RISE TO RESILIENCE

OUR COMMUNITIES, OUR FUTURE

POLICIES AND INVESTMENTS FOR A CLIMATE-RESILIENT NEW YORK AND NEW JERSEY

A CAMPAIGN SPEARHEADED BY WATERFRONT ALLIANCE

A RESILIENT FUTURE IS WELL-MANAGED AND FUNDED IN A MANNER THAT IS TRANSPARENT, JUST AND GREEN:

RISE TO RESILIENCE
OUR COMMUNITIES, OUR FUTURE

ACKNOWLEDGEMENTS

EXECUTIVE SUMMARY

ENDORSEMENT OF EXISTING CLIMATE PLATFORMS

1. MANAGED

GOVERNANCE IS ADAPTED TO A CHANGING CLIMATE

Goal: **Build a relationship across jurisdictions**
Action: Establish cross-jurisdictional climate governance and a framework for resilience planning and implementation

Goal: **Codify resilience into regulation, practice and incentives**
Action: Comprehensively integrate sea level rise and flood resilience into state and city laws, regulatory authority, incentives, and infrastructure budgets
Action: Reform the National Flood Insurance Program

2. FUNDED

FUNDING MECHANISMS ARE IN PLACE AND PRIORITIZE FRONTLINE COMMUNITIES AND CO-BENEFITS

Goal: **Establish an ongoing source of funds**
Action: Support implementation through the establishment of climate resilience funds

Goal: **Invest in social resilience**
Action: Establish long-term funding for community organizations and public social infrastructure to support individual and collective action in frontline communities

Goal: **Use a holistic approach to funding**
Action: Develop and fund a regional plan for integrated flood risk management that is supported by communities
Action: Reform funding sources to better prioritize long-term, multi-beneficial approaches and facilitate matching between funding sources

3. TRANSPARENT

RESIDENTS ARE INFORMED BY SCIENCE AND CLEAR MESSAGING

Goal: Standardize definitions of risk

Action: Develop consistent standards and projections across jurisdictions

Goal: Unite climate resilience under consistent messaging

Action: Develop and launch shared or consistent messaging, provide a clear "one-stop shop" for how resilience is being addressed

Goal: Disclose flood risk

Action: Pass enforceable flood risk disclosure laws

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Action: Integrate equitable and just best practices into resilience planning and capital project development

Goal: Support individual and collective choice to transition to safer housing

Action: Revise acquisition and buyout program structure to support community and environmental needs and establish long-term funding

Goal: Build the resilience of our public infrastructure and public and affordable housing

Action: Retrofit public housing developments at highest risk and build new safe and quality public and affordable housing on higher ground

Action: Increase the reliability and safety of public infrastructure, building in resilience

5. GREEN

SUPPORT GREEN JOBS, NATURE, AND HEALTH

Goal: Provide good green and blue jobs

Action: Develop good local green job opportunities

Goal: Invest in ecological restoration, protection, and resilience

Action: Restore ecological resilience

Action: Integrate natural and nature-based approaches into policy, practice, and capital infrastructure development

Goal: Address pollution and health risks to environmental justice communities

Action: Update policies to address changing pollution risks facing low-income communities and communities of color

Action: Address combined sewer overflows and prioritize green infrastructure investments in communities that need them most

APPENDIX A: New Jersey Rules and Regulations and Climate Resilience

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Disclaimer

This report is representative of the ideas and consensus-building of the Resilience Task Force, convened over a one-year period in 2019. This report was used to inform the solutions put forth by the Rise to Resilience coalition but represents a broader range of proposals. Involvement in the development and the policies detailed within the report, or partnership in the Rise to Resilience coalition does not necessarily constitute endorsement.

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Executive Summary

A Roadmap for climate resilience in New York and New Jersey

The climate crisis is here now. More than one million people in our region live in the future floodplain, but we are still unprepared for rising waters. Eight years after the devastation of Hurricane Sandy, we have yet to implement the comprehensive program for resilience that we urgently need to protect frontline communities across New York and New Jersey from the climate crisis.

Covid-19 has forced us once again to confront the vulnerability of our region—and how inequitably borne our disasters are by lower-income communities and communities of color. At the moment of this report's release, we must consider how doubly unprepared we are to address a climate disaster amid the ongoing pandemic recovery. Now is the time to rise up and build a more resilient future for New York and New Jersey.

To meet this challenge, we need bold policy reform and commitment to climate preparedness and adaptation at every level of government. The purpose of this report is to provide actionable recommendations for federal, state, and local governments to implement and manage our region's resilience-building efforts in a well-funded, transparent, equitable, and just manner.

The policies and investments laid out in this paper are the result of 15 months' work by a Resilience Task Force of more than 400 leaders from New Jersey and New York. This diverse coalition—spanning grassroots, environmental, business, government, and research organizations—worked to build consensus on the resources and policies needed to build our resilience to climate change, with a particular focus on flooding from increasing sea levels, frequency of storms, and precipitation.

From the outset, there has been agreement within this multidisciplinary group that our region, our people, and our economy are in a rapidly growing state of risk. Yet despite the many disparate plans already written and designs drawn since Hurricane Sandy in 2012, there has been little broad action or cohesion among efforts.

Calls to action

In May 2020, the Waterfront Alliance and its allies launched the Rise to Resilience coalition, an unprecedented regional grassroots coalition organized to put pressure on our elected officials to act on key elements of the Resilience Task Force's consensus-building, and guide them in translating smart, proposed policy solutions into legislative action.

The Rise to Resilience coalition has identified the following solutions for realizing stronger climate adaptation and resilience in our region.

Regional

- Establish an interstate Regional Climate Resilience Council to ensure our response to the climate crisis is a unified, coordinated effort.
- Pass enforceable flood risk disclosure laws in New York and New Jersey.
- Restore funding to the United States Army Corps of Engineers and execute a comprehensive coastal risk study that prioritizes people and nature.

New York

- Enact stronger flood risk assessment and prevention through the Community Risk & Resilience Act passed in 2014.
- Integrate resilient design and process into all state-funded infrastructure planning and capital projects.
- Establish long-term funding for statewide resilience investments, leveraging the New York State 2020 Environmental Bond Act as a $3 billion down payment.

- Strengthen Intro 1620 as a legislative framework for a well-funded and comprehensive citywide resilience strategy.

New Jersey

- Ensure a resilient Covid-19 recovery by directing stimulus funds toward green workforce development programs, affordable housing, and resilient infrastructure.
- Establish a clear system of governance to oversee the implementation of statewide resilience policy.
- Ensure that the Climate Resilience Plan and New Jersey Protecting Against Climate Threats (NJPACT) per Executive orders 89 and 100 effectively incorporate climate resilience into statewide policy.
- Amend municipal land-use law to ensure that all local master plans incorporate climate vulnerability assessments and resilience measures.

National

- Introduce legislation that re-envisions and funds FEMA so it can support our response to the climate challenges of the 21st century.
- Reauthorize and reform the National Flood Insurance Program
- Invest in a resilient recovery from Covid-19 by directing stimulus funds toward green infrastructure and workforce development.

What's at stake

Our entire region and our way of life. Whole towns and neighborhoods.[1] Three major airports. Dozens of wastewater treatment plants, toxic industrial areas, and bulk storage sites. Small businesses and large corporations. Our homes. And too much more. Millions of people are at risk, but especially those who live in low-income communities, communities of color, and immigrant communities.[2]

New Jerseyans and New Yorkers know well the threat is far from hypothetical. Hurricane Sandy was a harsh warning to our region and a test for what is to come. To date, policies and investments have failed to address climate change with the level of urgency to match the challenge. The response to that disaster was reactive. While progress has been made in some areas, existing resources, public engagement, adaptive capacity, flexibility, and pace on the whole are vastly inadequate in the face of the challenges presented by climate change.

Climate change is upon us and we're already paying for it. Multiple disaster declarations have been made in every county in both states and have cost us tens of billions of dollars. This is just the start. Today's greatest risk is inaction.

[1] As mapped using NYC Flood Hazard Mapper (2100 high tide projections using mid-high and high projections from the NYC Panel on Climate Change) and NJ Flood Mapper, using 2100 50% and 17% chance projections from Rutgers University.

[2] United States Global Change Research Program. 2018: *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018

By the numbers

- **1 million+** people living in the floodplain in our region TODAY[3]
- **$20 billion:** our National Flood Insurance Program debt[4]
- **6 to 1:** the return on investment for flood risk reduction[5]
- **1 out of 10** public housing units are in the floodplain[6]
- **106 mi²** wetlands at risk of loss by 2100[7]
- **53** flood-related federal disaster declarations (20 NJ, 33 NY) in the past 40 years
- **F:** New Jersey and New York's grades for flood risk disclosure[8]
- **In the red:** disasters and sea level rise widen racial wealth gaps[9]
- **20%** of the region's power generating capacity is at risk by 2100[10]
- **35-63 days over 90** fahrenheit or more by the 2080's[11]

Our vision

The New York and New Jersey harbor region and its surrounding waterways are a shared and resilient resource for all. Our communities are justly, wisely, and resolutely prepared for the reality of sea level rise and climate change, and stakeholders are joining together to make decisions that lead to equitable outcomes. Our waterways are resilient, accessible, and alive with commerce and recreation, healthy, natural resources, and exciting waterfront destinations that reflect the vitality and diversity of the communities that surround them.

A multi-pronged strategy is needed...now

Flooding is the most common natural disaster in the United States—and, it's getting worse. Our region faces up to six feet of sea level rise or more by the end of the century and an increase of both overall precipitation and extreme rainfall.[12,13,14]

To manage physical risks posed by rising seas and increased coastal storms (chronic inundation caused by sea level rise and acute flooding caused by increased precipitation and storm surge), a combination of three types of strategies may be used: **resist** (building infrastructure to keep water out), **accommodate** (raise or harden infrastructure and buildings at the structure scale to let water in, invest in green infrastructure to absorb increased precipitation), and **retreat** (changing land use rules and relocating buildings and infrastructure out of risky areas).

For design-level decision-making, we have relative confidence to 2050 (the time-frame associated with the greatest certainty of climate models). In this light, built infrastructure

[3] Regional Plan Association. 2017. Fourth Plan. http://library.rpa.org/pdf/RPA-4RP-Executive-Summary.pdf
[4] Government Accountability Office. 2018. National Flood Insurance Program. https://bit.ly/2JOLUP6
[5] National Institute of Building Sciences. 2018. Natural Hazard Mitigation Saves. https://cdn.ymaws.com/www.nibs.org/resource/resmgr/mmc/NIBS_MSv2-2018_Interim-Repor.pdf
[6] NYU Furman Center. 2017. Housing in the U.S. Floodplains. https://furmancenter.org/files/NYUFurmanCenter_HousingInTheFloodplain_May2017.pdf
[7] Regional Plan Association. 2017. Fourth Plan. http://library.rpa.org/pdf/RPA-4RP-Executive-Summary.pdf
[8] Adler, D, M Burger, R Moore, J Scata. 2019. Changing the National Flood Insurance Program for a Changing Climate. Environmental Law Institute. Washington, DC. www.eli.org
[9] Hersher, R., R Benincasa. March 5, 2019. How Federal Disaster Money Favors the Rich. NPR. https://n.pr/2VJcEF5
[10] Freudenberg, R. et al. 2016. Under Water: How Sea Level Rise Threatens the Tri-State Region. Regional Plan Association. http://library.rpa.org/pdf/RPA-Under-Water-How-Sea-Level-Rise-Threatens-the-Tri-State-Region.pdf
[11] New York City Panel on Climate Change. 2019. Chapter 2: New Methods for Assessing Extreme Temperatures, Heavy Downpours, and Drought. New York City Panel on Climate Change 2019 Report. Annals of the New York Academy of Sciences.
[12] FEMA. 2004. Flooding: America's #1 Natural Hazard!
[13] Gonzales, JE et al. 2019. Chapter 2: new methods for assessing extreme temperatures, heavy downpours, and drought. In: New York City Panel on Climate Change 2019 Report. Annals of the New York Academy of Sciences.
[14] Broccoli, AJ; MB Kaplan; PC Loikith; DA Robinson. 2013. State of the Climate: New Jersey. Rutgers Climate Institute. Rutgers University.

projects are only resilient within the time frame for which they were designed before they need to be raised in height or expanded beyond their original footprint, unless there are resist approaches that are simultaneously deployed. Resist and accommodation strategies have the challenge of much greater uncertainty beyond 2100, past which our region could be subject to six feet or higher of sea level rise. In the riskiest areas—those that will be regularly inundated by the end of the century—we are essentially buying transition time toward longer-term relocation and retreat. With this in mind, we must think of multiple time scales at once for planning, capital investment, financing, and building/zoning code changes, to ensure that:

- **Accommodate and resist (built) strategies are constructed with adaptability and flexibility in mind**
- **Resist approaches must be accompanied by accommodate and/or retreat strategies to reduce risk in areas behind flood infrastructure as a second layer of protection; and**
- **Retreat must be a viable option, transitioning in a way that is just and reduces long-term risk.**
- **Flood risk is approached comprehensively, in which all types of potential increased flooding are considered in planning and design.**

In addition to flooding, urban heat poses significant risks to people in urban areas and housing with low air-flow, lack of air conditioning, and low tree canopy cover/high impervious surfaces. By mid-century (2036-2065) In New York City alone, more than 100 New Yorkers will die each year in heat-related deaths, a number that could quadruple by the end of the century.[15,16] Heat stress also can affect physical infrastructure directly through warping or degradation of materials.[17,18] Additionally, a lack of grid resilience and high demand during heat waves can cause loss of power, reducing availability of air conditioning when it is needed most. To tackle urban heat, a multi-pronged approach is needed: investments in the resilience and air conditioning of public housing, cooling centers, incorporating climate design guidelines in building and infrastructure requirements, increased green infrastructure and use of reflective, rather than heat-absorbing surfaces, and investments in peak energy use management.[19] While the primary focus of this report is addressing the flood risks associated with our current and future states, multi-beneficial approaches that reduce flood risks and urban heat as well as other benefits are highlighted. For example, investments in green infrastructure can reduce urban heat and stormwater. Energy-resilient buildings can also be storm-resilient, with renewables and back-up power providing energy even if the surrounding grid is impacted.

