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When Disaster Meets Decades of Neglect:

Environmental Justice Dimensions of the May 2025 St. Louis Tornado

By

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ABSTRACT

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On May 16, 2025, an EF3 tornado tracked more than 22 miles through the heart of St. Louis, Missouri, killing five people and causing an estimated \$1.6 billion in damage. The storm's heaviest destruction concentrated in predominantly Black North and West St. Louis neighborhoods that had experienced decades of racially discriminatory housing policy and chronic disinvestment, while producing comparatively minor damage in wealthier, predominantly white neighborhoods along the same path. This thesis examines the May 2025 St. Louis tornado as a case study in disaster inequality, asking whether wind direction and speed can be explanatory for the distribution of building damage, or whether social factors may be contributing. This study also examines the experiences of residents and organizers, and what these reveal about how the ability to recover has unfolded across neighborhoods with vastly different histories of investment. Using a mixed-methods approach, this study combines building-level spatial and statistical analysis with qualitative content analysis of 38 community interviews from the People's Response Archive. Binomial generalized linear models applied to 2,702 individual building records across three census tracts demonstrate that racial composition may play a role in driving statistically significant additional variance in damage outcomes beyond wind speed, with residual deviance reduced by 428.5 points when neighborhood racial composition is added to the model. Qualitative findings document the near-total absence of coordinated government response in the immediate aftermath and the emergence of a large-scale community-led relief operation organized by Action St. Louis and ForTheCultureSTL within 48 hours of the storm. Together, these findings argue that the tornado's outcomes were not solely meteorological but social, produced at the intersection of a natural hazard with a landscape of vulnerability built by histories of redlining and systematic disinvestment. The thesis concludes with policy implications grounded in the demands of affected communities, centering Action St. Louis's People's Plan as a framework for equitable recovery.

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This thesis, while a critique of governmental institutions and the history of systematic disinvestment in the City of St. Louis, is ultimately a project rooted deeply in love for my home and all it has given me. Having grown up in St. Louis for thirteen years, the time I spent in this city is among my most treasured. I hope to see it thrive. It deserves to.

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Chapter 1: Introduction

1.1 Introduction

On May 16, 2025, a rain-wrapped, mile-wide tornado rated at an EF3 intensity touched down in Clayton, Missouri and quickly strengthened as it raced through the northern portions of St. Louis City. The tornado's path stretched 23.3 miles long, bringing maximum winds of up to 152 miles per hour – ultimately resulting in five fatalities, 38 injuries, and an estimated 5,000 structures and 4,000 trees damaged. This was the first fatal tornado in St. Louis since 1959. It lasted approximately 27 minutes (National Weather Service, 2025; East-West Gateway Council of Governments, 2025).

“We’re talking about a natural disaster meeting decades of systematic neglect, which just produces devastation,” said Kayla Reed, Executive Director of Action St. Louis (Kayla Reed, People's Response Archive, 2025). Reed spoke these words two weeks after the tornado, leading a community relief hub in O’Fallon Park that her organization had built from a YMCA parking lot in less than 48 hours post-tornado. Her framing captures the central consideration of this thesis: that the May 2025 St. Louis tornado was not primarily a meteorological event. It was co-produced by complex social and economic factors that came into relief during the natural disaster. This study examines how existing inequalities in St. Louis may have played a role in impacts and recovery.

Around the world, climate disasters are intensifying. Climate change is amplifying the risk of disasters not only by increasing the frequency and intensity of such events, but also by decreasing the resilience of surrounding communities (Gupta & Acharya, 2024). Along with a growing intensity of disasters, studies have shown that natural disasters such as hurricanes, floods, wildfires, and tornadoes disproportionately affect marginalized communities. Of the over 3 million people who were displaced by natural disasters in the United States between 2022 and 2023, individuals who identified as people of color, sexual or gender minorities, lower-income, disabled, and/or food insecure were more likely to be displaced (Aung & Seghal, 2024). This pattern is not only rooted in geography but is dependent on

historical policies that have left some communities overburdened and undersupported. Decades of redlining, systemic disinvestment, and inequitable access to public resources have left some neighborhoods across the country increasingly vulnerable to environmental hazards. Research has demonstrated that redlined neighborhoods tend to have more pollution burdens, less vegetation, and intensified urban heat islands compared to their respective city's average (Estien et. al., 2024).

St. Louis is a particularly legible city to observe and study these dynamics. The city has documented histories of racially discriminatory housing policy. These include well-documented federal government backed practices as the HOLC security maps of the 1930s that graded every Black neighborhood as hazardous, racially restrictive covenants that spread across more than 380 city neighborhoods by the 1940s, and urban renewal programs that demolished 54 St. Louis city blocks of thriving Black communities in the name of slum clearance (ArchCity Defenders et al., 2019). These policies predate and produce the geography that the tornado encountered in May 2025: the North Side of St. Louis already had aging, underinsured housing stock, hypervacancy rates among the highest in the country, and median home values that were a fraction of those in wealthier, predominantly white neighborhoods just miles away (ArchCity Defenders et al., 2019).

This thesis examines the May 2025 St. Louis tornado as a case study in disaster inequality, tracing how historical patterns of disinvestment shaped the distribution of physical damage, how institutional failures compounded that harm in the recovery period, and how community-led organizing filled the gap that government left. It argues that understanding what the tornado destroyed – and what it did not – requires understanding not just the meteorology of the storm but the political history of the city it moved through.

1.2 Research Question

This research investigates disparities in disaster damage, response, and recovery across the St. Louis region in the aftermath of the May 2025 tornado. Specifically, it asks:

- Is there a statistically significant difference in building damage across census tracts that cannot be explained by differences in wind exposure alone, and what role does neighborhood racial composition play in explaining that variation?
- What do the experiences of residents, organizers, and community members reveal about how recovery unfolded differently across neighborhoods, and what barriers shaped access to relief and reconstruction?
- What does the tornado reveal about how historical redlining and disinvestment continue to shape disaster vulnerability, institutional response, and community recovery capacity in St. Louis?
- How did community-led organizing fill the gaps left by formal emergency management systems, and what does the People's Response model suggest about the relationship between social capital and equitable recovery?

1.3 Scholarly Rationale

While substantial research exists on the role of historical disinvestment in shaping patterns of disaster vulnerability, as well as community engagement as a tool for resilience, relatively little scholarship examines the intersection of these dynamics within specific locations, and there is a dearth of data for the context of St. Louis. The academic study of disaster inequities, particularly their connection to urban planning and social policy, emerged most prominently in the wake of Hurricane Katrina, which exposed how structural inequalities amplify the human and material toll of climate disasters. However, similar analyses have yet to be applied to smaller-scale but equally revealing and subsequent events such as the May 2025 St. Louis tornado. In particular, it raises important questions as to how lessons from disasters such as Katrina are being learned and applied across the country.

Because the tornado occurred recently, scholarly literature on its social and infrastructural impacts remains scarce. Existing accounts are largely journalistic, focusing on individual narratives of loss and recovery. This thesis seeks to begin filling that gap by situating the 2025 tornado within St. Louis's longer history of unequal investment, with attention to the current-day disparities seen in disaster recovery. By connecting the city's planning and policy legacies to the spatial distribution of damage and recovery, this

research contributes to a growing body of work that links environmental justice to urban resilience (e.g. Lamb & Vale, 2025; Martin et. al, 2018).

This study adopts a mixed-methods approach to spatially consider the tornado path and its damage, combining spatial analysis with qualitative insights from community perspectives and on-the-ground policy work. In doing so, it recognizes the value of lived experience and local stakeholder knowledge in understanding disaster response and recovery – forms of evidence that remain underutilized in much of policy-oriented research. Through this integrative framework, the project aims not only to advance scholarly understanding of disaster inequity but also to highlight the importance of community voices in shaping equitable climate resilience strategies.

1.4 Policy Rationale

The questions posed in this thesis have implications for disaster preparedness and recovery policy in St. Louis and beyond. By better understanding structural conditions that may have played a role in producing unequal damage outcomes and the institutional failures that could have compounded these in the recovery period, this research offers a basis for future policy recommendations aimed at building more equitable emergency management systems. It also highlights the effectiveness of community-led recovery efforts and argues for the formal recognition and resourcing of community organizations as partners in disaster response rather than last-resort substitutes for government. Addressing these disparities is not only a matter of justice but of effective governance: when the communities most exposed to disaster risk are also the least served by formal recovery systems, the result has been shown to be slower, more uneven, and more costly recovery for entire regions.

1.5 Hypothesis

The May 2025 St. Louis tornado serves as a case study for examining disparities in disaster damage, response, and recovery across the St. Louis region. This thesis hypothesizes that the distribution of building damage across affected census tracts reflects not only differences in storm intensity but the accumulated structural vulnerabilities produced by decades of racially discriminatory housing policy and chronic disinvestment in majority-Black neighborhoods. It further hypothesizes that the recovery period

reproduced these inequities through institutional failures and barriers to formal relief access, and that community-led organizing by organizations such as Action St. Louis filled gaps that government response left – demonstrating both the remarkable capacity of community social capital and the structural conditions that made its activation necessary.

1.6 Research Design

This thesis employs a mixed-methods approach combining spatial and statistical analysis with qualitative content analysis to examine disparities in disaster damage and recovery across the St. Louis region. The quantitative component focuses on three census tracts affected by the May 2025 tornado: Census Tract 1096 in O'Fallon, Census Tract 1101 in the Greater Ville and Penrose neighborhoods, and Census Tract 2164.02 in Clayton. Using building-level damage data collected by Microsoft's AI for Good Lab shortly after the disaster, this analysis uses binomial generalized linear models to assess whether observed differences in damage rates across tracts can be explained by wind speed alone, or whether neighborhood racial composition (specifically the percentage of Black residents in each tract) explains significant additional variance. The analysis draws on 2,702 individual building records (drawn from Microsoft AI For Good Labs) across the three tracts and incorporates 2019-2023 American Community Survey demographic data merged by census tract FIPS code.

The qualitative component draws on 38 video interviews drawn from the People's Response Archive, a community-driven project documenting lived experiences and grassroots recovery efforts following the tornado. These interviews are analyzed alongside local news coverage and organizing documents from Action St. Louis, including its tornado response report and People's Plan. Together, these materials allow for an examination of whether and how recovery unfolded differently across neighborhoods, types of barriers residents encountered in accessing formal relief, and how community-led organizing responded to limits of the institutional response.

1.7 Chapter Roadmap

Chapter 2 provides a literature review situating this project within broader scholarship on environmental justice, disaster vulnerability, social capital, and equitable resilience. Chapter 3 provides

historical and institutional context for the St. Louis region, tracing the legacy of redlining and disinvestment and examining how the city-county divide shapes disaster response capacity. Chapter 4 details the methods used in both the quantitative and qualitative components of the study. Chapter 5 presents the statistical and qualitative findings alongside discussion situating those findings within the theoretical frameworks established in the literature review. Chapter 6 synthesizes the study's conclusions, offers policy implications for building more equitable and community-centered disaster response systems, and reflects on the limitations of this research and directions for future study.

Chapter 2: Literature Review

2.1 Environmental injustice and histories of disinvestment

Growing frequency and intensity of climate disasters is compounded by systemic environmental injustice in the United States, much of which can be traced to racially discriminatory housing policies of the 1930s and 1940s. The Home Owners' Loan Corporation (HOLC) redlining maps systemically and disproportionately stigmatized Black and people of color occupied neighborhoods access to a federally backed mortgage market, redirecting investment to white suburban neighborhoods (ArchCity Defenders et. al., 2019). Decades of disinvestment created housing decay, infrastructural obsolescence, disparities in service delivery, and a multi-generational decline in economic mobility in redlined areas. As communities of color were pushed into spaces, often undesirable land uses followed. Environmental racism research examines the historical siting of toxic facilities, exposure to pollution, and lack of green space that has historically disadvantaged communities of color (Bullard, 1990; Taylor, 2014; Nardone et al., 2021).

Thus, segregation was not the product of individual racial prejudice or personal choice, but rather of explicit governmental policies, local, state and federal, including discriminatory FHA home loan programs and public investment in whites-only suburban communities (Rothstein, 2017). Such de jure segregation is analytically distinct from informal discriminatory practices, because racial segregation was engineered by the state's own hand, as manifested in North St. Louis's building stock, insurance rates, and ability to recover. This disinvestment has led to a host of challenges in formerly redlined communities, such as an increase in urban heat island intensity (Hoffman et al., 2020; Nardone et al., 2021) disparate exposure to air pollution (Lane et al., 2022), and lower tree canopy coverage (Locke et al., 2021). These disparities in infrastructure interacting with climate hazards include their contribution to high surface temperatures and heat mortality, substandard housing and wind and indoor air hazards, and a lack of adequate flood control infrastructure that results in damage from heavy rainfall including rain from tornadoes.

