

Assessing Environmental Justice in Minnesota: Do Native Americans Face Disproportionate Risks?

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Abstract

Environmental justice is an area that has gained traction worldwide in recent years. Today, researchers are analyzing what factors play into this issue and what policymakers and environmental regulation can do to better these issues. Environmental justice focuses on any group that experiences an imbalance of environmental harms. These groups are commonly distinguished by factors such as race and income. I analyze primarily if Native Americans in the state of Minnesota may face disproportionate environmental harms, I also look at Black identifying individuals and population size as a means of comparison. I compared the number of environmental harms and the number of people that identify as Native American or Black in each zip code of Minnesota. My results showed that, on average, as the number of Black identifying individuals increase in each zip code, so do the number of environmental harms. I found the opposite for Native American identifying individuals. This may be because as environmental harms increase in more populous areas so does the percentage of African Americans. Native Americans may tend to live in more rural areas. This study emphasizes the need to further study which factors of environmental justice are affecting Minnesotans, and what changes can be made to create a more equal and just Minnesota.

Literature Review

The Issue that is Environmental Injustice

Environmental injustice and racism are a long and complex issue in today's society. These injustices are not particular to any specific minority group, different ethnicities, races, and socioeconomic groups are harmed alike. Often, the realization that these harms are occurring are hard to recognize until attention is brought to them, the health risks accompanied by these harms resulting from the injustices are often thought of to have occurred from ordinary health risks like smoking or poor diet. Brulle and Pellow (2006) further explain what exactly environmental inequalities are and what human health risks they pose. They cite the EPA in their research for the definition of environmental justice being "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no population, due to policy or economic disempowerment, is forced to bear a disproportionate share of the negative human health or environmental impacts of pollution or environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local and tribal programs, and policies" (Brulle & Pellow, 2006, p. 104).

The terms environmental justice and environmental inequality can be distinguished from each other as environmental inequality refers to "a situation in which a specific social group is disproportionately affected by the phenomenon of environmental racism" (Brulle & Pellow, 2006, p. 104). The literature further references Chavis's definition of environmental racism being "racial discrimination in environmental policymaking, the enforcement of regulations and laws,

the deliberate targeting of communities of color for toxic waste facilities, the official sanctioning of the life-threatening presence of poisons and pollutants in our communities, and the history of excluding people of color from leadership of the ecology movements” (Brulle & Pellow, 2006, p. 105). There is extensive evidence of proof of environmental injustice.

Environmental injustices go beyond just the United States. These issues bleed further into global political issues. Newell (2005) gives an example where the U.S. sent food as aid to Bolivia that contained genetically modified organisms (GMOs) that were not yet approved for consumption in the United States (Newell, 2005). This act was done in complete disregard of the current ban the country had on genetically modified (GM) food. This particular GMO was named StarLink, later on when traces of this GMO were found in US food supply it was immediately removed from the market, yet there was no effort to remove the food that was sent to Bolivia (Newell, 2005). So, in this fashion, should lower-income communities face disproportionate environmental risk in the form of agricultural harm because they cannot afford to supply themselves with risk-free food? Why is it fair to put low-income communities at a higher risk for harm? Why are lower income or BIPOC communities treated as less because they don't have the same resources as the rest? One may argue that it is up to the Bolivian government to decide whether to accept the food or not, however, the United States government accused Zambia and other countries of committing crimes against humanity by not accepting foods that contained GM food aid when its people were starving (Farbent, 2002). Bolivia may have been fearful of similar accusations or chose to put the hunger of their country above their health. These communities are not only facing disproportionate environmental harm that affects their health, but there are also laws and policies that allow for the continuance of these acts.

Lindsay Farbent (2022) addresses these health effects, and the laws and policies that allow for the extension of these societal issues. It is widely known that pollution is an issue that plagues and harms our environment, but it also leads to human health deterioration. Long-term exposure to pollution (something that could easily happen if one lives near a locally undesirable land usage site (LULU)) can increase one's chances of developing respiratory diseases, cardiovascular diseases, and even cancer (Farbent, 2022). Farbent discusses multiple examples of health risks from environmental harms and the documents increased the exposure to these harms by BIPOC communities in comparison to white communities. One example is lead poisoning. Exposure to lead and the risk of lead poisoning typically affects BIPOC communities (Farbent, 2022). Lead-poisoned water or lead built into infrastructure are the typical ways the communities are exposed (Farbent, 2022). Lead is a neurotoxin that leads to the impairment of cognitive, physical, and behavioral functioning, even with low-level exposure (Farbent, 2022). The comparison is drawn because BIPOC communities are "more likely to live in deteriorating neighborhoods because of limited financial resources" (Farbent, 2022, p. 112). Other issues arise in discussion of landlord neglect and institutional neglect of indoor environments like schools and daycare centers. Farbent (2022) suggests examining reinvestment patterns and city infrastructure projects that address lead-related projects and the demographics of the areas that receive these projects at higher rates.

