



Environmental Justice Assessments



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What is Environmental Justice?

United States Environmental Protection Act:

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

This goal will be achieved when everyone enjoys:

- The same degree of protection from environmental and health hazards, and
- Equal access to the decision-making process to have a healthy environment in which to live, learn, and work.

What is Environmental Justice?

Risk - environmental factor and frequency

- Natural
- Human-Made Mechanical
- Human-Made Societal

Vulnerability - individual characteristics

Adaptation - addressing an effect of climate change

Mitigation - addressing the cause of climate change



Why is this important for our community?

Some of our communities have been marginalized and underserved

iCAP 2020: Objective 8.3 Environmental Justice Plan

The University is a large player in our community, and integrated approaches and communication work best

Assessment Methodologies

Simple Indicators

- EJSCREEN

Weighted Indicators

- CalEnviroScreen
- ILSFA

Calculation of CalEnviroScreen Score for tract 6019000300

	Pollution Burden		Population Characteristics	
	Exposure Indicators	Environmental Effects Indicators*	Sensitive Population Indicators	Socioeconomic Factor Indicators
Component Score	80.40	$(0.5 \times 40.70) = 20.35$	97.66	81.16
Average of Component Score	$100.75 \div (1 + 0.5) = 67.17$ <i>Pollution Burden is calculated as the average of its two component scores, with the Environmental Effects component half-weighted.</i>		$178.82 \div 2 = 89.41$ <i>Population Characteristics is calculated as the average of its two component scores.</i>	
Scaled Component Scores (Range 0-10)	$(67.17 \div 81.19^{1**}) \times 10 = 8.273$ <i>The Pollution Burden percentile is scaled by the statewide maximum Pollution Burden scores.</i>		$(89.41 \div 96.43^{***}) \times 10 = 9.272$ <i>The Population Characteristics percentile is scaled by the statewide maximum Population Characteristics scores.</i>	
CalEnviroScreen Score	$8.273 \times 9.272 = 76.71$ A score of 76.71 puts this census tract in the 95-100 percentile or top 5% of all CalEnviroScreen scores statewide.			

* The Environmental Effects component was given half the weight of the Exposures component.

** The tract with the highest Pollution Burden score in the state had a value of 81.19.

*** The tract with the highest Population Characteristics score in the state had a value of 96.43.

Data Sources

The Champaign County GIS Consortium

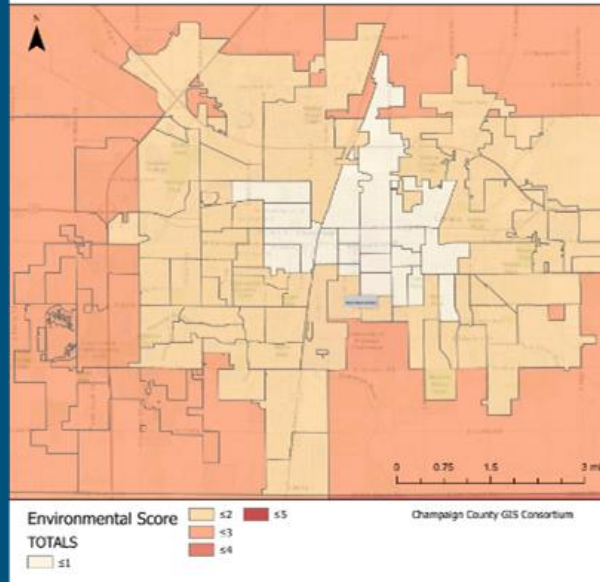
Used for the environmental score maps

Multi-Resolution Land Characteristics Consortium - NLCD 2016 Land Cover

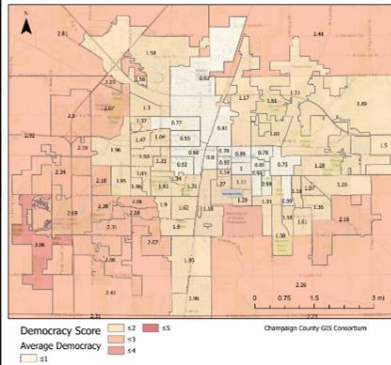
Used for the tree maps

Maps!