In an examination of instances of extreme weather, Klinenberg (2002) conducted a social autopsy of the 1995 Chicago heat wave that is particularly instructive. The geographic distribution of mortality in this wave, he observes, is "hauntingly similar to the everyday organization of urban inequality." The most extreme concentrations of death were in depleted, predominantly black neighborhoods of the city's south and west sides, already suffering from unemployment, poverty, institutional abandonment and massive depopulation. Those conditions were not created by the heat wave, but the heat wave passed along the lines. A synthesis of twenty years of sociological disaster research by Fothergill and Peek (2004) found that low-income households are more likely to live in vulnerable housing, be uninsured or without savings to cover losses, receive inadequate post-disaster assistance, and take longer to recover during reconstruction phases.

The theoretical framework of any interest in the issues raised here is Bullard's (1990) work on environmental justice (EJ). Bullard argues that communities of color do not suffer the disproportionate environmental impacts they do by accident, but because Black and poor communities are systematically excluded from the political decisions about where environmental hazards are sited, who gets protective infrastructure, and who gets prioritized in emergency response. In disaster settings, the EJ framework shifts justice questions away from the capacities of individuals to prepare and respond, and instead toward the structural features producing vulnerability, or, in other words, why certain residents are unprepared for a disaster event, and why they are not continually protected by urban systems.

2.2 Unequal Disaster Planning, Response, and the Reproduction of Injustice

Disaster preparedness and recovery strategies differ across US cities and are one of the key factors determining the communities at greatest risk from climate-related disasters. Both federal and local emergency management structures are less likely to allocate resources to low-income neighborhoods and communities of color, resulting in less protective infrastructure, mitigation projects, and disaster preparedness initiatives (Bullard & Wright, 2009). These differences affect not only immediate exposure to hazards, but also the longer-term ability to absorb and recover from extreme events.

Hurricane Katrina is the most-studied case of how inequitable planning and government response can create extreme environmental injustice. In New Orleans, the Lower Ninth Ward and other areas that were most flooded had a long history of insufficient drainage, evacuation investment, and flood protection infrastructure (Kates et al., 2006). Evacuation plans also assumed that residents would be able to leave by car, an assumption that proved catastrophically false. Black residents of New Orleans relied on public transit at four times the rate of white residents, leaving many without viable means of escape when buses were not mobilized in sufficient numbers before the storm (Bullard & Wright, 2009). This neglect directly contributed to deaths among residents without personal transportation (Brunkard et al., 2008). Survey data collected from over 1,200 Katrina survivors found that race and class independently shaped disaster outcomes: Black workers in New Orleans were nearly four times more likely than white workers to lose their jobs after the storm, and low-income Black homeowners faced the greatest compounded disadvantages in housing recovery and likelihood of return (Elliott & Pais, 2006).

Recovery programs from the disaster have institutionalized these inequalities. The Road Home Program, the largest post-Katrina housing recovery program, calculated how much to give homeowners based on their home's pre-Katrina value. This formula discriminated against Black homeowners, whose properties were systematically undervalued as a result of the same redlining processes that produced the original housing inequalities, resulting in grants that fell far short of actual repair costs (Gotham, 2014). These dynamics compounded pre-existing structural barriers to recovery, including widespread structural damage, low homeownership rates, and limited access to capital, that disproportionately affected Black neighborhoods in the Ninth Ward (Green et al., 2007). This pattern is neither unique to Katrina nor unique to hurricanes. Analyzing American disasters more broadly, Howell and Elliott (2019) show that FEMA and insurance systems are systematically more accessible to homeowners in wealthy neighborhoods. Renters and other low-income groups, who tend to live in older and poorly maintained housing, are less able to access either FEMA or insurance systems. At the county level, they found that in counties experiencing the most severe disaster damage, white survivors' wealth increases by an average of

\$126,000 while Black survivors' wealth decreases by an average of \$27,000 in the aftermath of large disasters.

One reason the failures compound is heirs' property: land that passes informally in families without the formal transfer of title. Heirs' property residents are often systematically denied FEMA disaster recovery assistance for not having clear title to their property, even if they had lived on and maintained it for decades. This has affected Black communities in particular because they were denied systems of wealth building that would have made title transfer to heirs a routine process (Facing South, 2018). This is the downstream effect of the redlining and discriminatory lending practices that made informal inheritance necessary, now being used against the neighborhoods that need those resources the most.

Disaster capitalism is described as the use of disaster to justify anti-democratic, market-oriented policies that displace marginalized communities and divert public money to private markets (Klein, 2007). Following Katrina, disinvestment in public housing, privatization of public education, and tax incentives for urban renewal all helped to accelerate gentrification in neighborhoods characterized as sites of revitalization (Gotham, 2012). Stoler et al. (2025) theorize "hazard gentrification," whereby private-sector investment and property appreciation following disaster recovery and mitigation spending displaces lower-income residents, particularly when reconstruction makes damaged neighborhoods attractive to outside investment. This dynamic, where recovery processes themselves become conduits of dispossession, was identified by residents and organizers as the primary threat in the immediate aftermath of the 2025 St. Louis tornado.

The foundational work of Quarantelli and Dynes (1977) established that community response to disaster tends toward organized, cooperative behavior rather than panic or breakdown. However, the critical question is whether that response is recognized and resourced by formal systems, or ignored while government response lags. Tierney's (2014) analysis of the social roots of risk situates institutional failure within a broader argument: disasters are produced by the same social order that produces everyday inequality, and the institutions responsible for disaster response are embedded in and reproduce that order.

When emergency management systems fail communities of color, that failure is not accidental. It reflects the same structural priorities that shape which neighborhoods receive preventive investment and which do not.

While hurricane, flood, and wildfire planning and reconstruction projects have been well-studied, little attention has been paid to social and policy-induced disparities of tornado damage across a city or region. Particularly in cities like St. Louis with segregated neighborhoods and chronically underinvested infrastructure, the impact of these disparities on tornado mitigation, emergency response, and recovery funding is largely unexplored. This gap shows the need to explore how policy legacies and government response interact to shape tornado impacts, as well as community resilience to such impacts.

2.3 Social Vulnerability and the Foundations of Disaster Resilience

The differential outcomes in the disaster literature are not only the result of differential exposure to hazards, but also vary depending on the social and institutional resources a community has before, during, and after a disaster strikes. Social cohesion and community capital are among the most meaningful determinants of community resilience, and mainstream emergency management systems have historically overlooked these social considerations in favor of technical and infrastructural solutions (Aldrich & Meyer, 2015).

A foundational theoretical framework for understanding these dynamics is Wisner et al.'s (2004) Pressure and Release (PAR) model, which links disaster impact to its root causes rather than treating catastrophe as the product of a natural hazard alone. In this framework, disaster is the outcome of a progression of vulnerability built up over time through human decisions — political and economic structures, disinvestment, and unsafe physical conditions such as deteriorated housing and absent local institutions. This thesis draws on the PAR model's core insight: that what appears as a natural catastrophe is more accurately understood as the intersection of a hazard with socially produced conditions.

The impact of social capital on disaster recovery has been well documented. Aldrich and Meyer (2015), after reviewing a large number of studies, found that social capital, defined as the networks of trust, reciprocity, and collective action within and between communities, is a core engine of recovery that

is more important than a community's socioeconomic context, population density, or the amount of aid it receives. They distinguish between bonding, bridging, and linking capital. Bonding capital, which refers to social connections within a community, supports spontaneous informal mobilization and mutual aid in disaster recovery. Bridging capital relates to connections of communities to outside networks and resources. Linking capital is the extent to which formal recovery mechanisms are accessible and accountable to individuals.

Across multiple disaster contexts, communities with higher social capital consistently show better recovery outcomes, including faster return of displaced residents and stronger collective response, even when physical damage is comparable (Aldrich & Meyer, 2015). Conversely, government recovery programs that disrupted social networks, for example by placing disaster victims in temporary housing that separated neighbors, consistently produced worse outcomes. The implication is significant: emergency management systems that fail to account for existing social infrastructure may actively undermine the most effective mechanisms of recovery.

These dynamics are particularly consequential in historically marginalized communities, where social cohesion has often been built precisely in response to institutional abandonment. Solnit (2009) observes across five major disasters that the dominant human response to catastrophe is not panic or individualism but mutual aid, solidarity, and spontaneous self-organization. She introduces the concept of "disaster collectivism" to describe the intense, purposeful cooperation that emerges when normal social order is suspended, and argues that the joy many survivors describe in these moments reveals unmet everyday desires for community, purpose, and collective care. In communities that have organized politically, that have developed shared analysis, trusted institutions, and collective practices of mutual care through prior struggle, those capacities are activated more rapidly and more effectively when disaster strikes. The People's Response in St. Louis, organized within 48 hours by Action St. Louis and ForTheCultureSTL and drawing on over a decade of community organizing infrastructure, is a direct example of what Solnit describes: not improvised charity, but the expression of a prior community that already knew how to show up for itself. Community-led response organizations are extraordinarily

effective in the immediate aftermath of disaster but are not designed or resourced for long-term recovery; without institutional follow-through from government, they risk exhausting themselves filling a gap that government created.

Despite this evidence, the mainstream disaster resilience literature has historically focused on technical and infrastructural approaches, often failing to account for the social and political dimensions of who gets to be resilient and on whose terms. Matin, Forrester, and Ensor (2018) address this gap directly through the concept of equitable resilience, which they define as a form of resilience that takes seriously social vulnerability and differential access to power, knowledge, and resources. Unlike conventional resilience frameworks, which can inadvertently reproduce inequality by raising housing costs, displacing residents, and directing resources toward already advantaged communities, equitable resilience centers the populations that bear the greatest burden and asks whether they can remain safely in their neighborhoods, maintain their livelihoods, and shape the strategies designed in their name. This procedural dimension. Who is in the room, whose knowledge counts, and whose interests drive planning connects directly to Harvey's (2008) argument that decision-making power in urban contexts is systematically concentrated among political and economic elites, leaving residents with the fewest resources excluded from shaping the policies that most directly affect their lives. In disaster recovery, this exclusion compounds the physical harm with a political one, as communities fight for recognition and resources at exactly the moment when they are most exhausted and vulnerable.

2.4 Toward Equitable Recovery: Frameworks for Community-Centered Disaster Policy

The literature reviewed in the preceding sections converge on a central problem: existing disaster policy frameworks, despite stated commitments to equity, are structurally misaligned with the needs of the communities most vulnerable to disaster. The question this thesis engages is not only whether damage patterns in St. Louis reflect systemic disinvestment, but what an adequate policy response would require. The equitable resilience literature offers several frameworks directly relevant to this question.

Both Lamb and Vale (2024) and Knox-Hayes et al. (2025) begin from the same recognition: resilience strategies that fail to account for existing inequalities can reproduce and intensify them. Green

infrastructure investments, building code upgrades, and post-disaster redevelopment all raise property values; in neighborhoods with high proportions of renters and low-income homeowners, this appreciation can trigger displacement, converting disaster recovery into a mechanism for deepening inequality. Knox-Hayes et al. (2025) propose the Equitable Resilience Framework (ERF), which combines a capabilities approach with community knowledge and tradeoff analysis to bring residents, researchers, and policymakers together in designing resilience solutions, addressing what they identify as the technocratic shortcomings of conventional resilience planning. Lamb and Vale (2024) complement this with a model organized around four domains they call LEGS: environmental safety and vitality, security from displacement, stable and dignified livelihoods, and enhanced self-governance. Together these frameworks argue that community participation must be treated not as an ethical add-on but as an operational requirement, because without it, resilience strategies will reflect the priorities of those with institutional power rather than the communities they claim to serve.

The deep skepticism documented in the People's Response Archive about developer-backed political interests and gentrification risk reflects precisely this understanding: the right to return and rebuild is inseparable from the right to shape what is being returned to. Residents in affected neighborhoods must have not only a voice in how their neighborhoods are rebuilt but the power to define what rebuilding means, whether it prioritizes returning families, maintaining affordable housing, preserving cultural and historical character, or building in ways that address rather than reproduce vulnerability.

Taken together, this body of literature, from Wisner et al.'s vulnerability framework to the equitable resilience literature to the Katrina scholarship to the mutual aid tradition, provides the analytical scaffolding for the case study this thesis presents. The following chapters apply this framework through spatial analysis of damage patterns and qualitative analysis of community experiences, and draw from it a set of policy recommendations aimed at shifting emergency management systems toward the equitable, community-centered model the literature demands. The following section provides background on the case of St. Louis.

Chapter 3: Background

3.1 The St. Louis City-County Divide

Since 1876, the City of St. Louis has operated as an independent city, entirely separate from St. Louis County. Unlike most American cities, which exist within a surrounding county, St. Louis functions simultaneously as a city and a county, collecting its own taxes, administering its own courts, and providing its own public services without the benefit of a broader county tax base to draw on. The City of St. Louis is governed by a Board of Aldermen as its legislative body and a Mayor as its chief executive, with eight county offices handling functions that would ordinarily fall under county government elsewhere in Missouri (City of St. Louis, n.d.).

