

# Air Pollution in Relation to Race and Income in Illinois

Rachel Wilham

University of Illinois Springfield

## Purpose

In a study of the distribution of air polluting sources in relation to poverty and race, minorities (non-whites) and people living in poverty were found to be disproportionately affected by air pollution from man-made sources. One reason for this disparity is the lack of inclusion in decision making about the siting of these sources by minorities and low-income families<sup>2</sup>.

Living near air polluting sites such as coal power plants and sites listed on the EPA's Toxic Release Inventory (TRI) can cause a variety of health impacts, including respiratory and cardiovascular diseases, cancer, and premature mortality. Therefore, when it comes to the siting of air polluting sources such as coal power plants and TRI Facilities, ensuring that everyone has an equal voice in the decision-making process is crucial.

The purpose of my research was to find out if there is a relationship between the siting of these polluting facilities in Illinois with minority status and/or income.

## Data and Methodology

To examine whether economic status and race have an impact on the placement of air polluting sources such as coal power plants and Toxic Release Facilities throughout Illinois the following actions were completed:

- Using data obtained from the U.S. Census Bureau, I created a Graduated Colors Map showing: 1- Population percentage of minorities and 2- Median household income at the census tract level throughout Illinois.
- Using data from the U.S. Department of Health & Human Services, mapped out the location of coal power plants and TRI facilities on both maps discussed above.
- Performed spatial joins between layers to allow for analysis of data.
- Calculated statistics of layers to get an understanding of the relationships between the population demographics and income, and the placement of air polluting sources.