Farbent (2022) further discusses the gaps and discrepancies in federal and state environmental laws that allow for permit obtention for polluting in BIPOC and low-income neighborhoods. The Comprehensive Environmental Response Compensation (CERCLA) was a major focus of the literature and displays how the EPA was biased in the cleanup of these

superfund sites because it was shown that higher-income and white neighborhoods had 20% faster cleanups than BIPOC or low income communities (Farbent, 2022).

Vicki Been (1993) explains another occurrence of environmental injustice in the siting of Locally Undesirable Land Uses (LULU's). Lulu's have a long history of being in neighborhoods that "follow the path of least resistance" as Been (1993) puts it. Been (1993) further explains how many of the neighborhoods that are chosen to house these Lulu's are disproportionately placed by poor and people of color. This is because these neighborhoods don't have the resources to oppose LULU's that higher income neighborhoods do.

The period of this article, 1980, of the landfills studied, (a type of LULU) three of the four host communities were predominately African American. Been (1993) also references the cross-statistic that in 1980, only 12% of the U.S. population was African American (Been, 1993). Been (1994) points out flaws in the proponent research stating it is failing to examine the demographics of the communities at the time the LULU's were built and instead examining the demographics of the current communities that host the LULU's. Been (1994) explains how they leave open the possibility that the LULU's were not sited in these areas because of the demographics but instead that the dynamics of the housing and job markets led BIPOC and those of lower socioeconomic classes to move to the area because of the price of available housing.

The article explains how market dynamics may play a role in the location of LULU's as well. Cheaper housing is disproportionately populated by lower socioeconomic classes and BIPOC. This theory explains a weakness in the research as it describes how the availability of low-income housing, zoning laws, and the dynamics of poverty may have led to these groups living in proximity to LULU's. The article also explains the theory of The Mobility Objection which poses the question of: if a LULU was sited in a wealthier neighborhood, would the

residents respond by moving away because they have the means to do so? In theory, this would lead to the property value decreasing. Relating to my research question, if these theories were true, it would mean that these LULU's are not being placed in lower socioeconomic neighborhoods, but instead that the neighborhoods have cheaper housing due to the LULU's, which leads to lower income individuals living there. It would also mean that environmental injustices are not occurring for economic and racial reasons and instead occurring because of housing market dynamics. However, I see a flaw in theory as I don't believe that entire neighborhoods would flee because of a LULU. Been (1994) also analyzes the unit of analysis used in past research. It is stated that most of the research at the time used "neighborhoods" as a unit of analysis. These block groups are supposedly too small, and the information produced from these assessments may be misleading as the area and density of the block groups vary. She suggests using census groups as they are structured more permanently in terms of area and density. These theories need to be further explored and researched to be proven.

There are more opponent theories of the current environmental research. David Pellow examines this and focuses on the mechanisms behind the outcomes of the research, he builds the following theory to aid in the future exploration of environmental inequalities. Pellow (2000) discusses that the term of environmental inequality needs to be redefined as a "sociohistorical process," rather than one particular event. He states that the interests of the multiple stakeholder groups often have contradicting and shifting interests that need to be understood to further examine these issues. He stresses how environmental inequalities are historical processes and aren't simply "perpetrator-victim" scenarios. This is an interesting theory as all societal issues are continually evolving over time, however, this theory seems to be a stretch. As stated before, these "stakeholders" often choose to take the path of least resistance when determining where to

place LULU sites, and there is evidence proving that lower-socioeconomic and BIPOC communities are that path.

