



BUILDING FOR EQUITY:

ADVANCING RACIAL JUSTICE IN FEDERAL FLOOD INFRASTRUCTURE PROJECTS

ACKNOWLEDGEMENTS



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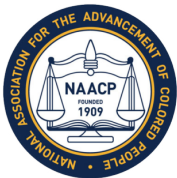
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EXECUTIVE SUMMARY

Flooding is a pressing environmental justice issue in the United States. Black communities are far more frequently and severely impacted by flood events than white communities.¹ In the aftermath of flooding, Black communities have a harder time recovering than white communities. After a natural disaster, Black communities lose an average of \$50,000 per household, while white communities gain \$75,000 per household.² Why are flood impacts so severe in Black communities? The answer begins at the confluence of systemic racism and flood prevention and can best be explained by policies and practices that place a greater emphasis on economic considerations rather than social equity.

Presented in collaboration between the NAACP's Environmental and Climate Justice Program and Columbia University's Master of Public Administration–Environmental Science and Policy Program, this report seeks to explore the barriers to effective flood protection for Black Americans. We examine national and local level challenges to obtaining effective and safe flood infrastructure for Black communities and offer concrete learnings and action items for activists and communities hoping to protect their communities from future flood events.

Our research confirms that Black Americans are systemically flood exposed and experience disproportionate flood impacts. We also note that it is difficult for communities to identify their level of flood exposure, due to omissions in the Federal Emergency Management Agency's floodplains. Official floodplain maps, used when making important decisions about zoning and property development, are outdated and omit critical information, in particular about potential climate impacts. Inaccuracies and omissions from FEMA's dataset likely perpetuate the under protection of high-exposure, high-vulnerability communities.

The United States Army Corps of Engineers constructs and manages a considerable amount of flood prevention infrastructure in the United States. Should a community experience flooding, they are encouraged to seek help from the Corps to build flood prevention and mitigation infrastructure. However, the federal processes and decision-making criteria used to approve new flood infrastructure are difficult to navigate and are structured in ways that do not always represent the needs of low-wealth communities of color. Army Corps decision-making criteria also over-emphasizes economic factors, including the value of protected properties, when determining which projects to approve.

In addition, Congress, as well as the Office of Management and Budget, are key players in the project approval and funding authorization process and both bodies have unique decision-making procedures and criteria. These additional layers of bureaucracy make it more challenging to move projects forward and require substantial political pressure to advance and complete construction. During research and interviews, we noted that many within the Army Corps are aware of the historical and structural bias against low-wealth communities present in the Corps' project approval process. To help rectify these disparities, the Army Corps has instituted a pilot program to provide 100% federal funding for a few select flood project feasibility studies (eliminating the need for local cost-sharing). The USACE is now also required to consider social and environmental impacts in their cost-benefit analysis, as well as nature-based solutions and climate change. Although these are important and welcome changes, these new policies and projects have not been implemented quickly enough given the projected increase in flooding due to climate change.

Furthermore, Army Corps projects require substantial financial resources from communities in need: communities are required to provide at least a partial cost-share at multiple phases of project development. As a result, Black communities, who typically have a fraction of the wealth of comparable white communities, are more likely to struggle to obtain vital flood protection, leaving them exposed to dangerous hazards.³

At the local level, history has shown that Corps experience with community engagement is very mixed. Many communities –from [Chicago, IL](#) to [Lake Allatoona, GA](#) to better known examples like New Orleans, LA– allege the Corps has ignored their preferences and needs, pushing forward with projects that have serious ecological impacts or ignore important social dynamics. In Galveston, TX, the Corps proposed a project that would disrupt community life and fail to protect many homes in favor of protecting higher value businesses. In St. James Parish, LA, the Corps sought to approve the construction of a polluting chemical plant, with potentially disastrous consequences for low-wealth Black residents. In these and other case studies, our report identifies powerful activist strategies and notes examples of community members challenging the Corps to improve project safety and prioritize the wellbeing of frontline communities.

It is imperative that we identify the influence of historic and systemic racism on communities and institutions, working to eradicate injustice and develop systems that work for all people. Given recent shifts in Army Corps’ policy and the Biden-Harris administration’s goals to advance racial justice in the United States, we hope that this report contributes to eliminating injustices within the context of federal flood policies and will play a role in addressing the disparities between Black and white communities during flood events and recovery. Our research informs a range of action items for future NAACP work on this issue at both the national and local level, including:

- NAACP national office to develop resources to aid local units in critical points of engagement with the US Army Corps of Engineers during project development, such as: creating a database or online bulletin board with public participation opportunities for USACE ongoing and proposed projects; drafting a how-to guide for communities interested in proposing a project; develop educational trainings and resources in coordination with local Units to advance natural or nature-based solutions to flooding and flood exposure.
- NAACP national office to ensure decisionmaker compliance with the 2021 Executive Order Advancing Racial Equity and Support for Underserved Communities Through the Federal Government and USACE January 2021 policy directive by advocating members of Congress to ensure Other Social Effects are a critical component of project approval, lobby federal appointees, Congressional representatives, and the White House to increase equity consideration during funding decisions, and encourage district and national level Army Corps officials to incorporate Other Social Effects and community-specific considerations into project cost-benefit analysis.
- Local Units to mobilize communities to advocate for expanded and more equitable flood infrastructure based on their specific needs. This includes approaching local elected officials, Congresspeople, Senators, and local Army Corps staff, as well as increasing awareness of flooding and infrastructural issues more broadly. Campaigns may include op-eds in local publications, social media campaigns, and other ways to spread the word (i.e., local signage, bumper stickers, letter-writing campaigns).
- Local Units to use investigative research tactics, such as submitting Freedom of Information Act Requests with a lawyer’s cover letter for USACE projects, as well as lawsuits as tools to push for more transparency and challenge CBAs for projects.
- Local Units to build coalitions with local governments, communities, and organizations with environmental justice interests. Include typical cost-share partners with USACE such as the Nature Conservancy, local flood districts, and other advocacy groups.

IMPORTANT ACRONYMS

ASCE: American Society of Civil Engineers

BCWK: Bayou City Waterkeeper

CBA: Cost-Benefit Analysis

CDC: Center for Disease Control

CEER: Coalition for Environment, Equity, and Resilience

EQ: Environmental Quality

EWN: Engineering with Nature (USACE office)

FEMA: Federal Emergency Management Agency

FPD: Southwestern Illinois Flood Prevention District Council

HCFCDD: Harris County Flood Control District

NED: National Economic Development

NLD: National Levee Database

NNBF: Natural and Nature-Based Features

OLB: Orleans Levee Board

OMB: Office of Management and Budget

OSE: Other Social Effects

P&G: Principles and Guidelines that guide Army Corps' project planning processes

RED: Regional Economic Development

SVI: Social Vulnerability Index

SRP: The Sustainable River Project

TNC: The Nature Conservancy

USACE: U.S. Army Corps of Engineers

WRDA: Water Resources and Development Act

I. FLOODING AND RACIAL JUSTICE: WHY IS THIS ISSUE IMPORTANT TO NAACP?

Founded in 1909, the NAACP is the preeminent civil rights organization in the United States. With over 2,000 Units across the country, the organization represents the most visible network of racial justice advocates in the United States.⁴ Among the organization's goals is to achieve equal rights for all Americans by eliminating racial prejudice. To achieve this goal, the NAACP seeks the enactment and enforcement of federal, state, and local laws securing civil rights and works to raise awareness of racial discrimination at all levels of government.⁵

On a more granular level, the NAACP's Environmental and Climate Justice Program has a core commitment to strengthen community resilience and livability by equipping communities with tools to engage with climate action planning in a way that integrates equity and advances civil rights.⁶ This mission is closely linked to one of the starkest racial disparities in the United States: the profound gap in post-disaster outcomes between white and Black communities. In the US, Black households bear the brunt of property damage from natural hazards, losing on average \$50,000 per household in the aftermath of a natural disaster while white households gain \$75,000.⁷



Figure 1: NAACP Members gather with "I am the NAACP" posters.
Source: NAACP

This disparity is especially striking in the aftermath of flood events, which disproportionately impact Black and Brown communities. Studies have demonstrated a substantial correlation between flooding and race: Black communities experience flooding at a disproportionate frequency and extent.⁸ These communities are also often unprotected. Flood zones documented in the Federal Emergency Management Agency's official floodplain maps are outdated and limited, meaning that many communities that experience flooding are not listed as living in flood-prone properties.⁹ FEMA's flood maps are used to help make decisions about infrastructure, property development, and insurance, meaning that inaccurate data can lead to dangerous consequences for residents.¹⁰ The substantial impact of flooding on Black communities, coupled with the failure of federal agencies to reflect flooding in these communities, is a pressing environmental justice concern.

The pursuit of equity in disaster preparedness and, by extension, disaster response is of exceptional importance to the NAACP and lays at the heart of the organization's mission to advance equity for Black Americans. It is also important to note that disparities in disaster preparedness and protection will only become more significant as our climate changes, prompting an increase in the number and diversity of extreme weather events.¹¹ It is critical that federal disaster preparedness and mitigation advance effective, equitable, and safe flood mitigation solutions. The need for improved flood mitigation and prevention infrastructure is particularly acute in the American South and Midwest, both of which are home to many predominantly Black communities.¹² At present, these regions experience an increased incidence of extreme rainfall, leading, by extension, to increased flooding; these trends will grow more pronounced as the climate changes.¹³

Among the most common forms of flood infrastructure deployed in the region are levees, artificial embankments used to control the flow of rivers and inhibit overflow.¹⁴ Many but not all US levees are built and maintained by the Army Corps of Engineers, an agency of the US federal government operating at the local level across the United States. Despite its presence in many flood-prone communities, the Army Corps has faced criticism from community representatives and activist groups that it has inadequately protected Black Americans and does not fully consider the needs and input of communities; these claims include allegations that the Corps mismanaged New Orleans’ levees before Hurricane Katrina, as well as suggestions that the Corps dismissed community activism in Vicksburg, Mississippi.¹⁵ This report details several of these incidents in the section titled “Advocacy and Collaboration.”

This report represents a collaborative effort between the NAACP’s Environmental and Climate Justice Program and the Columbia University Master of Public Administration–Environmental Science and Policy Program. Together, we sought to answer a series of pressing questions: is the Army Corps of Engineers planning process equitable? Are community interests represented? And most significantly: are Black communities inadequately protected from current flooding and will they be protected as flooding exacerbates due to climate change? Using a combination of data analysis and qualitative research, our team endeavored to answer these questions and identify important takeaways for activists and decision-makers working to increase equity and advance racial justice in US flood infrastructure. This report serves as a tool to empower Units and the NAACP national office in their advocacy efforts, both concerning the Army Corps and more generally in pursuit of racial justice in disaster preparedness and recovery.

II. EXPLORING OUR QUESTIONS: METHODS AND TECHNIQUES

Our team sought to determine whether United States Army Corps infrastructure adequately protects Black communities. To explore this question, we pursued both qualitative and quantitative analysis in three areas: 1) federal-level decision-making, 2) regional decision-making and case studies, and 3) nature-based flood infrastructure. We used data analysis, literature review, and expert interviews to develop comprehensive answers to our research question and identify valuable options for activists pursuing greater equity in flood infrastructure.



DATA

Our team used data analysis to complement our qualitative research, using data to add quantifiable evidence to more narrative accounts of disparities in Army Corps protection.

Our data analysts used the mapping tool ArcGIS to visualize the demographics in areas surrounding Army Corps infrastructure. We sought to identify who is protected by Army Corps levees, who is not protected, and whether flood exposed communities were adequately protected. In the course of our analysis, our team generated a series of visualizations, comparing levee location with data describing flood exposure, race, income, and property value. These visualizations allowed us to determine the dominant characteristics of protected communities and to identify gaps in Army Corps protection.

We selected three case studies – New Orleans, Indianapolis, and St. Louis – with numerous predominantly Black neighborhoods, as well as Army Corps levees and extensive data on flood exposure, race, and income. Using flood exposure data from both the Federal Emergency Management Agency as well as from First Street Foundation (which produces exposure maps that incorporate sea level rise projections, warming sea surface and atmospheric temperatures, and changing precipitation patterns), the data team generated a series of maps, which we then overlaid with demographic data drawn from the US Census American Community Survey. These maps were then analyzed to identify trends in flood protected and unprotected areas.

LITERATURE

The literature review adds historical, technical, and political context to the realities illustrated in our data analysis. Our scope was broad. We studied the lived experience of predominantly Black, flood-exposed communities, examined the benefits and drawbacks of Army Corps infrastructure, considered the political processes used to approve Army Corps projects, and delved into the ecological consequences of flood infrastructure.

To understand the decision-making at the federal level, our team studied legislation governing the Army Corps (including the biennial Water Resources Development Act), congressional funding mechanisms, and agency procedures. Of particular interest was the decision-making processes that prioritize projects for federal investment. We studied both the processes used to select and fund projects, as well as the –perhaps unintended– consequences of these systems. We considered what kinds of projects get approved for funding and which projects fail to receive funding, despite their apparent merit. The text used during this research included scholarly writing, government documents, and investigative reporting.

We also considered the local and regional implications of Army Corps decision-making by examining the history of flood infrastructure implementation and maintenance. Our regional research focused on the Midwest and Gulf Regions, given the frequency of extreme weather events, increased flooding, and the number of predominantly Black communities in both regions. We drew case studies from academic literature, published agency reports, and local journalism to provide insight into the experiences of frontline communities.

INTERVIEWS

To inform our research, we spoke often with local advocacy groups, including members of various NAACP Units, environmental organizations, and other advocacy groups representing frontline communities. We also spoke with community groups about their experiences working with regional units of the USACE, hoping to understand how the Army Corps communicates with the groups it seeks to protect. Lastly, we spoke extensively with representatives from the U.S. Army Corps of Engineers, who provided helpful background on the internal processes used by the Corps to implement and maintain federal flood infrastructure.

III. HOW DOES ARMY CORPS INFRASTRUCTURE PLANNING WORK?

To determine whether Black communities are adequately protected by Army Corps infrastructure, it is essential to understand the processes used to approve new projects and the criteria prioritized during decision-making. Becoming familiar with these processes is also vital for activism directed towards the Army Corps and federal decisionmakers: to influence decisions, we need to understand how they are made.

The Army Corps operates under the Department of Defense, an agency within the Executive Branch of the U.S. government.¹⁶ The Corps manages both military and civilian projects, with much of the Corps' civil work focusing on federal flood risk management infrastructure, waterways for commercial navigation, and restoration, protection, and management of aquatic ecosystems.¹⁷ To satisfy its broader goals of water management and safety, the Corps has several internal sub priorities and benchmarks new projects must satisfy. Each stage of project evaluation and implementation represents an opportunity for the advancement of equity and the improvement of Army Corps processes.

It is important to understand how Army Corps projects are approved and implemented. By examining the processes used to approve new projects, we can identify opportunities for racial justice-oriented policy changes and, by extension, pressure points for activist groups and communities hoping to make flood protection more equitable and racially just.

A. PROJECT APPROVAL AND PLANNING PROCESS

The Army Corps decision-making and project approval process is complex and mobilizes a number of federal entities, USACE district offices, local governments, and community groups. This elaborate and multifaceted process begins with community needs, but, because of its complications, community members often struggle to follow the process and identify opportunities and effective strategies to engage with Corps decisionmakers.

Phase 1: Project Proposal and Obtaining Study Approval

To secure an Army Corps flood mitigation project, local governments must identify the need for flood infrastructure by determining the scope of their flood exposure and its impacts. Using their understanding of flood conditions on the ground, local government representatives will typically schedule a meeting with their regional Army Corps division to discuss their desired project type or structure. However, before the Corps can begin a project study, it must get approval from Congress to both undertake and fund the study (see Stakeholder Map below for relevant committees).¹⁸ This phase is an important pressure point for communities to work with their congressional representatives to have the project approved for study.

Phase 2: Feasibility Study

If the project's benefits (i.e. economic, environmental, social) are determined to outweigh its costs, it will advance to a Feasibility Study, during which the Corps will assess the financial and technical feasibility of constructing the requested flood infrastructure.¹⁹ Feasibility studies may cost up to \$3 million dollars, though average costs are not easily identifiable for civilians.²⁰ Importantly, the Army Corps develops program options during the Feasibility Study phase, making it an important pressure point for communities hoping to explore nature-based options or push for specific cultural or geographic considerations. The Corps uses a cost-benefit analysis to compare project options, assessing which project type will be most valuable based on the Corps' criteria (outlined below). The Corps opens the Feasibility Study to public review and comment, which may be submitted via email or verbally by phone and during town halls. Opportunity for public comment is typically advertised in local news sources and on the Army Corps website. The results of the comment period must be reviewed before the project advances to the next stage.

