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“A Change is Gonna Come”: Examining Environmental Hazard Distribution and Gentrification in Atlanta, GA, 2005-2015

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by

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Under the Direction of Amy Spring, PhD

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ABSTRACT

Past research has found that minority and low socioeconomic status families are more likely to reside in neighborhoods with a disproportionate number of environmental burdens than white and high socioeconomic status families. It has also been posited that low-income minorities are replaced by higher-income whites when gentrification takes place in urban neighborhoods. It is the goal of this study to identify patterns between official environmental hazard recognition and gentrification as defined by racial turnover in the city of Atlanta by using census data and information from the Georgia brownfield records and the Toxic Release Inventory. I found that as the proportion of whites increased, the number of recognized environmental hazards increased and that the average number of recognized environmental hazards within the gentrifying census tracts was greater than that within census tracts that were not experiencing gentrification.

INDEX WORDS: Brownfields, Environmental hazards, Gentrification, Neighborhood, Racial turnover, TRI, Urban

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DEDICATION

To my mother, for your encouraging words. To my father, for your time and support. To my dearest Arlonna, for reminding me that each day is a new day and to keep going. Thank you. I love you.

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1 INTRODUCTION

Prior research has documented minority groups and low-income families as inhabiting neighborhoods that suffer more environmental burdens than those occupied by whites and higher-income families (Sicotte and Swanson 2007, Crowder and Downey 2010). While some of these neighborhoods have been able to get help tackling these problems, oftentimes it is a bit too late and even more often, communities are unable to command the attention of the government due to a lack of social capital. However, all neighborhoods are not static. Renewed interest in urban areas brings money back into cities in the form of higher income taxpayers and developers looking to accommodate them (Pattillo 2007; Boyd 2008; Hyra 2012; Hyra 2015; Rucks-Ahidiana 2022; Immergluck 2022). As neighborhoods experience changes in racial composition, how does the status of the environmental hazards within those neighborhoods change? In this study, I will examine environmental hazard distribution as cities experience gentrification.

I will be analyzing the city of Atlanta, GA for several reasons. First, environmental hazard distribution studies in the past have typically covered the United States as a whole or northern cities that were large industrial cities in the past, such as Philadelphia and Detroit (Mohai and Saha 2007; Sicotte and Swanson 2007; Sicotte 2014; Pais, Crowder, and Downey 2014). While these cities may have experienced social phenomena like those that took place in Atlanta, such as white flight, the lack of a large industrial presence sets Atlanta apart. This distinction may provide a different view into environmental hazard distribution over time that does not follow ethnic or income related lines that were initially shaped by the need to be closer to one's industrial or manufacturing job (see Sicotte 2014). Second, Atlanta experienced white flight like many other cities during the 1960s and 70s; however, it also became known as the

Black Mecca of the south (Hobson 2017). So, while there may have been an exodus of white residents from the city of Atlanta, there were also many black residents moving into the city from other regions. Next, Atlanta's extensive history involving race, including the civil war and the development of the rail, segregation, and construction of the interstates, all contribute to the current layout of Atlanta (Keating 2001). Despite being a city with a very racialized past, it has been, and continues to be, home to many black elites as well as low-income blacks. Lastly, Atlanta is consistently in the list of top ten cities experiencing gentrification within the United States (Immergluck & Balan 2018; Immergluck 2022).

This study combines census data with geocoded addresses to visually and statistically analyze and identify patterns between environmental hazard recognition and gentrification. By doing so, this study contributes to the discussion of racial turnover in urban neighborhoods related to gentrification, and the correlation of neighborhood racial turnover with other neighborhood changes like the recognition of environmental hazards. Using racial turnover as an indication of gentrification and relating this to environmental hazard recognition directly addresses claims from legacy minority residents that reinvestment in distressed urban areas often only occurs after white residents move in (Freeman 2006).

1.1 Literature Review

1.1.1 Gentrification

Critical to the study of gentrification is the way in which it is defined and measured. When Ruth Glass first coined the term gentrification in 1964 (Glass et al. 1964) she wrote of working class neighborhoods in London being overrun by middle class occupants until few, if any, working class residents remained. Since that first definition, there have been many contested definitions of gentrification as well as ways to measure the process. While some

definitions continue to explicitly highlight the displacement of lower-income residents (Essoka 2010, Pearsall 2012) others reference the upward socioeconomic changes (Smith 1979; Abel and White 2011; Hwang 2016), while still others focus only on the in-migration of higher-income residents (Eckerd 2011, Martin and Beck 2018).

Choosing which variables to include when measuring gentrification varies from study to study as it depends on the definition used and purpose of the study. Socioeconomic indicators and neighborhood characteristics are commonly used. For example, Essoka's 2010 study, which uses a definition of gentrification that focuses on displacement, measured gentrification by calculating changes in demographic variables that were hypothesized to be characteristics of the displaced (e.g. elderly, single mother, and minority status). Ley (1986) developed a gentrification index in order to capture the socioeconomic changes that occur as gentrification progresses. The index is a measure of the percentage of the adult population with at least a bachelor's degree along with the percentage of the adult population employed in managerial and professional positions. Martin and Beck's (2018) use of a definition of gentrification that highlighted the in-migration of higher-income residents resulted in the use of both socioeconomic indicators and neighborhood characteristics; that is, educational attainment and average housing prices, respectively.