Low Income and BIPOC Community Relationships with Environmental Injustice

Multiple different races, ethnicities, and socioeconomic classes are faced with these environmental harms, and there are many societal issues that bring these harms about. In the case of Houston, the primary harm was waste facilities, and black communities were the faced with disproportionate harm. In this case the occurrences came at the harm of discrimination in the housing market, lack of zoning, and because of decisions being made by public officials (Bullard, 1983). The data in this case shows that in the past six of eight Houston's city-owned garbage incinerators were in predominately Black communities, 1/8 was predominately in Hispanic, and 1/8 was predominately White (Bullard, 1983). Bullard (1983) shows that of past landfill sites, in 1970-1978 six permits were given by the state of Texas for landfill sites to the company Browning Ferris Industries in Houston, of the six permits given, five were in predominately black neighborhoods (Bullard, 1983).

The water crisis in Flint, Michigan is one known by many throughout the United States and is a case of environmental injustice and racism. Flint's majority population is BIPOC, and a majority live in poverty (Berliner, 2017). After the incident, many Flint residents sued multiple city officials from the city of Flint based on the basis of bodily harm (Berliner, 2017). City officials commissioned a study in 2011 to evaluate the conditions of the Flint River to determine whether the water was safe to be used as a primary source of drinking water. The study reported that the water was highly corrosive and couldn't be safely consumed without an anti-corrosive

agent to prevent lead and other metals from entering the water lines (Berliner, 2017). In 2014 the Flint Emergency Manager ordered water to be taken from the river despite knowing the water wasn't being treated (Berliner, 2017). Throughout the span of eight months multiple complaints of the water were filed because of the color, smell, and taste, they were all ignored. This is a case of environmental injustice; these communities were knowingly put at risk for environmental harm at the fault of government officials (Berliner, 2017). Flint is an example of an environmental injustice on both socioeconomic class and race.

In the analysis of neighborhood proximity to coal impoundments in the Appalachia, it was shown that there was unfair proximity to neighborhoods depending on socioeconomic class (Greenberg, 2017). Coal impoundments are large, hazardous dams that hold billions of gallons of wastewater and a sludge-like by-product of coal (Greenberg, 2017). The data of this article proves that both poverty and unemployment are higher in neighborhoods within 150km of a mine (Greenberg, 2017). The article continues on about how this research may explain how this is an environmental injustice not only to the surrounding low-income communities, but also how this research can be useful in the future to prove environmental inequality in resource-dependent communities (Greenberg, 2017).

Environmental Injustices Towards Native Americans

Previous research has explained what environmental injustice is and how racism increases the potential for health risks and other harms that are faced at the hands of these issues. There are examples of how different races, ethnic groups, cultures, and socioeconomic classes bare unfair risks. One of the groups that the literature didn't highlight specifically were Native Americans. Native American environmental injustice differs from other minority groups in

multiple ways. It differs in type of land the US government forcibly restricted from Indigenous people, how these injustices are harder to study because of cultural significance, and how Native Americans classify themselves to the U.S. census data.

One cultural significance is shown by the Hook and Smith (2004) analysis of the proximity of Native American lands to U.S. military bases. This article discusses how in the nineteenth century the US forced nearly all Native Americans onto reservations located in Western States, and during the same time it built a vast military complex in the same Western states in which Native Americans were concentrated. The land the Native Americans were relocated to was deemed undesirable by Americans (Hook & Smith, 2004). During the World Wars, the US also built and expanded its military bases on lands that had already been given to Native Americans (Hook & Smith, 2004). This forced relocation is leading to more current-day issues for Native Americans.

The loss of land by indigenous people is leading to increases in harms relating to climate change. As discussed above, the land Natives were forced to relocate to was deemed undesirable by Americans. Today, this land is more exposed to a wide variety of climate risks (Treisman, 2021). The land given to Natives is, on average, more exposed to climate change hazards like extreme heat and decreased precipitation, and less likely to lie over valuable resources like oil and gas (Treisman, 2017). Critics of this argument may state that this just a timely coincidence, and that there was no way of knowing that these lands would face disproportionate harms relating to climate change, but this can be referenced back to the last article and how the land that Natives were forced to relocate to was deemed undesirable by Americans at the time of the treaties. The fact that Native Americans were forced to relocate for the betterment of American industry and development is an injustice as is.

A result of climate change is extreme heat and drought which will likely lead to water insecurity for Native Americans. Mitchell (2019) explains how water insecurity for Native Americans will have a different impact as they are connected to water by culture, their livelihood, and their identities. The challenges that surface with water insecurity will impact indigenous people differently than other groups, and this article shows one of the difficulties in measuring environmental injustice for Native Americans. It's nearly impossible to get numerical data that measures for the loss of culture that diminished resources such as water may have for Indigenous communities. This poses a question of how to measure cultural loss in terms of environmental injustice.

