



Longwood University - Hot or Not?

Urban Heat Island Effect on Campus

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Introduction

Urban heat islands have elevated temperatures due to structural design, lack of vegetation and water, and increasing human activity. This leads to pollution, climate change and disproportionate negative health impacts.

Data/ Methods

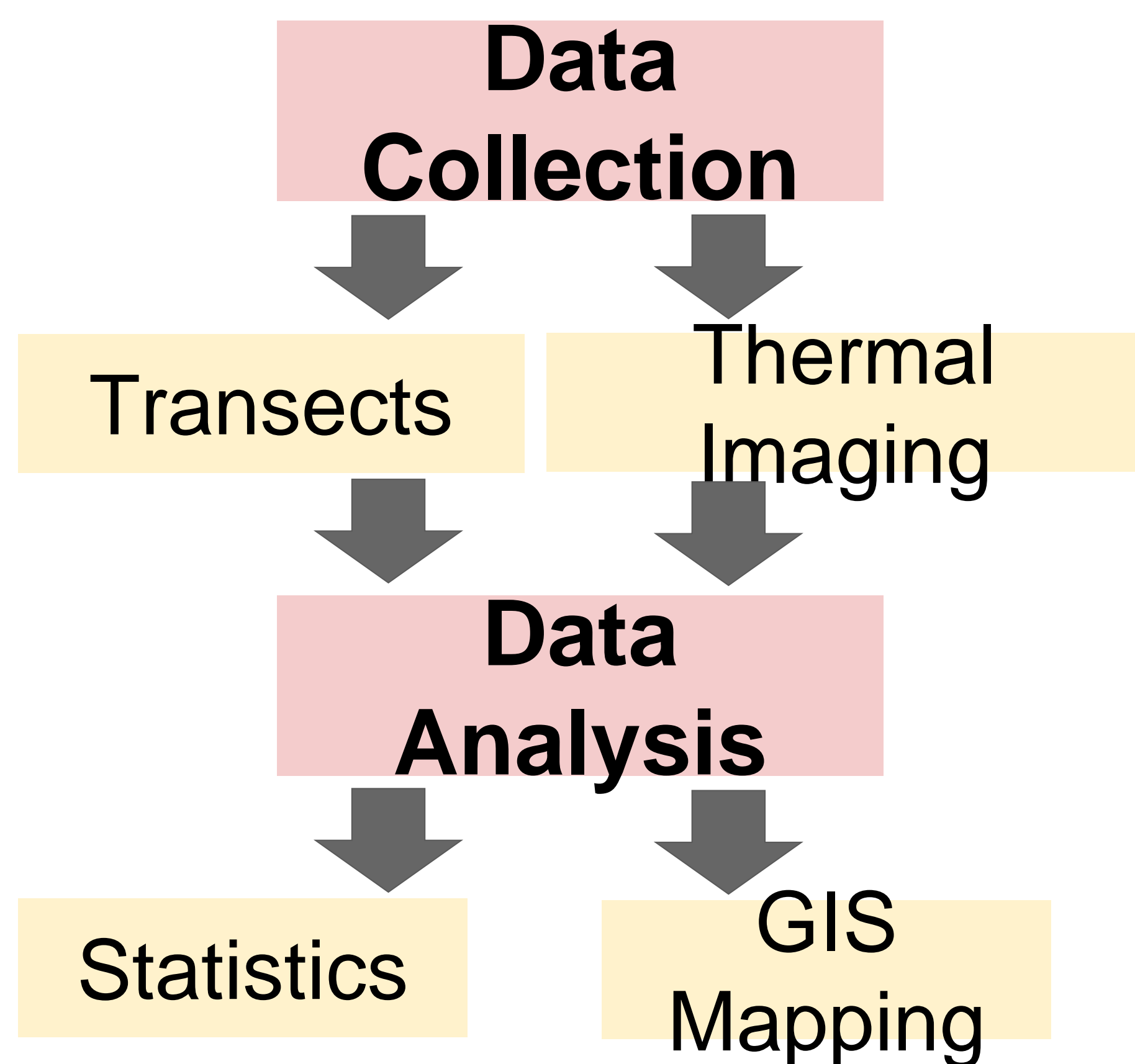


Figure 1. GPS unit (left) and thermocouple with data logger enclosed in PVC piping (right) employed in data collection. The thermocouple is fed through the PVC piping while recording data.