We're in this together, but risks are shared unequally

We all face the risks of climate change, regardless of where we live. Our ports, transportation networks, and our economies lie disproportionately along our coast and rivers. Climate change and sea level rise touch everyone, but hit low-income communities and communities of color those with the fewest resources to adapt, first and worst.[20]

We must fight climate change

Our governments must take transformative measures to significantly reduce emissions and reduce the impacts that we face in the future. Aggressive visions for how to get to a zero-emissions future are called for in the Equitable and Just National Climate Platform; by New York Renews and Jersey Renews; by the Climate Works for All platform, and equivalent targets developed through local, community-based visioning. These actions are needed to meet climate goals. The below policies complement mitigation strategies, and are a suite of options for adaptation and resilience, particularly to acute and long-term flooding caused by increased sea levels, precipitation, and coastal storms. As key policies are interpreted (e.g. the Climate Leadership and Community Protection Act in New York), our governments must seize the opportunity to support greenhouse gas reduction, mitigation, and adaptation simultaneously. Retrofits can be made for both energy efficiency and resiliency. Strategic investments in green infrastructure and wetlands can provide multiple benefits (reductions in urban heat, improved air quality, flood mitigation, carbon storage, and equitable public access to the water). Public transportation investments and climate-smart planning can similarly reduce existing urban heat and pollution while also reducing flood risk. Electrifying and increasing investments in water-based transportation of people and goods can provide more transportation options and reduce greenhouse gases. We must work together to achieve these multiple complementary goals to prepare us for a changing future in a way that builds the resilience of our communities and natural resources.

1. MANAGED

GOVERNANCE IS ADAPTED TO A CHANGING CLIMATE

Photo: Nathan Kensinger

1. MANAGED

The root of successful, multi-generational resilience is clear and sound leadership. The sea level rise, rising temperatures, and increased severity of storms associated with climate change have already worsened the stresses and natural hazards faced by vulnerable communities. Our leadership and governance structures need to adapt along with the challenge.

Goal: Build leadership across jurisdictions

Since Hurricane Sandy struck in 2012, changes have been made to the way that we govern flood resilience and adaptation. The State of New Jersey's Department of Environmental Protection reorganized to create a Chief Resilience Officer and Bureau of Climate & Flood Resilience. In New York State, the Community Risk & Resiliency Act committed the state to incorporating sea level rise into agency management, though without structural change. In New York City, a new Mayor's Office of Resiliency was developed to lead resilience policy and projects. And yet, action addressing future storm surges, stormwater/urban flooding, and sea level rise remains fragmented. Specific challenges include:

- **Lack of coordination in planning and decision-making** across agencies and levels of government can lead to an inconsistent, inefficient, and incomplete approach to risk. Hazard mitigation, building and infrastructure codes, land use regulations, planning, and floodplain management need shared frameworks for analyzing and reducing risk and adequate integration of future risk to be fully effective.
- **Funding streams for capital projects and planning across jurisdictions have inconsistent requirements for integrating climate risk,** social vulnerability, and ecological vulnerability. This results in more exposure to risk, lost opportunity to address gaps in protection, and challenges in implementing "dig-once" type actions that offer cost savings to taxpayers across coordinated capital projects.

Action: Establish cross-jurisdictional climate governance and a framework for resilience planning and implementation.

The framework below proposes ways to manage adaptation throughout the region, in which there are 1) clear lead agencies and coordination across jurisdictions; 2) land use management and policies that strive for risk reduction; and 3) robust and resourced community empowerment and involvement in decision-making efforts so that communities at the frontlines of climate change can inform and influence adaptation plans, programs, and capital projects. This framework could build from existing hazard mitigation and planning processes, which are currently often separated, and should/must involve increased coordination across agencies, political jurisdictions, and local climate plans. In the event of a disaster, functioning climate governance can ensure that recovery funds are directed towards projects that meet long-term goals for resilience, and also are vetted by communities in advance.[21]

Legislative or programmatic paths:

Federal: FEMA should reform the hazard mitigation planning process to 1) include future flood risk, 2) incentivize states and localities to collaborate across jurisdictional boundaries through a watershed-based approach to flooding, and 3) reduce the arduous and lengthy application process.

Interstate: Establish a Regional Climate Resilience Council that:

- **Provides consistent climate science** across jurisdictions to facilitate shared planning, building from New Jersey's Science and Technical Advisory Panel and New York City's Panel on Climate change.

[21] Pirani, R and L Tolkoff. 2014. Lessons from Sandy; Federal Policies to Build Climate-Resilient Coastal Regions. Lincoln Institute of Land Use Policy and Regional Plan Association.

- **Reduces risk:** Facilitates the development of a framework for assessing, monitoring, and reducing risk across jurisdictions and provides guidance for public and private development.
- **Provides civic oversight and longevity beyond electoral cycles:** is composed of frontline community representatives and experts in climate science, environmental justice, hydrology, engineering, architecture, emergency management, ecology, community development, planning, and social science.

State (New York): via Executive Order or an Act of legislation:

- **Lead:** support the lead state climate agency (NYSDEC) by increasing its authority and funding to support its increased duties related to climate resilience planning and investment. In addition to increased full time staff and resources, the state should revisit structure, considering consolidation of the Coastal Zone Management Program (currently under DOS), the Climate-Smart Communities Program, and watershed planning branches into one climate resilience office.
- **Plan and implement:** develop a framework and funding for assessing vulnerability, planning, monitoring risk, and implementing resilience projects in partnership with a regional resilience council and local hazard mitigation and watershed planners that:
  - **Establishes clear communication** about climate risk and what can be done.
  - **Funds: provides planning and implementation grants to localities** to meet the gap in unmet need, incentivize regional planning, and provide technical assistance for all communities, funded through a Climate Resilience Fund (see ***Funded*** section).[22] The program should also:
    - **Waive match requirements or allow an in-kind option for districts composed of primarily low-income residents**, building off existing community-based plans and requiring that a percentage of funds be allocated to grassroots organizations to facilitate robust community engagement and empowerment in decision-making.
    - **Incentivize collaboration across jurisdictions.**
    - **Require consistency** with state, regional, and county master plans, goals and regulation.
    - **Provide planning templates** to assist localities in identifying feasible adaptation pathways for different contexts and levels of risk.
    - **Provide financial guidance for municipalities at highest risk in order to reduce financial risk** (e.g., transfer of development rights, revenue sharing, in the floodplain).
  - **Codifies social vulnerability and racial equity into resource allocation criteria**, to steer resources toward areas of greatest need.
  - **Codifies natural resource vulnerability into planning processes and resource allocation criteria.**
  - **Codifies future risk** through floodplain maps and/or extension of special hazard areas for future flood risk that are used for planning and regulatory purposes.
  - **Empowers:** establish oversight by frontline experts, expanding the recently developed Climate Action Council and Climate Justice Working Group to include resilience experts from or working closely with frontline communities to influence the implementation of resiliency efforts, compensating for expertise and time.
  - **Regulates:** per the ***Community Risk and Resiliency Act of 2014***, develop and integrate specific permit review criteria for climate change into all relevant permits and standards to build consistency across regulations and rules that control what is built where and how.

[22] J Keenan. 2017. Regional Resilience Trust Funds: An Exploratory Analysis for the New York Metropolitan Region. Environment Systems and Decisions. Report of the Fourth Regional Plan. doi: 10.1007/s10669-017-9656-3

- **Coordinates:** through an interagency council on climate resilience:
  - Integrate resiliency guidelines into all capital planning and project development (see NYC Climate Design Guidelines and WEDG).
  - Track and report on progress toward broader climate mitigation and resilience goals to the Climate Action Council, Climate Justice Working Group, and broader public.
  - Coordinate closely with the Hazard Mitigation Planning Process.
  - Develop and regularly update a strategic plan.

State (New Jersey): Implement Executive Orders 89 and 100 and ensure that the resulting products meet the priorities identified in this paper and are updated over time.[23]

> **Lead:** support the New Jersey Department of Environmental Protection as lead climate agency to meet its increased duties related to climate resilience by increasing funding for additional staff, planning and programs (e.g. Resilient NJ, NJ Frames, Blue Acres).

> **Plan and implement:** Develop a resilience framework for assessing, monitoring, and reducing flood risk in partnership with an interstate climate commission and local hazard mitigation and watershed planners that:

- **Provides planning and implementation grants to localities** through making permanent the ResilientNJ or NJFRAMES programs to meet the gap in unmet need, incentivize regional planning, and provide technical assistance for all communities. Fund, inform, partner with, and empower local communities at the frontlines to 1) conduct vulnerability assessments; 2) develop community-based plans; and 3) implement projects based on those plans. See Massachusetts's MVP program, in which a law directs the state to develop a planning framework for voluntary use by local governments, which the state complements with a targeted grant program to incent local governments to apply the state-developed planning framework.[24] The program should also:
  - **Waive match requirements or allow an in-kind option for districts composed of primarily low-income residents**, building off existing community-based plans where they exist and requiring a percentage of funding be allocated to grassroots organizations to facilitate robust community engagement and empowerment in decision-making.
  - **Incentivize collaboration across jurisdictions**
  - **Require consistency** with state, regional, and county master plans, goals, and regulation and provide planning templates to assist localities in identifying adaptation pathways for different contexts and levels of risk.
  - **Provide financial guidance for municipalities at highest risk to reduce financial risk** (transfer of development rights, revenue sharing, shifting revenue sources away from property taxes in the floodplain).
  - **Require and provide clear guidance for climate change to be incorporated into Hazard Mitigation Plans.**[25]
  - **Codify social vulnerability and racial equity into resource allocation criteria**, through regularly-updated criteria and maps that steer resources and funding to areas and communities of greatest need.
  - **Codify natural resource vulnerability into planning processes and resource allocation criteria.**

[23] Herb, J, M. Kaplan, M. Campo, S. Kennedy, A. Wainwright, and H. Berman. 2019. An Overview of State Coastal Zone Management Policies Designed to Promote Coastal Resilience. Prepared for the New Jersey Department of Environmental Protection. New Brunswick, NJ: The Environmental Analysis & Communications Group, Rutgers University Bloustein School of Planning and Public Policy and Rutgers Climate Institute.

[24] Ibid.

[25] Ibid.

    - **Codify future risk** through floodplain maps and/or extension of special hazard areas that are used for planning and regulatory purposes.
  - **Empowers:** establish an oversight body of experts from frontline communities to oversee the implementation of resiliency efforts, compensating them for their expertise and time.
  - **Regulates:** revise to incorporate climate and build consistency across regulations and rules that control what is built where and how including developing a requirement for resilience master planning in municipal land use law.
  - **Coordinates:** increase coordination as detailed in Herb et al. (2019).[26] Make permanent the Interagency Council on Climate Resilience and ensure that the state:
    - Integrates resiliency guidelines into all capital planning and project development.
    - Tracks agency targets towards broader climate mitigation and resilience goals over time and reporting to the broader public.
    - Coordinates closely with the Hazard Mitigation Planning Process.
    - Develops and updates a strategic plan for meeting goals on a regular basis.

County, NJ: Establish (where the role does not already exist) the role of Chief Resilience Officer, or incorporate into the purview of an existing hazard management or planning role, charged with incorporating climate considerations into hazard mitigation planning.

Municipality, NJ: incorporate climate vulnerability assessment and resilience measures into master planning processes rooted in a community process that maximizes diversity and affordability, equity, climate resilience, and green infrastructure, and is:

- **Comprehensive and effective**, providing an integrated approach at multiple scales including high level policy (e.g. integration of climate design guidelines throughout all public investments and infrastructure projects, integrated approaches to density and zoning) and specific (e.g. neighborhood plan or strategies developed in close partnership with the local community where they have not already been developed).
- **Additive:** Where significant community-based planning processes have already occurred, build pathways to implementation.
- **Regularly updated** on an adaptive management cycle, with annual progress reports communicated to the public.
- **Transparent** about the constraints of possible adaptation pathways and challenges of infrastructure maintenance over time. A long-term plan for how to fund and maintain these structures and reduce risk behind the measures over time should be included.
- **Just:** prioritizes low-income communities and communities of color in resource allocation criteria.
- **Empowering:** municipalities and residents work together to decide strategies for their communities (see ***Equitable & Just*** section).
- **Inclusive of different time scales** and near-, mid-, and long-term strategies, especially in high-risk areas where relocation may be among few long-term options.
- **Strategic and long-term in approach to density:** include a strategy for upzoning/downzoning based on where more density can be borne and where it can't in light of many intersectional challenges: a climate crisis, an affordable housing crisis, generational racial inequities, crumbling infrastructure, combined sewer overflows, etc.
- **Regional in context** to inform an understanding of how sea level rise will affect settlement patterns over time with and without zoning interventions.
- **Measurable:** establishes clear, accessible, and equitable targets for risk reduction (e.g. number of people at risk of flooding, number of people with low adaptive capacity living in the floodplain, amount of public infrastructure addressed).

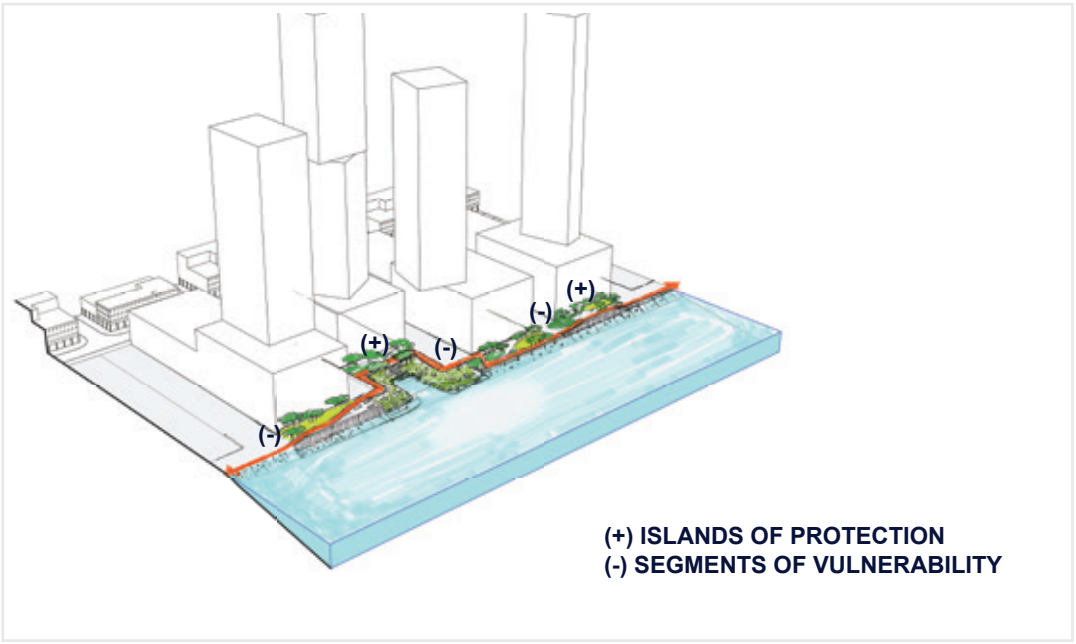
[26] Ibid.

