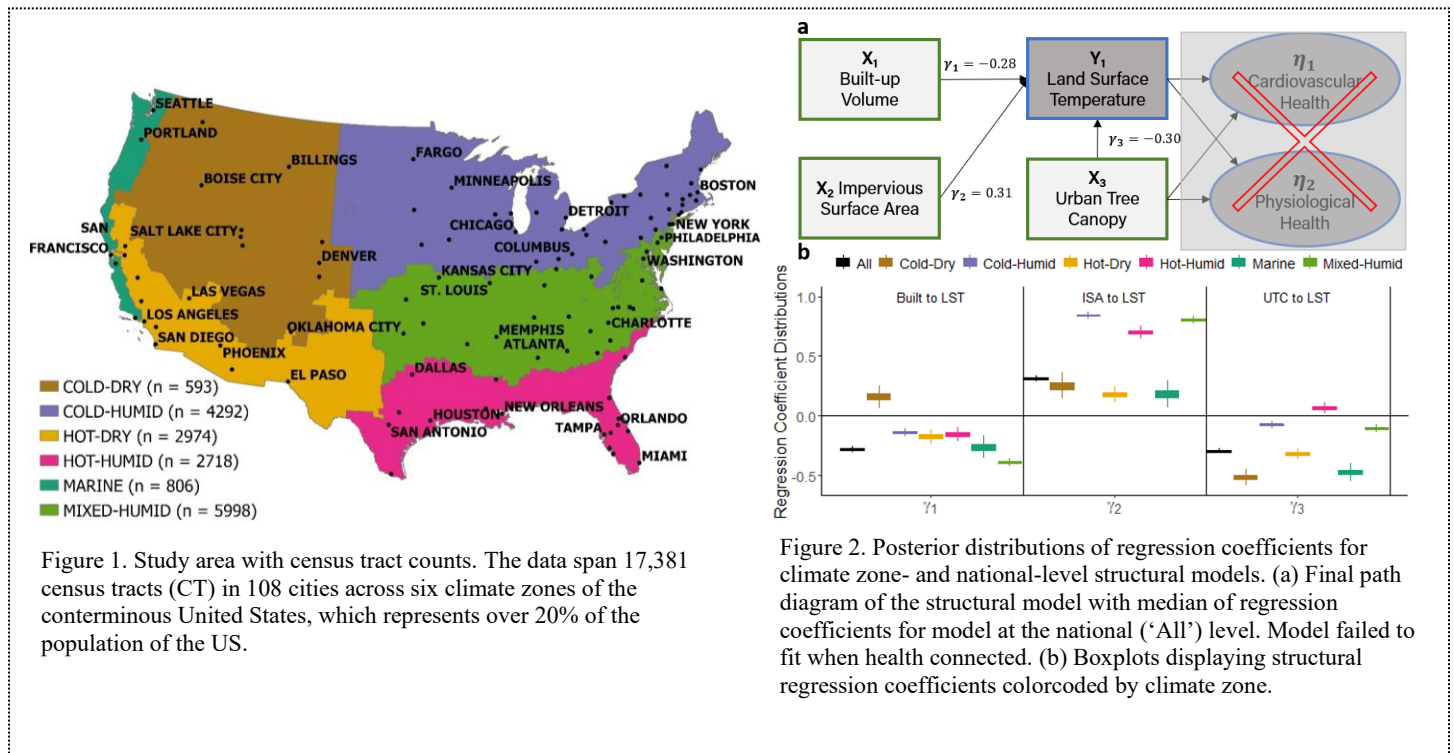


Testing relationships of urban tree canopy and the built environment with temperature and human health in US cities

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Background: Cities experience elevated temperature levels called the urban heat island (UHI) effect. When temperatures get too high, people suffer from cardiovascular and other physiological illnesses (Lin et al., 2009). Of all weather events, heatwaves cause the most deaths. UHI is caused by the presence of heat-storing surfaces like roads and building walls but can be mitigated by the presence of cooling features, such as trees. The climate of a city may impact the cooling capacity of a tree. Trees can also improve health and wellbeing on their own (Wolf et al., 2020).

Goals: In this project, we ask how the direct and indirect impacts of urban tree canopy, as mediated by temperatures, on heat-related health depend on the climate of the city.

Methods: After gathering data from across US cities at the census tract scale (Fig. 1), we used structural equation modeling to connect biophysical characteristics of cities, temperature, and health (Fig 2a). The model failed to fit well with the health latent variables.

Takeaways:

- Urban tree canopy does not have an association with chronic heat-related health conditions directly or indirectly at the census tract-scale.
- Urban tree canopy provides more cooling in places with dry summer seasons, and still provides some cooling in places with humid summer seasons (Fig 2b).
- Future models could add other health drivers, such as socioeconomic characteristics or air quality.

FOR FURTHER READING:

Lin et al. (2009). Extreme High Temperatures and Hospital Admissions for Respiratory and Cardiovascular Diseases. *Epidemiology*, 20(5), 738–746.
<https://doi.org/10.1097/EDE.0b013e3181ad5522>

Wolf et al. (2020). Urban Trees and Human Health: A Scoping Review. *International Journal of Environmental Research and Public Health*, 17(12), Article 12.
<https://doi.org/10.3390/ijerph17124371>