A Guide for TJCOG's Support of Environmental Justice Grants and Initiatives in the Triangle Region of NC

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Terms and Definitions

1. **Census Block Groups:** According to the U.S. Census Bureau, block groups are statistical divisions of census tracts, are generally defined to contain between 600 and 3,000 people, and are used to present data and control block numbering.[1] A block group consists of clusters of blocks within the same census tract that have the same first digit of their four-digit census block number.[2] North Carolina Department of Environmental Quality (NCDEQ) uses block groups as its geographical units to define its potentially underserved communities (PUCs) in its Environmental Justice Community Mapping System.

2. **Census Tracts:** According to the U.S. Census Bureau, census tracts are statistical subdivisions of a county or statistically equivalent entity.[3] These subdivisions generally have a population of 1,200 to 8,000 people. Bock groups are statistical divisions of census tracts. The White House uses census tracts as its geographical units to define PUCs in its Climate and Economic Justice Screening Tool.

3. **Community-based organization (CBO):** CBOs are public or private nonprofit organizations that provide services at the community level, particularly for underserved communities such as people of color and low-income populations.[4]

4. **Disproportionate environmental justice harms/effects:** According to the U.S. Environmental Protection Agency (EPA), these are adverse health and environmental effects that result from environmental injustices and disproportionately harm minoritized populations, low-income populations, or indigenous peoples.[5]

5. **Energy security:** According to the International Energy Agency, energy security is "the uninterrupted availability of energy sources at an affordable price."[6]

6. **Environmental hazard:** Environmental hazards are "extreme events or substances in the Earth and its ecological system that can cause adverse effects for humans and the things that they value."[7] Typically, environmental hazards are classified by their causal agent, such as pollution, chemical spills, and climate change.[8]

7. **Environmental justice (EJ):** The focus on and analysis of "disproportionate exposure to environmental hazards experienced by minoritized and low-income communities, to understand how such patterns have developed, and to develop programs by which these exposures can be remedied and prevented."[9]

8. **Environmental risk:** According to the EPA, environmental risk means the chance of harmful effects to human health or to ecological systems due to an environmental stressor.[10]

9. **People power:** The capacity and ability of a group of people to advocate for their needs in regard to environmental injustices, and to access and apply the necessary resources to address these injustices (whether directly or with the support of outside stakeholders).

10. **Potentially Underserved Communities (PUCs):** This report uses the term PUCs as a combination of any communities defined by the NCDEQ as potentially underserved, or any communities defined by the White House Climate and Economic Justice Screening Tool as disadvantaged. Generally, a PUC represents a predominantly minoritized population, whether by race, ethnicity, income, or another

socioeconomic indicator. More specifically, NCDEQ defines PUCs by examining the Race/Ethnicity and Poverty criteria of each block group.[11] The block group is then compared to both the County and the State and selected as a potentially underserved block group if it meets the following criteria for Race/Ethnicity and Poverty:

Racial/Ethnic composition:

- Share of nonwhites and Hispanic or Latino (of any race) is over fifty percent OR
- Share of nonwhites and Hispanic or Latino (of any race) is at least ten percent higher than County or State share.

AND

Poverty rate:

- Share of population experiencing poverty is over twenty percent AND
- Share of households in poverty is at least five percent higher than the County or State share.

Approximately 25% of North Carolina's block groups meet this definition of potentially underserved.

The dataset is a selection of the 2019 ACS data from the data tables B03002—Hispanic or Latino Origin by Race—and S1701—Poverty Status in the Past 12 Months.

The White House Climate and Economic Justice Screening Tool defines communities as disadvantaged by assessing census tracts. If a census tract meets the thresholds for at least one of the tool's categories of burden, or if it is on land within a Federally Recognized Tribe, the White House labels it as disadvantaged. Categories of burden include climate, energy, health, housing, legacy pollution, transportation, water and wastewater, workforce development, and socioeconomic status (e.g., low income).[12]

11. **TJCOG Region:** The Triangle J Council of Governments (TJCOG) Region includes the following seven counties in North Carolina: Chatham, Durham, Johnston, Lee, Moore, Orange, and Wake.

Executive Summary

Leadership at the federal level, as well as state level in North Carolina (NC), have demonstrated an increased prioritization of environmental justice work. For example, on April 21, 2023, the Biden Administration created an Office of Environmental Justice in the White House Council on Environmental Quality to coordinate environmental justice policy across federal agencies.[13] In addition, U.S. Congress passed the Inflation Reduction Act (IRA) in August 2022. [14] This bill dedicates billions of dollars towards environmental justice initiatives, including grants for local governments to partner with community-based organizations (CBOs) to develop community-led projects addressing environmental hazards.[15] In NC, Governor Cooper has recently signed executive orders that require environmental justice considerations into state investments and projects.[16]

This momentum of environmental justice commitments poses an opportunity for local governments in NC to apply for funding towards their environmental justice needs. The client, the Triangle J Council of Governments (TJCOG), is a local government entity that provides support and resources to local governments in Chatham, Durham, Johnston, Lee, Moore, Orange, and Wake counties in NC. TJCOG requested that I explore how they can best support its local government members in anticipation of incoming federal and state environmental justice funding.

To answer this question, my research methodology included a combination of literature review, analysis of environmental justice mapping tools, and 11 expert interviews. Expert interviews included six CBO representatives, one state agency representative, one state agency board member, and three local governments. More details on the methodology can be found in Section 3.

Ultimately, this research has identified 22 municipalities in the TJCOG region with potentially underserved communities (PUCs) in their jurisdictions that may qualify for environmental justice funding. Of these municipalities, nine contain more than one PUC: Durham, Garner, Goldston, Micro, Raleigh, Sanford, Selma, Siler City, and Smithfield. PUCs within these municipalities typically consist of a predominantly minoritized race/ethnic population or a low-income population. These PUCs experience disproportionate exposure to and effects of environmental hazards relative to other communities in the TJCOG region.

A summary of the most prominent hazards in the TJCOG region include industrial and hazardous waste sites, storage tank facilities and incidents, Brownfields Program sites, Concentrated Animal Feeding Operations (CAFOs), flooding, and extreme heat. In addition to these hazards, PUCs tend to face compounding environmental injustices due to inadequate housing infrastructure, decreasing property values, rising energy costs, and more.[17]

TJCOG can play many roles in supporting local governments with PUCs in obtaining and implementing environmental justice grants. For instance, TJCOG can connect local governments with CBOs to assist with community engagement methods so that PUC voices become incorporated in grant applications and any following project implementation. TJCOG can also facilitate connections between local governments that have overlapping environmental justice needs and proximity to one another. For example, TJCOG can apply for grants on these governments' behalf as a regional entity and coordinate their project implementation. Lastly, TJCOG can adapt existing environmental justice tools used in the region for other less equipped communities to tailor for their own purposes.

Sections 1 and 2 of this report provide literature review on the latest federal and state environmental justice initiatives and a summary of environmental justice issues in NC and the TJCOG region. Section 3 outlines the research methodology, including the data analysis and stakeholder interviews. Sections 4-6 detail the research findings, including a landscape analysis in Section 4 that identifies PUCs in the region and their most prominent environmental hazards. Section 5 presents case studies that take a deeper dive into three of these identified PUCs, and Section 6 provides supplemental grant guidance for TJCOG to consider when supporting any of these PUCs. The landscape analysis has an accompanying excel file labeled "TJCOG EJ Landscape" with additional details on each of the findings. This report specifies which tab in the excel file to reference based on each of the findings in the landscape analysis.

See the embedded file here:



TJCOG EJ Landscape.xlsx

1.0 Why this Research Matters

TJCOG expressed interest in understanding how they can best support their communities to prepare for incoming federal and state environmental justice grants. At the federal level, the Biden Administration made an executive commitment to environmental justice.[18] President Biden signed Executive Order 14008 in January 2021, which established the Justice40 Initiative.[19] Justice40 sets a goal for hundreds of Federal programs to provide 40% of their benefits towards communities traditionally underserved. As part of its implementation, the Biden Administration worked with Congress to pass and sign the American Rescue Plan, Bipartisan Infrastructure Law, and IRA to invest in environmental justice efforts across the U.S.[20]

The recent passage of the IRA has particularly prompted TJCOG's interest in and need for a clearer understanding of how to prioritize its support of local governments in its region. On August 16, 2022, President Biden signed the IRA into law.[21] While the IRA focuses on multiple policy areas, it will invest $369 billion towards environmental initiatives. These initiatives primarily focus on creating clean energy jobs and investing in clean energy manufacturing.[22] The IRA will also invest in environmental justice initiatives, such as dedicating $3 billion to areas disproportionately impacted by pollution and climate change.[23] For example, the U.S. Environmental Protection Agency (EPA) recently opened applications for the Environmental Justice Government-to-Government Program.[24] This program focuses on local government partnerships with CBOs to pilot activities that address environmental and public health challenges in traditionally underserved communities.

The state of North Carolina (NC) has also demonstrated increased prioritization of environmental justice. For example, the NC Department of Environmental Quality (NCDEQ) established an Environmental Justice and Equity Board in 2018.[25] This Board consists of sixteen members from across the state that advise NCDEQ on how to incorporate meaningful representation and involvement of traditionally underserved populations into its programs.[26] In addition, Governor Roy Cooper has demonstrated prioritization through recent executive orders. For example, in January 2022, Governor Cooper issued Executive Order No. 246 called North Carolina's Transformation to a Clean, Equitable Economy that sets a goal of reducing greenhouse gas emissions by 50% by 2030 and net-zero by 2050.[27] The order includes environmental justice actions and considerations, such as requiring state agencies to select a point person for environmental justice initiatives.

In preparation to compete for environmental justice funding on behalf of the TJCOG region and specific communities, TJCOG recognizes they need more research to identify the greatest needs in their region. Specifically, these research findings will inform how TJCOG prioritizes its own resources to support the communities with the greatest need, and to identify what type of role TJCOG can play throughout the grant application and administration process.

2.0 Environmental Justice Landscape in NC and the TJCOG Region

The following literature review outlines some of the most prevalent environmental justice issues in the state, as well as more specifically in the TJCOG region. Given NC's role in the history of the environmental justice movement, this literature review also provides a background on this history and how environmental injustices continue today. Literature review on the TJCOG region reveals that the region mirrors many of the injustices that occur in the other parts of the state. These examples, while limited, align with and set a foundation for the environmental justice issues identified in the findings section of this research.

2.1 North Carolina

NC has a host of environmental justice issues that intertwine with one another, including concentrated animal feeding operations (CAFOs), industrial pollution (e.g., coal ash, Brownfield sites, PFAs), climate change (e.g., increased flooding, extreme heat), and housing disparities (e.g., low-income housing has higher susceptibility to hazards and energy inefficiencies and insecurities).[28,29] This section briefly highlights some examples of these hazards (i.e., causal agents of environmental injustices) and their associated harms (i.e., negative effects).