Vickery and Hunter (2015) delve further into the research and lack-there-of in relation to environmental justice research and Native Americans. There are unique dimensions in studying environmental justice with Native Americans. They discuss how to quantify the cultural significance that is lost not only today, but in the past and the loss of land the led to cultural and livelihood changes. Another issue that arises in research of Indigenous people is what exactly is an appropriate definition of the populations that are deemed environmentally vulnerable (Vickery & Hunter, 2015)? There is an inconsistency in who classifies themselves as Native American, and the disparities between tribal enrollment and federally recognized lands. This can pose issues such as whether Native Americans are over or underrepresented in studies. The last biggest issue is that of tribal sovereignty and tribes are self-governed and self-regulated. Sovereignty enables the tribes to establish environmental regulation on their own lands, and the EPA is required to enforce these regulations even if they conflict with state regulation. However, economics plays a role in this as well as some tribes have more financial ability to pursue cases where the EPA didn't withhold their side. Not all tribes have enough resources to pursue

environmental justice cases and are able to seek remediation for harms that occur on tribal land (Vickery & Hunter). There are a lot of areas of uncertainty brought about by this article. How can we measure cultural loss? Who should be considered Native American in terms of variables in research to ensure the population is represented accurately? How does tribal sovereignty play a role in pursuit of environmental injustices?

Some of these questions need to be addressed by the Tribal and US governments. There are many logistics that need to be assessed when looking at environmental injustice towards Native American Tribes. There is a lack of vital communication between the US and Tribal governments (Walker & Bradley & Humphrey, 2002). Since there is this lack of communication the issues taking place on tribal lands is often misunderstood or underestimated. For these issues to be properly analyzed, the government-to-government relations need to be strengthened and the US government needs to reevaluate their rights granted to tribes based on past treaties (Walker & Bradley & Humphrey, 2002). Some of the questions that arise about environmental harm towards Indigenous people are because there is a lack of communication and knowledge of these issues.

In conclusion, environmental injustice is a widespread issue that is going to continue to be prevalent. All minority groups are affected by this issue, and these issues will persist until new laws and policies are implemented to stop this issue. There are some discrepancies in research that need to be addressed and opponent theories that need to be explored to ensure that that data being used to educate people on this matter is accurate and a proper representation of these populations.

There needs to be much more exploration and research done specifically in the case of Native Americans. Native Americans are a group that have already faced so many harms at the

hands of the US government and are still today continuing to face repercussions of actions the government enacted hundreds of years ago. With my research I hope to explore some of these questions and gain conclusive evidence that sheds a light of justice.

Methods and Analysis

The data I utilized for my analysis is a fusion between the United States Census Bureau data of Minnesota and the Minnesota Pollution Control Agency's (MPCA) information index- What's in My Neighborhood. The United States Census Bureau collects data every 10 years by sending out an invitation to each home in the United States and asks each household to fill out a questionnaire online, by phone, or by mail. The census is used to get a count of the population. This is primarily done to determine the number of seats each state gets in the U.S. House of Representatives but is also done to receive demographic information on the respondents age, race, income, educational level, ect. This means every ten years the U.S. can see how the demographics of the United States and specific regions and states are changing. What's in My Neighborhood is an informational index and interactive map that the MPCA developed to share information with the public about what environmental harms are occurring in Minnesota and where exactly they are located. Users can either view the data as an excel file or utilize the interactive map. The map gives users the ability to type in counties, cities, addresses etc. to see the harms in those areas. The data includes the exact location, and which harm is occurring from instances like contaminated sites and inspections to permits, licenses, and registrations of company activities that have an impact on the environment.

This data includes not only active sites, but also closed sites that have been reported to the MPCA since the 1980's. The types of activities vary- air pollution, brownfields. CERCLIC

sites, and various types of waste sites are all included, among others. Both the census and MPCA data was able to be organized by zip codes. The MPCA data counts how many instances of each type occur, as well as the total harms in each zip code. To analyze the data from both sources I merged the two together organizing by zip code and included demographic data from the census and cases of environmental harms from the MPCA data. The unit of analysis in my study are zip codes in Minnesota. The high number of zip codes allow me to see the affects that the variables have in smaller sub-sections of the state. The variables contain demographic information such as race, income, and education levels and others, as well as the different environmental harms. The primary focus of this study is on race and environmental harm variables that occur in each zip code. All the variables included in the study are interval.

