drought index therefore, water shortage cannot be calculated. On the other hand, real-time drought index (RDI) evaluates drought on a daily basis in real-time and calculate water shortage according to residential, agricultural, and industrial water. In this study, the water shortage based on real-time water supply and demand is calculated and a new drought index corresponding to such shortage is developed. The drought assessment is performed using the proposed drought index during national drought events from year 2008 to 2009. Based on the results of this study, it turns out that the regions supplied by small reservoirs and streams are more vulnerable in drought as compared with regions supplied by large-scale dams and rivers. The applicability of the proposed drought index is proved to be appropriate, from the comparison results between major historical drought situations and the corresponding situation modeled by this study.

Keywords: Drought; Real-time drought index; Water demand; Water supply

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