To begin, NC's Warren County arguably ignited the environmental justice movement in 1982. While environmental injustices existed across the state prior, this movement set the stage for environmental justice action in NC as well as the U.S. more broadly.[30] In the early 1980s, the Ward Transformer Company of Raleigh illegally disposed of and contaminated 40,000 cubic yards of soil in 14 NC counties. The State of NC decided to relocate the soil to Shocco Township in Warren County, one of the poorest counties in the state by per capita income and predominantly Black. Although this proposed relocation failed to meet EPA safety requirements, the EPA waived these requirements and allowed the state to pursue it. Hundreds of residents of Warren County protested, but the state completed the relocation to Shocco Township. The community's protests brought national attention to the issue of environmental inequities on low-income and minoritized communities. The protests also gained the support of civil rights and environmental groups across the U.S.[31]

Since then, NC continues to experience an array of environmental injustices that call for immediate action. For example, the establishment of CAFOs, a known contributor to environmental injustice, has significantly risen in the state. [32] From the mid-1980s to mid-1990s, NC went from the fifteenth largest hog producer to the second largest producer of all fifty states.[33] As of March 2022, NC is the third largest hog producer.[34] Regarding poultry production, North Carolina is the eighth largest producer.[35] A 1982-1997 study found that a larger concentration of CAFOs occupied counties in the eastern region of NC with a higher percentage of minoritized residents compared to more urban counties with a higher percentage of white residents.[36] The location of these CAFOs combined with their hazardous effects, such as pollution, water contamination, and soil contamination, create a disparity of harm on the health and quality of life of minoritized residents.[37]

Outside of CAFOs, other industrial pollutants like coal ash produced by coal-powered electrical plants cause significant environmental and health hazards in NC communities, especially PUCs.[38,39] Studies have

found that coal ash releases toxic metals like lead and mercury into the air as well as nearby groundwater.[40] After a coal ash leak of 82,000 tons in Eden, NC in 2014, the state passed the Coal Ash Management Act of 2014. This act required that power plants close any existing coal ash basins by 2019. The act also prohibited any construction or expansion of coal ash basins. As a result, some power plants have responded by seeking ways to relocate and reuse coal ash in mine reclamation rather than dispose of it, as allowed by the NC Coal Ash Management Commission. A UNC study found that 87% of the coal ash relocation sites existed in or near minoritized race/ethnic and/or low-income communities.[41]

As another example of an industrial pollutant, NC has the third highest Per- and Polyfluorinated Substances (PFAS) exposure of all U.S. states.[42] These man-made chemicals can contaminate drinking water through leaking into wastewater or polluting rainwater that then carries into groundwater. A sampling of NC public water systems in 2015 found that 20 of these systems in 11 counties contained PFAS, especially those in the lower Cape Fear River Basin.[43] PFAS cause many health problems like increasing the risk of cancer, cholesterol disease, and thyroid disease.[44]

Contamination of water in private wells presents another prevalent environmental justice issue in the state. As of 2018, about 24% of the state's population relies on private well water.[45] This population predominantly consists of low-income households and persons of color.[46] People who rely on private well water also hold full responsibility for monitoring and maintaining water safety, but they face barriers to accessing the information and resources necessary for testing and treatment. [47] As a result, users of these wells face disproportionate public health risks such as cancer, heart disease, and neurological abnormalities.[48]

One 20-year study, from 1998 to 2019, found that several of NC's private wells surpassed federal and state standards of toxic metal concentrations. [49] For example, in Anson, Stanly, and Union counties, more than 18% of well water tested revealed high toxic metal concentrations (e.g., arsenic, manganese, and lead).[50] Other counties also presented high levels of toxic metal concentration within the private wells tested. For example, Chatham County wells showed high levels of manganese, and Wake County wells showed high levels of lead, both surpassing EPA limits. A different well water contamination study focused solely on Chatham, Lee, and Moore Counties is discussed in the following subsection given its focus in the TJCOG region.

Lastly, according to research conducted by Dr. Danielle Purifoy from the University of North Carolina at Chapel Hill, NC's historical exclusion of predominantly minoritized communities in municipal incorporation has compounded the effects of environmental injustices such as proximity to landfills and Brownfields.[51] This proximity to environmental injustices not only causes health and environmental risks but also lowers these communities' property value and discourages further economic development, thus creating a housing disparity.[52]

2.2 TJCOG Region

A literature review of environmental injustices in the seven counties in TJCOG's region showed examples similar to those found across the state, primarily those involving industrial pollutants. Despite this existing literature, most examples of environmental injustices found in academic journals focused on other parts of the state.

Wake County, as the largest county in the TJCOG region, demonstrates some examples of environmental injustices throughout its history. For instance, the Town of Holly Springs has 10 county landfills in close proximity to predominantly Black neighborhoods. This means that although the town only makes up 1% of land area in Wake County, it contains 13% of the county's landfills, 90% of which reside within Black communities.[53]

In the early 2000s, the community of Shiloh, also in Wake County and predominantly Black, experienced contaminated soil, surface water, and groundwater from a nearby wood treatment plant. [54] Due to the community's demands and an organized campaign against the plant, officials at the county, state, and federal levels came in to assist by investigating the contamination. The plant ultimately provided an alternate water supply.[55]

As noted in the previous section, one 2019 UNC study assessed toxic metal contamination in private well water in Chatham, Lee, and Moore counties.[56] The study found a correlation between poverty and lead contamination, as well as a correlation between the percentage of Black residents and lead contamination. The study also found that while there was no correlation between the percentage of Black residents and arsenic contamination, arsenic contamination typically concentrated in the Slate Belt of North Carolina (i.e., the eastern portion of the Piedmont, which overlaps with these three counties). This pattern suggests that the area faces risk for a stronger correlation between Black residents and arsenic contamination if these counties do not take the appropriate steps in zoning and housing regulations to prevent this disparity.[57]

As noted, literature review identified through this research tends to focus on North Carolina statewide or in areas with a larger presence of low-income and communities of color. Therefore, this research turned to environmental justice mapping tools and interviews to gather a stronger understanding of the TJCOG region's current environmental justice landscape. Section 3 details this methodology. Section 4 then provides more details on the most prominent environmental hazards in the region and where they overlap with underserved communities.

3.0 Methodology

This research applied both quantitative and qualitative methods. Quantitative methods leveraged publicly available mapping tools to assess demographic and socioeconomic data alongside environmental hazards to understand where PUCs were located and what types of hazards were in their proximity. Qualitative methods included an initial literature review to gain a foundational understanding of environmental justice work in North Carolina and more specifically the TJCOG region (see Sections 1 and 2). Qualitative methods also included 11 semi-structured interviews primarily with CBOs and local government to inform the development of case studies and grant guidance found in Sections 5 and 6, respectively.

3.1 Data Analysis: Using Public Environmental Justice Mapping Tools to Prioritize Communities and Environmental Hazards

Several mapping tools exist to identify PUCs and the environmental hazards that overlap with these communities. Agencies that provide these tools include the White House, NCDEQ, and NC's Department of Transportation.[58,59,60] CBOs have also developed their own mapping tools, including Haw River Assembly and the Waterkeeper Alliance.[61,62] While this research explored each of these tools, it applied the White House Climate and Economic Justice Screening Tool (WH CEJST) to identify the most

vulnerable communities in the TJCOG region, and the NCDEQ Community Mapping System to identify the most prominent environmental hazards in the region.

3.1.A Identifying potentially underserved communities in the TJCOG region[1]

As noted, several publicly available environmental justice tools exist to identify PUCs in a specific region. NCDEQ recommends the WH CEJST as one way to identify PUCs. Therefore, this research applied this tool to the TJCOG region and the census tracts that meet the criteria to receive a "disadvantaged" status. The tool determines whether a census tract is "disadvantaged" based on environmental burden and socioeconomic thresholds. In the excel file "TJCOG EJ Landscape", the "Sources and Tool Guide" tab describes this tool in more detail.

According to the WH CEJST, the communities listed in Table 1 have the highest count of census tracts marked as "disadvantaged". This report uses the term PUCs in place of the term disadvantaged.

Please note that the tool provides data by census tract. Therefore, census tracts may overlap with multiple communities, and either overlap with a community's borders or are near the specified community. These population numbers do not necessarily represent a community's total population given they only represent the population for PUC census tracts.

[1] See the excel file "TJCOG EJ Landscape" for more details, tabs "Underserved Communities_SUMMARY" and "Underserved Communities_LIST"

Table 1: *Local Governments with the Highest Count of PUC Census Tracts*

Municipality	Count of PUC Tracts in Vicinity of Community	Sum of Tract Population (PUC only)
Durham	22	104,522
Raleigh	14	96,200
Selma	4	18,795
Sanford	3	10,330
Siler City	3	13,388
Smithfield	3	11,529
Garner	2	16,200
Goldston	2	8,813
Micro	2	12,108
Cary	1	5,097
Wilson's Mills	1	5,573
Knightdale	1	7,193
Zebulon	1	7,998
Benson	1	7,159
Pittsboro	1	5,187
Kenly	1	7,209
Princeton	1	6,673
Southern Pines	1	5,440
Archer Lodge	1	7,060
Robbins	1	8,237
Angier	1	3,103
Pine Level	1	4,422
Grand Total	**68**	**372,236**

Granted, this tool may not represent all municipalities with PUCs. During expert interviews for this research, CBOs noted that low-income communities cannot typically afford environmental tests to prove the harmful effects in their area. Therefore, federal and state environmental justice data tools may disproportionately leave out these communities' stories.

As a result, while the WH CEJST offers one way of identifying PUCs, NCDEQ acknowledges that other communities in need may not automatically appear in this tool. **When NCDEQ administers EJ-related state grants, they plan to offer an opportunity for local governments to define their own environmental injustices (i.e., to explain why they are a PUC) if they do not show up on the designated federal mapping tools**. TJCOG may consider ways to communicate this flexibility to communities, as well as to connect them with CBOs to identify and make the case for environmental justice needs in their area (see a list of CBOs in the excel file "TJCOG EJ Landscape", "CBOs" tab).

3.1.B Identifying prominent environmental hazards in the TJCOG region

NCDEQ developed a Community Mapping System and Environmental Justice Tool to identify PUCs and whether and how they overlap with environmental hazards.[63] NCDEQ defined these underserved communities based on racial/ethnic composition and poverty rate (see Terms and Definitions for more details). As seen in Figure 1 and Table 2 below, NCDEQ identified 154 census block groups in the Triangle region as PUCs, including 55 in Wake County and 47 in Durham County. **Please note: NCDEQ defines PUCs by census block group and by thresholds that vary slightly compared to the WH CEJST, although both include similar socioeconomic factors (e.g., income and poverty). A comparison of both tools shows that the NCDEQ map of PUCs largely overlaps with the WH CEJST map of PUCs in the TJCOG region.** In fact, the WH CEJST map of PUCs tends to span a larger area and encompass the PUCs in the NCDEQ map, likely because it defines PUCs by census tracts.

Given the limitation that the WH CEJST and NCDEQ tools are separate, the below compares the hazards from the NCDEQ tool to the PUCs also from the NCDEQ tool. Ultimately, these NCDEQ-identified PUCs are inclusive of the WH CEJST PUCs and therefore the findings should not largely differ.

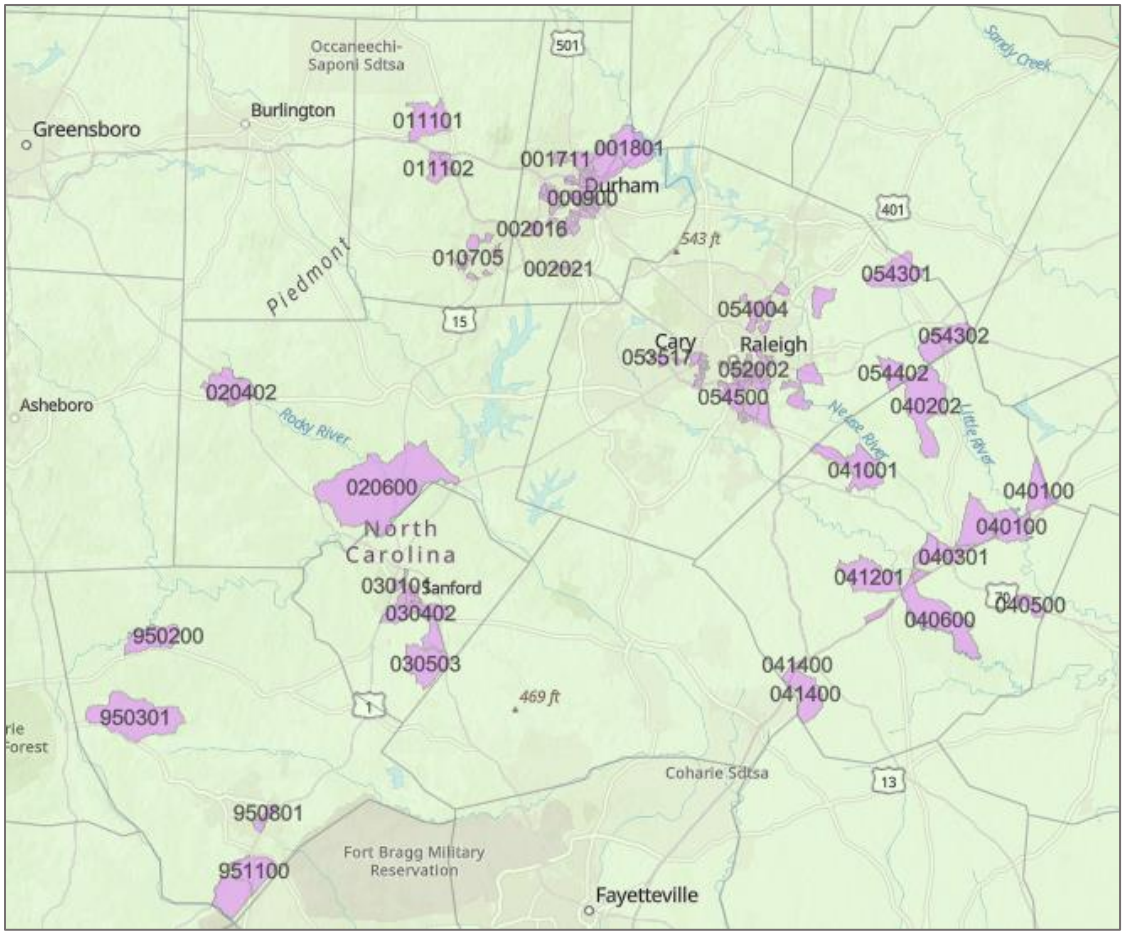


Figure 1: *Map of Potentially Underserved Communities (Census Block Groups) by Racial/Ethnic Composition and Poverty Rate in TJCOG's Counties. Block Groups labeled and highlighted in purple.*[64]