New York City: through act of legislation, establish:

- **Clear leadership and shared strategic goals across agencies:** establish clear authority, resources, and charge to 1) develop and update a comprehensive climate resilience strategy in partnership with all relevant agencies and communities; 2) lead climate resilience and mitigation policy; and 3) coordinate an interagency resiliency work group to build consistency in policy implementation across agencies; and 4) communicate progress towards goals to the public. This could be accomplished through an expansion of purview, budget, capacity, and public communication/engagement efforts within the Mayor's Office of Resiliency, or through a designation of a lead department, or establishment of a new department.
- **A comprehensive resiliency strategy** that provides a comprehensive planning and zoning approach rooted in a community process that maximizes diversity and affordability, equity, climate resilience, and green infrastructure, and is:
  - **Comprehensive and effective**, providing an integrated approach at multiple scales including high level policy (e.g. integration of climate design guidelines throughout all public investments and infrastructure projects) and specific (e.g. plans or strategies developed in close partnership with communities).
  - **Funded:** develop a long-term capital planning budget and framework that identifies and leverages public and private investment sources toward risk reduction and maintenance, as well as risk-reducing efforts that can be incorporated into regular infrastructure maintenance and replacement cycles.
  - **Additive:** Where significant community-based planning processes have already occurred (e.g. Hunts Point LifeLines, Resilient Edgemere), build pathways to implementation. Resolve any overlapping roles between/build upon the City's Comprehensive Waterfront Plan, Local Waterfront Revitalization plans, Hazard Mitigation Plans and federal, state, and regional resiliency plans.
  - **Regularly updated and well-communicated** (e.g every 5-10 years) on an adaptive management cycle, with progress reports communicated to the public, building from existing resources, such as New York City Office of Emergency Management's online hazard mitigation plan or "Know Your Zone" website.
  - **Transparent** about constraints of possible adaptation pathways and challenges of infrastructure maintenance over time in different physical contexts. If hard, integrated flood protection measures are chosen as a pathway for particular areas, a long-term plan for how to fund and maintain these structures and reduce risk behind the measures over time should be included.
  - **Just:** prioritizes low-income communities and communities of color in resource allocation criteria.
  - **Empowering:** municipalities and residents work together to decide near, mid-, and long-term strategies for their communities through robust engagement.
  - **Mission-driven in an approach to density:** include a strategy for evaluating and zoning based on where more density can be borne and where it can't in light of many intersectional challenges: a climate crisis, an affordable housing crisis, generational racial inequities, crumbling infrastructure, combined sewer overflows, and other issues.
  - **Regional in context** to inform an understanding of housing at risk due to sea level rise and how that will affect settlement patterns over time with and without zoning interventions is needed, using a similar approach to that of New York City Department of City Planning's Geography of Jobs report.
  - **Measurable:** establishes clear, accessible, and equitable targets for risk reduction (e.g. number of people at risk of flooding with low adaptive capacity, value of public infrastructure at risk of flooding).

CASE STUDIES: STATE ADAPTATION AND RESILIENCE PLANNING IN MASSACHUSETTS

In Massachusetts, the Municipal Vulnerability Preparedness (MVP) program is available to all municipalities in the state and provides grants for planning or actions. Each grant award also comes with a professional trained through the MVP program to facilitate the planning process, and supports a combined MVP/FEMA Hazard Mitigation Plan. Information about reducing carbon emissions and supporting adaptation is available on a one-stop-shop website (resilientMA) containing climate data, grant and planning resources, and research.



Islands of protection: without a coordinated vision and framework and integrated approach across public and private lands, uneven resilience measures result in islands of protection and segments of vulnerability. *Images by Sanjukta Sen.*[27]

Goal: Codify resilience into regulation, practice, and incentives

The influences that lead to risky land use practices must be addressed, so that risks are reduced over time through proactive enforcement, practice, and incentivization.

Action: Comprehensively integrate sea level rise and flood resilience into state and city laws, regulatory authority, incentives, and infrastructure budgets.

The regulations and rules surrounding land use should be updated to reduce risk before it starts. Clear guidance is needed regarding specific, enforceable standards for land use and buildings in areas of future tidal flooding and future floodplains into local planning, zoning. This should go further than individual properties, and be developed as an integrated approach to planning and capital project development.

Legislative or programmatic paths:

State (New York): Codify specific and enforceable requirements into state policy as per the 2014 Community Risk and Resiliency Act, with amendments or new legislation as needed:

- **Establish future flood risk maps as a basis for minimum standards for planning, regulation, practice, and incentives**.[27] These maps should demarcate the projected future high tide water levels and future 100-year floodplains through the end of the century and inform guidance for reviewing and requirements of state-controlled permits, planning, and capital projects.
- **Develop specific, enforceable guidance for relevant state land use permits to integrate climate projections and future flood risk maps** into land use and building requirements, prioritizing set-backs, living/soft shoreline stabilization methods, and maintaining public access to the water.
- **Restrict new development in areas projected to be underwater during the design life of the structure,** with limited exceptions (e.g. water-dependent uses), through either code and design requirements or expansion of the coastal hazard areas.
- **Integrate climate design requirements into all state-funded capital projects (new construction and significant retrofits), permit review, planning.** See New York City's Resilient Design Guidelines, Hoboken's Resilient Building Design Guidelines, and WEDG (Waterfront Edge Design Guidelines).[28]
- **Revise the Uniform Construction Code for resilience:** ensure all new (public and private) construction and significant retrofits occurring in the 2100 100-year floodplain meet climate design guidelines (bullet above).
- **Provide model local laws** and resilience planning tools for municipalities[29]
- **Develop incentives for meeting guidelines that exceed code** (e.g. WEDG), building off of existing incentives for LEED and clean energy (e.g., tax benefits, PACE).
- **Incentivize resilient natural shorelines:** through act of legislation or rule-making, incentivize resilient shorelines through simplified or expedited permitting, building off existing models in New Jersey (GP 24) and Maryland.

State (New Jersey): through implementation of Executive orders 89 and 100:

- **Establish future flood risk maps as a basis for minimum standards for planning, regulation, practice, and incentives.**[30] These maps should demarcate the projected future high tide water levels and future 100-year floodplains through the end of the century and inform guidance for reviewing and requirements of state-controlled permits, planning, and capital projects. Relevant rules and permits are included as ***Appendix A***.
- **Integrate climate design requirements into all state-funded capital projects (new construction and significant retrofits), permit review, planning.** See Hoboken's Resilient Building Design Guidelines and WEDG (Waterfront Edge Design Guidelines).[31]

[27] Clear guidance for hazard assessment, planning, and project development should accompany maps. Flood maps should build off of the FEMA 100- and 500-year floodplain, incorporating a sea level rise adjustment using moderate or high sea level rise projections. Rapid ice melt scenarios should be provided for an advisory (if low likelihood) perspective on potential long-term conditions.

[28] Precedents: NJ Energy Resilience Bank, NYC retrofit accelerator, NYSERDA Multifamily Performance Program. Guidelines are based on the design life and criticality of the structure. See Institute for Building and Home Safety, NYC's Climate-Resiliency Design Guidelines, and WEDG (Waterfront Edge Design Guidelines)

[29] See US Environmental Protection Agency. 2017. Smart Growth Fixes for Climate Adaptation and Resilience.

[30] Clear guidance for hazard assessment, planning, and project development should accompany maps. Flood maps should build off of the FEMA 100- and 500-year floodplain, incorporating a sea level rise adjustment using moderate or high sea level rise projections. Rapid ice melt scenarios should be provided for an advisory (if low likelihood) perspective on potential long-term conditions.

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- **Revise the Uniform Construction Code for resilience, working** with the Department of Community Affairs Division of Codes & Standards to ensure all new (public and private) construction and significant retrofits occurring in the 2100 100-year floodplain meet climate design guidelines (bullet above).
- **Develop specific, enforceable guidance for relevant state land use permits to integrate climate projections and future flood risk maps** into land use and building requirements, prioritizing set-backs, living/soft shoreline stabilization methods, and maintaining public access to the water.
- **Restrict new development in areas projected to be underwater during the design life of the structure,** with limited exceptions (e.g. water-dependent uses), through either code and design requirements or expansion of coastal hazard areas.
- **Provide model local laws** and resilience planning tools for municipalities.[32]
- **Develop incentives for meeting guidelines that exceed code** (e.g. WEDG), building off of existing incentives for LEED and clean energy (e.g., tax benefits, PACE.)

Local (New Jersey): Incorporate state-developed guidance into local law through resilient zoning, capital projects, and code.

New York City: through act of legislation:

- **Establish a resilient zoning overlay or expand NYC Special Coastal District areas,** consistent with any state-level regulatory layers, to integrate the advisory flood maps currently in development as a regulatory layer, with projected future high tide levels and floodplain through 2100. This overlay or special district expansion should:
  - **Develop and geographically map risk profiles** throughout the 2100 floodplain to inform guidance and requirements for permits, planning, and capital projects. This should include denoting areas in which buildings and infrastructure should adhere to New York City's Climate Resiliency Design Guidelines, and where residential development is prohibited or restricted due to risk.
  - **Accompany a comprehensive resilience strategy,** as described in ***Establish cross-jurisdictional climate governance and a framework for resilience planning and implementation***.
  - **Inform mechanisms for reducing and transferring development.**[33]
  - **Promote natural and nature-based shorelines** and protection of important habitat for wildlife vulnerable to climate change (e.g. wetland migration areas).[34]
- **Develop incentives for guidelines that exceed code** for projects in the floodplain, building off existing incentives for LEED and clean energy (e.g., tax benefits, PACE) and using rating systems like WEDG (Waterfront Edge Design Guidelines).
- **Incorporate New York City's Climate Resiliency Design Guidelines into capital planning and development design requirements and building code for all projects.**

[32] See United States Environmental Protection Agency. 2017. Smart Growth Fixes for Climate Adaptation and Resilience.

[33] Under New York Town Law § 261-a; General City Law § 20-f; Village Law § 7-701, N.Y. municipalities are given the express authority to include lands at risk from sea level rise, storm surge, or flooding in TDR programs. Ama R. Francis. 2019. Columbia University. Personal Communication.

[34] Calvin, E., R Freudenberg, S McCoy. 2018. The New Shoreline: Integrating Community and Ecological Resilience around Tidal Wetlands. Regional Plan Association. http://library.rpa.org/pdf/RPA-Wetland-Migration-Report.pdf

CASE STUDY VIA THE PEW CHARITABLE TRUSTS' *MITIGATION MATTERS* REPORT: ARKANSAS TAX CREDIT REWARDS LANDOWNERS FOR CONSERVATION[35]

Since the 1780s, Arkansas has lost more than 70 percent of its wetlands, making it harder for the state to combat seasonal floods along the Arkansas and Mississippi rivers that have worsened in recent years. Arkansas's ability to protect these areas is limited because many wetlands and riparian zones—the areas bordering rivers and streams—are privately owned. But a state tax credit has helped to stem the loss of these critical landscapes. The incentive applies to landowners who restore, enhance, or create wetlands on their property or who donate parts of wetlands and/or riparian zones to the state. Since 1995, the state has approved over $4.5 million in tax credits for projects to protect or create wetlands and riparian zones. Oregon also led the way with a similar program started in 1981, which has conserved more than 1,400 acres of land along 99 miles of streams.

CASE STUDY: MIAMI-DADE EXPANDS THE PACE PROGRAM TO INCLUDE SEA LEVEL RISE

In 2019, the Miami-Dade County Commission advanced legislation to expand the Property Assessed Clean Energy (PACE) financing program to incorporate measures to address flooding. PACE is a financing program that allows property owners to voluntarily opt into a special assessment district in order to finance improvements on their property. These measures include elevating electrical boxes and home foundations, improvements to the underground infrastructure of homes, and sewage treatment improvements.[36] With appropriate consumer protections in place, expansion of incentive programs like PACE is one method to support private action.

CASE STUDY: CLIMATE-RESILIENT DESIGN GUIDELINES

In the same way that LEED® shifted modern architecture toward energy efficiency, there are emerging guidelines and credit-based certification/verification programs that could be incentivized in the same way that LEED is by local laws, capital project commitments, and other means. Internationally, the ReLi standard is an all-hazards resilience standard. Another program, WEDG® (Waterfront Edge Design Guidelines) is applicable primarily for projects at the water's edge. And, New York City's Climate Resiliency Design Guidelines for structures and parks provide guidance for designing public capital projects for a changing future.

[35] The Pew Charitable Trusts. 2019. Arkansas Tax Credit Rewards Landowners for Conserving Wetlands. In: Mitigation Matters Policy Solutions to Reduce Local Flood Risk. https://bit.ly/2O8kkja

[36] Fuller, J. November 5, 2019. Miami-Dade Aims to Expand PACE Program to Help Protect Against Sea Level Rise. Miami Beach Times

Action: Reform the National Flood Insurance Program (federal).

In 2017 alone, our nation suffered more than $300 billion in damages because of extreme events, primarily flooding.[37] Our federal government is the ultimate risk manager, and is suffering increasing debts.[38,39] Most importantly, these debts represent the hundreds of thousands of American households and individuals that have experienced devastating loss. In many cases, because of lack of flood insurance and economic disadvantage, homeowners and small businesses are hit hardest, widening wealth gaps.[40]

Reforms to the National Flood Insurance Program (NFIP) and the Federal Emergency Management Agency (FEMA) are critical components of a forward-looking federal approach to managing our risks. After nearly two years of short-term extensions and stagnating reform initiatives, funding the flood insurance program for the next five years is a top priority. The following critical changes are recommended.

Proactively invest in preparing for disasters before they happen.

According to a 2018 report by the National Institute of Building Sciences, for every dollar spent on hazard mitigation for flooding, the nation saves between six and seven future dollars.[41] Despite these findings, the federal approach to flood disasters continues to lean heavily on response and recovery. The creation of state revolving loan and grant funds for proactive flood risk reduction is supported by more than 200 organizations nationally. Although the federal government spent $277.6 billion from 2005 to 2014 on overall disaster assistance, FEMA has spent just $600 million on its pre-disaster Hazard Mitigation Grant Program over the same period. Such funds could support key investments in risk reduction that prioritize green infrastructure, low-income communities, and the full range of crucial strategies, from property acquisition and floodplain restoration to berms and integrated flood protection.

It has been shown that many localities and individual properties that have received FEMA funds have failed to comply with the terms of the award. The federal government needs to improve tracking and disclosure of compliance data, and assist communities where needed. FEMA should also explore expediting bringing vulnerable properties into compliance with floodplain development requirements that decrease the potential for flood damage by community adoption of a cumulative and/or lower threshold "substantial damage" or "substantial improvement" standard.[42] Lastly, FEMA should strengthen regulations on payouts to influence retreat and encourage buyouts after major flood events to prevent repetitive future loss claims.

