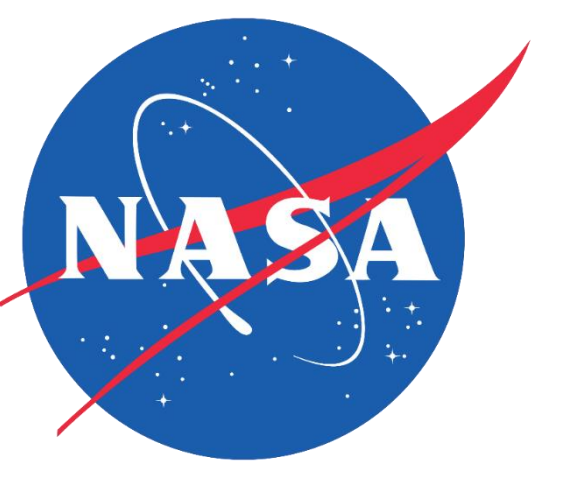
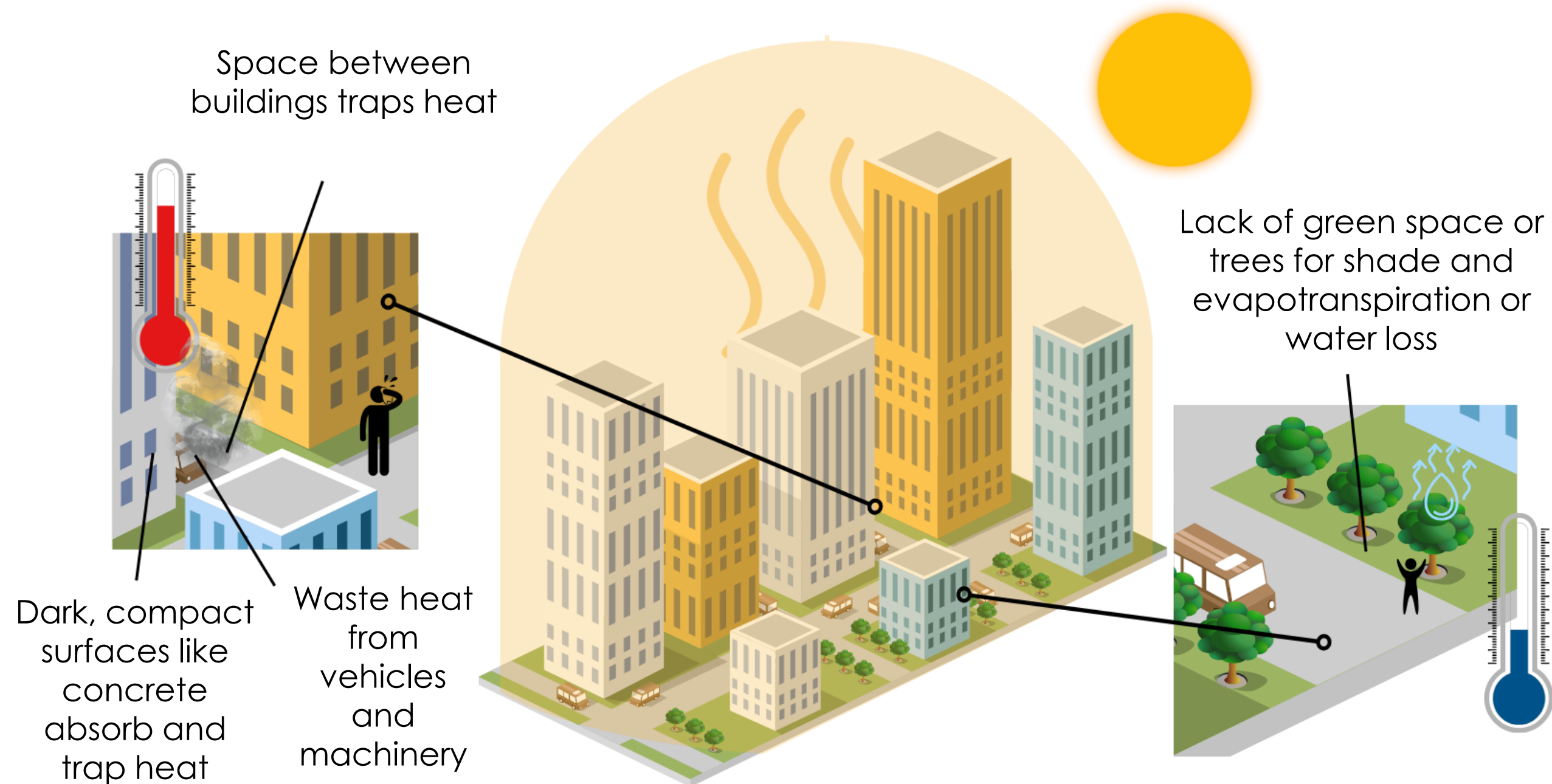




