



# DISTRIBUTION OF GREEN SPACE AND ENVIRONMENTAL JUSTICE IN CUYAHOGA COUNTY, OHIO

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## Introduction

- ❑ Race and socio-economic status are known to greatly influence resource allocation and access.
- ❑ Most studies have shown that minority groups have less access to green space.
- ❑ Uneven distribution of green space has become serious environmental justice concern.
- ❑ Access to green space has been associated with improved health behavior.
- ❑ It is therefore important to examine where these inequalities exist and ways to overcome them.

## Hypotheses

- ❑ Percent black population of census block groups will be negatively associated with proximity to green space.
- ❑ Median Income will be positively associated with proximity to green space.
- ❑ Percent black population of census block groups will be negatively associated with size of nearest green space.

## Methods

### Data Processing

- ❑ Linked population data to block groups boundary (n=1178)
- ❑ Manually digitized park access points (n=547).
- ❑ Calculated mean center of census block groups .
- ❑ Measured the distance (miles) from mean center to nearest park access point.

### Statistical Analysis

- ❑ Performed linear regression analysis between dependent and explanatory variables – R software.

Explanatory variable	Dependent variables
Percent black population	o distance to nearest park
Median Income	o Park size

### GIS Mapping

- ❑ Mapped spatial distribution of percent black population, median income and green space size.



Digitized park access points

## Study Area: Cuyahoga County, Ohio

- ❑ Cuyahoga county is one of the hyper segregated counties in Ohio state and US.
- ❑ High segregation is attributed to racial and social exclusion policies in the 19<sup>th</sup> and 20<sup>th</sup> centuries.
- ❑ 63.6% white, 29.7% black or African American, 2.6% Asian, 4.8% Hispanic or Latino.
- ❑ Minority and low-income residents are concentrated around Cleveland city.
- ❑ Poor health outcome in the county has been associated with racial segregation and income inequality.