The effects of this fragmentation on equity in the region are well documented. With over ninety separate municipalities in St. Louis County, each operating with its own tax base and governmental structure, public resources have never been distributed evenly across the region (ArchCity Defenders et. al., 2019). Wealthier, predominantly white suburban municipalities have directed investment inward, while municipalities with smaller, majority-Black tax bases have struggled to fund basic services and infrastructure. The City of St. Louis, with a shrinking population and a high concentration of low-income residents, has faced particular strain: property tax revenues have declined as population has fallen, even as the cost of maintaining aging infrastructure has grown. The result is a city that has been systematically under-resourced for decades, with the consequences concentrated most heavily in its predominantly Black North Side neighborhoods. As ArchCity Defenders et. al. (2019) argue, municipal fragmentation in St. Louis has long functioned not as a neutral administrative arrangement but as a structural mechanism for concentrating wealth in some places and deprivation in others, reinforcing the racial and spatial divides that shaped the region's development across the twentieth century.

3.2 History of Redlining, Unequal Investment, and Environmental Racism in St. Louis

The origins of environmental racism in St. Louis, understood as the disproportionate impacts of environmental hazards on people of color (Bullard, 1990), date back over a century, rooted in legacies of segregation and redlining that have shaped geographies of risk, disinvestment, and ecological burden across the city. In 1916, St. Louis became the first city in the country to pass a municipal segregation ordinance prohibiting Black residents from moving into blocks that were more than 75 percent white (ArchCity Defenders et. al., 2019). One year later, the Supreme Court invalidated explicit racial zoning in *Buchanan v. Warley*; however, institutions shifted to race-neutral tools used in discriminatory ways, including deed restriction, zoning categories, and real estate licensing rules (ArchCity Defenders et. al., 2019). Racially restrictive covenants became the primary mechanism of segregation, with thousands of properties across the St. Louis region containing covenants preventing the sale or occupancy of Black residents, binding not only the original signer but any successive property owner for terms ranging from 20 to 50 years (ArchCity Defenders et. al., 2019). By the 1940s, nearly 380 neighborhood deed covenants were in place in the City of St. Louis, eventually spreading into St. Louis County. Historian Colin Gordon estimated that over 80% of new suburban housing developed in the 1940s contained racially restrictive deed covenants, further deepening the segregation of city and county (ArchCity Defenders et. al., 2019).

In 1939, the Home Owners' Loan Corporation (HOLC) created residential security maps across the county, grading neighborhoods from A ("Best") to D ("Hazardous"). Regardless of housing quality or economic stability, every neighborhood with Black residents was graded a D. These grades determined access to federally-backed mortgages: between 1947 and 1952, of the over 70,000 new homes built in St. Louis County, fewer than 0.05% were available to Black families (ArchCity Defenders et. al., 2019). Redlining not only restricted Black families' housing options but prevented them from building generational wealth through home equity. Figure 1 shows the redlining map for St. Louis.

HOLC Redlining Map; St. Louis County vs. City of St. Louis

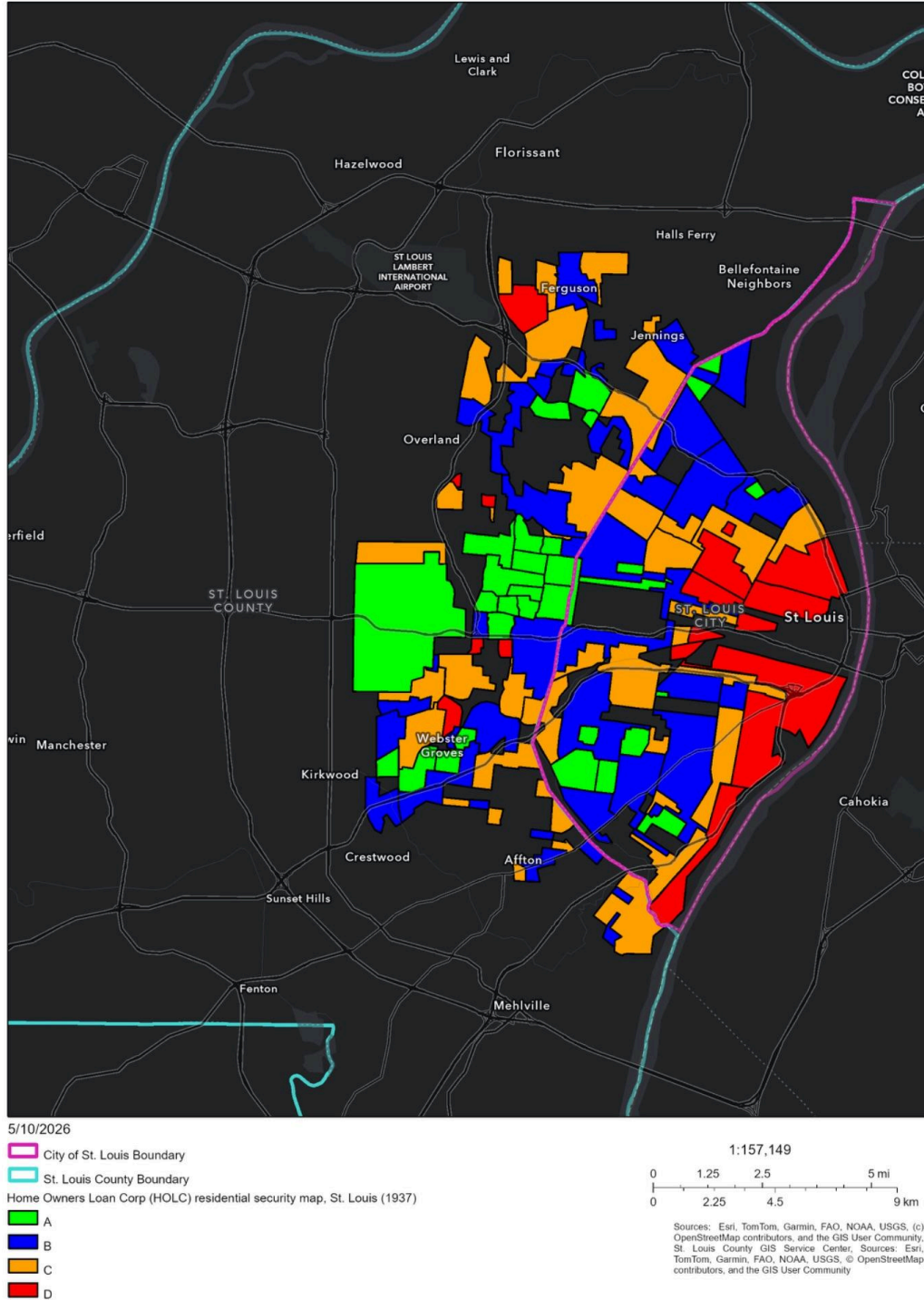


Figure 1: Home Owners Loan Corporation (HOLC) residential security map of St. Louis (1937) with city and county boundaries

The urban renewal programs of the mid-twentieth century compounded these harms. Beginning in the mid-1950s, the City of St. Louis demolished hundreds of blocks of Black neighborhoods under the banner of slum clearance. The Mill Creek Valley clearance, which began in 1959, demolished a thriving Black neighborhood of approximately 20,000 residents spanning 54 city blocks, destroying 5,600 housing units, 800 businesses, and 40 churches (Hays, 2023; Hemphill, 2018). Ninety-five percent of displaced residents were Black, and the city offered just \$100 in moving expenses per family (Blankenship, 2025). By the 1960s, 78 percent of all families displaced by urban renewal in St. Louis were people of color (Hays, 2023). Highway construction followed a similar logic, with Interstate 64/40 routed through the southern portion of the Mill Creek Valley footprint in ways that accelerated depopulation and severed once-connected communities (Blankenship, 2025).

The impacts from decades of structural financial policies impacts the environment, health, and quality of life for residents. The 2019 Environmental Racism in St. Louis report illustrated that Black St. Louis residents face disproportionately high exposure to lead, mold, and air pollution, with Black children more than twice as likely to test positive for elevated blood-lead levels and making far more emergency room visits for asthma than their white counterparts (Interdisciplinary Environmental Clinic, Washington University School of Law [IEC], 2019). Majority-Black neighborhoods also contain most of the city's vacant properties, which contribute to deteriorating housing conditions, illegal dumping, and higher energy burdens caused by aging and inefficient buildings (IEC, 2019). Data from 2019 showed that more than 40% of St. Louis City's census tracts had at least 10% vacant properties, ranking St. Louis as one of the worst cities in the country for hypervacancy (IEC, 2019). These inequities compound one another, shaping uneven health outcomes, limited access to resources, and reduced institutional support, and they are directly legible in the damage patterns produced by the May 2025 tornado.

The Delmar Boulevard corridor represents perhaps the most visible expression of this accumulated inequality. Known colloquially as the Delmar Divide, this major east-west thoroughfare has long functioned as one of the starkest racial boundaries in American urban geography, separating the predominantly white, wealthier neighborhoods of the Central West End and University City to the south

from the predominantly Black, lower-income neighborhoods of North St. Louis to the north. The divide is not merely demographic: it is physical, economic, and environmental. Properties north of Delmar are worth a fraction of comparable properties to the south, a direct consequence of decades of redlining, disinvestment, and discriminatory lending (IEC, 2019). The tornado's path moved through this geography with devastating clarity, producing the spatial damage pattern that this thesis examines.

3.3 The May 16, 2025 Tornado

On the afternoon of May 16, 2025, an EF3 tornado touched down in the St. Louis region and tracked more than 22 miles through the heart of the city before lifting near Southern Illinois University Edwardsville. With peak winds of 152 miles per hour and a width expanding to nearly one mile at points, the storm moved northeast through the city at approximately 55 miles per hour, passing through the Central West End, the Academy neighborhood, Fountain Park, Lewis Place, Kingsway East, the Greater Ville, and O'Fallon Park before continuing into Illinois (National Weather Service, 2025). The tornado killed five people and injured 38, making it the first deadly tornado to strike St. Louis since 1959 (National Weather Service, 2025). FEMA officials described the residential damage as the largest-scale the organization had surveyed since the 2011 Joplin tornado, with total damages estimated at \$1.6 billion (Smith, 2025). More than 5,000 structures were damaged or destroyed (East-West Gateway Council of Governments, 2025).

The tornado's path concentrated the heaviest destruction in predominantly Black North and West St. Louis neighborhoods that had experienced decades of disinvestment, while producing comparatively minor damage in wealthier, predominantly white neighborhoods it also passed through. In the Fountain Park neighborhood, the tornado reached EF3 intensity, partially destroying a strip mall and flattening a brick townhouse. Part of the Centennial Christian Church collapsed with three people inside; all were rescued, though one later died from injuries sustained in the collapse (National Weather Service, 2025). In the Greater Ville neighborhood, the tornado reached its peak intensity, flattening multiple brick townhouses along North Newstead Avenue. Investigators later noted that at least one structure initially rated as EF3 damage was downgraded after it was discovered that the building had been abandoned since

between 2011 and 2014 and had been gradually deteriorating for over a decade, raising questions about how much of the apparent wind damage was actually the product of preexisting structural vulnerability in the housing stock (National Weather Service, 2025).

Adding to the disaster was the failure of the city's outdoor warning sirens. Despite a tornado warning issued by the National Weather Service at 2:34 p.m., the City of St. Louis's tornado sirens did not sound. St. Louis's Emergency Management Commissioner Sarah Russell was attending an off-site emergency preparedness workshop when the warning was issued, leaving residents without the most basic alert that would have prompted them to seek shelter (Walker, 2025). Multiple participants in the People's Response Archive cited the absence of sirens as a critical institutional failure and named it explicitly alongside the deaths, treating the two as inseparable expressions of the same pattern of negligence toward North and West St. Louis.

The governmental response in the immediate aftermath was widely criticized as inadequate and slow. Governor Mike Kehoe authorized \$100 million in state aid, but federal aid remained pending for weeks as residents navigated the gap between the scale of destruction and the availability of institutional support (Keller, 2025). Eighty volunteer structural engineers affiliated with the Missouri Structural Assessment and Visual Evaluation coalition conducted habitability assessments in the first week, placing color-coded stickers on structures to indicate safety status, though the stickers were non-binding and left residents to make consequential decisions about their homes without enforceable guidance (Solomon, 2025). Tens of thousands of residents were left without power for extended periods. The absence of coordinated government relief in the days and weeks following the storm created the conditions under which the community-led People's Response emerged as the primary source of aid for thousands of North and West St. Louis residents, a dynamic examined in detail in the results chapter that follows.

3.4 The 2025 Mayoral Election and Political Context of Recovery

The political conditions under which the May 2025 tornado's recovery has unfolded were shaped significantly by a mayoral election that concluded just 31 days before the storm. Tishaura Jones served as the 47th mayor of St. Louis from 2021 to 2025, becoming the first African American woman to hold the

position (City of St. Louis, n.d.). Her 2021 victory was built substantially on North St. Louis voter support and the active backing of grassroots organizations. Kayla Reed, Executive Director of Action St. Louis, campaigned relentlessly for Jones, later saying "all of that background creates the reality where Tishaura wins" (Markon, 2021). Jones was not only a political ally of North St. Louis; she was a resident of it. Her home sits across the street from Ivory Perry Park in North City, which the tornado flattened (Jones, People's Response Archive, 2025). In a post-election interview reflecting on her defeat, Jones observed that North St. Louis voters faced an impossible standard: "We had neighborhoods that had not been touched in decades, but there's no patience there. The expectations there are so high to deliver and deliver immediately to address the decades of neglect in four years, which is impossible" (Lippmann, 2025).