# Quantifying and Mapping Urban Heat to Inform Equitable and Sustainable Urban Planning Initiatives in Wichita, Kansas

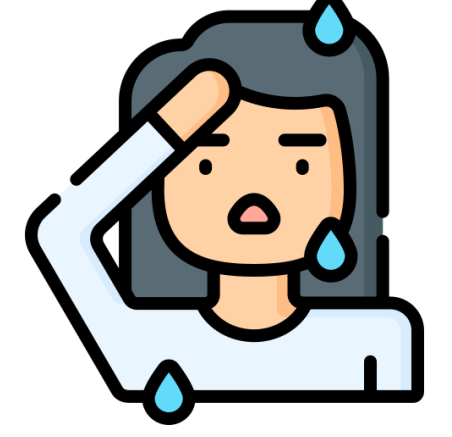
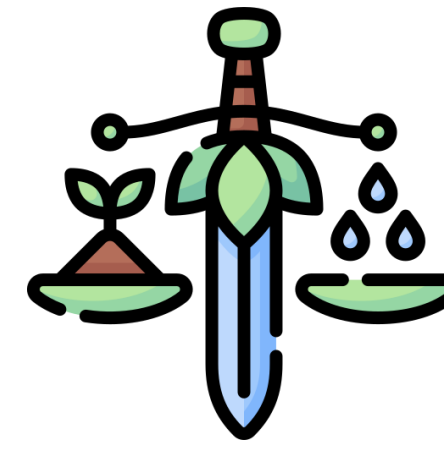


## What Is an Urban Heat Island?



An Urban Heat Island is an urban or metropolitan area that is **significantly warmer than its surrounding rural areas** due to how well the surfaces in each environment **absorb and retain heat**.

## Heat and Environmental Justice



Extreme heat impacts populations in the same city in different ways based on their **sociodemographic characteristics or ability to cool**, creating **heat inequity**.

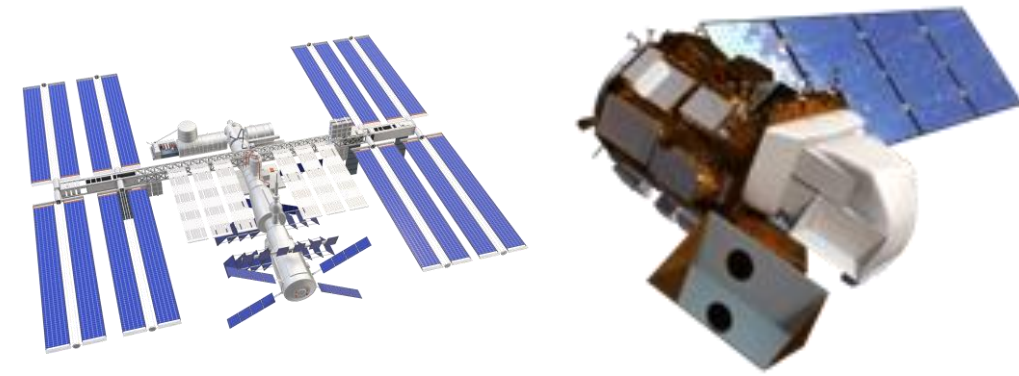
The presence of "intra-urban" heat islands is largely due to the spatial distribution of **buildings, impervious surfaces, and vegetation**.

Urban heat increases the risk of heat-related **morbidity** and **mortality** and can place an inequitable **burden on vulnerable populations**, like low-income areas or those with pre-existing health conditions.

$$\text{Exposure to Heat} + \text{Sensitivity to Heat} + \text{Capacity to Adapt} = \text{Heat Vulnerability}$$

## How Can Satellite Data Help?

Satellites can help us **quantify** the magnitude of urban heat islands & **delineate** parts of Wichita that are disproportionately affected by urban heat.