Discussions of gentrification in the United States often tend to revolve around issues of race as well. Researchers and residents of neighborhoods often contend that low-income minorities are being replaced by middle- and upper-class whites (Lees 2016). It is not always the case that white newcomers are replacing minority residents, as demonstrated by Monique Taylor's research on the black gentry in Harlem (Taylor 1992; Taylor 2002). Nevertheless, legacy minority residents often cite the arrival of whites as the clear mark of gentrification

(Freeman 2006). To legacy residents, the arrival of whites signifies economic but also cultural changes to their neighborhood (Freeman 2006). Legacy residents also point to the arrival of whites as the impetus for their neighborhood finally receiving better services like better police protection and garbage pickup, which they attribute to white residents' power to command government attention and resources (Freeman 2006). Thus, there is a clear but complicated racial component to gentrification that is partially but not fully tied up in socioeconomic status. In order to account for the racial component of gentrification, and in contrast to prior studies, this study will identify gentrification by viewing racial turnover. Furthermore, measuring racial turnover, specifically the increase in the white population, is a good measurement of gentrification for this study because of Atlanta's high concentration of minorities at 51.8% (U.S. Census Bureau 2019) and Atlanta's extensive residential segregation (Keating 2001). However, by limiting the measurement of gentrification to racial turnover, I am accounting for only one dimension of gentrification, and I am losing the ability to account for any gentrification that may be occurring in majority-white census tracts because I am not accounting for socioeconomic changes amongst residents, e.g., advanced degrees or income, or changes in the neighborhood characteristics, e.g., housing prices or property taxes. In the conclusion, I discuss how results might differ if I utilized a comprehensive index of gentrification and suggest this as an avenue for future research.

1.1.2 Environmental Hazards

Previous studies find that minority and/or low-income groups are more exposed to environmental hazards (Ringquist 2005; Sicotte and Swanson 2007; Crowder and Downey 2010; Eckerd and Keeler 2012; Sicotte 2014). Two common types of environmental hazards have been used in prior research: Toxics Release Inventory (TRI) sites and brownfields. I will be

combining these two hazard types in order to focus on assessing their distribution in relation to demographics. Data in the TRI contains information on certain toxic chemicals released from facilities that may harm human or environmental health. It is not completely exhaustive of all toxic chemicals nor all facilities that release them as there are requirements that must be met in regard to which chemicals are reported and who must report. Brownfields are properties that also pose a threat to human or environmental health. However, unlike TRI sites, they are no longer active sites and their "expansion, development, or reuse…may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant" (EPA 2018).

TRI sites are often used when conducting research on neighborhood hazards, inequality, and residential mobility (Sicotte and Swanson 2007; Crowder and Downey 2010; Pais, Crowder, and Downey 2014; Downey, Crowder, and Kemp 2017) because they actively produce pollutants. Research on siting decisions highlights neighborhood inequality by examining whether or not a community can keep a new TRI facility from being placed in or near its boundaries. These efforts are a reflection of how effective neighborhood activists are as well as how much social capital they hold. Residential mobility studies reveal racial disparities between those living in neighborhoods with environmental hazards and those that do not. Crowder and Downey (2010) found that in addition to Blacks and Latinos being more likely than whites to live in neighborhoods with high levels of industrial pollution even when income and education are controlled, Blacks are also less likely to leave their hazard laden neighborhoods and more likely to move to neighborhoods with higher levels of hazards than their white counterparts.

Brownfield properties, on the other hand, have been the subject of gentrification studies given the potential for redevelopment and reinvestment (Essoka 2010). Under the Georgia Brownfield Act, prospective purchasers of contaminated property are eligible to receive

incentives, including limited liability protection and tax incentives, after the successful cleanup of the contaminated property. This makes neglected, urban areas more attractive to developers as they look to accommodate residents with higher incomes looking to return to the city. Developers can redevelop these properties without fear of punishment due to past contamination and can potentially recoup the price of the cleanup through tax incentives (GA Environmental Protection Division 2020).

1.2 Theoretical Framework

I will utilize and extend the racial-income inequality thesis to examine the changing distribution of recognized environmental hazards as cities experience gentrification (defined for this purpose as racial turnover). The racial-income inequality thesis states that socioeconomic disparities between races determines a group's proximity to environmental hazards (Crowder and Downey 2010). The thesis is largely supported by existing evidence showing that minority and/or low-income groups are more exposed to environmental hazards (Ringquist 2005; Sicotte and Swanson 2007; Crowder and Downey 2010; Eckerd and Keeler 2012; Sicotte 2014). However, this research does not take into account the official recognition of these environmental hazards, which is the first step in cleanup and redevelopment. Extending the racial-inequality thesis, I hypothesize that an influx of white residents into predominately-minority neighborhoods is associated with the official recognition of environmental hazards. Thus, in the visual and statistical analysis to follow, I expect that recognized environmental hazards are more often found in neighborhoods experiencing racial turnover from minority to white than in other types of neighborhoods. And, I expect that the number of recognized hazards in these neighborhoods has increased as the white population increased. To test these expectations within the context of

Atlanta, I examine changing demographics at the census tract level between 2005 and 2015, alongside the changing distribution of TRI facilities and brownfields over the same time period.

