Environmental Gentrification | Superfund Sites in Queens

Background

There have been numerous studies that reveal that low income communities of color receive severely less environmental protection than more advantaged groups. Urban residents tend to seek neighborhoods that fit their preferences, depending on their budgetary limits. As a result, people tend to repel away from land uses that are environmentally hazardous and need to be cleaned up. One of these types of land uses is superfund sites, which is any land in the U.S. that has been contaminated by hazardous waste and identified by the EPA as a candidate for cleanup because it poses a risk to human health and/or the environment. Thus, the areas surrounding superfund sites before they are cleaned up tend to have lower property values due to the undesirability of the neighborhood's property. However, once a superfund site undergoes an environmental cleanup, the desirability of the land tends to increase since it becomes more habitable and safe to live. As a result, more privileged groups enter the neighborhood and make the neighborhood less affordable, effectively displacing the current low income residents of color in the neighborhood.

Brooklyn and Queens, two boroughs of NYC, are perfect examples of communities made up of working class and low income communities of color. As a result, I hope to use two superfund sites in these boroughs to show the gentrification that occurs in a neighborhood subsequent to a superfund site cleanup. I will use two different sites to show this trend, the Superfund site at Wolff-Alport Chemical Company in Ridgewood, Queens, which has still not been cleaned up and the Superfund site at the Radium Chemical Company in Woodside, Queens, which was cleaned up in 1995.

This project hopes to answer two questions: Will these two superfund sites and their surrounding neighborhoods have a higher risk of gentrification than the neighborhoods at a farther radius from the superfund sites? Will gentrification in the surrounding neighborhood correspond to environmental cleanup?

Methodology

Using census tract data from Social Explorer for 1990, a gentrification risk index was created in Excel by using three factors: high percentage of people of color, low median household income, and high percentage of people without bachelor degrees. Using census tract data from Social Explorer, for 2000, the same index was created, except to show that a neighborhood now had the opposite 3 factors: Low percentage of people of color, high median household income, and low percentage of people without bachelor degrees.

Using the indices, Cluster and Outlier Analysis was used to show if any of the census tracts surrounding the superfund sites were outliers in 1990, and then to show if any of the census tracts surrounding the superfund sites became part of a cluster in 2000. The spatial query tool was used to create a buffer to select the census tracts surrounding each superfund site. This tool was used to see if the average gentrification risk decreased as the radius from a superfund site increased in 1990. The same tool was used to see if the average advantage stayed the same as the radius from a superfund site increased in 2000. I then created a chart through Microsoft Excel to represent these respective changes based on buffer distance.

Sources

National Historical Geographic information System, Accessed on 2016, http://www.nhgis.org/; Social Explorer, Accessed in 2016, http://pearson.socialexplorer.com/; Environmental Protection Agency, Superfund, Accessed in 2016, https://www.epa.gov/superfund; *Journal of Planning Literature, February 2016; vol. 31: pp. 23-36, first published on October 23, 2015; Urban Affairs Review, January 2011; vol. 47: pp. 31-59, first published on August 27, 2010,*

