An Overview of the Lincoln Park Neighborhood
Vulnerability and Resilience

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An Overview of the Lincoln Park Neighborhood: Vulnerability and Resilience

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To learn more about this project visit: z.umn.edu/OneBlock or contact Madison Rodman, Resilience Extension Educator, University of Minnesota Sea Grant Program, at mrodman@umn.edu.

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Executive Summary

This report is an effort to collect and share information about the Duluth, Minnesota, Lincoln Park neighborhood as a whole, with the intention of providing geographic, demographic, economic, social, and historical context for current and future water-related climate resilience projects. It was developed as part of the 2021-2024 Minnesota Sea Grant One Block at a Time Project.

At the westernmost point of Lake Superior is Duluth, Minnesota, a city of 86,000 people. Within Duluth, the Lincoln Park neighborhood extends southwest from Duluth’s downtown district, along the St. Louis River Estuary and the Port of Duluth-Superior. The community is proud of its industrial heritage, which is rooted in the river and the port. However, disinvestment coupled with the area’s legacy of industrial contamination have made the neighborhood especially vulnerable to the impacts of climate change.

The neighborhood’s history has been shaped by its earliest Ojibwe communities and their descendents, European immigrants and their descendents, cycles of industrial development and collapse, and neighborhood-level self-advocacy. Compared to the city of Duluth’s demographic averages, Lincoln Park’s residents are more racially diverse, and experience poorer health outcomes, higher unemployment, higher poverty rates, and greater risk of involuntary displacement. It is important to note that Lincoln Park contains three distinct census tracts, each with its own unique socioeconomic conditions.

Increasingly intense rainfall events, caused by climate change, combined with the neighborhood’s social and physical vulnerabilities, amplify the risk of property damage and negative human health impacts. However, active neighborhood organizations and community-led climate adaptation projects have the potential to increase community resilience to the impacts of climate change. Partnerships among residents, community organizations, local governments, and academic institutions can accelerate resilience-building efforts by increasing community access to technical assistance, facilitating community dialogs, and incorporating neighborhood priorities into plans and projects.
Introduction to Lincoln Park

Geography
At the westernmost point of the Laurentian Great Lakes sits Duluth, the fifth most populous city in the state of Minnesota. Duluth, population 86,000, is built along 20 miles of the St. Louis River and 17 miles of Lake Superior shoreline. The portion of the river separating Duluth, Minnesota, from Superior, Wisconsin, constitutes the largest freshwater estuary in North America, the St. Louis River Estuary. Within this water-rich community is the Lincoln Park Neighborhood, hereafter Lincoln Park, which extends southwest from Duluth’s downtown business district. Lincoln Park is bounded at its southeastern edge by the St. Louis River Estuary and the Port of Duluth-Superior. It is built on a steep, rocky hillside at the bottom of the Miller Creek watershed (South St. Louis Soil and Water Conservation District, n.d.). Miller Creek, a designated trout stream, runs through the neighborhood before emptying into the St. Louis River. The Lincoln Park neighborhood shares its name with a large, wooded, neighborhood park, also called Lincoln Park. The park’s designation, in 1894, was intended to allow residents continued access to the beauty of Miller Creek, which runs the full length of this 10-block-long park. Additional creeks and watersheds in the neighborhood include Merritt Creek, 32nd Avenue West Creek, Coffee Creek, and Buckingham Creek (City of Duluth 2017).

Figure 1. Watershed Boundary including creeks within the Lincoln Park area
Area of Concern Designation
Due to its legacy of industrial contamination, the lower St. Louis River and adjacent neighborhoods (including Lincoln Park) received federal designation in 1987 as the St. Louis River Area of Concern (SLR AOC) (EPA 2023) (Figure 2). The Great Lakes Water Quality Agreement defines Areas of Concern as “geographic areas designated by the Parties where significant impairment of beneficial uses has occurred as a result of human activities at the local level” (EPA 2023). With the establishment of the Great Lakes Restoration Initiative (GLRI n.d.) in 2010, remedial action plans for the AOC began receiving funding. Since then, the SLR AOC has received concentrated attention from federal and state agencies and substantial funding has been directed toward remediation of contaminated sediments, restoration of habitats, and revitalization of affected neighborhoods (EPA 2023). This attention and investment has brought change to portions of Lincoln Park, such as new recreational bike and water trails, breweries, hotels, and the redevelopment of the neighborhood’s downtown area as the historic Lincoln Park Craft District. (City of Duluth 2017; Hartig et al. 2019; Minnesota Climate and Health Program, City of Duluth 2015)

Figure 2. St. Louis River Area of Concern
Lincoln Park’s Three Unique Census Tracts

This report is an effort to collect and share information about the neighborhood as a whole, with the intention of providing geographical, demographic, economic, social, and historical context for current and future water-related climate resilience projects. However, it is important that project planners understand the patchy nature of socioeconomic conditions across the neighborhood when planning and facilitating community resilience projects.

Lincoln Park comprises three census tracts: 002400, 002600, and 015600 (Figure 3). These will be referred to hereafter as tracts 24, 26, and 156, respectively. Very small portions of the neighborhood lie within census tracts 20 and 158 (Figure 3), but the number of households in these very small areas of overlap are not sufficient to alter the demographic statistics for the neighborhood. Therefore, data from tracts 20 and 158 were not included in this report.

Socioeconomic conditions vary widely across these census tracts. For example, while Lincoln Park’s homeownership rate (45.6%) is much lower than Duluth’s home ownership rate (60.4%), within the neighborhood, the homeownership rate in tract 24 (69%) is higher than Duluth’s overall homeownership rate, while the rates are drastically lower in tracts 26 (54.7%) and 156 (31.1%). Consider also that 3.5% of workers over the age of 16 in tract 26 have no access to a vehicle, while 6.7% of workers over the age of 16 in tract 156 do not have access to a vehicle (Table 1). These differences demonstrate the importance of understanding Lincoln Park both as a neighborhood and as a collection of communities. When planning community projects and outreach campaigns, community input can be more representative of the neighborhood as a whole, and project benefits can be more fairly distributed, if the unique strengths, needs, and barriers of Lincoln Park’s multiple communities are taken into consideration.
Figure 3. Duluth, Minnesota’s Lincoln Park Neighborhood Census Tracts
Table 1. Duluth, Minnesota Lincoln Park Neighborhood Demographic Data. US Census Tracts 24, 26, 156

<table>
<thead>
<tr>
<th>Demographic Attribute</th>
<th>Tract 24</th>
<th>Tract 26</th>
<th>Tract 156</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (2020)*</td>
<td>1,053</td>
<td>2,032</td>
<td>2,967</td>
</tr>
<tr>
<td>Age, 65 Years and Older†</td>
<td>11.6%</td>
<td>8%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Racial Identity, White Only*</td>
<td>84.3%</td>
<td>89.6%</td>
<td>68.4%</td>
</tr>
<tr>
<td>Racial Identity, Black/African American Only*</td>
<td>3.2%</td>
<td>2.3%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Racial Identity, Asian or Pacific Islander Only*</td>
<td>1.7%</td>
<td>1.4%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Racial Identity, Native American or Alaska Native Only*</td>
<td>1.8%</td>
<td>3.5%</td>
<td>7.5%</td>
</tr>
<tr>
<td>Racial Identity, Native American/Alaska Native: Only and Mixed*</td>
<td>5.0%</td>
<td>9.0%</td>
<td>13.3%</td>
</tr>
<tr>
<td>High School Graduate or Higher†</td>
<td>67%</td>
<td>58%</td>
<td>21%</td>
</tr>
<tr>
<td>Bachelor’s Degree or Higher†</td>
<td>16%</td>
<td>20.8%</td>
<td>8.7%</td>
</tr>
<tr>
<td>Unemployment Rate†</td>
<td>12.1%</td>
<td>5%</td>
<td>16.2%</td>
</tr>
<tr>
<td>Median Household Income†</td>
<td>$47,222</td>
<td>$46,619</td>
<td>$27,051</td>
</tr>
<tr>
<td>Owner-Occupied Housing Rate†</td>
<td>69%</td>
<td>54.7%</td>
<td>31.1%</td>
</tr>
<tr>
<td>Median Gross Rent†</td>
<td>$1,056</td>
<td>$838</td>
<td>$760</td>
</tr>
<tr>
<td>Percentage of Housing Vacant†</td>
<td>4%</td>
<td>4.7%</td>
<td>10.9%</td>
</tr>
<tr>
<td>No Vehicle Available (of workers 16 years and older)†</td>
<td>4.4%</td>
<td>3.5%</td>
<td>6.7%</td>
</tr>
<tr>
<td>Without Health Care Coverage‡</td>
<td>6%</td>
<td>5.9%</td>
<td>5.7%</td>
</tr>
<tr>
<td>Disability Rate†</td>
<td>14.5%</td>
<td>13.1%</td>
<td>23.5%</td>
</tr>
<tr>
<td>Households with a Computer (includes smartphones, tablets, etc.)†</td>
<td>45.9%</td>
<td>39.6%</td>
<td>38.8%</td>
</tr>
<tr>
<td>Households with an Internet Subscription (Includes Cellular Data Plans)†</td>
<td>42.2%</td>
<td>35.1%</td>
<td>36.2%</td>
</tr>
</tbody>
</table>

*DEC Redistricting Data 2020  
†American Community Survey 2021 5 Year Estimates  
‡American Community Survey 2020 5 Year Estimates
Community Characteristics

Demographic Data Sources
To prepare this report, demographic data for the city of Duluth and for census tracts 24, 26, and 156 were collected from the U.S. Census Bureau’s online dataset. These data include both 2020 redistricting data and American Community Survey data, which are reported by the U.S. Census Bureau as one-year estimates and as five-year estimated averages. Summarized data for St. Louis County were gathered from the U.S. Census Bureau’s QuickFacts tool.