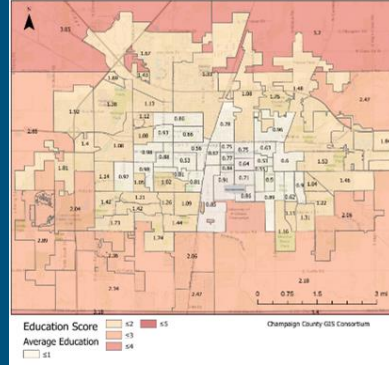
Map of Total Environmental Score



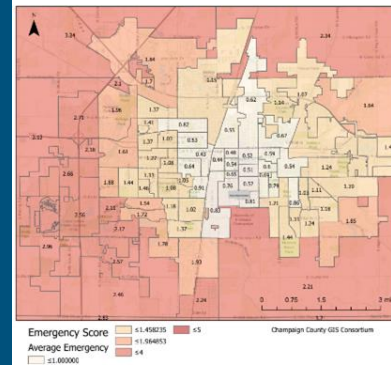
Map of total Democracy Score



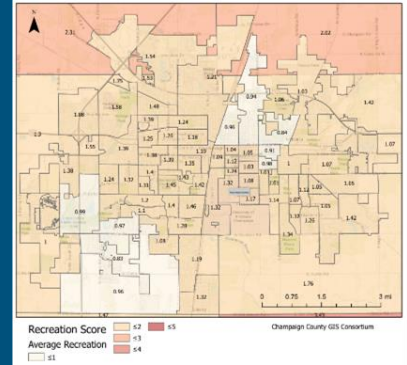
Map of total Education Score



Map of Total Emergency Score



Map of total Recreation Score

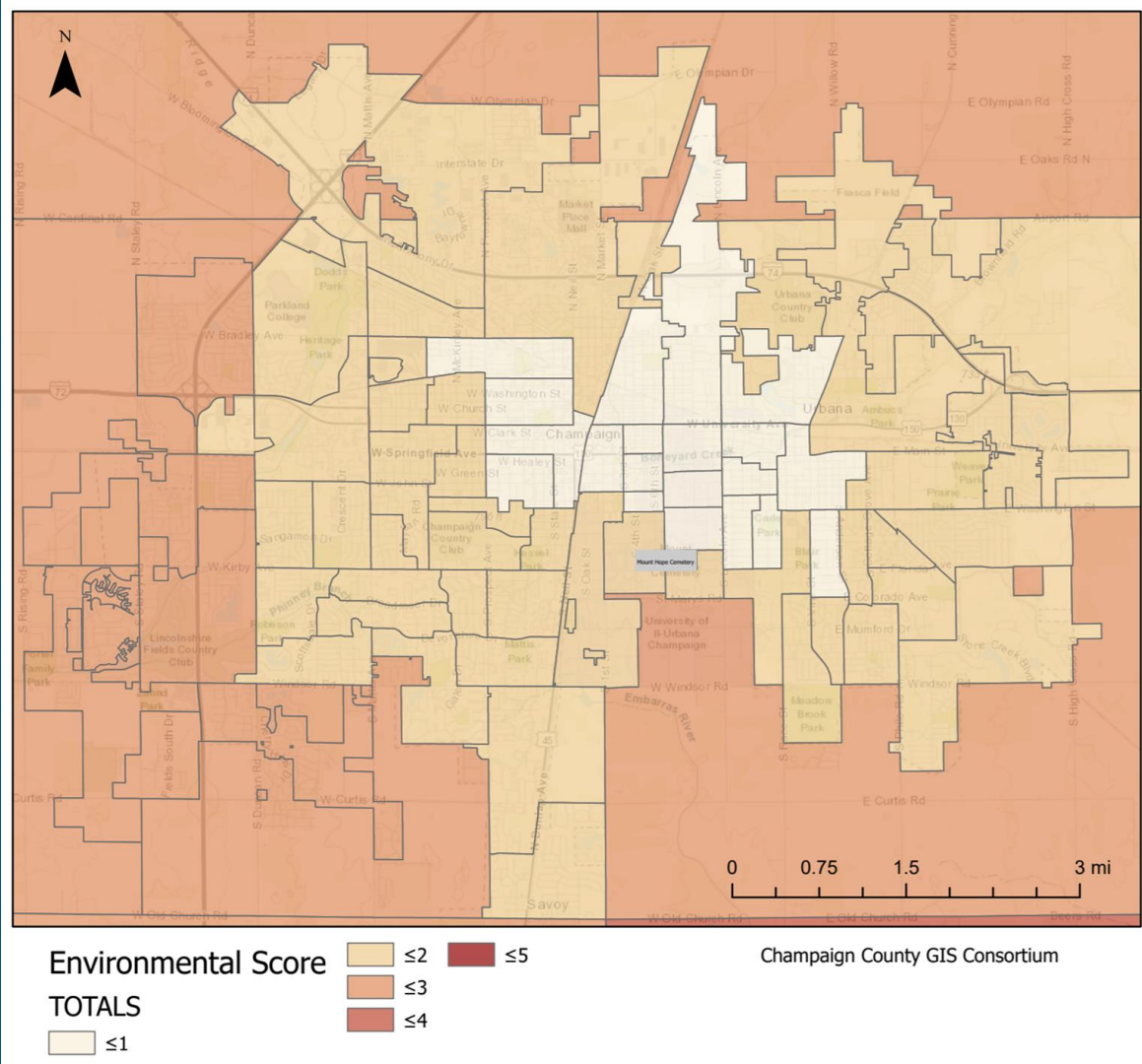


Total Environmental Score

Data comes from the Champaign GIS Consortium and was used to specify precincts, and feature locations.

The red levels indicate need for improvement as distances to features are farther away.

While much of the area near the University has short distances to nearly all features (with the exception of recreational areas) areas in southern Champaign and Savoy consistently have distances that are much greater.