Projection: GCS North American 1983
UEP 232: Intro to GIS
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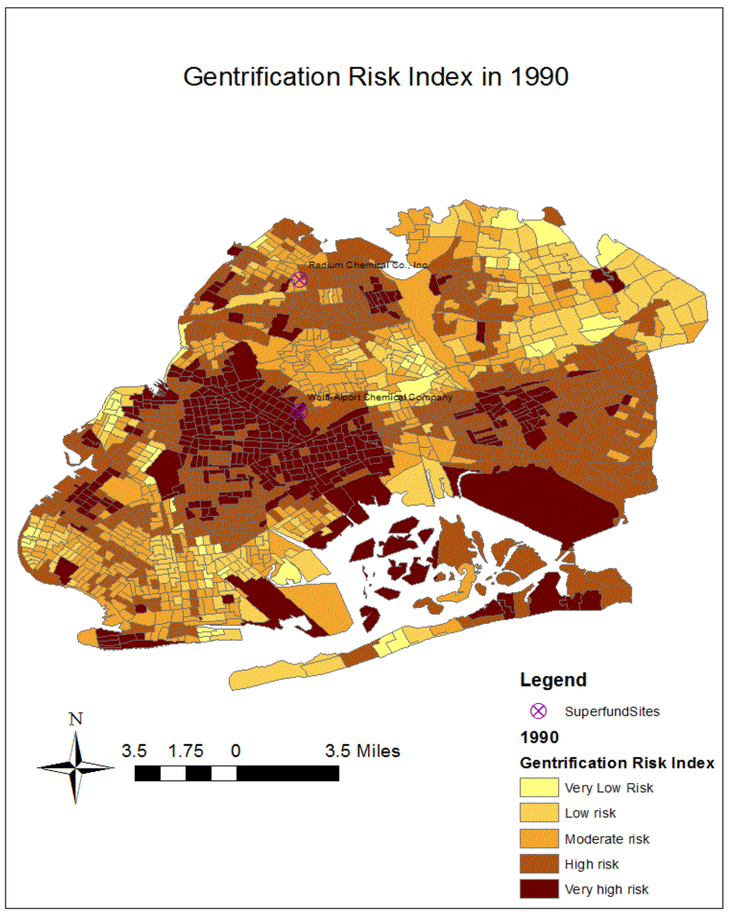
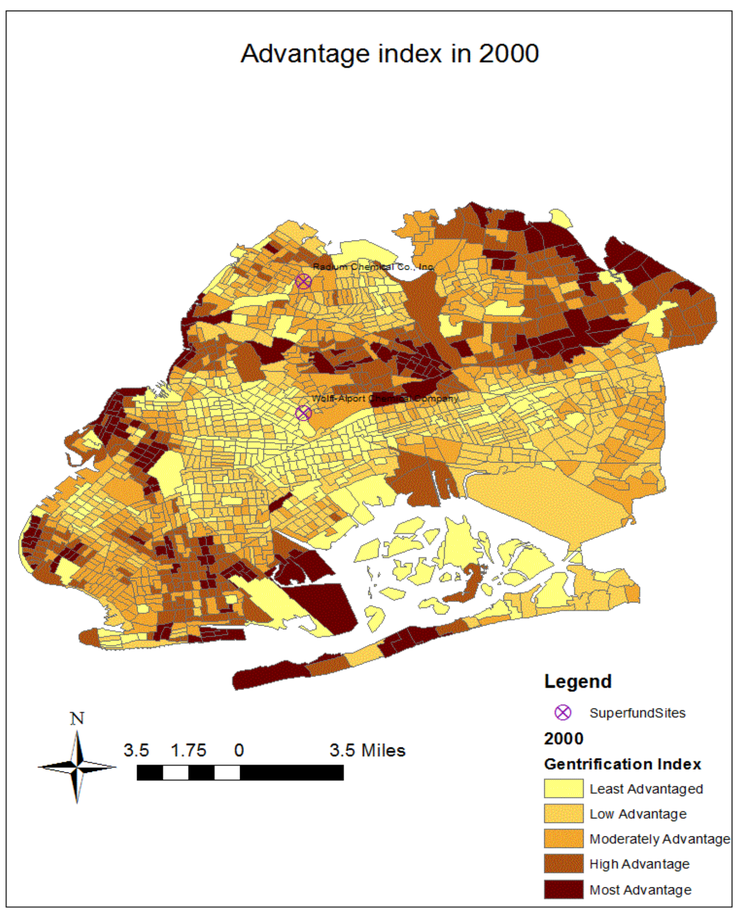
Cartographer: Kyle Lui

Factor	Interpretation of Factor
Percentage of People of Color	Higher percentages of people of color in an urban neighborhood tend to signify lower income and a higher risk of gentrification due to the legacy of housing gentrification in American cities.
Median Household Income	Lower household income creates a higher vulnerability to displacement when rent increases in neighborhoods that start to have a tighter housing market
Percentage of people without Bachelor Degrees	Educational attainment has a high correlation with one's earnings, which gives one more stability in a tight housing market if rents start to increase