Improve the applicability of FEMA and NFIP to urban areas and future risk.

Many flood risk reduction measures employed in dense, urban communities do not result in reduced insurance premiums despite their effectiveness. FEMA can make strides to increase its applicability to urban areas and those facing future risk, including:

- Expand mitigation options and premium credits: Provide detailed information on how partial mitigation measures will result in reduced risk and flood insurance premiums for the urban context (e.g. multifamily buildings, attached homes, narrow lots).

[37] Adam Smith. 2018. 2017 U.S. billion-dollar weather and climate disasters: a historic year in context. National Oceanic and Atmospheric Administration. https://bit.ly/2mttGHR
[38] Government Accountability Office. 2018. National Flood Insurance Program. https://bit.ly/2JOLUP6
[39] AECOM. 2013. The Impact of Climate Change and Population Growth on the National Flood Insurance Program Through 2100. Prepared for Federal Insurance and Mitigation Administration Federal Emergency Management Agency.
[40] NPR. March, 5, 2019. How Federal Disaster Money Favors the Rich. https://n.pr/2VJcEF5
[41] National Institute of Building Sciences. 2018. Natural Hazard Mitigation Saves. https://www.nibs.org/page/mitigationsaves
[42] Adler, D; M Burger; R Moore; J Scata. 2019. Changing the National Flood Insurance Program for a Changing Climate. Environmental Law Institute. Washington, DC.

- Improve product offering and informational resources for multifamily, mixed-use, commercial, and historic buildings.
- Provide options for homeowners in expanded areas to help encourage expanded uptake in the X-zone and areas of future flood risk, as 25% of floods occur outside of special flood hazard areas.[43]
- Provide maps and technical assistance for incorporating future risk into decision-making and regulations, updating regularly based on scientific advancement.

Increase risk transparency and insurance coverage.

While flood insurance costs are rising, the real costs of flood insurance are hidden from consumers and borne by taxpayers. This imbalance needs to be corrected, with costs adjusted for fairness and transparency about risk increased.

- **Better reflect risk in ratings and do so justly:** the rising costs of insurance are increasing the economic burden on homeowners and disproportionately affecting low- and middle-income individuals. A good solution cannot be either/or; affordability must be ensured and risk must be realized. Realizing actual risks in pricing is an important step in the right direction, but safeguards should be employed for those who need it most so that housing-burdened owners do not face steep increases. For wealthy owners, risk-based pricing could be phased in.
- **Increase transparency:** Develop a transparent, open-data system to share information related to flood damage claims, number of repetitive loss properties, and enforcement to benefit planning, funding, and programmatic decision-making.
- **Increase the size of the insurance coverage pool and the ease of policy renewal:** Having insurance is critically important for enabling individuals, families, and small businesses to bounce back after a disaster, yet the percentage of individuals that hold policies is low despite requirements for federally-backed mortgages.[44] Issues contributing to a lack of insurance include extensive paperwork to continue policies post-disaster that must be renewed annually and the lack of continuation after receiving individual assistance. Automatic renewals, optional monthly installment payments, and increasing penalties for lenders that do not enforce the requirement are all ways to increase coverage.

Provide resources to support a just transition in the coastal zone.

Many individuals and families are extremely vulnerable to flooding and face poverty. Newark, New Jersey and Coney Island, for example, have poverty rates of one in four or higher.[45] Even if an individual or family may want to reduce their risk, the economic and social factors that contribute to what options are available and preferable are far more complicated than clear communications about risk.[46] Long-term strategies are needed to support a just transition away from areas of risk. In the meantime, key actions can be taken now:

- **Provide assistance for low-income individuals and families to adapt**, beyond loans which increase debt. This may include insurance rates based on housing burden, grants for retrofits, and relocation assistance.

[43] FEMA. Flood Insurance - Frequently Asked Questions. https://bit.ly/30QZ7Oe
[44] Dixon, L. et al. 2017. The Cost and Affordability of Flood Insurance. RAND Corporation https://www.rand.org/pubs/research_reports/RR1776.html
[45] Sources: NYC Department of City Planning's Community District Profiles (2019) and the US Census, 2010.
[46] Elliot, R. 2019. 'Scarier than another storm': values at risk in the mapping and insuring of US floodplains. The British Journal of Sociology 2019 Volume 70 Issue 3. https://bit.ly/2M3ijEd

- **Provide resources to study and support the facilitation of long-term migration away from coastal areas and floodplains.** Proactive development of better resources and options for long-term migration is needed. FEMA should work to establish a federal program to assist states, localities, and communities to transition in areas of highest risk. It is also recommended that FEMA explore pilot programs to support innovative ideas, such as a "discounts for buyouts" program for repetitive loss properties and areas expected to be inundated by the end of the century that would offer homeowners discounts on their flood insurance premiums now, in exchange for a commitment to accept a future buyout at an agreed-upon triggering event.[47] By structuring plans in advance, uncertainty and long lag-times that can make relocation even more difficult can be reduced. Further, there are currently no restrictions on spending federal funds on rebuilding in areas where the land will be underwater in the future. Reforms could help reduce the 2.57 million severe repetitive loss properties expected by 2100.[48]

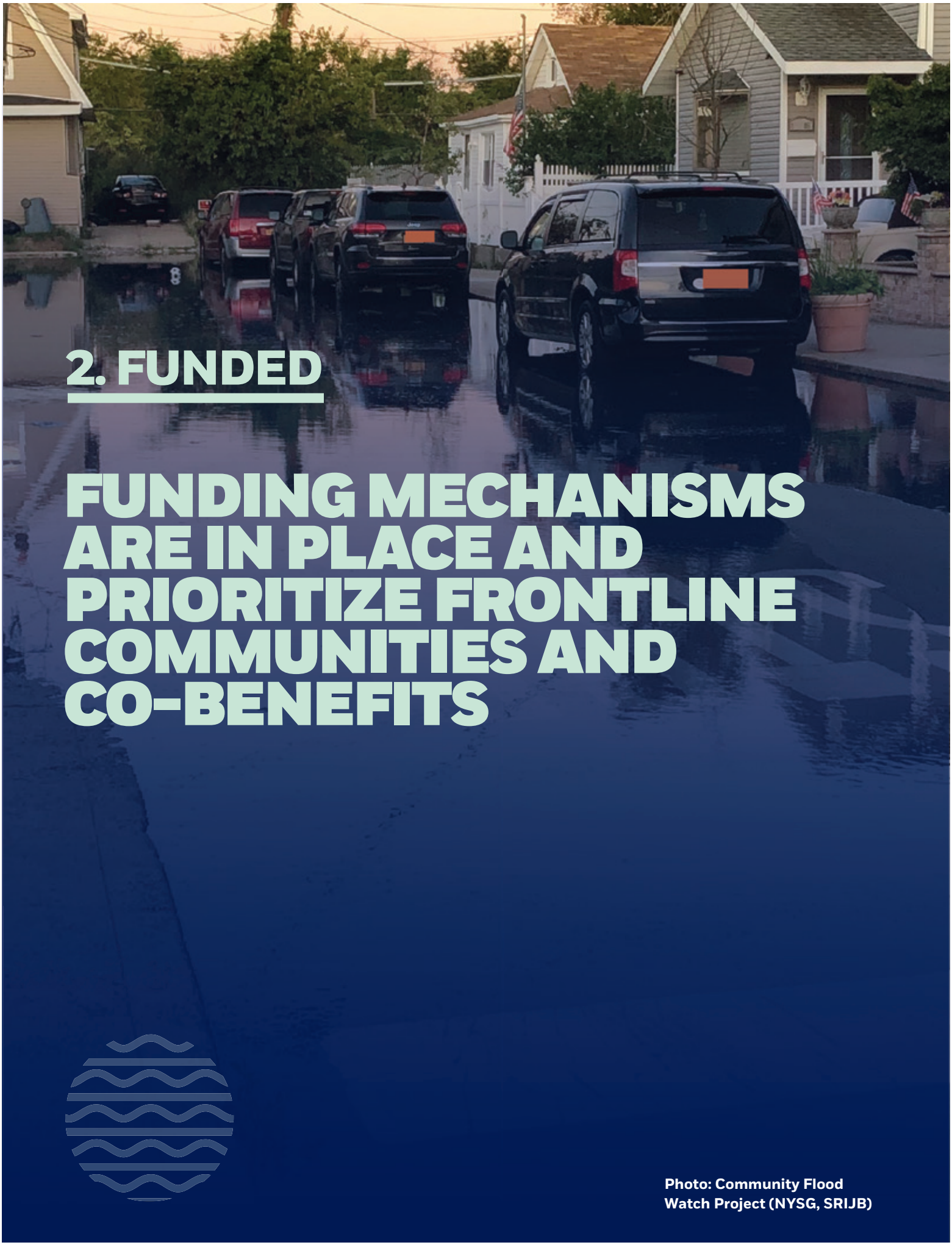
Limit mitigation elevation in areas that will be inundated by sea level rise. At this time there is no restriction on spending federal funds on elevating structures where the land underneath will be covered by water.

Legislative or programmatic paths:

Federal: through Act of Legislation, such as S2187, the National Flood Insurance Program Reauthorization and Reform Act of 2019 and H7037, the State Flood Mitigation Revolving Fund Act of 2019

[47] Adler, D; M Burger; R Moore; J Scata. 2019. Changing the National Flood Insurance Program for a Changing Climate. Environmental Law Institute, Washington, DC http://www.eli.org.

[48] Moore, Robert. 2017. Seeking Higher Ground: How to Break the Cycle of Repeated Flooding With Climate-Smart Flood Insurance Reforms. Natural Resources Defense Council. https://perma.cc/Q66X-D4HE



2. FUNDED

FUNDING MECHANISMS ARE IN PLACE AND PRIORITIZE FRONTLINE COMMUNITIES AND CO-BENEFITS

Photo: Community Flood Watch Project (NYSG, SRIJB)

2. FUNDED

Overview: We are already experiencing the costs of climate change across the nation and here in New York and New Jersey. In one year alone (2017), our nation suffered more than $300 billion in damages due primarily to flooding. Regionally in 2012, Hurricane Sandy alone caused more than $70 billion of damages.[49] By the end of the next century, climate change is projected to cost both New York and New Jersey billions in flood damage, in addition to the approximately $100 billion loss in property values for each state.[50,51] These costs will be magnified with blackouts, train and road closures, fuel and food shortages, and increasing insurance premiums. Accrued through centuries of building in vulnerable areas and patchwork maintenance and infrastructure investments, these costs are being exacerbated by rising seas and climate change. In addition to re-thinking the way we design, manage, and negotiate our relationship with land and water, investments in resilient infrastructure are needed, and can reap returns of 6:1 (e.g. in avoided losses, energy savings, and more) and prevent downgrades in bond ratings.[52,53] The recommended strategies are reflective of this perspective, focusing on:

- A dedicated, broad-based, ongoing source of funds.
- Significant federal funding to supplement needs at state and local levels, particularly for large-scale infrastructure investments.
- Incentives and leveraged private financing.

[49] Russ, Hilary. 2012. New York, New Jersey put $71 billion price tag on Sandy. Reuters

[50] New York: Rosenzweig, Cynthia et al., Eds. 2011. Responding to Climate Change in New York State. Technical Report, New York State Energy Research and Development Authority. And New Jersey: Williamson, S.; M. Ruth; K Ross; and D Irani. 2008. Economic Impacts of Climate Change on New Jersey. The Center for Integrative Environmental Research, University of Maryland.

[51] Union of Concerned Scientists. 2018. 2.5 Million Homes, Businesses Totaling $1 Trillion Threatened by High Tide Flooding. Study Finds Coastal Municipalities May Lose Huge Sums in Property Tax Revenue https://www.ucsusa.org/about/news/25-million-homes-threatened-high-tide-flooding

[52] National Institute of Building Sciences. 2018. Natural Hazard Mitigation Saves. https://cdn.ymaws.com/www.nibs.org/resource/resmgr/mmc/NIBS_MSv2-2018_Interim-Repor.pdf

[53] Wertz, M; E Hoffman; L Jones; K Okuji. 2019. Local government - US: Cities' heightened focus on mitigating climate risk is credit positive. Moody's Investors Service, Sector In-Depth.

Goal: Establish an ongoing source of funds

Resilience investments not only result in cost-savings, but can be used to pursue multiple co-benefits, from reducing personal risk to improving infrastructure operation and efficiency, cleaning air and water, and improving habitat and ecological health. A state resilience fund and dedicated funds within municipal budgets are needed to support planning and capital implementation of a range of projects that address the exposed developed areas already in the floodplain. Projects range from integrated flood protection to buyouts, and when paired with the codification of resilient design (see ***Managed*** section), these investments will result in savings over time.

Action: Support implementation through the establishment of climate resilience funds

The planning, management, and implementation of flood risk reduction is a critical function for which there is no current ongoing source of funding. The development of a climate resilience fund in each state would provide a critical resource to support municipalities in adaptation planning, investments, and programs. These funds would:

- Reduce our risk and result in government and taxpayer cost savings.
- Create more than 100,000 jobs.[54]
- Support local vulnerability assessment, community engagement, and planning.
- Support a range of capital project development, from green infrastructure to grey infrastructure, and a program to acquire and restore property in harm's way.
- Prioritize investments in frontline communities, those most physically and socially vulnerable to the impacts of climate change.
- Prioritize natural and nature-based approaches that result in co-benefits.
- Support municipalities in the development of local financing mechanisms.

State-level funds and distribution that is proportionate to where damages have been experienced or where the climate impacts greatest are critical to ensuring an equitable and comprehensive approach. Relying on primarily municipal funding sources for adaptation and resilience tends to perpetuate a cycle in which 1) low-income communities have fewer resources to use for adapting and 2) municipal reliance on property taxes in the floodplain limits the potential political will to restrict development in the floodplain. Investments should be justly distributed by learning from tools that incorporate existing pollution exposure and burden, such as California's CalEnviroScreen and those that focus on social vulnerability to natural hazards, such as the social vulnerability indices developed by the Centers for Disease Control and Prevention and the Hazards and Vulnerability Research Institute at the University of South Carolina. Such a fund could be capitalized via:

- **A small surcharge on property and casualty insurance:** A 2-3% surcharge could result in between $17 billion and $26 billion raised in New York and between $8 billion and $12 billion raised in New Jersey over 10 years.[55] This surcharge is progressive since insurance is based

[54] Rebuild by Design.