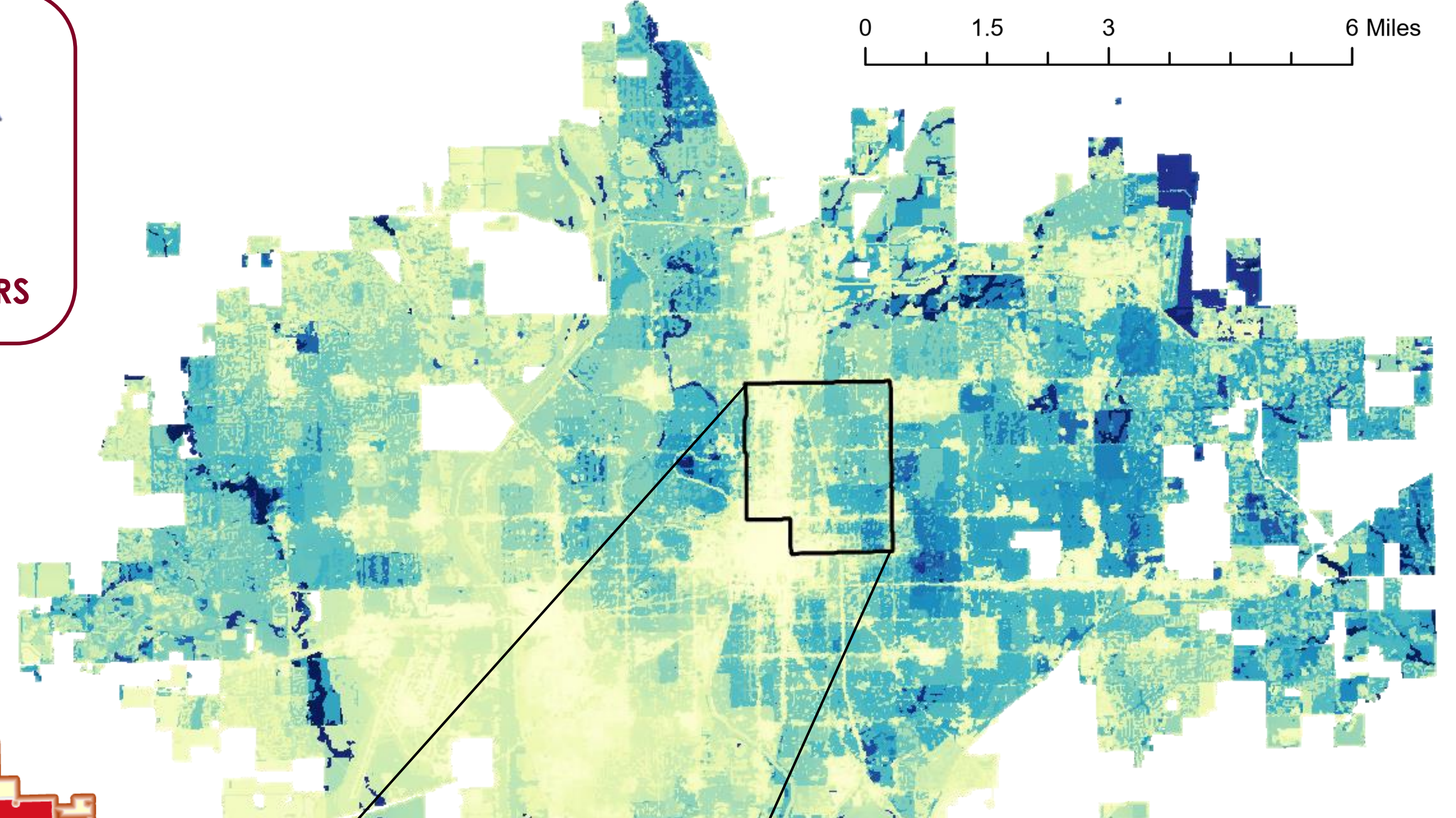
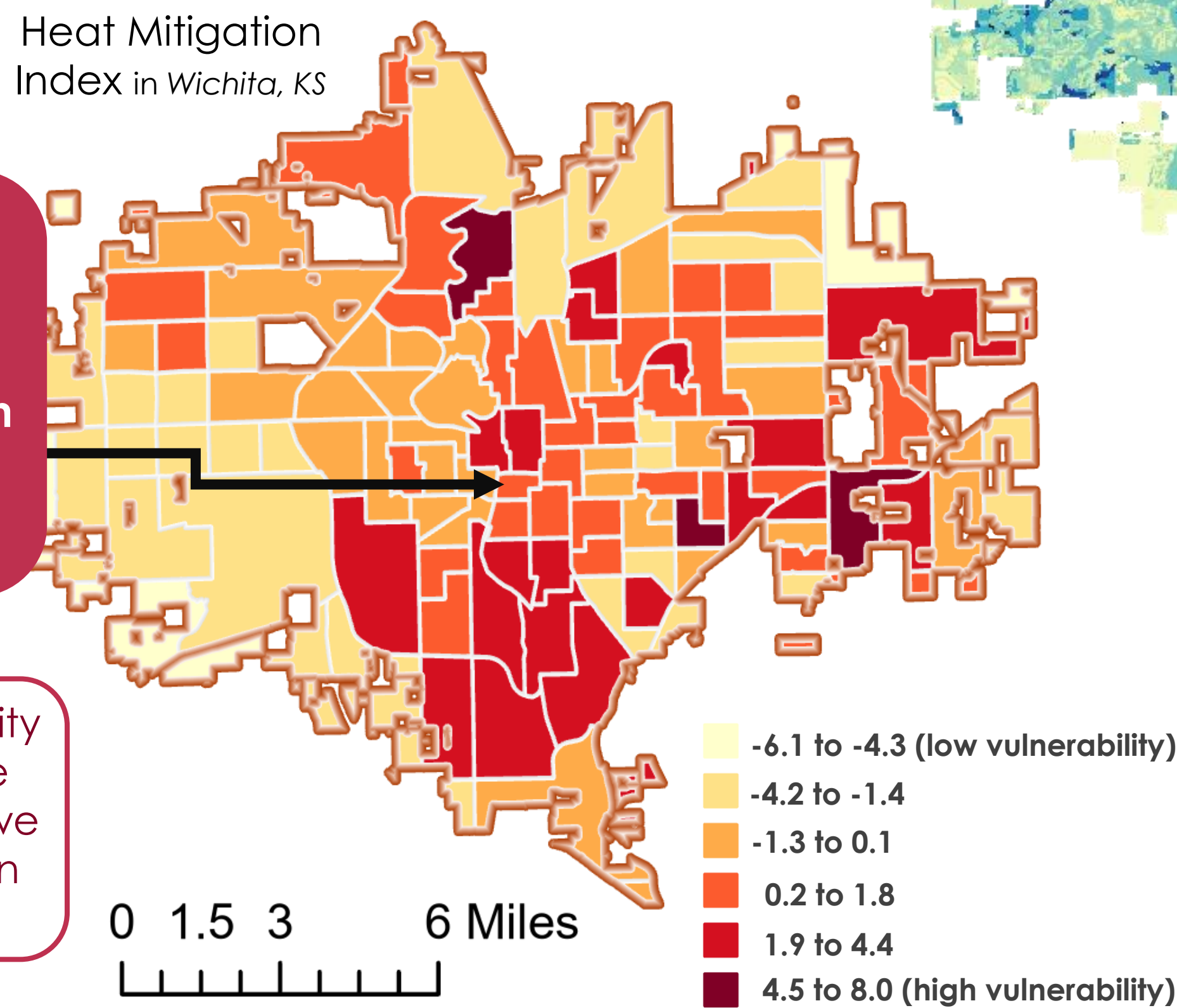
ISS ECOSTRESS Landsat 8 TIRS

