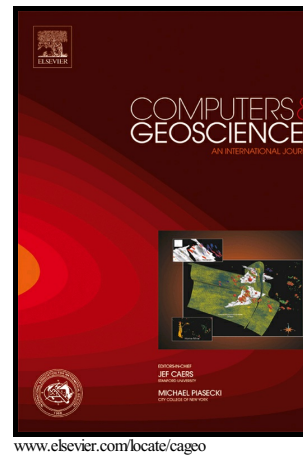


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Incorporation of the Penman-Monteith potential evapotranspiration method into a Palmer Drought Severity Index tool

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Abstract

Calculating the Palmer Drought Severity Index (PDSI) using the Thornthwaite potential evapotranspiration (PET) method has come under recent scrutiny for overestimating drought conditions when air temperatures exceed the historical baseline. With increasing air temperatures around the world, calculating PDSI using the Thornthwaite PET method may no longer be the appropriate option. Therefore, various researchers have called for the use of the physically-based Penman-Monteith PET method to estimate PDSI. We present an addition to the PDSI tool developed by Jacobi et al. (2013) that includes an option to use the Penman-Monteith method to calculate PET as an input to the PDSI calculations. Comparisons with a global PDSI dataset also estimated using the Penman-Monteith method indicate good spatial correlation. This addition to the Jacobi et al. (2013) tool allows users to easily calculate a suite of Palmer drought indices using Penman-Monteith potential evapotranspiration for current and future drought projections at any spatial scale.

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