

University of British Columbia

Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

# How Urban Trees Keep Our Campus Cool?

Assessing the resilience of UBCV campus in coping with summer heatwaves  
using Spatial Multi-Criteria Evaluation

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An aerial photograph of a suburban neighborhood. In the upper left, a street with parked cars and a few houses is visible. The center and right portions of the image are dominated by a dense canopy of trees in various shades of green and yellow, suggesting an autumn setting. Several houses with different roof colors (grey, brown) are interspersed among the trees.

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Up to  
**49.6°C**

In July 2021

How has the temperature  
changed over the past 20 years?



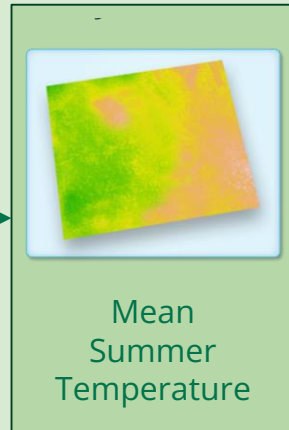
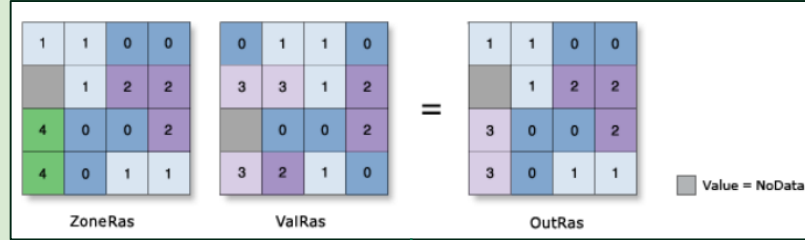
More than  
**20,000**

People live on campus

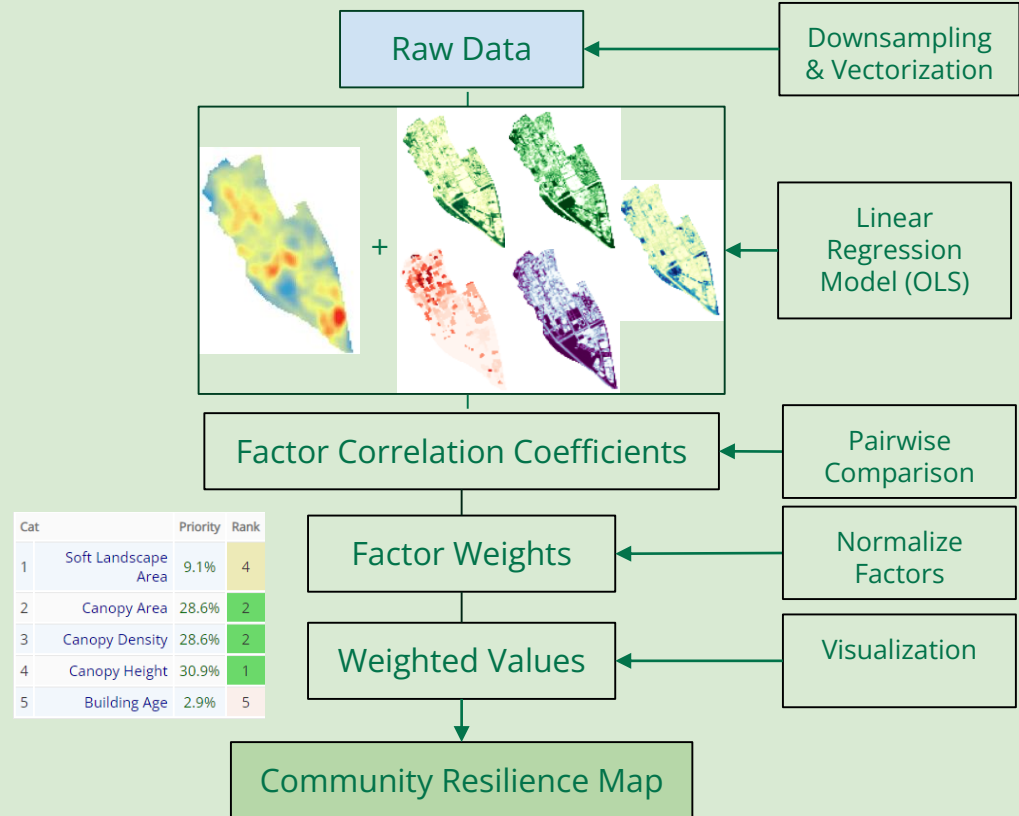
Are campus communities  
resilient to extreme heat?

