

UTK Office of Sustainability Internship Presentation 2019 -2020

Implementing Green Infrastructure at UTK



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OFFICE OF SUSTAINABILITY

“The Sustainability Internship Program provides students of any background with the opportunity to create and execute a project on an Office of Sustainability program or initiative of their choice. Student interns benefit from hands-on experience in an environmental organization and professional development training in these unpaid positions. Students gain valuable connections with campus and other members of the University by working collaboratively on their projects.”



IMPLEMENTING GREEN INFRASTRUCTURE

Rainwater Harvesting



Downspout Disconnection



Rain Gardens



Bioswales



Green Roofs



What is Green Infrastructure?

Simply put, 'Green Infrastructure' refers to built systems using natural mechanisms such as plant and soil systems to mitigate negative effects from a wide range of sources that are commonly associated within any urban setting such as: stormwater runoff, excessive heat, energy consumption, and more.

Why Use Green Infrastructure?

Green Infrastructure (GI) has emerged as an engineering solution to most of the previously listed problems within cities. Aside from their intended functional purpose, they also are aesthetically pleasing and offer health benefits that promote mental well-being.

Perhaps the strongest argument for these systems is that they are typically cheaper when compared to conventional mitigation strategies.

GETTING STARTED

Fall 2019:

- After deciding which GI system to implement I began selecting particular buildings to conduct thermal imaging on:
 - 1.) Austin Peay
 - 2.) Science and Engineering
 - 3.) Walters Life Science
- Thermal images were done at various times of day on MWF to simulate the phenomenon known as the Urban Heat Island whereby surrounding buildings capture then dissipate heat slowly throughout the day and night (peak times being ~3hours after sunset).
- Additional research as well as collaboration with numerous UT faculty members was conducted throughout the remaining semester.

Spring 2020:

Spring was the 'implementation' phase of my research.

- After compiling the data of the thermal imaging and the feasibility of a green facade construction, Walters Life Science was the optimal location due to its plain wall and easy accessibility.
- After meeting with two Facility Services members as well as a fellow intern and mentor, the likelihood of the project dimmed. However, a transition to team with my fellow intern Hannah Loftis to establish a green roof on campus was the new goal.
- Dr. Robert Denovo, professor and associated Dean of Veterinary Medicine, was recommended to seek out because he has been an advocate for green infrastructure on campus for 20 years.
- After establishing a meeting and discussing logistics it seemed that after months of closed doors and dead ends that we were finally going to have a suitable location for our project.

THERMAL IMAGES



Austin Peay @ 3am

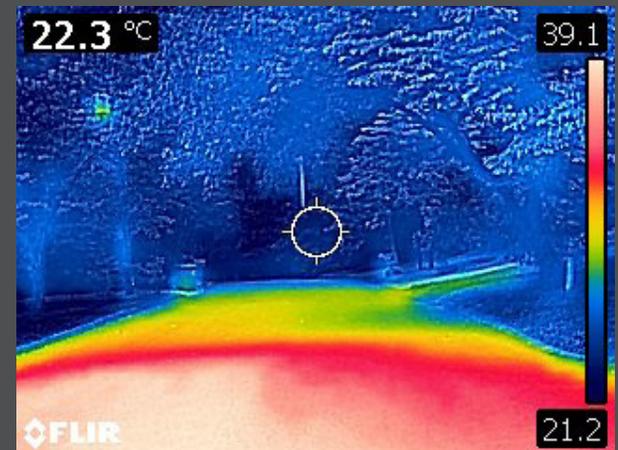


Science and Engineering @ 3am

Walters Life Science @ 3am



Visual Comparison between Asphalt (red) and Vegetation (blue)



UNFORESEEN EVENTS AND COMPLICATIONS

Unfortunately, due to extreme circumstances involving COVID-19 my project and the internship was halted. Fortunately, I have two semesters left and look forward to continuing my progress come Fall 2020.

Complications:

Roughly halfway through my original idea it was becoming apparent that maybe a green roof would be better to pursue. Fortunately, most of my research gathered in the previous term was easily transferable to this project.

Throughout the internship the largest hurdle to overcome was trying to establish maintenance and site location. Luckily for both Loftis and I, we were fortunate enough to eventually line-up a meeting with Dr. Denovo who happily supplied both.

A personal complication I faced in the beginning was exactly how to conduct my research and carry out this internship. I felt overwhelmed with the endless possibilities I could have explored, compounded with the lack of research experience. I may have felt out of my element, but was excited and motivated by my peers to pursue this internship.

Sources & Thanks To

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