Demographics and Disparities
One way to describe who lives in Lincoln Park is to use quantitative demographic data. Numbers can tell us if people are moving into or out of an area, if the residents of a block ride the bus or drive to work, and how racially or economically diverse a street, block, or neighborhood is. While these numbers do not tell the whole story and cannot replace getting to know the people who live here, they can enable us to detect patterns and trends. This information can help us design outreach campaigns and engagement practices that are accessible to all members of the community.

When comparing the Lincoln Park population (census tracts 24, 26 and 156 combined) to that of Duluth as a whole, there are some patterns and differences, or disparities, worth noting. For example, while Duluth’s population has remained relatively stable over the past decade (with an increase of 0.5%), Lincoln Park’s population has decreased by 4.2%. Lincoln Park is more racially diverse compared to the city of Duluth overall; Lincoln Park’s Native American community contributes significantly to this diversity (Table 2).

Table 2. Duluth, Minnesota and Lincoln Park Neighborhood Demographic Data

<table>
<thead>
<tr>
<th>Demographic Attribute</th>
<th>St. Louis County</th>
<th>Duluth</th>
<th>Lincoln Park</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population 2020 *</td>
<td>200,808</td>
<td>86,697</td>
<td>6,052*</td>
</tr>
<tr>
<td>Age 65 Years and Older†</td>
<td>19.5%</td>
<td>15.7%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Racial Identity: White Only</td>
<td>92.1†</td>
<td>84.8%*</td>
<td>75.6%*</td>
</tr>
<tr>
<td>Black/African American Only</td>
<td>1.6%†</td>
<td>3.6%*</td>
<td>6.3%</td>
</tr>
<tr>
<td>Asian or Pacific Islander Only</td>
<td>1.2%†</td>
<td>1.7%*</td>
<td>1.1%*</td>
</tr>
<tr>
<td>Native American or Alaska Native Only</td>
<td>2.4%†</td>
<td>2.6%*</td>
<td>5.2%*</td>
</tr>
<tr>
<td>Racial Identity: Native American/Alaska Native: Only and Mixed</td>
<td>data not available</td>
<td>2.9%*</td>
<td>10.4%*</td>
</tr>
<tr>
<td>Census Response Rate 2020§</td>
<td>67.3%</td>
<td>75%</td>
<td>65.8%</td>
</tr>
</tbody>
</table>

Lincoln Park summarized data was calculated using Census tract data (tracts 24, 26, and 156). Weighted averages were calculated when appropriate. See Appendix II for details.

*DEC Redistricting Data 2020
†American Community Survey 2021 5 Year Estimates
§US Census Bureau Tracking Self-Response Rate Maps
*US Census Bureau QuickFacts
Lincoln Park residents are, on average, younger than Duluth’s, and are more likely to be renting their homes. Average rental costs in Lincoln Park and Duluth are comparable ($838 and $897), although these rates vary considerably across both the city of Duluth as a whole and within Lincoln Park (Table 1). Fewer than half of Lincoln Park’s residents have a computer (40.3%) or internet access (36.9%) in their homes, and 5% of Lincoln Park workers over the age of 16 do not have access to a vehicle (Table 3). Median home value for owner-occupied units in Lincoln Park is significantly lower than the average Duluth home ($107,582 versus $167,300), making Lincoln Park a more affordable option for prospective first-time homeowners (Table 3), although much of the housing stock is in need of repair (Minnesota Climate and Health Program City of Duluth, 2015).

The most notable disparities between Lincoln Park and the city as a whole are educational attainment and internet access. While 93.9% of Duluth’s residents have a high school diploma, only 41.1% of Lincoln Park’s residents graduated from high school or completed their GED. In addition, 37.3% of Duluthians have a bachelor’s degree or higher, while only 14.1% of Lincoln Park’s residents have a bachelor’s degree or higher. Across the city of Duluth as a whole, 91.3% of households have an internet subscription, while only 36.9% of Lincoln Park households have an internet subscription (Table 3). To view the U.S. Census Bureau data that was used to compile demographic tables and to check for updated statistics, see Appendix II.

<table>
<thead>
<tr>
<th>Demographic Attribute</th>
<th>Duluth</th>
<th>Lincoln Park</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population Change 2010-2020*</td>
<td>+432</td>
<td>-252</td>
</tr>
<tr>
<td></td>
<td>0.5% increase</td>
<td>4% decrease</td>
</tr>
<tr>
<td>High School Graduate or Higher†</td>
<td>93.9%</td>
<td>41.1%</td>
</tr>
<tr>
<td>Bachelor’s Degree or Higher†</td>
<td>37.3%</td>
<td>14.1%</td>
</tr>
<tr>
<td>Unemployment Rate†</td>
<td>6.2%</td>
<td>18.9%</td>
</tr>
<tr>
<td>Median Household Income†</td>
<td>$61,944</td>
<td>$37,131</td>
</tr>
<tr>
<td>Poverty Rate†</td>
<td>18.5%</td>
<td>22.6%</td>
</tr>
<tr>
<td>Owner-Occupied Housing†</td>
<td>60.4%</td>
<td>45.6%</td>
</tr>
<tr>
<td>Median Home Value (Owner-Occupied)‡</td>
<td>$167,300</td>
<td>$107,582</td>
</tr>
<tr>
<td>Median Gross Rent†</td>
<td>$897</td>
<td>$838</td>
</tr>
<tr>
<td>Vacancy Rate (Housing)†</td>
<td>6.7%</td>
<td>7.6%</td>
</tr>
<tr>
<td>No Vehicle Available (workers 16 years of age and older)†</td>
<td>2.5%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Without Health Care Coverage‡</td>
<td>3.5%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Disability Rate†</td>
<td>11.7%</td>
<td>18.4%</td>
</tr>
<tr>
<td>Households With A Computer†</td>
<td>96.1%</td>
<td>40.3%</td>
</tr>
<tr>
<td>Households With An Internet Subscription†</td>
<td>91.3%</td>
<td>36.9%</td>
</tr>
</tbody>
</table>

Lincoln Park summarized data was calculated using Census tract data (tracts 24, 26, and 156). Weighted averages were calculated when appropriate.

*DEC Redistricting Data 2020
†American Community Survey 2021 5 Year Estimates
‡American Community Survey 2020 5 Year Estimates
Vulnerability and Resilience

When hazardous events occur, outcomes vary among neighborhoods. These outcomes are determined by each community’s ability to prepare for and respond to disruptions and emergencies. However, social factors such as poverty, crowded housing, or lack of transportation affect a community’s ability to effectively prepare and respond. Social vulnerability is the degree to which a community is vulnerable to hazardous events because of these social factors.

The Centers for Disease Control (CDC) and the Agency for Toxic Substances and Disease Registry (CDC/ATSDR) measures and reports degrees of social vulnerability using a Social Vulnerability Index (SVI), where a higher index indicates a higher level of vulnerability and a lower index a higher level of resiliency. The CDC/ATSDR’s SVI uses census data to calculate census tract rankings for 16 social factors, which are grouped into 4 main domains: socioeconomic status, household characteristics, racial and ethnic minority status, and housing type/transportation. The overall SVI for a community is composed of these 4 main domains (Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry 2022) (Figure 4). Lincoln Park’s SVI rankings, divided by domain, are mapped in Figure 5 and summarized in Table 4.