[55] This method has been explored, by J Keenan. 2017. Regional Resilience Trust Funds: An Exploratory Analysis for the New York Metropolitan Region. Environment Systems and Decisions. doi: 10.1007/s10669-017-9656-3 (the "Keenan Study") and further estimated through indicative analysis conducted by an underwriter of municipal debt, using National Association of Insurance Commissioners data that includes automobile premiums (among other forms of insurance that were excluded in the Keenan Study). These numbers represent net revenue through a two and three percent surcharge combined with an annual bond issue. In both New York and New Jersey, insurance surcharges are in place whose legislative intent is to protect consumers in the event of an insolvency. These include: Life Insurance Guaranty Fund (NY INS § 7501, et seq.) and Property and Casualty Security Funds (NY INS § 7601, et seq.). New Jersey has a similar fund known as the Surplus Lines Guaranty Fund, but the fund has not utilized its statutory authority to impose a surcharge since 1993 (NJ Rev Stat § 17:22-6.73).

on the value of the insured's item, leading those with more property to a higher percentage. Additionally, the smallest policies could be excluded.

- **Capital budgets:** funds could be reallocated from a percentage of existing state capital dollars, and/or via the establishment of a line item in future state budgets tied to a state-level resilience fund. Since much of this work could be completed through state agencies, reallocating a percentage of existing capital dollars would not necessarily result in cuts to agencies, but could result in cuts to specific projects. However, this would also incentivize state agencies to rethink infrastructure priorities that are not planned to address future flood risks. Given the current deficit in adaptive capacity, this strategy is likely effective only in the short term without additional sources of revenue.

The funding should be managed through a dedicated fund and structured to ensure that the money is protected from other competing future needs. Investments in planning and project development help better position municipalities to seek support from federal, state, and other sources of funding and financing. There are multiple mechanisms for financing resilience investments at lower borrowing rates that could be employed once funding sources are established. Examples include Clean Water State Revolving funds used to finance water infrastructure at low/no additional cost and infrastructure banks.

Legislative or programmatic paths:

Federal

- Establish a resilience revolving fund through act of legislation, such as H7037, the State Flood Mitigation Revolving Fund Act of 2019.
- Support minimum annual allocations to the FEMA Building Resilient Infrastructure and Communities (BRIC) Program, with 1) provisions to ensure that funds are flexible and prioritize public infrastructure, low income communities, and co-benefits; and 2) higher caps for urban projects.

State of New Jersey:

- Integrate requirements for climate-resilient design into state infrastructure loan requirements provided by the New Jersey Infrastructure Bank.
- Establish a Climate Resilience Fund with an ongoing source of funding.

State (New York):

- Pass the Bond Act of 2020 with provisions that prioritize transparency and frontline communities as a down payment on resilience.
- Establish a Climate Resilience Fund with an ongoing source of funding.[56]

Municipal: For larger municipalities, through act of legislation, mayoral order or ballot measure:

- Establish an annual budget item supporting resilience investments and programs.
- Develop new financing mechanisms to leverage private sector investment.

CASE STUDY: ESTABLISHING ONGOING SOURCES OF FUNDS

There are models around the country for establishing sources of funding for flood risk reduction and climate resilience. One precedent is the Pontchartrain levee district in Louisiana, which was established in 1895 to be responsible for 115 miles of levee on the east side of the Mississippi River, and is funded through an ad -valorem tax, interest, and royalties. While there are programs in New York and New Jersey to fund environmental and clean energy initiatives, there are no ongoing/dedicated sources of funds specifically for flood resilience. The State of New Jersey's Clean Energy Program provides financial incentives, programs, and services for New Jersey residents, business owners and

[56] The organization Rebuild by Design has explored and proposed such a fund and associated management structure for New York State, highlighting the broad need.

local governments to save energy, money and the environment, and is supported through a statewide societal benefits charge. The New York State Energy Resources Development Authority is funded by energy ratepayers through a systems benefit charge and proceeds from auctions through the Regional Greenhouse Gas Initiative. The Environmental Protection Fund in New York supports capital projects that protect the environment and enhance communities, and is capitalized via a dedicated portion of real estate transfer taxes.

Goal: Invest in social resilience

Key components determining social resilience are the hazards and stressors communities and individuals are exposed to, and the adaptive capacity with which they have to respond. Socially vulnerable communities (low-income communities and communities of color, socially isolated, and immigrant communities) are already exposed to a high level of stressors, upon which climate change is layered, adding both long-term and acute risks.[57] Strengthening the resilience of both individuals and communities is key to achieving this goal.

Action: Establish long-term funding for community organizations and public social infrastructure to support individual and collective action in frontline communities

When it comes to planning for the future, educational institutions, grassroots organizations, and active community members are the best conduit for sharing information. They know best what the needs and solutions are, are embedded and trusted within communities, and are often able to mobilize more nimbly than public agencies and target assistance following a disaster. As highlighted in New York City Environmental Justice Alliance's *Midway to 2030: Building Resiliency and Equity for a Just Transition*, long-term funding for community-led preparedness not only increases disaster preparedness, but also supports social and economic resilience. For example, in Hunts Point, Bronx, The Point CDC developed community WiFi infrastructure to support communication during extreme weather emergencies as part of *Resilient Networks for RISE : NYC*, an initiative built in partnership with New York City's Economic Development Corporation.[58] As part of this initiative, local residents were trained as Digital Stewards to design, organize, and build the networks and serve as the primary points of contact for participating businesses. Similarly, in Red Hook, Brooklyn, a team of mostly young adults led the development of a free community WiFi network powered by solar energy. Research has demonstrated that communities fare better during extreme climate events when they have robust social networks within their neighborhoods and services that support individual and community action. This reinforces the need for public funding to support community organizations in both advanced emergency planning and response.[59]

A multitude of volunteer and community organizations active in disaster preparedness and relief, and community-based planning already exist within the region. Additionally, many organizations deeply embedded within communities may perform these functions, though they may not be formally part of their mission. And yet, with the exception of the more formalized and

[57] USGCRP, 2018: Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018

[58] NYC Environmental Justice Alliance. 2018. Midway to 2030: Building Resiliency and Equity for a Just Transition. https://bit.ly/2O0vOVO

[59] New Jersey Climate Adaptation Alliance (NJCAA). 2014. Stakeholder Engagement Report: Environmental Justice. Climate Change Preparedness in New Jersey. Authored by Nicky Sheats, Esq., Ph.D., Thomas Edison State College, Trenton, NJ.

government-affiliated Community Emergency Response Teams (CERT), many groups do not receive ongoing funding to support their work. Increased support funding for local community organizations and community facilities is needed for:

- **Community-based resilience:** facilitate community-based education and decision-making related to planning and capital/project design and development in the neighborhood. Support the capacity-building and leadership of organizations led by most impacted (frontline) communities and communities of color. Invest in community assets that promote social cohesion (e.g. libraries, public parks, and gathering spaces).
- **Preparing for and responding to disasters:** strengthen formal and informal social networks, particularly those involved in volunteer disaster preparedness and response
- **Supporting, risk awareness, and individual action:** provide counseling, technical and financial assistance, and programmatic counseling support for low- to moderate-income owners and renters (e.g., insurance coverage, retrofits, relocation).

The support of grassroots organizations in areas with high social vulnerability and high hazard exposure is most critical to ensure not only preparedness for and direct response to disasters, but other associated and indirect cascading risks facing socially-vulnerable communities. For example, in 2020, investments in financial services and mortgage assistance, health, utilities, housing, as well as storm preparedness all became critically important simultaneously during the Covid-19 crisis. Funding for community organizations can also support planning and decision-making processes by increasing staff capacity and resources to make planning processes more accessible for residents (e.g., language, meeting times, child care, food, compensation for participants' time, etc.).

CASE STUDY: RISE, ROCKAWAY

In Rockaway, Queens, New York, the RISE Center serves as a community hub for artists and scientists to connect with local residents and visitors to the Rockaways through programming and public art exhibitions. The Center was established following the impacts of Hurricane Sandy, and serves as both a learning and social gathering space to bring people together to promote resilience, ranging from projects to build the resilience of natural resources through dune restoration to developing local fresh food and health-centered programs.

CASE STUDY: CENTER FOR NYC NEIGHBORHOODS (NEW YORK, NY)

The Center for NYC Neighborhoods works to preserve and protect affordable homeownership in New York City, viewing homeownership through two fundamental lenses: racial equity and climate change. Hurricane Sandy informed the Center's mission by revealing New York City's vulnerability to climate change, particularly in middle- and working-class neighborhoods struggling to recover from the 2008 foreclosure crisis. This led the Center to consider the dual threats of rising sea levels and flood insurance costs to financial and physical resilience. Today, recovery and resilience programs serve New York City's homeowners at highest risk from climate change by combining financial and mortgage counseling with a first-of-its-kind resilience counseling program (**FloodHelp NY**). Counseling strengthens homeowners' understanding of the complexities of viable adaptive strategies, flood insurance, and federally-funded programs, leading to better outcomes. A City University of New York study found that the Center's Sandy recovery services were highly effective in keeping homeowners from dropping out of recovery services: counseling was provided to 4,000 homeowners after Sandy and resolved 6,000 homeowner issues.[60] The Center's Home Resiliency Audit, empowered approximately 700 homeowners to take informed actions to understand their flood insurance rating and increase their resilience to flooding.

[60] Periera et al, Patterns of Attrition and Retention in the Build it Back Program, 2019. https://www1.nyc.gov/assets/housingrecovery/downloads/pdf/2019/patterns_of_attrition_and_retention_in_the_build_it_back_program_02_2019_report.pdf

CASE STUDY, NJ VOLUNTEER ORGANIZATIONS ACTIVE IN DISASTER

Volunteer and Community Organizations Active in Disaster play a critical role in community preparedness and response. New Jersey Voluntary Organizations Active in Disaster (NJVOAD) is an award-winning program originally formed during the mid-1980s and fully constituted in its current form after Hurricane Andrew struck in 1992. The NJ VOAD has prepared for and responded to many disasters since, from the tragic events of September 11, 2001 to Hurricane Sandy. NJVOAD has done this through providing training to counties and localities to develop local or regional Voluntary/Community Organizations Active in Disaster (VOADs/COADs). As a result of these efforts, VOADs/COADs today serve all 21 counties of the state. NJVOAD also provides coordination and communication that helps not only in preparation and immediate response to disasters (including the Covid-19 crisis), but also in the recovery. The experience of this community and volunteer group is codified in the New Jersey Long-Term Recovery Guide, HELPNJNOW.ORG and a New Jersey VOAD/COAD Manual led by the organization.

Philanthropic paths: provide general operating support for grassroots organizations offering critical resiliency functions; encourage grantees to incorporate climate resilience into educational and outreach programs.

Legislative or programmatic paths:

Federal

- FEMA: maintain and strengthen the Community Services and Coordinating Technical Partnership programs.
- FEMA hazard mitigation programs, BRIC, and HUD: explore and pursue mechanisms for pass-through grants from recipients (state and city) to local community organizations involved in adaptation, resilience, and response.

State: Dedicate ongoing budget support toward organizations that provide disaster preparedness and expand their coverage of climate resilience services through a Climate Resilience Fund.

Municipal:

- Establish ongoing budgetary support for social resilience.
- Through the budget process or act of legislation, increase funding provided to local providers of floodplain outreach and education services, and work to establish or expand local program provision where it does not exist.
- Increase representation and leadership of frontline communities in climate decision-making (e.g. Advisory Councils).

Goal: Use a holistic approach to funding

When government entities study feasibility of infrastructure projects, or debate the merits of various grant proposals or alternative projects, they often use cost-benefit analyses, grant review criteria, and other methods to support decision-making. These can have a broad effect on what kinds of projects and organizations are supported. When these structures are developed in a way that prioritizes multi-beneficial approaches, and are based on a more inclusive and equitable definition of need, governments bend toward climate justice.[61] Adaptation and resilience investments are opportunities to increase environmental and neighborhood quality. For example, a seawall has few co-benefits, whereas flood protection integrated into an urban park or planted berm provides benefits for human health and wellbeing, economic vitality, property values, habitat and wildlife connectivity, public access to the water, carbon mitigation, reduced urban heat, and water management.

Action: Develop and fund a regional plan for integrated flood risk management that is supported by communities

In addition to other mission priorities, the United States Army Corps of Engineers (USACE) conducts studies to inform flood control projects across the nation. In the New York and New Jersey region, the **New York-New Jersey Harbor and Tributaries Study (NYNJHATS)** has been evaluating six alternatives for addressing storm surge in the New York-New Jersey harbor region. While there were significant omissions in the study scope, federal funding through the Water Resources Development Act is one of the few large scale funding avenues for projects, and a study of the region's future risks and what can be done is critically needed. The project was halted in February 2020. Federal, state, and local leaders need to work to restore funding and ensure USACE has authorization to proceed with and expand on what has been completed to date, and to execute a study and plan that meets the requests called for by many advocates:

- **Address vulnerability and risk to tidal flooding from sea level rise and riverine flooding as well as storm surge as the primary purpose of the study**, using Rutgers and the New York City Panel on Climate Change's moderate or high projections.
- **Empower community decision-making through a robust and funded engagement process led by local and state partners.** As part of this process, community members and local elected officials should be part of the decision-making, in which the lenses of population density and infrastructure, cultural and environmental resources, and social vulnerability are disaggregated and discussed to better determine community values. With effects potentially lasting for generations, communities should be informed and asked "what is the future that we want?" This kind of engagement can help to inform the relative importance of the stressors facing these communities as well as specific vulnerabilities and the extent to which the alternatives address them. Federal funding should be passed through to state, local, and grassroots partners to ensure effective empowerment in decision-making.
- **Include strong social vulnerability metrics to ensure** an understanding of potential displacement and existing inequities, and the impact of various measures (positive or negative) on these existing vulnerabilities.
- **Thoroughly evaluate the role of non-structural measures.**
- **Thoroughly evaluate the ecosystem impacts associated with different options.**

[61] See CalEnviroScreen as a potential model or, to analyze mitigation and adaptation co-benefits, see C40 Cities' Adaptation and Mitigation Interaction Assessment tool

- **Account for co-benefits provided by natural and nature-based features and ability to reflect community value/priorities in cost-benefit analyses.**
- **Build in flexibility, to allow for limited modifications over time and ability to seek matching funds over a longer time period.**[62] Include near-, mid-, and long-term options. Further, certain aspects of design and implementation are best executed by state, local, and community, rather than federal entities. The ultimate authorization should include a specific plan for how projects will be managed and maintained over time, including leadership roles and authorities at the local level, including flexibility and resources to support sound grassroots engagement. Given the uncertainty in planning horizons and the need to adapt over time, the Corps should also seek an approach to authorization that provides flexibility over different time scales and scenarios.