With the evidential support shown through past research and analyses, my study hypothesis are the following:

1. In a comparison of Minnesota zip codes, those with a higher population of Black individuals will be more likely to have a higher number of environmental harms.
2. In a comparison of Minnesota zip codes, those with a higher population of Native American individuals will be more likely to have a higher number of environmental harms.
3. In a comparison of Minnesota zip codes, those with a higher population will be more likely to have a higher number of environmental harms.
4. In a comparison of Minnesota zip codes, when testing for percent Black, percent Hispanic, percent Native American, percent high school graduates, percent White, count of population over 25 by 100, and median income per \$1000, those

with a higher population of Native Americans will be more likely to have a higher number of harms and wastewater harms.

To test the following hypotheses, I excluded environmental data that was provided by the MPCA that had no corresponding U.S. Census Data. This data was reported by the MPCA because it had an impact on Minnesota waterways but was reported as occurring in zip codes outside of Minnesota in neighboring states such as Iowa and Wisconsin. I did this by creating a dummy variable that excluded the environmental cases that had no correlating census data. The total number of valid zip codes analyzed ended up being 1,067. Below is a table that showcases examples of harms and zip codes that experience a high number of harm and a low number of harms on average.

Examples of Harms	Zip Codes with High Numbers of Total Cases	Number of Cases	Zip Codes with Low Number of Total Cases	Number of Cases
Air Quality	55021	1207	55728	1
Feedlots	55025	508	55300	4
Wastewater	55006	880	55029	7
Industrial Stormwater	55044	918	55034	1
Solid Waste	55082	730	55035	1
Super Fund Sites	55330	776	55039	1
Aboveground Tanks	55369	665	55048	2
Brownfields	55379	879	55062	1
Environmental Review	56401	840	55062	1

Hypothesis One: In a comparison of Minnesota zip codes, those with a higher population of Black individuals will be more likely to have a higher number of environmental harms

I conducted a bivariate correlation with the variables “Total Harms” which tested the total number of environmental harms and “PERBLACK” the percentage of respondents that identify as black in each zip code in Minnesota. As shown by Graph 1, the results of this correlation are statistically significant ($P < .001$). Graph 1 shows that for every 1% increase in the population of black respondents, the number of environmental harms increase by 7.34.

(Graph1 about here)

I found that in the tested zip codes that had percentagr of census respondents that identify as black there were more cases of environmental harm occurring. These results are interesting as it shows that on average, as the percentage of black respondents increase in each tested zip code, there is also an increase in the number of environmental harms that are occurring. This leads me to reject the null hypothesis.

Hypothesis Two: In a comparison of Minnesota zip codes, those with a higher population of Native American individuals will be more likely to have a higher number of environmental harms

Once again, I ran a similar bivariate correlation wither the variables “Total harms” testing the total number of environmental harms and “PERNATIVE” the percentage of respondents that identify as Native American in each tested zip code in Minnesota. As shown Graph 2 there is a

negative correlation between the two and the P level reports significance. ($P=.004$) to oppose this hypothesis. Graph 2 also shows that as the total number of environmental harms increase, there is a 2.14% decrease in number of individuals who identify as Native American in each zip code.

(Graph 2 about here)

I found that in the tested zip codes those in which had a higher number of respondents identifying as Native American there is a decreasing amount of environmental harm cases occurring. These results are surprising and therefore leading me to accept the null hypothesis.

Hypothesis Three: In a comparison of Minnesota zip codes, those with a higher population will be more likely to have a higher number of environmental harms

The results of last two hypotheses lead me to my third hypothesis to explain a possible variable that may affect the number of environmental harms occurring in each tested zip code. I ran another bivariate correlation, this time between “Total Harms” the total number of environmental harms reported and “popover25” a count of the population in each tested zip code over the age of 25. “Popover25” was used to gauge the approximate total population in each tested zip code to analyze if higher populated zip codes had more instances of environmental harms. As shown by Table 3 there is statistical significance ($P<.001$). Graph 3 shows that as the harms increase by .06% in each tested zip code there is an increase in the population. This leads me to reject the null hypothesis.

(Graph 3 about here)

I found that in zip codes that had a higher population over the age of twenty-five there is an increase in the number of environmental harms occurring. These results show a possible

explanation as to why the first null hypothesis was rejected, and the second was accepted. It is possible that persons identifying as black tend to live in more populated zip codes overall, and that because these zip codes include larger cities, there are more instances for total environmental harms to occur while the individuals identifying as Native American may tend to live in lower populated zip codes where there is less opportunity for total number of environmental harms to occur.