![Components of Social Vulnerability Index (SVI)](#)

The four main domains include socioeconomic status, household characteristics, racial and ethnic minority status, and housing type/transportation. Within the four domains are 16 social factors. A higher index indicates a higher level of vulnerability and a lower index a higher level of resiliency. (Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry 2020)
Table 4. SVI rankings for Lincoln Park Census Tracts

<table>
<thead>
<tr>
<th>SVI Ranking</th>
<th>Tract 26</th>
<th>Tract 24</th>
<th>Tract 156</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socioeconomic Status</strong> (includes high school diploma, health insurance, poverty)</td>
<td>Low-medium</td>
<td>Medium-high</td>
<td>High</td>
</tr>
<tr>
<td><strong>Racial and ethnic minority status</strong></td>
<td>Low-medium</td>
<td>Low-medium</td>
<td>Low-medium</td>
</tr>
<tr>
<td><strong>Household characteristics</strong> (includes over 65 years of age, under 17 years of age, disability status)</td>
<td>Medium-high</td>
<td>Low</td>
<td>Low-medium</td>
</tr>
<tr>
<td><strong>Housing type and transportation</strong> (includes multi-unit structures, crowding, no vehicle)</td>
<td>Medium-high</td>
<td>Low-medium</td>
<td>High</td>
</tr>
</tbody>
</table>

Figure 5. Duluth, Minnesota Lincoln Park neighborhood A) socioeconomic status, B) racial and ethnic minority status, C) household characteristics, d) housing type and transportation. Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry/Geospatial Research, Analysis, and Services Program 2020.
Community resilience is linked to social cohesion, and social cohesion is the degree of connectedness and solidarity among a group of people (Manca 2014). Social cohesion has been linked to social infrastructure, which is defined as “the social resources embedded in the underlying organizational, cultural, and constructed features of a society (Swader 2023).” These resources include both physical, or “hard” infrastructure, such as parks, libraries, benches, drinking fountains, playgrounds, and cafes, as well as “soft infrastructure” such as social support systems, neighborhood clubs, and habits of public gathering such as coffee klatches, farmers’ markets, or neighborhood baseball games. Neighborhoods can be designed to foster resilience by providing and maintaining public spaces that encourage social cohesion.

Social infrastructure can dramatically increase community resilience when disasters occur. For example, in 1995, a heat wave in Chicago killed more than 700 people. However, in neighborhoods with nearly identical demographics, those with functional social infrastructure had lower death rates than those without. Sociologist Eric Klinenberg, who lived through the heat wave, mapped heat wave-related deaths across the city and found that the highest death rates were in historically segregated, Black, and poor neighborhoods. However, within these disenfranchised neighborhoods, there were areas that fared much better than others. Klinenberg found that the neighborhoods with extremely high death rates lacked functional social infrastructure. However, in otherwise identical adjacent neighborhoods, which had functional public spaces and active community institutions such as coffee shops, libraries, and grocery stores, the death rates were significantly lower. In these neighborhoods, neighbors checked in on each other, and people were ten times less likely to die in the heat wave (Beck, Rashid 2023. See also Klinenberg 1999.)

Social cohesion is directly linked to community resilience, and social cohesion can be nurtured by providing and maintaining physical spaces that foster a vibrant social life. In Lincoln Park, social infrastructure should be considered when designing for climate resilience.

**Historical Context of Duluth and Lincoln Park**

**Early History**

For generations, Ojibwe and Dakota people have lived in the area now known as Duluth. A more extensive history of the Duluth area from Ojibwe perspectives can be found in the 2015 Duluth Ethnographic Study and the report’s interactive website, created by the Fond du Lac Band of Lake Superior Chippewa. To access these and additional historical resources, please see Appendix I: History.

The *manoomin*, or wild rice, that grows in the St. Louis River Estuary is central to the Ojibwe history of how Anishinaabe people arrived in the Western Great Lakes region; the estuary and the surrounding area was and is a culturally and spiritually significant place. When Europeans first arrived at the St. Louis River in the 18th century, Ojibwe communities and infrastructures were well established throughout the area. The current neighborhood of Lincoln Park is on land that once contained the main trail connecting the Ojibwe village of Nagaajiwanaang, where the Fond du Lac neighborhood exists today, to Onigamissing, the “Little Portage” between the Estuary and Lake Superior, where Duluth’s canal and aerial lift bridge are today. In winter, members of the Fond du Lac Band, and later, Euro-American traders, traveled over the ice along the shore of the river, but in the summer, they used this trail to avoid the marshy ground that joined the river to the land (Fond du Lac Band of Lake Superior Chippewa 2022; Turnstone Historical Research 2015).
In response to the *Sandy Lake Tragedy*, Bezhike, also known as Chief Buffalo of La Pointe, successfully negotiated with the federal government for the Lake Superior Ojibwe Nation’s right to stay on their homelands. The legal outcome of this negotiation was the Treaty of 1854, which constitutes the legal foundation for Euro-American settlement of the area and the establishment of the city of Duluth. In exchange for allowing Euro-American settlement in the area, Bezhike negotiated for numerous provisions, one of which was the retention of a square mile of land around the Point of Rocks, a landmark that today marks the northeastern point of the Lincoln Park neighborhood (Figure 6). Historical accounts written at this time indicate that Bezhike chose to reserve this location as unceded territory in order to protect burial grounds on Rice’s Point. After Bezhike’s death, this land was illegally sold and eventually incorporated into the city of Duluth (*Fond du Lac Band of Lake Superior Chippewa 2022; Turnstone Historical Research 2015*).

![Image](https://example.com/image.jpg)

*Figure 6. Point of Rocks Unceded Territory (Turnstone Historical Research, 2015)*

In 1879, railroad construction on Rice’s Point disturbed the burial ground. Also during this time, the Euro-American community realized that part of the city was being built on illegally purchased land, causing Duluth’s development to be temporarily halted. The situation made national headlines throughout the 1880s and 1890s, but construction eventually proceeded (*Turnstone Historical Research 2015*).

**Euro-American Settlement: Timber, Iron, the Port, and the Railroad**

Duluth was incorporated in 1857, following the signing of the Treaty of 1854. Development was stalled due to the financial crisis of 1857, but was revived in 1869 when Jay Cooke, who recognized the potential of the St. Louis River as a transportation hub, succeeded in making Duluth a major railroad and shipping center (*Summit Envirosolutions 2017*).
In 1870, portions of the Point of Rocks were blasted to extend Superior Street from downtown Duluth to the West End, which allowed for commercial and residential construction to expand into the neighborhood now known as Lincoln Park. Approximately 60% of Duluth’s population at this time were immigrants, almost entirely Scandinavian, Irish, German Catholic, and French Canadian. These laborers were recruited from Europe to work for the railroad companies, ore docks, grain elevators, flour mills, and railyards located on Rice’s Point or along the lakeshore. These new arrivals temporarily found lodging at Northern Pacific Railroad’s immigrant houses, and then typically settled in the West End (Summit Envirosolutions 2017).

In 1874, due to the failure of banks owned by Cooke and the financial panic that followed, the city’s population fell from over 5,000 to 1,300. Grain from across the Midwest, delivered via the railway and shipped out of the port, provided the economic foundation of Duluth’s subsequent economic recovery, and Duluth’s population again expanded rapidly, along with the expansion of the port. The population in 1897 was estimated to be 30,000. Lumber milling and the shipping industry, both reliant on the river, dominated the economy. When logging and the lumber industry declined, transportation of iron ore took over, again with the railroad and the Port of Duluth-Superior serving as Duluth’s economic drivers (Summit Envirosolutions 2017). [For a graph of Duluth’s population from 1860 to 2020, see Lundgren 2021]. West Duluth neighborhoods operated as a separate city, with its own business districts, community clubs, and schools. While the city of Duluth’s identity is strongly tied to Lake Superior, there is evidence that West Duluth residents connected much more closely with the river and its industrial heritage (Lundgren 2021).

By the early years of the 20th century, Duluth’s population had grown to 53,000 (Summit Envirosolutions 2017). Lincoln Park remained a mostly Euro-American immigrant community. However, U.S. Steel, located further up the St. Louis River, actively recruited Black workers from southern states. By 1920, most of Duluth’s 495 Black residents were employed by U.S. Steel. Morgan Park, U.S. Steel’s company town, excluded African Americans, so many Black workers settled in the adjacent neighborhood of Gary (Figure 8). Following the lynching of 3 Black men in Duluth in 1920, the Black community formed the Duluth branch of the National Association for the Advancement of Colored People (NAACP) and met at St. Mark’s church in Duluth’s Hillside neighborhood (Minnesota Historical Society, 2024). However, many of Duluth’s Black community members left the area following the lynchings. By 1940, Duluth’s Black population had declined to 309 (Wilson 2020).
Figure 8. Map of the City of Duluth's neighborhood boundaries. Boundary data from City of Duluth 2023.
Redlining

Beginning in 1933, President Franklin D. Roosevelt enacted a series of programs and regulations called the New Deal. In an effort to mitigate the impacts of the Great Depression, these programs aimed to spur economic recovery, initiate financial reform, and provide relief for the poor and unemployed. New Deal legislation and programs included the Social Security Act, the Civilian Conservation Corps, and the National Housing Act of 1934. The National Housing Act’s purpose was to make home mortgages more affordable and to reduce the frequency of bank foreclosures (Library of Congress n.d.). In an effort to reduce risks to lenders, the Federal Home Owners’ Loan Corporation (HOLC) commissioned maps of cities, with neighborhoods ranked to reflect their mortgage security from A (low risk) to D (high risk). Neighborhoods that were considered to pose a high risk to lenders were colored red. This ranking made it difficult, if not impossible, to obtain or afford a mortgage in these redlined neighborhoods (Nelson et al. 2023).

