

Distribution of public recreational green space in Greenville, SC

An Assessment of Public Access Based on Race and Economic Status

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Abstract

With increasing populations of urban residents, it is necessary to assess the availability of public green space from which all members of society can benefit. Several studies suggest that proximity to green space results in better human health. The purpose of this study is to assess the spatial distribution of public recreational green space within Greenville city limits to determine if various racial and economic groups have equal access. We hypothesized that lower income groups and racial minorities would have less public green space available within an easily accessible distance of their residence. Using ArcGIS, we mapped Greenville’s public parks, athletic fields, and athletic courts and compared their distribution to race and median household income census data from the year 2000. In contrast to prominent literature, this study found that minorities and lower income groups in Greenville actually have greater access to public green space than the highest income residents. These results lend support to the idea that higher income residents may have more access to private outdoor space such as lawns and neighborhood parks and so have less need for public recreational green space. Understanding the factors that influence the need for public green space will allow future urban planning professionals to more accurately determine areas in which green space should be created or preserved.

I. Introduction

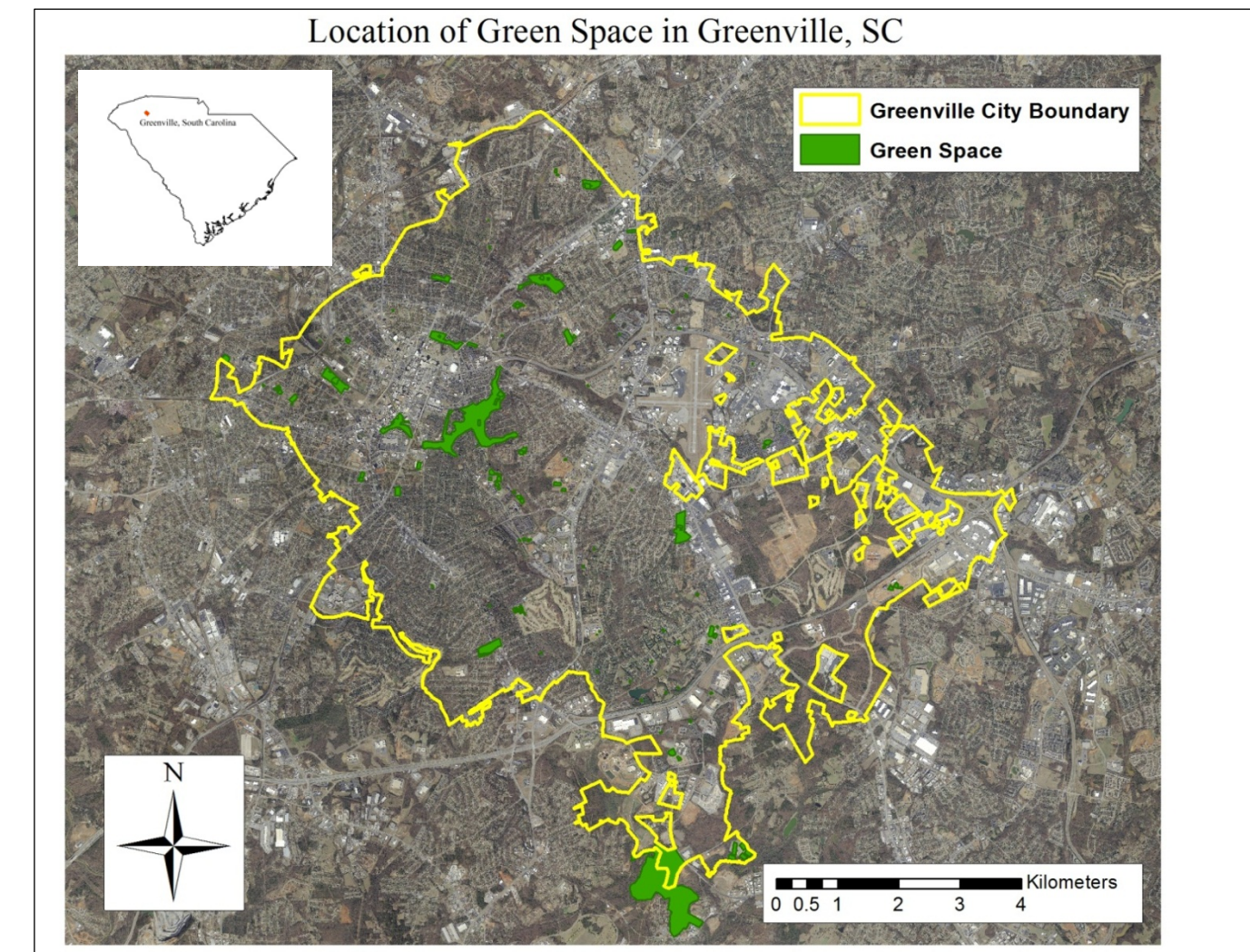
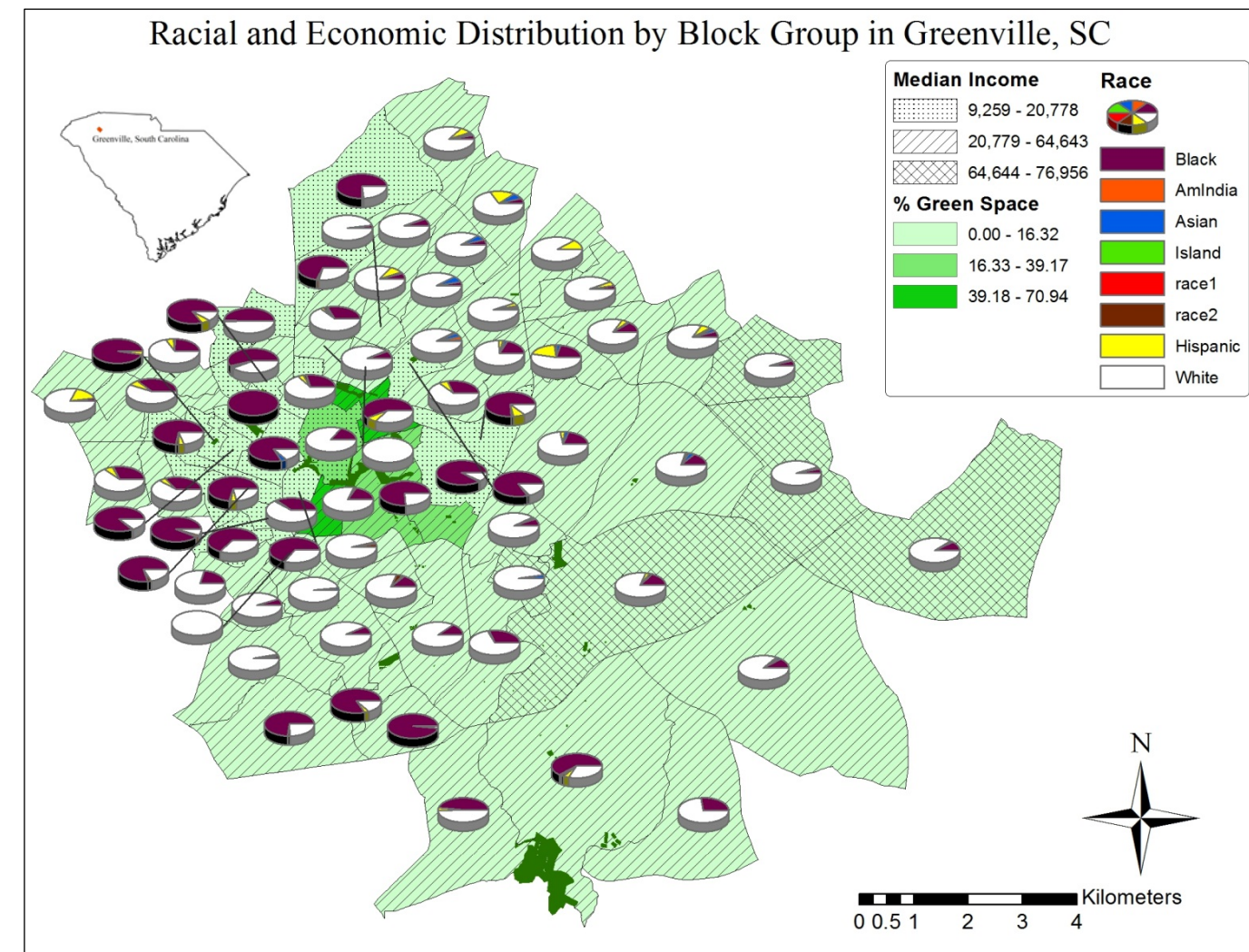
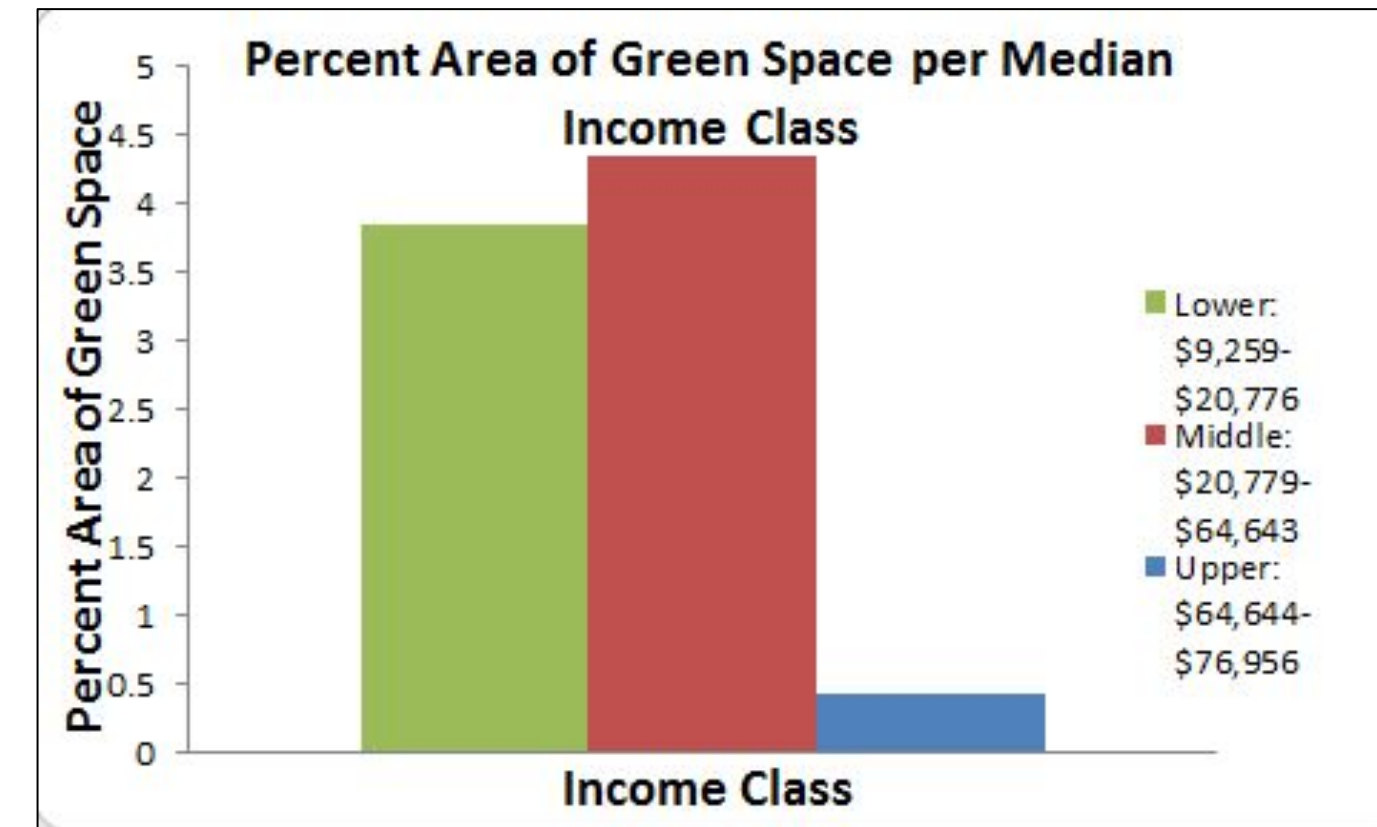
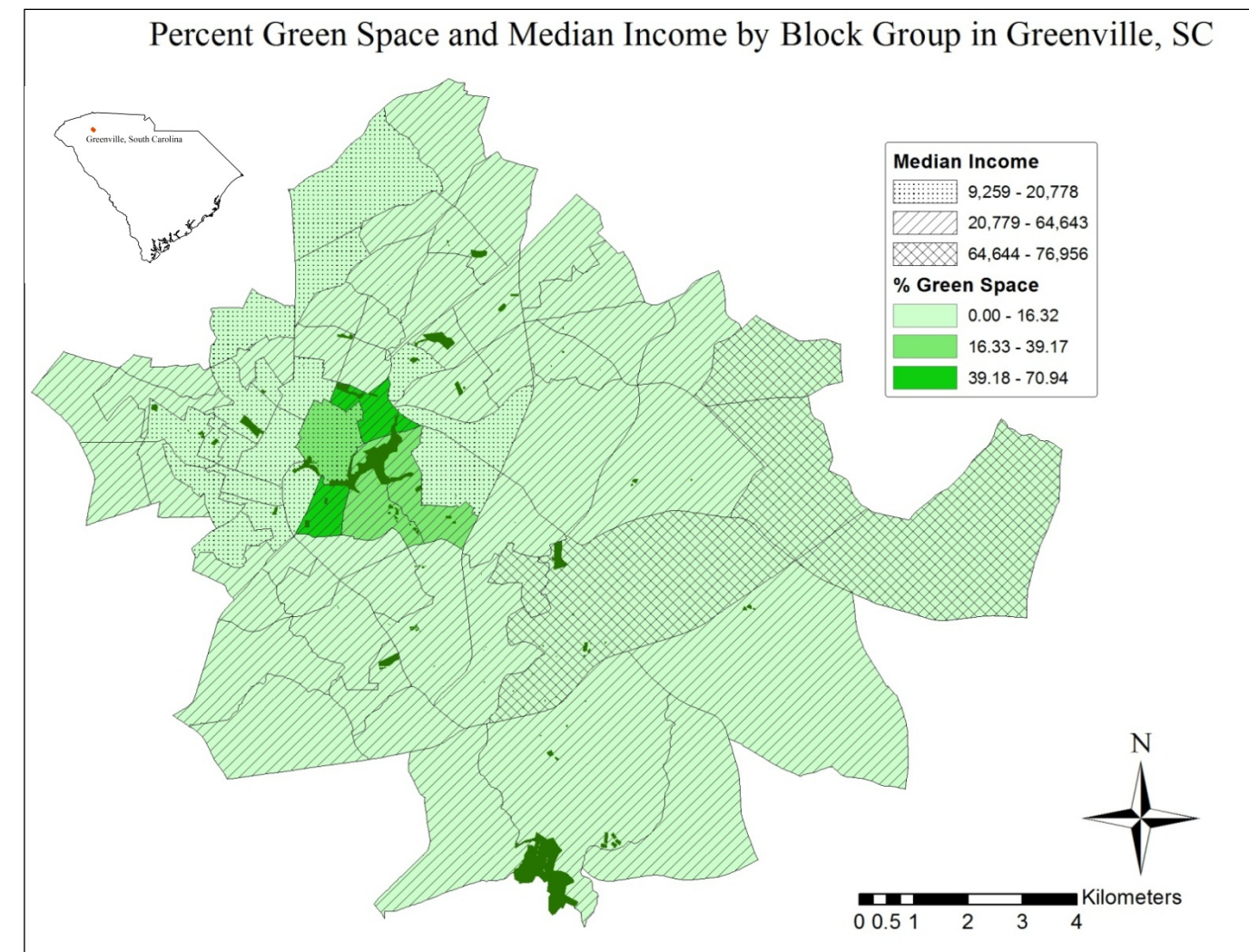
Greenville is located in upstate SC and is a growing urban environment surrounded by smaller communities and rural areas. Because it is urban, efforts have been made to rejuvenate green space in downtown Greenville city. It is necessary to evaluate if efforts are being made to create green space throughout the city, rather than in downtown alone. Downtown Greenville is an area that appears to be a wealthier part of town and displays sufficient green space development. There is a lot of wealth disparity in Greenville, and this study was conducted to determine if green space is related to this and if its development has only been promoted in wealthier areas of the city.



