ArcGIS analysis of evapotranspiration in Austin, TX

Across various vegetation and precipitation schemes

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Objective: The water budget for Austin, TX is of paramount concern to policymakers and representatives from the region. As the fastest growing city in the United States, Austin's water supply has come under heightened scrutiny. One significant question to ask regarding Austin's water budget is the quantity of water lost to evapotranspiration (ET) across different soil moisture conditions. This study looks to quantify the response of Austin's surface and near-surface water supply in four different vegetative schemes: 1) undeveloped land, 2) riparian zones and street trees, 3) parks and grassy lawns, and 4) paved or open-water surfaces.

Data required: Fine-resolution GIS maps of Austin's land use and land cover will be necessary to develop the four categories listed above, and they have already been obtained. A fine-resolution Austin DEM will also be necessary to determine flowpaths of surface water during flood and baseflow conditions. Additionally, weather station data from points across the city will be needed to quantify parameters for Penman-Monteith ET estimations. These numbers are publically available and have been obtained. For accurate vegetation transpiration estimates, a leaf porometer has been obtained to quantify stomatal resistance across dominant vegetation types. These values together, combined with soil moisture sensors (obtained) that monitor soil water storage, will create a complete picture of ET in Austin.