![Figure 9. Home Owners Loan Corporation’s Residential Security Map of Duluth, Minnesota, rotated. Grades are color coded as follows: A: Green, B: Blue, C: Yellow, D: Red (Nelson et al. 2023)](image)

The real estate agents, lenders, and developers who assigned these rankings based their assessments of risk not only on the quality and value of the homes, but also on the race, class, and ethnicity of the people in those neighborhoods. Therefore, predominantly American-born White neighborhoods would receive a higher grade (lower risk) than a comparable neighborhood with a predominantly Black, Asian, Latino, Native American, or immigrant population. The result was that home mortgage access and affordability was determined by a neighborhood’s racial and ethnic composition. Access to capital in the form of home ownership was shifted further toward American-born White families and further out of reach for Black, Asian, Latino, Native American, and immigrant communities. The result was that many families of the New Deal generation faced racially and ethnically unequal barriers to the opportunity to establish intergenerational wealth, contributing to the economic inequality we experience today (Nelson et al. 2023).

Lincoln Park received three HOLC grades: B, C, and D (Figure 9). Areas east of the neighborhood’s park (Lincoln Park) received B and D grades, while the area west of the park received a C grade. The description of the redlined area (grade D) of Lincoln Park reads as follows: “This is a small development on a steep rocky hill, inaccessible to the occupants. A low income class occupy [sic] the small, cheap, undesirable homes in the area (Nelson et al. 2023).” The neighborhood that was graded “B” was described as “… an area of small modest homes, some duplexes and double houses, ranging in age up to 30 years. It is favorably located on a hill overlooking Lake Superior. The area is occupied by salaried persons from the business district. The average house value in the district is $4,000.” West of the neighborhood’s park (Lincoln Park), the area receiving a C
grade was described as “… an old section situated on a steep incline. Foreign industrial workers occupy the area, Italians predominating. Most of the construction is old and shabby” (Nelson et al. 2023). Neighborhoods that were considered to be good investments for lenders, and given an “A” grade, were located in Duluth’s Condon Park area and Denfeld (Nelson et al. 2023, Figures 8 & 9).

The Construction of Highway 53

Today, the main transportation route between the cities of Duluth and Superior is Highway 53, which originally followed Garfield Avenue and Piedmont Avenue north of Rice’s Point through Lincoln Park. In the 1960s, most of the homes on the west side of Piedmont Avenue were demolished to make way for a reconstructed, elevated expressway, which was completed in the 1970s, along with the I-35/Highway 53 Interchange, known locally as the “Can of Worms.” The remaining two-lane Piedmont section of Highway 53 was replaced in 2004 with another elevated four-lane divided highway. The construction of the I-35/Highway 53 interchange and Interstate Highway 53 through the Lincoln Park neighborhood introduced a physical barrier between the St. Louis River and the residential area of the neighborhood (Summit Envirosolutions 2017).

![Figure 10. “Can of Worms” interchange in southeast Lincoln Park, Duluth, Minnesota](Nicklawske, 2019)

Transitions: the End of Heavy Industry, and Redevelopment Efforts

By the 1980s, the era of heavy industry in Duluth and Superior had ended (Hartig et al. 2019). This caused severe economic hardship and loss of identity, both of which hit hardest in the historically industrial western neighborhoods. Lincoln Park began to be perceived as an unsafe, high-crime neighborhood (City of Duluth 2017), a perception that has persisted for decades. Western neighborhoods were also left with a legacy of heavy industrial contamination.

In 2000, Lincoln Park residents worked with Duluth Local Initiatives Support Corporation (LISC) to revitalize the 3rd Street corridor. New lighting, curbs, and gutters were installed and street trees were planted. Improvements were made outside of the 3rd Street corridor as well, including new homes on West 2nd Street, a new playground at the Harrison Community Center, and the reconstruction of Piedmont Avenue. Building on these successes, additional community improvements were made, which are documented in the 2012 Lincoln Park Revitalization Plan (At Home in Duluth Collaborative 2012).
Redevelopment of The St. Louis River Corridor

The establishment of the Great Lakes Restoration Initiative in 2010 established a funding mechanism to support the implementation of remedial action plans already developed for the Area of Concern (AOC). Building on the environmental remediation and restoration happening in the estuary, the city of Duluth turned its attention to revitalizing the neighborhoods that were economically devastated by the loss of heavy industry. Investments in economic development and tourism had been directed toward Duluth’s eastern, lakeshore neighborhoods. Formerly industrial, riverside communities on the west side of the city, with their Superfund sites, degraded habitats, and contaminated soils and sediments, were largely neglected and some community members felt they had been forgotten by the city (Passi 2015). However, as remediation efforts began to make the river swimmable and fishable again, the city of Duluth identified the economic potential of redeveloping riverside neighborhoods as recreational and tourism destinations and initiated a planning process for redeveloping the St. Louis River Corridor.

Community responses to the redevelopment plans for the St. Louis River Corridor were not all positive. Western Duluth’s identity and heritage had been rooted in the port, the railway, and heavy industry. Some community members expressed fears that a changed identity was being imposed on them (Passi 2015), but the expansion of Duluth’s tourism and recreational economy into western neighborhoods presented an opportunity to revive the neighborhoods’ economies. In 2014, led by then-Mayor Don Ness, the city passed the St. Louis River Corridor Initiative, which invested $18 million in public park and trail improvements along the river from Lincoln Park to the Fond du Lac neighborhood (City of Duluth 2016). The stated intention of the Corridor Initiative was to draw tourists to western neighborhoods, improve the housing market, and create tourism-related jobs. In 2016, led by then-Mayor Emily Larson, the city adjusted the plan’s budget to better prioritize resident concerns (Passi 2016). Funding for 13 small neighborhood parks was increased from $500,000 to $1,200,000, with funding per park increased from a maximum of $50,000 per park to a fixed sum of $90,000 per park. Changes to the original plan also resulted in re-routing the Cross City Trail onto a community-determined river route, and a public process to examine the St. Louis River Natural Area’s potential to ensure perpetual green space protection and river access under the Duluth Natural Areas Program (Peterson 2023, personal correspondence). For a complete summary of the city’s neighborhood parks public engagement process and a summary of community needs and priorities, please see the St. Louis River Corridor Parks Mini-Master Plans. Also, see the St. Louis River Alliance’s River Connection Summary Report and calendar of events to learn about ongoing efforts to improve local residents’ access to these improved recreational opportunities on the St. Louis River.

Lincoln Park Small Area Plan and Health Impact Assessment

In 2015, the city published their Lincoln Park Small Area Plan, which outlined proposed redevelopment plans for the Lincoln Park commercial area and adjacent residential communities - most of which are contained within census tract 156. In 2014 and 2015, a Health Impact Assessment (HIA) was conducted by the Minnesota Department of Health in order to provide recommendations for Lincoln Park’s Small Area Plan (Minnesota Climate and Health Program, City of Duluth 2015).

The HIA kickoff event allowed attendees to identify problem areas on large scale maps of the study area and resulted in the collection of 23 community surveys. This was followed by a public meeting at which residents were invited to provide feedback on preliminary HIA assessment data. Approximately 22 people attended and reported concerns such as sidewalk conditions, access to healthy food, crime and safety, and housing affordability and blighted properties. A second public meeting was held, at which the city provided opportunities for public input on the draft Small Area Plan. Attendees were also invited to comment on the findings from the HIA and provide recommendations. All feedback from these meetings was incorporated into
future drafts of the Small Area Plan and was used to inform HIA recommendations (Minnesota Climate and Health Program, City of Duluth 2015).

One-on-one interviews were also conducted with six community members. Themes that came up during these interviews included a desire for more businesses and retail; fewer drugs and less crime; more opportunities such as classes, theaters, social events; and overall revitalization. People mentioned the importance of physical, mental, and social wellbeing, and specifically, having opportunities to engage with others in their community (Minnesota Climate and Health Program, City of Duluth 2015).

City staff and the HIA coordinator collected additional community comments on May 3, 2014 at a Lincoln Park community event. Concerns included lack of access to healthy food and safety issues related to the release of sex offenders in the neighborhood (Minnesota Climate and Health Program, City of Duluth 2015).

Two more public meetings were hosted by the city of Duluth to solicit input from residents to be incorporated into the Small Area Plan draft recommendations. The two highest priority issues, according to meeting participants, were access to healthy food and affordable housing. Issues related to access to health care, drug and alcohol use, blighted properties, social cohesion, and exercise or physical activity were also prioritized. Additional one-on-one conversations documented concerns about housing quality and affordability, crime and drugs, safe activities for children and older adults, and access to healthy food (Minnesota Climate and Health Program, City of Duluth 2015).

In response to these recent redevelopment planning processes, there has been an increase in community action. For example, the Lincoln Park Business Group, Ecolibrium 3, Fair Food Access, the River Corridor Coalition, Lincoln Park Resource and Community Garden, Lincoln Park Children and Families Collaborative, and numerous western-neighborhood community clubs, have worked to ensure that resident voices are at the table when investment and development decisions are being made. Community groups have long advocated for economic revitalization in the Lincoln Park neighborhood. However, the community is also aware that Lincoln Park's high proportion of rental properties and low-income households places it at high risk of involuntary displacement, which often accompanies redevelopment. Neighborhood advocacy groups focus on both the need for economic revitalization and the need for anti-displacement strategies (Abt Associates and NYU Furman Center 2023) to be in place in order to prevent neighborhood gentrification from occurring in response to the neighborhood's economic revitalization (City of Duluth, Planning and Development Division 2020).