The Feasibility Study phase requires local partners to share the cost of the study (ranging from 25–50% cost-share) with the federal government.²¹ While some communities are eligible for a greater degree of federal funding, most must meet cost-share

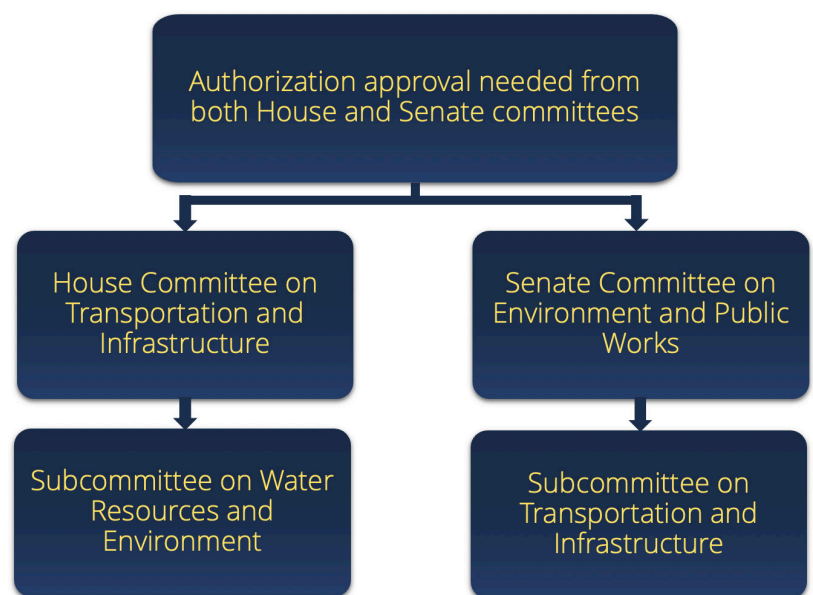


Figure 2: Congressional committees involved in decision making for authorization of Army Corps projects

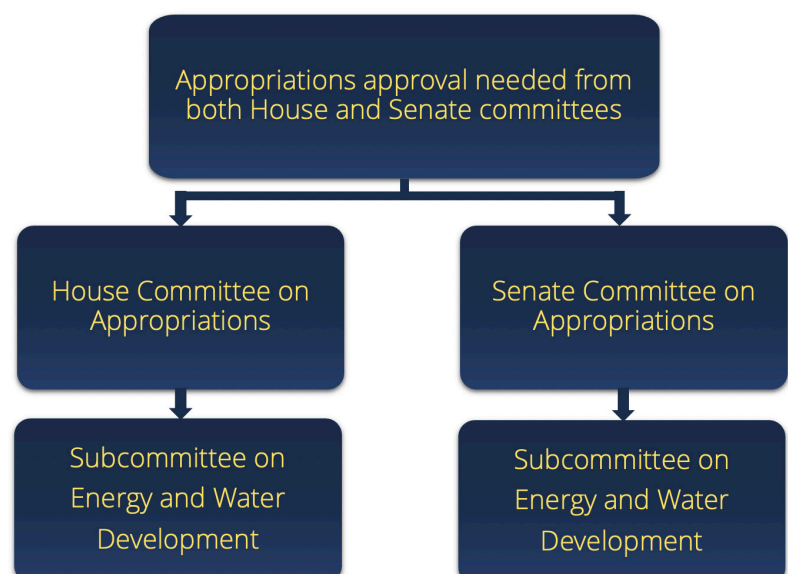


Figure 3: Congressional committees involved in decision making for appropriations to fund Army Corps projects

requirements. The Army Corps' Floodplain Management Services program, for example, is 100% federally funded and provides some initial Corps services to help understand flood risk and identify potential remediation solutions.²²

To obtain federal funding, the Corps must wait for the passage of the annual Energy and Water Development Appropriations Act, placing the project on hold until funds are obtained.²³ At the community level, cost-sharing requirements, which apply both during feasibility studies and subsequent project development and construction, are often prohibitive. Communities who cannot meet cost-sharing requirements may request funding from nongovernmental organizations, or other funding sources, but there is no guarantee that they will be able to obtain the funds they need.²⁴ As a result, projects in low-wealth communities may fail to advance because local governments lack the necessary funding.

Phase 3: Feasibility Report and Administration Review

Following a Feasibility Study, which typically takes 2–3 years, the Army Corps will produce a Feasibility Report, which is used to move the project through various phases of internal approval and review. These internal processes typically consider the project's technical components, surveying the report for factual or scientific inaccuracies.

Should the Feasibility Report be approved by the Corps' Chief of Engineers, the program proposal will move to the Office of Management and Budget (OMB).²⁵

Phase 4: OMB Approval and Congressional Appropriations

The program proposal will then be subjected to a second cost-benefit analysis by the Office of Management and Budget.²⁶ Only after meeting the requirements of the OMB cost-benefit analysis can projects receive funding and begin construction. This second cost-benefit analysis is another challenging benchmark for project approval, and we will outline its potential pitfalls later in this report.

Once authorized by OMB, the project will be returned to Congress for funding allocation, during which representatives deliberate on whether to fund this project in the Energy And Water Development bill during the upcoming fiscal year (see Stakeholder Map for relevant committees). Many projects are not funded in the year in which they are approved. The annual USACE construction appropriations typically range from \$2.1 billion to \$2.7 billion annually, but the agency has a backlog totalling \$32 billion of authorized but unfunded projects.²⁷ As a result, the appropriations phase represents a common stumbling block for Army Corps projects.

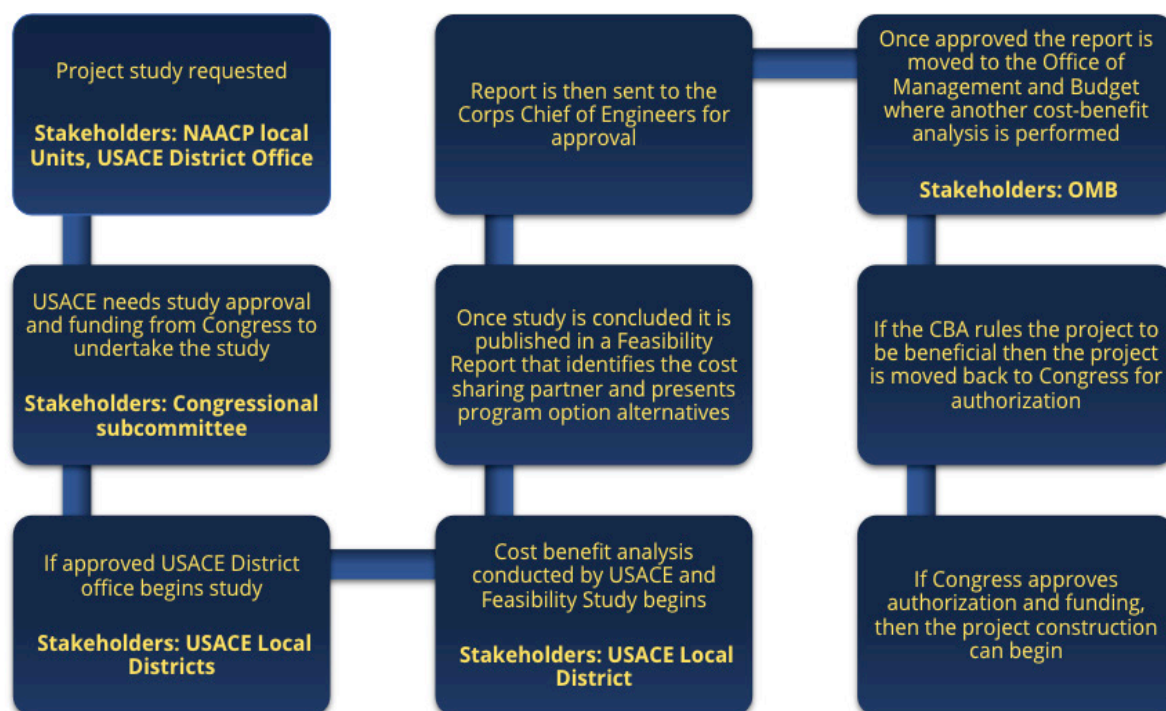


Figure 4: Federal flood project process and approval and associated stakeholders

B. THE ROLE OF THE ARMY CORPS COST-BENEFIT ANALYSIS

The Army Corps of Engineers has been required to complete cost-benefit analysis (CBA) to identify which projects to invest in and implement since 1936, but it was not until the 1983 Principles and Guidelines (P&G) that the contemporary cost-benefit analysis and requirements took shape.²⁸ While past cost-benefit analyses required that environmental quality be treated as a co-equal goal to economic development, the 1983 P&G placed economic development at the center of the Corps' planning efforts, making it the only required component of cost-benefit analysis.²⁹ In doing so, the P&G elevated economic contributions above other project attributes and failed to consider the challenges of quantifying social impacts, cultural value, and environmental benefits in monetary terms.

The P&G established four criteria, known to the Army Corps as "accounts", by which to measure a project's desirability. These include

- **National Economic Development (NED)**, reflecting changes in national economic output
- **Environmental Quality (EQ)**, noting effects on natural and cultural resources, including potential pollution and damage to natural resources
- **Regional Economic Development (RED)**, conveying regional and local economic impacts
- **Other Social Effects (OSE)**, describing plan impacts on communities that alter well-being, happiness, and community satisfaction, including displacement and the disruption of valued community elements and dynamics³⁰

Because only NED was required when the P&G was implemented, the account took on outsized import and other factors were not as actively incorporated into project planning.³¹ In addition, the OSE account in particular was –and is today– vaguely delineated and therefore challenging to implement.³²

C. THE ROLE OF THE OFFICE OF MANAGEMENT AND BUDGET

The Army Corps does not operate in a vacuum. Though the Corps is now reexamining its cost-benefit analysis, the Office of Management and Budget plays a sizable role in the approval of Army Corps projects and requires similar changes to cost-benefit practices.

Both the Army Corps and the Office of Management and Budget (OMB) are required to use a discount rate, an interest rate used to value future costs and benefits in present-day dollars when evaluating Army Corps projects.³³ Lower discount rates reflect a greater appreciation for future impacts of a particular project: the lower the discount rate, the closer the value of future benefits is to the value of present-day benefits. They are, consequently, an important way to reflect an organization's interest in the protection of future generations.

One might assume, therefore, that discount rates would be uniform across the federal government. However, while the Corps uses an annually adjusted water planning discount rate, the Office of Management and Budget employs a different discount rate during project analysis.³⁴ The USACE discount rate is the average annual yield on government securities with 15 years or more to maturity, resulting in an annual change in the discount rate. As of 2020, the USACE rate is 2.75%.³⁵ By contrast, the discount rate used by the OMB is 7% as a minimum threshold.³⁶ When used during cost-benefit analysis, a lower discount rate yields a higher value of future costs and benefits, meaning that a project is more likely to be ruled beneficial under USACE criteria.³⁷ Because projects must pass both a USACE cost-benefit analysis and an Office of Management and Budget cost-benefit analysis, a project may be approved by USACE, only to fail to receive authorization from OMB. It is unclear how often projects reach this phase of planning but fail to advance past OMB. Lowering the discount rate and ensuring consistency across all federal agencies conducting CBA on Army Corps projects would create a more uniform set of priorities for Army Corps projects. A change to the OMB discount rate would also allow Army Corps planners and the communities they serve to submit projects for approval with greater certainty that they will receive the funding they need.

IV. HOW THE PROBLEM PLAYS OUT LOCALLY: DISPARATE OUTCOMES IN BLACK COMMUNITIES

In this section, we detail three case studies in which Black communities are inadequately protected by USACE from flooding. We used maps generated in ArcGIS to illustrate the relationships among flood exposure, race, and income. The results of our analysis demonstrate that in two of our three cases race has the strongest association with flood exposure and the absence of flood protection infrastructure: in these cases, Black residents are more likely to be flood-exposed and less likely to be protected by Army Corps of Engineers infrastructure compared to white residents. In all three cases, low-wealth communities were more likely to be flood exposed than their more affluent neighbors, and Black residents were broadly flood exposed. Communicating these relationships clarifies the consequences of Army Corps protocols and can be a helpful way to articulate the urgency of reforming project approval criteria. We hope that these cases serve as a catalyst for conversations at the community-level about who is protected by Army Corps flood infrastructure, who is flood exposed, and how those groups often differ.

GREATER ST. LOUIS

For more maps and data analysis, please see Appendix Section D

In Greater St. Louis, about 111,700 acres are protected by the USACE's 75.8-mile long Metro East Levee System.³⁸ In Centreville and East St. Louis, two areas protected by the levee system, both FEMA and First Street data show extensive flood exposure with over 2,600 homes considered moderate-high exposure (Figure 5). In these two communities, 97% identify as Black and report low median incomes (Centreville's is \$15,000).³⁹ In Centreville and East St. Louis, about 46% and 38% of residents respectively live below the poverty line, a rate higher than the national average of 13.1%.⁴⁰ Of the areas surveyed, the most flood-exposed areas have the highest percentage of residents living in poverty. In Centreville and East St. Louis, we see a clear correlation between poverty, a condition disproportionately impacting Black residents, and flood exposure.

This correlation is not a coincidence. Beginning in the 1960s, Black and Brown residents experienced discriminatory lending and home financing practices in more central parts of St. Louis, which pushed communities of color outside of the city's core and closer to flood-prone riverbank areas, like Centreville and East St. Louis.⁴¹ These communities are low-wealth, and their proximity to the riverbank and ensuing flood exposure have been exacerbated by failing infrastructure. Since the late 1980s, deteriorating sewage systems have leaked raw sewage into Centreville and East St. Louis's streets during heavy rainfall.⁴²

The convergence of these issues is the result of historic structural inequality. As redlining pushed more Black residents towards

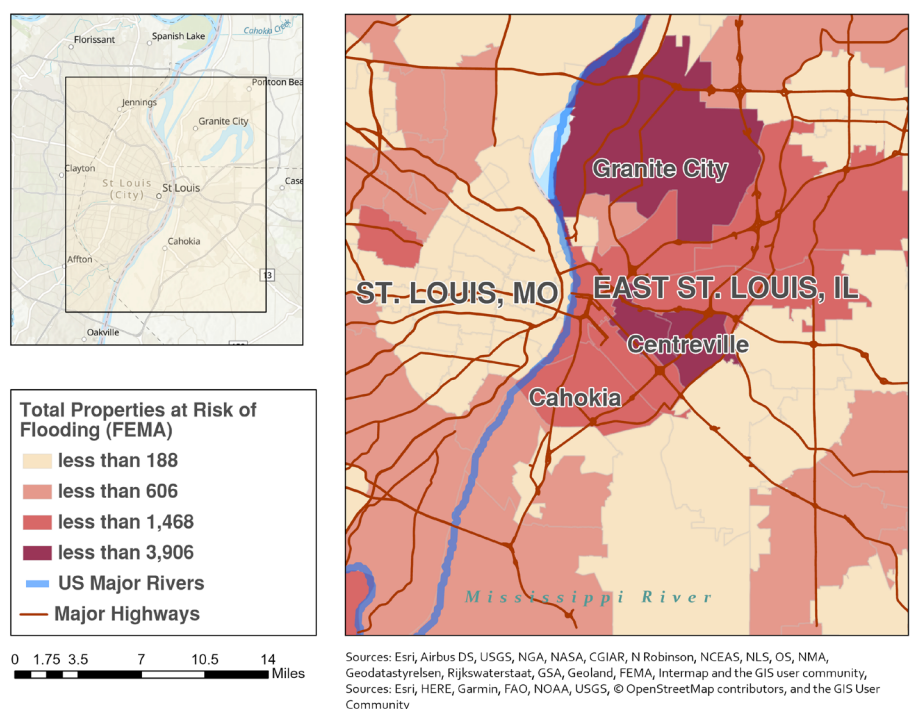


Figure 5: Total FEMA Properties at Risk by Zip Code

This map shows the number of properties at risk of flooding in St. Louis as of 2020, using data from the Federal Emergency Management Agency. The darker pink areas represent the areas with the greatest concentration of flood exposed properties.



Figure 6: Flooding in East St. Louis in 2008. Source: Derick Holtmann

Centreville and East St. Louis, white residents left the area, taking their financial resources with them.⁴³ In the absence of a more substantial tax base, it is difficult, if not impossible, to remediate the area's infrastructural problems. Limited resources are compounded by poor governance, with residents noting that they feel ignored by local officials who have long failed to address flooding or other infrastructural issues.⁴⁴ Residents have also expressed the belief that these safety threats would be addressed more quickly and meaningfully were their towns not majority Black.⁴⁵ They allege, systemic racism has impeded improvements to flood protection and quality of life.

The levee system that is intended to protect the area is similarly deteriorated: the East St. Louis Levee was cited in 2007 as not compliant with the 1% safety standard, threatening a change in neighborhood's designation from a "protected" area to a "flood hazard area".⁴⁶ This change would, in turn, negatively impact property values, and drive flood insurance costs up.⁴⁷ To address these urgent concerns and begin upgrading the levee system, the Flood Prevention District (FPD) Council was created in 2009 and partnered with USACE to complete restoration work on the area's levees.⁴⁸ However, because the community has been unable to meet cost-sharing requirements independently with little assistance from federal agencies, the project was delayed until federal funding could be obtained by the FPD in 2019, delaying the project by 10 years.⁴⁹

Even with cost-sharing support, the project is costly for local and federal funders. To date, the USACE has invested \$7 million while the East St. Louis council has spent \$16 million.⁵⁰ The project has already cost \$156 million, with an additional \$95.2 million in appropriations from the award plan as a combination of local and federal funding for Fiscal Year 2019.⁵¹ Without this long-delayed outside funding, improvements to the levee system would have been continually delayed, in favor of other projects with more immediate funding sources. Residents have been left vulnerable and flood exposed and will remain so until the project can be completed.⁵² Once upgraded, the levee system will mitigate some of the catastrophic flooding residents have experienced, improving conditions in Centreville and East St. Louis and, perhaps, making it easier to improve other failing infrastructure. In the meantime, residents wait for assistance, knowing that they have yet to receive help in large part because their community cannot meet onerous financial requirements.

INDIANAPOLIS, INDIANA

For more maps and data analysis, please see Appendix Section D

Note: the maps shown in this section show data at the zip code level for ease of reference, but our text also discusses individual neighborhoods, whose demographics may differ from those of the broader zip code in which they fall. To see more granular demographic data, please refer to the block group-level maps included in our appendix.

Founded in 1821, Indianapolis sits at the junction of the west fork of the White River and Fall Creek, a historic wetland area. The city is diverse, with 60% of the population identifying as white, 29% Black or African American, and 11% Hispanic or Latinx, a gender-neutral term meaning of Latin American origin or descent.⁵³ Yet despite the city's diversity, the experiences of its residents are far from equitable. Our research shows that Black and white communities in central Indianapolis experience vastly different degrees of flood exposure. Further, when we juxtapose maps showing per capita income, race and flood exposure there is consistent overlap between communities with a higher percentage of flood-exposed Black residents and zip codes with per capita incomes below \$26,000. Our analysis is consistent with broader data: in Indianapolis, white residents have a median household income of \$57,000 while Black residents have a median household income of \$34,000.⁵⁴ Based on our geospatial analysis and additional qualitative data, we can conclude that Black communities in central Indianapolis typically have lower incomes and greater flood exposure than white communities.