Table 2: *Number of Potentially Underserved Communities (Census Block Groups) by County*

County	Number of PUCs by Census Block Groups
Chatham	3
Durham	47
Johnston	18
Lee	12
Moore	7
Orange	12
Wake	55
Total	**154**

Based on the NCDEQ Community Mapping system, several types of environmental hazards overlap with PUCs in most of TJCOG's counties. To narrow down to the most prominent hazards, I scanned each county by each type of environmental hazard and created a heat map in Figure 2 below.

Following the legend below, boxes shaded in light yellow in the heat map represent hazards that appeared between three and five times in a county. Orange boxes represent hazards that appeared between six and ten times in a county, and brown boxes represent hazards that appeared more than ten times in a county. All of these shadings represent hazards that overlap with, or are in close proximity to, one or more underserved communities. Notably, metropolitan areas experienced higher numbers of environmental hazards compared to suburban and rural areas, but the number of hazards does not necessarily equate to a larger harm on a community.

Legend

Number of Instances of a Hazard Overlapping with One or More PUC	Shading
Few Instances (3-5)	
Medium Instances (6-10)	
High Instances (>10)	

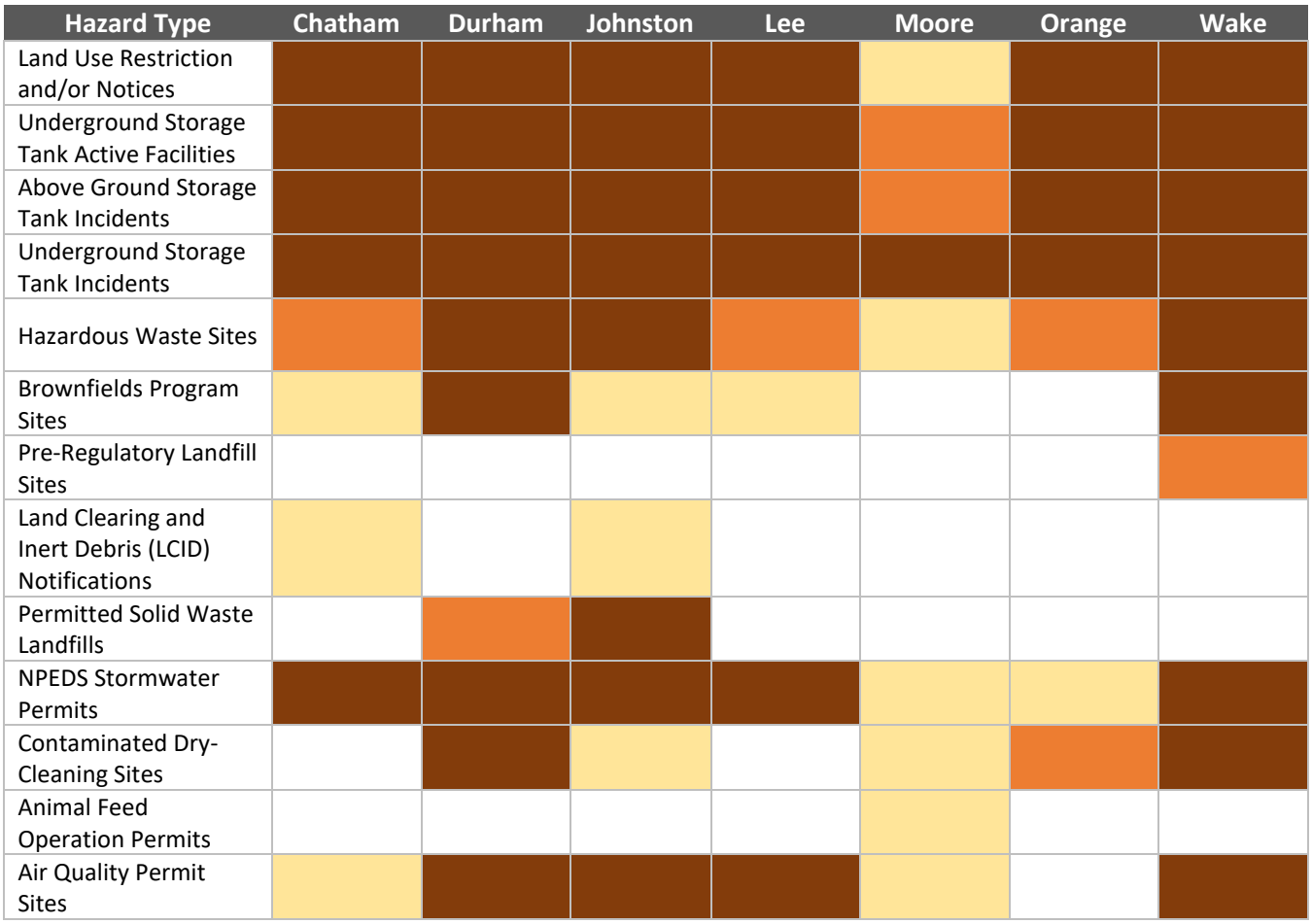


Figure 2: *Heat Map Displaying Frequency of Environmental Hazards in Potentially Underserved Communities, by County*

The above assessment identified the following list as the most prominent hazards in the region. The list organizes hazards by tiers based on their frequency in TJCOG's region:

> **Tier 1:** Land use restriction and/or notices, underground storage tank active facilities, above ground storage tank incidents, underground storage tank incidents, NPEDS stormwater permits
>
> **Tier 2:** Hazardous waste sites, Brownfields program sites, contaminated dry-cleaning sites, air quality permit sites
>
> **Tier 3:** Animal feed operation permits

NCDEQ provides a glossary that defines each of these hazards.[65]

The following describes examples of hazards in some of the PUCs in the TJCOG region. For example, overlaps in hazards particularly occurred in the urban areas of the Triangle region like Raleigh and the City of Durham. Wake and Durham County have dozens of hazardous waste sites, some of which cluster in underserved communities near the City of Durham and just south of Raleigh. Raleigh, Durham, and Chapel Hill also have high concentrations of underground storage tank incidents that overlap with underserved communities. Outside of these counties, fewer hazards existed in the region but revealed some clusters in minoritized and low-income communities. For example, one underserved community in Moore County, where 49% of the population consists of one or more minoritized races and 53% of the population is classified as low-income, has four hog feeding operations, relatively high compared to the rest of the county.

3.2 Interviews: Speaking with CBOs and Local Government to Inform Case Studies and Develop Grant Guidance

As noted, this research included 11 interviews across CBOs, local governments, and NCDEQ. Identifying CBOs entailed a basic internet search of any NC-based CBOs with environmental justice as a primary component of their work, as well as through consultation with this research project's advisor, Dr. Albright, and through suggestions provided by other CBOs during this research project's initial interviews. Many of the CBOs have a statewide focus on environmental justice (e.g., NC Environmental Justice Network), while some have a more local focus that includes the TJCOG region (e.g., Haw River Assembly). One CBO, Environmental Justice Community Action Network, focuses on Sampson County and therefore excludes the TJCOG region. However, this CBO's approach to environmental justice provided insights still relevant for how actors in the TJCOG region can approach environmental justice.

Interviews with CBOs included the following: North Carolina Environmental Justice Network, NC Black Alliance, Environmental Justice Coordinator, NC Conservation Network, Environmental Justice Community Action Network, Ellerbe Creek Watershed Association, and Haw River Assembly. Interviews with state and local government actors included the following: NCDEQ, NCDEQ Environmental Justice and Equity Advisory Board, the City of Raleigh, Southern Pines, and Siler City.

To analyze these interviews, I applied a thematic analysis to identify common themes among CBOs in regard to their approach to environmental justice. For example, many CBO interviewees described how they engaged with community members and local governments, and where gaps existed that TJCOG could support. These responses tended to fall under themes, such as where TJCOG could fill information gaps through supporting data collection, and where TJCOG could fill communication gaps to bridge the

work of CBOs and local governments. Many of these responses informed the grant guidance listed in Section 6.

Regarding the interviews with local governments (i.e., Raleigh, Southern Pines, Siler City), I pulled insights directly from these discussions to develop the case studies on each municipality. I also leveraged these municipalities' websites that provide resources and an overview of their work to supplement the interview findings.

4.0 EJ Landscape Analysis for TJCOG Prioritization

A large portion of this research sought to understand where TJCOG should focus its support regarding environmental justice issues in the region. More specifically, this portion identified where TJCOG could prioritize its support geographically, and what environmental hazards it should prioritize.

4.1 Potentially Underserved Communities in the TJCOG Region[2]

Based on the WH CEJST tool, Table 3 displays the municipalities that contain the greatest presence of PUCs, by count of census tract.

Table 3: *Local Governments in the TJCOG Region with the Most PUC Census Tracts*

Municipalities with more than one PUC tract	Municipalities with one PUC tract
Durham, Raleigh, Selma, Sanford, Siler City, Smithfield, Garner, Goldston, Micro	Cary, Wilson's Mills, Knightdale, Zebulon, Benson, Pittsboro, Kenly, Princeton, Southern Pines, Archer Lodge, Robbins, Angier, Pine Level

Urban areas, particularly Durham and Raleigh, contain the highest concentration of these PUCs, with 15 in the vicinity of Raleigh and 22 in the vicinity of Durham. Selma has the next highest concentration of PUC tracts, with four in its vicinity, followed by Sanford, Siler City, and Smithfield, which all have three PUC tracts in their vicinity.

Raleigh and Durham's proximity towards one another could present an opportunity for the two cities to partner through EJ initiatives, from a geographical perspective. The proximity of Selma and Smithfield in Johnston County could also pose potential for the municipalities to work together based on their relatively high concentration of PUC tracts. The next two subsections will describe prominent environmental hazards in the region and where these communities and hazards could present additional opportunities for collaboration.

4.2 Prominent Environmental Hazards in the TJCOG Region[3]

As noted in the methodology, although the WH CEJST provides a way for identifying PUCs, it does not provide mapping of environmental hazards. NCDEQ provides a Community Mapping System that can help identify the TJCOG region's most prominent environmental hazards. See Section 3 for the methodology behind identifying these hazards with this tool. Table 4 lists the TJCOG region's most

[2] See the excel file "TJCOG EJ Landscape" for more details, tab "Underserved Communities_SUMMARY" and tab "Underserved Communities_LIST"

[3] See the excel file "TJCOG EJ Landscape" for more details, tab "Hazards and Harms"

prominent hazards identified with this tool, as well as additional hazards marked with an asterisk identified through literature review and interviews.