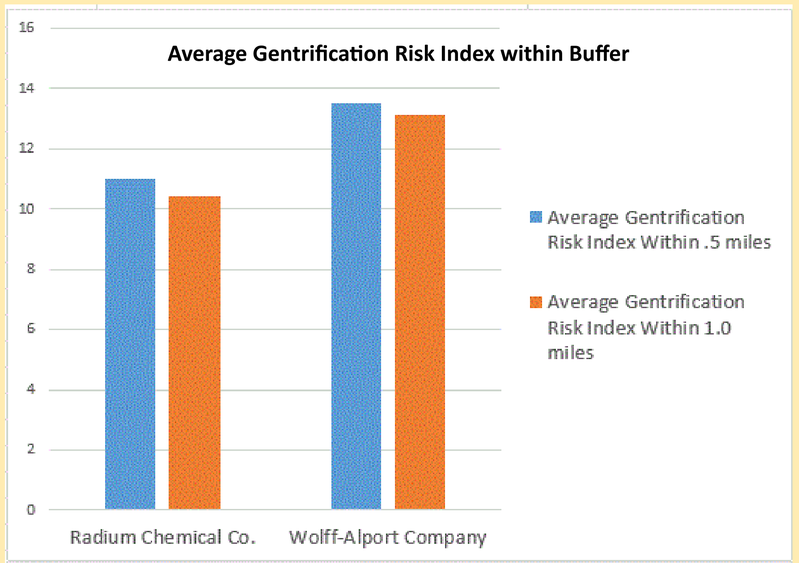


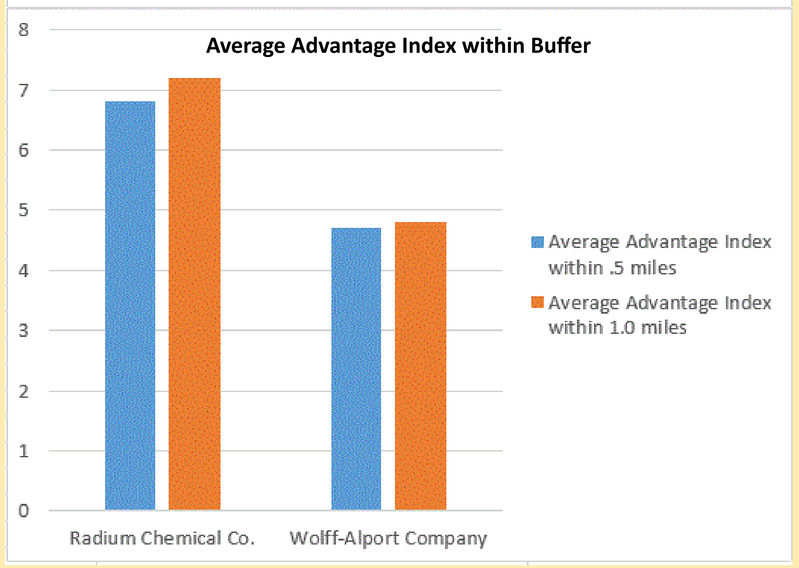
Conclusions

The two maps represent the risk of gentrification risk of each census tract in 1990 and the advantage of each census tract in 2000, respectively. Using cluster and outlier analysis, neither of the two Superfund sites were outliers before the cleanup of Radium Chemical Company, which did not suggest that Superfund sites were outliers in terms of gentrification risk due to their environmental hazards. In addition, neither of the Superfund sites became part of a cluster after the environmental cleanup of Radium Chemical Company, which did not suggest that either of the two sites became gentrified after the cleanup.

In addition, while using the spatial query buffer to calculate the mean gentrification risk as the radius from the superfund site increased, this data did reveal that gentrification risk decreased as the radius increased from the Superfund site before the environmental cleanup. Furthermore, after the environmental cleanup the average advantage index increased as the radius increased, which did not align with my original hypothesis. As a result, none of my spatial analysis confirmed the original research questions I hoped to answer.

However, further research is needed before we reach a final conclusion on this issue, especially because the time frame in which I used data was slightly flawed. In addition, future analyses may want to look at more factors and do a more detailed way of weighing the different factors and reclassifying them to more accurately represent gentrification in the neighborhood.





Limitations and Sources of Error

In this spatial analysis, there were numerous limitations that I took into consideration. First, NYC is a diverse place and has many immigrants. Due to language barriers, these residents, who often come from low income backgrounds, may not have answered the survey. In addition, I realized that it may take more than 5 years for a neighborhood to change its makeup due to gentrification. As a result, if I were to redo the spatial analysis, I would do 15 years after the cleanup instead of 5 years to show a more significant change from gentrification.

Furthermore, the borough of Queens may not have had a tight housing market at the time, which would have affected the risk of gentrification and delayed the effects of gentrification. I also realized while doing the project it would've more comprehensible for the audience if I just stuck with a gentrification risk index instead of also creating an advantage index that showed the opposite of the gentrification risk index.

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