2 DESIGN AND METHODS

2.1 Data Sources

Population data for this study come from the 2000 decennial census, 2010 decennial census, and the American Community Survey (ACS) 5-year estimate for 2011-2015. At each point in time, I determine the annual proportion of white residents within each census tract for the city of Atlanta. In order to track the location of TRI facilities and brownfields, I use the Environmental Protection Agency's Toxics Release Inventory and the Georgia Environmental Protection Division's brownfield records, respectively. The TRI data is available by year for each state and the United States as a whole. It contains the facility name, address, and chemical information for each location that was required to report for the year. The brownfield records contain the facility name, address, cleanup plan acceptance date, cleanup completion date, and other information relating to the site.

2.2 Sample

The sample consists of all 165 census tracts within the city of Atlanta as determined by the 2010 decennial census. The boundaries of the census tracts changed from census 2000 to census 2010 and there was an increase in the number of census tracts from 151 to 165. I will use the census 2000 boundaries to determine the initial area for Atlanta so that I will not include any annexed areas that were acquired between the two decennial surveys. The 2011-2015 ACS 5-year estimate will be used to determine the population for 2015. Linear interpolation will be used to estimate the population value of 2005.

2.3 Change in White Population

Neighborhood racial turnover is a key focus of this study, as one dimension of gentrification that is especially salient in the context of Atlanta. Racial turnover is defined at the census tract level by comparing the population percentage that is white in 2005 and 2015. I then develop a categorical measure of gentrification, as defined by racial turnover. I define gentrified tracts as those that started with a low white population percentage in 2005, which I define as less than 40% white, and subsequently saw an increase in the white population by at least 10% by 2015. In 2005, 101 tracts had white percentages that were less than 40%. Census tracts with a white population percentage of 40% or more in 2005 were not counted as tracts eligible to be gentrified. Two census tracts with no population in 2005 were also excluded. The threshold for gentrification is set at a 10% increase in percentage white. The 10% threshold is based on prior research on the dynamics of neighborhood racial change, which has most often used a 10% increase in a racial or ethnic group as the definition for racial transition (Ellen 1998; Anacker 2010; Moye 2014).

2.4 Geocoding Hazardous Sites

TRI facilities and brownfields were geocoded in ArcGIS based on their addresses in the listings. Geocoding was labor-intensive because some addresses were incomplete, unclear, or contained errors. The TRI records contained complete addresses. The brownfield records contained complete addresses, multiple addresses per listing, intersections, tract descriptions, block descriptions, and some were not defined. I created an address for listings with multiple addresses by first looking on a map to see if these addresses are adjacent. If they were adjacent, then I chose the first numerical address that corresponded to an actual address on a parcel map for the city of Atlanta. The addresses within the listings with non-adjacent addresses were

separated by one tax parcel when viewed on a map. I did not view this as a large enough distance to create separate listings; therefore, I repeated the process of choosing the first numerical address that corresponds with an address on the parcel map. I created an address for listings with intersections and blocks so that they could be geocoded as well. If the intersection or block lied completely within a census tract, then I picked any address at that spot. If it did not lie completely within a census tract, then I chose an address on the first street listed in the intersection name. Listings that contained descriptions that were not clearly defined were removed. These included listings that did not have an address or intersection. Some listings contained the same description in the "Property Name" column as well as the "Address" column, such as Buckhead Avenue Block D-1. Other listings contained only a street name, such as Piedmont Rd, while others listed a tract, such as North Avenue Tract. Addresses that were unable to be matched using the address locator I created in ArcGIS were plotted manually by viewing the location using Google Maps.

Brownfields that lacked a start date were excluded from the count as there is no way to determine when they were added to the list. Brownfields that had a start date but were eventually withdrawn are included as an application indicates the property has been identified as a brownfield even if a developer decides not to continue with the purchase and cleanup of the property. For both TRIs and brownfields, addresses that did not fall within the city of Atlanta boundaries were removed even if they were listed as Atlanta addresses in the listings. Following the geocoding process, existing TRIs and brownfields in the city of Atlanta could be mapped. The number of TRI sites differed from year to year ranging from a minimum of ten to a maximum of 25. The total number of brownfields per year ranged from 24 to 108 with a general upward trend from 2005 to 2015. I combine TRI and brownfields in the following analysis since

I am primarily interested in the distribution of recognized environmental hazards and its correlation to neighborhood racial turnover, which I do not expect to differ by type of hazard. However, future research could also consider TRI and brownfields separately to see if results differ.

2.5 Analysis

First, I calculated descriptive statistics for census tracts to show the average number of hazards within each tract in 2005 and 2015, the racial composition, and the level of racial turnover. Then, I conducted visual mapping analysis using ArcGIS software to view the racial composition of census tracts and the distribution of environmental hazards in 2005 and 2015. Proportion levels were set using the defined interval classification set at 10 classes. The locations of the geocoded brownfields and TRIs were plotted on the maps. I used visual analysis to determine overlap between racial composition and the distribution of environmental hazards. I then overlayed gentrified tracts to determine overlap between gentrification as defined by racial turnover and the distribution of environmental hazards. Last, I conducted descriptive statistical analysis to determine the average number of environmental hazards in gentrified versus non-gentrified tracts.