Much of the Black population of Indianapolis resides just north of the downtown area in the Martindale-Brightwood, Meadows, and Fall Creek neighborhoods.⁵⁵ These areas are, on average, far more flood exposed than nearby white

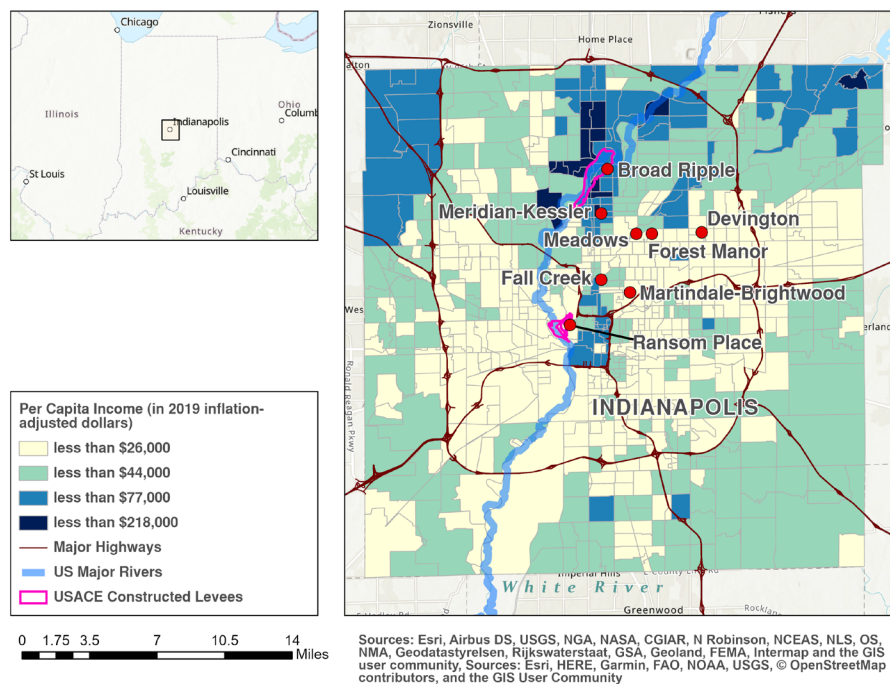


Figure 7: Per Capita Income

This map shows annual per capita income in 2019 inflation-adjusted dollars for Indianapolis. The darker blue areas represent the areas with the highest incomes. Areas with a per capita income below \$26,000 are shown in yellow. Data source: 2019 American Community Survey 5-Year Data.

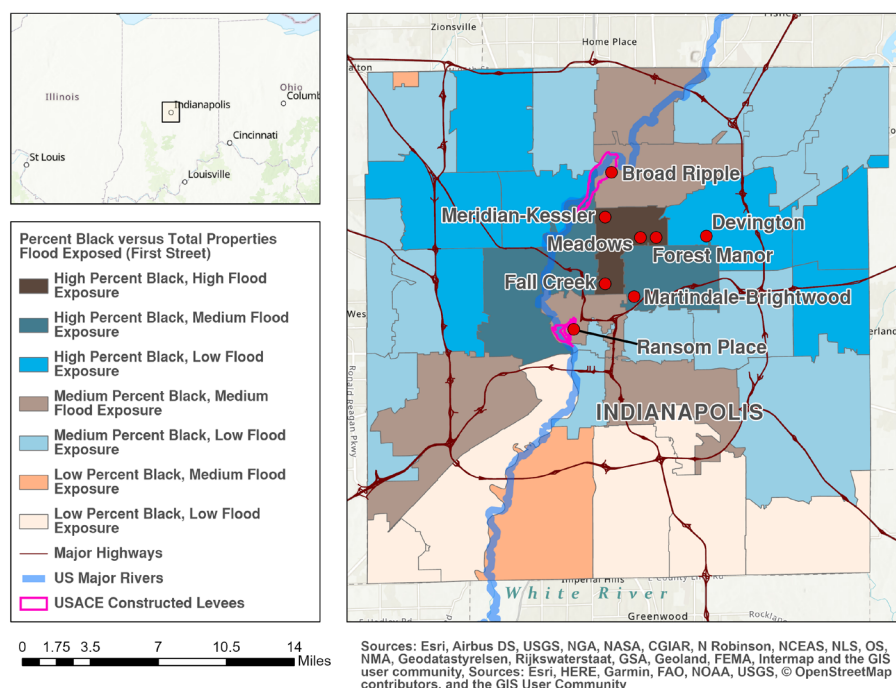


Figure 8: Percentage of Black Residents vs. Total Flood Exposed Properties

This map shows the number of properties at risk in Indianapolis as of 2020, using flood exposure data overlaid with the percentage of the population that identifies as Black. The dark brown areas where the neighborhoods of Meridian-Kessler, Meadows, Forests Manor, and Fall Creek are located indicate where there is both, a high percentage of Black residents and a number of flood exposed properties. Bright blue areas indicate a high percentage of Black residents but a low flood exposure. Areas with a low percentage of Black residents and low flood exposure are shown in light orange. Data source: First Street Foundation and 2019 American Community Survey 5-Year Data.

neighborhoods. For example, data from the First Street Foundation notes that 22% of homes in Meadows, a predominantly Black neighborhood, are highly flood exposed (see Figure 7). By comparison, in the Broad Ripple neighborhood just north of Meadows, where 92% of the population identifies as white and is more affluent, only 9.2% of households are flood exposed per First Street Data. Broad Ripple is not only whiter than other neighboring communities, it is also better protected, falling behind one of the city's two USACE levees. Similarly, the city's second levee also protects a predominantly white neighborhood, Ransom Place, whose population is 62% white. Importantly, our research did not identify any central Indianapolis neighborhoods in which homogeneously white communities were highly flood exposed.

In addition to observing greater flood exposure and less protection among Black residents, our research also noted a lag in flood protection implementation. Though flooding has been a problem in Indianapolis for several decades (the first plans for levees emerged during the 1940s), the city's levee projects were not completed until 2019, following more than 20 years of planning and construction.⁵⁶ During that time period, climate change impacts have grown more acute, exacerbating flood exposure and likely rendering the city's levees obsolete. We get some sense of the reduced benefits of levees by comparing First Street Foundation Data, which attempts to integrate climate change projections, and FEMA flood exposure maps, which do not include climate projects. Though FEMA does not note substantial flood exposure behind the city's levees, First Street notes that up to 15% of households behind Indianapolis's levees may be flood exposed. Given disparities between the two datasets, additional study is needed to adequately represent flood exposure among Indianapolis residents. However, there are several clear takeaways from the Indianapolis case: Black and white communities experience disparate flood impacts, and the city's Black communities have, on average, fewer resources at their disposal to help cope with a flood event. The Army Corps has attempted to mitigate flood exposure through levee construction, but these levees protect whiter neighborhoods and, because of prolonged construction periods, may not provide the degree of flood protection needed to withstand climate change impacts.

NEW ORLEANS, LOUISIANA

For more maps and data analysis, please see Appendix Section D

Although most of New Orleans is in a levee-protected zone, the majority of the city still faces either moderate to severe flood risk due to a history of water engineering. Past engineering efforts, including damming up the Mississippi River and draining wetland areas, have led to high rates of land subsidence and coastal erosion; these trends are causing the already low-lying city to continuously sink farther below sea level.⁵⁷ As a result, New Orleans is particularly vulnerable to sea-level rise and coastal storm surge.⁵⁸ Black communities, who make up 60% of the city, face particularly high levels of flood exposure (as shown in Figure 9).⁵⁹ New Orleans East, which is made up of predominantly low-income Black communities or communities of color, has some of the highest levels of flood exposure in the city. Predominantly Black New Orleans East neighborhoods (including Pontchartrain Park, the Lower 9th Ward, and Plum Orchard) have the

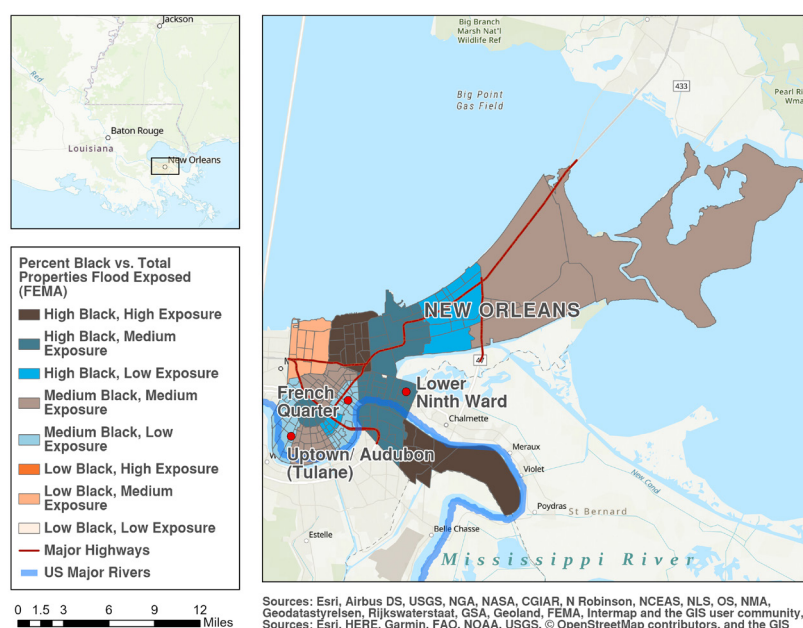


Figure 9: FEMA Flood Exposure vs. Percent Population Black

This map shows the number of properties at risk of flooding in New Orleans as of 2020 using flood exposure data overlaid with the percentage of the population that identifies as Black. The dark brown areas indicate where there is both a high percentage of Black residents and a high number of flood exposed properties. Bright blue areas indicate a high percentage of Black residents but a low flood exposure. Areas with a lower percentage of Black residents and low flood exposure are shown in orange. Data source: Federal Emergency Management Agency (FEMA) and 2019 American Community Survey 5-Year Data.

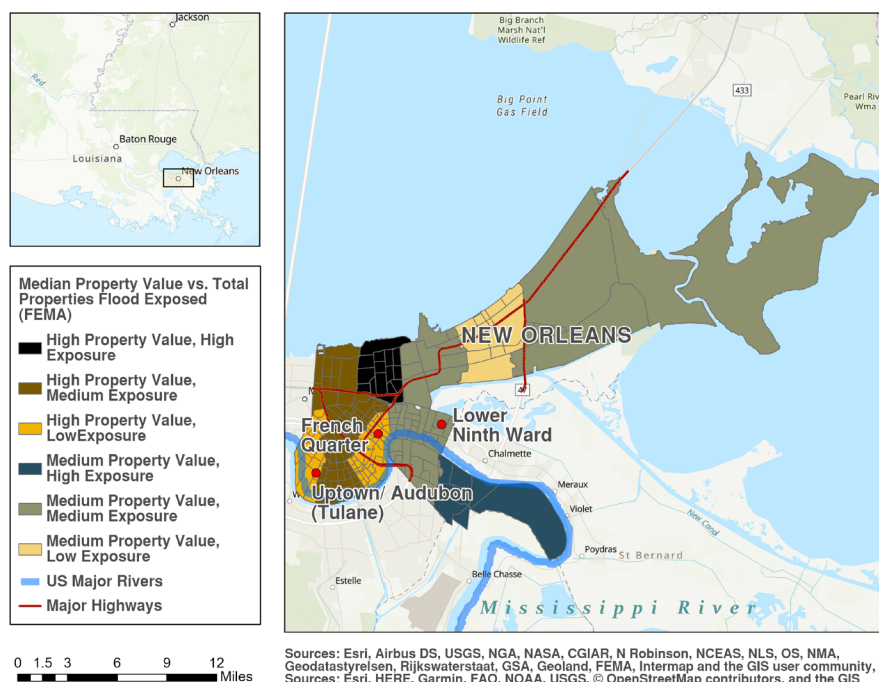


Figure 10: FEMA Flood Exposure vs. Median Property Value

This map shows the number of properties at risk of flooding in 2020 using flood exposure data overlaid with median property values in New Orleans. The blue color indicates a high flood risk and medium property values. The Lower Ninth Ward neighborhood shows both, median property values and median flood risk. Data source: Federal Emergency Management Agency (FEMA) and 2019 American Community Survey 5-Year Data.

The disproportionate level of flood exposure that Black residents of New Orleans face is the result of institutional racism that can be traced back to the colonization of the region. Early wealthy settlers had access to maps that showed what areas of land were above sea level. After all the land above sea level was bought by wealthy settlers, lower-income settlers, including free people of color, were forced to settle in the “low lying flood-prone, mosquito-infested back swamp.”⁶⁰ A history of racially discriminatory policies on the federal, state, and local level, including redlining, gentrification, and discriminatory zoning, have lowered property values and created deep racial and economic inequities that perpetuated the disenfranchisement of Black communities.⁶¹ These inequities caused Black New Orleanians to be particularly vulnerable to flood risk by the time Hurricane Katrina hit in 2005. Due to over 50 breaches in the city’s USACE-built levee system, 80% of the city experienced flooding.⁶² However, the city’s extreme poverty areas, all of which were predominantly Black, bore the brunt of the disaster: Black households were 50% more likely to experience flooding and, by extension, more likely to be displaced.⁶³ It is estimated the storm killed up to 1100 people in the New Orleans region and out of 818 deaths for which race was listed, 55% were Black.⁶⁴

After Katrina, the United States Army Corps spent years denying full responsibility for the levee breaches that took place during the Hurricane, only to have their culpability demonstrated by a series of lawsuits and independent investigations.⁶⁵ A 2015 study demonstrated that the Corps failed to adequately

lowest per capita income in the city ranging from \$0 to \$26,000. They also have low median property values ranging from \$119,200 to \$201,400 (as shown in Figure 10). This combination of economic challenges and high flood exposure, with the percentage of properties at risk ranging from 18.3% to 36.6%, makes New Orleans’ Black residents particularly vulnerable to devastating and prolonged flood impacts. By contrast, uptown and central New Orleans, which are both more elevated and predominantly white, has the highest incomes, highest property values (ranging from \$360,000 to \$760,000), and the lowest level of flood risk (12.6% to 23.2% of properties at risk). The disparities within our data demonstrate that Black New Orleanians experience disproportionate flood exposure and have far fewer means with which to recover from flood events.



Figure 11: New Orleans protestor. Source: Lee Celano

convey the different risk levels associated with project options when presenting local Orleans Levee Board (OLB) officials with options for levee construction, leading local officials to select a less expensive, higher risk proposal.⁶⁶ The same study also identified design failures in the Corps' flood system, prompted by inappropriate efforts to cut costs and the Corps' misinterpretation of a pivotal engineering test.⁶⁷ Cost-cutting reduced project costs by approximately \$100 million but also diminished the overall engineering reliability of the levee.⁶⁸ The study furthermore concluded there was no evidence that improper maintenance of the New Orleans levee system on the part of the Orleans Levee Board played a role in the failure of the 17th Street and London Avenue Canals.⁶⁹ The circumstances surrounding Hurricane Katrina are profoundly complex, with numerous factors and actors influencing the outcomes experienced by New Orleans residents.

Contrary to mainstream narratives that Hurricane Katrina was too large of a storm for levee systems to handle, experts found storm surge heights were not higher than the levee floodwalls USACE had built. A 2008 court ruling placed full responsibility for floodwall collapses of the 17th Street and London Avenue Canals on the Corps, which caused at least \$27 billion in direct residential, commercial and public property damage.⁷⁰ However, due to the legal immunity provision established by the Flood Control Act of 1928, the Corps was not held financially liable.⁷¹ Under this act, the federal government cannot be held liable for the failure of projects initiated by its agencies, including defective flood-control projects.⁷²

In response to Hurricane Katrina, Congress created the National Levee Safety Act of 2007 and brought together public and private sector representatives to develop a national levee safety program.⁷³ The National Levee Safety Act directed the Army Corps of Engineers to undertake the first-ever nationwide levee inventory, establishing the National Levee Database (NLD).⁷⁴ After community groups called for more transparency in inspection and maintenance processes post-Katrina, the Corps also required more frequent and robust local levee inspection procedures both in New Orleans and nationwide.⁷⁵ The Corps now requires local levee districts to conduct quarterly inspections using more rigorous standards, checklists and GPS.⁷⁶ In addition, the Corps now requires a comprehensive levee inspection and screening assessment be conducted every five years.⁷⁷ Comments by the local levee districts (local sponsors) are stored in a federal database maintained by the Corps.⁷⁸

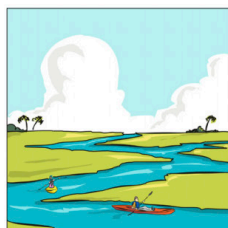
V. HOW DOES THE ARMY CORPS USE NATURE BASED FEATURES?

In the United States, flood protection infrastructure has primarily been constructed of hard materials. Levees and dams are typically made of earthen materials and often augmented with concrete floodwalls, cement, and steel.⁷⁹ In recent years, activists, planners, and policymakers have begun to embrace green infrastructure, also known as natural and nature-based infrastructure. Green infrastructure is often favored by environmental groups because of its ecological advantages: wetlands, salt marshes, and mudflats can allow communities to reduce flood risk while preserving local environments. Green infrastructure techniques can preserve local ecosystems by conserving and restoring features found naturally in the environment and serves to improve quality of life and economic benefit in the community. This section seeks to address some of the long term flood resilience measures through natural and nature based features as alternatives and in conjunction to grey infrastructure.

