Research Review: Assessing Urban Forest Threats across the Conterminous United States: A Summary of a Research Article Published in the *Journal of Forestry*, 06 July 2022

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This is a new series of articles where we review current literature in the field of Urban Forestry.

Article Overview

Urban forests are among the most stressed ecosystems in the world. In addition to often-cited threats like compacted soils, limited space for root growth, improper location, and human-caused damage, changes in temperature over time, precipitation, invasive insect damage, and wildfires are emerging as cause for additional concern.

Urbanized lands are increasing in size as population increases. Maintaining equal access to proper tree cover will mitigate risk to human health and well being and potentially limit the effect of increased intense and damaging weather events. Not all urban forests will be affected similarly. Having an understanding of local urban forest threats and stressors will provide information upon which to make decisions about management plans projected into the future.

What is unique about this study?

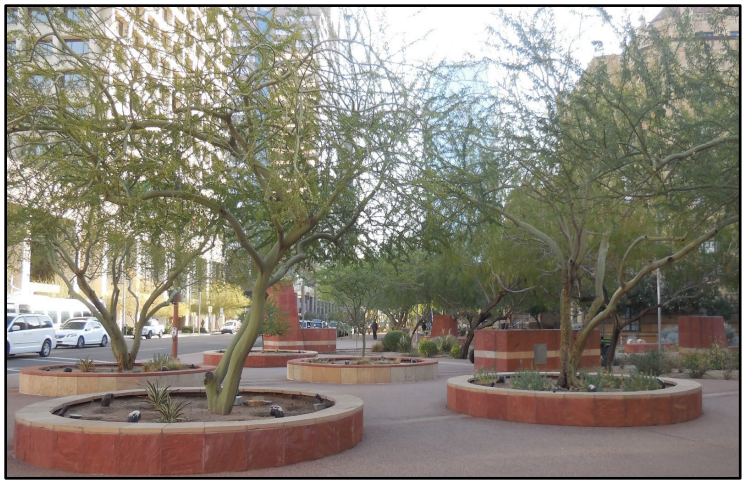

Figure 1: A small part of the Phoenix urban forest.

The authors of this study evaluated the magnitude of urban forest threats in the coming years and accounted for geographic differences among each. They developed a model for measuring threats, called the Cumulative Threat Index (CTI), which includes an equal measure of threats such as urban tree cover, air temperature, precipitation, aridity, flooding, wildfire, sea level rise, hurricanes, tornadoes, ice storms, and pests, designed to reveal the greatest cumulative threat per unit area of land (at the county level). This allowed them to determine which counties in the conterminous US face the greatest relative threat to urban forests. They found the largest risk to canopy cover decline due to threats along the eastern seaboard given the confluence of many risk factors influencing their urban areas. With any study using a model to determine future data, there are limitations. In this case, the information is based on both projections and historical data, so there is some room for error.

What does this mean for urban foresters and our communities in Arizona?

In the western United States the most anticipated risks will be related to wildfire, temperature changes, and pests, which are longer-term and large-scale, as opposed to sudden devastating threats found in the eastern US like hurricanes or tornadoes. The geographic cover of urban areas is increasing in Arizona, while our tree canopy cover is steadily declining. This information can be used to aid urban forest managers and policy makers, in collaboration, as they plan for new tree planting projects and installments. It will assist with species selection and proper planting location to ensure long term success for increased canopy cover. Arizona and New Mexico will soon have an *Urban Tree Threat Response Guide I*. This project is funded through DFFM and the US Forest Service Cooperative Agreement via the Urban and Community Forestry Program. The response guide and website, available in early 2023, will assist tree care professionals in early detection of tree stressors relative to our unique vegetation and provide details about how to address such threats in our communities.

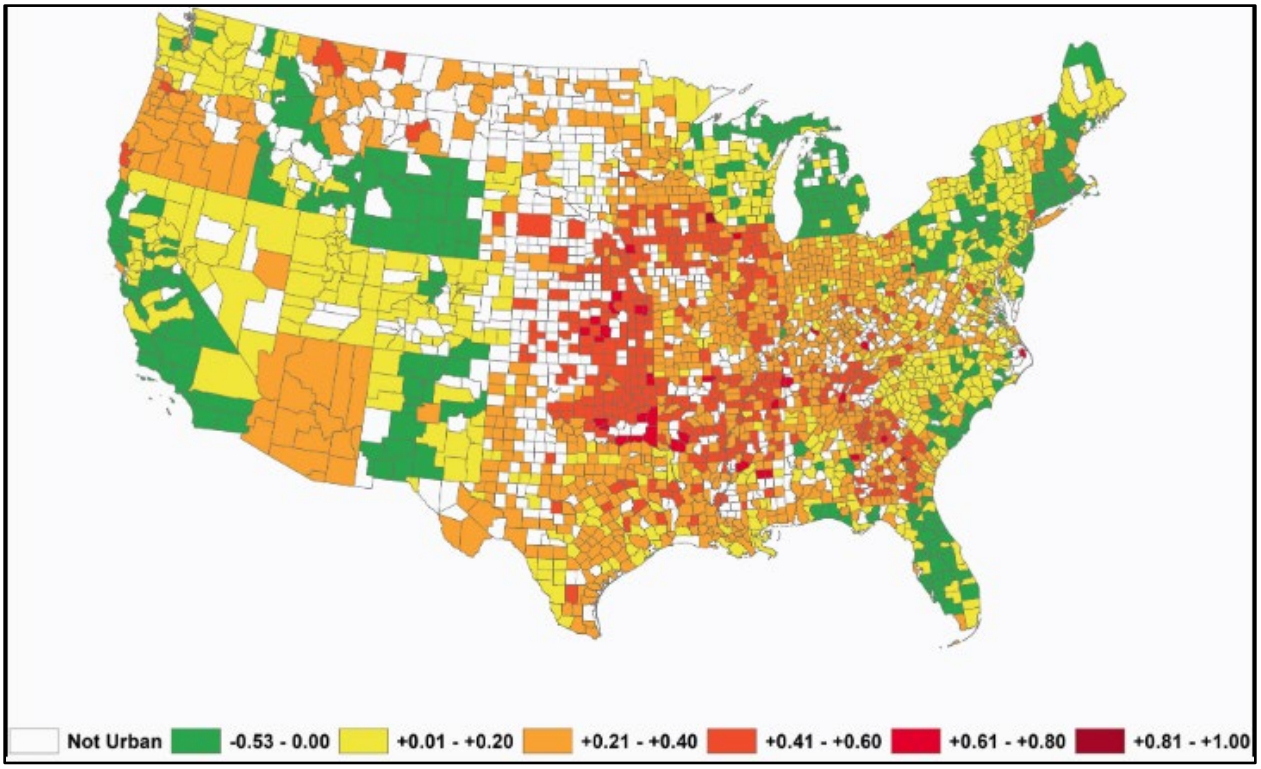

Figure 2: Projected urban tree cover change index from 2010–2060, from the study. Positive values indicate projected reductions in percent urban tree cover. Counties with no urban land in 2010 are excluded. Map courtesy of original publication, cited below.

Citation

David J Nowak, Eric J Greenfield, Alexis Ellis, Assessing Urban Forest Threats across the Conterminous United States, *Journal of Forestry*, 2022;, fvac019, https://doi.org/10.1093/jofore/fvac019