Please note that some of these hazards connect with one another. For example, “sites with hazardous substances” can cause air pollutants as well as water contamination through leaked chemicals. Similarly, another hazard “CAFOs” can contaminate water through waste disposal. More details on these hazards, their effects, and example TJCOG communities with these hazards can be found in the TJCOG EJ Landscape excel file tab “Hazards and Harms”.

Table 4: *The Most Prominent Environmental Hazards in the TJCOG Region*

Types of Environmental Hazards in the TJCOG Region
Air pollutants (e.g., PFAS, biogas)
Water pollutants (e.g., industrial pollutants, untreated wastewater, stormwater discharge)
Sites with hazardous substances or residual and/or waste disposal
Storage tank active facilities and/or incidences
Brownfield program sites
Concentrated Animal Feeding Operations (CAFOs)
*Household energy inequities (e.g., disproportionate burden of the energy system, like higher energy costs, service outages, and less access to energy-efficient housing and clean energy infrastructure)
*Flooding
*Extreme heat (i.e., more frequent, longer-lasting heat waves due to climate change)

**Identified through stakeholder interviews and literature review*

In summary, many of these environmental hazards existed across the entire TJCOG region, especially in urban and suburban areas. As an exception, CAFOs existed in more rural areas, especially in Moore County. These hazards also typically clustered around PUCs across the region, thus making a case for grant application opportunities. No one hazard stood out as significantly more prominent than the others. However, storage tank active facilities and/or incidences appeared to have the most frequency in the region.

4.3 Recommendations for TJCOG’s Prioritization of PUCs and Hazards

Given the number of PUCs in the TJCOG region, and the prevalence of many of the same environmental hazards in these PUCs, TJCOG may consider regional coordination opportunities for grant applications. For example, Wake County has six municipalities with these PUCs, including Angier, Cary, Garner, Knightdale, Raleigh, and Zebulon. According to the NCDEQ Community Mapping System, all of these municipalities showed evidence of storage tank facilities and/or incidences in their PUCs. Proximity to these storage tanks poses a risk for water contamination, if communities have not already experienced contamination. In addition, all of these municipalities except for Angier showed evidence of sites with hazardous substances or residual or waste disposal, which can also lead to water contamination.

As another example, Chatham County's Goldston and Siler City both have more than PUC. The NCDEQ mapping system shows that these PUCs have many overlapping environmental hazards including industrial air pollutants and stormwater discharge. Lastly, Johnston County contains several municipalities with PUCs that could coordinate together. For example, Selma, Micro, Smithfield, Wilson's Mills, Kenly, Pine Level, Princeton, Archer Lodge, and Benson all contain some sort of proximity to a hazardous waste site or storage tank facility or incident. To strengthen regional collaboration, TJCOG may consider connecting communities with fewer resources and experience in environmental justice work with communities that have more resources and experience. Examples of the latter include the more urban parts of the region such as Durham and Raleigh.

Overall, the findings on PUCs and environmental hazards in the TJCOG region did not reveal a particular clustering of communities or hazards to suggest prioritizing certain communities over others. As federal and state agencies release environmental justice grants, these grants' eligibility requirements and areas of focus (e.g., types of hazards) may help TJCOG further prioritize based on these findings.

4.4 Engaging with PUCs through CBOs

As TJCOG selects municipalities with whom to work on environmental justice initiatives, engagement with CBOs can elevate the voices of members of PUCs. This research project's interviews with CBOs provided an initial list of CBOs with whom to engage. Table 5 provides a summary of this list and the excel file "TJCOG EJ Landscape", tab "CBOs" contains more details on each of these organizations.

Table 5: *Statewide and Local CBOs Involved in Environmental Justice Work in NC*

Statewide organizations	Local organizations in the TJCOG Region
North Carolina Environmental Justice Network	Ellerbe Creek Watershed Association (ECWA)
North Carolina Black Alliance	Haw River Assembly
North Carolina Conservation Network	Partners for Environmental Justice
Toxic Free NC	Interfaith Creation Care of the Triangle
Sol Nation	Orange Chatham Interfaith Care for Creation
Democracy Green	
NC WARN	
CleanAIRE NC	
Clean Water for NC	
Black Workers for Justice	
North Carolina Climate Justice Collective	
Environmental Defense Fund (North Carolina)	
Waterkeeper Alliance South Atlantic Region	
Dogwood Alliance	

A local government's relationship with CBOs and PUCs in its area will determine how it approaches a PUC to engage community members in preparing for a grant. Based on CBO recommendations from interviews, the following steps suggest how to approach PUCs where a local government does not already have established relationships:

- Assess a community's demographics, health statistics, and EJ tools (see TJCOG EJ Landscape, "Sources and Tool Guide") to get a general understanding of the community's context and EJ needs
- Identify and reach out to CBOs in the area that represent the community's minoritized identity groups. Also, identify local government representatives and/or community members who have worked on environmental issues in the community (whether through a basic online news search or coordinating with the CBOs)
- Convene with CBOs and other identified stakeholders to discuss a community engagement approach

5.0 Case Studies - A Deeper Dive into Example PUCs

Based on the PUCs identified in the previous section, Section 5 presents case studies that take a deeper dive into three of the municipalities that contain some of these PUCs: Raleigh, Southern Pines, and Siler City. These case studies exemplify the type of information that TJCOG can gather when meeting with their municipalities that contain PUCs. This gathering of information can include a more detailed understanding of municipalities' past and ongoing initiatives related to environmental justice, as well as any potential gaps where TJCOG could provide support through grant funding or direct assistance. Once TJCOG gathers this information, they can follow the grant considerations in Section 6 to support these municipalities, should these municipalities require grant support.

Each case study in this section includes an analysis based on the WH CEJST and NCDEQ mapping tools, as well as inputs from local government staff through interviews. The WH CEJST map profiles display the location of PUCs in relation to a municipality and explain which indicators' thresholds those PUCs did not meet in order to qualify as a PUC. This informs which areas a municipality may consider targeting for environmental justice work.

The NCDEQ map profiles display the types and locations of environmental hazards in relation to a municipality. As noted, the NCDEQ defines PUCs slightly differently than the WH CEJST based on race/ethnicity composition and income indicators. More details on these two tools and their methodology can be found in the "TJCOG EJ Landscape" excel file under "Sources and Tool Guide".

5.1 Raleigh

5.1.A General Profile

As of 2021, the City of Raleigh has 469,124 residents, demonstrating a 0.3% growth from the previous year.[66] About 56% of people identified as White alone, compared to 29% who identified as Black or African American alone, and 4.7% as Asian alone.[67] About 11.3% identified as Hispanic or Latino, and 5.4% of people identified as two or more races. About 52% of housing units are owner-occupied, where over 90% of households have a computer and access to the internet. The median household income for 2017-2021 was nearly $73,000, and 70% of residents participated in the labor force.

The City of Raleigh has a mayor, 8-member city council, and city manager. It also has 26 departments, including some of the following departments relevant to environmental justice work: Planning and Development, Sustainability, Equity and Inclusion, and Community Engagement.[68]

5.1.B Raleigh's PUCs (WH CEJST Profile)

Figure 3 displays shaded census tracts that are deemed "disadvantaged" according to the WH CEJST indicators, or in other words, PUCs. Raleigh overlaps with 15 census tracts identified as PUCs with a population of over 100,000 (noting this 100,000 may include people in a portion of a census tract outside of Raleigh's jurisdiction). Most of Raleigh's PUCs exceeded the thresholds for indicators around income, health (e.g., share of people with diabetes), and housing costs (e.g., share of households making less than 80% of the area median family income and spending more than 30% of income on housing). The excel file "TJCOG EJ Landscape" provides the specific census tracts and links to the tool's selection of each tract to view more details.

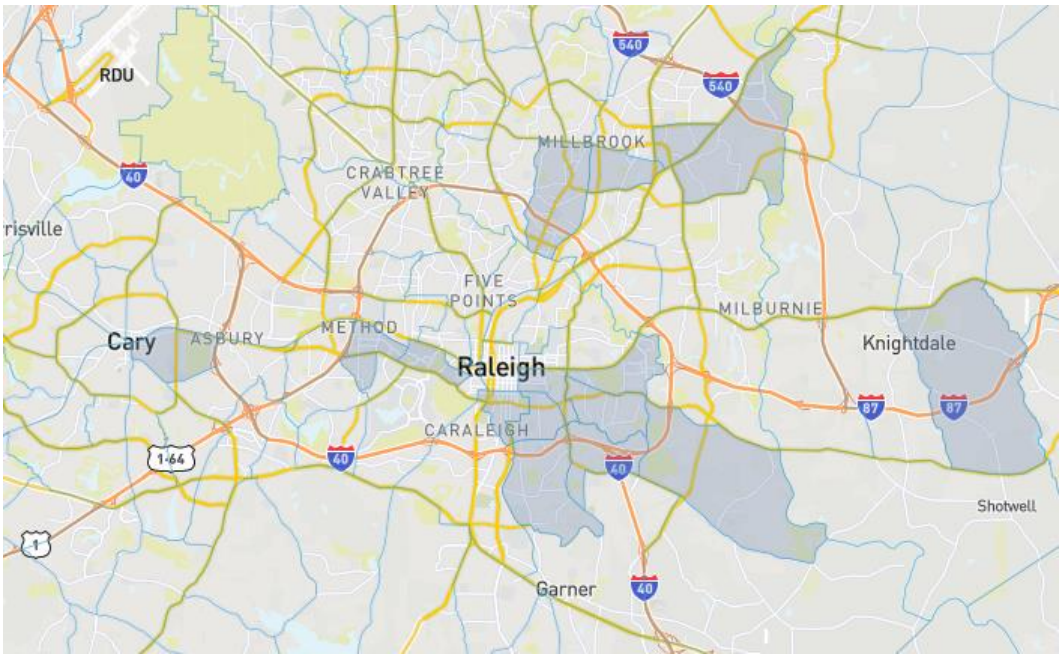
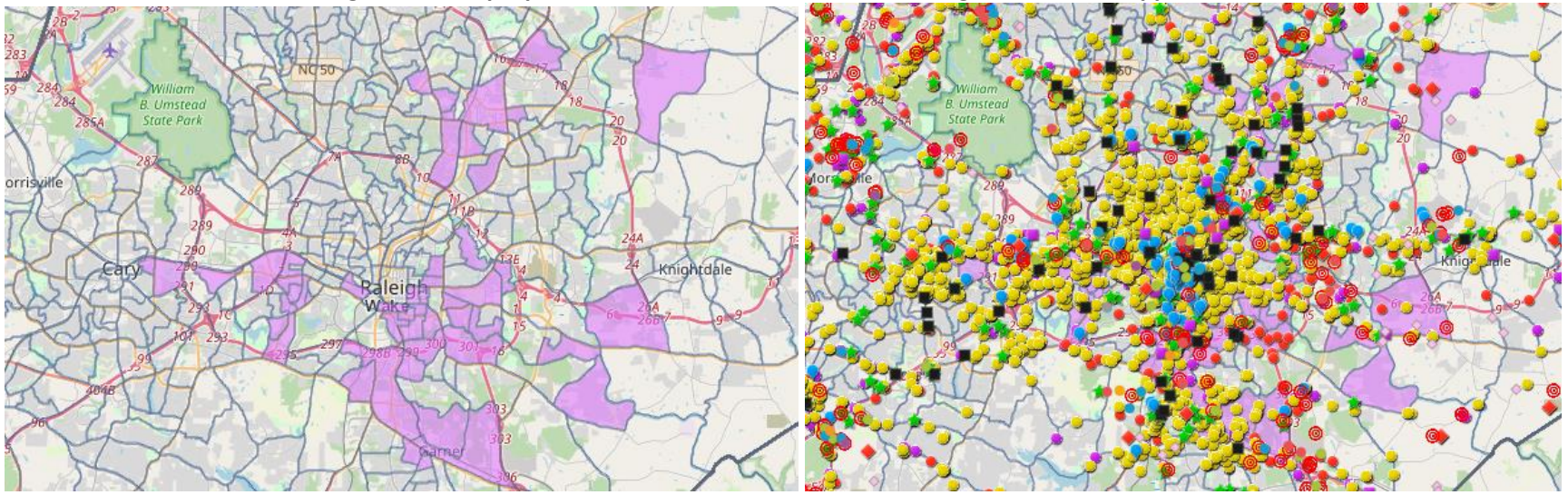