3 RESULTS

3.1 Descriptive Statistics

Table 3.1 reports descriptive statistics of the census tracts for the city of Atlanta in 2005 and 2015. In 2005 there were 48 environmental hazards within the census tracts comprising the city of Atlanta resulting in an average of 0.29 hazards per tract. The number of hazards increased to 126 in 2015 raising the average to 0.76 hazards per tract. It is likely that this increase in environmental hazards is related to increasing awareness and advocacy which has led

to more sites being listed. During this period 21 census tracts experienced gentrification (13%) and 144 did not (87%). From 2005 to 2015, 1% of tracts experienced an extreme decrease in their white population proportion, 2% experienced a high decrease, 11% experienced a moderate decrease, 35% experienced a low decrease, 25% experienced a low increase, 11% experienced a moderate increase, 11% experienced a high increase, and 4% experienced an extreme increase in their white population proportion.

Table 3.1 Descriptive Statistics of Census Tracts

	N (%)	Mean	Std Dev
Environmental Hazards			
2005	48	.29	.950
2015	126	.76	1.763
Change, 2005-2015	78	.47	.813
Gentrifying			
Yes	21(12.7)		
No	144(87.3)		
Change in White Population Proportion			
Extreme decrease (≤ 20)	1(.6)		
High decrease (-19.99- -10)	4(2.4)		
Moderate decrease (-9.99- -5)	18 (10.9)		
Low decrease (-4.99- 0)	58(35.2)		
Low increase (0.1-4.99)	41(24.8)		
Moderate increase (5-9.99)	19(11.5)		
High increase (10-19.99)	18(10.9)		
Extreme increase (≥ 20)	6(3.6)		
N	165		

*Note: The change in white population is a measure of percentage point change.

3.2 Mapping Analysis

Map 1 displays the proportion of whites in each census tract and the location of environmental hazards in 2005. The majority of the southern and western census tracts had a white population proportion below ten percent. The population proportion increased sharply to the north with majority of the tracts having a proportion of whites above 60% including several with proportions above 90%. Moving easterly, the proportion white increase was more gradual and diverse. However, the eastern tracts also showed intense segregation with some neighboring

tracts having white population proportions of below 30% and above 80%. Environmental hazards were spread throughout the center of the city stretching towards the west and southeastern regions. Roughly 82% of the census tracts did not have an environmental hazard, 12% contained one hazard, about 4% contained 2 hazards, 1% contained 3 hazards, and the only census tract with more than three hazards contained a total of ten hazards. Of the 48 hazards in 2005, 40% were located in census tracts that were eligible for gentrification, i.e. census tracts with a population proportion of whites below 40%.