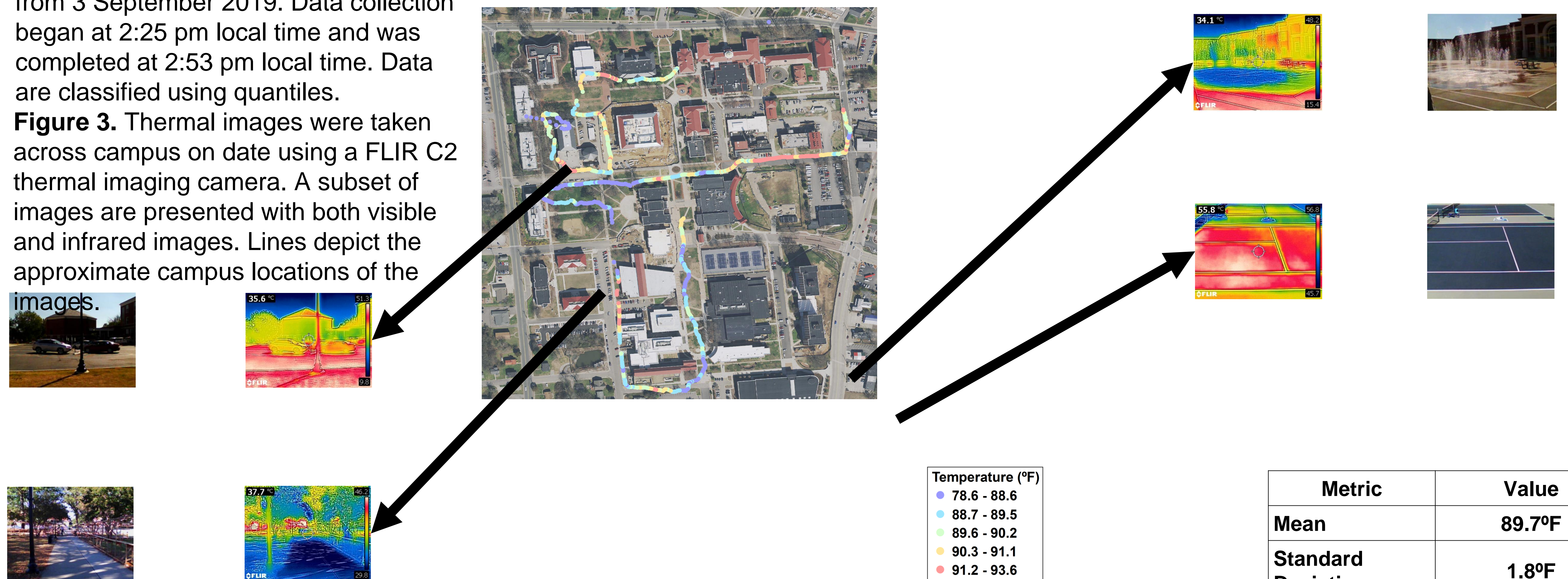
Research Goal: Identify spatial variations of temperature across campus

Purpose: Understanding how urban designs can mitigate small scale temperature patterns

Results

Figure 2. Transect temperatures (°F) from 3 September 2019. Data collection began at 2:25 pm local time and was completed at 2:53 pm local time. Data are classified using quantiles.

Figure 3. Thermal images were taken across campus on date using a FLIR C2 thermal imaging camera. A subset of images are presented with both visible and infrared images. Lines depict the approximate campus locations of the images.



Main Findings

- The analysis finds significant spatial variation in temperature across campus
- A qualitative analysis demonstrates that the presence of adequate vegetation is associated with lower temperatures
- Consequently, surfaces composed of heat-absorbing materials and/or lacking canopy coverage are associated with higher temperatures

Implications

- Campus designs that include adequate plant canopy coverage will assist with effective mitigation of high temperature environments
- Manicured lawns, with inadequate soil moisture, are a poor substitute for healthy, native trees
- In regards to temperature, manicured lawns are similar to asphalt and concrete