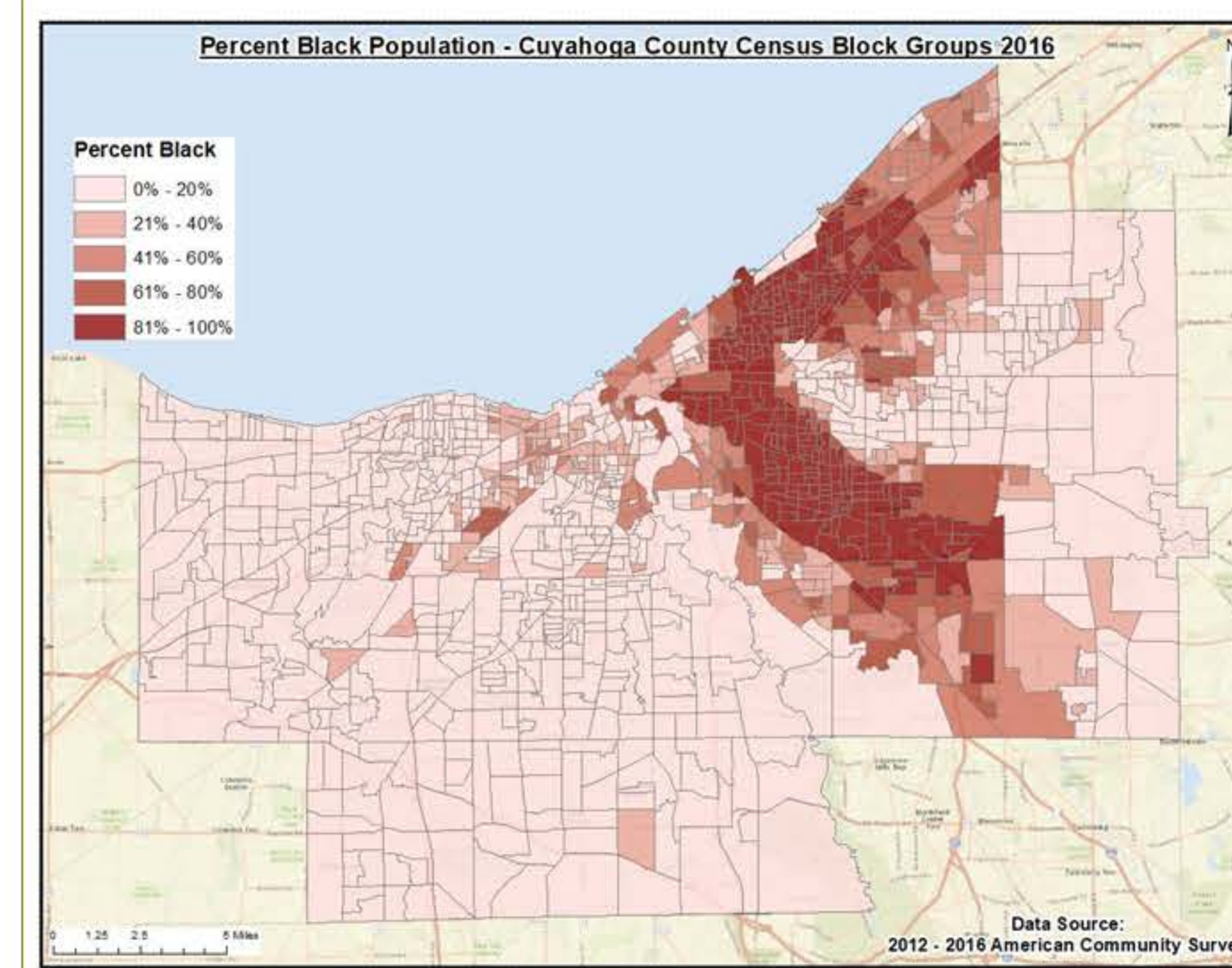


Figure 1.

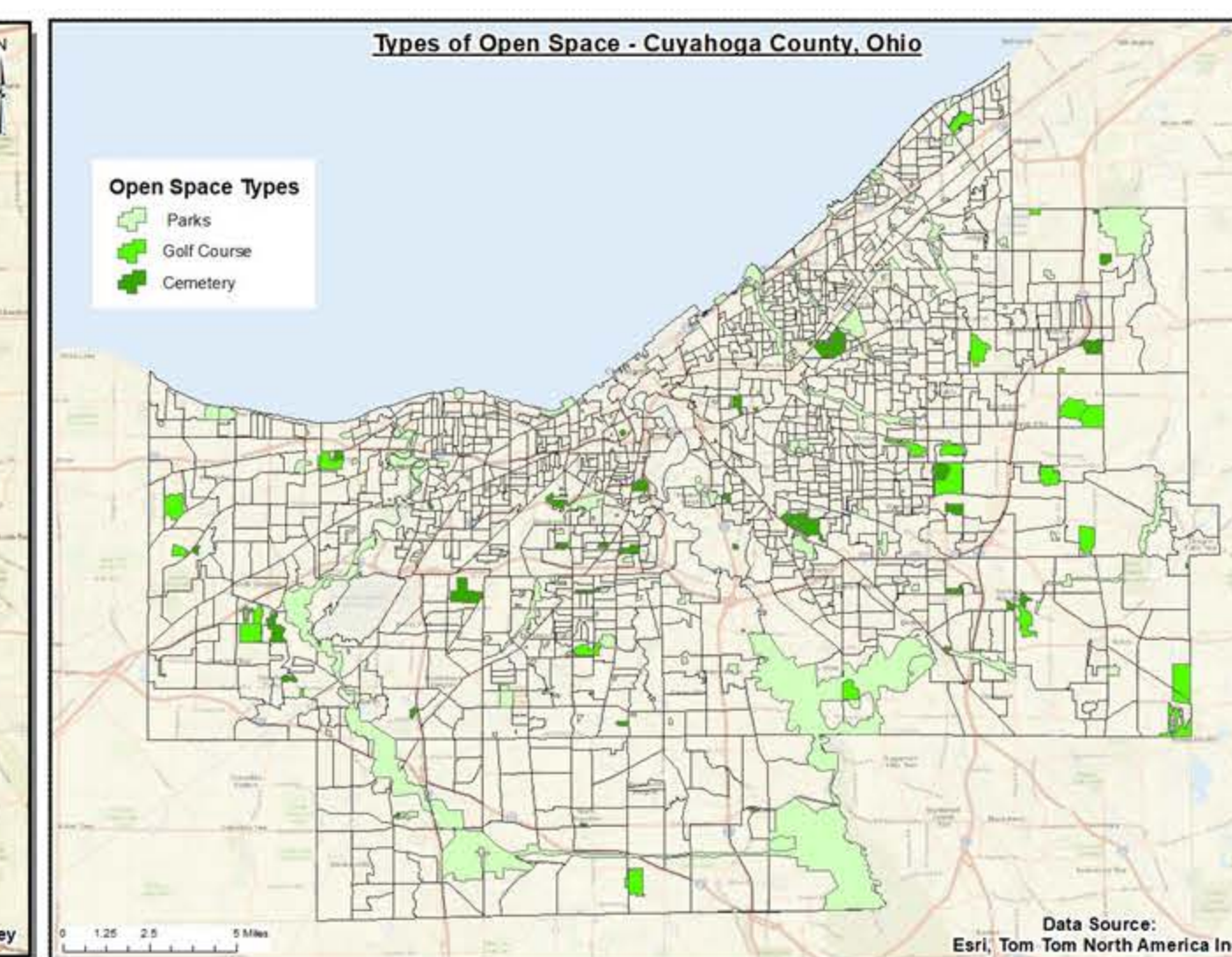


Figure 2.