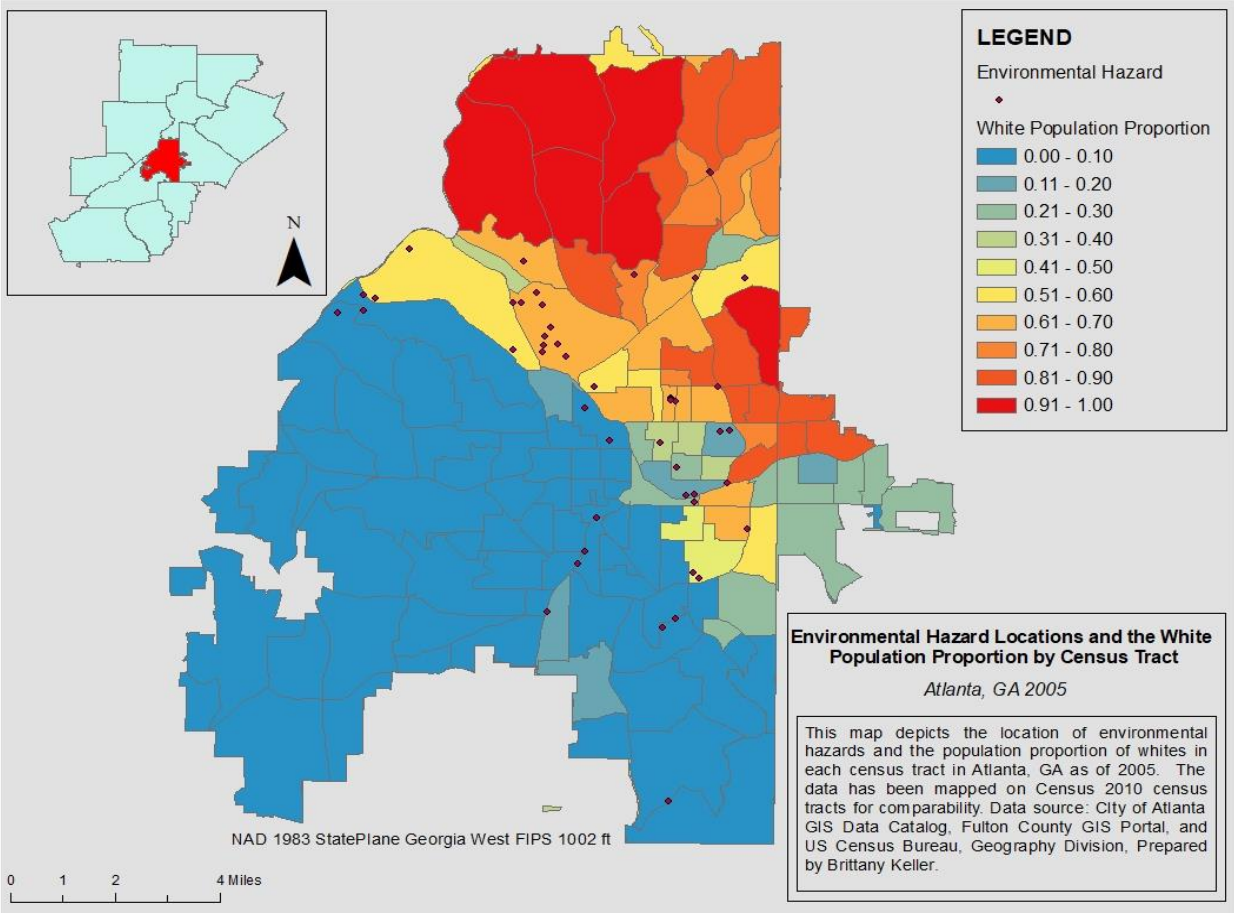

Figure 1: Environmental Hazard Distribution and the White Population Proportion by Census Tract, 2005

Map 2 displays the population proportion of whites in each census tract and the locations of environmental hazards for 2015. The pattern of the population proportions is similar to that of the 2005 map: extremely low proportion of whites in the southern and western tracts, extremely high proportion of whites in the northern tracts, and a more diverse range of proportions in the eastern tracts. The total number of hazards increased from 48 to 126. Hazards were concentrated in the central region of the city and spread into the northwest, northeast, and southeastern portions of the city. The percentage of census tracts without an environmental hazard decreased to 68%, 15% contained one hazard, and the remaining tracts contained anywhere from two to 17 hazards. Of the 126 hazards, 42% were in census tracts that were eligible for gentrification based on the 2005 white population proportions. Environmental hazards mostly occupied census tracts at the boundary where census tracts with white population proportions of less than 10% met those with a proportion above that. As can be seen in Maps 3 and 4, this region is also where many gentrified tracts are located. In addition, a greater number of hazards were in tracts where the white population proportion was above 10%. Notably, tracts farthest away from this boundary did not contain any identified hazards on the side least populated by whites.