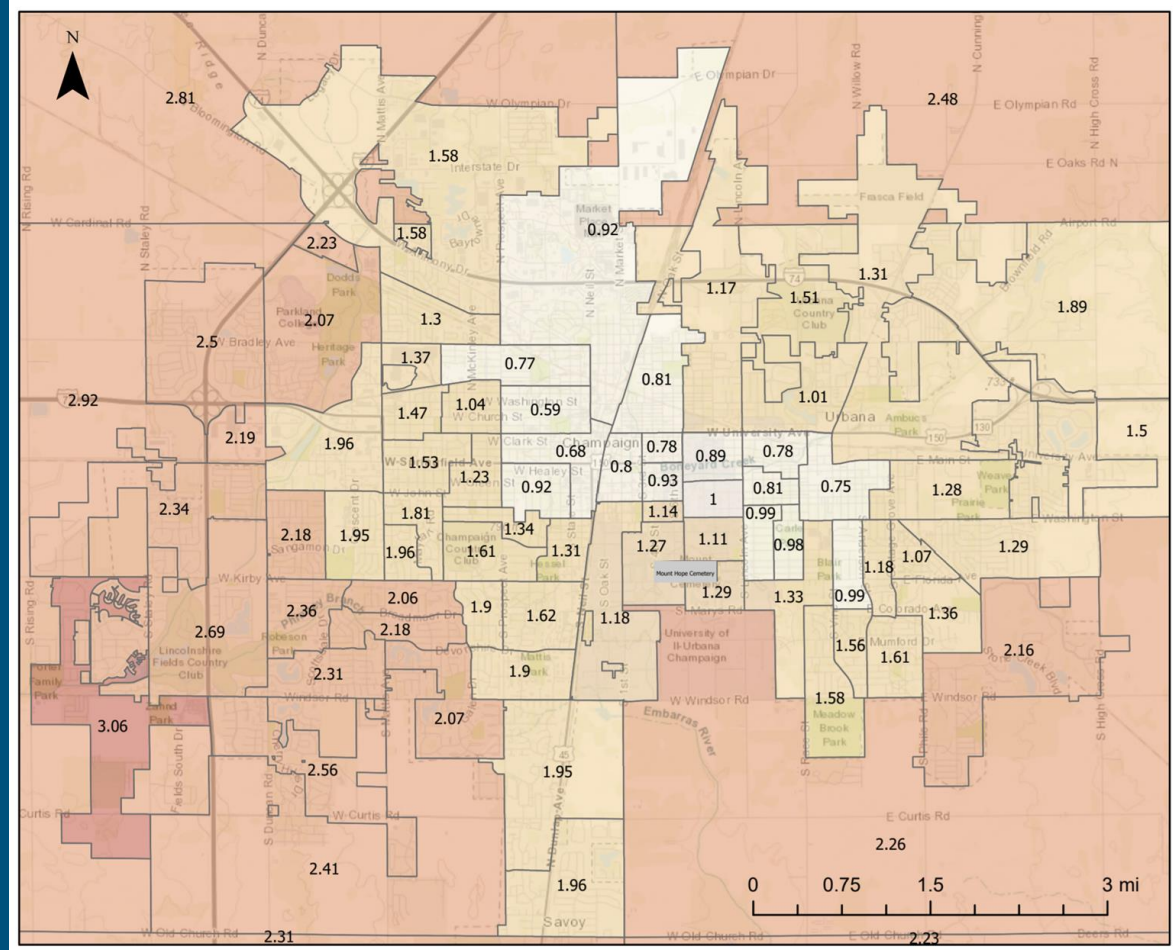


Democracy Score

Public health, public works, and
city hall/ government buildings

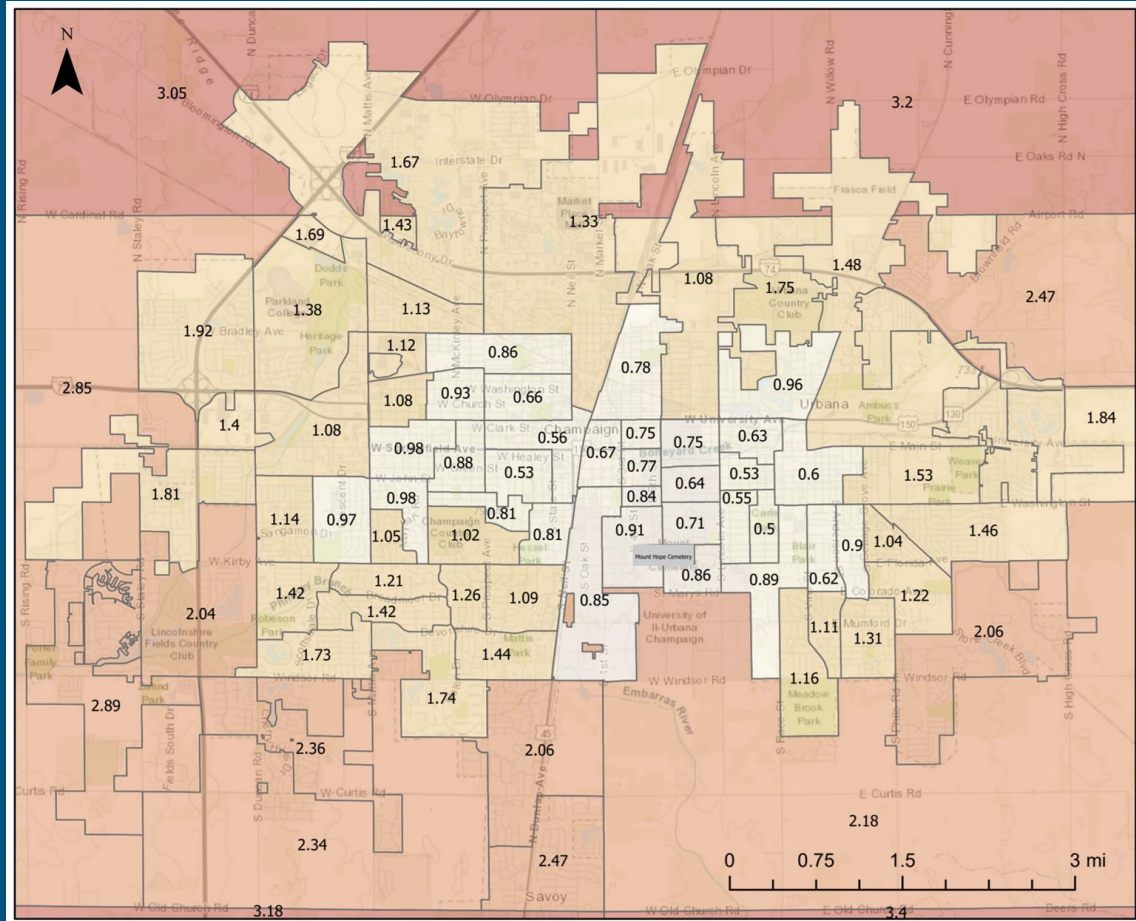
In terms of democratic buildings the
distances in Southern Champaign and Savoy
are much greater, getting into distances
close to 2 miles or more from buildings.