Figure 3: *Map of PUCs (by census tracts) in the Raleigh area. Tracts are highlighted in light blue. From the White House Climate and Environmental Justice Screening Tool, 2014-2022 data.*[69]

5.1.C Raleigh's Environmental Hazards (NCDEQ Community Mapping System Profile)

According to the NCDEQ Community Mapping System, Raleigh's PUCs are seen below highlighted in purple. The left image displays the PUCs only, and the right image displays the added layer of environmental hazards and their locations. Given the multitude of hazards, the description below the maps summarizes the most prevalent hazards and how to identify them on the map.

a. Raleigh's PUCs in purple | **b. Raleigh's PUCs overlapped with environmental hazards**



Legend of Most Prevalent Hazards: Underground storage tank incidents (●), above ground storage tank incidents (●), underground storage tank active facilities (●), Brownfield program sites (🎈), contaminated dry-cleaning sites (■), stormwater permit sites (◎), hazardous waste sites (★)

Figure 4 a and b: *Map of PUCs (by census block groups) and environmental hazards in the Raleigh area. From the NCDEQ Community Mapping System, data sources vary*[70]

According to Figure 4b, some of the most prevalent hazards in the Raleigh area include storage tank incidents, Brownfield-related sites, stormwater permit sites, and hazardous waste sites. These hazards do not display a particular pattern or clustering around any portion of the Raleigh area. Instead, these hazards cluster nearer to central Raleigh and slightly disperse further away. These findings align with the previously noted literature review of common environmental concerns in the region, such as landfills and industrial-related pollution.

5.1.D Raleigh's Past and Present EJ Efforts

The City of Raleigh developed its first Community Climate Action Plan in 2021 and corresponding Community Climate Action Plan Implementation Progress Report in 2023 that demonstrate how Raleigh has embedded equity throughout its environmental work. Raleigh's environmental priorities are to focus on their biggest climate impacts in the area: flooding and prolonged extreme heat.

Examples of EJ projects include the following:

- Raleigh developed a Flood Early Warning System that identifies locations at risk of flooding. Tools like creek elevation gauges, street flooding sensors, and flood cameras help identify locations at risk or currently flooding, then Raleigh's Stormwater staff alert emergency personnel to dispatch to these locations to support any residents in the area.
- In 2021, Raleigh tested a technology that created "Cool Pavement" in communities with urban heat islands. This technology added Titanium Dioxide to treat roads, showing a reduction in Nitrogen Oxides by 37%.
- Also in 2021, Raleigh partnered with the CBO Partners for Environmental Justice (PEJ) to develop a Walnut Creek Watershed Learning Network. This network offers a six-week course on watershed management, environmental justice, and civic engagement. The program empowers community members most affected by flooding by educating them on how flooding relates to governmental and legal processes. The program also allows for community members to provide feedback on how flooding affects their community. Participants received a stipend to attend and then design and implement their own watershed management project in their community.

5.1.E Areas to Potentially Support Raleigh

Raleigh's suggestions for areas where additional funding could advance their EJ work (and broader EJ work in the region) include:

- Capacity building (e.g., hiring EJ staff) within local governments
- Energy efficiency efforts (e.g., investing in energy efficiency alongside affordable housing)
- Transportation electrification (e.g., developing infrastructure for electric vehicles such as adding charging stations)

5.1.F CBOs with Whom Raleigh could Partner

- NC WARN and/or Interfaith Creation Care of the Triangle due to their focus on affordable energy
- NC Environmental Justice Network, NC Black Alliance, and/or NC Conservation Network to identify any other local entity to partner with

5.2 Siler City

5.2.A General Profile

As of 2021, Siler City has 7,848 residents.[71] This population grew by 2.1% compared to 2020.[72] About 45% of people identified as White alone, compared to 19% who identified as Black or African American alone. Approximately 53% of the population identified as Hispanic or Latino.[73] About 51% of housing units are owner-occupied, where 87% of households have a computer and 71% have access to the internet. 55% of residents aged 5 years and older speak a language other than English at home. 61% of people 16 years and older participate in the workforce. The median household income for 2017-2021 was $40,440.

Siler City has a mayor and a Board of Commissioners with seven members. It also has nine government departments, including the following departments relevant to environmental justice work: Planning, Community Development, and Public Works and Utilities.[74]

5.2.B Siler City's PUCs (WH CEJST Profile)

According to the WH CEJST, the below figure displays shaded census tracts that are deemed "disadvantaged", (i.e., PUCs). Siler City overlaps with three census tracts identified as PUCs[4]. These PUCs have a total population of 13,388, noting this likely includes residents outside of Siler City's jurisdiction.[75] Siler City's three PUCs exceeded the WH CEJST thresholds for indicators around agriculture loss rate (i.e., economic loss to agricultural value resulting from natural hazards), transportation barriers (i.e., low average of relative cost and time spent on transportation), heart disease (i.e., share of people with heart disease), low income, and unemployment. Ultimately, this map reveals that a large part, if not all, of Siler City could qualify as a PUC when applying for grants related to environmental justice.

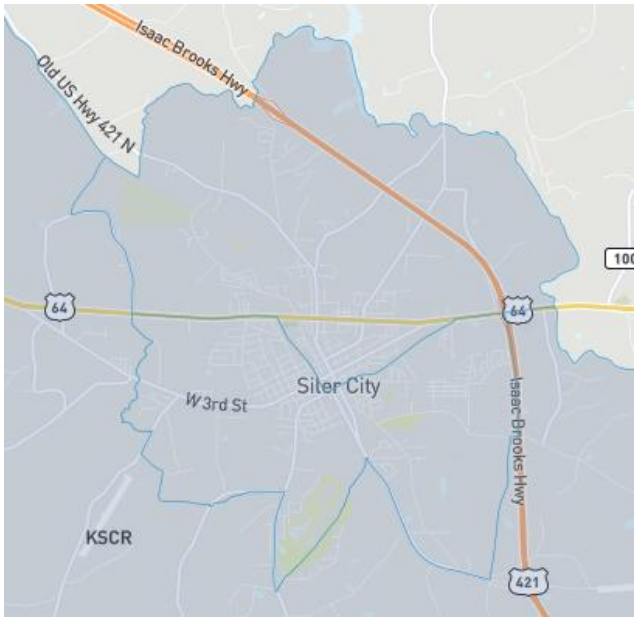
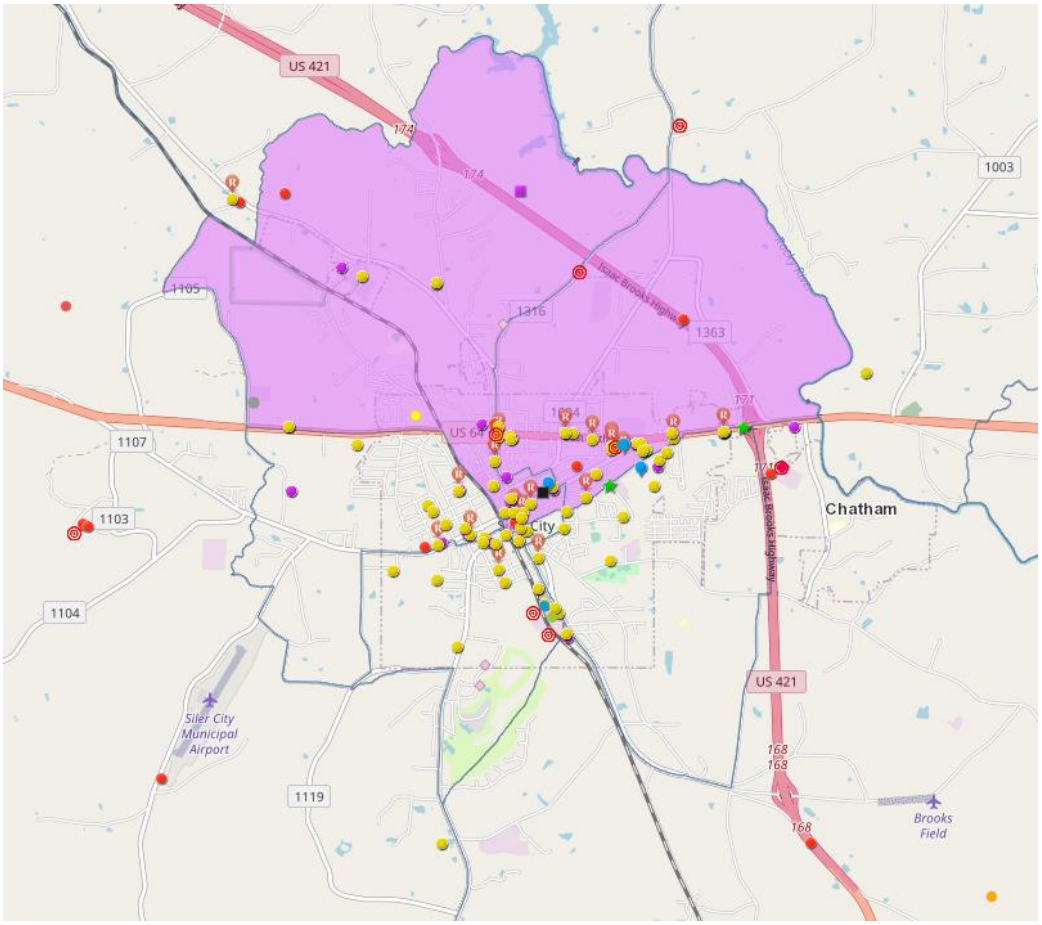


Figure 5: *Map of PUCs (by census tracts) in Siler City. Tracts are highlighted in light blue. From the White House Climate and Environmental Justice Screening Tool, 2014-2022 data.*[76]

[4] Overlap primarily occurs with the census tracts #37037020402 and #37037020401, with some overlap with #37037020300

5.2.C Siler City's Environmental Hazards (NCDEQ Community Mapping System Profile)

Siler City's PUCs are seen below highlighted in purple with an added layer of environmental hazards and their locations.



Legend of Hazards: Underground storage tank incidents (●), above ground storage tank incidents (●), underground storage tank active facilities (●), Brownfield program sites (●), contaminated dry-cleaning sites (■), stormwater permit sites (◎), hazardous waste sites (★), land use or restriction sites ( ), pre-regulatory landfill sites (■)

Figure 6: *Map of PUCs (by census block groups) and environmental hazards in Siler City. From the NCDEQ Community Mapping System, data sources vary*[77]

Based on this map, some of the most prevalent hazards include storage tank incidents, stormwater permit sites, Brownfield program sites, and land use or restriction sites. According to NCDEQ, land use or restriction sites include open dumps, waste disposal, Brownfields, or other types of contaminated sites. Most of these hazards cluster around central Siler City (i.e., the intersection of 2nd Avenue and Raleigh Street) as well as near U.S. Route 64. Other hazards exist scattered in the northern part of Siler City, near Old U.S. Highway 421 N and U.S. 421. These noted hazards and their patterns largely overlap with the two PUCs noted on the previous page, census tracts #37037020402 and #37037020401.

5.2.D Siler City's Past and Present EJ Efforts:

Siler City's work related to environmental justice involves Brownfield cleanup, revitalization of low-income housing, and a new community engagement initiative.

In 2018, Siler City received two EPA grants under the Brownfield Redevelopment Program. Siler City is conducting assessment grants of Brownfield sites and has completed two phases of assessments.