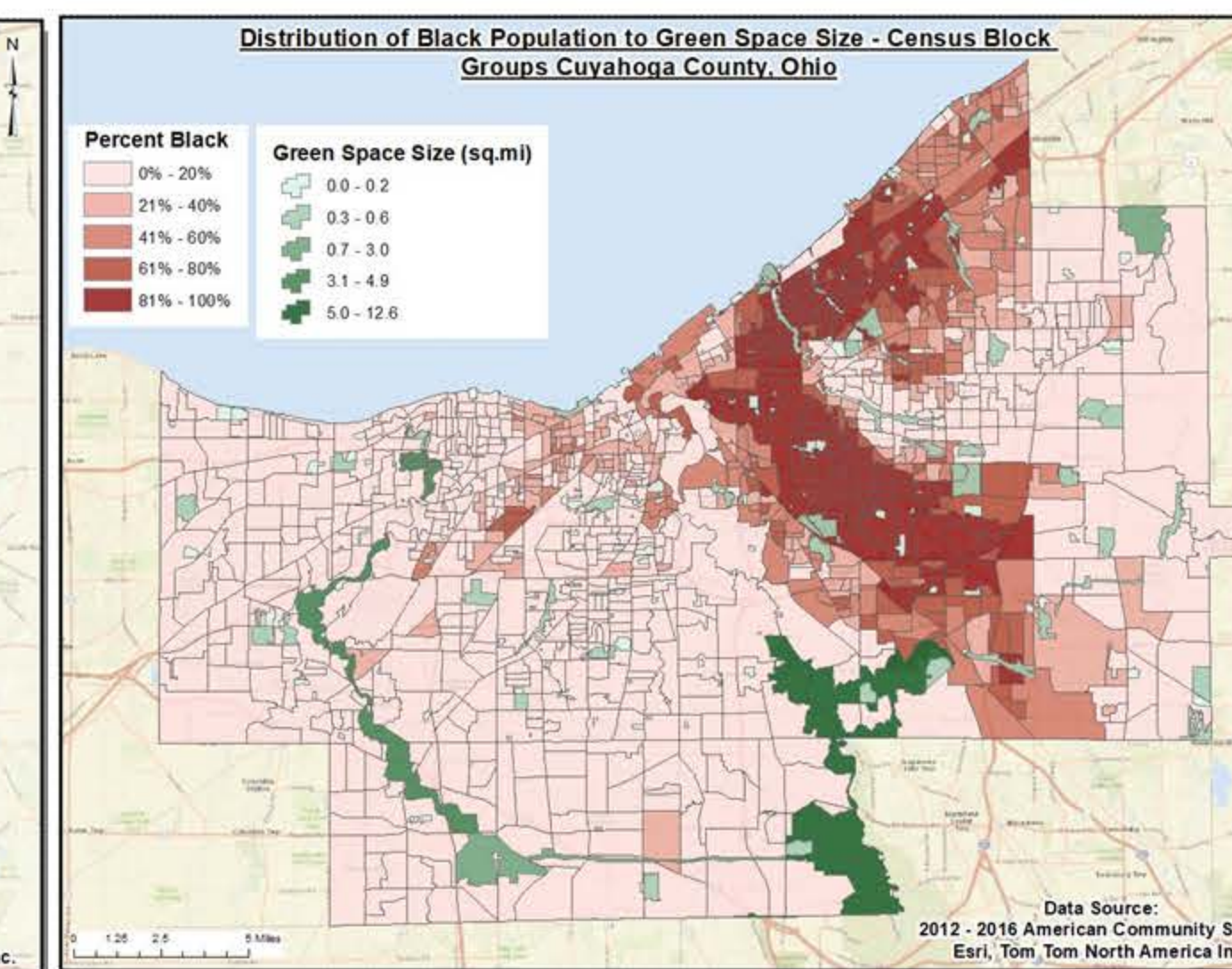


Figure 3.

