

Trends In Regional Evapotranspiration Across The United States Under The Complementary Relationship Hypothesis

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Abstract. The hypothesis of a complementary relationship in regional evapotranspiration allows for estimation of actual evapotranspiration on a regional scale by simple, physically based models that take into account feedbacks in land surface-atmosphere dynamics. A regional, seasonal Advection-Aridity model is used to create a monthly time-series of actual evapotranspiration for a period of 27 years at a 5-km resolution over the conterminous United States.

This time-series allows trend analysis of actual evapotranspiration using the Mann-Kendall test on annual and seasonal bases and results are presented for the conterminous United States. Trends are analyzed within the context of the complementary relationship on a regional basis to establish that regional trends can be determined to originate in either the energy budget or the water budget, or both. Intra-annual trend results are compared with results from another study.

The regional-seasonal Advection-Aridity model is offered as a tool for studies of climate change and variability.

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