Often the preservation of these natural features provides long-term protections to flood events while preserving services that communities rely on such as fishing, tourism, and access to water resources.⁸⁰ USACE considers "green" infrastructure, also called natural and nature-based features, in its assessment of potential strategies for federal flood infrastructure projects. Engineering with Nature, an Army Corps initiative, seeks to research and integrate natural and engineered systems expanding its applications from civil works navigation and transportation projects to flood management, ecosystem restoration, and water operations.⁸¹

It is important to consider the effects of flood infrastructure and the types of materials used during construction. Hard infrastructure projects, including most levees and dams, can have unintended negative consequences beyond their intended benefits, including reduced water accessibility, permanent ecosystem changes, the amplification of existing social hierarchies, and economic consequences for communities

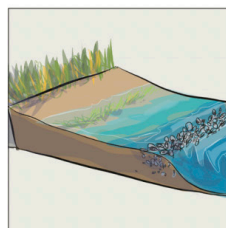
relying on the natural environment for their livelihoods and incomes.⁸² Given these potential tradeoffs, communities, government agencies, and activist groups should consider taking a holistic approach to flood prevention projects, implementing extensive evaluations and assessments to ensure solutions are equitable and beneficial for individuals and the natural environment.⁸³ This approach includes collaboration among environmental justice organizations, scientists, urban planners, and governmental bodies.⁸⁴ Further case studies examining relationships centered around natural and nature based features can be found in the section Natural Infrastructure Case Studies: Working with the Army Corps on page 26.



COASTAL WETLANDS

Coastal wetlands are found along ocean, estuary, or freshwater coastlines.

They are often referred to as “sponges” because of their ability to absorb wave energy during storms or normal tide cycles.



OYSTER REEFS

Oysters are often referred to as “ecosystem engineers” because of their tendency to attach to hard surfaces and create large reefs made of thousands of individuals.

In addition to offering shelter and food to coastal species, oyster reefs buffer coasts from waves and filter surrounding waters.



DUNES

Dunes are coastal features made of blown sand. Healthy dunes often have dune grasses or other vegetation to keep their shape.

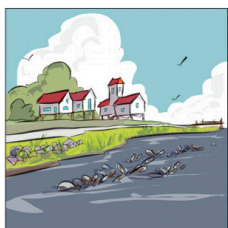
Dunes can serve as a barrier between the water’s edge and inland areas, buffering waves as a first line of defense.



WATERFRONT PARKS

Waterfront parks in coastal areas can be intentionally designed to flood during extreme events, reducing flooding elsewhere.

Waterfront parks can also absorb the impact from tidal or storm flooding and improve water quality.



LIVING SHORELINES

Living shorelines stabilize a shore by combining living components, such as plants, with structural elements, such as seawalls.

Living shorelines can slow waves, reduce erosion, and protect coastal property.

Figure 9: Natural or nature based features that increase coastal resilience and provide natural solutions to flood management. Data source: Federal Emergency Management Agency (FEMA), *Building Resilience with Nature-Based Solutions*⁸⁵

VI. TURNING THE PAGE: RECENT CHANGES TO ARMY CORPS POLICY

To integrate equity considerations more fully into the Army Corps’ practices, Congress passed the 2007 Water Resources and Development Act (WRDA), which called for the creation of new Army Corps project development guidance. This guidance, released as the 2015 Principles, Requirements, and Guidelines aimed to mitigate the impact of the NED account on project approvals.⁸⁶ The 2015 Principles, Requirements, and Guidelines attempted to alter the valuation process for flood mitigation projects in low-wealth communities, advance natural, and nature-based approaches, and assess the impact of the project on the watershed at large.⁸⁷ It is important to note, however, that the implementation of these additional requirements and guidelines took place more than 20 years after a cost-benefit analysis was first required for Army Corps projects. Though concerns about the value placed on NED persisted from the accounts’ conception, it wasn’t until much later that those concerns were translated into new legislation and guidance.

Indeed, despite legislative attempts to alter the Corps’ requirements, concerns about its areas of focus for prospective projects persist today.

To try and address the inequitable side-effects of the cost-sharing requirement, the 2020 Water Resources Development Act authorized a pilot program, allowing USACE to waive the cost-sharing requirement for 10 feasibility studies in rural and economically disadvantaged communities, as long as federal costs equal \$10 million or less.⁸⁸ Though small-scale, this pilot program is an important opportunity, not only for communities who may see their feasibility studies funded but also for advocates looking for real-world examples of how the Army Corps might address the challenges of the cost-sharing requirement. At present, there is no public plan for how the Corps will select communities to be included in the pilot program. Instead, the USACE will select participants based on the definition of “Economically Disadvantaged Communities” as provided in the 2020 WRDA. This definition states that if a county has a greater percentage of people living in poverty than the state average and its population has a greater concentration of people of color and/or indigenous people than the state as a whole it is considered “Economically Disadvantaged”.⁸⁹

Further, the 2020 WRDA amended the Corps’ practices and required that future projects consider climate change, environmental justice, and sustainable solutions.⁹⁰ The Corps now has a mandate to examine social impacts and consider how conditions may change in the face of rising sea levels, increased inland flooding, and more frequent extreme weather events.⁹¹ In congruence, the 2020 WRDA now requires natural and nature based features to be considered during the feasibility report including an analysis of the long term costs and benefits. This mandate has been supplemented by President Joseph R. Biden’s recent Executive Orders Advancing Racial Equity and Support for Underserved Communities Through the Federal Government and Tackling the Climate Crisis at Home and Abroad, both of which call for an equity and racial justice-oriented mobilization of the federal government against the climate crisis.⁹²

The second significant change within the Corps is a January 2021 policy directive, calling for substantial changes to its cost-benefit analysis. This directive expanded the USACE decision framework to consider not only National Economic Development (NED), but also Environmental Quality (EQ) and Other Social Effects (OSE) when making budgetary decisions.⁹³ On January 5th, 2021, USACE released a policy directive to make substantial changes to its cost-benefit analysis. This policy directive expanded the USACE decision framework to consider not only National Economic Development (NED), but also Environmental Quality (EQ) and Other Social Effects (OSE) when making budgetary decisions.⁹⁴ The 2020 WRDA, coupled with the January 2021 policy directive, marks a substantive departure from past Army Corps requirements and will hopefully mitigate overreliance on NED during cost-benefit analysis. However, neither the 2020 WRDA nor the 2021 policy directive tells the Corps how to incorporate OSE into its analysis.

These changes represent a unique opportunity for communities, activists, and policymakers to influence the Corps’ cost-benefit analysis and, in doing so, promote equitable flood infrastructure in the United States.

A. CASES OF ARMY CORPS INTEGRATING EQUITY INTO PROJECT PLANNING

Though the national emphasis on making USACE more equitable is relatively recent, the agency has worked to integrate equity into the planning process on specific projects. This work has mainly taken place at the regional level with some USACE offices, including offices in North Carolina and Alabama, placing a greater emphasis on the Other Social Effects account to reflect uniquely important cultural or historical values. These cases are an excellent example of the potential within the Corps to better reflect non-economic merits in the future.

SELMA, ALABAMA

The Army Corps manages flood infrastructure in the Alabama River, near the Edmund Pettus Bridge, a National Historic Landmark, and the site of the Bloody Sunday beatings of civil rights marchers. In a 2020 flood risk management study that reviewed flood risks along the Alabama River, the Corps incorporated historic significance and community resilience into its Other Social Effects account, to reflect the unique significance of the location.⁹⁵ The proposed project design that USACE recommended in its study, a riverbank stabilization project, was the project scenario that was the most “cost-effective and least

environmentally damaging” but also the most beneficial in terms of the Regional Economic Development and Other Social Effects analysis.⁹⁶ The Corps used 36 unique metrics to gauge social vulnerability and community resilience, including the presence of a food desert, per capita income, percentage of the population living with disabilities, and access to flood insurance.⁹⁷ Importantly, the USACE granted an exception to the National Economic Development account, meaning the Corps did not need to prioritize economic benefit given the unique historic importance of the site. While the selection of a project whose social benefits outweighed any economic remuneration is encouraging, this project remains an exception to the Corps’ typical practices. Processes like the one used in Selma is an example of how the Corps could work in the future. A better integration of social impacts and community needs might promote more projects like the Selma project and, in doing so, better reflect the unique needs of flood exposed communities.

PRINCEVILLE, NORTH CAROLINA

USACE’s flood risk management project in Princeville, NC, the first town founded by formerly enslaved people, was also granted an exception to NED requirements. Catastrophic flooding in Princeville from Hurricane Floyd in 1999 prompted President Bill Clinton to issue Executive Order 13146, which created a “President’s Council on the Future of Princeville, North Carolina” and mandated that the town be rebuilt and protected from future floods, given its exceptional historical importance.⁹⁸ To address the requirements of the Executive Order, USACE emphasized its Other Social Effects analysis, with particular focus on impacts to “community cohesion, cultural and historical values” as well as local economic impact.⁹⁹ The Corps’ 2016 project study also considered environmental justice impacts citing NEPA Executive Order 12898 which requires federal agencies to examine potential disproportionate impacts on predominantly Black communities like Princeville, which is over 96% Black and low-income with the median household income (\$21,000) being 40% of the national median (\$51,900).¹⁰⁰ In interviews about the Princeville project, USACE staffers pointed to the importance of the narrative Princeville assembled to argue its historic and cultural import, which helped justify investment from the federal government.¹⁰¹ Like Selma, Princeville is an exception to Army Corps practices, not the rule. Nevertheless, the project exemplifies what is possible if measures of social and environmental benefit are prioritized over economic development objectives.

VII. ADVOCACY AND COLLABORATION

While many Army Corps decisions are made at the national level, important project-specific choices are made by local Army Corps offices or regional divisions. Congressional committees, national-level Army Corps officials, and the Office of Management and Budget staff are influential actors in the decision-making process on Army Corps projects, but these groups can be inaccessible and ensconced in complex bureaucracies.

The USACE has a stated mission to create solutions in collaboration with partners “to energize our economy and reduce disaster risk.”¹⁰² Despite this stated goal, our research demonstrates that USACE does not always adequately consider outside perspectives and collaborate with communities, resulting in flood infrastructure that is insufficient and, sometimes, harmful. Despite this, many community groups have found successful ways to work with USACE and other agencies responsible for flood protection to improve flood infrastructure plans, making them more equity-oriented and safer.

In this section, we will outline examples of local advocacy groups working to improve USACE projects and make their communities safer for Black, Brown, and low-wealth residents. These cases can serve as a helpful blueprint for Units hoping to pursue comparable activism in their own communities.

A. BUILDING COALITIONS TO ADVANCE EQUITY CRITERIA IN FLOOD INFRASTRUCTURE PLANNING: CASE STUDY IN HOUSTON, HARRIS COUNTY, TX

In the wake of devastating flooding during Hurricane Harvey, activists called on Harris County to change the way flood infrastructure projects and disaster relief funding is awarded in the Houston Area. A diverse coalition of environmental, racial, and climate justice advocacy groups, including the NAACP Houston and the Houston-based advocacy group Bayou City Waterkeeper (BCWK), banded together under a new moniker: The Coalition for Environment, Equity, and Resilience (CEER).¹⁰³ For too long, the Coalition argued, disaster funding in Harris County had replicated systemic racism, providing disproportionate aid to white residents and leaving Black communities unprotected and unaided.¹⁰⁴ They attributed these disparities to federal and local government cost-benefit analyses, which prioritized property values and failed to address issues of equity and flood exposure.¹⁰⁵

Together, the members of CEER pushed the Harris County Flood Control District (HCFCD) to create an equity criterion for the county's 2018 Flood Infrastructure Bond Program. The Coalition called for two important changes to the County's calculus when deciding to fund flood infrastructure projects. First, the group advocated for the integration of a Social Vulnerability Index (SVI) into Harris County flood infrastructure planning.¹⁰⁶ Developed by the Center for Disease Control (CDC), the Social Vulnerability Index uses social



Figure 12: NAACP Houston Branch sea level training.
Source: NAACP

and economic variables, including income and race, to determine which communities are most vulnerable to natural disasters.¹⁰⁷ Integrating the Social Vulnerability Index into the county's flood mitigation and recovery planning would amplify the needs of exposed communities with fewer means to adapt to changing circumstances. Second, CEER members called for the use of a "worst first" approach, which would prioritize funding projects in most impacted and underserved communities before addressing communities with greater wealth or less exposure.¹⁰⁸ The group's lobbying of Harris County government was successful and, in 2019, the County passed the "Harris Thrives" resolution, which mandated the integration of both SVI and the "worst first" approach.¹⁰⁹

One year later, in August 2020, the CEER coalition again pushed Harris County to integrate greater equity in flood infrastructure and recovery. Working with the county's Flood Control Task Force, CEER successfully pushed for greater community involvement in flood infrastructure planning, emphasizing the need for engaging diverse stakeholders during the planning process. Following CEER's lobbying, Harris County passed a new resolution renaming and restructuring the task force. Harris County's new Community Flood Resilience Task Force is now required to have at least three members representing low-wealth and/or socially vulnerable communities.¹¹⁰ The resolution also established a new community engagement project to increase transparency and communication about flood infrastructure projects.¹¹¹

Thus far, it seems that changes to Harris County's flood mitigation strategy have been effective. Halls Bayou, a smaller section of the high-poverty region Greens Bayou that is largely left off FEMA's current floodplain map, has been earmarked \$100 million in bond funding for 17 flood mitigation projects. East Aldine, a low-income Latinx community not included in Houston's boundaries, will also now be eligible for much-needed drainage infrastructure.¹¹² Without the activism of CEER, it is unlikely that these communities would have received this much-needed infrastructure. Though CEER members, including Bayou City Waterkeeper, continue to push for additional transparency, these initial changes set an important precedent for how government institutions can use an equity screening criteria to ensure frontline low-wealth communities of color are prioritized for disaster prevention and mitigation projects in funding decisions.

B. USING PUBLIC COMMENT PERIODS AND LAWSUITS TO ADVANCE ENVIRONMENTAL JUSTICE: CASE STUDY IN NEW ORLEANS, LA

Community and environmental groups played an instrumental role in holding USACE accountable for the catastrophic damage their engineering design failures caused during Hurricane Katrina (see Partnerships Chart on page 55). In the wake of the hurricane, community groups engaged with the Corps through public hearings, public comment periods, and the local USACE district, hoping to influence the recovery efforts and answer lingering questions about how the levees failed. However, many advocacy groups involved in discussions with the Corps, including Levees.org and the Sierra Club Louisiana Delta chapter, have alleged that these conversations were largely performative and were ultimately ignored by Corps officials.¹¹³



Figure 14: NAACP sea level rise training. Source: NAACP

In addition, Stephen Estopinal, civil engineer and eight-year veteran of the post-Katrina Levee Authority East, has stated that “major decisions were made and locked in stone before anyone outside of the Corps’ sphere of influence could contribute.”¹¹⁴

In subsequent years, the Corps has endeavored to improve communications with outside groups in New Orleans, but members of the Sierra Club’s Louisiana Delta chapter have said that mechanisms for integrating public feedback remain ineffective. The group notes that by the time the public comment period starts for a given project, USACE has typically already developed the project’s plans and is hesitant to change course.¹¹⁵ Despite this tense climate, activists continue to lobby the Army Corps for improved practices and greater consideration of community viewpoints.

One significant example of successful activism directed at the New Orleans Corps District comes from RISE St. James, a group working to stop the Corps from granting a federal permit to allow the construction of a petrochemical plant in nearby St. James Parish.¹¹⁶ St. James Parish falls within an area known as “Cancer Alley,” a stretch of land between New Orleans and Baton Rouge known for its high concentration of polluting petrochemical facilities. RISE St. James’ Stop Formosa Plastics campaign brought together several advocacy groups, including the Louisiana Bucket Brigade, Center for Biological Diversity, Healthy Gulf, ACLU, and the Sierra Club Louisiana Delta chapter, to prevent the Corps from allowing the construction of yet another plant and exacerbating the area’s already poor air quality. The campaign coalition members deployed a variety of tactics, including op-eds, a digital public comment campaign and, eventually, legal action to stall and block the project’s approval.¹¹⁷ In 2020, the coalition filed a lawsuit, alleging the Corps had failed to analyze the environmental impact of the plant or complete legally mandated archeological surveys. The coalition’s suit suggested serious misconduct on the part of the Corps, and in response, in February 2021, the Corps suspended Formosa Plastics’ permit, bringing construction on the plant to a halt.¹¹⁸ In February 2021, the Corps suspended Formosa Plastics’ permit, bringing construction on the plant to a halt.¹¹⁹ Natural Resource Committee Chairman Raúl Grijalva and Congressman Donald McEachin also sent a letter to President Biden asking the Corps to permanently revoke permits for the project citing that the project undermines the administration’s racial and climate justice goals.¹²⁰ The success of RISE St. James’ advocacy work underscores the importance of working in tandem with other advocacy groups. Together, the Stop Formosa Plastics coalition presented a rigorous, evidence-based legal argument against the construction of the petrochemical plant.