# Methods

- Zonal Statistics



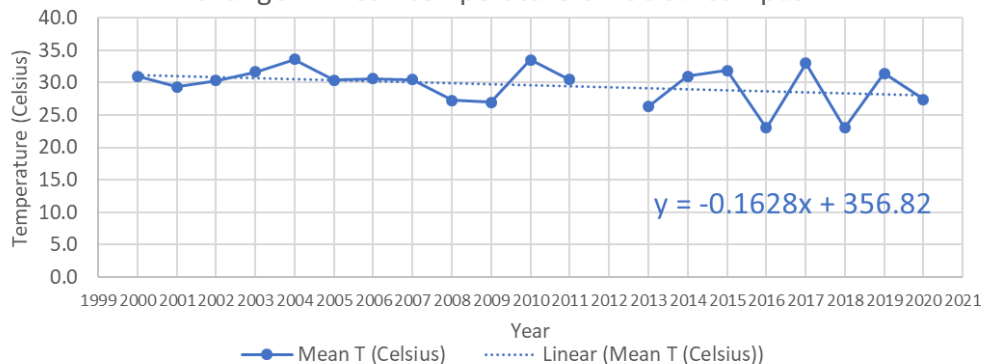
- Multi-Criteria Analysis



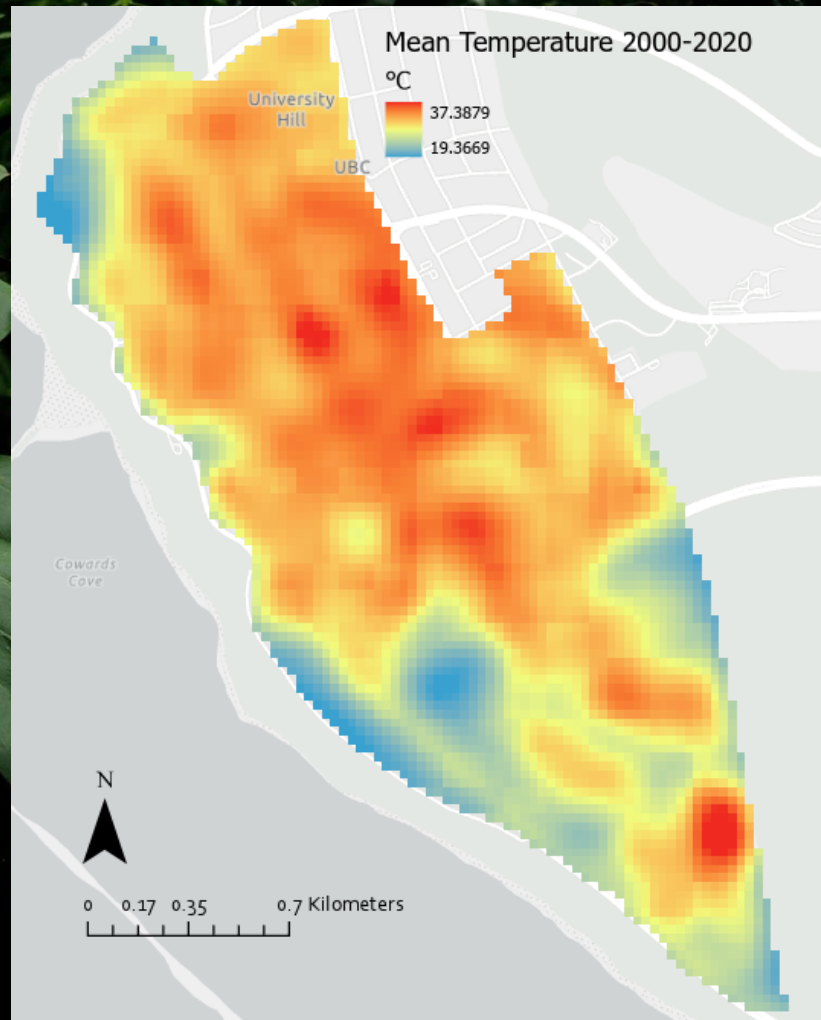
# Results

## Mean Temperature Change UBCV Campus 2000-2020

Change in mean temperature on UBCV Campus



Mean temperature has fluctuated over the past 15 years, but has shown a slight downward trend overall





# Results

## Community Resilience UBCV Campus

Relative Resilience  
Weighted Sum



Most Resilient Pixel

Least Resilient Pixel



Equal Weights

0 0.15 0.3 0.6 Kilometers



# Discussion

Mean summer temperatures on campus have dropped slightly over the past two decades.

Multi-criteria analysis highlights areas that are resilient or vulnerable to extreme heat.



## Uncertainty

Spatial resolution

LiDAR point classification

Explanatory variables

Factor weights

.....

## Future Directions

- Higher data resolution is required.
- Include variables that cover broader categories.
- Use better fit models when determining factor weights for each variable.