Siler City is also overseeing a housing project funded by a $750,000 Community Development Block Grant (CDBG) under the North Carolina Department of Commerce's Neighborhood Revitalization Program. This project has identified houses of families with low-income backgrounds that require replacement or repairment. While this project does not explicitly address environmental justice issues, literature review has shown a correlation between low-income housing and poor indoor air quality.[78]

Lastly, Siler City's Community Engagement Department has recently begun hosting discussion forums every other month in one of Siler City's five commission districts. These forums occur within each district at a publicly available location, such as a church, where community members may come and voice any concerns they have. Siler City held its first meeting in February 2023, and will rotate each meeting in a new commission district until it has reached each district each year. During the February meeting, community members voiced environmental concerns related to sewer, wastewater, and a nearby poultry processing plants (i.e., concerns about the plant's smells).

5.2.E Areas to Potentially Support Siler City

Siler City's suggestions for areas where additional funding could help EJ-related work include:

- Any investments for pedestrians or bikers to reduce traffic pollution (e.g., adding sidewalks, crosswalks). Siler City has data that show they have several households without a vehicle.
- Any electric vehicle investments such as funding for charging stations. Siler City has a few charging stations, but they would like additional stations
- Improvements in stormwater infrastructure to prevent runoff/flooding

As noted further above, some of Siler City's community members' suggestions include:

- Projects to address wastewater and sewage, as well as air pollution/smell from CAFOs

5.2.F CBOs With Whom Siler City could Partner

- Clean Water for NC due to its focus on water contamination
- Waterkeeper Alliance South Atlantic Region due to its focus on CAFOs, including poultry farms
- NC Environmental Justice Network, NC Black Alliance, and/or NC Conservation Network to identify any other local entity to partner with

5.3 Southern Pines

5.3.A General Profile

As of 2021, Southern Pines has 15,968 residents.[79] This population grew by 3.1% compared to 2020.[80] About 72% of people identified as White alone, compared to 17% who identified as Black or African American alone. 9% of the population identified as Hispanic or Latino.[81] About 60% of housing units are owner-occupied, where 92% of households have a computer and 87% have access to the internet. 11% of residents aged 5 years and older speak a language other than English at home. 52% of people 16 years and older participate in the workforce. The median household income for 2017-2021 was $69,792.

Southern Pines has a mayor and three town councilmembers. It also has 10 departments, including the following departments relevant to environmental justice work: Planning, Community Development, and Public Works.[82]

5.3.B Southern Pines' PUCs (White House WH CEJST Profile)

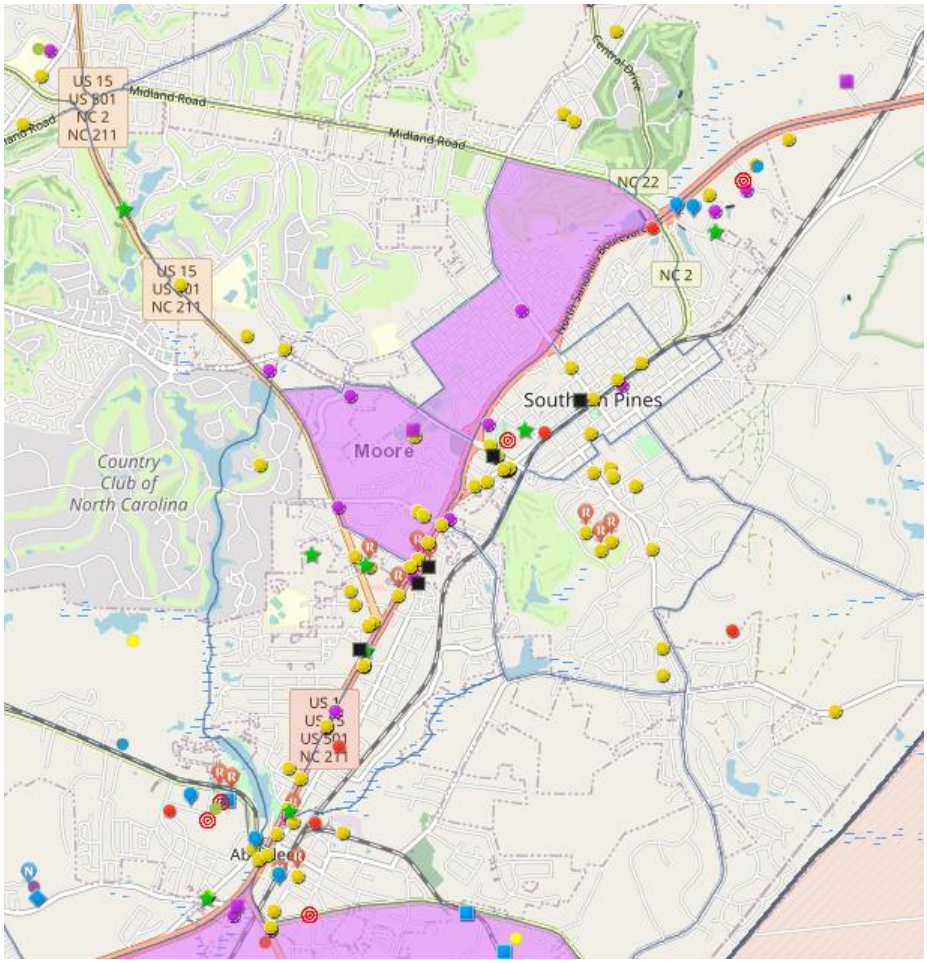
Southern Pines overlaps with 1 census tract identified as a PUC with a population of 5,440 (noting this may include people in a portion of a census tract outside of the town's jurisdiction). Southern Pines' PUC exceeded the thresholds for indicators around diabetes (i.e., share of people with diabetes) and low income.



Figure 7: *Map of Potentially Underserved Communities (by census tracts) in the Southern Pines area. Tracts are highlighted in light blue. From the White House Climate and Environmental Justice Screening Tool, 2014-2022 data.*[83]

5.3.C Southern Pines' Environmental Hazards (NCDEQ Community Mapping System Profile)

Southern Pines' PUC is seen below highlighted in purple with an added layer of environmental hazards and their locations.



Legend of Hazards: Underground storage tank incidents (●), above ground storage tank incidents (●), underground storage tank active facilities (●), Brownfield program sites (), contaminated dry-cleaning sites (■), stormwater permit sites (◎), hazardous waste sites (★), land use or restriction sites ( ), pre-regulatory landfill sites (■)

Figure 8: *Map of PUCs (by census block groups) and environmental hazards in Southern Pines. From the NCDEQ Community Mapping System, data sources vary*[84]

According to this map, some of the most prevalent hazards include storage tank incidents, contaminated dry-cleaning sites, hazardous waste sites, and land use or restriction sites. As noted before, land use or restriction sites include open dumps, waste disposal, Brownfields, or other types of contaminated sites. These hazards generally cluster near downtown as well as U.S. 1, especially where U.S. 1 begins to intersect with U.S. 501. The PUC on the previous page overlaps with this clustering near U.S. 1, especially where there are underground storage tank incidents and active facilities.

5.3.D Southern Pines' Past and Present EJ Efforts

Southern Pines is currently developing a new Comprehensive Long-Range Plan (CLRP) which includes discussion around diversity, equity, and inclusion as well as environmental justice. For example, they will incorporate metrics targeting historically marginalized segments of their community. The Town anticipates other areas where they can incorporate environmental justice into their work, whether through the CLRP or elsewhere, such as incorporating equity considerations in their rezoning criteria.

In addition to this long-term planning, Southern Pines' Community Development department meets with the West Southern Pines community, a predominantly Black community, to gather community input on their needs. Southern Pines collaborates with a group of residents called the West Southern Pines Community Connectors to engage with this community. Community members have raised concerns regarding kudzu infestations, lack of sidewalks, and a general need for infrastructure development around residential lots (e.g., water pipes, street paving). Despite this need for redevelopment, the community has expressed concerns around how redevelopment would lead to gentrification.

5.3.E Areas to Potentially Support Southern Pines

- Grant application and management addressing the following areas:
    - Kudzu remediation
    - Clean up of sites where disposal of solid wastes, abandoned lots etc.
    - Infrastructure development of West Southern Pines community (e.g., sidewalks, landscaping, park maintenance, housing inventory)
- Gathering EJ-related data for grant applications
- EJ frameworks or criteria that Southern Pines could incorporate into their planning, rezoning criteria, etc.

5.3.F CBOs with Whom Southern Pines could Partner

- NC Environmental Justice Network, NC Black Alliance, and/or NC Conservation Network to identify a more local entity to partner with

6.0 Additional Considerations for TJCOG's Grant Support in Environmental Justice

The previous sections have provided recommendations for where TJCOG should prioritize its support geographically as well as the type of environmental hazards to consider addressing. Once TJCOG connects with the identified municipalities to discuss (or continue discussing) environmental justice activities, Section 6 provides additional considerations for any grant support TJCOG may provide. This grant guidance largely comes from interviews with CBOs including the NC Environmental Justice Network, NC Black Alliance, NC Conservation Network, Environmental Justice Community Action Network, Ellerbe Creek Watershed Association, and Haw River Assembly.

6.1 General Considerations for Grant Application

1. **Consideration:** Focus on federal/state grants and project proposals that prioritize infrastructure and capacity building

   Justification: CBOs recommended that TJCOG and local governments prioritize infrastructure for their grant projects since a lack of or inadequate infrastructure (e.g., water infrastructure) demonstrates a great need in the environmental justice space. CBOs also cannot facilitate these types of projects.

   Regarding capacity building, CBOs and local government acknowledged that people power, or the capacity and ability of a group of people to advocate for and address environmental injustices, is lacking. For example, many communities do not have the education, resources, and capacity to advocate for their environmental justice needs. In addition, many local governments do not have the capacity or dedicated staff to facilitate the necessary community engagement to empower these community members. Internships or temporary job placements are typically too short to fill these roles.

2. **Consideration:** Prepare for grants that will be framed around the outcomes of environmental hazards (e.g., poor air quality) rather than around the causes of these outcomes (e.g., PFAS)

   Justification: NCDEQ expects that EJ grants will be framed around environmental justice outcomes. For example, their existing grants focus on water and air quality, rather than the causes of poor water and air quality like hazardous waste sites. Therefore, while understanding the sources of hazards in the TJCOG region is important, grants will likely not call for applications for issue-specific projects. NCDEQ will expect that data and the narrative in a grant application focus on the outcomes.

3. **Consideration:** Partner with CBOs for any community outreach and engagement. Embed this community engagement throughout the grant application and project implementation process. Lastly, consider CBOs as sub-awardees to formalize this partnership and provide them financial support.

   Justification: Several state-wide, regional, and local CBOs exist that already have established relationships with PUCs and can fill this community engagement gap. See "Community Engagement and Education" considerations further below for more details and the "CBOs" tab in the "TJCOG EJ Landscape" excel file.

4. **Consideration:** Model processes for grant application and project proposals after successes in the region. This can include leveraging any tools/frameworks that communities with EJ

successes used (as they are willing to share) and creating templates for other communities to tailor for their own purposes. This can also include identifying opportunities for partnerships between communities further ahead in environmental justice work and communities who need additional support.

Justification: Some communities have made advancements in their environmental justice approach, as well as their broader equity approach, from which other communities can learn.

For example, Raleigh has an Office of Sustainability and Office of Equity that have embedded environmental justice work in their project portfolios. Raleigh has also developed and applied tools that can be referenced and tailored for other communities. Specifically, Raleigh developed an Equity Impact Matrix which evaluates the health, environmental, and economic impacts of its proposed strategies in its Community Climate Action Plan. More details can be found in the Raleigh case study under Section 5.

Another example is the Town of Carrboro which has a 2022 Comprehensive Plan focused on two pillars: 1) Race Equity and 2) Climate Action and Resiliency. They are currently preparing for implementation of this plan, including developing a framework for how to integrate the race equity and climate goals so that implementation of one pillar advances, or at least does not harm, the other pillar.