Legislative or programmatic paths:

Federal: through the Water Resources Development Act or separate legislation, Congress should:

- Amend and fund the NYNJHATS to meet the above and expand funding for public engagement (ideally passed through to the local governments).
- Direct the USACE to draft an implementation plan to address and consider the 2013 updated Principles and Guidelines for Water and Related Land Resources Implementation Studies in the plan formulation, and provide the USACE with any funding needed to implement the principles.
- Direct the Army Corps to adopt fundamental changes to processes identified in the 2019 Resources for the Future report, Environmental Projects in Urban Areas: Analysis to Support Project Planning and Budgeting for the US Army Corps of Engineers.

States of New York and New Jersey: through act of legislation and/or bi-state compact, State and City partners should:

- Work together with the USACE to execute a study and plan, thoroughly evaluate and ensure integration of non-structural policy and programmatic measures (e.g. zoning, land use, retrofits, buyout programs).
- **Dedicate resources to public engagement** to empower the public to be part of the decision-making process. Approximately ten public meetings with a total of a few hundred participants (fewer than 30 in New Jersey) were held in a few locations for a region of more than 16 million thus far as part of NYNJHATS. As there are likely limitations on the ability to quickly mobilize federal resources, state and city partners must play an important role to better inform the public, increase awareness, gauge public values, and inform the decision-making process. For comparison, the design competition Rebuild by Design included the creation of Citizen Advisory Committees who host public meetings, identify community values, collect feedback, and bring local knowledge to the decision-making table. Local knowledge is critical to determining equitable and sound resilience solutions that may not be captured without robust engagement.

[62] Boyd, J and L Shabman. 2019. Environmental Projects in Urban Areas: Analysis to Support Project Planning and Budgeting for the US Army Corps of Engineers. Resources for the Future.

Action: Reform funding sources to better prioritize long-term, multi-beneficial approaches and facilitate matching between funding sources

Federal criteria for grant selection use a range of selection criteria and cost-benefit analyses to inform decision-making, and do not always employ a holistic lens. Further, inconsistency between agencies in methodology leads to challenges in implementation, especially when some methods are far less suitable for urban areas. Prior to, and especially following a disaster, these variations can make it difficult to piece together multiple sources of funding, or to stretch a project over multiple phases.[63,64] Further, disaster mitigation grants, particularly those received directly after a disaster, are not fully geared toward long-term benefits, multi-beneficial approaches, and equity. Funding for investments in resilience projects should be viewed through an environmental justice lens, building off tools like California's CalEnviroScreen or the US Environmental Protection Agency's EJSCREEN to ensure prioritization of multi-beneficial and equitable approaches.

Legislative or programmatic paths:

Federal: Programmatically implement the reforms highlighted in Pirani and Tolkoff (2014),70 particularly:

- Develop shared investment criteria and consistency across standards and funding sources (multiple agencies).
- Incorporate metrics that value and prioritize multi-beneficial approaches and equity in decision-making criteria and transparent cost-benefit analyses.
- Reform FEMA assistance programs so that:
  - Additional hazard reduction and resilience measures are not only allowable cost additions, but preferred or required.
  - Hazard mitigation assistance is permitted to go directly towards municipalities meeting certain requirements (without first having to go through states) and cap for project size is increased for large cities.
  - The speed of supplemental funding is increased following a disaster.

State, county and local: programmatically or through act of legislation, develop and codify multi-beneficial criteria for all resilient infrastructure plans and investments

[63] Pirani, R and L Tolkoff. 2014. Lessons from Sandy; Federal Policies to Build Climate-Resilient Coastal Regions. Lincoln Institute of Land Use Policy and Regional Plan Association.

[64] FEMA, for example, requires a complete project to have only one phase, and permit applicants to consider environmental benefits only when the benefit-cost ratio reaches .75, whereas the Department of Interior sets no such threshold - National Fish and Wildlife Foundation. 2013. "2013 Hurricane Sandy Coastal Resiliency Competitive Grants Program RFP." http://www.nfwf.org/hurricanesandy/Pages/2013rfp.aspx

3. TRANSPARENT

RESIDENTS ARE INFORMED BY SCIENCE AND CLEAR MESSAGING

Photo: Community Flood Watch Project (NYSG, SRIJB)

3. TRANSPARENT

Sandy-affected and frontline communities have first-hand knowledge about the risks they have already and will face due to their lived experience. These risks include, but are not limited to, climate hazards. Many New Yorkers and New Jerseyans who did not experience Sandy or who live outside of the floodplain, however, have a general sense that there is an increased risk due to climate change and sea level rise, but understanding the complexities of where, how much, and what can be done about it remains a challenge. The following actions are needed to build the base of public and stakeholder awareness of risk and options for addressing it, so that communities are well-informed, engaged, and empowered in shaping the future of our region for generations to come.

Goal: Standardize definitions of risk

Emergency management, green infrastructure investments, planning, and large-scale capital projects are often managed separately by different agencies at different levels of government. Varied strategies and planning standards are employed to address the acute hazards and long-term impacts of sea level rise and climate change. Better decision-making and broad understanding of risk and the cost of inaction are facilitated by increasingly standardizing the way that hazards are defined. Consistency enables evaluation and prioritization of different risk mitigation strategies, and translation into standards for planning, regulation, and infrastructure design.

Action: develop consistent standards and projections across jurisdictions

in New York and New Jersey to inform planning and risk management by county, flood-shed, or other equivalent science-based planning and management boundaries. Near-term actions include:

- Formally adopt consistent climate projections and coordinated definitions of hazards and risk across jurisdictions.
- Formalize a regional forum for the coordination/development of agreement across jurisdictions.
- Employ citizen science to empower and inform from the ground up.

Legislative or programmatic paths:

Federal: enable the US Army Corps of Engineers to use regional climate (NPCC and Rutgers) projections.

State, New Jersey: formally take the above actions through Executive action or legislation, building off the work of Rutgers University and the State's Science Advisory Board. Work with neighboring states to establish consistency on hazard definitions and methods for addressing and managing risk.

State, New York: work with neighboring states to coordinate and establish consistency. New York has adopted sea level rise projections, through the Community Risk & Resiliency Act.

Goal: Unite climate resilience under consistent messaging

Communicating well and consistently about hazards and risk and the need to build resilience into how public investments and planning connect to those needs is critical. It is also critical that this communication is ongoing, to ensure not only preparation for potential shocks but to support long-term adaptation. Uniting the multiple efforts and public agencies under consistent branding or messaging can help unite public understanding and the means to address it.

Action: Develop and launch shared or consistent messaging; provide a clear "one-stop shop" for how resilience is being addressed

Branding of flood-resilience and adaptation efforts and websites and messaging have been developed in both states and in New York City (e.g. "Resilient NJ," "Flood Help NY," "New York Rising" "Blue Acres," "Climate-Smart Communities," "Know Your Zone," the New York City Hazard Mitigation Plan, and the New York State Hazard Mitigation Plan). From the user's perspective, however, this communication is fractured, and each of these initiatives, programs, or communication strategies perform slightly different functions at different time scales (project vs. ongoing). Additionally, if one does not live in a flood zone, these resources seem irrelevant, even though the potential disruption of utilities, transportation, and food networks will affect us all. A critical measure of successful awareness is whether or not the majority of residents in risky areas are able to quickly answer: 1) who is in charge of flood risk management; 2) what is my risk; and 3) what can I do/can be done? Building consistency will require collaboration across agencies and levels of government, but can build greater awareness and political will toward addressing climate change. The State of New Jersey has begun this process through developing a one-stop-shop website (Climate Change New Jersey) and committing to incorporating learning about climate change into school curricula statewide.

Legislative and programmatic paths:

Regional: build consistency across state lines around risk and climate communication.

State (New York):

- Establish a "one-stop shop" website for all relevant adaptation and resilience programs and projects, including clear messaging on the broader societal implications and links to resources and providers for community services
- Incorporate climate change and resilience into educational curricula.

Municipal/County:

- Consolidate county-level information related to adaptation, resilience, and hazard mitigation planning and resources in one place and establish consistency with state messaging. Partner with local messengers and artists and employ multiple media conduits to reach target audiences.

City of New York: Incorporate resiliency into building signage or letter grades, as is being done for energy efficiency through the implementation of Local Law 33 of 2017.

CASE STUDY: LA SAFE (LOUISIANA'S STRATEGIC ADAPTATION FOR FUTURE ENVIRONMENTS)

LA SAFE is a partnership between the State of Louisiana and the Foundation for Louisiana to address changing coastlines and increased flood risk, addressing community resilience holistically – integrating risk planning with planning for stormwater management, housing, transportation, economic development, education, recreation, and culture. The Regional Adaptation Strategy summarizes goals and action items developed through LA SAFE's planning effort for implementation across a larger geography over a 50-year time frame. This initiative is both a plan and a brand, developed through extensive community engagement to co-design resilience projects in six parishes in southeast Louisiana. Through developing a clear brand tied to a public communication, planning, and implementation strategy, LA SAFE has created a clear place to go for all things adaptation in the state.

Goal: Disclose Flood Risk

Nationally and locally, "right to know" policies supporting awareness of flood risk associated with properties in which they may have an interest (purchase, rental, lease, or investment) are weak or nonexistent. There is little to no national flood risk disclosure requirement (except upon entering into a federally-backed mortgage agreement), and nearly half the states do not have regulatory or statutory requirements for sellers to disclose a property's history of flood damages to a homebuyer. New Jersey and New York have no or very weak flood risk disclosure requirements, respectively, both receiving an "F" for flood risk disclosure from the Columbia University Sabin Center for Climate Change Law and the Natural Resources Defense Council.[65,66] Disclosure has been considered by Congress as part of the reform of the National Flood Insurance Program (NFIP), but is not certain to pass or be applicable to properties not covered by the NFIP. Further, sea level rise is unlikely to be incorporated. Any disclosure effort should also be paired with strong buyout/flood prone property acquisition programs to ensure that homeowners are not trapped with few options for relocation.

Action: Pass enforceable flood risk disclosure laws

modelled after existing successful disclosure laws, such as recently amended laws in the State of Texas, or the State of Mississippi's Property Conditions Disclosure Statement, as well as previous "right to know" campaigns and policies including lead paint disclosure, CarFax, and others. Such a law should be applicable to buyers, renters, lessees, and investors, to be communicated as early as possible in the process and before contract signing. Such a law should incorporate at least disclosure of (and allow localities to exceed) the following:

- Whether or not the property is within the FEMA designated flood hazard zones.
- Whether or not the property is located within a wetlands area.
- Whether any portion of the property will be located within an area of future regular tidal inundation or the 100-year floodplain as defined by federal, state, or municipality-produced or officially adopted flood risk maps.
- Prior physical damage caused by flood to a structure on the property.
- Prior insurance claim for a flood-related loss on the property, or notification regarding designation as a repetitive loss structure (including amount).
- Federal legal obligation to obtain and maintain flood insurance.

CASE STUDY: AMERICANS WANT FLOOD RISK DISCLOSURE AND INFRASTRUCTURE RESILIENCE

Three-quarters of Americans—74 percent—support a national requirement that home sellers inform potential buyers if a property has flooded repeatedly, and a condition that such properties be covered by flood insurance, according to a poll by The Pew Charitable Trusts. The support is strong across party lines, and from both residents of inland and coastal communities. The same poll also found that 77% of Americans say federally-funded infrastructure should be constructed to withstand the impacts of flooding.[67]

[65] Adler, D, M Burger, R Moore, J Scata. 2019. Changing the National Flood Insurance Program for a Changing Climate. Environmental Law Institute. Washington, DC. www.eli.org

[66] Natural Resources Defense Council and Columbia University. 2019. State Disclosure Laws Leave Homebuyers in the Dark About Flood Risks *https://www.nrdc.org/flood-disclosure-map*

[67] SSRS Research. 2019. Pew Charitable Trusts Flood Policy Survey. The Pew Charitable Trusts. https://bit.ly/35hyEft and SSRS Research. 2019. Pew Resilient Infrastructure Survey. The Pew Charitable Trusts. https://bit.ly/2OpHGB8

Legislative or programmatic paths:

Federal: pass a national right-to-know flood risk disclosure law, meeting the above standards[68]

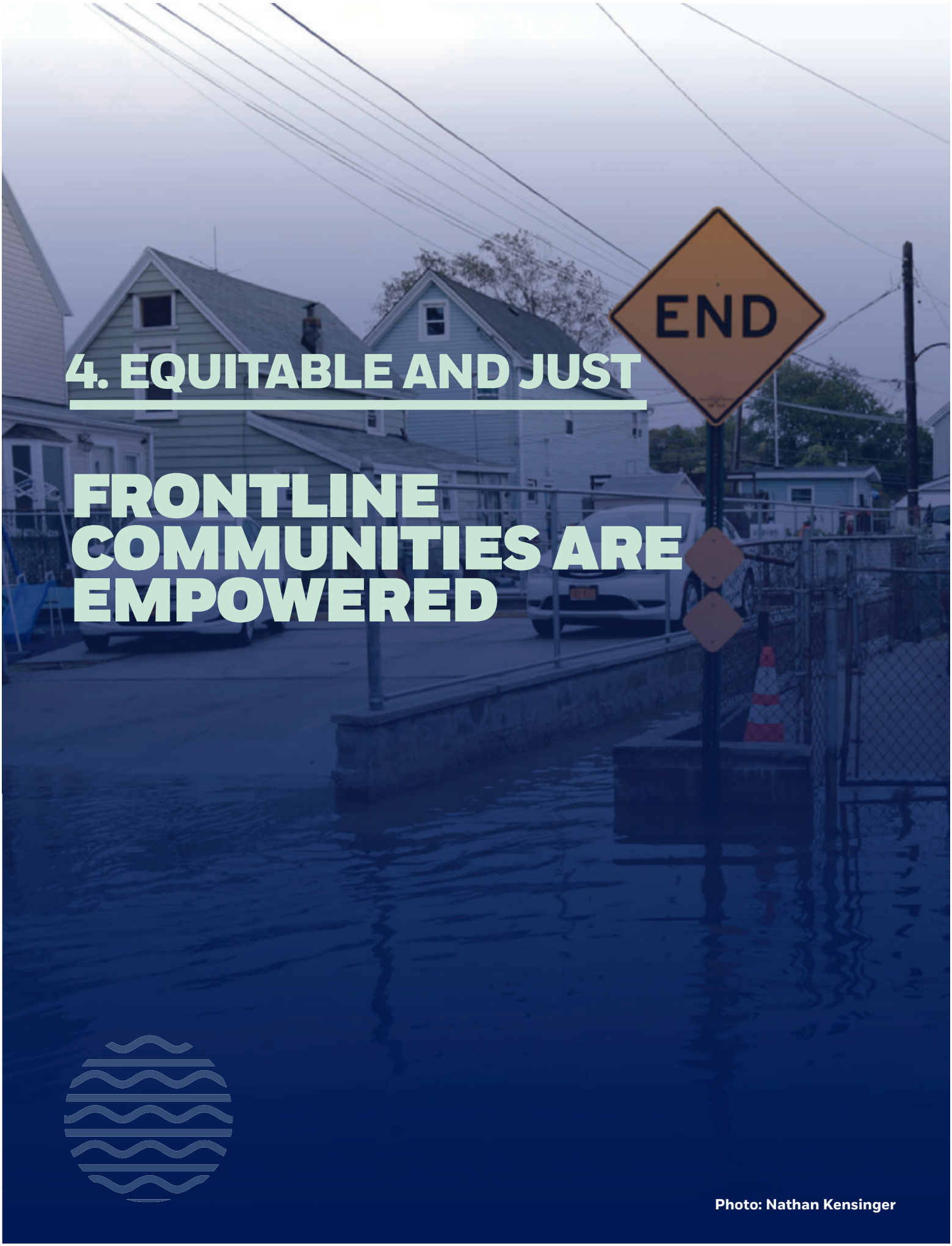
State (New Jersey):

- Through new legislation, pass a statewide flood risk disclosure law meeting the above standards.
- Provide guidance and information for landowners and realtors about the current risk of their property, tied to state flood maps.

