



A regional perspective on trends in continental evaporation

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Climate models suggest that enhanced greenhouse gas concentrations and aerosols have major impacts on the land energy and water cycles, and in particular on evapotranspiration (ET). Here we analyze how the main external drivers of ET (incident solar radiation and precipitation) vary regionally, using recent data from an eddy-covariance flux tower network (FLUXNET) and a multi-model re-analysis (GSWP-2). Trends in radiation (global “dimming” and “brightening”) are expected to impact ET only in regions where ET correlates with radiation. In central Europe this correlation is particularly strong, and trends derived from weighing lysimeters and river-basin water budgets follow trends in radiation. In central North America the correlation is weak, and trends in precipitation rather than radiation explain trends in ET. Our results reconcile previous hypotheses by demonstrating the strongly regional and temporal differentiation of trends in evaporation.