**Future Redevelopment: I-35 Hwy 53 Interchange**

Lincoln Park's I-35-Hwy 53 Interchange (the Can of Worms) is currently being reconstructed to improve safety by eliminating blind merges and left exits, replacing aging infrastructure, and better accommodating freight movements through the interchange (Minnesota Department of Transportation 2024). The Metropolitan Interstate Council and the Minnesota Department of Transportation asked the public to define a vision for a reconstructed Interstate 35, which traverses the length of the city of Duluth and includes the Can of Worms Interchange. In 2022, 83 participants were asked to rate the comment “I would like to be able to bike or walk across I-35 easier” from strongly agree (5) to strongly disagree (1). The average score was 4 (agree). In confirmation of these results a separate survey of residents’ sense of connection to the river revealed that many people in the Lincoln Park neighborhood feel cut off from the river, due to the lack of public access to the river in Lincoln Park (St. Louis River Alliance 2023). Themes that were identified within public comments included “safer and more connected bike and pedestrian routes,” “walkability and improved public transit,” as well as “a corridor that supports the demands of tourism and industry.” Specific to the Lincoln Park
neighborhood, comments included a need for increased connectivity from Lincoln Park to Lake Superior (Duluth-Superior Metropolitan Interstate Council 2023).

The initial proposal for the reconstruction of the interchange involved replacing the Highway 53 bridge in Lincoln Park with a retaining wall design that eliminated the usable space underneath the highway and created a barrier between the residential and business districts. Public response to this plan was negative and after several public input sessions the plan was changed to preserve the bridge and pier design of the original structure (Minnesota Department of Transportation 2020). As of this writing construction has been halted due to findings of historical significance in the area (Duluth-Superior Metropolitan Interstate Council 2023).

**Future Redevelopment: West Superior Street Reconstruction**

**Project Plan**

Over the past several years the city of Duluth has invested heavily in updating its aging infrastructure, particularly its streets and the utilities below them. Following the recent completion of a full reconstruction of Duluth’s downtown section of Superior Street, funding is now being directed toward Lincoln Park’s commercial strip (City of Duluth, n.d.).

The current plan for West Superior Street’s redevelopment involves a full reconstruction of Superior Street between West Michigan Street and Carlton Street (Figure 11). The design for the reconstructed commercial strip incorporates ADA accessible sidewalks, protected bike facilities and bike parking, electric vehicle charging stations and outdoor power, seating and outdoor dining areas, public art, lighting, wayfinding, planters, trash bins, and vehicle parking. In addition, the project plan includes stormwater management upgrades, much of which will use green stormwater infrastructure.

![Figure 11. West Superior Street Reconstruction, through the commercial district of the Lincoln Park Neighborhood. West Superior Street is indicated in orange. (City of Duluth, 2023)](image-url)

As of this writing (January 2024), the reconstruction project’s public consultation process is underway. In addition to an online survey and online comment page, five in-person open house events have been planned. Prior to each event, postcards are mailed to all residents located two blocks north and two blocks south of the
project area. The public input events are posted to the city’s website and social media outlets. Each public input event is featured in a press release and in partnership with community non-profit organizations, emails are sent to Lincoln Park residents.

**What Are Residents Saying?**

Three of the five scheduled public input events have been held as of January 2024. Participant feedback from public input events one and two, the number of participants and their places of residence, and a presentation from public input event three are available on [the project’s website](#). The fourth and fifth open house events are scheduled for the winter of 2023-2024 and late spring 2024. Community outreach and environmental review were scheduled to be completed in December 2023. Construction is scheduled to begin in the spring of 2026 and is expected to be completed in the fall of 2028.

**Climate Challenges in Northeast Minnesota**

**Climate and Climate Projections**

Duluth experiences a humid continental climate that is modulated by the thermal mass of Lake Superior, which cools the city in the summer and keeps it slightly warmer than inland areas in the winter. Duluth’s annual average temperature is 40°F and annual precipitation averages 31.2 inches (1991-2020 climate normals). Duluth’s winters are generally long, cold, and snowy. Between 1991 and 2020, the average number of days per year below 32°F was 169.7 ([GLISA 2024](#)) and average yearly snowfall was 90.2 inches ([National Centers for Environmental Information, National Oceanic and Atmospheric Administration, n.d.](#)).

![Graph](image)

*Figure 12.* Duluth, Minnesota 1991-2020 monthly normals from station USW00014913. Data from U.S. Climate Normals Quick Access ([National Centers for Environmental Information National Oceanic and Atmospheric Administration n.d.](#)).
Duluth’s climate characteristics are rapidly changing. Air temperature is increasing, precipitation is increasing and becoming more irregular, and intense precipitation events are becoming more frequent. Lake Superior is changing too. The amount and duration of ice cover on Lake Superior is decreasing, which is causing surface water temperature and evaporation rates to increase. Reductions of ice cover in winter are amplifying warmer summer air temperatures (GLISA 2024).

Temperature
The most extreme warming in Minnesota is occurring in winter. Average annual winter low temperatures in northern Minnesota have already risen (become less cold) by 7.2°F since 1895 (Minnesota Department of Natural Resources State Climatology Office, n.d., Figure 13). As extreme cold becomes less frequent, ice cover on Lake Superior is reduced. Between 1973 and 2010 the average yearly extent of Lake Superior’s surface area coverage by ice was reduced by 79 percent (Wang et al. 2012). Reduced ice cover can result in more winter lake-effect precipitation and increased wave activity (GLISA 2024, Huang et al. 2021) that can result in increased shoreline erosion. Less ice cover and earlier breakup in the spring also allows the exposed water to absorb more heat. Since 1980, surface water temperatures on Lake Superior have warmed twice as quickly as air temperature (Austin & Colman 2007). Although summers are not warming as quickly as winters, state climatology data shows that since 1895, summer high temperatures in Northern Minnesota have already increased by 1.4°F.

![Total temperature change since 1895](image)

**Figure 13.** Temperature changes across Minnesota since 1895. Minnesota Department of Natural Resources State Climatology Office n.d.

In Duluth, these warming trends are projected to continue. Annual daily temperature averages, maximum and minimum temperatures, and the number of extreme heat days are projected to increase. In winter, the number of days below freezing and snow depth are projected to decrease. The extent of these changes will depend on whether global greenhouse gas reductions are accomplished. Based on an unmitigated high-emissions scenario, Duluth’s climate in the year 2099 could be similar to today’s climate in northern Ohio (Fitzpatrick & Dunn 2019, Figure 14). Further details and numerical estimates of projected climate variables for the end of century in Duluth, Minnesota, under a high-emissions scenario are shown in Table 5.
**Figure 14.** Duluth, Minnesota could feel like Oregon, Ohio in the 2080s based on a high emissions scenario. Map generated by “What will climate feel like in 60 years” web application by Matt Fitzpatrick University of Maryland Center for Environmental Science - Appalachian Lab.

**Table 5.** Summary of select climate variables showing difference between end-of-century (2080-2099) values relative to historical simulations (1995-2014) for Duluth, Minnesota under a very high emissions (SSP 585) scenario. *(Liess et al. 2023)*.

<table>
<thead>
<tr>
<th>Climate variable for Duluth, Minnesota</th>
<th>Projected average change relative to historical simulations*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual daily average temperature</td>
<td>increase 11.5°F</td>
</tr>
<tr>
<td>Annual daily minimum temperature</td>
<td>increase 12.1°F</td>
</tr>
<tr>
<td>Annual daily maximum temperature</td>
<td>increase 10.8°F</td>
</tr>
<tr>
<td>Annual number of days that exceed 90°F</td>
<td>25.9 days</td>
</tr>
<tr>
<td>Daily minimum temperature in summer (Jun-Jul-Aug)</td>
<td>increase 10.4°F</td>
</tr>
<tr>
<td>Annual number of days with a minimum temperature below 32°F</td>
<td>decrease 62.8 days</td>
</tr>
<tr>
<td>Daily minimum temperature in winter (Dec-Jan-Feb)</td>
<td>increase 16.3°F</td>
</tr>
<tr>
<td>Annual number of days with snow cover depth greater than 1 inch</td>
<td>decrease 46.7 days</td>
</tr>
<tr>
<td>Annual number of days with snow cover depth greater than 6 inches</td>
<td>decrease 37.3 days</td>
</tr>
<tr>
<td>Average annual precipitation</td>
<td>increase 3.1 inches</td>
</tr>
<tr>
<td>Annual number of days with precipitation greater than 0.01 inches</td>
<td>decrease 8.1 days</td>
</tr>
<tr>
<td>Annual number of days with precipitation than 1 inch of precipitation</td>
<td>increase 1.3 days</td>
</tr>
<tr>
<td>Annual number of days with precipitation greater than 2 inches</td>
<td>increase 0.9 days</td>
</tr>
</tbody>
</table>

*Average calculated from Duluth, Minnesota city limits custom area of interest*
Precipitation
Precipitation patterns are already changing in Duluth. From 1951 to 2021, average annual precipitation increased by 4.1% (GLISA 2024). The majority of this change occurred in autumn and Duluth has seen a 20% increase in average autumn precipitation from 1951 to 2021 (GLISA 2024). While average precipitation is increasing overall, much of this is due to increasingly irregular, frequent, and intense precipitation events. In the Midwest, from 1958 to 2021, the total precipitation accumulating in the top 1% of heaviest precipitation days has increased by 45% (USGCRP 2023).