State (New York):

- Through act of legislation, amend existing flood risk disclosure law to reflect the above priorities, remove the $500 "opt-out" disclosure, and face stricter penalties.
- Provide guidance and information for landowners and realtors about the current risk of their property, tied to state flood maps.

[68] As this path is unlikely in the near term, pursuing state strategies first may be more strategic



4. EQUITABLE AND JUST

FRONTLINE COMMUNITIES ARE EMPOWERED

Photo: Nathan Kensinger

4. EQUITABLE & JUST

Communities in the floodplains of New York and New Jersey already face multiple stressors, lowering their adaptive capacity. Out of the more than one million people living in flood-prone areas across the region, one third of these residents are elderly, low-income, disabled, or otherwise socially vulnerable.[69] In both states, poverty rates are higher in the floodplain than the national averages for all areas.[70] And, many individuals in low-income communities and communities of color are more vulnerable due to cumulative environmental, financial, and social impacts.[71,72] Climate change exacerbates existing stressors and injustices, and is a threat multiplier in frontline communities.[73,74] The burden of stressors and low adaptive capacity of low-income communities and communities of color demands a lens of equity and justice throughout the planning, awareness-building, and project development process.

An equitable and just approach is key to successful planning, and will assess and address:

- **Distributive equity:**[75] reducing disparities across social groups, neighborhoods, and communities in vulnerability, adaptive capacity, and the outcomes of adaptation actions.
- **Contextual/structural equity:** addressing existing vulnerabilities and uneven adaptive capacity due to different social, economic, and political factors and structural racism. Prioritizes investment in public infrastructure and communities facing the highest risk and with the greatest vulnerability.
- **Procedural and leadership equity:** providing a just and robust process for community participation in planning and decision-making that maximizes community values and cogenerative approaches. Seeking and positioning underrepresented groups and people of color from frontline communities to lead in decision-making processes. Supporting individual, community, and collective action.

[69] Regional Plan Association. 2017. Fourth Plan. http://library.rpa.org/pdf/RPA-4RP-Executive-Summary.pdf
[70] NYU Furman Center. 2017. Housing in the U.S. Floodplains. https://furmancenter.org/files/NYUFurmanCenter_HousingInTheFloodplain_May2017.pdf
[71] Bautista, E; E Hanhardt; J Camilo Osorio, and N Dwyer. 2014. New York City Environmental Justice Alliance Waterfront Justice Project. Local Environment: The International Journal of Justice and Sustainability.
[72] Broderick, B; M Honig; J Nader Saliani; E Bautista; J Gilmore; A Hernandez. 2018. New York City Environmental Justice Alliance and Science Action and Advocacy Network. https://scaan.net/waterfrontmap/
[73] WE ACT for Environmental Justice. https://www.weact.org/whatwedo/areasofwork/climate/
[74] NPR. March, 5, 2019. How Federal Disaster Money Favors the Rich. https://n.pr/2VJcEF5
[75] Adapted from/Informed by Hughes McDermott, M; S Mahanty; K Schreckenberg. 2013. Examining equity: A multidimensional framework for assessing equity in payments for ecosystem services. Environmental Science & Policy.

Goal: Support Collective Action Through a Just Process

The strategies used to adapt to climate change will impact communities (negatively or positively) for generations to come. Consequently, it is essential to embed education and equitable and just processes throughout the different stages of adaptation, in which communities are empowered to make decisions about what adaptation looks like in their neighborhoods. An equitable and just response to climate change requires that everyone can play a part in determining our region's resilient future.

Action: Integrate equitable and just best practices into resilience planning and capital project development.

Regional and district-scale resilience strategies should be developed through an inclusive, accessible, strategic, collaborative, and just process of meaningful engagement with communities, prioritizing those with the highest vulnerabilities and lowest adaptive capacities. A just process empowers residents with the necessary resources to take informed actions that reduce risk and increase resilience. Best practices should be informed by and implemented in partnership with community and environmental justice organizations with local expertise. Key features include:

- **Provide clear reflections and feedback on existing community and local plans and assessments of need/s** developed by or in strong partnership with community organizations when developing adaptation plans or projects.
- **Invite and fund community organizations to co-lead the review and development of plans or projects** through facilitating community input and decision-making throughout the process (see ***"Funded, Invest in social resilience***"), using participatory action research methods (working together to understand the problem and change it for the better through an iterative process).
- **Use best practices for building community power** as described in the National Association of Climate Resilience Planners ***Community-Driven Climate Resilience Planning Framework***.[76] Ensure that especially frontline communities and communities of color have a voice at the table; acknowledge historical injustices; address power dynamics that lead to some voices being heard more than others and establish a clear structure that shifts these dynamics (e.g. ensure frontline community representation in decision-making structures); make meetings more accessible to all (addressing language, child care, timing and other barriers); seek community input early and often; joining meetings already happening to reduce planning fatigue; review and respond to unmet commitments; provide compensation to local leaders for their time.
- **Provide a platform for community decision-making.** Facilitate community leadership in establishing a robust two-way iterative feedback process that builds capacity, trust, and collaboration, and centers on community decision-making.

[76] National Association of Climate Resilience Planners. 2017. Community-Driven Climate Resilience Planning: a Framework, Version 2.0. http://www.nacrp.org/

CASE STUDY: WE ACT NORTHERN MANHATTAN CLIMATE ACTION PLAN (MANHATTAN, NYC)

In 2015, WE ACT for Environmental Justice led seven public workshops with hundreds of community members and dozens of meetings with partners and stakeholders to develop a plan to build resilience in the face of disproportionate impacts of climate change on poor and working class communities. This extensive engagement resulted in a climate action plan that is designed to both mitigate environmental impacts and simultaneously address systemic inequality, acknowledging that poor and working class communities are hit hardest by environmental pollution and climate change. This approach resulted in many innovative solutions due to the unique expertise and perspective of community members, such as the concept of investing in "social hubs" as ways to build social resilience. And finally, the project led to the community's development of a Climate Justice Working Group, supported by WE ACT staff and continuing to engage community members on ways to address the climate crisis locally (through solar projects, assessing the functioning of cooling centers, and education), and through policy (e.g. New York State's Climate Leadership & Community Protection Act, and New York City's passage of the Climate Mobilization Act).

CASE STUDY: SOUTH IRONBOUND RESILIENCY ACTION PLAN (NEWARK, NJ)

The *South Ironbound Resiliency Action Plan* lays out resiliency goals for a portion of the Ironbound neighborhood in the East Ward of Newark, New Jersey, an area with both high physical (impacts from stormwater, flooding, and urban heat) and social vulnerabilities to climate change. To produce this plan, the Ironbound Community Corporation (ICC) and volunteer planners from the Community Planning Assistance Program of the New Jersey Chapter of the American Planning Association worked together to get community input into priorities. ICC's experience as a community and environmental justice organization embedded within the community for many years positioned the organization well to establish a just process, in which community members were asked about their priorities, ranging from public health to safety to flooding. This approach was then used to identify solutions that addressed multiple goals, ranging from a "Greening Vacant Lots" transition program to microgrid development. This process, built on a strong foundation of engagement, and establishing a community decision-making structure (Community Advisory Board), is now a tool that positions community members to advocate for their funding priorities and longer term climate mitigation and adaptation goals to be met in planning and capital project implementation.[77]

Legislative or programmatic paths:

All levels of government: through legislative action, require the establishment of a community advisory committee and just process standards for major public capital resilience projects, following the principles of the National Association of Climate Resilience Planners' Community-Driven Climate Resilience Planning framework.[78]

Federal:

- Programmatically through the US Environmental Protection Agency, better define the National Environmental Policy Act (NEPA) Environmental Justice guidance to ensure a more rigorous examination of environmental and displacement impacts on low-moderate income communities and communities of color.

States (both New Jersey and New York):

- Reform permitting to ensure that Environmental Impact Statements include race and ethnicity in analysis of potential impacts.
- Through act of legislation, identify communities of highest vulnerability (to inform funding prioritization, communication, and other assistance), advised by environmental justice

[77] Ironbound Community Corporation and American Planning Association New Jersey Chapter. 2015. South Ironbound Resiliency Action Plan.

[78] National Association of Climate Resilience Planners. 2017. Community-Driven Climate Resilience Planning: a Framework, Version 2.0. http://www.nacrp.org/

advisory councils, and integrate potential impacts to frontline communities into agency practice.
- Where needed, support counties or other district-scale institutions in the development and implementation of these strategies.

State of New York:
- Reform the State Environmental Quality Review guidance to ensure that environmental impact statements include race and ethnicity in analysis of potential impacts as well as potential displacement of residents.

Goal: Support individual and collective choice to transition to safer housing

Much of the development along our coastline and river edges sits atop what was once part of a connected system of wetlands that buffered the impacts of storms. Buying out flood-prone property and restoring floodplains is the only strategy that permanently eliminates the risk of flood damage. As such, relocation to areas of low or no flood risk is an important long-term adaptation strategy, not just a short-term recovery tool for homes ravaged by disasters.

While multiple government programs conduct land acquisition and preservation programs, only a few focus exclusively on acquisitions in the floodplain, with the New Jersey Department of Environmental Protection's Blue Acres program being the most established and resourced among them.[79] In both states, federal funding for the disaster recovery programs is fully allocated as the one-time authorization following Hurricane Sandy is being spent down. Further, these programs do not necessarily have it in their mission (or resource power) to assist residents in finding safe homes nearby, though some may attempt to perform these functions.

Federal systems for response and recovery currently exacerbate historical and existing racial, income, and accessibility inequities.[80] A study on the national scale found that counties with locally-administered FEMA buyouts have higher income, education, and population density compared to counties without buyouts.[81]

Action: Revise acquisition and buyout program structure to support community and environmental needs and establish long-term funding

The increasing threat of flooding requires a revision of voluntary buyout programs, which have historically not prioritized individuals with higher need and lower adaptive capacity, resulting in disaster aid favoring wealthier and whiter communities.[82,83] Furthermore, because buyout programs were not designed to manage relocation services, they've created perverse outcomes such as those found in the voluntary post-disaster buyouts in Staten Island, where 99% of the 323 households studied relocated to areas of higher social vulnerability, and 20% remained

[79] New Jersey received $300 million in supplemental funds to support an increase in Blue Acres land acquisitions following the storm.
[80] NPR. March, 5, 2019. How Federal Disaster Money Favors the Rich. https://n.pr/2VJcEF5
[81] Mach, K., Kraan, C., Hino, M., Siders, A. R., Johnston, E., Field, C. 2019. *Managed retreat through voluntary buyouts of flood-prone properties.*
[82] Mach, 2019.
[83] NPR. March, 5, 2019. How Federal Disaster Money Favors the Rich. https://n.pr/32i4Pc1

exposed to coastal flood hazards.[84] Buyout programs must transform into holistic relocation programs that help community members find safer areas to live, work, and operate, and that restore ecosystems. This includes redefining success to focus on relocation and restoration outcomes (affordable relocation in nearby safe/upland transit-connected areas, collective versus individual action, site restoration success, net increases in floodplain basin).
These programs can be improved to accomplish the following:

- **Permanently protect acquisition and buyout properties as conservation land to prohibit reselling or redevelopment** of the property, with provisions (where needed) to allow for very limited uses to restabilize communities following a disaster and for development of integrated flood protection infrastructure and utilities necessary for public enjoyment of the newly naturalized area.
- **Restore ecosystems and floodplains:** Connect acquisition programs with ecological restoration funding to maximize environmental and community benefits.[85,86]Integrating with ecological restoration programs has many advantages: absorption of floodwaters, habitat value, green space, and public waterfront access. To date, restoration has only occurred in the minority of buyout programs, despite its potential as an efficient way to reduce risk and reap multiple benefits.
- **Ensure safe and affordable relocation** by integrating owner and tenant relocation assistance services into acquisition programs so residents can identify and access good housing options. These services should serve tenants, multi-family buildings, and businesses, in addition to single-family homeowners. Explore land readjustment and other strategies to support collective action.[87]
- **Prioritize need and safety** by incorporating housing burden and total number of residents in cost benefit analyses (rather than property value alone).
- **Provide counseling and regular communication about options:** relocation means leaving home, and potentially schools, healthcare providers, social networks, and more. Programs should employ social workers and trauma experts to counsel residents and provide options (from funded retrofit programs to relocation), and to support individual and community decision-making that maximizes maintenance of social networks and minimizes pain. These resources should be prioritized for socially vulnerable populations, low-income communities, and communities of color that have faced continued disinvestment.
- **Establish voluntary advance-commitment programs** to enable owners to stay in place and guarantee a buy-out at pre-storm value based on a triggering event (storm damage or life rights, as is practiced by the Monmouth County Conservation Foundation), as well as other incentives. This strategy ***must be paired with prohibitions on future development in surrounding and equally risky areas.***

Long-term funding for programs at all levels of government is also needed. Following Sandy, the New York State (New York Rising) and New York City (Build it Back) programs purchased damaged properties on a voluntary basis, using federally-appropriated community disaster block grant disaster recovery funds (CDBG-DR). These funds are now nearly expended. While the voluntary shift in land use from private land use to public management is generally seen as a last resort for the most risky properties, going forward it is an important strategy that can prevent thousands of families from having to endure flooding, and save billions in taxpayer-backed insurance payouts. When paired with further mitigation and floodplain restoration efforts, a

[84] McGhee, D., Binder, S., Albright, E. First, Do No Harm: *Evaluating the Vulnerability Reduction of Post-Disaster Home Buyout Programs*. 2019.
[85] Currently, some acquisition programs including HUD allow for redevelopment of properties.
[86] Nationally, a study found that of FEMA buyouts between 1990-2000 (10k properties), only 7.5% were ecologically restored, approximately 40% became vacant lots (parking or grass) and ~45% recreational fields. Zavar, E., & Hagelman III, R. R. (2016). Land use change on U.S. floodplain buyout sites, 1990-2000. Disaster Prevention and Management: An International Journal, 25(3), 360–374.
[87] Hong, Y-H, I Brain. 2012. Land Readjustment for Urban Development and Post-Disaster Reconstruction. Lincoln Institute for Land Use Policy. Land Lines: 24(1)

multitude of benefits can be realized, including the restoration of water-absorbing floodplains, expansion of coastal natural habitats, and creation of new public green space and public access to the water for nearby residents.