Hypothesis Four: In a comparison of Minnesota zip codes, when testing for percent Black, percent Hispanic, percent Native American, percent high school graduates, percent White, count of population over 25 by 100, and median income per \$1000, those with a higher population of Native Americans will be more likely to have a higher number of harms and wastewater harms.

With the results of the last hypothesis, I ran two linear multiple regression analyses. I controlled for percent Native, percent Black, percent Hispanic, percent graduated high school, percent White, count of the population over 25 divided by 100, and the median income divided by 1,000. My dependent variable was “Total Harms,” the total number of environmental harms, and my second was “Hazardous Waste,” which is the total number of hazardous wastes sites that occur. I chose this variable because hazardous waste sites are one example of a Locally Undesirable Land Use (LULU’s). Shown in the column labeled “Total Harms,” when controlling for all these variables, all racial demographic coefficients report as being negative besides “percent Hispanic.” No report being statistically significant. “Percent High School Graduates” is also a negative coefficient but does not report statistical significance. “Median Income by 1,000”

reports negative and statistically significant. The strongest correlation on the table is “Percentage of Population Over 25 by 100.” The coefficient is positive and significant.

The second dependent variable tested was “Wastewater.” I chose this second variable based upon the literature review case of coal wastewater in the Appalachians. This variable produced different results, as “percent Black,” “percent Hispanic,” and “percent White” were all reported as negative and not significant. “Percent Native American” was the only racial coefficient that was reported as positive, however, it is not significant. “Percent High School Graduates” was reported as positive, and “Median Income by 1,000” was reported as negative, however both were not statistically significant. The only variable reported as being statistically significant was “Percentage of Population over 25 by 100” and positive.

(Table 1 about here)

I found that when controlling for all the demographic variables there is still not statistically significant evidence that environmental injustice towards Native Americans is occurring in Minnesota. These results lead me to accept the null hypothesis. There may be correlation between the independent and dependent variable but none of them are statistically significant.

Conclusion

This study concludes that there are more determinate factors than race when analyzing environmental justice. As shown by my analysis that identifying as black in the census reports face a higher number of environmental harms, while those identifying as Native American face a decrease in the number of environmental harms occurring in their zip codes. My third analysis brings light to a variable that might explain these disproportionate results. *Table 1* and *Table 3*

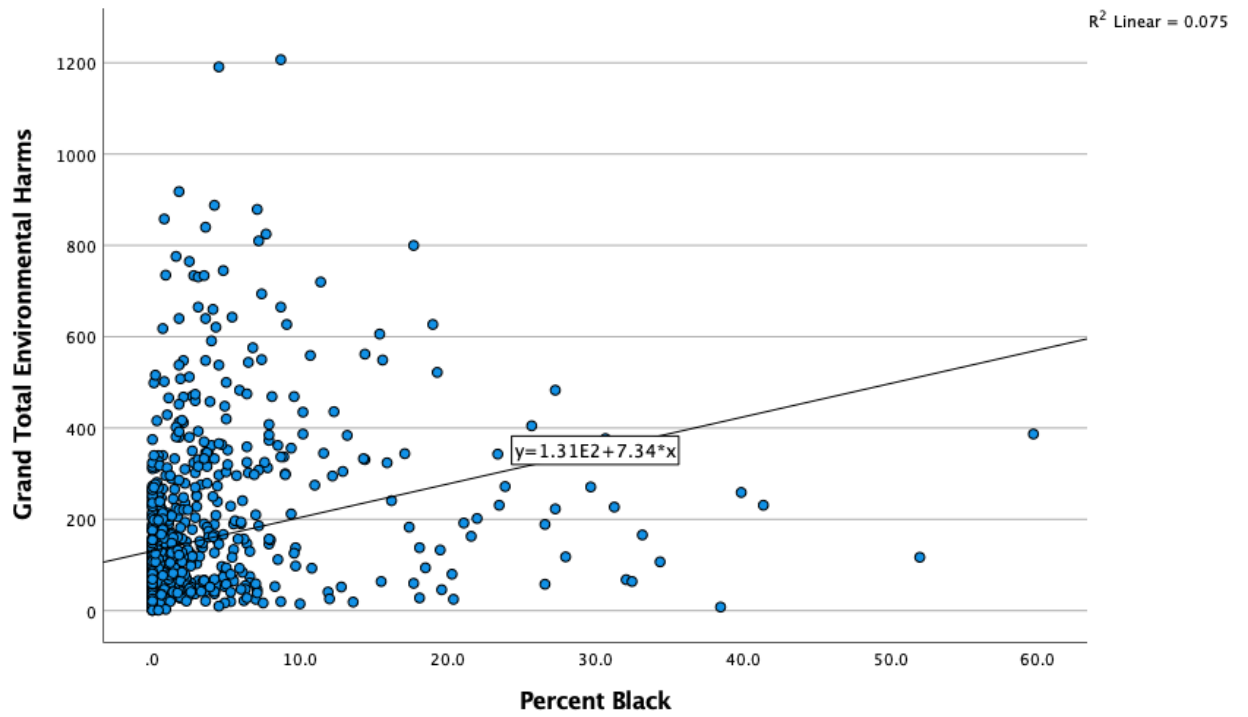
show statistical significance with values that are $>.001$. Both correlating figures also demonstrate that as the independent variable increases, the number of environmental harms also increase.