The precipitation trends observed today are projected to continue into the future (Table 5, Figure 15). Much of this overall increase will be due to increasingly frequent, irregular, and intense precipitation events (USGCRP 2023). Despite increased average yearly precipitation, the irregularity of precipitation events is likely to result in drier soils. This has implications for drought and wildfire frequency and intensity.

Projected precipitation changes are expected to vary by season. In Duluth, Minnesota, under a high-emissions scenario, the end of the century is projected to have more precipitation in winter and spring and less precipitation in summer. Autumn precipitation rates are projected to remain the same as autumn precipitation rates currently observed in 2023.

![Days per 100 Years With More than 4 in. Precipitation](image)

**Figure 15.** Extreme precipitation event projections for Minnesota. Days per 100 years with more than 4 inches of precipitation. Historical (1981-2010) on left and end of century (2081-2100) on right under a high emissions scenario. (University of Wisconsin Center for Climatic Research and University of Minnesota Climate Adaptation Partnership 2022). Downscaled data is from the University of Wisconsin Probabilistic Downscaling v2.0. 2022.

Impacts of a Changing Climate
Climatic changes such as increased temperatures and more frequent, irregular, and intense precipitation events, will impact human communities in many ways. Impacts likely to affect the Duluth area include reduced air quality, which will negatively impact human health, changing forest composition, and changing seasons.
Ground-level ozone, particulate matter, pollen, and mold are all expected to reduce air quality as the climate warms. More frequent extreme heat events and droughts, and increases in rates of vector-borne diseases, will have direct effects on human health. In our forests, northern tree species have already shifted northward; landscapes may change from boreal to temperate, or even shift towards savanna. Where forest migration is impeded by barriers such as cities, agriculture, or time, there is a risk that forest canopy cover will be reduced. Climate change will affect the timing of seasons in the future. Winters are expected to become shorter, spring and summer will arrive sooner, summers will last longer, and the first freeze in the autumn is expected to occur later. Many of these changes have already been observed (Minnesota Climate Adaptation Partnership 2024). [To read more about these climate change impacts, see CCSP 2008; Freilich et al., 2020; Friesen et al 2020; Janowiak et al. 2017; Wilson et al. 2023].

While reducing greenhouse gas emissions is a necessary policy priority to avert the most extreme climate change scenarios, some degree of climate change is already locked in for future generations. In fact, Duluth is already experiencing the effects of a changing climate, with fewer and shorter cold snaps, warmer summers, and more extreme winter and summer storms (National Weather Service, n.d.). Therefore, our response to climate change must include adaptation and mitigation of impacts on human communities and habitats.

**Human Dimensions of Climate Change in Duluth: Flooding**

The purpose of this report is to support neighborhood-level adaptation to increased flood risk in Lincoln Park. It is therefore appropriate to focus here on how climate change, water, and Lincoln Park’s topography intertwine to produce increased flood risk in the neighborhood.

Extreme rain events with at least six inches of rain falling over an area of at least 1,000 square miles are called mega-rains. These have been more than twice as common during the first 22 years of the 21st century than during the last 27 years of the 20th century (Minnesota State Climatology Office 2022). More intense rainfall events means an increased risk of flooding.

With fewer nights of extreme cold, insects such as emerald ash borers and eastern larch beetles, normally kept in check by extreme cold, are showing indications of increased winter survival (Minnesota Department of Natural Resources 2024). This has the potential to reduce forest canopy cover and result in a loss of associated hydrologic function (University of Minnesota Climate Adaptation Partnership 2024). The potential loss of forest cover on Duluth’s steep, rocky hillside, combined with more frequent flooding, raises the risk of severe erosion and damage to human infrastructure (Hazzard 2023).

An example of the effects of a mega-rain occurred in Duluth in 2012. On June 19 and 20, 2012, up to ten inches of rain fell on already saturated ground, causing water to rush through Duluth’s neighborhoods. This event caused more than $100 million in damage to homes, businesses, and public infrastructure in northeastern Minnesota. The flash flood uprooted trees, washed out roads, transported boulders, and clogged storm drains. Nine counties in northeastern Minnesota were declared federal disaster areas as a result of the flooding (Czuba, Fallon, & Kessler 2012; Lake Superior Duluth Streams 2019).
In the city of Duluth, the magnitude of destruction and damage was exacerbated by impervious soils, bedrock, and the steep gradients of Duluth’s many streams. High impervious surface coverage in the city intensified the damage to urban neighborhoods (Blum et al. 2020, Hollis 1975, Lake Superior Duluth Streams 2019, Minnesota Department of Natural Resources 2023). The hardest-hit communities were Duluth Heights and the Fond du Lac neighborhoods (Figure 8). Miller Creek flooded Duluth Heights and the St. Louis River inundated the Fond du Lac neighborhood (Czuba, Fallon, & Kessler 2012, Figure 8).

As Minnesota’s climate continues to change and communities experience more frequent and intense rainfall events, Duluth’s flood of 2012 is likely to be repeated. Communities need to be prepared for more frequent, more intense, flooding.

When assessing the risk posed to human health due to flooding, it is important to note the concentrated presence of contaminated soils and hazardous waste sites in Lincoln Park. A brownfield inventory assessment was conducted in Duluth in 2018. In Lincoln Park, including Rice’s Point, 205 of the sites surveyed appeared to meet the definition of a brownfield (Bay West n.d.). In Lincoln Park’s residential areas, excluding the industrial areas southeast of Highway 35, there are seven designated brownfield properties, 47 inactive hazardous waste sites, and 34 active hazardous waste sites. Most of these are located in census tract 156. Outside of the residential area there is one Superfund site in the neighborhood, which is located on Rice’s Point (United States EPA n.d.). These present additional risks if the neighborhood were to be inundated with water.
Solutions

Lincoln Park has inherited significant vulnerabilities such as hazardous waste sites, large areas of impervious surfaces, neglected structures, and generational and racial economic and social inequality. Lincoln Park is also a neighborhood that has demonstrated its desire and ability to take charge of its future - to build better sidewalks, houses, and parks; to advocate for residents’ priorities during redevelopment planning processes; and to nurture social cohesion (See Appendix I: Agencies and Organizations Working in Lincoln Park for a partial list of organizations that are active in Lincoln Park).

How can neighborhood organizations and the city of Duluth support Lincoln Park’s efforts to increase their resilience to climate change impacts?

Supporting neighborhood-led efforts could involve providing access to resources. For example, Minnesota Sea Grant was able to acquire grant funding to hire a consultant to identify city codes and ordinances that could be updated to allow for increased use of green stormwater infrastructure to mitigate flood risk. Another resource that might be beneficial to neighborhood groups is university research capacity and university extension services, which can provide data and research findings to inform local decision-making processes, or develop and facilitate community education or outreach in support of neighborhood resilience efforts.

Technical expertise is another area where organizations or the city may be able to contribute to local resilience-building projects. Consider green stormwater infrastructure (GSI), which uses or mimics the natural water cycle to treat water where it falls by maximizing local infiltration, evapotranspiration, or retention for reuse. Because GSI treats and holds water where it falls it is a powerful tool in flood mitigation. It also provides co-benefits such as creating green spaces or adding tree canopy cover, which reduces urban heat island effects and provides shade for residents. GSI can be technically complicated and city stormwater and planning teams, together with University extension GSI experts, are in a position to advise communities on the technical aspects of specific GSI techniques, which can help neighborhoods to make decisions based on the best available knowledge. For more information about green infrastructure, see Chapter 24.4 of the Fifth National Climate Assessment.

Another way to support neighborhood resilience-building work is to assist with facilitating connection. This could take the form of connecting residents with city representatives, or it could involve convening Lincoln Park residents, facilitating discussions of neighborhood issues and creating the opportunity for residents to design projects together. Communities might also benefit from being connected to ongoing programs and projects that may be able to augment the neighborhood’s logistical capacity or provide funding. Minnesota Sea Grant’s One Block at a Time project focused on connecting residents in all these ways. The outcome was a community-led decision to host a neighborhood block party where residents were able to talk directly with city stormwater staff. The community worked together to identify a top issue of concern on their block and develop a solution. The outcome was a rain-barrel-for-residents program in which 20 rain barrels were distributed for free, 10 of which were installed at residents’ homes by Community Action Duluth Construction Corps.