The effect of this would be a decrease in
effective political power of these people as
it is more difficult for them to access
services such as public works or city hall.



Libraries, colleges, high schools, and middle schools

Similar to the democratic buildings, the education buildings are primarily concentrated in central Champaign-Urbana while diminishing in the southern area.



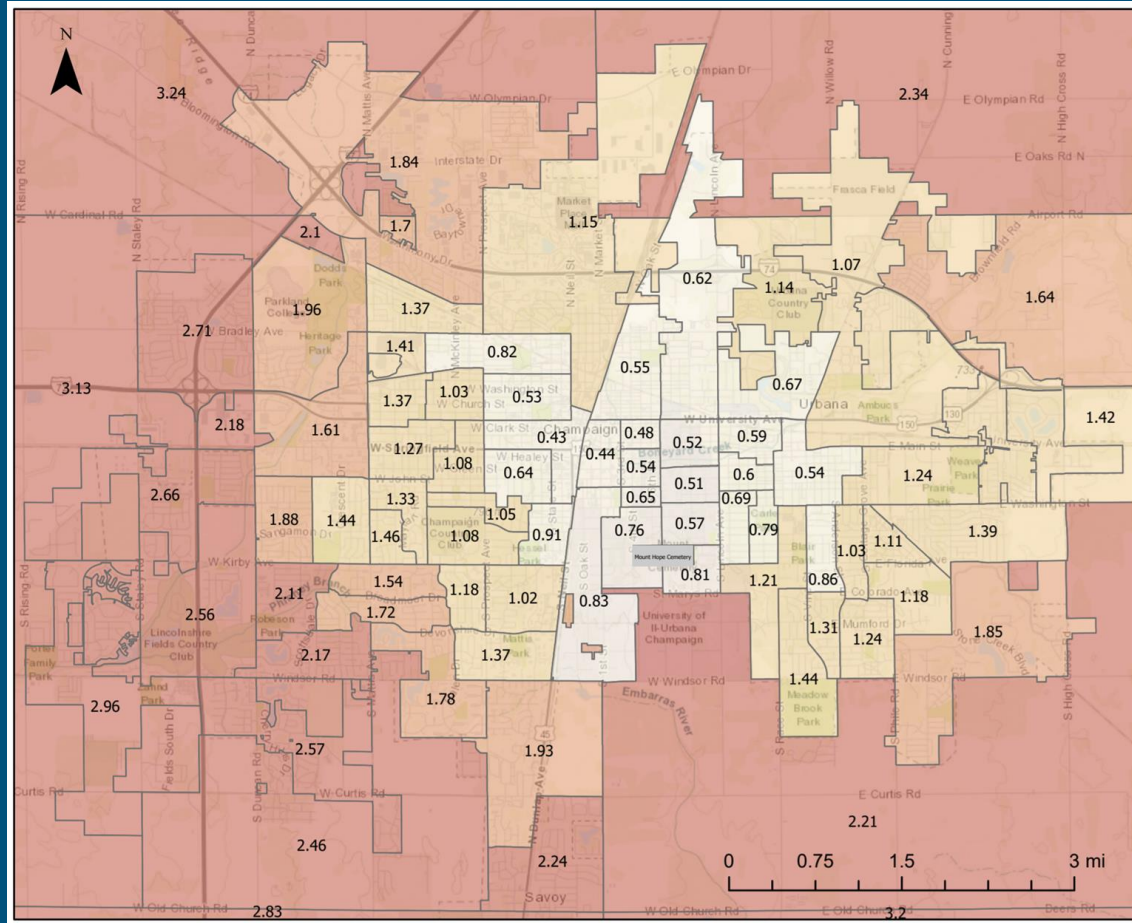
Emergency Score

ambulance operation points, mental health facilities, hospitals, clinics, fire stations, police stations, and jails (not really any jails in chambana)

The Emergency score was again similar to democracy and education categories as it did well near the university and central Champaign and then drastically fell further from the city center.

This is likely due to the higher concentration of hospitals and mental health centers near the university as well as the presence of the Carle hospital which has multiple buildings near campus that deal in a variety of fields.

Additionally there are more police stations near campus than anywhere else in Champaign. While we had discussed the possibility of police stations having a negative effect due to over policing of an area, I feel that in this case the police tend to have a more positive than negative impact on the surrounding community.

