COMPARATIVE ANALYSIS OF NYC AND DETROIT WATER QUALITY THROUGH POPULATION AND INCOME

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Introduction

The motivation for this project sprouts from the current water crises in the United States and how two well-populated cities have opposite water qualities. We chose NYC and Detroit as our focus cities because we figured that it would be beneficial to look at this question regarding popular cities in the US. We hope this analysis will shed light on the persistent water crisis in the US.

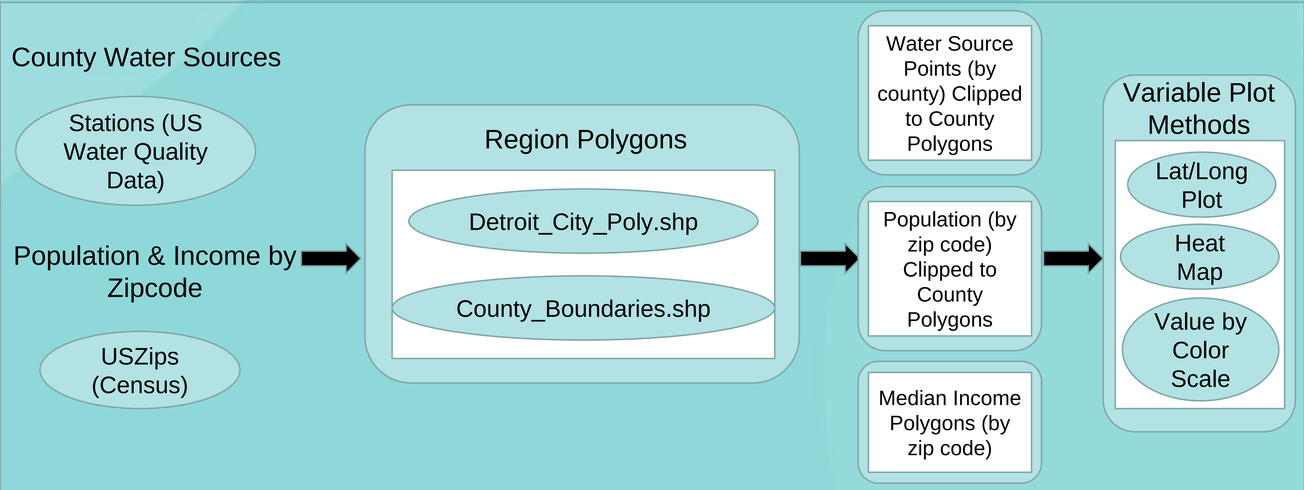
Research Questions

1. Why does New York City have better water quality than Detroit?
2. Does population or income (or both) affect the quality of water more?

Data Used

- Water Infrastructure Sites from Water Quality Data US Portal (point)
- Population Density from US Census (Zip code points with population density values)
- Income Distribution from US Census (Zip code polygons with Median Income values)
- US County Boundaries from US Census Cartographic Boundary Files (polygon shapefile)

Methods



Visual Analysis

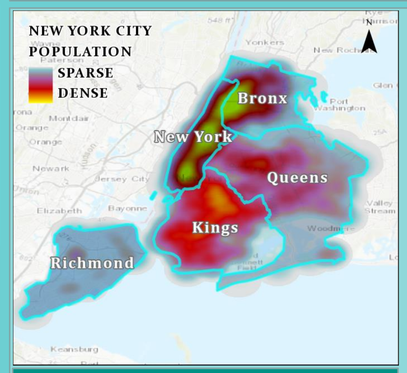


Figure 1: Map of population density for New York City

Figure 2: Map of public water sources (streams, lakes, reservoirs, estuaries, wells, rivers) in New York City

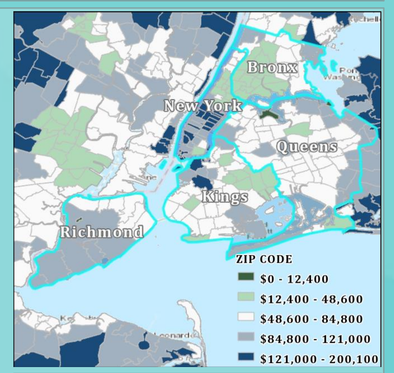


Figure 3: Map of income range of New York City by zip code

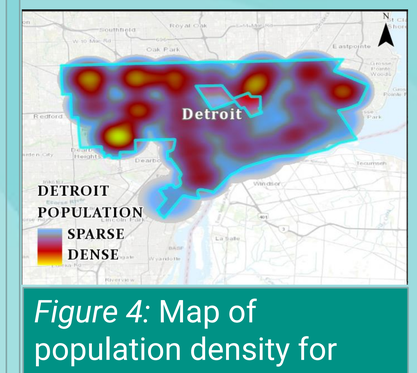


Figure 4: Map of population density for Detroit

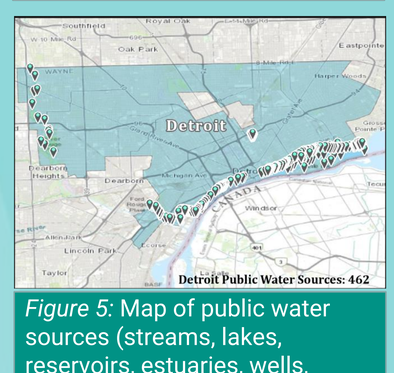


Figure 5: Map of public water sources (streams, lakes, reservoirs, estuaries, wells, rivers) in Detroit

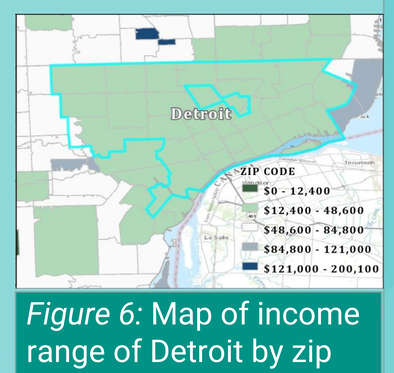


Figure 6: Map of income range of Detroit by zip code

Conclusions

The results of this study conclude that the quality of water is more dependent on median household income rather than population. Looking at the maps and comparing New York City to Detroit, there is more diversity in the income ranges as well as a higher median income. This diversity in income range allows for better funding of public water resources by the local government since they could charge more for water rates and surcharges. In addition, residents can fund improvements to their water infrastructure. Population density was included in this study because we wanted to see if there was any correlation between the location of public water resources and the density of the population, but this resulted in no correlation when looking at the map.

References

1. US News Air & Water Quality Rankings (https://www.usnews.com/news/best-states/rankings/natural-environment/air-water-quality)
2. Lawnstarter City Rankings for Best Water Quality (https://www.lawnstarter.com/blog/studies/best-cities-for-water-quality/)
3. Water Quality US Data (https://www.waterqualitydata.us/portal/)
4. US Census (www.census.gov)

Acknowledgments

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