Combining environmental variables, like land surface temperature, with socioeconomic and health variables, like asthma prevalence and disability, gives us a **heat vulnerability index by Census tract**

Heat Mitigation Index in Wichita, KS

Many of these highly heat vulnerable areas towards the center of Wichita have also been historically redlined, like zip code 67214

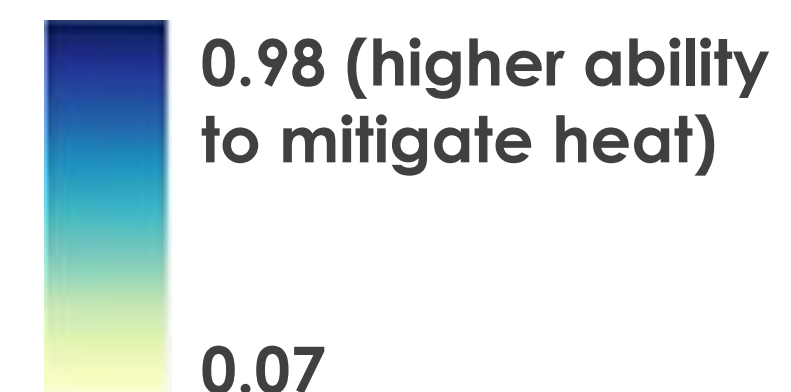
What happens to the ability of these heat vulnerable areas to mitigate heat if we increase canopy cover in Wichita?



Heat Mitigation Index Based on current tree canopy cover in Wichita, KS

Increasing canopy cover is an effective methodology for lowering heat burden on communities that experience vulnerability

Heat Mitigation Index Based on increased tree canopy cover in Wichita, KS



**Increasing canopy cover in heat vulnerable areas can strengthen climate resiliency through incorporating environmental justice into decision making.**

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## Acknowledgements

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**Big thanks to:** Lance Watkins, Christina Dennis & Akshay Agarwal for their guidance and support on this project

## Images

Icons by Freepik, IconHubs, pixelperfect, wahya (flaticon), Urban heat graphic created on Canva, Elements from Skechtify, Alexel, Pesky, Viktor Morozuk, Leremy Gan, gstudioimagen, and vectorwin