C. EMPLOYING PUBLIC PRESSURE TACTICS AND SOCIAL MEDIA CAMPAIGNS: CASE STUDY IN VICKSBURG, MS

The historic town of Vicksburg, Mississippi was first founded in 1825.¹²¹ Today, approximately 67% of the population of the town of Vicksburg, Mississippi identifies as Black or African American.¹²² The town has flooded several times in recent memory, most notably in 2019, when a devastating flood covered over 500,00 acres of land for well over six months.¹²³

Existing levees along the Mississippi and Yazoo Rivers built by the USACE were meant to stop the rivers from overflowing into the land. But these levees and their associated floodgates created an enclosed area into which water could drain and accumulate known as the Yazoo Backwater Area.¹²⁴ Leading up to the Flood of 2019, the USACE announced the closure of the structure that drains the Backwater Area, known as the Steele Bayou Control.¹²⁵ With the closure of the Steele Bayou Control and the absence of other pumps, there was no way to drain the Backwater area of rainwater. The previous year had been marked

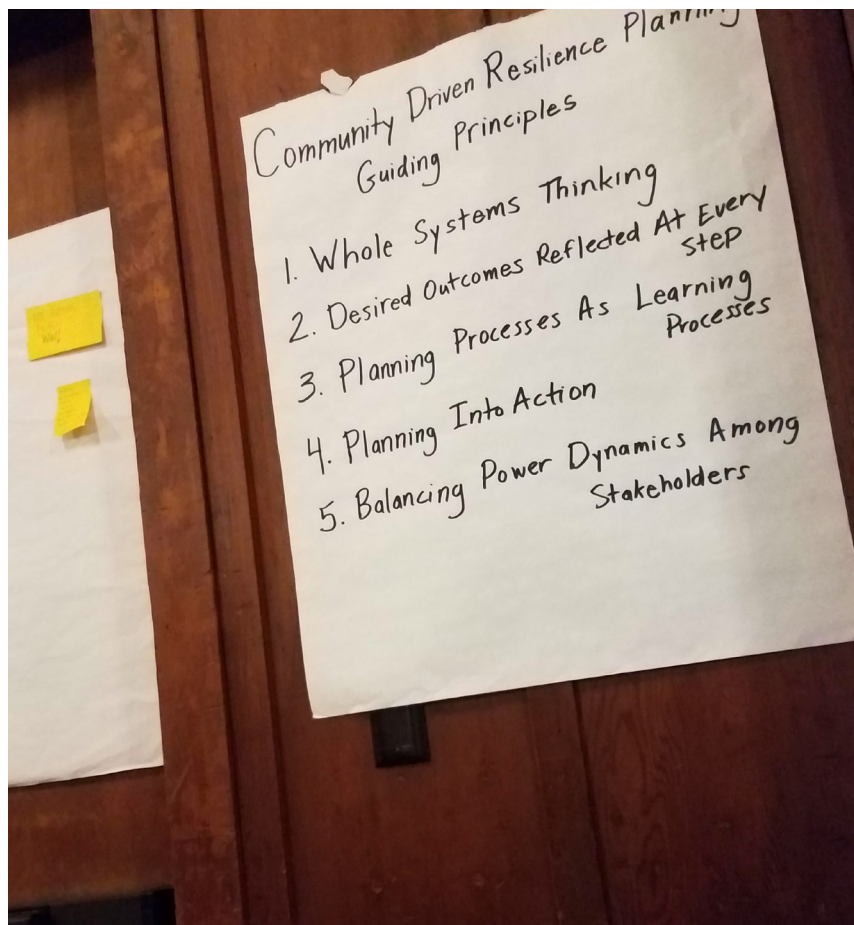


Figure 13: Resilience planning at NAACP meeting in February 2019. Source: NAACP

by numerous incidents of above-average precipitation and the resulting water eventually overflowed from the Backwater into Vicksburg.¹²⁶ Residents, angered by the failure of the Corps to protect them from flooding, began advocating for a new pump project, which would have mitigated the extreme flooding Vicksburg experienced in 2019.

Local groups began to build activist coalitions and place pressure on their congressional representatives to advance the project.¹²⁷ Residents displayed #FINISHTHEPUMPS on bumper stickers and handmade yard signs and used social media to educate others on the importance of the project.¹²⁸ Community members also sought support from the Mississippi Levee Board, hoping to secure their support for the project. In response to this grassroots activism, Mississippi's congressional representatives expressed support for the project and used their influence to advance the project's approval.¹²⁹ In 2021, the project was approved for a total cost of approximately \$400 million.¹³⁰

D. WORKING WITH CONGRESSIONAL REPRESENTATIVES AND THE CORPS TO PROMOTE EQUITABLE FLOOD PROTECTION: CASE STUDY IN NEW YORK, NY

After Hurricane Sandy hit New York in 2012, government officials and community groups both played key roles in implementing more equitable flood protection measures.¹³¹ USACE and the New York City Parks Department partnered on the Atlantic Shorefront Coastal Storm Risk Management Study, which would examine both flood mitigation and recreational uses for New York City's public beaches.¹³² The study's initial scope, however, only included the shoreside of the Rockaways, a predominantly white and high-wealth community.¹³³ At the same time, the Corps was conducting a secondary study on coastal

storm risk in Jamaica Bay, a predominantly low-wealth Black and Brown community. Both the Rockaways and the Jamaica Bay projects received their own study approvals, and officials assumed the two were hydraulically separated by the Rockaway peninsula.¹³⁴ The Jamaica Bay study lacked a non-federal cost-share partner and, as a result, stalled, while the project in the Rockaways was able to proceed, supported by cost-sharing support from the New York City Parks Department. Reflecting on Hurricane Sandy, during which damages in the Rockaways and Jamaica Bay had demonstrated that the two areas were, in fact, hydraulically connected, Army Corps officials reconsidered their approach for the two projects.¹³⁵ Instead of separating the Rockaways and Jamaica Bay, officials elected to integrate its flood mitigation plans for the two communities.¹³⁶ In an additional positive development, the 2013 Sandy Recovery Improvement Act provided 100% federal funding for the projects, eliminating the need for local cost-share partners.¹³⁷

While the Army Corps examined hydrologic connections between the two projects, local government representatives and community groups, including the Rockaway Initiative for Sustainability and Equity (RISE), advocated publicly for equity considerations in flood infrastructure. Their activism played a key role in advancing the protection of frontline communities impacted by Hurricane Sandy. Government officials on the city and federal level including Congressman Gregory W. Meeks, who represents the Rockaways, worked with community groups and the Corps to organize public meetings and conduct community engagement to share information about flood mitigation projects proposed for the area.¹³⁸ By creating open channels of communication between communities and the Corps, activist groups and elected officials helped expand the scope of the USACE Rockaways project to include the predominantly low-wealth, Black, and Brown communities on the bayside of the Rockaways.¹³⁹ Their work demonstrates the importance of collaborative processes in Army Corps planning--with appropriate communication and vocal advocacy, projects can be made more equitable and effective.

A few years later, in order to ensure that future flood infrastructure would include greater equity considerations, local advocacy groups played an important role in advancing improvements to federal policy. The Rise to Resilience Coalition, a joint effort from numerous community groups including the Waterfront Alliance, Coney Island Beautification Project, and the Rockaway Initiative for Sustainability and Equity, worked to persuade congressional representatives in the Senate and House to reform the 2020 WRDA and expand authorization for the New York-New Jersey Harbor and Tributaries Study to better address sea-level rise and engage marginalized communities.¹⁴⁰ The coalition's post-Sandy advocacy represents the impact of coalition building and ongoing activism.





Figure 15: Portion of the Green River in Kentucky that is a part of the Sustainable Rivers Project, a joint partnership between The Nature Conservancy and the Army Corps of Engineers. Source: Mike Wilkinson

E. NATURAL INFRASTRUCTURE CASE STUDIES: WORKING WITH THE ARMY CORPS

Our team's discussions with environmental advocacy groups and climate justice interest groups have suggested that USACE's proposals of natural and nature-based features (NNBF) are often out-of-step with scientific principles and environmental benefits, as well as the interests of frontline communities.¹⁴¹ Thus, forming partnerships with organizations that advocate for equitable flood mitigation solutions using ecologically sound science is critical to approaching flood management solutions. This section illustrates how organizations and communities have advocated for integration of nature-based strategies into existing Army Corps projects.

Leveraging Partnerships Between Army Corps and Nonprofits: The Sustainable Rivers Project

The Sustainable River Project (SRP) is a partnership between The Nature Conservancy (TNC) and the Corps that seeks to examine the impact of existing infrastructure on the surrounding ecosystem and on those that rely on the natural resources for their livelihoods. In this collaboration, TNC advises the Corps on sustainable water management for 66 federal dams in 16 rivers across 15 states, Figure 10.¹⁴² This program evaluates changes in seasonal flow rates that run through dams and other existing infrastructure and develops "prescriptions" that are recommended to USACE for water control adjustment to the river flow. These prescriptions are a strategic management approach to adjust the quantity and quality of the flow in response to environmental fluctuations.¹⁴³ Seasonal adjustments benefit and strengthen ecological function, preserve water-dependent activities such as tourism and recreation, and improve fisheries in the region.¹⁴⁴ Due to the potential reduction in flood events and the environmental, social, and economic benefits as a result of this program, funding increased from \$400,000 to \$5,000,000 in 2020.¹⁴⁵

The interconnection of waterways and the uniqueness of the environments must be kept front of mind when considering environmental features related to flood management. For example, although a berm may seem like an environmentally friendly solution to flood management and created from natural materials, it is not a solution that can be applied universally – these features can create surfaces that can increase the velocity of water flow and increase potential energy carried in the water that may result in adverse outcomes downstream. By collaborating with local scientists, upstream regions can identify where a river is allowed to spread without posing a threat to people or the environment. This type of action can slow the inertia of the river, lower the height of flow, and replenish aquifers.¹⁴⁶

Given the large variability in ecosystems, social frameworks, organizational structures, and funding processes, there is not a one size fits all approach to ensuring the most efficient natural flood management solutions are implemented. Even when ecosystems appear to be similar, keystone species and trophic hierarchies that are critical to habitat resilience may differ greatly. The rich biodiversity in these habitats strengthens the ecosystem services the habitat provides by creating redundancies that make the environment more resilient to shocks. Furthermore, political dynamics, cultural uses, and dependencies on water resources vary across regions. Moreover, the concept of resilience ranges across both environmental and urban contexts, therefore, collaboration among groups and community members is critical in creating safe and sustainable environments for both people and the ecosystem.¹⁴⁷ Inclusive community collaboration during planning is paramount to ensure nature based solutions are just and do not contribute to gentrification or displacement.¹⁴⁸ This should resemble a multi stakeholder collaboration that draws on traditional knowledge, anecdotal evidence, the scientific and academic community, and other local stakeholders while being cognizant of historical power dynamics between groups.¹⁴⁹ This type of collaboration should empower communities, prioritizing their specific needs and visions for a resilient environment.¹⁵⁰ A transformative co-production of community resilience will work to uphold community experiences and values of those most affected by flooding, increasing equity and meaningful social change.¹⁵¹



Figure 16: Map of the Sustainable Rivers Project, a joint partnership between The Nature Conservancy and the United States Army Corps. Source: The Nature Conservancy

Empowering Communities Through Education: Case Study in Galveston, TX

In Galveston, Texas the US Army Corps of Engineers is at work on the Galveston Bay Coastal Barrier Project, initially proposed by the Corps in 2009.¹⁵² Put forward as a way to protect coastal communities from storm surge, the Coastal Barrier Project has gone through several permutations since its introduction, with most plans centering on networks of floodwalls and concrete levees.¹⁵³

In response to the preponderance of hard infrastructure options in the Corps' plans, Bayou City Waterkeeper (BCWK), a Houston-Based environmental advocacy group, began collaborating with community members and the Army Corps to identify appropriate nature-based solutions for the Coastal Reef Barrier Project.¹⁵⁴ BCWK has pressed the Corps to revise its designs and integrate more non-structural and nature-based solutions that can be implemented more quickly than hard infrastructure alternatives. BCWK argues integrating nature-based solutions into the project is also more cost-effective and beneficial to the Galveston Bay ecosystem, which is the second most productive estuary in the U.S. and is a crucial part of the region's local economy.¹⁵⁵ Proposed strategies include restoring wetlands and marshes to reduce the impacts of storm surge and restricting development in high-risk areas.¹⁵⁶

Initially, one design iteration of the Galveston Bay Coastal Barrier Project included 500-ft levee extending the length of Galveston Island and the Bolivar Peninsula.¹⁵⁷ This massive levee would have bisected the Bolivar Peninsula, resulting in the displacement of many businesses and homes under eminent domain.¹⁵⁸

Recognizing the threat of community upheaval, BCWK worked to educate residents and businesses that would be impacted by the levee, clarifying the true impact of the proposed design. To better understand the project's impacts, BCWK filed a Freedom of Information Act (FOIA) request to gain access to detailed USACE maps and data showing which communities on the island would be excluded from levee protection.¹⁵⁹ USACE's project plans had only shown general maps of the project area, making it difficult to understand who would and would not be affected by construction and protected by the levee. BCWK used the Corps' data to create a public website in which community members could look up

their address to see if their house or business was included in the levee protection zone.¹⁶⁰ The maps demonstrated that the levee was designed to include businesses while excluding some homes prompting public concern.¹⁶¹

By showing residents and businesses the true extent of the levee project, BCWK was able to galvanize significant public engagement during the comment period. This engagement prompted the Corps to revise their design to be more inclusive and include nature-based protections in the project's design.¹⁶² However, community groups are concerned that the project's nature-based component, a large-scale dune system, is simply a greenwashed levee and would disrupt natural ecosystems in Galveston Bay in much the same way that grey infrastructure would.¹⁶³ Additional concerns include the long-term operations and maintenance costs to the taxpayers, the effectiveness of the design, and the number of years required to complete the project an estimated 20-years.¹⁶⁴ However, despite lingering criticism, BCWK's strategy of rousing community concern, educating residents on the benefits of nature-based infrastructure, and engaging constructively with the Corps has been successful in putting non-structural and nature-based options on the table for the Galveston Bay Coastal Barrier Project.

VIII. CONCLUSION

Black Americans experience disproportionate flood exposure and impacts. Our research shows these communities are under-protected by existing Army Corps flood infrastructure and struggle to obtain new protective infrastructure. In addition, more than 70% of Black Americans live in the American South or the Midwest, regions that are expected to experience an increase in extreme precipitation and flood events as climate change worsens.¹⁶⁵ The cumulative picture here is dire: Black communities in cities we examined are more flood exposed, poorly protected, and circumstances are expected to get worse. At the same time, it is challenging for communities to improve their circumstances by obtaining new flood mitigation infrastructure through the United States Army Corps and, at a broader level, the United States Congress and the Office of Management and Budget. Our research, though restricted to a few case studies and a limited analysis of broader trends, provides a strong foundation for both future research on flood impacts in Black communities and advocacy on behalf of flood-exposed groups.

We concluded that, despite recent efforts to address disparities in Army Corps protections, the decision-making process employed over-relies on a project's economic value. These conditions replicate systemic racism and classism, resulting in worse post-flood outcomes for Black communities and disproportionate benefits for white ones. Even for communities fortunate enough to move forward in discussions with the Army Corps about their desired project, many will be unable to meet onerous cost-sharing requirements and, as a result, be unable to move forward with a preliminary Feasibility Study or eventual construction. Here again, we see the replication of systemic racism and classism through project requirements that are more easily met by white and affluent communities. Further, we saw that even projects that meet these already demanding criteria may not be completed, should they be unable to pass an additional

Figure 17: Climate Justice banner. Source: NAACP

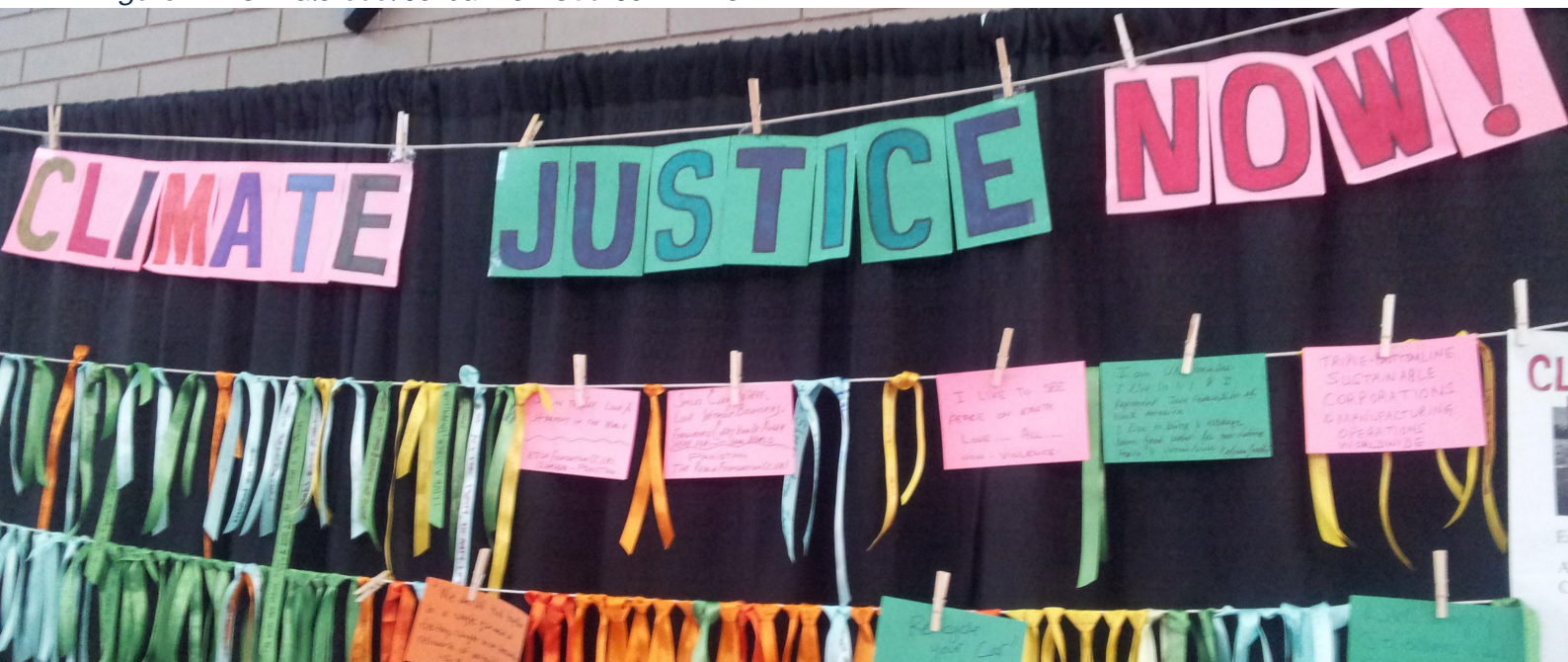




Figure 18: Left: Baton Rouge sea level rise training, NAACP; Top Right: NAACP Seal, Justin Valas; Bottom Right: Wilmington, NC sea level rise training, 2015, NAACP

authorization through the Office of Management and Budget.¹⁶⁶ Congress may also elect not to appropriate funding for the federal share of project costs, creating a sizable backlog of approved-but-unfunded flood infrastructure projects.¹⁶⁷

At the local level, case studies from New Orleans, Vicksburg, and New York demonstrate the challenges communities face when attempting to convey their needs to the Army Corps. But there are substantive positive takeaways from these cases as well. The New Orleans, Vicksburg, and New York cases also underscore the power of community advocacy in influencing the actions of the Corps and obtaining stronger protection for Black and low-wealth communities. Additional cases from Selma and Princeville highlight the potential within the Corps itself to change project approval criteria and employ more equitable practices. Taken collectively, our local cases demonstrate the capacity for communities to affect change and the Corps' attempts to rectify its harmful practices.