As a first option for TJCOG's role, TJCOG can share these examples of success with other communities. This support can include developing templates based on these communities' tools/frameworks. TJCOG can then work with other communities to populate these templates for those communities' localized purposes.

As a second option, communities with less capacity or experience in this space could partner with communities like Raleigh or Carrboro in the grant application process where they have overlapping environmental justice needs, whether formally as sub-awardees under TJCOG or informally where Raleigh or Carrboro serve as a thought partner.

5. **Consideration:** Sign up for NCDEQ Environmental Justice Program listserv: To join the listserv, send an email to ej@ncdenr.gov

   Justification: While minor, this was NCDEQ's main recommendation for TJCOG to stay up to date on the latest environmental justice grants.

6.2 Considerations for Informational Sources for Grant Application

Community Engagement and Education:

1. **Consideration:** Leverage CBOs to engage with and educate PUCs about how to participate in government processes to address environmental hazards

   Justification: Community members typically require education on how local and state government gathers community input on potential or existing environmental hazards. This type of education empowers community members to raise concerns and inform government policy and project decisions. Example topics include rezoning and permitting processes.

Local governments should also provide a comfortable, welcoming, and accommodating space for these community members to give input. These traditionally underserved community members have faced equity barriers through past community engagement methods (e.g., public forums that require transportation and time off from work to participate).

Lastly, facilitators of this community engagement should have an established relationship with the community and represent the identities of these communities. CBOs can provide support in these ways as they are typically already doing this work, and they have expressed an interest in working with local government to support community engagement efforts. TJCOG could also leverage its network of experts to support the development of educational tools alongside CBOs and community members.

2. **Consideration:** Appoint community members of PUCs to be on Boards and Planning Commissions so that they can represent their communities' needs, as well as communicate back to their communities on zoning plans, etc. Work with CBOs to identify the appropriate community members and how to accommodate them.

   Justification: CBOs provided this recommendation for similar reasons as the previous consideration. Community members from PUCs are not usually aware of government planning decisions until their input is too late, and they typically do not have the time or resources to properly engage in public forums, nor the awareness or education of how to go about engaging in these forums.

Data Collection:

3. **Consideration:** Prioritize the White House Climate and Economic Justice Screening Tool to identify PUCs (referenced as "disadvantaged" communities in the tool).

   Justification: Federal agencies are mandated to use this tool, so NCDEQ recommends that local governments do the same and prioritize this EJ tool over others.

4. **Consideration:** Serve as a liaison to connect communities with universities to conduct EJ research

   Justification: Many CBOs leverage NC universities to conduct EJ research (e.g., test water and air quality). NC universities that play this role include UNC at Chapel Hill and Appalachian State University. According to CBOs, these universities have expressed capacity to conduct more research, but there's a lack of communication and partnership between them and the communities that need this research. TJCOG could help fill this gap by creating a connection between these stakeholders based on their communities' data needs.

   Caveat: It was brought up during CBOs' interviews that while data share one part of the EJ story, community members' voices should carry enough weight on their own to justify a need for funds. TJCOG should consider how much of the grant application and project implementation process should go towards filling the data collection gap versus the community engagement gap. This requires additional discussion based on specific communities' environmental justice needs and grant requirements.

7.0 Limitations and Next Steps

As noted, this guide serves as a starting point for TJCOG's environmental justice grant considerations. TJCOG could build on this guide with additional research and discussions with environmental justice experts and CBOs to validate or supplement findings.

Several limitations exist within this research project. For example, time and resource limitations prevented data collection from community members directly impacted by environmental injustices in the TJCOG region. In addition, the identity of the researcher did not reflect the identities of the populations typically defined under PUCs. These limitations can therefore misrepresent the experiences of PUC populations when identifying the best path to support them. Future research can increase PUC representation in the planning and execution of the research.

Data collection was also limited to 11 stakeholder interviews. Several more CBOs in the state exist that could speak to environmental justice issues and community engagement best practices, including for the TJCOG region. In addition, while three local government interviews provided insight for the case studies, more interviews could provide a broader perspective on the needs of the 22 municipalities identified in this research.

As another limitation, mapping tools that informed this research had slightly different capabilities, uses, metrics, and geographic levels that may have harmed the accuracy of findings. For example, the NCDEQ Community Mapping System presented underserved communities at the census block group level compared to the WH CEJST that presented underserved communities at the census tract level. In addition, the NCDEQ tool and WH CEJST applied similar but still varying criteria to define an underserved community. This research identified communities with the WH CEJST, but it identified hazards with the NCDEQ tool. To understand the true overlap between underserved communities in the CEJST to the NCDEQ hazards, this research could benefit from a combined tool. TJCOG may consider creating a version of this tool.

Mapping tools also likely did not reveal the full context of environmental justice issues in a geographic area, as data only tell one side of a story. While interviews and literature review revealed additional findings, they likely did not reveal all environmental justice hazards, locations, and affected populations in the region.

Despite these limitations, the research findings demonstrate a strong case for environmental justice funding in the TJCOG region. The number and location of underserved communities in the region, as well as the overlap in types of environmental hazards, suggests opportunities for local governments to collaborate. Therefore, TJCOG may consider facilitating this collaboration between these local governments in addition to any CBOs in the area to strengthen EJ grant applications.

As another next step, TJCOG may consider sharing findings from this research with its local governments. For example, local governments may have feedback on the list of PUCs from the WH CEJST alongside the identified environmental hazards in these PUCs, including those they would prioritize. These conversations could further hone TJCOG's prioritization of communities to support in the grant application process.

Lastly, TJCOG may consider setting up conversations with prominent environmental justice CBOs in the state, such as NC Environmental Justice Network, NC Conservation Network, and NC Black Alliance. These CBOs have established community engagement methods with traditionally underserved

populations in the state. Whether or not these CBOs currently work in the TJCOG region, they have a statewide presence and openness to expanding their work to the region. They also have environmental justice and community engagement expertise from which TJCOG and local governments could learn to inform grant applications and project development.

8.0 Appendix

8.1 Interview Questions

The below provides a sample of questions that guided how I prepared for each interview across CBOs and local government. I tailored these questions specific to each interviewee and their respective entity's work based on a scan on their organization's website.

Interviews with Local Government Employees (ideally those overseeing environmental initiatives)

- **Introductions**
  - Introduce oneself and purpose of this research project and this interview in particular
  - Ask interviewee for an overview of their role, expertise, what they oversee, etc.

- **Goal 1: Understand current state of vulnerable communities**
  Note: *Census data and NC EJ Tool will be reviewed beforehand for general sense of demographics and potentially underserved communities*
  - Briefly summarize findings with interviewee of potentially underserved communities in their area, as identified by NCDEQ (i.e., the general locations of the underserved communities within the municipality and racial/ethnic composition and poverty rate).
  - Ask interviewee if these findings align with their understanding, or if they have any corrections or additions?
  - What are some of the challenges that these communities face?
  - How does your local government approach supporting these communities? Or, how does your local government engage with these communities? (E.g., are there special programs set up, are there community groups you work through to reach these communities)

- **Goal 2: Understand environmental hazards in the city/town**
  - What are the top environmental concerns in your municipality, whether current or potential? How do these affect the aforementioned vulnerable communities?
  - Were there any recent environmental concerns (last 5-10 years) that the community has dealt with?
    - If so, what were they and how did the community respond?
    - Are there any examples of lessons learned, challenges, or successes from past responses to environmental hazards?
    - Are there any long-term effects that persist today?

- **Goal 3: Understand government's environmental justice initiatives re: priorities, capacity, evaluation, etc.**
  - Recognizing your community has a lot of competing priorities, where do the environmental concerns typically fall when it comes to near-term funding and resource allocation?
  - How do you evaluate the urgency of environmental hazards?
    - Review some of EPA's indicators if needed, see if there are any different or additional considerations

- How do you evaluate vulnerable communities in your municipality?
    - If they mention any local data or reports, ask if those are available to share
- Of the spending in this area, what types of initiatives are you currently investing in, or plan to invest in, to address environmental hazards?
    - Are there funding/resource gaps?
- What are some of the barriers or limitations that the local government faces to support the noted vulnerable communities? (e.g., limited funding/resources)
- What are your greatest challenges to addressing environmental hazards?

Example EPA indicators:

Environmental

- Proximity to environmentally regulated facilities
- Proximity to multiple contaminant sources

Health

- Existing health conditions? Look at infant mortality rate, low birth weight, age-adjusted mortality rate, life expectancy at birth
- # illnesses attributable to chemical contaminants
- # diseases attributable to pathogens

Social

- Vulnerability to exposure - little access to safe drinking water or sewage treatment, low socioeconomic status

Economic

- % of residents with reliance on polluting industries for jobs and economic development
- % of community residents with employment in pollution-generating industrial facilities
- # of brownfields in community
- Reliance on natural resources for community's economic base

- **Goal 4: Understand other involved stakeholders**
    - Do you work with any community organizations or leaders in the area that work on environmental justice or environmental initiatives more broadly? If so, do you recommend any we reach out to?
    - Do you recommend any other experts who can speak to environmental hazards occurring in your community?

<u>Interviews with Community Organizations</u>

- **Introductions**
    - Introduce oneself and purpose of this research project and this interview in particular
    - Ask interviewee for an overview of their role, expertise, what they oversee, etc.

- **Goal 1: Understand scope of organization work as it relates to TJCOG region and environmental hazards**
  Note: *A review of the organization's geographic scope and work will be done prior to the interview based on publicly available information. Questions will be tailored accordingly.*

- Where is your organization involved in the following seven counties: Chatham, Durham, Johnston, Lee, Moore, Orange, Wake?
- Can you provide a general overview of the scope of work your organization does in this(-ese) community(-ies) related to environmental justice?

- **Goal 2: Understand additional details of community**
  - How would you describe the communities your organization supports?
  - What are some of the greatest challenges these communities face? (across policy areas)
  - How do these challenges relate to or affect the communities' outcomes?

- **Goal 3: Understand additional details of environmental hazards**
  - What are the top environmental concerns for the community, whether current or potential? Which ones is your organization involved in understanding/addressing?
  - Were there any recent environmental concerns (last 5-10 years) that the community has dealt with?
    - If so, what were they and how did the community respond?
    - Are there any long-term effects that persist today?

- **Goal 4: Understand ethical considerations and evaluation of environmental injustices**
  - How do you evaluate environmental hazards? How do you evaluate communities in need? What types of indicators do you use to prioritize your services?
    - Review some of EPA's indicators if needed, see if there are any different or additional considerations
  - Based on the above, what type of data do you use?
  - What are considerations not typically incorporated in data collection and evaluation that more appropriately account for the experiences of vulnerable populations dealing with environmental injustices?
    - How do you gather insight on community members' perspectives/experiences regarding environmental injustices?
    - How can local governments or other stakeholders play a larger role in addressing environmental injustices?