Jones ran for reelection in 2025 against Alderwoman Cara Spencer, who had narrowly lost to Jones in the 2021 general election. In the March 2025 primary, Spencer received more than double Jones's vote total, with 23,826 votes for Spencer versus 11,612 for the incumbent, dominating not only south St. Louis but also wards represented by politicians ideologically aligned with Jones's progressive policies (Huguelet, 2025). Spencer defeated Jones in the April 8, 2025 general election by a margin almost as wide as in the primary, becoming the 48th mayor of St. Louis (Huguelet, 2025). She was sworn in on April 15, 2025 (City of St. Louis, 2025).

The financing of Spencer's campaign is significant context for understanding subsequent recovery dynamics. A surge of big-dollar donations tied to construction firm Clayco and other developers pushed Spencer ahead of Jones in total fundraising in the final weeks of the campaign (Huguelet, 2025). One high-profile donation came from Bob Clark, Clayco's founder and executive chairman, who contributed \$111,330.25 to the PAC supporting Spencer's campaign – an amount he said matched what his firm spent responding to a city request for proposals for a North City site that was ultimately rejected (First Alert 4, 2025; Kukuljan, 2025).

Spencer was sworn in as mayor on April 15, 2025, 31 days before the tornado struck. In response to criticism for the failure of the city's outdoor warning sirens to sound, Spencer placed the emergency

management commissioner on leave (Gladney et. al., 2025). In the weeks that followed, Spencer acknowledged the scale of the gap between need and response: "There is a huge gap in what residents need and what we've been able to provide. That is unequivocal, just an enormous gulf of need that we have been unable to meet" (Pfeiffer, 2025). She and Chief Recovery Officer Julian Nicks wrote to Missouri's emergency management agency that "the incident of May 16, 2025, is on a scale comparable to the 2011 Missouri Joplin tornado, and the City does not have the capacity or expertise to execute a recovery effort of this magnitude" (Grumke, 2026). Spencer publicly criticized the federal response, blaming "turmoil at the national level" and what she described as a FEMA "pullback" that created delays and added bureaucratic barriers (Brown Jr., 2025). Federal disaster assistance was not confirmed until June 9, 2025, nearly a month after the tornado (City of St. Louis, 2025).

By December 2025, the city's own progress report indicated that of more than 2,900 damaged owner-occupied homes, only 184 had received emergency stabilization or repairs from the city, representing roughly 6% of the damaged stock (City of St. Louis, 2025). At the six-month mark, Spencer acknowledged that "there's still so much left to be done," describing the range of emotions residents expressed as "disappointment, fear, heartbreak" (Lippmann & Rosenbaum, 2025). By February 2026, city officials reported that nearly 5,000 damaged properties still did not have a city assistance application on file (Grumke, 2026). Nearly a year after the tornado, Spencer acknowledged that "the overall response to the tornado has been slower than even we would like," attributing part of the delay to uncertainty about what FEMA would and would not cover (First Alert 4, 2026).

On April 17, 2026, protesters disrupted Mayor Spencer's first State of the City address at City Hall, demanding recovery funding for North St. Louis residents. Several held signs featuring enlarged photos of homes still sitting in the same state of destruction nearly twelve months after the tornado, and chants of "Fund North City" filled the chamber for approximately 20 minutes before five protesters were arrested (Bryant, 2026). Melanie Marie, an organizer with Action St. Louis's People's Response, said the counterevent was organized to make sure city leaders "know that we are self-deployed, self-determined

and we're not going anywhere" (Lippman & Wimbley, 2026). The demonstrators vowed to return for the one-year tornado anniversary in May 2026 (Bryant, 2026).

3.5 Environmental Justice Organizing in St. Louis

Environmental justice activism in St. Louis has long been rooted in confronting the disproportionate environmental burdens borne by low-income, majority-Black neighborhoods across the region. From the documented presence of nuclear waste at the West Lake Landfill in North St. Louis County, uncovered through years of grassroots advocacy by groups like Just Moms STL (Just Moms STL, 2025), to the air pollution and lead exposure documented in the 2019 Environmental Racism in St. Louis report, community-based organizations have consistently served as the primary mechanisms through which environmental harm is named, resisted, and brought to public attention. This organizing tradition is the context in which the community response to the May 2025 tornado must be understood.

Action St. Louis, an organization key to the tornado response for the most vulnerable residents, was born out of the Ferguson Uprising of 2014, initially organized as a coalition rooted in collective direct action against systemic racism and state violence (Action St. Louis, n.d.). Formally incorporated in 2016, the organization has grown into one of the most prominent Black-led grassroots organizations in St. Louis, building political power for Black communities through campaigns combining organizing, communications, advocacy, and direct action (Action St. Louis, n.d.). Its theory of change centers on a strategy to invest, divest, and contest: contesting for power in order to invest in the solutions that make communities well and divest from carceral systems that produce only further marginalization (Giving Compass, n.d.).

Action St. Louis's housing justice work is particularly relevant to the context of disaster vulnerability in North St. Louis. The organization has focused much of its work on the conditions that make residents vulnerable long before disaster strikes: vacancy, landlord neglect, unaffordable rents, and the barriers facing residents attempting to navigate an inadequate housing system. One of its most visible efforts has been its leadership in the We the Tenants coalition, which organizes renters, documents unsafe housing conditions, and advocates for structural reforms including a Tenant Bill of Rights and stronger

enforcement of housing codes (Action St. Louis, n.d.). These issues, the quality and legal status of the housing stock, residents' relationship to the formal property and insurance system, and the degree to which local government enforces minimum standards of habitability, directly shaped the damage patterns and recovery challenges documented in the wake of the 2025 tornado. The same conditions that made North St. Louis housing stock vulnerable to wind damage were the conditions that Action St. Louis had been organizing against for years.

Action St. Louis's broader policy platform, the People's Plan, was developed in coalition with approximately 50 local organizations and addresses systemic inequities across housing, public safety, democracy, and equitable funding (Action St. Louis, n.d.). When the May 2025 tornado struck, the organizational infrastructure, relationships of trust, and community networks that Action St. Louis had built over nearly a decade were immediately activated in service of disaster relief and recovery. The People's Response hub, which Action St. Louis co-organized with ForTheCultureSTL, was not improvised from nothing. It was the expression of a prior organizational capacity built through years of sustained grassroots work. ArchCity Defenders, a legal advocacy organization working on eviction defense and housing stability in predominantly Black neighborhoods, announced a partnership with Action St. Louis at the Northside Movement Center in 2025, representing a significant expansion of the shared infrastructure for movement work in North St. Louis (ArchCity Defenders, n.d.).

In the aftermath of the May 2025 tornado, the networks and organizing infrastructures developed through years of housing and environmental justice work were mobilized to support community-led relief and advocate for equitable recovery in the hardest-hit neighborhoods. The following chapters examine the spatial dimensions of the disaster and the community experiences it produced, arguing that the effectiveness of the People's Response, and the inadequacy of the government response that made it necessary, cannot be understood apart from the organizing history documented in this chapter.

Chapter 4: Methods

4.1 Introduction

This study employs a mixed-methods approach combining spatial and statistical analysis with qualitative thematic analysis to examine disparities in disaster damage and recovery across the St. Louis region. The quantitative component uses building-level damage data from Microsoft's AI for Good Lab and wind speed data from the National Weather Service, analyzed using binomial generalized linear models, to assess whether observed differences in damage rates across three census tracts can be explained by wind speed alone or whether neighborhood racial composition explains significant additional variance. The qualitative component draws on 38 video interviews from the People's Response Archive, organized and analyzed thematically to examine how residents and organizers experienced the damage and described the recovery. Together these components address two related but distinct questions: whether the spatial distribution of damage reflects social vulnerability beyond meteorological exposure, and how affected communities experienced and responded to the disaster and its aftermath.

4.2 Spatial analysis

Using ArcGIS Online, spatial patterns of damage and damage disparities were analyzed between St. Louis County and the City of St. Louis. Three census tracts, one in St. Louis County (Census Tract 2164.02) and two in the City of St. Louis (Census Tracts 1096 & 1101).

4.2.1 Study Area

The analysis focuses on three census tracts affected by the May 2025 tornado: Census Tract 1096 (O'Fallon), Census Tract 1101 (Greater Ville and Penrose), and Census Tract 2164.02 (Clayton). Census Tracts 1096 and 2164.02 were selected as the primary comparison cases because they experienced similar mean wind speeds during the event, allowing for comparison of damage outcomes while holding hazard severity relatively constant. Census Tract 1101 was included to broaden the within-city analysis and provide additional context for intra-city variation in damage. The three tracts also represent distinct

governance contexts – the independent City of St. Louis versus St. Louis County – though governance was not directly tested as a variable in the quantitative analysis. Figure 2 shows the census tracts of interest along the path of the tornado.

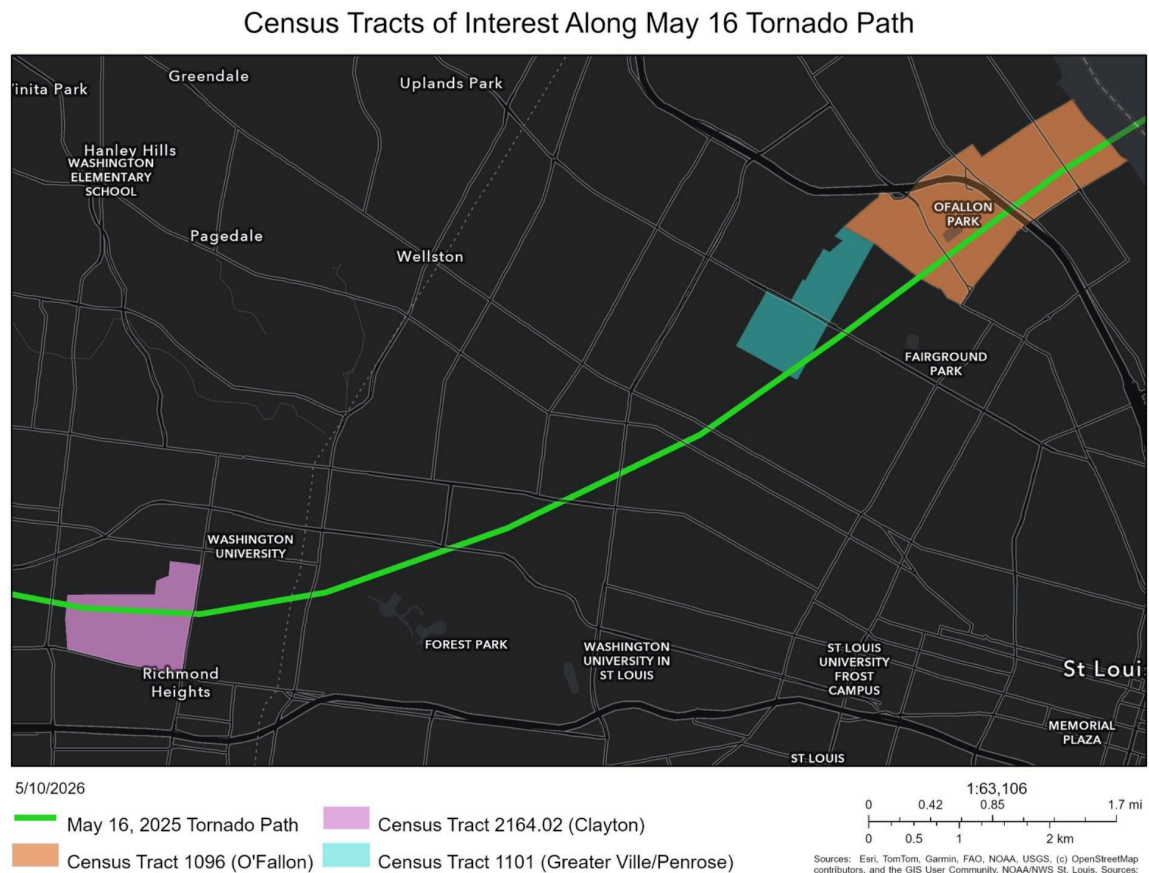


Figure 2. Census tracts of interest along the May 16 Tornado Path.

4.2.2 Data layers

Three data layers were used, all publicly available through ArcGIS Living Atlas:

Table 1. Data Layers Used in Spatial Analysis

Layer	Source	Date	Description
Layer 1 Tomado Path	National Weather Service	May 16, 2025	Depicts the tomado's path. Used to confirm that the three study census tracts fall within the tomado's path.
Layer 2 Wind Speed Survey	National Weather Service Damage Survey	May 16, 2025	852 individual wind gust measurements along the tomado path, including Enhanced Fujita (EF) scale rating and wind speed in mph. Wind speed values were assigned to each building using a nearest neighbor spatial join (<code>st_nearest_feature()</code> , <code>sf</code> package in R).
Layer 3 Building Damage Assessment	Microsoft AI for Good Lab / Planet Labs	May 18, 2025	Machine learning-based damage assessment applied to high-resolution satellite imagery. Maps 78,000+ building footprints and classifies each by estimated percentage of structural damage (0–100%). Serves as the primary dataset for comparing damage across census tracts.