## Results

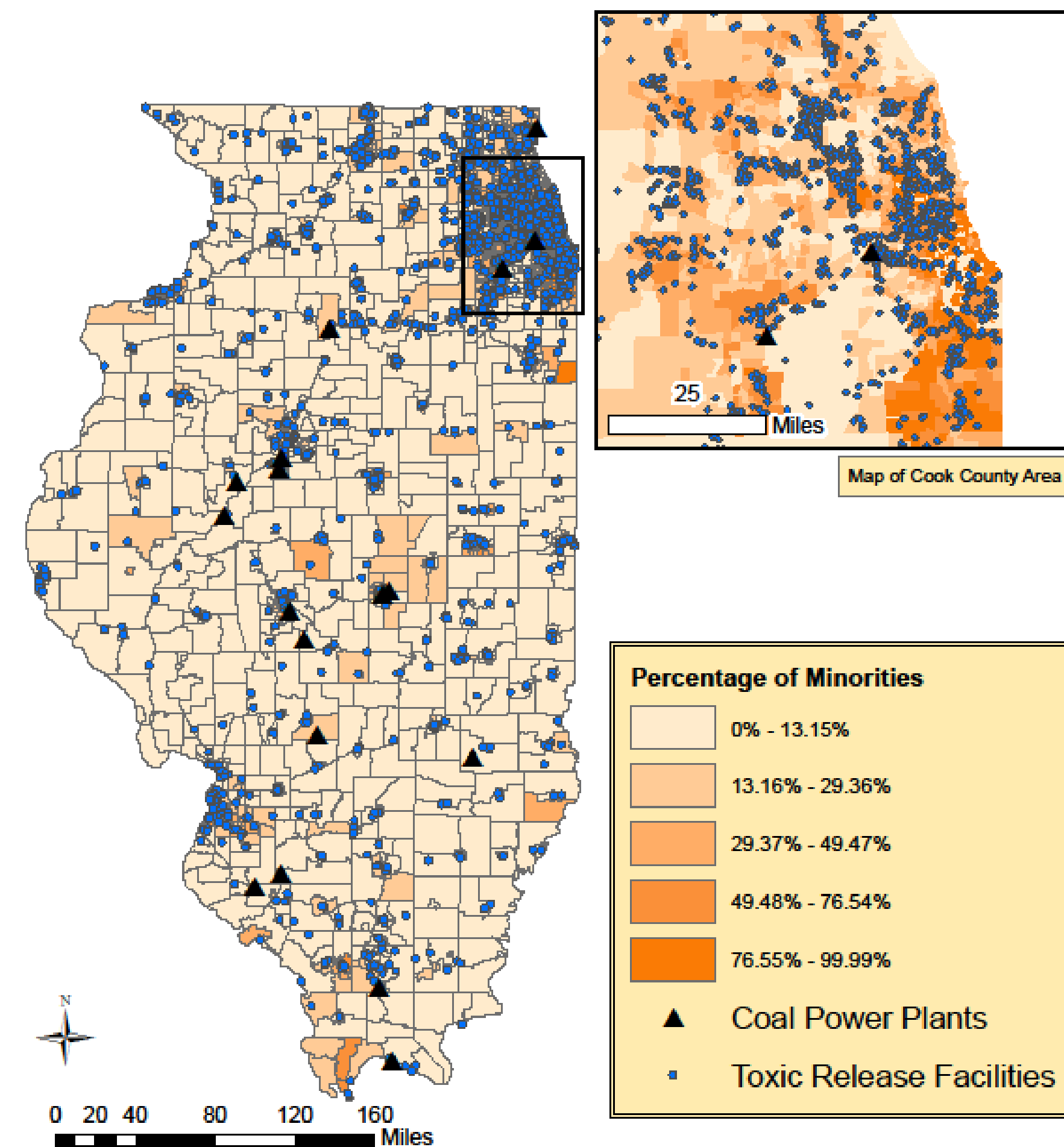


Figure 1. Map showing percentage of minorities living in each census tract in Illinois in relation to TRI facilities and coal power plants.

- On average, census tracts containing coal power plants have a population ratio of 87% white and 13% minorities.
- On average, census tracts containing TRI facilities have a population ratio of 74% white and 26% minorities.