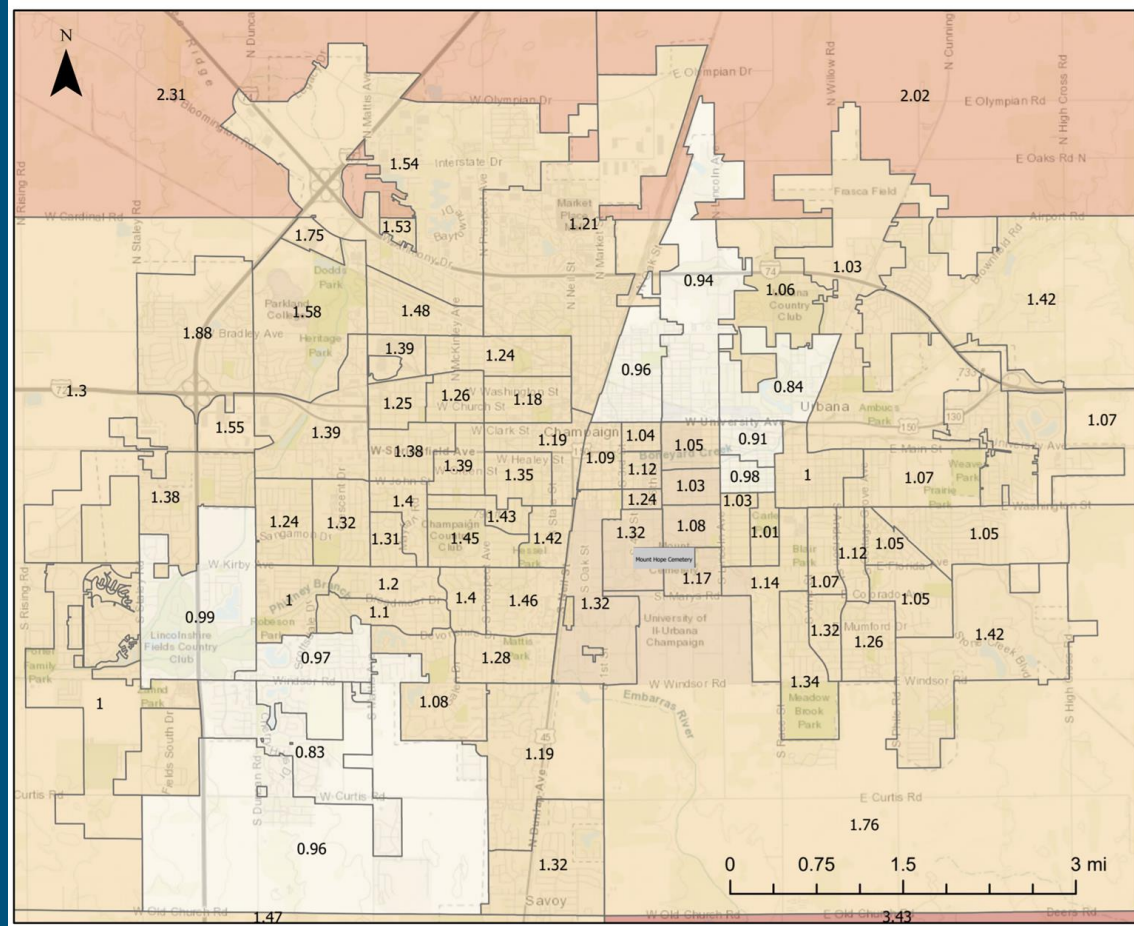


Recreation Score

forest preserves, public golf courses, parks, lakes, misc recreational centers

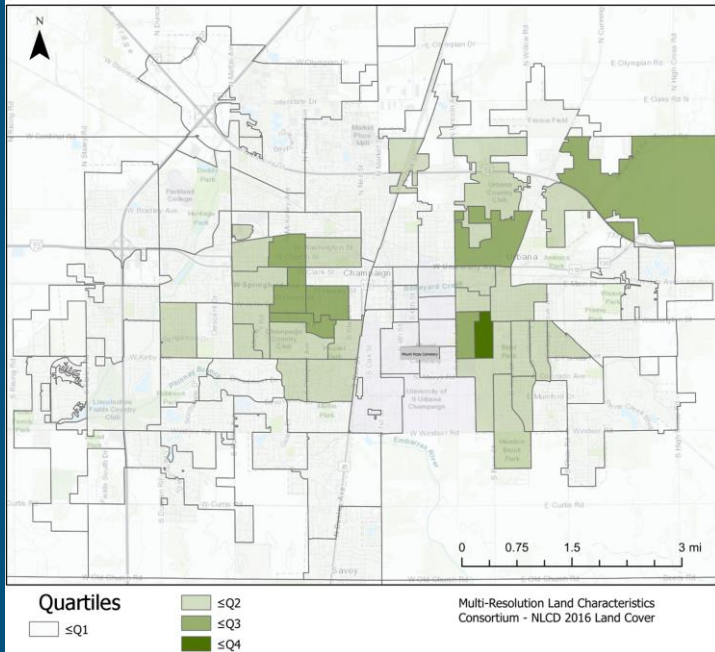
Recreational areas are different from the other categories looked at as the university and immediate areas actually have a somewhat lower score than areas in Northern Urbana and Southern Champaign.

This could be due to a number of things such as an intensification of commercial and educational buildings or urban development in general.