In Lincoln Park, a community defined by its river and creeks, its industrial heritage, and its strong sense of neighborhood identity, there is great potential for community-generated adaptation to our changing climate. For those who join in this work either as visiting volunteers, interns, or organizational staff, we hope that the resources provided in this report will set a foundation for effective project development and truly collaborative partnerships.
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Appendices

Appendix I: Resources
This appendix was compiled to assist those involved with resilience-building efforts in Lincoln Park, especially those who may be new to the area, to easily locate foundational planning documents and reliable reference sources. It is also intended to direct newcomers to people and organizations to consult or partner with.

Agencies and Organizations Working in Lincoln Park
It would be impossible to create a comprehensive list of every organization that works in Lincoln Park, but here are some. Not included are the many faith-based organizations that are active in the community. Understanding what these organizations are working on, or have done, is a good place to start if you are new to the neighborhood.

- American Indian Community Housing Organization (AICHO)
- Arrowhead Economic Opportunity Agency
- Boys and Girls Club
- Bridging Health Duluth
- City of Duluth Parks and Recreation
- Community Action Duluth
- Duluth Art Institute
- Duluth Public Schools, Independent School District 709
- Duluth Seaway Port Authority
- Duluth Transit Authority
- Ecolibrium3
- Entrepreneur Fund
- Fair Food Access Committee
- Family Freedom Center
- Great Lakes One Water Partnership
- Harrison Community Club
- Housing and Redevelopment Authority
- Lincoln Park Business Group
- Lincoln Park Children and Families Collaborative
- Lincoln Park Senior Center
- Lincoln Park Resource and Community Garden
- Local Initiatives Support Corporation (LISC)
- One Roof Community Housing
- Ready North
- St. Louis County Public Health and Human Services
- St. Louis River Alliance
- Western Lake Superior Habitat for Humanity
- Western Lake Superior Sanitary District
Apartment Complexes
Income Restricted: There are three apartment buildings in Lincoln Park that are income restricted. These are high-population centers that are exclusively for people with low-incomes - good locations for focused outreach and input solicitation.

- Lincoln Park Apartments
- Midtowne Manor
- Garfield Square Apartments

Market Rate: There are also three apartment buildings in Lincoln Park that provide market rate housing. Merritt School Apartments are lower priced than Lincoln Park Flats or Enger Lofts, which are both new additions to the neighborhood.

- Lincoln Park Flats
- Enger Lofts
- Merritt School Apartments (located on the border between Denfeld and Lincoln Park)

Area of Concern
EPA, St. Louis River AOC.

- The EPA maintains a comprehensive website on all things AOC, including history, process, partner organizations, maps, and remedial action plans. Consider this the authoritative Area of Concern library.


- Go to Case Study 9 - The St. Louis River Story. This is a great place to start with the Area of Concern - a quick summary of the process and history.


- This is a project report documenting the economic outcomes resulting from the cleanup of the St. Louis River Area of Concern.

Climate Change and Your Mental Health

When working in the field of climate change, it is important to pay close attention to the state of our mental health. Climate change is undeniably happening, and worst-case scenarios are certainly possible. These realities can have detrimental effects on our emotional wellbeing and our ability to function as agents for positive change. Lack of hope can also deter community participation.

Although emotionally navigating current and potential climate realities can be difficult, there is ample evidence to support a hopeful outlook. Identifying opportunities for positive outcomes is an essential component of our work; this can improve our own mental health, strengthen our ability to accomplish effective climate adaptation work, and motivate communities to participate in working toward better futures. The Harvard Center for Health Communication is a good place to start learning about effective climate communication strategies that motivate community involvement. For an excellent directory of resources for working with our own emotions, visit the All We Can Save Project website. And for a good list of groups and other resources that can help us navigate climate distress, visit Dr. Jennifer Atkinson’s website. Maintaining our own mental health as climate professionals is a vital part of our work, and sharing a hopeful outlook can help others to feel there is reason to participate as well.
Climate, Hydrology, and Geography

● This is a great resource regarding the relationship between emerald ash borer, ash tree loss, and stormwater management.

Climate and Health Vulnerability Assessment Tool, Minnesota Department of Health
● The Minnesota Climate & Health Vulnerability Assessment Tool is a pilot mapping tool that allows communities to visualize and analyze health, climate, and environment data. Minnesota communities can use this tool to better understand local climate exposure probabilities and vulnerabilities, ultimately supporting more strategic and equitable resilience planning.

Climate Explorer, Minnesota Department of Natural Resources
● Tool that allows you to view past and projected climate information in Minnesota. You can explore data on a variety of scales. This tool is especially good for historical climate data.

CliMAT - Minnesota Climate Mapping and Analysis Tool, University of Minnesota Climate Adaptation Partnership
● Currently the best tool for downscaled and highly localized climate projections for Minnesota that incorporate the newest (at the time of this report’s publication) global climate models (CMIP6). To quickly locate and cite dependable climate facts, without using an interactive data tool, the Minnesota Climate Adaptation Partnership’s website is a reliable source of up-to-date climate statistics.

EJScreen: Environmental Justice Screening and Mapping Tool
● This is the tool EPA uses to inform their work. It’s based on a nationally consistent dataset and approach to combining environmental and demographic socioeconomic indicators. The indicators are publicly-available data; EJScreen provides a way to display this information and includes a method for combining environmental and demographic indicators into EJ indexes. EJScreen is not intended to be used for risk assessment. Screening results should be supplemented with additional information and local knowledge to get a better understanding of the issues in a selected location.

● The Fifth National Climate Assessment is the US Government’s preeminent report on climate change impacts, risks, and responses. It is a congressionally mandated interagency effort that provides the scientific foundation to support informed decision-making across the United States.

● This is the best resource for information about the 2012 flood.

Green Infrastructure
● This website is an excellent one-stop shop for green stormwater infrastructure information. It does a great job explaining how GSI works and how it is applied in neighborhood settings. BREC is the website for the Recreation and Park Commission for the Parish of East Baton Rouge.

GLISA, the Great Lakes CAP/RISA team
● GLISA plays an important role in the region by co-producing usable climate information with a diverse array of partners while also advancing fundamental physical and social science in support of climate adaptation action.
**National Weather Service: Duluth Significant Weather Events Database**
- Here you will find every significant weather event in the Duluth area that has been documented by the National Weather Service. You can search by event type (tornadoes, floods, etc.) or by date.

**Plant Hardiness Zone Map, USDA 2023**
- The USDA’s hardiness zones were officially updated in November 2023 to reflect new climate normals. These zones are used by gardeners, greenhouses, nurseries, and farmers to determine what to grow in their area. What can be grown in Duluth is rapidly changing. Note also the narrow band within which Duluth is situated; its proximity to Lake Superior creates conditions for a Zone 4 environment, while the surrounding area is Zone 3. To really get an idea of the modulating effect of Lake Superior, zoom in to the islands near the south shore of Western Lake Superior.

**Population Vulnerability Assessment and Climate Adaptation Framework**
- The Duluth Vulnerable Population Assessment and Climate Adaptation Framework report includes a review of past and projected climate change impacts, identification of community vulnerabilities, and development of adaptation strategies. The assessment identifies climate risks and impacts on the population of Duluth MN as well as climate change impact multipliers such as urban heat island effects. Vulnerable populations throughout the city are identified and mapped using GIS.

**South St. Louis Soil and Water Conservation District, Miller Creek**
- This is St. Louis County SWCD’s website for the Miller Creek Watershed. You will find contact information, history of previous restoration projects, current restoration projects, the Miller Hill Mall Stormwater Management Plan, and a good map.

**University of Minnesota Climate Adaptation Partnership**
- Website provides a reliable source of up-to-date climate statistics, reports and tools for Minnesota communities

**Community Events**
Here are two good places to check for upcoming events or community programs.
- [City of Duluth Events and Programs Calendar](#)
- [Perfect Duluth Day Event Calendar](#)

**History**
**An Ethnographic Study of Indigenous Contributions to the City of Duluth**, Duluth Indigenous Commission and Turnstone Historical Research, 2015
- This is a report, commissioned by Duluth’s Indigenous Commission, documenting the history of the Duluth area, focusing exclusively on Indigenous communities. This report was based in part on extensive interviews with community members.

**HOLC Descriptions of Duluth** Nelson et al., Mapping Inequality: Redlining in New Deal America
- Here you will find the original 1936 HOLC descriptions of all Duluth’s neighborhoods. Zoom in to the city you are interested in. Click on a neighborhood section and the original HOLC grade and justification for assigning the grade should pop up.

**Mapping Inequality Website** Nelson et. al, Mapping Inequality: Redlining in New Deal America
- This is a great place to learn about the history of redlining, and to access HOLC descriptions and maps.

**Onigamiinsing Dibaajimowinan: Duluth’s Stories** Fond du Lac Ban of Lake Superior Chippewa
This is a companion to the Ethnographic Study of Indigenous Contributions to the city of Duluth. This interactive website is built and maintained by the Fond du Lac Band.

Sandy Lake Tragedy and Memorial. Great Lakes Fish and Wildlife Commission
- This is a brochure explaining the Sandy Lake Tragedy and its implications for Minnesota’s history and the Treaty of 1854.

- This is a newspaper article from the Duluth Herald, published in 1921. It documents an example of West Duluth functioning as its own city, separate from Duluth as a whole and disconnected from Lake Superior.