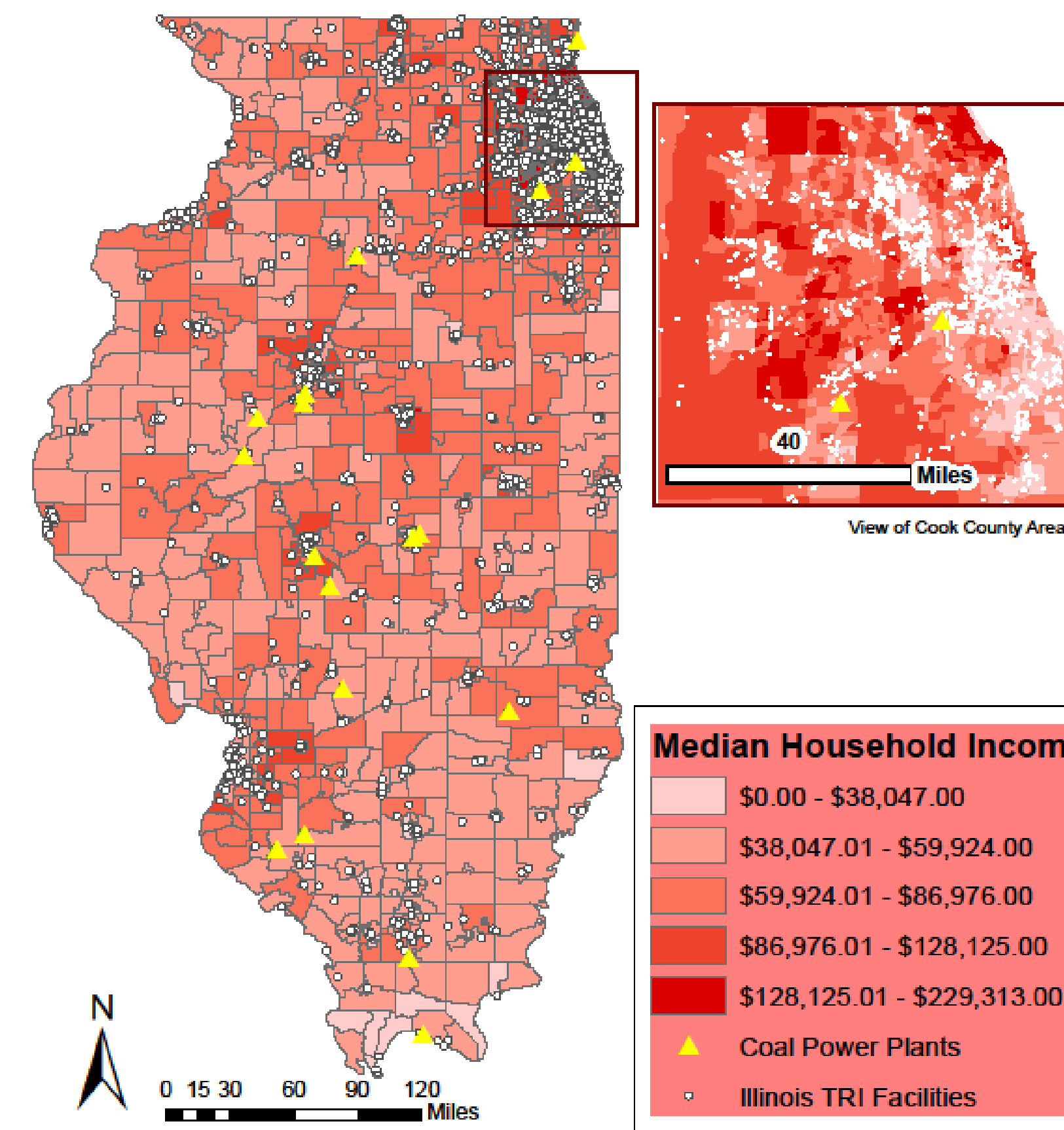


Figure 2. Map showing median household income by census tract in Illinois in relation to TRI facilities and coal power plants.

- On average, census tracts containing coal power plants have a median household income of \$56,000.00.
- On average, census tracts containing TRI facilities have a median household income of \$59,100.00.

## Conclusions

- The average household income in Illinois is around \$63,000. Therefore, my findings show that polluting facilities such as TRI and coal power plants are more likely to be placed in census tracts that have a median household income lower than the average income in Illinois.
- The population ratio across Illinois is about 70% white and 30% minorities. Therefore, my findings show that the siting of coal power plants and TRI facilities is not related to the population ratio in Illinois.

## Limitations

- These findings only reflect data for the state of Illinois.
- Data is for TRI facilities and coal power plants. Inclusion of other sources of air pollution may result in different conclusions.

## References

- EPA Coal Power Plant Data (2017) [downloaded file]. U.S. Department of Health and Human Services. URL: <https://toxmap.nlm.nih.gov/toxmap/download.html> [November, 2019]
- Mikati, I., Benson, A.F., Luben, T.J., Sacks, J.D., Richmond-Bryant, J. (2018) Disparities in distribution of particulate matter emission sources by race and poverty status. *American Journal of Public Health*, 108(4), 480-485. URL: <http://dx.doi.org.ezproxy.uis.edu/2048/10.2105/AJPH.2017.304297> [November, 2019]
- Race (2017) [downloaded file]. United States Census Bureau. URL: <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml> [November, 2019]
- Selected Economic Characteristics (2017) [downloaded file]. United States Census Bureau. URL: <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml> [November, 2019]
- TRI Facility Data (2016) [downloaded file]. U.S. Department of Health & Human Services. URL: <https://toxmap.nlm.nih.gov/toxmap/download.html> [November, 2019]

## Acknowledgements

This poster is based on a course project from (ENS 404 Fundamentals of GIS). The author would like to thank the Geographic Information Systems (GIS) Lab at UIS for its assistance in the design and/or printing of this poster.