Indeed, recent developments within the Army Corps, including the organization's 2015 Principles, Requirements, and Guidelines and its new cost-sharing pilot program, suggest the agency is thinking more concretely about equity considerations. Within the executive branch, President Joseph R. Biden's recent Executive Orders Advancing Racial Equity and Support for Underserved Communities Through the Federal Government and Tackling the Climate Crisis at Home and Abroad, advance equity considerations, racial justice, and climate action across the federal government.¹⁶⁸ These orders, coupled with recent changes within the Army Corps, may prompt a shift in Army Corps practices to rectify unjust practices in flood protection.

We are encouraged by these developments but see considerable room for improved flood infrastructure practices. This moment represents a pivotal opportunity for activists to build coalitions, lobby decision-makers, and advance the needs of Black and low-wealth communities across the United States. Local units can work collaboratively, joining together with other environmental and racial justice advocacy groups to advance equity in flood protection. At the national level, the NAACP can seize this unique moment and work to change the decision-making process at the federal level to better integrate equity. Together, activists and community members have the influence, opportunity, and collective power to effect real change, providing stronger protections for communities that need them most.

IX. ACTION PLAN: RAISING AWARENESS AND EMPOWERING NAACP ADVOCACY

Below, we outline our action plan for local and national activism in greater detail, describing specific actions and lobbying efforts that may advance equity considerations in flood mitigation efforts.

National Office Advocacy:

Immediate Actions:

- **Act as a central hub and educate local Units on opportunities to engage with USACE. Key engagement points for local Units and communities to get involved include:**
 1. Submitting project ideas to USACE
 2. Working with congressional representatives to identify funding for project feasibility study
 3. Collaborating with USACE to develop program options and push for nature-based features
 4. Participating in the public comment period after publication of a local feasibility study
 5. Lobbying the Office of Management and Budget as well as congressional committees responsible for allocating funding towards projects
- **To facilitate local action, the national office can build the following resources for use at the local-level:**
 - Create a database or online bulletin board with public participation opportunities for USACE ongoing and proposed projects.
 - Draft a how-to guide for communities interested in proposing a project, conduct educational sessions on how to submit a project to USACE, with the goal of helping Units submit projects for the 100% federally funded pilot project program.
 - Develop educational trainings and resources in coordination with local Units to advance natural or nature-based solutions to flooding and flood exposure. In addition, facilitate conversations between experts with technical expertise in nature-based solutions and local communities looking for effective solutions to their specific concerns.
- **Participate in upcoming public comment periods:**
 - As an organization, comment on the changes to WRDA during the public comment period. WRDA is updated every two years, creating an opportunity for activists and communities to advocate for more explicit requirements surrounding equity and racial justice for Army Corps projects. Mobilizing local Units to contact and lobby their elected representatives for WRDA changes is also effective and essential.
 - When individual Army Corps projects are of particular significance (whether culturally, historically, or environmentally), the National Office should support local Units during project-specific public comment periods and support local advocacy whenever possible.

Long Term Strategy:

- Three-tiered strategy to ensure compliance with the 2021 Executive Order Advancing Racial Equity and Support for Underserved Communities Through the Federal Government and USACE January 2021 policy directive. First, advocate that members of Congress (in particular members of committees responsible for oversight on WRDA) ensure Other Social Effects and other equity metrics are not just considered but become a critical component of project approval. Second, lobby federal appointees, Congressional representatives, and the White House to increase equity consideration during funding decisions at the Office of Management and Budget and during Congressional appropriations. Third, encourage Army Corps officials, including at the district and national level (DOD Secretary for Civil

Works), to incorporate Other Social Effects and community-specific considerations into project cost-benefit analysis.

- Advocate that Army Corps integrate more equitable and inclusive community engagement processes, such as a creation of a USACE Community Flood Resilience Task Force to provide oversight and accountability during project planning.
- Encourage FEMA Inspector General and other high-level officials within FEMA to update floodplains and other relevant federal data tools to reflect both the true extent of flood exposure and incorporate climate projections. This work would align FEMA's datasets with the 2020 WRDA that requires USACE to factor sea level rise into project planning and the 2021 Executive Order Tackling the Climate Crisis at Home and Abroad, which calls for the integration of climate change considerations across all branches of the federal government.

Local Unit Advocacy:

Immediate Actions:

- Mobilize communities to advocate for expanded and more equitable flood infrastructure based on their specific needs. This includes approaching local elected officials, Congresspeople, Senators, and local Army Corps staff, as well as increasing awareness of flooding and infrastructural issues more broadly. Campaigns may include op-eds in local publications, social media campaigns, and other ways to spread the word (i.e., local signage, bumper stickers, letter writing campaigns).
- Encourage community engagement in USACE studies or projects as early as possible, including scheduling meetings with local USACE district offices early in the project development process and advocating for community-specific considerations well before the beginning of the public comment period. Groups should maintain an active role in USACE project development from initial project development through the beginning of construction and not restrict their role to the official public comment period.
- Develop and submit a draft resolution to the NAACP Resolution Committee to make advancing racial justice in flood project decision making a core priority to NAACP at the national level.

Long Term Strategy:

- Build coalitions with local governments, communities, and organizations with environmental justice interests. Include typical cost-share partners with USACE such as the Nature Conservancy, local flood districts, and other advocacy groups (see Appendix for additional examples).
- Identify local experts (scientists and community members familiar with the local context and have a connection to the area) to ensure appropriate recommendations to the USACE. This is especially critical during feasibility study periods and public input hearings.
- Develop educational campaigns with local experts and community members to understand citizen relationships to the land and teach about nature-based solutions for use at future public input hearings. Through community meetings and informational materials, equip communities with information about flood infrastructure decision making, flood mitigation techniques, and data teaching. Educational campaign goals should aim to equip residents in these regions to be confident in asserting their local-cultural understanding and offer sustainable solutions that fit with the environment in the area, as well as a broader understanding of how climate change impacts flooding in their area.
- Use investigative research tactics, such as submitting Freedom of Information Act Requests with a lawyer's cover letter for USACE projects, as well as lawsuits as tools to push for more transparency, and bring challenges to CBAs for projects.

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XI. APPENDIX

A. IMPORTANT TERMS AND ACRONYMS

Army Corps Project Accounts: The Army Corps uses four criteria to evaluate a project's desirability, ranking projects based on their contributions to each of these four categories. These criteria are:

National Economic Development (NED): reflecting changes in national economic output

Environmental Quality (EQ): noting effects on natural and cultural resources;

Regional Economic Development (RED): conveying regional and local economic impacts;

Other Social Effects (OSE): describing a project's impacts on communities that fall outside the National Economic Development, Environmental Quality, and Regional Economic Development accounts.

Cost-Benefit Analysis: Cost-Benefit Analysis quantifies all potential advantages and disadvantages resulting from the implementation of a new project, making the comparison of prospective projects easier. In theory, cost-benefit analysis can include important social impacts, including cultural value and equity concerns. However, cost-benefit analysis is often limited to a consideration of economic benefit, resulting in the exclusion of other important factors.

Cost-sharing: Communities are required to share costs with the federal government at multiple points during project development and completion. First, during a preliminary project feasibility study and then later during construction. This requirement is often prohibitive for low-wealth communities, who struggle to raise funds for vital infrastructure projects.

Discount Rate: The discount rate is an interest rate used to value future costs and benefits in present-day dollars when evaluating an investment or project. A lower discount rate reflects a greater appreciation for future benefits of a particular project. In other words, the closer the value of future benefits is to the value of present-day benefits.

Environmental Justice: Environmental Justice is the principle that all communities have a right to equal protection from environmental hazards and an equitable enforcement of environmental laws and regulations. To advance environmental justice, we must address practices that damage quality of life for communities and advance principles of sustainability, equity, and harmony with nature.

Flood Risk: The Army Corps defines flood risk as the measure of the probability and severity of flooding in a particular community. We define flood risk a bit more broadly, viewing it as a combination of exposure, vulnerability, and coping capacity.

Exposure: Exposure describes the extent to which a community experiences extreme precipitation, storm surge, sea-level rise, and other factors that cause or contribute to flooding.

Social Vulnerability: Vulnerability refers to characteristics of a community or external stresses a community experiences that reduce its ability to resist and recover from damaging events. Communities experiencing external exposures such as racism, classism, and other forms of systemic discrimination possess greater social vulnerability.

Coping Capacity: Coping capacity represents a community's ability to return to the quality of life they experienced prior to a natural disaster or sudden shock after that disaster takes place. Typically, communities with more wealth have a higher coping capacity.

Grey Infrastructure: Infrastructure created using hard materials, including steel, cement, plastics, and other artificial materials, is considered "grey" infrastructure.

Levee: Levees are artificial embankments used to control the flow of rivers and inhibit overflow. Often made using some combination of soil, sand, wood, plastic, and metal.

Nature-Based Infrastructure/Green Infrastructure: Nature-based infrastructure replicates or preserves natural features to protect communities from flooding and other risks.

Engineering with Nature (EWN): Engineering with Nature is a division within the Army Corps that studies and intersects ecology and engineering in efforts to create more sustainable water management infrastructure.

Natural features: The term “natural features” describes landscape elements created in the environment as a result of evolutionary, geologic, biological, and chemical processes.

Barrier Islands: Barrier islands can be either artificially constructed or existing islands off the coast of a flood protection zone. Barrier islands can help to attenuate wave energy and stabilize sediment to prevent coastal erosion.

Beaches and Dunes: Artificial or existing beaches and dunes can be used to protect coastal communities from wave energy. However, these settings often require continual replenishment with additional sand, meaning the rate of shoreline erosion exceeds the volume of sand on the beach or dune itself.

Coral and Oyster Reefs: Artificial or existing coral and oyster reefs can help attenuate wave energy, protecting coastal communities from storm surge. These reefs can also support healthy local fisheries, providing an important economic benefit.

Forests/Shrubs: Planting additional trees, shrubs, or other appropriate flora can reduce shoreline erosion and protect coastal communities from flood impacts. These trees and shrubs can also help ensure soil retention, meaning that soil is not washed away during a storm or other flood event.

Mudflats: Mudflats are landscapes that result from tidal shifts and promote healthy and dynamic ecosystems. Preserving and maintaining existing mudflats can protect coastal communities from future flooding without destabilizing local ecosystems.

Wetlands/Marshes: Preserving wetlands and marshes can attenuate waves, while supporting healthy fisheries. Wetlands can aid natural carbon sequestration, during which carbon is removed from the atmosphere and stored within wetland soils. In doing so, wetlands help mitigate climate change.

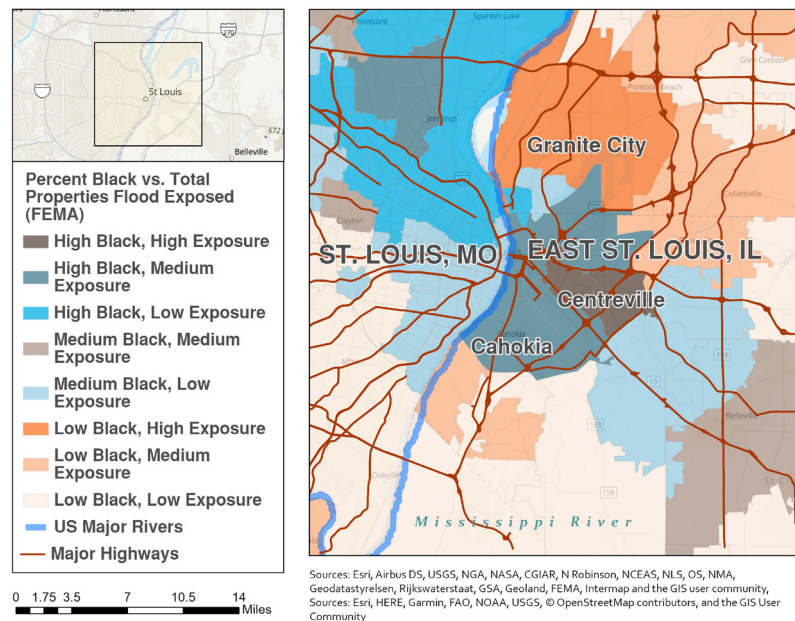
Principles and Guidelines, 1983: An internal U.S. Army Corps policy directive requiring the use of a cost-benefit to identify which projects to invest in and implement by the U.S. Army Corps of Engineers.

Principles, Requirements, and Guidelines, 2015: An internal U.S. Army Corps policy directive attempting to mitigate the impact of NED accounts on project approvals in an attempt to alter the valuation process for flood mitigation projects in low-wealth communities, advance natural, and nature-based approaches, and assess the impact of the project on the watershed at large.

Water Resources Development Act (WRDA): A legislation that provides guidance for the development of new water infrastructure projects by the U.S. Army Corps of Engineers. A 2020 amendment to WRDA revised the Corps' practices and required that future projects consider climate change, environmental justice, and sustainable solutions.

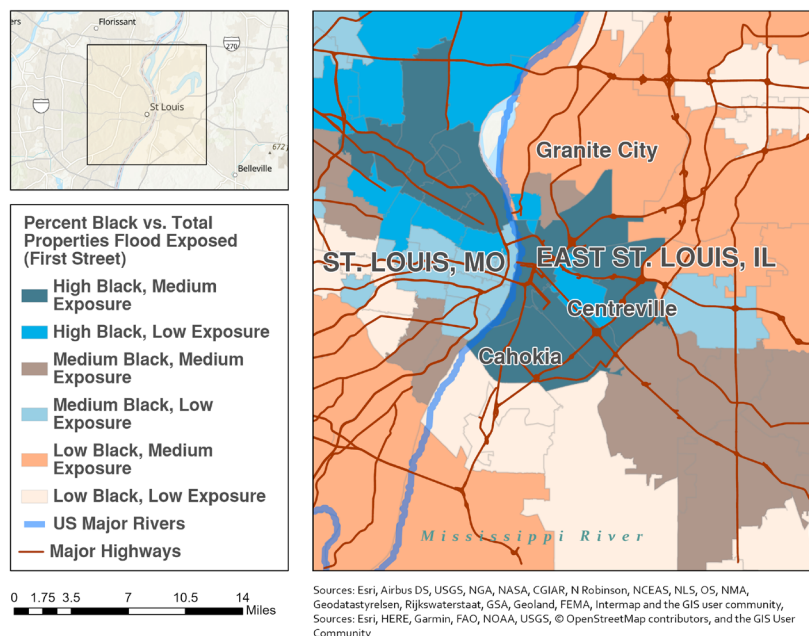
B. MAPS

We have included a standardized set of maps here from New Orleans, Indianapolis, and St. Louis. The maps included here detail flood exposure and race, as well as economic data and additional information on the racial demographics of levee protected areas.



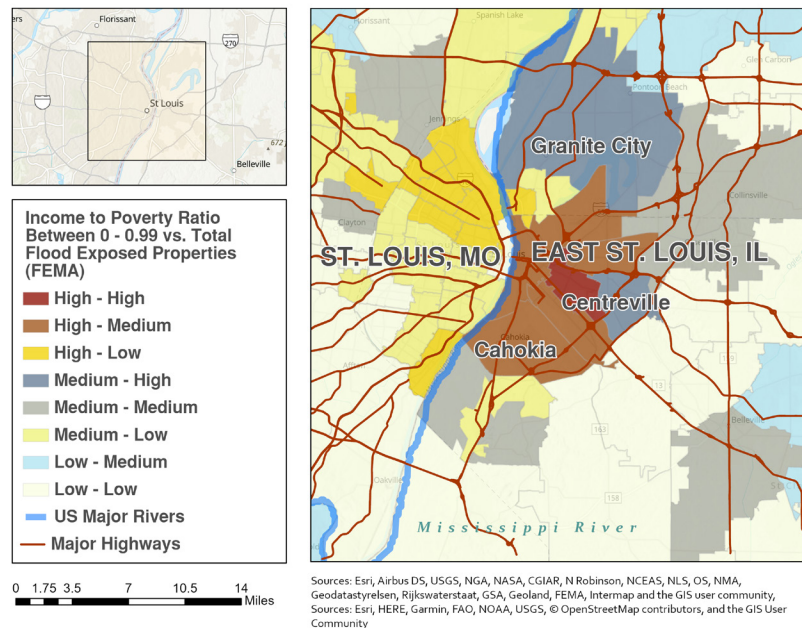
Stl-1: FEMA Flood Exposure vs Percent Black by Zip Code

This map shows the number of properties at risk of flooding in St. Louis as of 2020, using flood exposure data from the Federal Emergency Management Agency. This information is overlaid with the percentage of the population that identifies as Black. The dark brown areas show where there is a high percentage of Black residents, as well as extensive flood exposure. Bright blue indicates a high percentage of the population is Black, but there is little flood exposure. Bright Orange means that there is a small Black population, but there is extensive flood exposure.