Table 1. Data Layers Used in Spatial Analysis.

4.2.3 Data Preparation and Processing

The building damage and wind speed layers were clipped to the three study census tracts in ArcGIS Online using the Overlay Layers intersect tool. Direct spatial joining in ArcGIS Online was unsuccessful due to geometric incompatibilities between wind point measurements and building polygon features. All further processing was conducted in R (version 4.5.2).

Building damage CSVs were loaded into R and merged using `rbind()`. Building centroids stored in Web Mercator (EPSG 3857) were reprojected to WGS 1984 (EPSG 4326) using the `sf` package. Wind

speed values were assigned to each building using `st_nearest_feature()`, a nearest neighbor join that assigns each building the wind speed of its closest measurement point. This produced complete wind speed coverage across all 2,702 building records. American Community Survey (2019–2023) demographic data were merged by census tract FIPS code using `left_join()`.

4.2.4 Variable Selection and Multicollinearity Assessment

Six candidate predictor variables were initially considered alongside wind speed: percentage Black residents, percentage in poverty, median year built, median home value, percentage renter occupied, and percentage vacant. Sequential model testing revealed singularities and near-perfect multicollinearity among social variables. Full correlation results are reported in Table 3. Percentage Black residents was retained as the sole social vulnerability indicator for the reasons documented in Section 4.2.4a below.

4.2.4a Justification for Retention of Percentage of Black Residents

The decision to retain percentage Black residents rather than poverty rate warrants further justification. As the background chapter documents, racial composition and poverty are not independently produced in North St. Louis — both are the downstream consequence of a century of racially discriminatory housing policy, from HOLC redlining to FHA lending exclusions to urban renewal displacement. The near-perfect correlation between these variables ($r = 0.99$) reflects that history rather than statistical redundancy alone. Retaining percentage Black is consistent with this thesis's theoretical framing, which treats racial geography as the primary lens through which accumulated vulnerability is legible. It is also consistent with Kashian et al.'s (2021) finding that race predicts tornado damage independently of poverty when examined across a larger sample. It should be noted, however, that this choice means the model's findings cannot be interpreted as evidence that race per se causes differential damage outcomes. Rather, percentage Black functions here as a spatial index of the compounded structural vulnerabilities that racially discriminatory policy produced and that are inseparable from one another in this context.

4.2.5 Statistical Analysis

Two binomial generalized linear models (GLMs) were estimated using the `glm()` function in R with a binomial error family. The outcome variable, `damage_pct`, represents estimated percentage of structural damage per building, ranging from 0 to 1. Model 1 included wind speed as the sole predictor. Model 2 added percentage Black residents. Both models were also estimated using a quasibinomial error family to assess overdispersion. Model fit was compared using an Analysis of Deviance table with a chi-square test.

In a binomial GLM, residual deviance measures how much variation in the outcome remains unexplained by the model's predictors. A statistically significant predictor indicates that a relationship is unlikely to be due to chance, but does not indicate how much of the variation it actually explains — a model can have a significant predictor and still leave most of the variation unaccounted for. This study therefore uses reduction in residual deviance between models as the primary measure of explanatory improvement.

4.3 Qualitative Analysis

4.3.1 Interviews (People's Response Archive)

38 video interviews archived and made publicly available by the People's Response Archive, a community-driven project produced and led by St. Louis resident Damon Davis were analyzed. The archive documents the experiences of residents, volunteers, and local organizers in the weeks following the May 2025 tornado, centered on organizing efforts at the People's Response hub in O'Fallon Park. Interviews were collected by community members, filmmakers, and citizen journalists and were made publicly available in August 2025. Participants include a diverse mix of affected residents and local volunteers, providing firsthand insight into community mobilization, resource distribution, and recovery challenges.

Interview segments were organized in NVivo (Version 15) by thematic category to facilitate retrieval and comparison across the 38 interviews. Two parent categories structured the analysis: Tornado Damage, covering physical destruction and emotional impact, and Tornado Response, covering

community organizing, mutual aid, government response, inequality, and future orientations. Segments within each category were then analyzed thematically for recurring patterns and points of convergence across interviewees. This approach is used to examine two related but distinct questions: how residents and organizers experienced and described the damage, and how they described the recovery process, the barriers they encountered, and what they argued genuine recovery would require. This thesis does not include a quantitative component on recovery outcomes. The spatial analysis documents damage at a single point in time and does not track rebuilding or displacement over time. The qualitative recovery findings therefore stand on their own as a community-centered account of how recovery has unfolded.

4.3.2 The People's Plan

This analysis also examines the People's Plan, a comprehensive policy platform developed by Action St. Louis in coalition with approximately 50 local organizations. The People's Plan platform planks on housing, participatory budgeting, community land trusts, and equitable funding are examined for the ways in which they respond to structural conditions identified through the above analysis. Cross-referencing the People's Plan with interview content allows the analysis to trace the relationship between what residents named as needed in the immediate aftermath of the tornado and the longer-term policy agenda that community organizations had already developed before the storm arrived. The People's Plan serves as a primary analytical source for the policy implications chapter, grounding the thesis's recommendations in the community-generated framework rather than in externally derived prescriptions.

Chapter 5: Results & Discussion

5.1 Statistical Results

Key finding: Wind speed alone does not explain the distribution of building damage across the three study tracts. The addition of neighborhood racial composition as a predictor reduces residual deviance by 428.5 points – more than five times the reduction produced by wind speed alone – and is statistically significant at $p < 0.0001$.

This section presents the results in two steps: a descriptive overview of tract-level damage rates, wind exposure, and socioeconomic characteristics, followed by the results of two binomial generalized linear models.

5.1.1 Descriptive Statistics

Table 2 summarizes damage rates, wind exposure, housing characteristics, and socioeconomic and demographic profiles for each tract.

Table 2. Tract-Level Damage, Wind Exposure, Housing, and Socioeconomic Characteristics

Characteristic	Census Tract 1096 (O'Fallon)	Census Tract 1101 (Greater Ville/Penrose)	Census Tract 2164.02 (Clayton)
STORM EXPOSURE			
Average wind speed	101.4 mph	121.1 mph	94.4 mph
BUILDING DAMAGE			
Total buildings	1,093	846	729
Buildings damaged	761 (69.6%)	546 (64.5%)	131 (18.0%)
Mean damage footprint % *	28%	38%	4%
HOUSING CHARACTERISTICS			
Median year housing built	1938	1950	1938
Median home value	\$67,600	\$58,600	\$833,800
% Renter occupied (including vacant)	38.4%	39.6%	48.3%
% Vacant	29.7%	39.7%	3.8%
SOCIOECONOMIC CHARACTERISTICS			
Median household income	\$30,961	\$32,667	\$130,991
Poverty rate	34.3%	39.3%	8.5%
% Black residents	94.2%	98.7%	6.6%

**With 0% being no damage and 100% being completely destroyed, the average extent to which a building was damaged*

Table 2. Tract-level damage, wind exposure, housing, and socioeconomic characteristics

Census Tract 1096 (O'Fallon) recorded the highest proportion of damaged buildings at 69.6%. Census Tract 1101 (Greater Ville/Penrose) recorded a damage rate of 64.5%, while Census Tract 2164.02 (Clayton) experienced the lowest rate at 18.0%. This represents a nearly fourfold difference in damage rates across the three tracts.

This ordering does not correspond to differences in wind exposure. Tract 1096 recorded a mean wind gust speed of 101.4 mph — lower than Tract 1101 (121.1 mph) and only marginally higher than Tract 2164.02 (94.4 mph) — yet sustained the greatest proportion of building damage. The tract that experienced the most damage was not the tract that experienced the strongest winds.

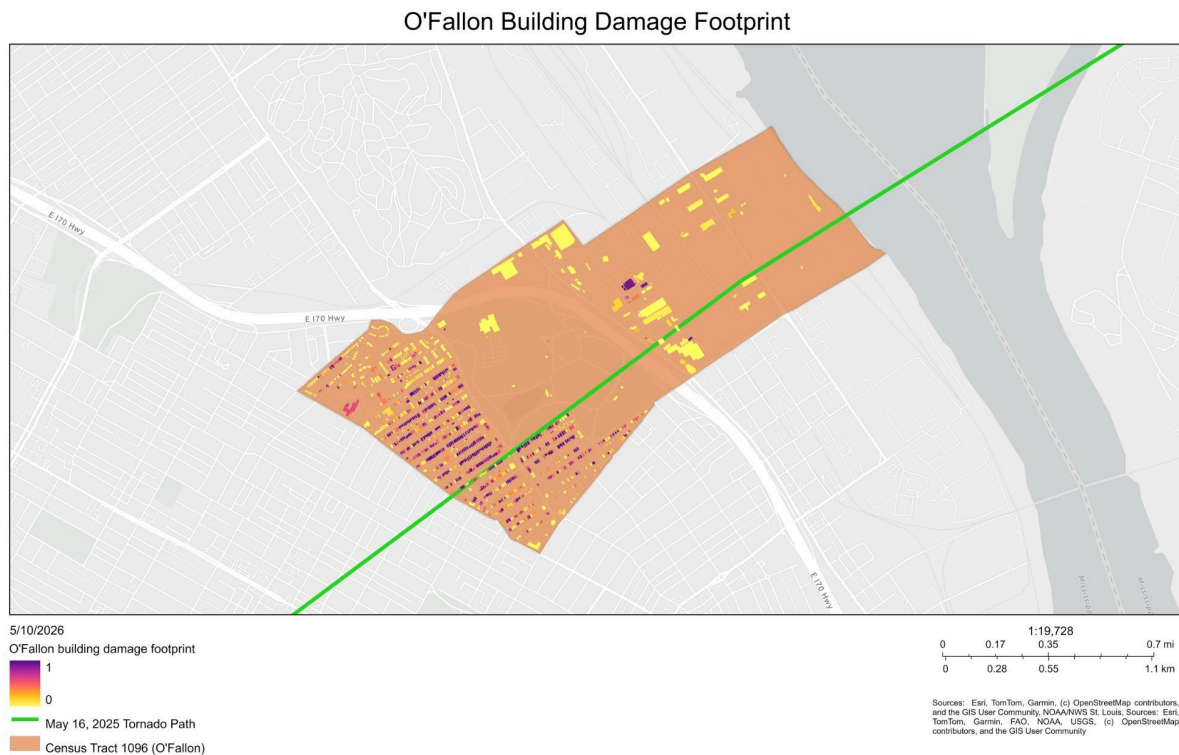


Figure 3: Building damage footprint for Census Tract 1096 (O'Fallon), with “0” meaning no damage and “1” meaning completely destroyed.

Greater Ville/Penrose Building Damage Footprint



Clayton Building Damage Footprint



Figure 4 (above): Building damage footprint for Census Tract 1101 (Greater Ville/Penrose).

Figure 5 (below): Building damage footprint for Census Tract 2164.02 (Clayton)

The socioeconomic profiles of the three tracts are sharply differentiated. O'Fallon and Greater Ville/Penrose are majority Black neighborhoods (94.2% and 98.7% respectively) with median household incomes of \$30,961 and \$32,667, poverty rates above 34%, and median home values below \$68,000. Clayton is a majority white neighborhood (6.6% Black) with a median household income of \$130,991, a poverty rate of 8.5%, and a median home value of \$833,800. The O'Fallon and Clayton tracts share a median housing construction year of 1938, while Greater Ville/Penrose has a median construction year of 1950, meaning the majority Black neighborhoods contain housing stock of comparable or greater age to the majority white comparison tract.

5.1.2 Regression Results

The dispersion parameter of 0.618 in the quasibinomial model indicated slight underdispersion, confirming the standard binomial specification was appropriate.

5.1.2a Model 1: Wind Speed Only

The windspeed-only model produced a residual deviance of 2243.1 on 2700 degrees of freedom. Wind speed was a statistically significant predictor of building damage (estimate = 0.021, SE = 0.002, $z = 8.824$, $p < 0.0001$), with higher wind speeds associated with greater damage. However, the large residual deviance relative to degrees of freedom indicates that wind speed alone leaves substantial variance in damage outcomes unexplained.

5.1.2b Model 2: Wind Speed and Racial Composition

The full model adding percentage Black residents as a predictor produced a residual deviance of 1814.6 on 2699 degrees of freedom. Both wind speed (estimate = 0.018, SE = 0.002, $z = 7.967$, $p < 0.0001$) and percentage Black residents (estimate = 0.032, SE = 0.002, $z = 14.406$, $p < 0.0001$) were highly significant predictors of building damage.

5.1.2c Model Comparison

An Analysis of Deviance with a chi-square test confirmed that the addition of racial composition significantly improved model fit. Adding percentage Black residents reduced residual deviance by 428.5

points on 1 degree of freedom ($p < 0.0001$), representing a substantial improvement over the windspeed-only model. Table 3 summarizes the model comparison.