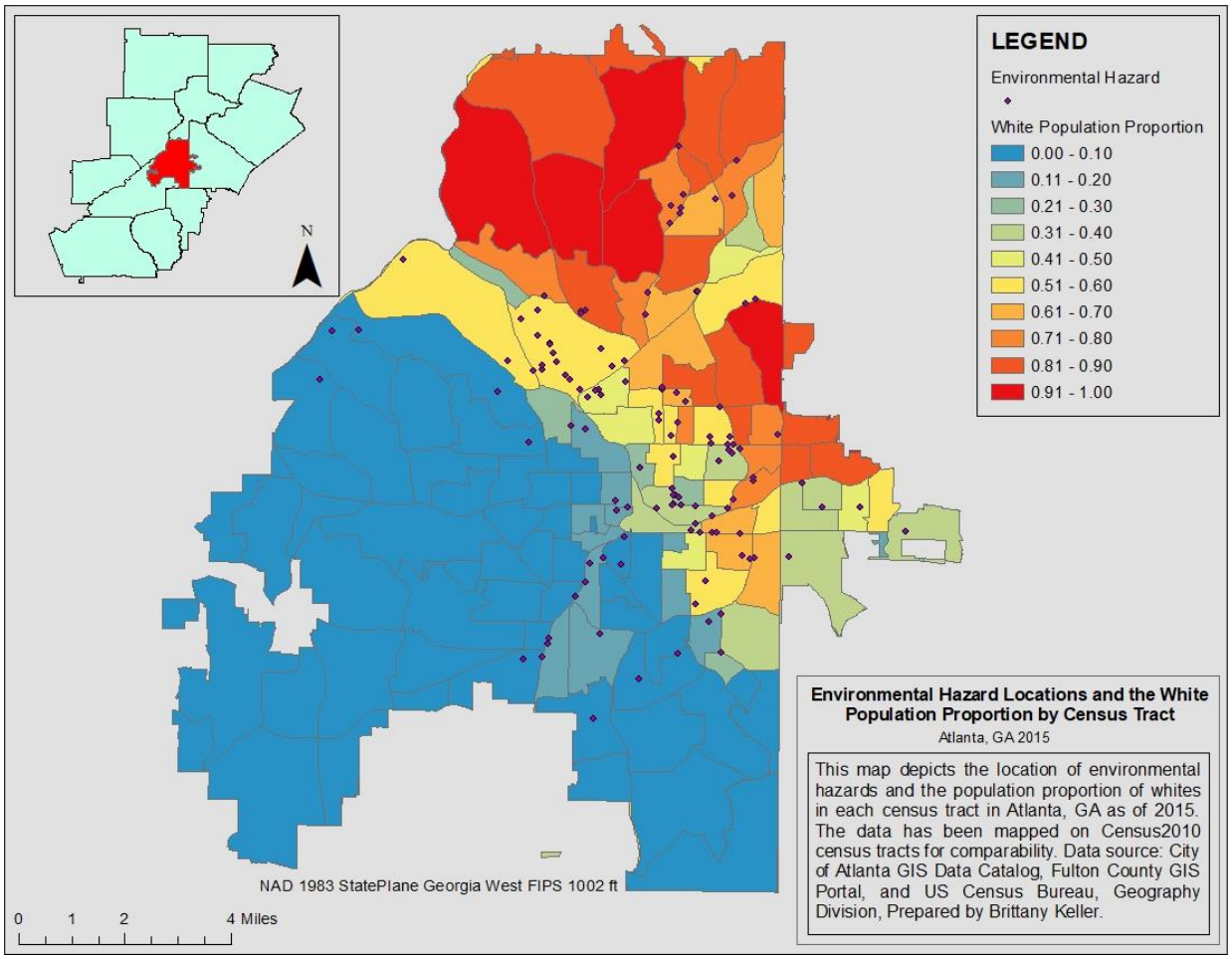

Figure 2:Environmental Hazard Distribution and the White Population Proportion by Census Tract, 2015

Maps 3 and 4 display the gentrified census tracts along with the environmental hazards and white population proportions for 2005 and 2015, respectively. I show maps for both years so that the increase in hazards from 2005 to 2015 can be compared. Gentrification is defined as an increase in the white population by at least 10% in census tracts from 2005 to 2015 where the initial white population proportion is less than 40%. Gentrified census tracts were mostly located in the central and eastern portions of the city; the only gentrified census tract outside of this area was in the northeastern portion of the city. These same locations included a large portion of the environmental hazards, which increased in number between 2005 and 2015. This indicates evidence in support of my hypothesis; as the proportion of whites increased, the number of recognized environmental hazards seemed to increase. However, quantifying the number of hazards in gentrified versus non-gentrified tracts would provide useful further evidence. I present this analysis next.