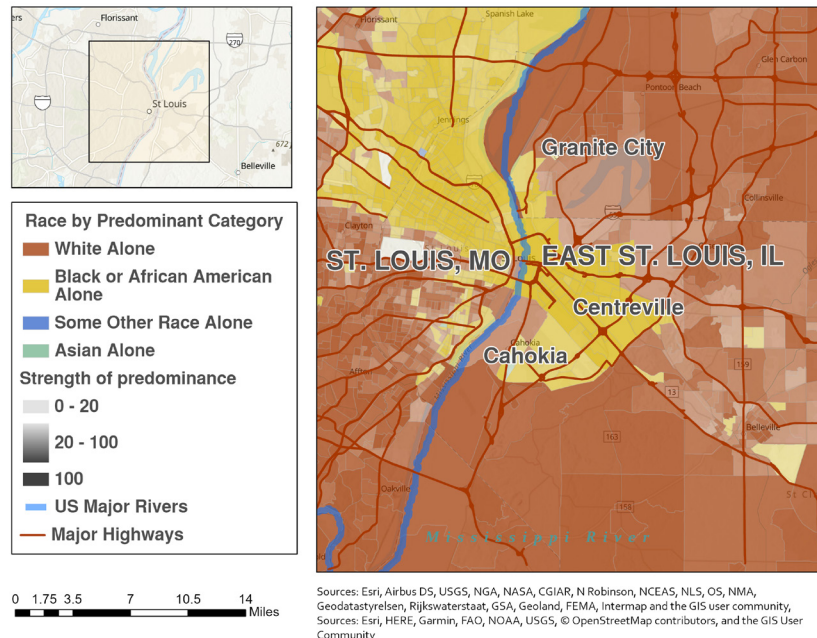
Stl-2: First Street Foundation Flood Exposure vs Percent Black by Zip Code

This map shows the number of properties at risk of flooding in St. Louis as of 2020, using flood exposure data from the First Street Foundation. This information is overlaid with the percentage of the population that identifies as Black. The dark brown areas show where there is a high percentage of Black residents, as well as extensive flood exposure. Bright blue indicates a high percentage of the population is Black, but there is little flood exposure. Bright Orange means that there is a small Black population, but there is extensive flood exposure.



Stl-3: FEMA Flood Exposure vs Income to Poverty Ratio

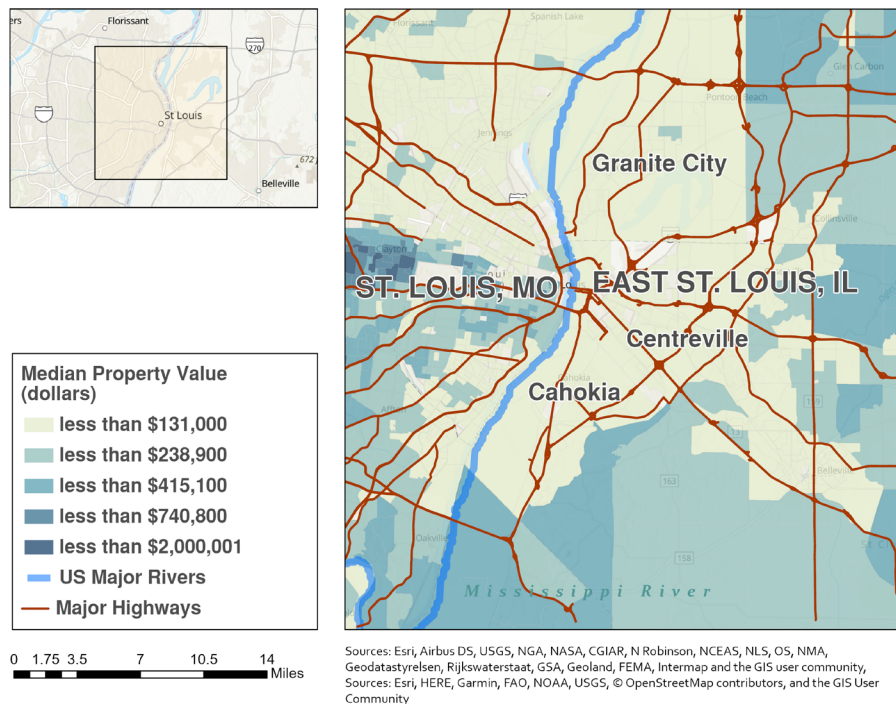
This map shows the number of properties at risk of flooding in St. Louis as of 2020, using flood exposure data from the Federal Emergency Management Agency. This data is then overlaid with the percentage of residents with an income to poverty ratio of less than 1, which represents families living below the poverty line. Brick red on this map suggests a high concentration of FEMA flood exposed properties and a high concentration of residents living in poverty.



Stl-4: Race at Block Group Level

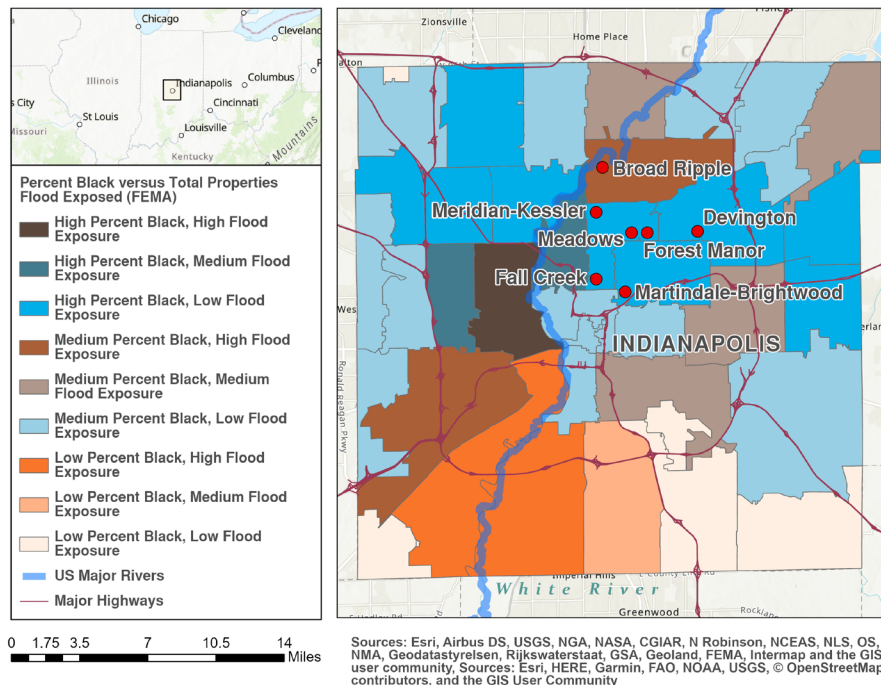
This map describes race at the more granular block group level. The more opaque the color, the stronger the majority of a given racial group is within that block group (i.e. a more transparent yellow indicates Black residents represent a slimmer majority). The greatest concentration of Black residents is represented by the map's darker yellow squares.

Note: Because this map is more granular than the zip code-level maps, predominance of one race may differ somewhat between the two maps.



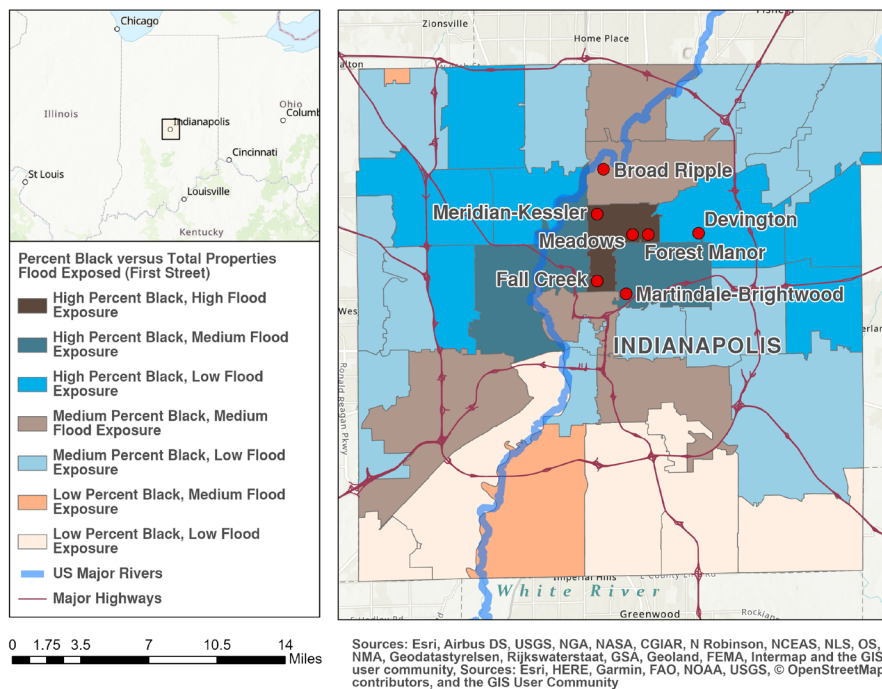
Stl-5: Median Home Value at Block Group Level

This map shows the median home value at the block group level, overlaid with the locations of USACE levees. Darker blues indicate a higher median home value, while lighter blues represent lower median home values.



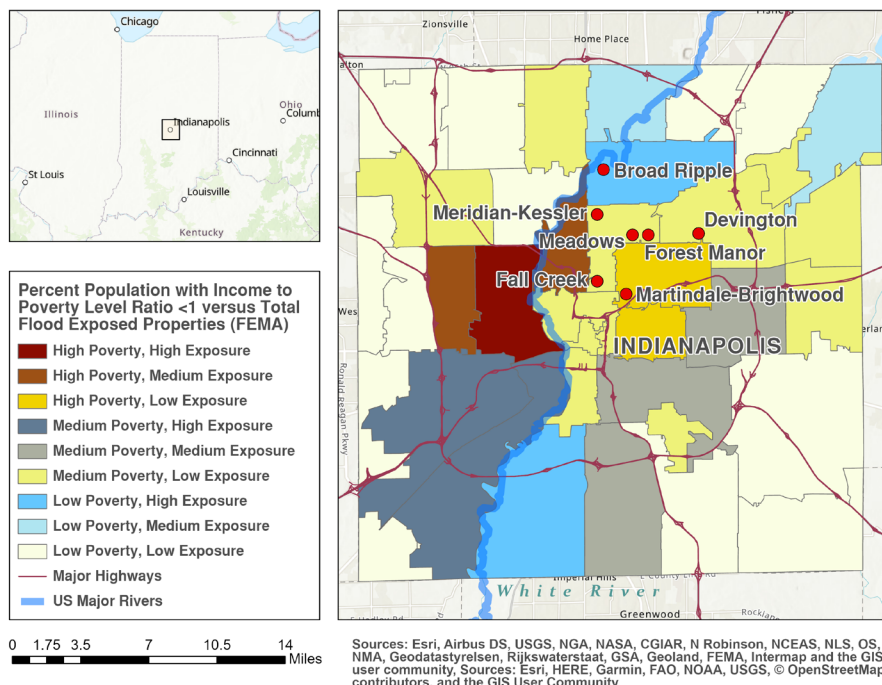
Ind-1: FEMA Flood Exposure vs Percent Black by Zip Code

This map shows the number of properties at risk of flooding in Indianapolis as of 2020, using flood exposure data from the Federal Emergency Management Agency. This information is overlaid with the percentage of the population that identifies as Black. The dark brown areas show where there is a high percentage of Black residents, as well as extensive flood exposure. Bright blue indicates a high percentage of the population is Black, but there is little flood exposure. Bright Orange means that there is a small Black population, but there is extensive flood exposure.



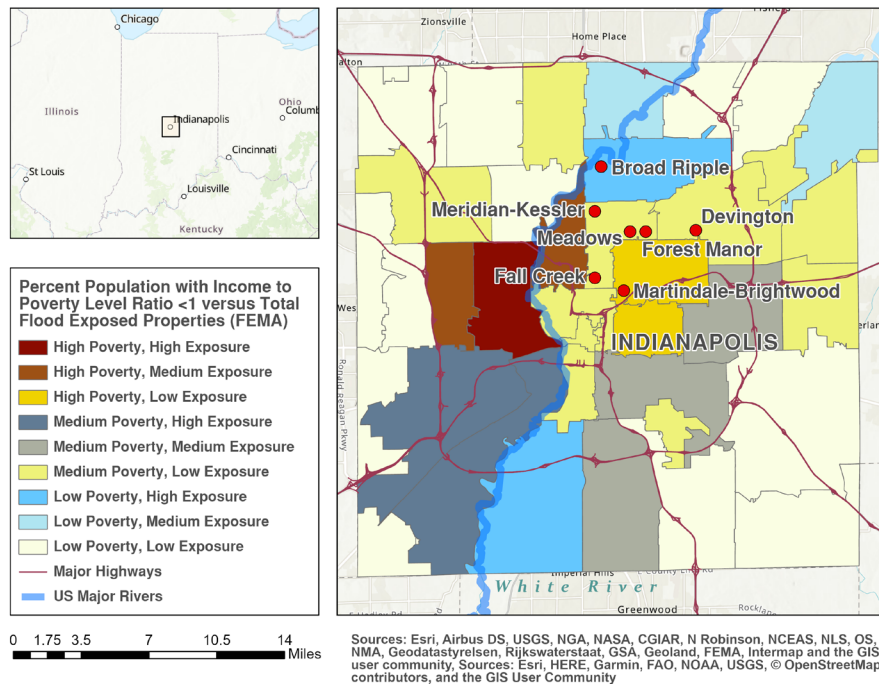
Ind-2: First Street Foundation Exposure vs Percent Black by Zip Code

This map shows the number of properties at risk of flooding in Indianapolis as of 2020, using flood exposure data from the First Street Foundation. This information is overlaid with the percentage of the population that identifies as Black. The dark brown areas show where there is a high percentage of Black residents, as well as extensive flood exposure. Bright blue indicates a high percentage of the population is Black, but there is little flood exposure. Bright Orange means that there is a small Black population, but there is extensive flood exposure.



Ind-3: FEMA Flood Exposure vs Income to Poverty Ratio

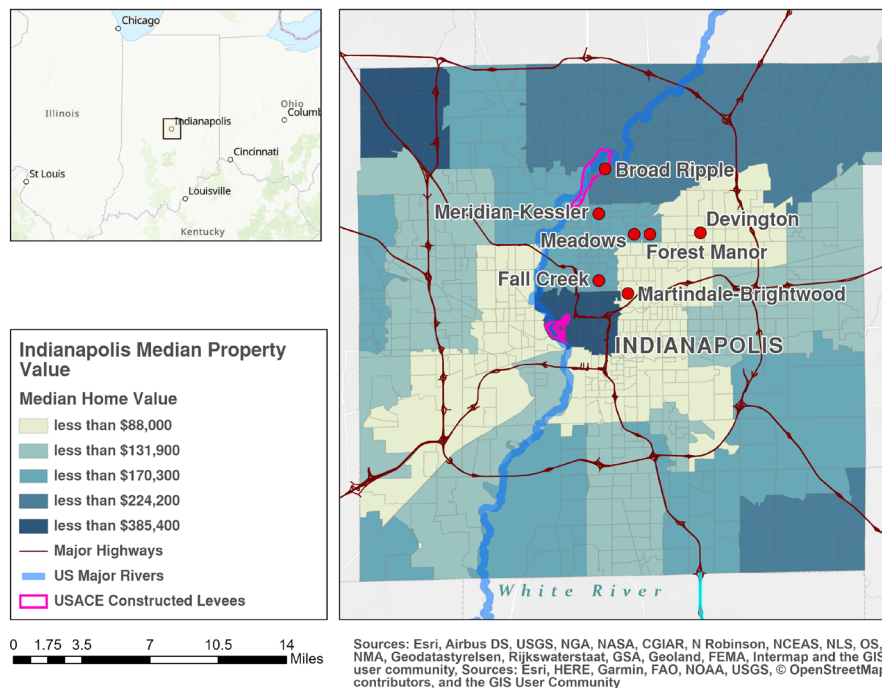
This map shows the number of properties at risk of flooding in Indianapolis as of 2020, using flood exposure data from the Federal Emergency Management Agency. This data is then overlaid with the percentage of residents with an income to poverty ratio of less than 1, which represents families living below the poverty line. Brick red on this map suggests a high concentration of FEMA flood exposed properties and a high concentration of residents living in poverty.



Ind-4: Race at Block Group Level

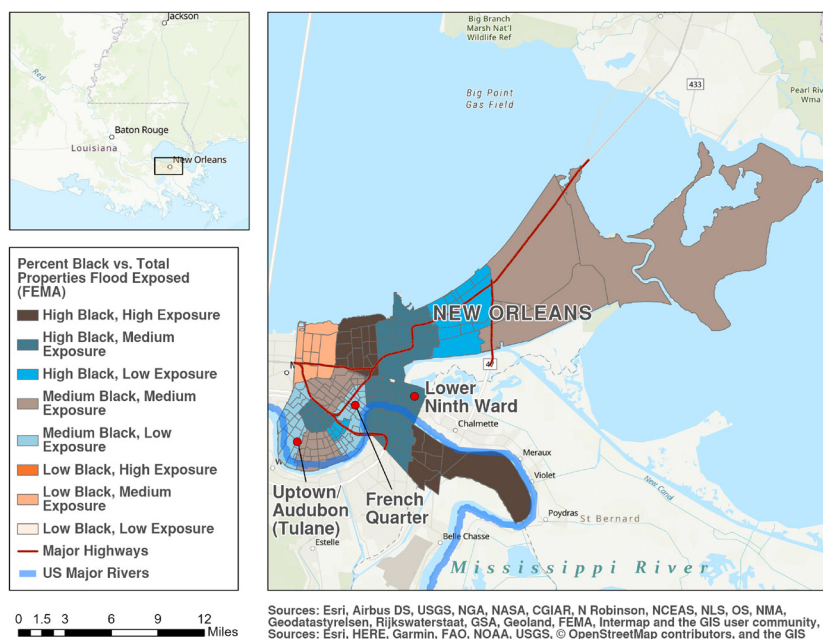
This map describes race at the more granular block group level. The more opaque the color, the stronger the majority of a given racial group is within that block group (i.e. a more transparent yellow indicates Black residents represent a slimmer majority). The greatest concentration of Black residents is represented by the map's darker yellow squares.