Table 3. Model Comparison — Windspeed Only vs. Windspeed + Racial Composition			
	Model 1 Windspeed Only	Model 2 Windspeed + % Black	Notes
MODEL SPECIFICATION			
Family	Binomial	Binomial	
Outcome variable	damage_pct	damage_pct	
Predictors	Wind speed (mph)	Wind speed (mph) % Black residents	
MODEL FIT			
Null deviance	2322.0	2322.0	Degrees of freedom: 2701
Residual deviance	2243.1	1814.6	Degrees of freedom: 2700 / 2699
Deviance reduction	—	428.5	vs. windspeed only model
p-value (chi-square test)	—	< 0.0001	
COEFFICIENTS			
Intercept	-2.718 (SE = 0.223)	-5.122 (SE = 0.295)	
Wind speed	0.021 (SE = 0.002, $p < 0.0001$)	0.018 (SE = 0.002, $p < 0.0001$)	
% Black residents	—	0.032 (SE = 0.002, $p < 0.0001$)	
OVERDISPERSION CHECK			
Quasibinomial dispersion parameter	0.618	0.618	Value < 1 indicates underdispersion; binomial appropriate
Number of observations	2,702	2,702	

Table 3. Model comparison — windspeed only vs. windspeed + racial composition

The multicollinearity assessment conducted prior to finalizing the model revealed near-perfect correlations between percentage Black residents and other candidate social vulnerability indicators — poverty rate ($r = 0.99$), vacancy rate ($r = 0.97$), and renter occupancy ($r = 0.70$) — making it impossible to include multiple social variables simultaneously. Percentage Black residents was retained as the sole social vulnerability indicator. The full multicollinearity assessment is documented in the Methods chapter (Section 4.2.4a). Table 3 summarizes the multicollinearity assessment results.

Table 4. Multicollinearity Assessment — Correlation Matrix of Social Vulnerability Indicators

Pearson correlation coefficients between candidate predictor variables. Values approaching 1.0 indicate near-perfect collinearity.

	% Black Residents	% Poverty	% Renter Occupied	% Vacant	Median Year Home Built	Median Home Value
% Black Residents	1.00	0.99	0.70	0.97	N/A	N/A
% Poverty	0.99	1.00	N/A	N/A	N/A	N/A
% Renter Occupied	0.70	N/A	1.00	0.86	N/A	N/A
% Vacant	0.97	N/A	0.86	1.00	N/A	N/A
Median Year Home Built	N/A	N/A	N/A	N/A	1.00	N/A
Median Home Value	N/A	N/A	N/A	N/A	N/A	1.00

Key

$r \geq 0.95$ — Near-perfect collinearity; variable removed from model

$r \geq 0.65$ — High collinearity; variable removed from model

N/A — Correlation not computed (variable removed prior to this check)

Variable Removal Sequence

Step 1: Median year home built and median home value produced singularities in initial model (perfect collinearity with neighborhood identifier given only 3 tracts). Removed.

Step 2: % Vacant ($r = 0.97$ with % Black) produced singularity; % Renter Occupied ($r = 0.70$) produced unstable negative coefficient. Both removed.

Step 3: % Poverty ($r = 0.99$ with % Black) produced counterintuitive negative coefficient confirmed as statistical artifact. Removed.

Table 4. Multicollinearity assessment – Correlation Matrix of Social Vulnerability Indicators

5.2 Qualitative Results

Key finding: Across the 38 interviews, three themes emerged consistently: the near-total absence of coordinated government response in the immediate aftermath of the tornado, the rapid emergence of a large-scale community-led relief operation that became the primary source of aid for affected residents, and widespread fear among participants that the recovery period would reproduce and accelerate the displacement of Black families from North and West St. Louis.

5.2.1 "The North Side Is Destroyed": Physical Damage and Structural Vulnerability

Residents and organizers consistently described the physical scale and geographic specificity of the destruction. Andrew Poncho Rucker, driving through the affected area with his daughter in the car, described what they saw:

It looked like a bomb went off... I could just hear my daughter in the back saying, 'Daddy, the North Side is gone. The North Side is destroyed.' And I'm trying to fight back tears because I got friends that live here and I got memories of here. I went to school here. And it's just all just destroyed. (Andrew Poncho Rucker, People's Response Archive, 2025)

The physical toll documented across interviews was severe: roofs torn entirely from homes, hundred-year-old trees thrown across streets, buildings with back walls sheared off leaving interiors exposed to the street. For Rodney Wilson, the experience lasted barely over a minute but the aftermath stretched out for months, culminating in a house fire from tornado-related damage in the weeks that followed. For WyKeisha Atkins, the tornado took her father-in-law's leg when a beam came through the living room as he was making his way to the basement. Michael McLemore, in a building on Lexington Avenue when the storm hit, captured the scale of physical destruction plainly: "The roof is gone. The front porch is gone. A lot of the trees have been snapped in half. Old trees in our backyard have been snapped in half. Our fencing is down" (McLemore, People's Response Archive, 2025).

Interviewees noted the geographic concentration of destruction north of Delmar Boulevard. Kennard Williams, who drove from the Central West End into North City shortly after the storm, described crossing Delmar as passing between two entirely different cities:

Coming out of the Central West End, like some of the restaurants and bars and stuff... they had some chairs and tables knocked over. They were setting stuff up, getting ready to go back to happy hour... and just across Delmar... down power lines, snapped in half trees, walls of brick buildings sheared off the side of the building... just seeing the duality of two different St. Louises and seeing the amount of destruction and damage that was caused, particularly who was being impacted by it. (Kennard Williams, People's Response Archive, 2025)

Kayla Reed, Executive Director of Action St. Louis, connected this geographic pattern directly to the history of the neighborhoods affected: "Most of the damage took place north of Delmar, where we know folks are more likely to be impoverished, have less economic opportunity, where homes have

been... redlining happened in this footprint. So homes are worth less here — where it'd be the same house in Tower Grove that's worth \$450,000, over here maybe it's worth \$50,000. So we're talking about a natural disaster meeting decades of systematic neglect, which just produces devastation" (Reed, People's Response Archive, 2025).

The lack of insurance emerged across interviews as a specific material barrier shaping damage outcomes. Multiple participants connected this directly to the racialized history of American wealth inequality and property ownership in North St. Louis. Jared Boyd described it as the downstream consequence of generations of exclusion from wealth-building systems, while Kennard Williams specified that many affected homes are generational properties with deeds still in the names of grandparents or great-grandparents, leaving current residents unable to navigate the insurance and documentation processes that formal recovery programs require.

5.2.1a Emotional Damage: Place, Identity, and the Weight of Witnessing

Interviewees described emotional impacts that were inseparable from the physical destruction. Cami Thomas, an organizer with roots in St. Louis, articulated the connection between place and selfhood in terms that collapse the boundary between the physical and the psychic:

Sometimes if I close my eyes, I literally feel like I'm back in May 16th. Emotionally, I was impacted more than anything... I literally, growing up, used to look at my skin and the color of it. I used to think that what I was made of was the same thing that made the bricks. I literally thought that I was like, 'we were from the same clay'... So seeing that — seeing me, seeing us laid out on the street in bricks scattered about — was like it's worse than ego death. (Cami Thomas, People's Response Archive, 2025)

Thomas later described being afraid to process what she had seen, fearing her body might not survive it. Emotional responses across the archive ranged from grief to disorientation to a specific, politically grounded rage at the institutional failures that followed. Tishaura Jones, former mayor of St.

Louis, captured a sentiment that recurred across multiple interviews: "I feel like we are suffering here and nobody knows. I feel like we're the canary in the coal mine" (Jones, People's Response Archive, 2025).

5.2.2 Government Response

Across the archive, participants documented not a delayed or inadequate government response but, in many instances, no response at all. The most immediate expression was the inaccessibility of emergency services in the minutes and hours after the storm. Michelle Higgins, a pastor who received a call from a congregant trapped under rubble at Centennial Church, described what happened when she tried to reach 911:

When I called 911, 911 was a voicemail saying, 'Hang up and call 911 if this is actually urgent.' The frustration, the rage, the helplessness... I immediately became a first responder, dressed for a church event, didn't care... and called everybody I knew... many of us came out to Centennial Church, brought any tool we had and helped to pick Demarco and the other victims out of the rubble. And we did lose Miss Pat. She was one of the first fatalities at Fountain Park. (Michelle Higgins, People's Response Archive, 2025)

Similar experiences were documented across the archive – busy or unavailable 911 lines, absent emergency services, and the failure of the city's outdoor warning sirens to sound before the storm despite a National Weather Service warning issued at 2:34 p.m. (Walker, 2025). In the absence of emergency services, residents became first responders themselves: driving through uprooted trees, moving boulders to reach neighbors, and going door to door with food from their own freezers.

As the immediate emergency gave way to a longer recovery period, the pattern of government absence became more entrenched. Two weeks after the tornado, community organizations were still operating as the primary providers of relief while the city had yet to stand up formal recovery infrastructure. Former Mayor of the City of St. Louis, Tishaura Jones, documented city departments continuing routine operations in other parts of the city while tornado-affected neighborhoods remained in crisis, describing residents living in cars and tents on their own properties while the city sat on millions of

dollars that could have been deployed immediately. Grace Young, reflecting on Action St. Louis's experience coordinating with city officials, described the situation plainly: "Government fails residents who don't have good access to resources. And that's where Action St. Louis and activists come in to fill that gap... these set government structures are not conducive to responding to crisis" (Young, People's Response Archive, 2025).

5.2.3 "We Keep Us Safe": The Community-Led Response

In the absence of an adequate government response, a large-scale community relief operation emerged within 48 hours of the tornado, organized by Action St. Louis and ForTheCultureSTL at the O'Fallon Park hub. Rachel Herertado described the transformation of an empty parking lot into a full-scale relief operation in under two hours:

When we got here Saturday morning after the tornado, it was an empty parking lot when I got here. And two hours later, we had a line of residents all the way down West Florissant pulling through to get supplies and connection to resources and support. And like, no one else could stand that up. The city hasn't been able to stand that up, right? Other nonprofits, government entities, federal, city, state — like no one has been able to stand this up the way that these organizers have been able to do that. And yeah, it just honestly confirms everything I know to be true: that we keep us safe. (Rachel Herertado, People's Response Archive, 2025)

The scale of mobilization was substantial — 2,000 volunteer signups from a single Google sheet posted the first night, 1,500 volunteers on a single Saturday, and an average of over 300 per day for nearly two weeks. Action St. Louis built operational infrastructure including a centralized data intake system, a door-to-door delivery network for residents unable to reach the hub, and referral pipelines to specialized services.

5.2.3a Who Showed Up: Community Solidarity in Practice

The archive documents the texture of this solidarity at the level of specific individuals. Dara Escribde described a group of older Black women who became the daily backbone of the operation:

We have a group of Black women who I can name but I won't because they may not want their names out there. These women are beautiful. They are bubbly and buoyant and consistent. They have come out every single day almost — like this is their 9 to 5. And you know they all have to be like 50 and older. But it doesn't matter, the heat doesn't bother them, the sun doesn't bother them, the attitudes don't bother them, the lifting doesn't bother them. They are showing up every single day until they feel like the need has been met. (Dara Escridge, People's Response Archive, 2025)

Escridge also described a youth football team and cheerleading squad whose experience at the hub became a moment of community formation — packaging goods, handing off supplies, and discovering, as she put it, "what it means to be in community." Ohun Ashe described a volunteer named Miss Joanne, an elder who showed up every single day to work the assembly line and became, in Ashe's words, "a light in a moment where it can be a lot of darkness." Britney Jansen described a four-time deployed Marine veteran and civil engineer with a metal leg, whose own roof had been destroyed by the tornado, who pushed his wife in her wheelchair several blocks to the hub to volunteer. "I wouldn't have met him otherwise," Jansen reflected (Jansen, People's Response Archive, 2025).

The archive also documents the persistence of joy as a dimension of the community response. Aaron Williams, coordinating the response while simultaneously supporting a colleague sleeping in his car after losing his housing, described a Saturday when a block party broke out next to the relief operation:

Still found a way to find joy in these situations. Stop the Violence is right next to us. They set up a whole block party just based off of them running material for us. They brought out a DJ. People pulled up in their cars and for a Saturday we kicked it while still doing the same stuff that we need to do to keep people alive, to keep people safe. And that's honestly that's how Black people move, man. And I always find joy and peace in that. Because we can deal with a lot of stuff and still thrive. (Aaron Williams, People's Response Archive, 2025)

Melanie Marie, a Ferguson-based organizer, described her presence at the hub as rooted in reciprocity: "When we had our own uprising and our own disaster in Ferguson, the community came out for us. The world came out for us. And so I feel that even though this happened in the city, it's imperative that I come and put my boots on for the same community that did the thing for me" (Marie, People's Response Archive, 2025).

5.2.3b The Cost of Carrying It: The Limits of Community-Led Response

The same interviews that document the remarkable capacity of the community response also document its costs. Organizer PTSD, physical exhaustion, and suppressed grief were consistent themes across interviews. Melanie Marie described the panic that returned when sirens went off in the weeks after the tornado. Britney Jansen described suppressing her own exhaustion in the presence of volunteers who had sustained losses they had not yet begun to process. Annie Rice put the cumulative toll plainly: "We're all really tired. Like these folks are tired and I know the folks in their homes are really tired and I don't know what the answer is. I just — we just have to keep trying" (Rice, People's Response Archive, 2025).