## Results

### Multiple Linear Regression for proximity to green space

Explanatory Variable	Coefficient - Slope	P - Value
Percent black population	- 2.840e-03	3.26e-06 ***
Median Income	1.017e-05	1.68e-4***

- ❑ P – Value indicates a statistically significant relationship between percent the dependent and independent variables.
- ❑ Coefficient for black population indicates that for every 1% increase in black population there is a -0.0043 decrease in distance to park.
- ❑ Coefficient for median income indicates that for every 1% increase in median income there is 1.017e-05 increase in distance to park.
- ❑ Accept the hypotheses that percent black population is negatively associated with proximity to green space and median income is positively associated with proximity to green space in Cuyahoga county.

### Simple Linear Regression for size of nearest park

Explanatory Variable	Coefficient - Slope	P - Value
Percent black population	-0.0142	1.35e-07 ***

- ❑ P – Value indicates a statistically significant relationship between percent black population and park size.
- ❑ Coefficient indicates that for every 1% increase in black population there is a -0.0142 decrease in size of nearest green space.
- ❑ Thus as black population increase in a census block group, size of green space consequently decreases.
- ❑ Accept the hypothesis that percent black population of census block groups is negatively associated with size of nearest green space.

## Discussion & Implications

- ❑ Relationship between proximity to green space and black population in Cuyahoga county deviates from findings of most studies on green space accessibility and environmental justice.
- ❑ Results indicates close proximity between black block groups and green space location.
- ❑ This can be attributed to Cleveland's "Greenway Plan".
- ❑ Relationship between median income and proximity to green space on the other hand correlates with most existing literature.
- ❑ Relationship between park size and the location of blacks in the county also correlates with most existing literature.
- ❑ Black block groups have relatively smaller park size ranging between 0.16 and 0.55 square miles as seen in figure 3.

## Conclusion and Future Studies

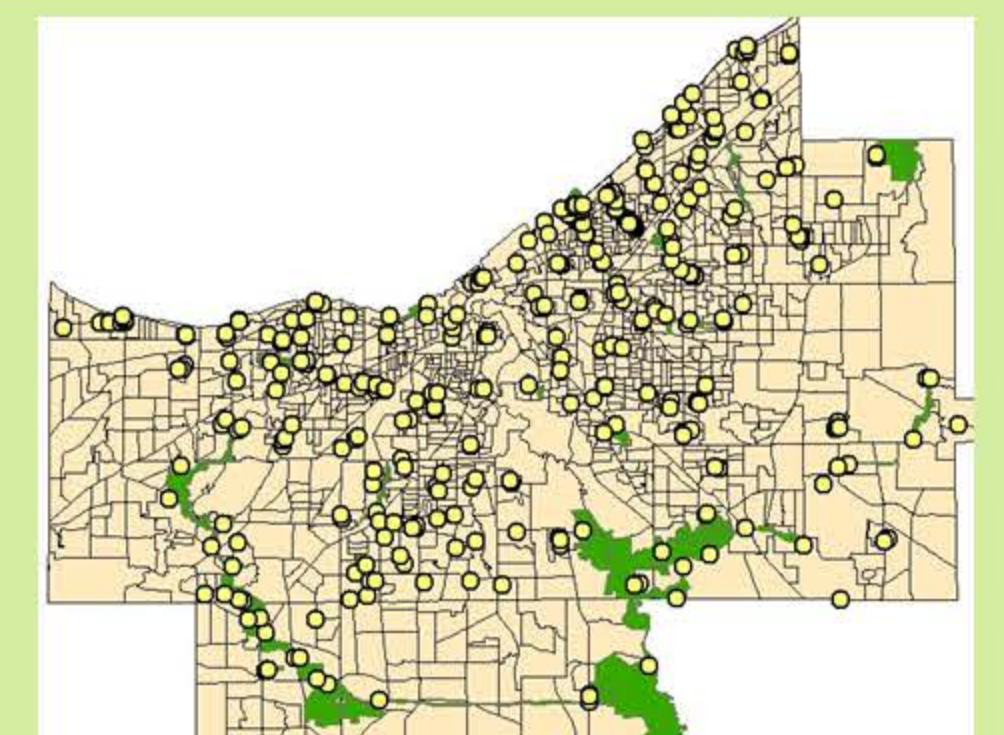
- ❑ Though high percentage of black population lives in close proximity to green space in Cuyahoga county, size of these green spaces are relatively small.
- ❑ Future studies should consider other explanatory variables like, population density, unemployment rate and educational attainment.
- ❑ Also is the need to examine the relationship between park proximity and health outcomes in these black block groups.
- ❑ Future studies should also examine the rate of park usage in these black block groups.

## Acknowledgment

- ❑ Prof. Louisa M. Holmes

## References

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547 Park access points