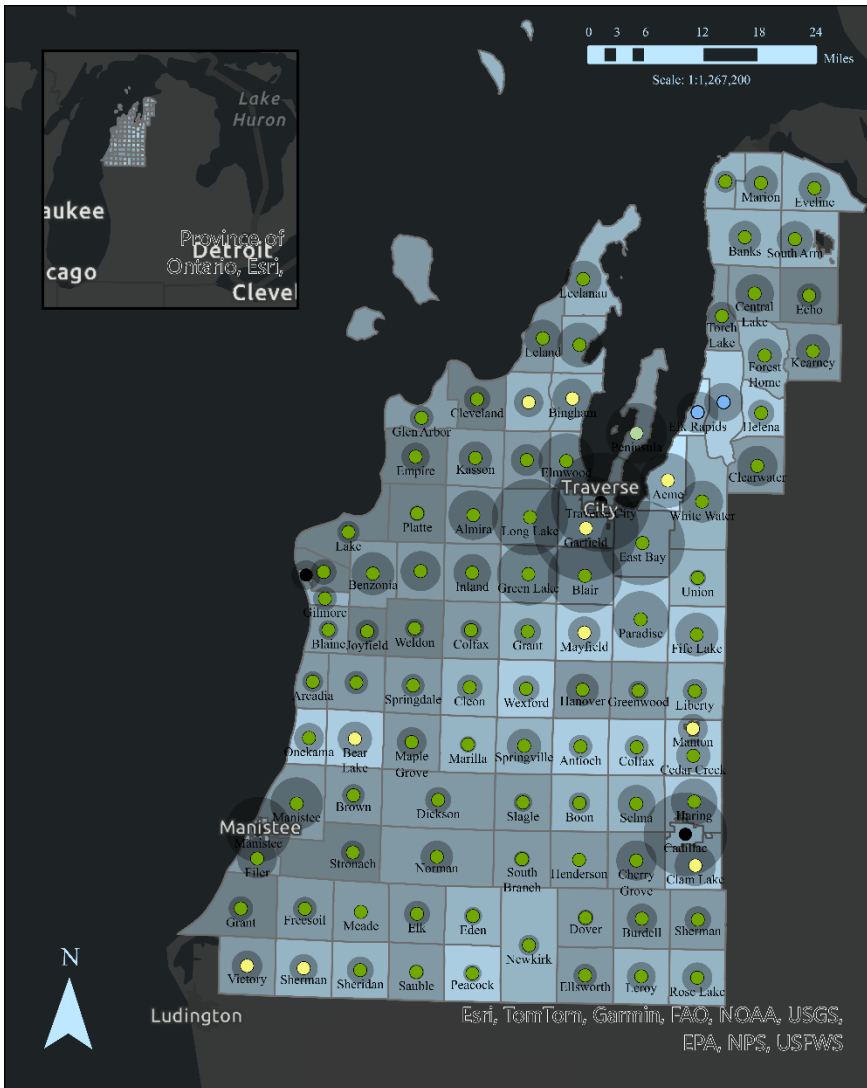# Land Use and Evapotranspiration in Northwestern Lower Peninsula of Michigan

Majority Land Cover
- Agriculture
- Grass/Shrub
- Trees
- Urban
- Water/Rock

Population
8,000

Mean Evapotranspiration
- Lowest
- Low
- Mid
- High
- Highest

Overview

I employed zonal and focal statistics to visualize land cover, population, and evapotranspiration within townships in the Northwestern Lower Peninsula of Michigan. Evapotranspiration rates reflect the combined water loss through evaporation and transpiration. While higher rates of evapotranspiration seem to align with areas predominately covered by trees, this pattern becomes less apparent when mapped zonally within each township.

Methodology

Inputs: land cover raster, evapo-transpiration raster, population raster, township shape layer

I started by using the 'focal statistics' tool on each input raster layer with a 'rectangle' neighborhood of 5280 map units (1 mile) in width and height. For mapping population data, I chose the 'sum' statistic to display an aggregation of people, as it reduces the impact of unoccupied areas of land on the final visualization. For evapotranspiration, I used the 'mean' statistic, which provides a summary of the central tendency of evapotranspiration rates including detailed variation. For land cover, I selected the 'majority' statistic because land cover is categorical data, and the majority is more relevant than the minority or range concerning the impact on evapotranspiration.
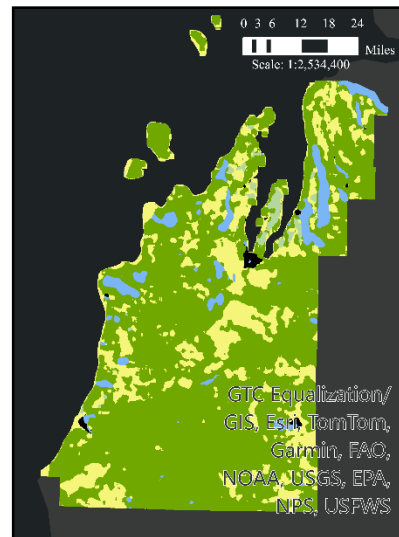
I then applied these same statistic types for each variable using the 'zonal statistics as table' tool, selecting the township shape layer as the 'feature zone'. Finally, I joined the tables to the township shape layer and applied symbology to the zonal and focal statistic outputs.
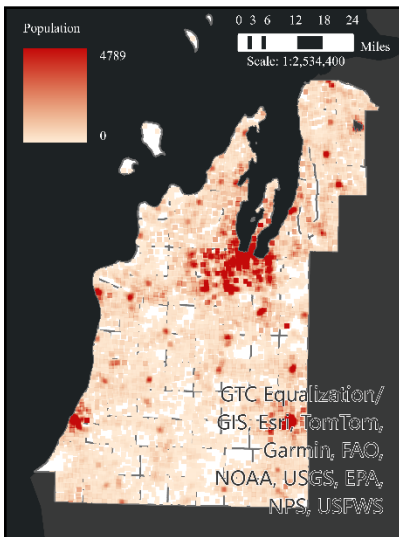
Population Focal Statistics
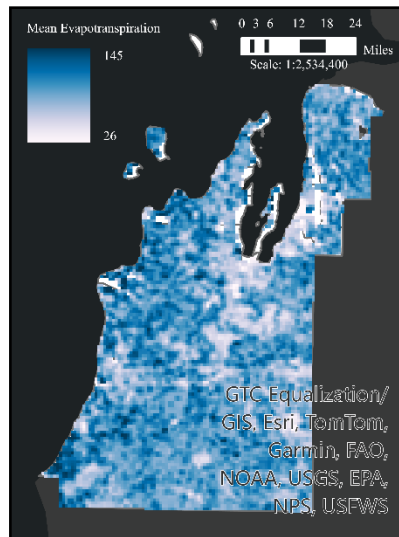
Evapotranspiration Focal Statistics

Land Cover Focal Statistics

Majority Land Cover
- Agriculture
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Lawson Schultz, 2024