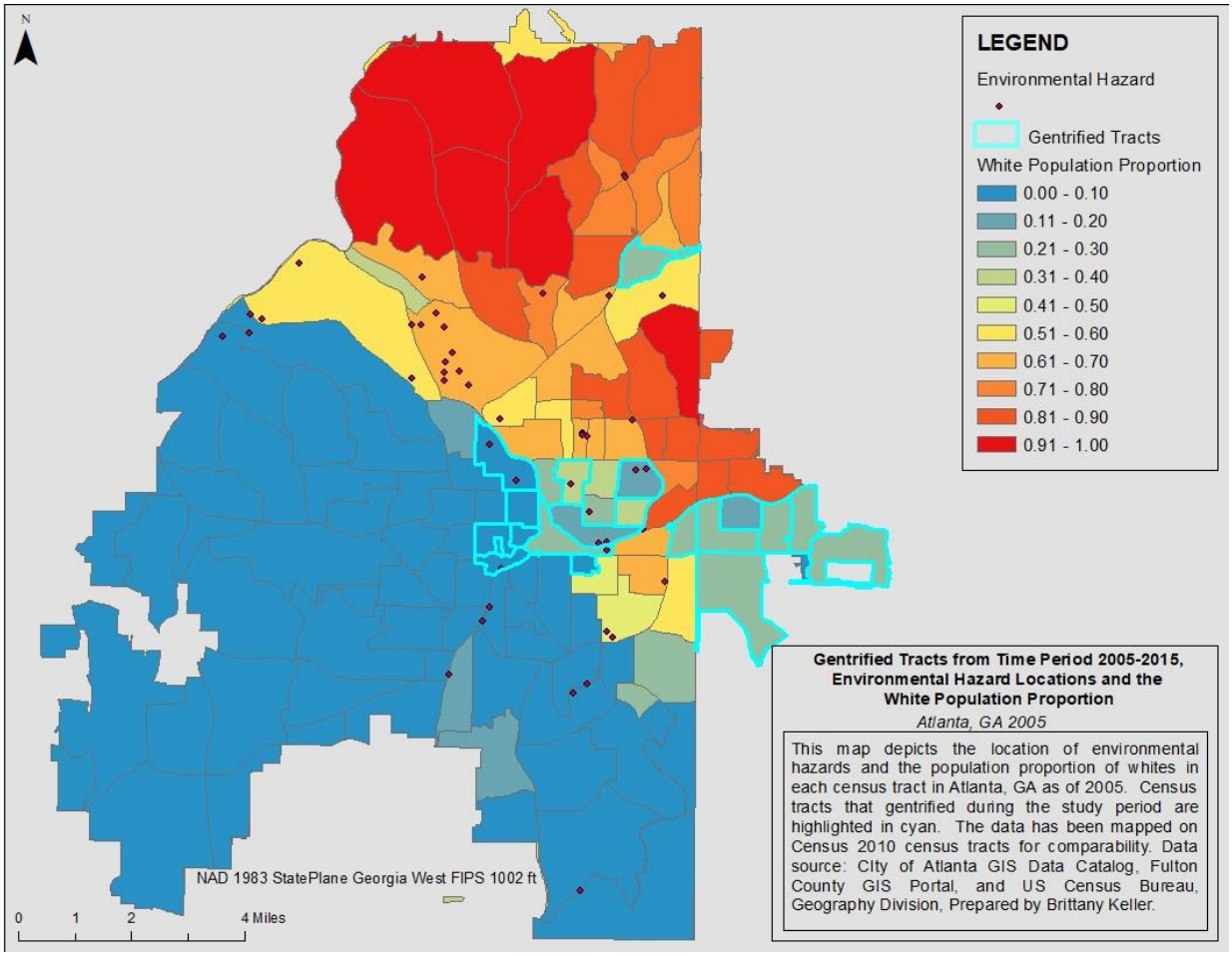

Figure 3:Gentrified Census Tracts, Environmental Hazards, and the White Population Proportion, 2005

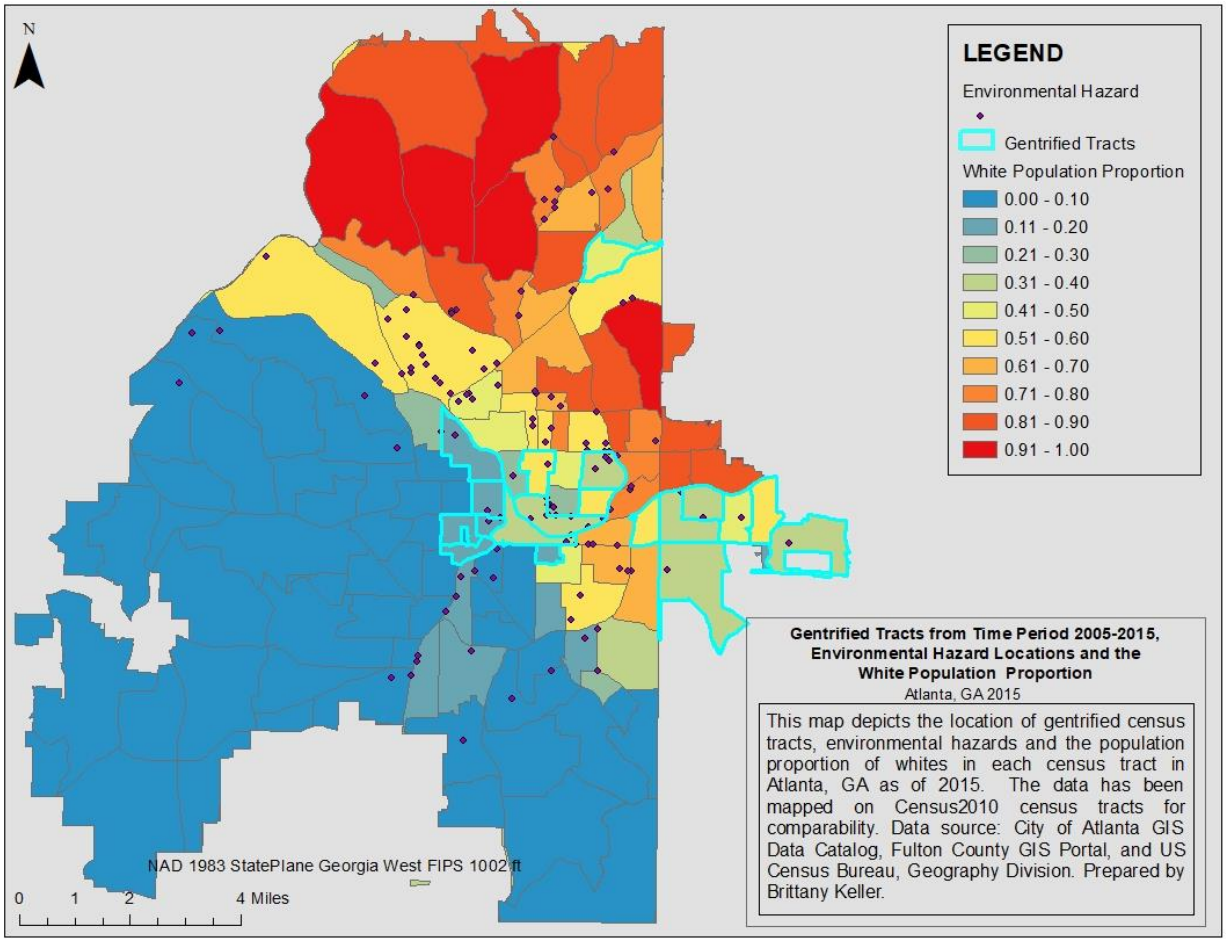

Figure 4:Gentrified Census Tracts, Environmental Hazards, and the White Population Proportion, 2015

3.3 Gentrifying vs Non-gentrifying Census Tracts

In order to provide a better understanding of the relationship between gentrification and hazard distribution, Table 2 provides a comparison of the gentrified tracts to the non-gentrified tracts. In 2005, the 21 census tracts that gentrified during the study period contained 9 hazards total resulting in an average of .43 hazards per gentrifying tract. The 144 census tracts that did not gentrify contained a total of 39 hazards giving an average of .27 hazards per non-gentrifying tract. By 2015 the total number of hazards nearly tripled to 126. The gentrified tracts contained a total of 23 hazards averaging 1.10 hazards per gentrified tract. The non-gentrified tracts contained a total of 103 hazards therefore averaging .72 hazards per non-gentrified tract. On average, gentrified census tracts contained more hazards than non-gentrified tracts. And, the gap in the number of hazards between gentrified and non-gentrified tracts grew over time.