Table 2 and *Figure 2* show just the opposite. Zip codes that have a higher population also tend to have more industry and possibilities for pollutants while those with lower populations do not.

The focus of this research was to analyze specifically if Native Americans face disproportionate harms in Minnesota. While this analysis may not show that, literature still suggests that this is still an issue, and other approaches may show that. Possible implications may be the difficulty in measuring the harms and using census data a way to measure the Native American population in each zip code. The literature suggests that measuring the true impacts of environmental degradation is troublesome to measure when analyzing Native Americans because of the cultural and spiritual impact the environment has on their culture. The topic of environmental justice is tricky to measure and provide substantial evidence for as there are likely other factors that contribute to results.

Appendix

Graph 1: Correlation Between Total Number of Environmental Harms and Percentage of Black Respondents



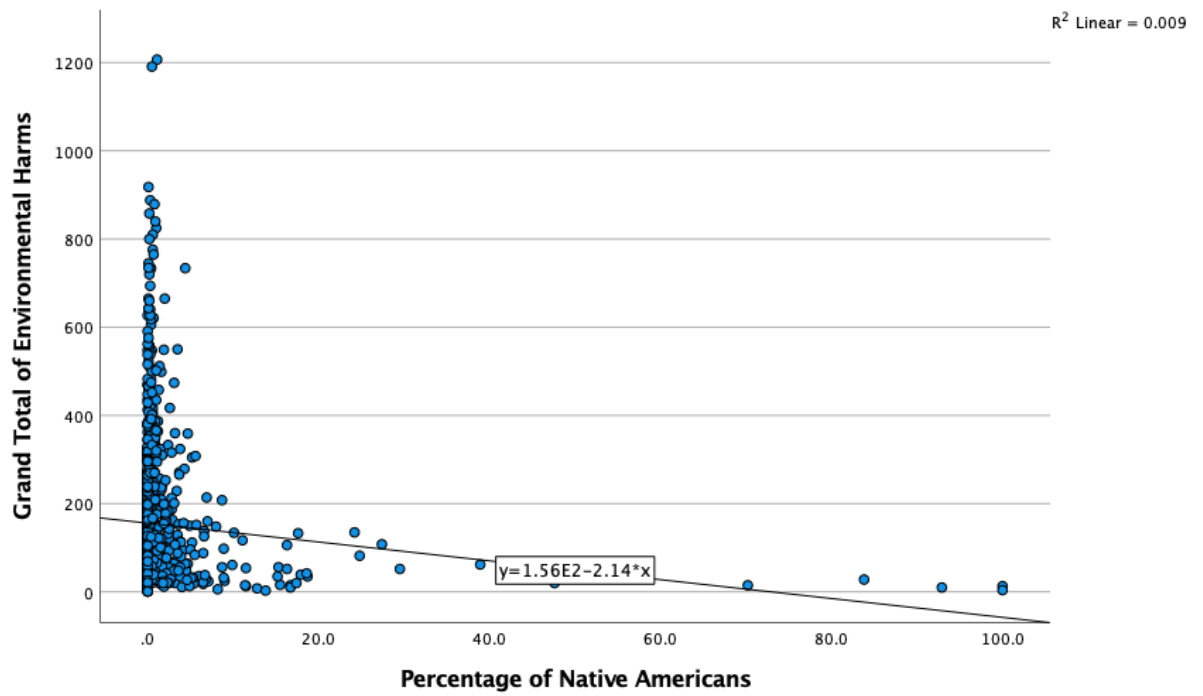
Pearson Correlation= .273**