Planning Documents
2020 - 2024 Consolidated Plan (Community Development Plan)
- The city’s consolidated plan focuses on community development, rather than land use, which is addressed in the city’s comprehensive plan.

Analysis of Impediments to Fair Housing Choice 2020 (City of Duluth Planning and Development Division Report)
- This report is difficult to locate, but contains valuable data on demographic changes in Lincoln Park during the neighborhood’s revitalization. It also gives a clear definition of gentrification, as well as an explanation of how it occurs and how to address or prevent it.

City of Duluth West Superior Street Reconstruction Project
- The city maintains this website in order to provide the public with access to the reconstruction plans, priorities, timelines, funding sources, and the opportunity to contribute input. At each event, very detailed documentation of public input processes was done, and it’s all shared on this site. For example, you can see where each participant lives, works, or plays; what they submitted as free-response comments; which design features or project objectives they prioritize, and more.

Duluth Minnesota Online Planning Library
- Here is where all of Duluth’s publicly accessible planning documents are housed.

Health Impact Assessment for Small Area Plan (limited to census tract 156 and portions of tracts 128 and 20)
- The Small Area Plan refers to the redevelopment of Lincoln Park’s commercial strip. This Health Impact Assessment was conducted in order to provide recommendations for the plan and to inform its development. To learn what a Health Impact Assessment is, visit the World Health Organization’s HIA Webpage.

Historic Resources Inventory For the Lincoln Park Neighborhood
- The Duluth Heritage Preservation Commission initiated this inventory to document the historic buildings in the Lincoln Park neighborhood. The report was published in 2017.

Imagine Duluth 2035: Forward Together, An Update to the 2006 Comprehensive Land Use Plan
- A comprehensive plan lays down the guiding principles and policy priorities that guide future planning and legislative processes. See Chapter 11 - General Development for the City’s green infrastructure priorities.
Promoting health equity through the built environment in Duluth, MN: External Resources and Local Evolution Toward Health in All Policies

- This is an academic journal article, published in 2021, summarizing and analyzing the Small Area Plan’s Health Impact Assessment process.

LNPK Neighborhood Revitalization Plan 2012

- The At Home In Duluth Collaborative compiled this report in 2012, together with One Roof Community Housing, City of Duluth Community Development Office, and the Duluth Local Initiatives Support Corporation. This plan is for the entire neighborhood, but note that the neighborhood boundaries used in this report are different from the boundaries used by the city in 2023.

Lincoln Park Small Area Plan 2017 (limited to census tract 156 and portions of tracts 128 and 20)

- This is the plan for the redevelopment of Lincoln Park’s commercial district (also known as the Craft District). Its scope is limited to that area, which includes census tract 156 and portions of tracts 128 and 20 (which are not part of Lincoln Park)

St. Louis River Corridor Parks Mini-Master Plans

- Published in 2016, this documents the plans for improving the neighborhood parks located in the St. Louis River Corridor. Improving the neighborhood parks was a component of the St. Louis River Corridor revitalization plan.

Social Infrastructure, Social Cohesion, Resilience

CDC/ATSDR Social Vulnerability Index (SVI) Agency for Toxic Substances and Disease Registry, 2022

- This is an online SVI mapping tool. This was used to produce the SVI maps included in this report

Denaturalizing Disaster: A Social Autopsy of the 1995 Chicago Heat Wave Klinenberg, 1999

- This is an academic journal article, authored by Eric Klinenberg, about the Chicago Heat Wave of 1995 and the role of social cohesion in producing resilience.

Developing an Anti-Displacement Strategy Abt Associates and NYU Furman Center, 2023

- Go here to understand the definition and mechanism of gentrification, as well as how to prevent and address it.

How to Talk to People: The Infrastructure of Community. The Atlantic. Beck, Rashid, 2023

- This is a transcript of an interview with Eric Klinenberg about the Chicago Heat Wave and social infrastructure. There is also a link to the podcasted interview.
Appendix II: Community Characteristics

Summary of Census Data as of 2023 and Links to Census Data Tables: City of Duluth and Lincoln Park

Finding and understanding demographic data can be challenging. Often, it’s easiest to re-cite data that was reported in previous reports; the problem with this strategy is that the data reported by others may be outdated, or, if you cannot trace the source of the data or do not know how it was collected, it can be easily misinterpreted. To accurately report on city and neighborhood demographics, it’s best to use U.S. Census Bureau data, and to check for updated data regularly.

The list below includes all the data used in this report, together with a link to the Census Bureau table the data came from. Here, you will be able to see which survey tool was used to generate the data, what year it was collected, if it represents a 1 year or a 5 year period, and more. You will also be able to search for metrics not included in this report.

City of Duluth Demographics
Source: Census Bureau QuickFacts and United States Census Bureau Tables

- Census Response Rate 2020: “Duluth city”: 75.0%
- Population, DEC Redistricting Data 2020: 86,697
- Population, DEC Redistricting Data 2010: 82,265
- Age, 65 Years and Older: 15.7%
- Racial Distribution: White alone: 88.6%
- Bachelor’s Degree or Higher: 37.3%
- High School Graduate or Higher: 93.9%
- Unemployment Rate: 6.2%
- Industry for the Civilian Employed Population: Educational services, health care, social assistance: 33.0%
- Median Household Income: 61,944
- Poverty Rate: 18.5%
- Home Ownership Rate: 60.4%
- Median Home Value (Owner-Occupied): $176,300
- Median Gross Rent: $897
- Housing Occupancy: Vacant Housing Units, Percentage: 6.7%
- Transportation: No Vehicle Available (Workers 16 years and over in households): 2.5%
- Without Health Care Coverage: 3.5%
- Disabled Population: 11.7%
- Households with a computer: 96.1%
- Households With An Internet Subscription: 91.3%

Lincoln Park Demographics
(Census block groups 24, 26, 156). Source: United States Census Bureau Tables unless otherwise noted
* What are weighted averages, and how to calculate them.
*weighted average calculator: https://www.rapidtables.com/calc/math/weighted-average-calculator.html

- Census Response Rate 2020
  - Tract 24: 75.8%
  - Tract 26: 73.0%
  - Tract 156: 57.3%
  - Total: 65.8%
- Population (DEC Redistricting Data 2020)
  - Tract 24: 1053
- Tract 26: 2032
- Tract 156: 2967
- Total: 6052

- **Population 2010 (DEC Redistricting Data 2010)**
  - Tract 24: 1099
  - Tract 26: 2,123
  - Tract 156: 3082
  - Total: 6304

- **Age, 65 Years and Older**
  - Tract 24: 122
  - Tract 26: 164
  - Tract 156: 107
  - Total: 393

- **Racial Distribution, White Alone**
  - Tract 24: 888
  - Tract 26: 1,661
  - Tract 156: 2,028
  - Total: 4577

- **Bachelor’s Degree or Higher (age 25+)**
  - Tract 24: 169
  - Tract 26: 423
  - Tract 156: 259

- **High School Graduate or Higher**
  - Tract 24: 706
  - Tract 26: 1,177
  - Tract 156: 617

- **Unemployment Rate**
  - Tract 24: 12.1%
  - Tract 26: 5%
  - Tract 156: 16.2%
  - Total: 18.9%

- **Industry for the Civilian Employed Population**
  - Tract 24: Educational services, health care, social assistance: 174
  - Tract 26: Educational services, health care, social assistance: 350
  - Tract 156: Educational services, Health Care, Social Assistance: 258

- **Median Household Income**
  - Tract 24: $47,222
  - Tract 26: $46,619
  - Tract 156: $27,051

- **Poverty Rate (Poverty Status in the Past 12 Months, 2021 ACS 5 year estimates)**
  - Tract 24: 21.5%
  - Tract 26: 14.8%
  - Tract 156: 28.4%
  - Total: 22.6%

- **Home Ownership Rate (owner-occupied)**
  - Tract 24: 69%
  - Tract 26: 54.7%
  - Tract 156: 31.1%
  - Total: 45.6%
• **Median Home Value (Owner-Occupied)**
  - Tract 24: $120,600
  - Tract 26: $112,200
  - Tract 156: $99,800

• **Median Gross Rent**
  - Tract 24: $1,056
  - Tract 26: $838
  - Tract 156: $760

• **Housing Occupancy (percentage vacant)**
  - Tract 24: 4%
  - Tract 26: 4.7%
  - Tract 156: 10.9%
  - Total: 7.6%

• **Transportation: No Vehicle Available (workers 16 years or older)**
  - Tract 24: 28 of 632 4%
  - Tract 26: 39 of 1,113 3.5%
  - Tract 156: 74 of 1,098 6.7%

• **Without Health Care Coverage**
  - Tract 24: 63
  - Tract 26: 120
  - Tract 156: 169

• **Disabled Population**
  - Tract 24: 153
  - Tract 26: 267
  - Tract 156: 696

• **Households with a computer**
  - Tract 24: 483
  - Tract 26: 804
  - Tract 156: 1,150

• **Households with an Internet subscription**
  - Tract 24: 444
  - Tract 26: 713
  - Tract 156: 1,074