Table 3.2 Hazards in Gentrifying vs Non-gentrifying Census Tracts

	Mean	Std Dev	Min	Max	Sum (hazards)	N (tracts)
2005						
Gentrifying	.43	.746	0	2	9	21
Non-gentrifying	.27	.977	0	10	39	144
Total					48	165
2015						
Gentrifying	1.10	1.670	0	6	23	21
Non-gentrifying	.72	1.777	0	17	103	144
Total					126	165
Change, 2005-2015						
Gentrifying	.67	.924	0	4	14	21
Non-gentrifying	.45	.8	0	7	64	144
Total					78	165

4 CONCLUSION

In this study, I examined the relationship between environmental hazard distribution and gentrification as defined by racial turnover. I created GIS maps of the city of Atlanta displaying the population proportion of white residents in each census tract and the locations of environmental hazards during two periods of time and investigated how the amount and distribution of hazards changed as census tracts experienced gentrification. Contrary to the racial-income inequality thesis, for the city of Atlanta, whites are not more likely to distance themselves from environmental hazards. Instead, the influx of white residents to predominately minority neighborhoods seems to be associated with the official recognition of environmental hazards.

My results showed that as the white population proportion increased in census tracts that were eligible to gentrify, the number of hazards in those census tracts also increased. The number of hazards also increased during this period for non-gentrifying census tracts; however, gentrifying census tracts contained more hazards on average and their increase in hazards was greater. One possible explanation for this deviation from the racial-income inequality thesis is that potential residents may not view hazards as deal breakers because the hazards' presence will likely not be permanent. The identification of a brownfield means that action is in progress (or was once in progress) to remediate the area. If potential movers know that improvements are coming to an area with the intention to turn eyesores into gems, they may be more likely to be fine with the current state of the neighborhood and the temporary yet negative aspects of such changes, such as construction and increased traffic.

The GIS maps also highlighted a finding I did not expect to see: the lesser amount of hazards in majority Black, non-gentrifying census tracts. I speculate that hazards exist in these

areas, but these hazards have yet to be officially recognized. Hazard recognition may be less likely to occur in predominately minority areas because of the distance away from census tracts with higher proportions of whites. If whites are less likely to move into these neighborhoods because they are not close to majority white neighborhoods, then environmental hazard identification, leading to revitalization, would be less of a priority. This would be consistent with Hwang and Sampson's (2014) finding that gentrification tended to not progress in neighborhoods with large proportions of Blacks. In the context of Atlanta, if hazard recognition coupled with proximity to census tracts with high proportions of whites are indicators of future gentrification, then many of the majority Black census tracts in the far corners of the city boundaries may never experience gentrification as defined by racial turnover.

This study contributes to gentrification discourse by showing that gentrification, defined solely by racial turnover, does occur and that it can proceed unequally across an area. By combining census data with geocoded addresses of environmental hazards, this study provides a view of how gentrification and environmental hazards are associated. In opposition to the racial-income inequality thesis, whites are not more likely to avoid areas with environmental hazards. The nuanced part of this evidence is that the movement of whites occurs with the identification of environmental hazards, not in spite of the presence of environmental hazards. This is because the identification of environmental hazards serves as a prerequisite for revitalization. Future research should investigate if and how revitalization takes place in minority dominated census tracts that are not in close proximity to majority white census tracts. Future research should also further examine the inequality that exists within environmental hazard identification in order to create policy directed at equitable revitalization efforts across geographic areas.

This study has limitations. First, gentrification is determined only by racial turnover. Racial turnover was chosen as the sole determinator of gentrification because of the intense housing segregation in Atlanta and to address displacement by viewing the change in the proportion of white residents. However, it is not without its flaws. This definition excludes other characteristics of potential gentrifiers such as educational attainment and income thereby excluding the existence of black gentrifiers and putting forth the assumption that all majority black census tracts are homogenous. This limits the study to only being able to capture racial change and not socioeconomic change. Future research would benefit from comparing different definitions of gentrification to determine whether environmental hazard distribution is most impacted by racial turnover, socioeconomic turnover, or a combination of the two. Another limitation is the use of only one city. The results are specific to Atlanta, GA and may not be accurate for other cities not only because of its history and layout but also because of the incentives offered by the Georgia Brownfield Act and the effect that may have had on the increased identification of brownfields. The inability to geocode and map all brownfields is another limitation. Unclear brownfield entries prevented me from viewing the full scope of hazard identification. However, it is unclear if that would have made a difference in the results considering the clustering of hazards around moderately white census tracts and the huge difference in the number of identified environmental hazards in the tracts with white population portions of 10% or less compared to the others.

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