** = Significance at the .01 level

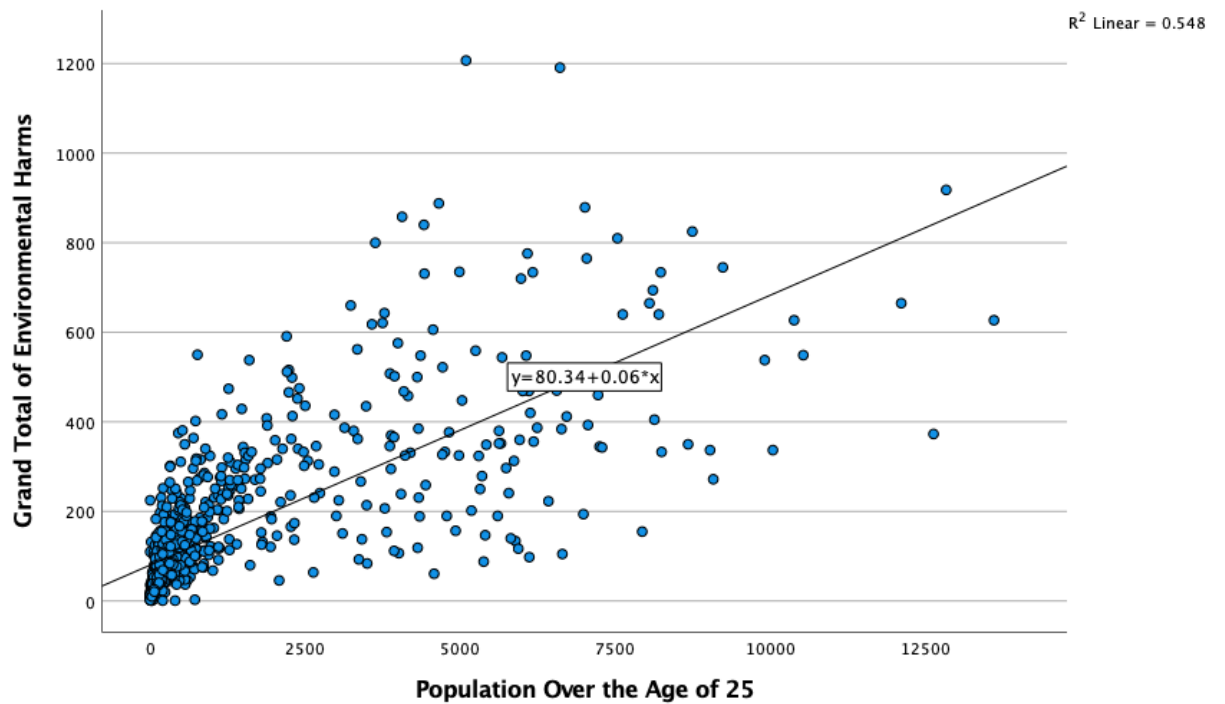
Slope of 7.34

$R^2 = .075$

Graph 2: Correlation Between Total Number of Environmental Harms and Percentage of Native Americans



Pearson's Correlation= $-.096^{**}$
**= significance at the .001 level
Slope of -2.14
 $R^2 = .009$

Table 3: Correlation Between Total Number of Environmental Harms and Count of Population over 25

Pearson's Correlation= .741**

**= Significance at the .001 level

Slope of .06

R²= .548

Table 1: Linear Regression Analysis: The effect of Population Count and Demographics on Various Environmental Harms

Independent Variables	Total Harms	Wastewater
Percent Black	-1.456 (1.108)	-.010 (.016)
Percent Native American	-.962 (1.119)	.011 (.025)
Percent Hispanic	1.721* (.684)	-.006 (.011)
Percent White	.675 (.716)	-.003 (.008)
Precent High School Graduates	-.529 (.371)	.001 (.006)
Population Over 25 by 100	6.460* (.233)	.012* (.003)
Median Income by 1000	-1.863* (.381)	-.012* (.006)
Constant	97.136 (71.478)	.931 (.931)

Note: Entries are linear regression coefficients with standard errors in parentheses

*p<.001

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