

Assessment of Drought Changes in China during 1961–2019 based on Various Indices

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Abstract

With the aggravation of climate change, drought has become a more prominent extreme event with significant influences on both natural ecosystems and human society. The IPCC AR6 new results show that the changes in meteorological and agricultural droughts display an increasing trend in some regions. And the increasing trend shows that anthropogenic climate change plays an important role in exacerbating agricultural and ecosystem droughts. The atmospheric evaporation demand (AED) is a key variable in addressing drought change. Changes in AED are not only a direct response to climate warming, but also a driving factor for drought changes, affecting the physiological processes of vegetation.

In assessment of drought changes and their impacts, the selection of drought indices is crucial. Our study explored changes in drought condition over China and evaluated the effectiveness of four different drought indices (SPEI, SPI, MCI, and PDSI) in reflecting drought change. Four drought indices all displayed “drying trend” in North, Northeast, and Southwest China during 1961–2019. The above four indices consistently show better performance in the Middle and Lower Reaches of the Yangtze River, and in western Northwest, Northeast, and South China.

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