What’s Hot at UCF: A UHI Study
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Introduction
• Urban heat islands (UHIs) are areas of land in developed cities that exhibit higher temperatures than the surrounding land
• On local scales, a UHI effect causes higher temperatures that persist over longer periods of time
• Globally, UHIs impact atmospheric temperatures and world climate
• The University of Central Florida (UCF) was the UHI study site
• A UHI effect at UCF increases risk of heat stroke in animals, including humans

Study Question
• How do the temperature indexes at UCF differ in urban vs. natural lands?

Hypotheses
• Urban lands will yield average temperatures that are at least 2°C higher than that of natural lands during the day
• Urban lands will take at least two more hours to cool to the same temperature as natural lands at night
• Parking lot D will exhibit higher temperatures than other urban lands due to its wider pavement canyon

Methods
• Data collection locations were determined by creating transects in the following directions: cardinal (4), intercardinal (4), and secondary-intercardinal (8)
• 40 HOBO Pro v2 data loggers were mounted to various structures on campus approximately 2.5 meters in height
• Temperature was recorded at canopy level every two hours for six weeks
• Data was analyzed by finding the averages and standard deviations of urban and natural lands

Discussion
• 40% of data loggers were in urban lands while 60% were in natural lands, reflecting UCF’s composition of approximately 60% natural lands
• The highest average temperatures were found at 13:00 due to the latent warming effect of the sun’s highest point at 12:00
• At 5:00, the coolest temperature in urban lands was 20.09°C at data point 10 while the coolest in natural lands was 18.44°C at map point 40
• At 13:00, the warmest temperature in urban lands was 29.39°C at data point 12 while the warmest in natural lands was 29.20°C at map point 22
• The average temperatures in urban lands were 0.95°C higher than temperatures in natural lands at 5:00
• The average temperatures in urban lands were 0.47°C higher than temperatures in natural lands at 13:00
• Average temperature differences were lower than the hypothesis of a 2°C difference because UCF consists of many hybrid zones that have both urban and natural land characteristics
• Because data points 7 and 8 are near a large body of water, they exhibit relatively cooler temperatures during the day but relatively warmer temperatures at night
• Overall, urban lands exhibited higher temperatures throughout the day and retained heat longer throughout the night, as shown in Figures 1, 2, and 3
• Because data was collected from 6 October 2015 to 16 November 2015, seasonal bias exists
• Further studies are required to expand data and accurately measure average temperatures at UCF on a year-long scale

Acknowledgments
A warm thank you to Alaina Bernard, Ryan Chabot, Jennifer Elliot, Ray Jarrett, and Amanda Lindsay for their invaluable contribution of information, time, and supplies

Figure 1: A map of UCF with 40 data logger locations and average temperature gradients at the coolest time of the day
Figure 2: A map of UCF with 40 data logger locations and average temperature gradients at the warmest time of the day
Figure 3: This graph shows the increase and decrease in average hourly temperatures with standard deviation bars based on data collected over six weeks; the left oscillation minimum and maximum temperatures are labeled for urban lands and the right for natural lands.