Example EPA indicators:

Environmental
- Proximity to environmentally regulated facilities (http://www.epa.gov/enviro/html/fii/fii_query_java.html)
- Proximity to multiple contaminant sources

Health
- Existing health conditions? Look at infant mortality rate, low birth weight, age-adjusted mortality rate, life expectancy at birth
- # illnesses attributable to chemical contaminants
- # diseases attributable to pathogens

Social
- Vulnerability to exposure - little access to safe drinking water or sewage treatment, low socioeconomic status

Economic
- % of residents with reliance on polluting industries for jobs and economic development

- % of community residents with employment in pollution-generating industrial facilities
- # of brownfields in community
- Reliance on natural resources for community's economic base

8.2 Endnotes

[1] Census Glossary. United States Census Bureau. Accessed April 17, 2023. https://www.census.gov/programs-surveys/geography/about/glossary.html
[2] Census Glossary. United States Census Bureau. Accessed March 21, 2023. https://www.census.gov/programs-surveys/geography/about/glossary.html#par_textimage_4
[3] Ibid.
[4] "Engaging Community-based Organizations." U.S. Department of Health & Human Services, Office of the Assistant Secretary for Preparedness and Response. Accessed April 6, 2023. https://www.phe.gov/Preparedness/planning/abc/Pages/engaging-CBO.aspx
[5] Environmental Justice 2020 Glossary. United States Environmental Protection Agency. 2020. Accessed March 21, 2023. https://www.census.gov/programs-surveys/geography/about/glossary.html#par_textimage_4
[6] "Energy security: reliable, affordable access to all fuels and energy sources." International Energy Agency. Accessed April 6, 2023. https://www.iea.org/topics/energy-security
[7] Liverman, D. (2001). Environmental risk and hazards.
[8] Ibid.
[9] David E. Newton. "Environmental Justice: A Reference Handbook, Second Edition". ABC-CLIO, c2009. Chapter 1: Background and History. Accessed September 20, 2022.
[10] "About Risk Assessment". United States Environmental Protection Agency. June 22, 2022. Accessed March 21, 2023. https://www.epa.gov/risk/about-risk-assessment
[11] "NCDEQ's Potentially Underserved Block Groups 2019." NCDEQ. Created September 10,2021 and updated January 27, 2022. https://ncdenr.maps.arcgis.com/home/item.html?id=13a1aace03134969b8181c1f9f026960#overview
[12] Methodology of the Climate and Economic Justice Screening Tool. Executive Office of the President of the United States, Council on Environmental Quality. Accessed March 21, 2023. https://screeningtool.geoplatform.gov/en/methodology#3/33.47/-97.5
[13] "FACT SHEET: President Biden Signs Executive Order to Revitalize Our Nation's Commitment to Environmental Justice for All." The White House. April 21, 2023. https://www.whitehouse.gov/briefing-room/statements-releases/2023/04/21/fact-sheet-president-biden-signs-executive-order-to-revitalize-our-nations-commitment-to-environmental-justice-for-all/
[14] "Inflation Reduction Act: Advancing Environmental Justice." U.S. Environmental Protection Agency. Accessed March 21, 2023. https://www.epa.gov/inflation-reduction-act/advancing-environmental-justice
[15] Ibid.
[16] "Governor Cooper Signs Executive Order Detailing Next Steps on Path to a Clean Energy and Equitable Economy for All North Carolinians." NC Governor Roy Cooper. January 7, 2022. https://governor.nc.gov/news/press-releases/2022/01/07/governor-cooper-signs-executive-order-detailing-next-steps-path-clean-energy-and-equitable-economy
[17] Aneesh Patnaik, Jiahn Son, Alice Feng, Crystal Ade. "Racial Disparities and Climate Change." Princeton University. August 15, 2020. https://psci.princeton.edu/tips/2020/8/15/racial-disparities-and-climate-change
[18] "Justice40: A Whole-Of-Government Initiative." The White House. Accessed March 15, 2023. https://www.whitehouse.gov/environmentaljustice/justice40/
[19] Ibid.
[20] Ibid.
[21] "Inflation Reduction Act: Advancing Environmental Justice." U.S. Environmental Protection Agency. Accessed March 21, 2023. https://www.epa.gov/inflation-reduction-act/advancing-environmental-justice
[22] Ibid.
[23] "What the Inflation Reduction Act Means for Climate.", EarthJustice.org. August 16, 2022. https://earthjustice.org/brief/2022/what-the-inflation-reduction-act-means-for-climate
[24] U.S. Environmental Protection Agency, The Environmental Justice Government-to-Government Program, 2023. https://www.epa.gov/environmentaljustice/environmental-justice-government-government-program

[25] "Secretary's Environmental Justice and Equity Advisory Board." North Carolina Department of Environmental Quality. Accessed March 21, 2023. https://www.deq.nc.gov/outreach-education/environmental-justice/secretarys-environmental-justice-and-equity-advisory-board
[26] Ibid.
[27] "Governor Cooper Signs Executive Order Detailing Next Steps on Path to a Clean Energy and Equitable Economy for All North Carolinians." NC Governor Roy Cooper. January 7, 2022. https://governor.nc.gov/news/press-releases/2022/01/07/governor-cooper-signs-executive-order-detailing-next-steps-path-clean-energy-and-equitable-economy
[28] "The Issues Faced." North Carolina Environmental Justice Network. Accessed March 21, 2023. https://ncejn.org/issues/
[29] "Environmental Injustice." North Carolina Black Alliance. Accessed March 21, 2023. https://ncblackalliance.org/environmental-justice/
[30] David E. Newton. "Environmental Justice: A Reference Handbook, Second Edition". ABC-CLIO, c2009. Chapter 1: Background and History. Accessed September 20, 2022.
[31] Ibid.
[32] Nicole, W. (2013). CAFOs and environmental justice: The case of North Carolina.
[33] Ibid.
[34] Shahbandeh, M. (2022). Top U.S. states by number of hogs and pigs 2022. https://www.statista.com/statistics/194371/top-10-us-states-by-number-of-hogs-and-pigs/
[35] Ibid.
[36] Edwards, B., & Ladd, A. (2001). Race, class, political capacity and the spatial distribution of swine waste in North Carolina, 1982-1997. *North Carolina Geographer*, *9*, 51-70.
[37] Nicole, W. (2013). CAFOs and environmental justice: The case of North Carolina.
[38] Kravchenko, J., & Lyerly, H. K. (2018). The impact of coal-powered electrical plants and coal ash impoundments on the health of residential communities. *North Carolina Medical Journal*, *79*(5), 289-300.
[39] Carignan, A., Culley, M., Dinkins, L., Farge, C., Heath, D., Irby, P., Papilia, M., & Posey, R. (2016). Environmental Justice Concerns Associated with Potential Coal Ash Sites in North Carolina. University of North Carolina at Chapel Hill. https://ie.unc.edu/wp-content/uploads/sites/277/2017/01/ENEC698-Coal-Ash-Relocation-pits-Final-Paper.pdf
[40] Ibid.
[41] Ibid.
[42] Scruggs, S. (2019). "PFAS – a problem in North Carolina drinking water." National Institute of Environmental Health Sciences. https://factor.niehs.nih.gov/2019/3/feature/2-feature-pfas
[43] Ibid.
[44] Ibid.
[45] Eaves, L. A., Keil, A. P., Rager, J. E., George, A., & Fry, R. C. (2022). Analysis of the novel NCWELL database highlights two decades of co-occurrence of toxic metals in North Carolina private well water: Public health and environmental justice implications. *Science of The Total Environment*, *812*, 151479.
[46] Sohns, A. (2023). Differential exposure to drinking water contaminants in North Carolina: Evidence from structural topic modeling and water quality data. *Journal of Environmental Management*, *336*, 117600.
[47] Eaves, L. A., Keil, A. P., Rager, J. E., George, A., & Fry, R. C. (2022). Analysis of the novel NCWELL database highlights two decades of co-occurrence of toxic metals in North Carolina private well water: Public health and environmental justice implications. *Science of The Total Environment*, *812*, 151479.
[48] Ibid.
[49] Ibid.
[50] Ibid.
[51] Purifoy, D. M. (2021). North Carolina [Un]incorporated: Place, Race, and Local Environmental Inequity. American Behavioral Scientist, 65(8), 1072–1103. https://doi.org/10.1177/0002764219859645.
[52] Ibid.
[53] "Real People – Real Stories (by issue)". Exchange Project of the Dialogue For Action. Accessed September 18, 2022. https://exchangeproject.unc.edu/real_people/by_issue/
[54] Ibid.
[55] Ibid.

[56] George, A., Aliy, D., Appleton, R., Edwards, B., Gaskin, M., Hampton, C., & Williams, K. (2019). Well Water Contamination and Environmental Justice in Chatham, Lee, and Moore Counties. https://ie.unc.edu/wp-content/uploads/sites/277/2019/01/Fall2018_ENEC698_Well-Water-Environmental-Justice_final_report.pdf
[57] Ibid.
[58] White House Climate and Economic Justice Screening Tool (WH CEJST). Executive Office of the President of the United States, Council on Environmental Quality. November 22, 2022. https://screeningtool.geoplatform.gov/en/methodology#3/33.47/-97.5
[59] NCDEQ North Carolina Community Mapping System. NC Department of Environmental Quality. May 23, 2019. https://deq.nc.gov/outreach-education/environmental-justice/deq-north-carolina-community-mapping-system
[60] Environmental Justice / Transportation Disadvantage Index Tool. NC Department of Transportation. August 31, 2022. https://connect.ncdot.gov/projects/planning/Pages/EJ-TDI-maps.aspx
[61] Mapping the Haw River. Haw River Assembly. July 9, 2021. https://storymaps.arcgis.com/stories/a3f657158d2d4adeb6a10bf98cee97b9
[62] North Carolina's Factory Farms are Everywhere – even Floodplains and other Flood-prone Areas. Waterkeeper Alliance. 2022. https://www.ewg.org/interactive-maps/2022-nc-cafo/map/
[63] NCDEQ North Carolina Community Mapping System. NC Department of Environmental Quality. May 23, 2019. https://deq.nc.gov/outreach-education/environmental-justice/deq-north-carolina-community-mapping-system
[64] Map of Chatham, Durham, Johnston, Lee, Moore, Orange, Wake Counties. NCDEQ North Carolina Community Mapping System. January 2022. Retrieved November 20, 2022. https://deq.nc.gov/outreach-education/environmental-justice/deq-north-carolina-community-mapping-system
[65] NCDEQ North Carolina Community Mapping System Glossary of Terms and Definitions. NC Department of Environmental Quality. May 23, 2019. https://deq.nc.gov/ej/nccms/nccms-glossary-terms-updated-january-2022/download?attachment
[66] U.S. Census Bureau. (2021). *U.S. Census Bureau QuickFacts: Raleigh city, North Carolina*. Retrieved March 21, 2023. https://www.census.gov/quickfacts/raleighcitynorthcarolina
[67] Ibid.
[68] "Departments." City of Raleigh. Accessed April 4, 2023. https://raleighnc.gov/departments
[69] Raleigh, North Carolina. White House Climate and Economic Justice Screening Tool (WH CEJST). November 22, 2022. https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5
[70] Raleigh, North Carolina. NCDEQ Community Mapping System and Environmental Justice Tool. May 2019. https://www.deq.nc.gov/ej/nccms/deq-nc-communitymappingsystemej-tool-1final/download
[71] U.S. Census Bureau. (2021). *U.S. Census Bureau QuickFacts: Siler City, North Carolina*. Retrieved March 21, 2023. https://www.census.gov/quickfacts/silercitytownnorthcarolina
[72] Ibid.
[73] Ibid.
[74] "Town Departments." Siler City. Accessed April 4, 2023. https://www.silercity.org/departments
[75] Siler City, North Carolina. White House Climate and Economic Justice Screening Tool (WH CEJST). November 22, 2022. https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5
[76] Ibid.
[77] Siler City, North Carolina. NCDEQ Community Mapping System and Environmental Justice Tool. May 2019. https://www.deq.nc.gov/ej/nccms/deq-nc-communitymappingsystemej-tool-1final/download
[78] Adamkiewicz, G., Zota, A. R., Fabian, M. P., Chahine, T., Julien, R., Spengler, J. D., & Levy, J. I. (2011). Moving environmental justice indoors: understanding structural influences on residential exposure patterns in low-income communities. *American journal of public health*, *101*(S1), S238-S245.
[79] U.S. Census Bureau. (2021). *U.S. Census Bureau QuickFacts: Southern Pines, North Carolina*. Retrieved April 4, 2023. https://www.census.gov/quickfacts/southernpinestownnorthcarolina
[80] Ibid.
[81] Ibid.
[82] "Town Departments". Southern Pines. Accessed April 4, 2023. https://www.southernpines.net/126/Town-Departments
[83] Southern Pines, North Carolina. White House Climate and Economic Justice Screening Tool (WH CEJST). November 22, 2022. https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5

[84] Southern Pines, North Carolina. NCDEQ Community Mapping System and Environmental Justice Tool. May 2019. https://www.deq.nc.gov/ej/nccms/deq-nc-communitymappingsystemej-tool-1final/download