Kennard Williams articulated the political argument that this exhaustion demands: "I would hope that this would be the last time that we have to stand something up like this and do all of this again without the help of governmental systems that we pay taxes for... I don't think that St. Louis is going to be an isolated incident of government not stepping in to help the people, but the people having to step in to help the people" (Williams, People's Response Archive, 2025).

5.2.4 "A Microcosm of Everything": Participants' Structural Critique

The final thematic dimension of the qualitative findings is participants' own structural critique of what the disaster revealed and what they feared the recovery would reproduce. Rachel Herertado offered the most direct synthesis: "Seeing the tornado, the impact of the tornado, is like a microcosm of all these things, all these different types of oppression that we see people go through" (Herertado, People's Response Archive, 2025). Kareem Jackson developed this analysis in terms that named the historical continuity of the structural conditions the tornado exposed:

A freak of nature, a tornado, touches down in North and West St. Louis and so many Black people are affected simultaneously, and they want to hide the fact that the problem is... the problem. It's existed since age-old times and it's mutated and migrated and shapeshifted... but it's still the problem. And this tornado has basically exposed that. (Kareem Jackson, People's Response Archive, 2025)

Several interviewees identified the recovery period itself as a potential new vector of displacement. Kayla Reed identified the city's recovery zoning structure – in which the most heavily damaged areas were designated Zone C, the lowest recovery priority – as an early signal of which neighborhoods would be left behind. Figure X shows the city's zoning map that Reed refers to. Tishaura Jones named the gentrification threat directly, describing widespread fear that the tornado would accelerate the displacement of Black families from homes owned for generations. Kennard Williams connected this risk to the political economy of the city's leadership, and Annie Rice stated the fear plainly: "My hope is that we find some way to make it right so that people can stay in these areas and we don't just turn into clearing and rebuilding and a whole bunch more white folks move in and displace Black families" (Rice, People's Response Archive, 2025).

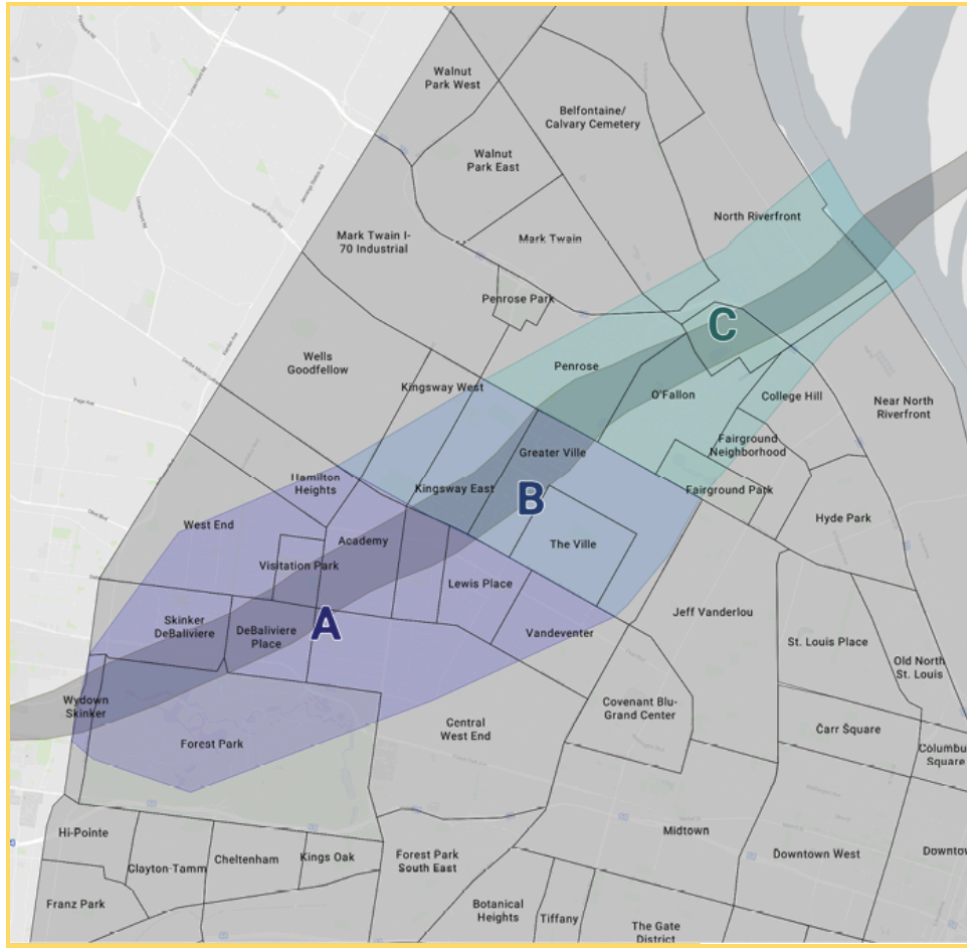


Figure 6: St. Louis City's zoning map for tornado recovery

Against this, interviewees articulated specific demands for what genuine recovery would require. Kayla Reed called for reparations, arguing that North City deserved investment before the tornado and was owed even more now. Ohun Ashe called for the recovery to deliver what had long been withheld — not just rebuilding but the decades of investment and support that had been denied. Grace Young insisted on the procedural dimension, arguing that any growth excluding existing residents would not constitute genuine recovery. Melanie Jones White offered the most complete synthesis, holding government accountable while refusing passivity:

The government has not done the job that they were supposed to do. They were delayed in response. They were non-visible at all... The fact that Action St. Louis and For the Culture had to come in and strategically

work through those pieces where the government wasn't was a problem. So going back to what my hope is — my hope is that people understand and get comfortable in the fact that if we want change to happen, we as a people have to make the change happen. We have to be the thing that we want to see. (Melanie Jones White, People's Response Archive, 2025)

5.3 Discussion

The findings suggest a central argument: the tornado was not only a meteorological event. It was also a social one, produced at the intersection of a natural hazard with a landscape of vulnerability built by a century of deliberate policy.

5.3.1 Wind, Race, and the Production of Unequal Damage

The regression analysis establishes that wind speed alone does not explain the distribution of building damage across the three study tracts. The tract that experienced the most damage was not the tract that experienced the strongest winds, and the addition of racial composition to the model reduced residual deviance by 428.5 points, more than five times the reduction produced by wind speed alone. Wisner et al.'s (2004) PAR model offers a framework for understanding what produced this pattern: vulnerability built into the landscape by prior human decisions, such that what appears as a natural catastrophe is more accurately understood as the intersection of a hazard with socially produced conditions. The HOLC maps that graded every North St. Louis neighborhood with Black residents as D, the FHA lending programs that directed mortgage capital to white suburbs, and the urban renewal programs that demolished 54 city blocks of Mill Creek Valley were not market outcomes. They were explicit government policy (Rothstein, 2017; ArchCity Defenders et al., 2019). Klinenberg's (2002) social autopsy of the 1995 Chicago heat wave offers a direct parallel: the geography of mortality followed the everyday organization of urban inequality rather than the geography of heat exposure alone.

The strong correlations between racial composition and poverty, vacancy, and renter occupancy reflect the degree to which these vulnerabilities are spatially concentrated and socially intertwined, a pattern consistent with the compounding disinvestment the background chapter documents. Fothergill and Peek (2004) find that low-income populations are more vulnerable to disaster due to building type and

construction quality, noting specifically that low-rent and unreinforced masonry buildings are among the most vulnerable structures in wind events. The NWS post-storm survey noted that a brick townhome on Marcus Avenue initially rated EF3 was downgraded to EF2 after investigators discovered the structure had been abandoned and deteriorating since 2011, suggesting preexisting structural conditions contributed to damage outcomes independent of wind intensity (National Weather Service, 2025). Kashian et al. (2021) find that poverty and African American status are associated with greater tornado damages even when controlling for tornado risk across five decades of national data, a pattern these local findings are consistent with. The income gap between Clayton and O'Fallon exceeds \$100,000 and their racial compositions are near mirror opposites, differences that are consistent with, though not reducible to, the policy history this thesis documents.

5.3.2 Government Failure and Institutional Neglect

The qualitative findings document a government response that was, across multiple dimensions, inadequate to the scale of the disaster. Tierney (2014) argues that failures in emergency management systems often reflect the same structural priorities that shape patterns of preventive investment, and the evidence here is consistent with that argument. The failure of the city's outdoor warning sirens, the inaccessibility of 911 services in the immediate aftermath, the continuation of routine city operations while tornado-affected neighborhoods remained in crisis, and the delayed deployment of available resources all point toward a pattern of institutional unresponsiveness that participants experienced as a continuation of longstanding neglect rather than an isolated failure.

The barriers participants identified in navigating formal recovery, including lack of insurance, the heirs' property problem, and the inability to document ownership of generational homes, are consistent with the national patterns Howell and Elliott (2019) document in their research on disaster recovery and racial wealth inequality. Facing South's (2018) documentation of heirs' property as a downstream consequence of discriminatory lending is directly relevant to what participants described. The municipal fragmentation documented in the background chapter provides additional structural context: ArchCity Defenders et al.'s (2019) argument that fragmentation in St. Louis has functioned as a mechanism for

concentrating resources in some places and deprivation in others helps situate the city's limited recovery capacity not as a neutral administrative condition but as the product of structural arrangements with a documented history.

5.3.3 Community Response and Its Limits

The People's Response emerged within 48 hours of the tornado as the primary source of relief for thousands of North and West St. Louis residents. Solnit (2009) argues that effective disaster collectivism is rarely purely spontaneous but draws on prior community capacity built through sustained collective work, and the People's Response is consistent with that argument. The same organizing infrastructure Action St. Louis had developed through years of work on housing, public safety, and environmental justice made it possible to stand up a full-scale relief operation in under two hours.

The archive documents patterns consistent with all three forms of social capital Aldrich and Meyer (2015) identify as central to disaster recovery. Bonding capital appears in the older Black women who showed up every day, the youth football team discovering what it meant to be in community, and Miss Joanne's daily presence at the assembly line. Bridging capital appears in Melanie Marie's account of reciprocity rooted in the Ferguson Uprising and in the 2,000 volunteers who signed up from a single Google sheet. Linking capital appears in Action St. Louis's directive to the city to join their process rather than the other way around. Quarantelli and Dynes (1977) established that community response to disaster tends toward organized, cooperative behavior rather than panic, and Aaron Williams's account of the block party that broke out next to the relief operation reflects what Solnit (2009) describes as the activation of collective needs that everyday life ordinarily suppresses.

The archive also documents the costs of carrying a response that, in the absence of adequate government action, became the primary source of relief for an extended period. Bullard and Wright (2009) identify this as a central tension in community-led disaster response: when community organizations absorb costs that government has not covered, those costs fall on the people least positioned to bear them. As Kennard Williams articulated, the People's Response was a remarkable expression of community capacity, but the question it raises is why that capacity was necessary in the first place.

5.3.4 Recovery, Displacement, and the Right to Remain

The risks participants identified in the recovery period are grounded in a pattern of displacement with deep historical roots in St. Louis. The city's designation of the most heavily damaged neighborhoods as Zone C, the lowest recovery priority, is consistent with a longer history in which redevelopment efforts from Mill Creek Valley to Pruitt-Igoe to the highway construction programs removed Black residents from land subsequently converted for other uses.

Klein's (2007) concept of disaster capitalism and Stoler et al.'s (2025) theorization of hazard gentrification offer frameworks for understanding the displacement risk participants named. The mechanism Stoler et al. identify, in which post-disaster recovery investments displace lower-income residents as reconstruction attracts capital and raises property values, is consistent with what participants described: a mayor backed by development companies, Zone C designations suggesting differential recovery priority, and fears about generational families being pushed from homes they have owned for decades. Kashian et al. (2021) find that tornado damage is associated with increased community abandonment in vulnerable areas over time, a pattern with direct implications for North St. Louis if recovery investment does not prioritize existing residents.

Harvey's (2008) right to the city framework offers a way of framing what participants were demanding: not merely access to reconstruction but meaningful participation in shaping its terms. The demands articulated across the archive, including calls for reparations, long-withheld investment, and assurance that there is a future for existing residents, reflect what Matin et al. (2018) and Lamb and Vale (2024) describe as the core requirements of equitable resilience: that recovery strategies center the ability of residents to remain in their communities and shape the decisions made in their name.

5.3.5 Synthesis

Taken together, the statistical and qualitative findings are consistent with a single argument that is simultaneously empirical, historical, and theoretical. The regression analysis establishes that racial composition explains substantial additional variance in damage outcomes beyond wind speed across 2,702 individual buildings. The 38 interviews provide the human account of what those patterns

represent: the geographic concentration of destruction north of Delmar, the institutional failures that left residents to pull each other from rubble, the extraordinary community capacity that filled a gap government did not, and the structural critique articulated by the people most affected. Both sets of findings are most legible against the century of policy decisions documented in the background chapter. The May 2025 St. Louis tornado is not a local anomaly. It is a local instantiation of a well-documented national pattern in which disasters act as accelerants of existing inequality, government response systematically underserves the communities most harmed, and community-led response fills a gap that should not exist.

