GIS Prioritization of Neighborhoods for Green Infrastructure Projects in Phoenix, AZ

Bridget Harding1,2,3 [ISPI Intern], Maggie Messerschmidt2 [Supervisor], Rhian Stotts1 [DCDC Mentor]
1 Decision Center for a Desert City, 2 The Nature Conservancy Urban Project
3 Internship for Science Practice integration

Research Question
Which areas in the City of Phoenix can be prioritized for a green infrastructure project that serves low-income communities with little access to urban parks and in need of heat-stress mitigation?

Background
Living in the Valley of the Sun, residents of Phoenix, Arizona demand water to assist in mitigating adverse effects of sun exposure and heat. Phoenix is not short of water, but the uncertainty of the future climate of Arizona and the condition of its rivers has resulted in models that show worst-case scenarios of Phoenix’s water supply depleting by the year 2035.

People living in impoverished areas of Phoenix, are known to be at risk of facing such issues (Harlan et al., 2006).

Methods

Findings
The final map that will arise from the model will display the prioritized regions of the City of Phoenix that could be home to an innovative green infrastructure project in neighborhoods that are of low income (of the lower 2 income brackets below $30,000), have low access to urban parks (areas beyond a ½ mile or 10 minute walk of a park), high risk of flooding (regions with a 1% or higher chance of flooding over the next year), land use and land cover (lowly vegetated areas in residential neighborhoods), and have high percentage of impervious surfaces (lowering the percentage can improve natural infiltration of water). Each other these variables acting together provide the ground work for prioritizing neighborhoods for green infrastructure that will serve multiple purposes, such as integrating a storm water collector, improve access to parks and overall livelihood of a neighborhood.

Future Research
Future work on this project, as it is an on-going project in the beginning phases, should include a number of additional spatial layers. These layers include, but are not limited to: Urban Heat Island, Heat-related Health Incidents, Schools, per capita or per single family household water use, light rail green space corridors, etc. A more refined approach to the current layers, such as better defining the parks buffer using a sidewalk layer, should be taken as well.

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