Note: Because this map is more granular than the zip code-level maps, predominance of one race may differ somewhat between the two maps.



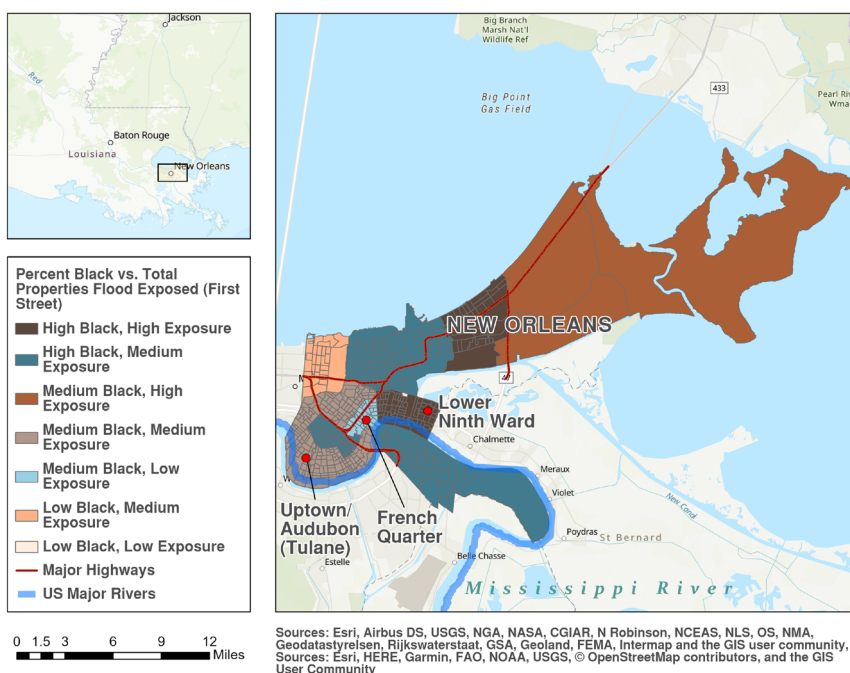
Ind-5: Median Home Value at Block Group Level with levee locations

This map shows the median home value at the block group level, overlaid with the locations of USACE levees. Darker blues indicate a higher median home value, while lighter blues represent lower median home values.



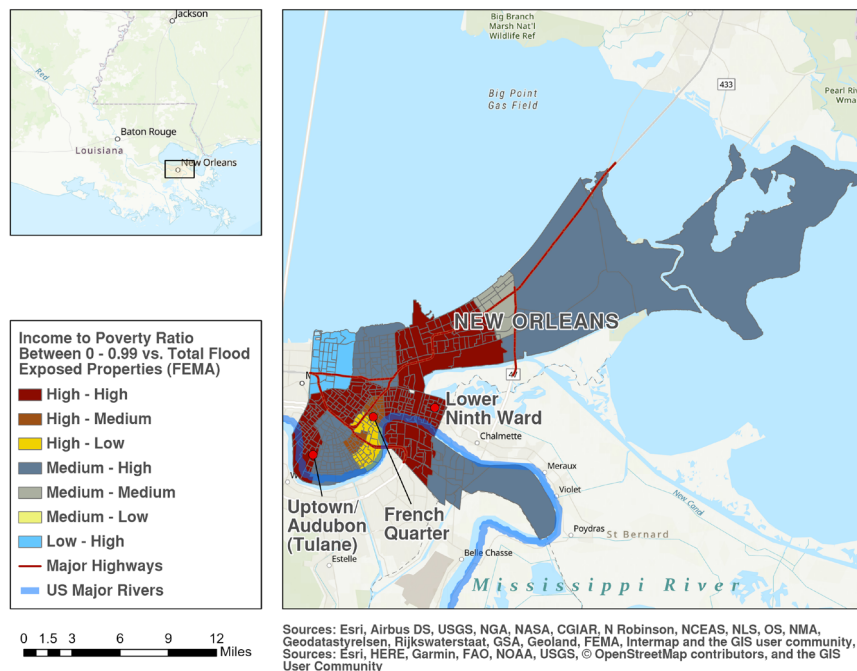
NOLA-1: FEMA Flood Exposure vs Percent Black by Zip Code

This map shows the number of properties at risk of flooding in New Orleans as of 2020, using flood exposure data from the Federal Emergency Management Agency. This information is overlaid with the percentage of the population that identifies as Black. The dark brown areas show where there is a high percentage of Black residents, as well as extensive flood exposure. Bright blue indicates a high percentage of the population is Black, but there is little flood exposure. Bright Orange means that there is a small Black population, but there is extensive flood exposure.



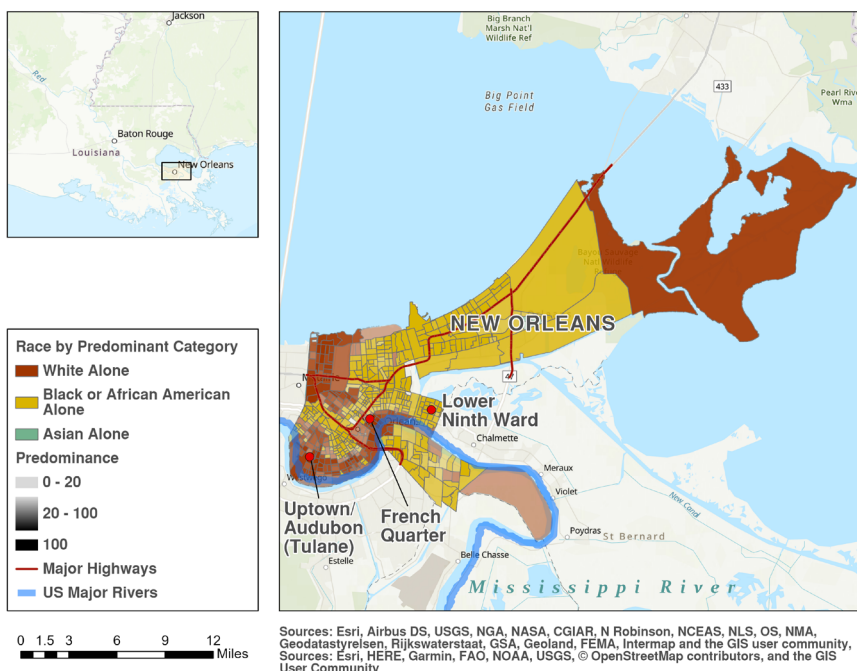
NOLA-2: First Street Foundation Exposure vs Percent Black by Zip Code

This map shows the number of properties at risk of flooding in New Orleans as of 2020, using flood exposure data from the First Street Foundation. This information is overlaid with the percentage of the population that identifies as Black. The dark brown areas show where there is a high percentage of Black residents, as well as extensive flood exposure. Bright blue indicates a high percentage of the population is Black, but there is little flood exposure. Bright Orange means that there is a small Black population, but there is extensive flood exposure.



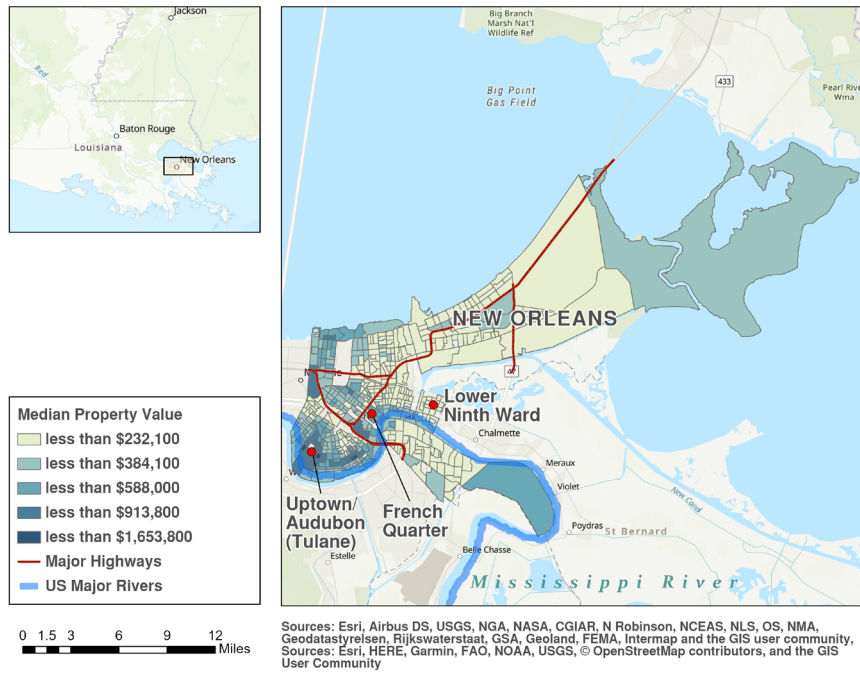
NOLA 3: FEMA Flood Exposure vs Income to Poverty Ratio

This map shows the number of properties at risk of flooding in New Orleans as of 2020, using flood exposure data from the Federal Emergency Management Agency. This data is then overlaid with the percentage of residents with an income to poverty ratio of less than 1, which represents families living below the poverty line. Brick red on this map suggests a high concentration of FEMA flood exposed properties and a high concentration of residents living in poverty.



NOLA-4: Race at Block Group Level

This map describes race at the more granular block group level. The more opaque the color, the stronger the majority of a given racial group is within that block group (i.e. a more transparent yellow indicates Black residents represent a slimmer majority). The greatest concentration of Black residents is represented by the map's darker yellow squares.



NOLA-5: Median Home Value at Block Group Level

This map shows the median home value at the block group level, overlaid with the locations of USACE levees. Darker blues indicate a higher median home value, while lighter blues represent lower median home values.

C. LIST OF EXPERT WITNESSES

For this report, interviews were conducted with individuals and organizations across local, regional, and federal level agencies working in flood infrastructure implementation and maintenance projects. Experts interviewed and their geographical location are listed in alphabetical order below.

Judah Asimov, Senior Manager, Planning and Outreach, Rockaway Initiative for Sustainability and Equity (New York City, NY)

Marshal Awais, Watershed Specialist, Bayou City Waterkeeper (Houston, TX)

Marci Bortman, Climate Adaptation Advisor, The Nature Conservancy (New York City, NY)

Gretchen Benjamin, Large River Specialist, The Nature Conservancy (La Crosse, WI)

Monica Gregory, Resilience Coordinator, Office of Resilience, Miami-Dade County (FL)

Shameika Hanson, Community Protection Specialist, The Nature Conservancy (Cold Spring Harbor, NY)

Erin Flannery Keith, Assistant Regional Counsel, Office of Regional Counsel, EPA Region 1, U.S. Environmental Protection Agency (Boston, MA)

Andrew J. Kruczkiewicz, Senior Staff Associate, International Research Institute for Climate and Society, The Earth Institute, Columbia University (New York City, NY)

Jordan Macha, Executive Director and Waterkeeper, Bayou City Waterkeeper (Houston, TX)

Darryl Malek-Wiley, Senior Organizing Regional Representative, Environmental Justice and Community Partnership Program, Sierra Club – Delta Chapter (New Orleans, LA)

S. Kyle McKay, Environmental Laboratory Researcher, U.S. Army Corps of Engineers

Andrew Peck, Freshwater Ecologist and Resilience Specialist, The Nature Conservancy (Highland, NY)

Chuck Perrodin, Public Information Director, Coastal Restoration and Protection Authority (New Orleans, LA)

Sandy Rosenthal, Founder and Executive Director, Levees.org (New Orleans, LA)

Naomi Walker, Mapping Water Injustices Fellow, Bayou City Waterkeeper (Houston, TX)

Dr. Maria Wegner, Senior Economic Policy Advisor, U.S. Army Corps of Engineers

Elissa Yeates, Research Hydraulic Engineer, Coastal and Hydraulics Laboratory, U.S. Army Corps of Engineers

D. PARTNERSHIPS CHART

Types of Partner Advocates	Purpose	Example
Government	Actors that carry political influence over flood infrastructure planning and policies as well cost sharing capabilities	City councils and Mayors, State governors, Congressional representatives, Silver Jackets flood risk team (USACE)
Mechanical / Infrastructure	Authorities or government-affiliated entities that provide, operate, and maintain water systems, flooding infrastructure or collaborate with USACE within their scope	Houston Clear Lake City Water Authority, Louisiana Coastal Protection and Restoration Authority (CPRA), levee boards such as Mississippi Levee Board, local flood districts** such as Harris County Flood Control District
NGOs / Not-for-profit organizations	Organizations working in flood management issues, demonstrate an interest in environmental justice, and are driven to protect via advocacy, education and/or action	National Networks: Water Equity and Climate Resilience Caucus, National Association of Climate Resilience Planners, American Society of Adaptation Professionals, American Flood Coalition National: Nature Conservancy** (local offices), Environmental Defense Fund, Sierra Club (local chapters), Center for Biological Diversity, American Rivers (local offices), Taxpayers for Common Sense, ACLU Regional: Midwest • IN: The White River Alliance • MO: Great Rivers Environmental Law Center Southeast • MS: Finish the Pumps Gulf • LA: Louisiana Bucket Brigade, Levees.org, Sierra Club Louisiana Delta chapter, Deep South Center for Environmental Justice, MR-GO Must Go coalition, The RISE St. James coalition, Coalition Against Widening the Industrial Canal • TX: Texas Environmental Justice Advocacy Services; Houston, TX: Residents Against Flooding, Coalition for Environment, Equity, and Resilience (CEER), Bayou City Waterkeeper (BCWK) Northeast • NY: Rise to Resilience coalition, NYC-EJA, Rockaway Initiative for Sustainability and Equity (RISE), Waterfront Alliance

Types of Partner Advocates	Purpose	Example
Technical / Research	Experts with knowledge in ecosystem conservation and nature-based solutions for flood management	NOAA Sea Grant Programs, NOAA Coastal and Estuarine Land Conservation Program, Thriving Earth Exchange, USDA extension offices, local universities USACE offices: • Environmental Laboratory • Coastal and Hydraulics Laboratory • Institute for Water Resources • Engineering with Nature
Communities / Individuals	Hold a connection and knowledge of the area, can describe priority community needs, motivated to be involved in advocating for flood protections in a formal or semi-formal manner with USACE	Local Indigenous groups, community groups, journalists, land trusts, homeowners, residents, renters, etc.

** While we recommend building partnerships with a variety of advocates with different backgrounds and expertise, early contact with these partners should be initially prioritized because they are common local project cost share partners.

Contacting the USACE

Included are Divisions and District information of the cities mentioned in this report. To find a list of contact information of all USACE Division and District offices across the United States, see [here](#) (for an interactive map see [here](#)).

Division	District-Civil Works Offices
Mississippi Valley Division 1400 Walnut St Vicksburg, MS 39180-3262 601-634-5998 cemvd-pa@usace.army.mil https://www.mvd.usace.army.mil	4155 Clay St Vicksburg, MS 39183-3435 601-631-5000 cemvk-pa@usace.army.mil https://www.mvk.usace.army.mil 1222 Spruce St St. Louis, MO 63103-2833 314-331-8000 TeamSTL-PAO@usace.army.mil https://www.mvs.usace.army.mil 7400 Leake Ave New Orleans, LA 70118 504-862-2201 askthecorps@usace.army.mil https://www.mvn.usace.army.mil
Southwestern Division 1100 Commerce St Ste 831 Dallas, TX 75242-1317 469-487-7107 ceswd-pa@usace.army.mil https://www.swd.usace.army.mil	2000 Fort Point Rd Galveston, TX 77550 409-766-3004 swgpao@usace.army.mil https://www.swg.usace.army.mil
Great Lakes and Ohio River Division 550 Main St Room 100032 Cincinnati, OH 45202-3222 513-684-3010 dll-lrdor-dd-p@usace.army.mil https://www.lrd.usace.army.mil	600 Dr. Martin Luther King Pl Louisville, KY 40202 502-315-6766 lrl-pagemaster-pa@usace.army.mil https://www.lrl.usace.army.mil

E. RELATED READINGS (FROM NAACP)

For those interested in learning more about environmental justice, disaster preparation and recovery, and other issues relevant to this report, please see the following NAACP publications. For additional information, please visit the NAACP's Environmental and Climate Justice Resources Page (www.naacp.org/climate-justice-resources).

Disaster Preparation and Recovery

[In the Eye of the Storm: A People's Guide to Transforming Crisis & Advancing Equity in the Disaster Continuum](#)

[Equity in Building Resilience in Adaptation Planning](#)

Environmental Justice

[And the People Shall Lead: Centralizing Frontline Community Leadership in the Movement Towards a Sustainable Planet](#)

[Coal Blooded: Putting Profits Before People](#)

[Fumes Across the Fence-Line: The Health Impacts of Air Pollution from Oil & Gas Facilities on African American Communities](#)

[Lights Out in the Cold: Reforming Utility Shut-Off Policies as if Human Rights Matter](#)

BUILDING FOR EQUITY:

ADVANCING RACIAL JUSTICE IN FEDERAL FLOOD INFRASTRUCTURE PROJECTS