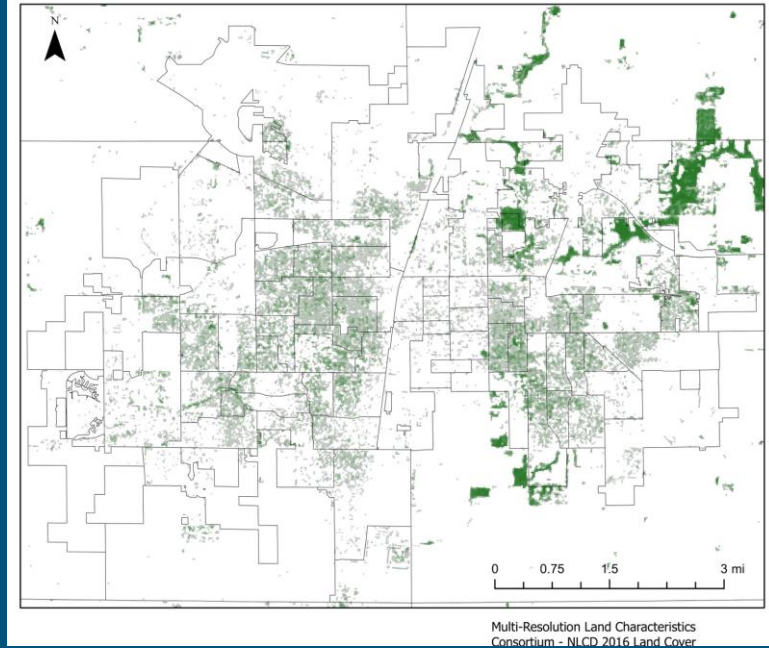


Tree Coverage Maps

Comparative Tree Coverage Across Precincts



Tree Coverage Across Champaign-Urbana



Direction for Future Work

1. Data Gathering
 - a. Additional Data Sets
 - b. Spatial scale
 - c. Time scale
2. Final Score Methodology
3. Qualitative Information

References

Agency for Toxic Substances and Disease Registry. (2021, April 28). CDC/ATSDR Social Vulnerability Index (SVI). Retrieved May 8, 2021, from Agency for Toxic Substances and Disease Registry: <https://www.atsdr.cdc.gov/placeandhealth/svi/index.html>

Cutter, S. L. (1996). Vulnerability to environmental hazards. *Progress in Human Geography*, 20(4), 529-539.

Johnson, M. F. (2021, April 26). Energy, Infrastructure, and Justice in Illinois (and Beyond). Retrieved May 8, 2021, from <https://echo360.org/lesson/e851cb51-59ad-4646-a257-ef9972de30a3/classroom#sortDirection=desc>

Luers, A. L., Lobell, D. B., Sklar, L. S., Addams, C. L., & Matson, P. A. (2003). A method for quantifying vulnerability, applied to the agricultural system of the Yaqui Valley, Mexico. *Global Environmental Change*(13), 255-267. doi:10.1016/S0959-3780(03)00054-2

Shepard, P. (2012, July 30). Environmental Justice: Peggy Shepard at TEDxHarlem. Harlem, New York: TEDx Talks. Retrieved May 7, 2021, from https://www.youtube.com/watch?v=zJX_MXaXbJA

The Climate Reality Project. (2019, November 7). Climate adaptation vs. mitigation: What's the difference, and why does it matter? Retrieved May 8, 2021, from The Climate Reality Project Blog: <https://www.climate realityproject.org/blog/climate-adaptation-vs-mitigation-why-does-it-matter>

United States Environmental Protection Agency. (2021, May 3). Environmental Justice. Retrieved May 8, 2021, from <https://www.epa.gov/environmentaljustice>

United Way. (2020). ALICE in Illinois: A Financial Hardship Study. United Way of Illinois. Retrieved May 8, 2021, from <https://www.unitedforalice.org/illinois>

United Way of Champaign County. (2021). ALICE in Champaign County. Retrieved May 8, 2021, from <https://www.uwayhelps.org/blog/fight-for-ALICE>

United Way. (n.d.). Our Mission. Retrieved May 8, 2021, from United Way Our Impact Mission: <https://www.unitedway.org/our-impact/mission>

Image Credits

[1] - <https://media.nationalgeographic.org/assets/photos/000/204/20429.jpg>

[2] - <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30>