

Local factors important for water availability

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An important issue that has grabbed the attention of scientists and policy makers alike is the amount of freshwater that will be available to populations across different climate settings, especially as rain belts reorganize in response to warming temperatures over the 21st century. The amount of freshwater available on land, calculated from runoff, is a function of supply and demand, where annual rainfall determines the supply and the dryness determined by solar radiation largely controls the demand. Local factors, such as vegetation and soil types that are directly tied to regional climate, modulate the surface water supply and demand. However, there are no observations to quantify the effect of regional climate on surface water availability.

In a new study, Williams et al. investigate how such climate and vegetation factors modulate the regional surface water balance and associated freshwater supply. They incorporate new meteorological data from 167 FLUXNET sites across the globe. The researchers find that, consistent with previous studies, annual average solar radiation and rainfall control 62 percent of the surface water supply and demand. However, 13 percent of the supply and demand balance is controlled by vegetation type and other regional climatic factors.

Further, they find that in grasslands, evaporation rates are 9 percent higher than in forests in the same climate setting, contrary to common expectations. On the basis of their study, the researchers recommend that [climate models](#) investigating water availability should take into account local factors, [regional climate](#), and even topography for more accurate prediction of future water resources.

More information: “Climate and vegetation controls on the surface water balance: Synthesis of evapotranspiration measured across a global network of flux towers” *Water Resources Research*, doi:10.1029/2011WR011586 , 2012.

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