Data from: Evapotranspiration is resilient in the face of land cover and climate change in a humid temperate catchment

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Files in this package

Title	**dataset_hamilton_evapotranspiration**
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> Hamilton S, Hussain M, Lowrie C, Basso B, Robertson G (2018) Evapotranspiration is resilient in the face of land cover and climate change in a humid temperate catchment. Hydrological Processes, online in advance of print. https://doi.org/10.1002/hyp.11447

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Keywords	evapotranspiration, evaporation, crops, forest, land use, climate change
Spatial Coverage	USA, Michigan, Kalamazoo and Barry Counties

Abstract

In temperate humid catchments, evapotranspiration returns more than half of the annual precipitation to the atmosphere, thereby determining the balance available to recharge groundwaters and support stream flow and lake levels. Changes in evapotranspiration rates and therefore catchment hydrology could be driven by changes in land use or climate. Here we examine the catchment water balance over the past 50 y for a catchment in southwest Michigan covered by cropland, grassland, forest, and wetlands. Over the study period about 27% of the catchment has been abandoned from row-crop agriculture to perennial vegetation and about 20% of the catchment has reverted to deciduous forest, and the climate has warmed by 1.14°C. Despite these changes in land use, precipitation and stream discharge, and by inference catchment-scale evapotranspiration, have been stable over the study period. The remarkably stable rates of evapotranspirative water loss from the catchment across a period of significant land cover change suggest that rainfed annual crops and perennial vegetation do not differ greatly in evapotranspiration rates, and this is supported by measurements of evapotranspiration from various vegetation types based on soil water monitoring in the same catchment. Compensating changes in the other meteorological drivers of evaporative water demand besides air temperature—wind speed, atmospheric humidity, and net radiation—are also possible, but cannot be evaluated due to insufficient local data across the 50-y period. Regardless of the explanation, this study shows that the water balance of this landscape has been resilient in the face of both land cover and climate change over the past 50 y.

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