II. Literature Review

As an increasing number of people are living in cities, it is important to assess the quality of life within these urban environments. Many studies have been dedicated to analyzing the kind of urban design and city planning that is most beneficial to human health. Analysis of this scientific literature concludes that views of greenery, proximity to outdoor green space, and access to natural light and ventilation within urban design promotes human health (Jackson 2003). Nature, often in the forms of parks and gardens, decreases the stress of urban living and positively impacts mental and physical well-being (Jackson 2003; Maas *et al.* 2006). The positive impact of green environment on perceived general health is especially influential among people who spend more time in the vicinity of their homes, particularly the elderly, youth, and residents in lower socioeconomic groups (De Vries *et al.* 2003). Kuo *et al.* (as cited in Jackson 2003) determined that trees within close proximity to housing are associated with decreased levels of domestic violence and that the presence of outdoor green space can promote the development of stronger social ties among neighbors and within neighborhoods. Wells (as cited in Jackson 2003) found that the cognitive function of low-income children improves when they are exposed to views of green vegetation rather than pavement. A study conducted in Bristol reported that residents living closer to a green space were more likely to participate in physical activity and, therefore, were less likely to be overweight or obese (Coombes *et al.* 2010). Emily Talen argues that urban parks are the single most important category of publicly owned open space in U.S. cities (Talen 2010). It is obvious that green spaces within urban environments promote human health and, therefore, should be both abundant and distributed throughout cities so that they are easily accessible to all residents. However, assessments on the distribution of green spaces within urban areas have found that residents with lower household incomes often have unequal access to green spaces when compared to residents of higher incomes. Barbosa *et al.* (as cited in McConnachie & Shackleton 2008) found that private and public green space distribution is largely influenced by education and wealth. One study found that low income areas in Phoenix and Chicago and had fewer acres of park space accessible to residents (Talen 2010; Martin *et al.* 2004). A study conducted in South Africa found a similar trend in that the wealthiest suburbs had more green space in proportion to the number of residents per household than poorer townships and that the poorest areas of “Reconstruction and Development Programme” housing had significantly less access to green space (McConnachie and Shackleton 2008). These are examples of social injustice in that city planning essentially promotes better health for its higher income residents. Due to the abundance of scientific studies that have found a relationship between access to green space and household income, it is important to assess whether this injustice is present in the city of Greenville, SC.

IV. Results and Discussion



The census blocks identified as middle class residents in Greenville were found to have the most public recreational green space within their census blocks.

The census blocks identified as upper class actually had the least amount of public recreational green space, but aerial photographs displayed that the residents in these areas have very large lawns.

The census blocks identified as lower class/below poverty line contained less public recreational green space than the middle class blocks but much more than the upper class blocks.

The majority of census blocks with a high percentage of minority residents were either low income or in census blocks of middle income that are adjacent to low income blocks.

Note: Green space is represented by the darkest green polygons on all displayed maps.

III. Methodology

Public recreational green spaces were classified as athletic fields, athletic courts, and parks.

Median household income was collected from the U.S. Census Bureau 2000 data and divided median income by three categories: low/poverty, middle, and upper.

Poverty line was determined by US census Bureau 2000 data (under \$18,052 per year based on the assumption that it is a family household (average of 4 people), with 2 children under 18 rather than an individual).

The class breaks were determined based on similar methods used by Thompson and Hickey (2005 *Society in Focus*, Boston, MA) in which 14-20% of American population was calculated as below poverty level, and 16% of Americans were calculated as upper class. However, in this study poverty was divided into slightly different categories, defining lower class as annual household income of below \$20,000, resulting in 27% of the total Greenville population, middle was 57%, and upper class was the remaining 16%.

The data for this study was collected from the U.S. Census Bureau, American Fact Finder, and TIGER Shapefiles. In ArcMap, layers were joined and clipped to within the Greenville City boundary. Parks were selected spatially by their intersection within the Greenville boundary. Parks were then divided into smaller polygons through a union of the park layer and the block boundaries so that percentage green space per block could be determined.

V. Conclusion

- Middle class residents in Greenville were found to have the most access to public recreational green space.
- Higher income residents in Greenville seem to have less need for public recreational green space than lower income groups and racial minorities because of private parks and lawns.
- Higher income residents may have more access to transportation and can afford to travel greater distances to access green space.
- Minorities and low income residents have greater need for public green space because they have less private green space than higher income residents and less easily accessible green space than middle class residents.



V.I. Future Research

- Further assessment is needed to determine the current condition of parks.
- Further surveys and observations are needed to determine the frequency of green space use.
- Further research is needed determine what has replaced public green space in areas of higher income households.
- The results of this study can be used by future developers and city planners to determine areas with the most need for public green space.

VIII. Acknowledgements

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VII. References

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