Is Pan Evaporation Decreasing Across the Conterminous United States? 
If so, so what?

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Abstract. Using only annual hydrologic observations, we show that pan evaporation is complementary to actual evapotranspiration, when the latter is measured using water budgets in the basin containing the pan. Using the complementary relationship hypothesis, actual evapotranspiration can be successfully modeled across the climatic spectrum, allowing for the creation of a 42-year, monthly, spatially distributed time-series of actual evapotranspiration at a 5-km resolution across the conterminous United States. Long-term trends in actual and potential evapotranspiration and in the components representing the energy budget and the vapor transfer mechanism are reported. At the continental scales, we support the findings of other workers: that actual evapotranspiration is decreasing by 0.6 mm/year/year and that its components net available energy and the drying power of the air are decreasing by 1.9 mm/year/year and 7.4 mm/year/year, respectively. However, in examining the component time-series at smaller spatial scales, we question their conclusions that either one or the other of these components can individually account for such trends and contend instead that the component trends operate within the framework of the complementary relationship.