Chapter 6: Policy Implications & Conclusion

The findings of this thesis point toward several policy implications for disaster preparedness and recovery in St. Louis and beyond. This chapter presents those implications, grounded in the demands articulated by community members themselves, before reflecting on the limitations of this study and directions for future research. It closes with a synthesis of what the thesis as a whole argues and contributes.

6.1 Policy Implications

Rather than offering an independent set of policy recommendations, this thesis foregrounds the People's Plan, an agenda that North St. Louis communities had already developed before the tornado arrived, and argues that the tornado makes its implementation not only more urgent but more legible as a matter of disaster policy. The people most affected by the storm have been the most precise analysts of what it revealed and what genuine recovery would require.

6.1.1 Centering Community Self-Determination in Recovery

The most consistent demand across the archive is also the most fundamental: that the people of North and West St. Louis drive the solutions to their own recovery. Kayla Reed articulated this as a question of self-determination: "We want to create a long-term plan for Black people in North City to be self-determining about what the rebuild actually looks like that is for them" (Reed, People's Response Archive, 2025). Grace Young framed the procedural dimension: "My hope for the future is that whatever this new world of recovery will look like for North St. Louis that the residents who are impacted are driving the solutions... any growth that excludes them isn't going to be a true St. Louis" (Young, People's Response Archive, 2025).

This demand maps directly onto the People's Plan's Building Inclusive Democracy pillar, which calls for participatory budgeting: a fully resourced process through which St. Louisans can direct public resources to meet their needs, including an Office of Participatory Budgeting to facilitate community

engagement and provide support to residents directing the allocation of funds in their communities (People's Plan STL, 2021). Applied to the recovery context, this means decisions about how rebuilding funds are allocated must be made with and by affected residents rather than developers or outside consultants. The Washington University in St. Louis Community Development and Disaster Preparedness report reinforces this, identifying the underutilization of grassroots organizations as a core gap in St. Louis's emergency management framework, noting that community-based groups played essential roles in the immediate tornado response yet operated without formal recognition, funding, or integration into official systems (Afadapa et al., 2025).

6.1.2 Recovery as Economic Justice

A dimension of recovery that participants named and that policy frameworks must address is the economic opportunity embedded in rebuilding. Erica Henderson captured it plainly: "Rebuild this community with people who make it up. Diverse Black contractors, hiring from community, those who are looking for employment opportunities. Look at the number of volunteers that have been here daily" (Henderson, People's Response Archive, 2025). Aaron Williams made the same argument in different terms, describing residents clearing houses before professional contractors arrived: "They were knocking out blocks of houses before the contractors even started showing up. That's people protecting their own dignity. We know how to fix the problems that have been set at our feet. We just need the right resources to do it" (Williams, People's Response Archive, 2025).

These demands are consistent with the People's Plan's Making St. Louis Home pillar, which calls for building community wealth through community land trusts, prioritizing green jobs as part of economic development, and creating a reparations plan to address the multigenerational harms of redlining and disinvestment in North St. Louis City (People's Plan STL, 2021). Kayla Reed put it most directly: "North City deserves reparations. They deserved it before a tornado. So I can't even tell you what the word is now, what they are owed" (Reed, People's Response Archive, 2025).

6.1.3 Resisting Displacement and Protecting the Right to Remain

Multiple participants identified the recovery period itself as a potential new vector of displacement, grounded in a reading of both history and current political conditions. Kennard Williams named the risk directly: "Our mayor was elected with being backed by a lot of development companies and these construction companies that are absolutely going to be salivating at the chance to come in and redevelop all of these areas at the expense of people who live there right now. Any conversation about rebuilding should be done with the residents who live there, who have invested in the community" (Williams, People's Response Archive, 2025). As the background chapter details, the current mayor's campaign received substantial funding from Clayco and other development interests. The concerns participants named are structurally grounded.

On April 17, 2026, nearly a year after the tornado, protesters disrupted Mayor Spencer's first State of the City address, with one protester yelling that residents were "sitting in tents one year later" and others chanting "Fund North City" before five were arrested (Lippmann & Wimbley, 2026). Melanie Marie, an organizer with Action St. Louis's People's Response, said the counterevent was organized to make sure city leaders "know that we are self-deployed, self-determined and we're not going anywhere" (Lippmann & Wimbley, 2026). The gap between the scale of destruction and the pace of institutional response has not closed, and the risks of hazard gentrification that Stoler et. al. (2025) theorize are not abstract in this context. The People's Plan's community land trust model offers a direct tool for protecting residents against displacement by transferring vacant city-owned lots to community control. Jared Boyd articulated what rebuilding should actually look like: "We need to plan for not just getting them back to where they were, but figuring out what's the best thing for them. Some of them may need one-floor ranch style homes or other living situations that let them age gracefully in place and kind of be in their community as opposed to moving into a senior facility that's unfamiliar to them and disconnects them from their neighbors, their community, their people, their churches, their institutions" (Boyd, People's Response Archive, 2025).

6.1.4 Reforming Emergency Management Systems

The WashU report's four-pillar framework – preparedness, engagement, collaboration, and representation – provides a practical roadmap for the institutional reforms this thesis argues are necessary. Its recommendations include integrating social workers into official disaster response systems with formal roles on planning commissions, funding and training neighborhood-level organizations to serve as on-the-ground emergency responders particularly in historically marginalized communities, and intentionally including high-risk groups in formal disaster planning (Afadapa et al., 2025). The report also identifies a critical structural gap: the City Emergency Management Agency has repeatedly requested budget increases from the Board of Aldermen and remains financially unable to fill even the minimum number of needed positions (Afadapa et al., 2025). Adequately funding CEMA is not a bureaucratic nicety. It is a precondition for the kind of coordinated response that North St. Louis residents deserved and did not receive on May 16, 2025.

6.1.5 The Inside/Outside Strategy: How Change Actually Happens

The policy demands outlined above will not be implemented through good intentions alone, and the People's Plan itself recognizes this. Its theory of change centers on building power through a strategy to invest, divest, and contest. What is needed is not simply better government but community organizing that both pressures institutions from outside and infiltrates them through elections – what organizers call the inside/outside strategy (Metzger, 2026). The strategy argues that fundamental social transformation requires both poles simultaneously: outside movements that organize, mobilize, and create pressure, and inside actors who share the movement's commitments and use institutional positions to resource and legitimize that outside work (Be Freedom, 2015).

Tishaura Jones, former mayor and a North St. Louis resident who described her own park, Ivory Perry Park, as "totally flattened" by the storm, represents the kind of inside actor this strategy envisions: someone with deep roots in the affected community, whose administration documented the inadequacy of the tornado response from the inside, and whose political defeat in the April 2025 mayoral election illustrates why sustained electoral organizing matters alongside movement work. As Metzger noted, some

alderpeople who emerged from the Ferguson Uprising operate with demonstrably different accountability to North St. Louis communities, and Action St. Louis already operates a 501c4 arm engaged in electoral campaigns. The inside/outside strategy is not a theoretical aspiration in St. Louis. It is already being practiced.

The April 17, 2026 protest at Spencer's State of the City address demonstrates the outside pole in action: direct pressure, visibility, and refusal to let the recovery disappear from the public agenda. Melanie Marie's framing of the counterevent – that the community is "self-deployed, self-determined and we're not going anywhere" – is precisely the outside movement logic the strategy requires. Aledra Allen captured the longer horizon: "We will come together and use our power to hold our city, our electeds accountable for the things that we deserve, for our rights, for justice. Because we can do that together" (Allen, People's Response Archive, 2025). The two orientations, organizing pressure and institutional power, are not alternatives. They are the complementary poles of the same strategy.

6.2 Limitations

This study has several limitations that should inform how its findings are interpreted and how future research builds on them.

The most significant limitation of the quantitative analysis is that it covers only three census tracts. With three data points at the tract level, it is impossible to statistically disentangle the compounding social vulnerability indicators that are near-perfectly correlated across the study tracts. The finding that racial composition explains significant additional variance beyond wind speed is robust, but the specific mechanism connecting race to damage cannot be determined from this analysis alone. A further limitation concerns the ecological fallacy: because demographic variables are measured at the census tract level while damage outcomes are measured at the individual building level, the analysis cannot establish whether specific buildings owned or occupied by Black residents experienced greater damage. Rather, the findings indicate that buildings located in majority Black census tracts experienced higher damage rates, with tract-level demographic characteristics used as a proxy for the structural conditions that racially discriminatory policy produced at the neighborhood scale.

The building damage data itself introduces additional uncertainty. The AI4G dataset provides comprehensive, building-level spatial coverage captured shortly after the disaster, but the imagery may not fully capture on-the-ground conditions due to visual obstructions such as cloud cover, smoke, or debris. The machine learning classification algorithm assigns damage levels by interpreting satellite imagery, and misclassification of individual structures is possible, particularly where visual damage signatures are ambiguous or atypical. The model was trained on the xBD dataset (Gupta et al., 2019), a large-scale benchmark containing over 700,000 building annotations across 15 countries and eight disaster types. Because the xBD dataset draws primarily from international disaster events, the model may be less accurate when applied to tornado damage in the US Midwest context of this study. Because the tornado occurred in May 2025, this study was conducted in the early aftermath of the disaster. The recovery is ongoing, and the longer-term consequences for displacement, neighborhood change, and the distribution of recovery resources are not yet fully visible. This thesis captures a moment in an unfolding story rather than a complete picture.

Finally, the 38 interviews from the People's Response Archive represent a community-driven but non-random sample, disproportionately representing organizers and volunteers connected to Action St. Louis and ForTheCultureSTL. Perspectives from residents less connected to organizing networks are likely underrepresented, and the archive does not include perspectives from city officials or emergency managers, meaning the government failure narrative is told primarily from the perspective of those harmed by it rather than those responsible for it.

6.3 Future Research Directions

Expanding the quantitative analysis to a larger number of census tracts across the full tornado path would allow for the statistical disentanglement of social vulnerability indicators that was not possible with three tracts and would provide a more complete picture of how damage was distributed across the city.

Longitudinal research tracking recovery outcomes over time in the affected neighborhoods would capture what this study cannot: not just who was most damaged, but who recovers, at what pace, and whether the recovery process reproduces or ameliorates the inequities the disaster exposed. Tracking displacement rates, property value changes, and demographic shifts over the next five to ten years would test the hazard gentrification hypothesis that participants named.

Comparative research examining other recent tornado events in cities with similar histories of racial segregation and disinvestment, including Joplin, Mayfield, and Selma, would help determine whether the patterns documented here are consistent across contexts and would contribute to a growing body of tornado-specific environmental justice scholarship that remains underdeveloped relative to hurricane and flood research.

Finally, research examining the political dimensions of disaster recovery – specifically how the inside/outside organizing strategy performs in shaping recovery policy outcomes – would contribute to both disaster sociology and political organizing literatures. The May 2025 St. Louis tornado offers a case where community organizing infrastructure was already in place, its capacity was demonstrated in the immediate response, and the political conditions of the recovery period are documented. Following that story as it unfolds would yield important insights into how social capital translates, or fails to translate, into durable policy change.

6.4 Conclusions

This thesis set out to examine whether the distribution of building damage from the May 2025 St. Louis tornado could be explained by wind exposure alone, and what the experiences of residents and organizers reveal about how recovery has unfolded across neighborhoods with vastly different histories of investment and disinvestment. What the evidence shows is that neither the damage nor the recovery can be understood through a meteorological lens alone. The tornado moved through a city whose geography of vulnerability had been produced over a century by deliberate policy, and it found in North and West St. Louis exactly what those policies had left behind.

This thesis makes several contributions to the growing literature on disaster inequality and environmental justice. It applies building-level statistical analysis to a tornado event in a context where such analysis is rare, demonstrating that racial composition explains statistically significant additional variance in damage outcomes beyond wind speed across 2,702 individual buildings. It draws on a community-generated archive of 38 interviews conducted in the weeks immediately following the disaster, centering the voices of the people most affected. And it situates both sets of findings within the specific political and historical conditions of St. Louis, a city whose governance structure, racial geography, and organizing history make it a particularly instructive case for understanding how disasters interact with accumulated inequality.

What makes this case study distinctive is also what makes it urgent. The tornado struck 31 days after a new mayor took office. The recovery is ongoing. The displacement risks that participants named are not historical; they are unfolding now, as demonstrated by the arrests of five protesters at City Hall on April 17, 2026, nearly a year after the storm, still demanding that North St. Louis be funded and not forgotten. And the community organizations that filled the gap government left are still fighting to ensure that rebuilding serves the people who were there before the storm.

Understanding that fight requires understanding not just the tornado but the city it moved through, and the century of deliberate decisions that made some neighborhoods so much more vulnerable than others when the storm arrived. The May 2025 St. Louis tornado is not a local anomaly. It is a local instantiation of a well-documented national pattern in which disasters act as accelerants of existing inequality, government response systematically underserves the communities most harmed, and community-led response fills a gap that should not exist. The people of North and West St. Louis have named what is owed and what genuine recovery requires. The question is whether the institutions with the power to act will listen.

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