Legislative or programmatic paths:

All programs should be adequately resourced so that low-income individuals and families can remain affordably in nearby neighborhoods at low risk of flooding (and high quality of life factors such as transit connections, low crime rates, good schools, and others) if desired, and that the needs of low-income communities and communities of color are listened to and prioritized in decision-making and resource allocation.

Federal:

- **Increase resources via the establishment of a federally-funded state revolving loan and grant program** supporting the full range of resilience approaches (buyouts to berms) and a "discounts for buyouts" program.[88]
- **Change eligibility criteria and fundable activities** for existing federal buyout programs (Housing and Urban Development CDBG and FEMA) to address the goals above.[89]
- **Increase transparency in FEMA and HUD buyout program reporting** to enable better evaluation and policy learning over time, especially origin and relocation data.
- **Exempt primarily low-moderate income municipalities** from paying the non-federal match for buyout funding, and/or increasing administrative support for less wealthy or dense municipalities. Many municipalities face political and financial pressure to continue investing in the floodplain.[90,91]

New Jersey: via an act of legislation or through the state budget, expand the mission and resources of the Blue Acres program to be better-equipped to accomplish the priorities described above.

New York: through the state budget, a bond act, and/or establishing a Climate Resilience Fund, dedicate funding to the re-establishment of a floodplain buyout program, and expand the mission and resources to be better equipped to accomplish the priorities described above.

Municipality/County:

- **NJ:** expand the mission of NJ Open Space Trust Funds to better serve social and environmental goals. Work with the state to identify areas in need of services and work with neighborhood organizations to raise awareness about program availability.
- **NYC:** Through act of legislation or Mayoral act, expand missions to better serve social and environmental goals. Expand the resources available and cement existing buyout programs into a long-term, funded, and well-advertised program.

[88] Adler, D; M Burger; R Moore; J Scata. 2019. Changing the National Flood Insurance Program for a Changing Climate. Environmental Law Institute, Washington, DC http://www.eli.org.
[89] US Department of Housing and Urban Development. 2013. Program Design & Implementation Toolkit. https://bit.ly/2OfhPtZ
[90] Harvey, 2017.
[91] Mach, 2019.

Goal: Build the resilience of our public infrastructure and public and affordable housing

Sea level rise, increased and more extreme temperatures, increased stormwater, and coastal surge will overwhelm the infrastructure that is already struggling to function effectively due to decades of under-investment and delayed maintenance. As was shown at great cost following hurricane Sandy, from which our underground transportation systems are still recovering, major flood events are capable of disrupting and destroying foundational public systems and infrastructure throughout New York and New Jersey. Rising temperatures have increased the risks of residents without air-conditioning. These threatened systems are public resources utilized by all, but socially vulnerable communities are hit the hardest when they fail.

Action: Retrofit public housing developments at highest risk and build new safe and quality public and affordable housing on higher ground.

The current 500-year floodplain contains 14% of our region's public housing, including 46,099 units of public and subsidized housing in NYC and 6,701 in Northern New Jersey. NYC, which has the greatest amount of public and section eight housing in the nation, faces outsized risk: 80% of rental units in the current 100- and 500-year floodplain are affordable housing (either public, subsidized, or rent-stabilized housing), and 28% of those units belong to the New York City Housing Authority (NYCHA).[92] "A 1 in 500-year flood in 2050 would impact more than half of NYCHA's current apartment stock and ~50% of its total population.[93,94] Another climate hazard, extreme heat, results in hundreds of hospital visits annually.[95]

After years of insufficient investment, many housing authorities are struggling just to meet existing operational costs. Since 2011, NYCHA's (New York City Housing Authority) overall five-year capital needs have increased by over 70% to a staggering $40 billion, as repairs are deferred and its buildings slip deeper into disrepair. To be resilient, public housing must catch up on outstanding capital needs while integrating resilience upgrades into planned retrofits and/or general maintenance. For buildings with the highest exposure and vulnerability to hazards (flooding, heat), stand-alone resilience projects must be initiated to safeguard residents, including energy security and efficiency, flood protection, relocating critical infrastructure above the ground floor, electrification of heating systems, air conditioning, etc.

As existing affordable and public housing is upgraded, a significant amount of new affordable units is also needed in flood-safe areas. In New Jersey, growth in the urban northeast is particularly high, with Hudson County projected to grow by nearly 20% by 2032.[96] NYC's population is predicted to increase to nine million residents by 2030, requiring a net gain of 318,500 housing units – including 250,660 units for low and moderate-income residents.[97]

[92] Jessica Yager of the Furman Center, as quoted in Urban Omnibus 2014 article. (https://urbanomnibus.net/2014/10/the-storm-that-will-be-protecting-public-housing-in-the-new-100-year-floodplain/#_ednref2)
[93] Trigoboff, Sara. 2019. Public Housing Underwater. Cornell University. Note: the study also found that the risk of chronic inundation more than doubles between the 2060 and 2080 maps, rising from 5.5% of all NYCHA residents to 17.6%."
[94] Omnibus, 2014.
[95] New York City Housing Authority. 2019. Sheltering Seniors from Extreme Heat, A Study of NYCHA Senior Housing.
[96] State of New Jersey Department of Labor and Workforce Development. 2015. Population and Labor Force Projections for New Jersey: 2012 to 2032. Retrieved online 11/13/2019 https://www.state.nj.us/labor/lpa/content/njsdc/2015Projections%202032.pdf
[97] (NYC Department of City Planning, 2016) - as quoted in SagePub

While the shortage of affordable housing in the metropolitan region is already staggering,[98,99,100] sea level rise will only exacerbate this need. The combination of expected population growth,[101] internal climate migration from low-lying neighborhoods (and the related reduction in housing stock from flooded areas), means that more affordable housing must be built and focused on neighborhoods in upland areas.

Legislative or programmatic paths:

At all levels of government, implement mechanisms to increase affordable housing development (deep affordability) in areas of low risk/higher ground, incentivizing planning for housing across municipal jurisdictions.

Federal:

- HUD should fully fund baseline public housing capital needs.
- Pass the top policy goals of the Disaster Housing Recovery Coalition (comprising 800 local, state, and national organizations) to ensure that federal disaster recovery resources reach all impacted households, including those with the lowest incomes.
- Establish a federally-funded state revolving loan and grant program supporting a full range of resilience approaches including investments in housing resilience.[102]

State, New Jersey:

- Address key funding policy goals contained in the *Housing & Community Development Network of NJ (HCDNNJ) Key Policy Goals of 2019-2020*
- Support programs to assist in the development of Community Land Trusts.
- Create an affordable and public housing trust fund.

State, New York:

- Through act of legislation or budgeting, increase resources invested in existing public housing.
- Support programs to assist in the development of Community Land Trusts.

Municipal, NJ: implement mandated "Fair Share" housing requirements, encouraging density outside of the floodplain.

City of New York:

- Support programs to assist in the development of Community Land Trusts.
- Increase resources invested in existing public housing and cooling centers.[103],[104]

[98] Novogradac & Company LLP. 2014. Housing Market Study for Choice Neighborhoods Initiative Mott Haven Neighborhood of Bronx, NY. https://bit.ly/3506jtc In 2014, 253,300 households were on the waiting list for public housing, and 122,190 households were on the waiting list for a Section 8 Voucher in NYC.
[99] Econsult solutions. 2017. New Jersey Affordable Housing Need and Obligations. https://bit.ly/2OawdUn
[100] Atmonavage, Joseph. 2018. N.J. needs to build 155,000 affordable housing units. No one can agree on how or where. NJ Advance Media.https://bit.ly/2Qh1U19
[101] NYC Department of Planning. 2019. Geography of Jobs.https://on.nyc.gov/2NLaFyQ
[102] Adler, D; M Burger; R Moore; J Scata. 2019. Changing the National Flood Insurance Program for a Changing Climate. Environmental Law Institute, Washington, DC http://www.eli.org.
[103] WE ACT for Environmental Justice. 2019. 2019 Policy Agenda. https://bit.ly/35eSkzY
[104] New York City Housing Authority. 2019. Sheltering Seniors from Extreme Heat. https://on.nyc.gov/2tUiqLM

Action: Increase the reliability and safety of public infrastructure, building in resilience

Increasing populations have expanded the importance of our region's interconnectivity, while also increasing demands on public infrastructure within and across state lines.[105] Further, quality public infrastructure and functioning and affordable transportation networks are especially important for low-income communities who depend on this infrastructure every day to get to work. The American Society of Civil Engineers most recently gave New York and New Jersey grades of C- and D+, respectively, for the state of their infrastructure.[106] Our governments need to invest in our public infrastructure to not only meet existing needs, but also to ensure the resilience of these systems over time. These investments can also contribute to our local economy through supporting local, quality jobs. As described in "***Green, Invest in natural resilience***" extra investments in redundancy and resilience should also be integrated into the way projects are built.

Legislative or programmatic paths:

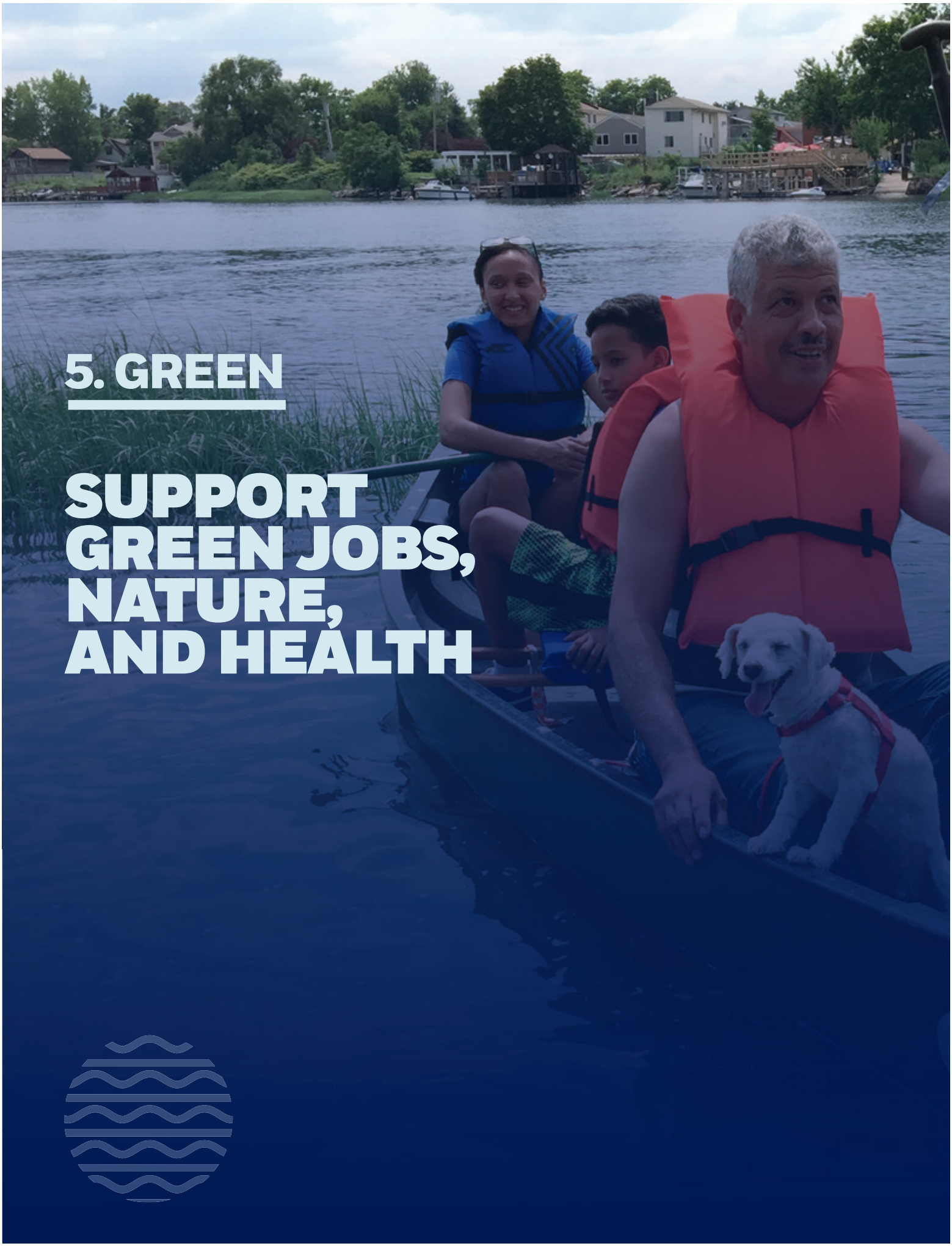
All levels of government: for government-funded major capital projects, building off America's Transportation Infrastructure Act of 2019, pass an act of legislation requiring resilience to be integrated into all major capital projects.

Federal:

- Through a major transportation infrastructure bill, fund investments in regional transportation priorities, both for repairs and needed additional capacity.
- Through Water Resources Development Act funding, federally-supported state revolving resilience loan and grant fund, or other means, increase federal funds for resilient infrastructure.

Both states: invest in regional transportation priorities, both for repairs and needed. additional capacity, building in resiliency to all capital projects and significant repairs.

[105] Geography of Jobs, NYC Planning Department Report. 2019.
[106] American Society of Civil Engineers. 2019. Infrastructure Report Card. https://www.infrastructurereportcard.org/state-by-state-infrastructure/.



5. GREEN

SUPPORT GREEN JOBS, NATURE, AND HEALTH

4. GREEN

Natural resources provide a multitude of benefits, including, but not limited to: habitat and biodiversity, human health, water quality, flood management, cooling/urban heat reduction, and more. Multi-beneficial approaches such as green infrastructure (e.g. green roofs, rain gardens, rainwater harvesting, and trees) should not only be prioritized, but proactively invested in to ensure the best possible long-term outcomes for our region. These investments can benefit community livability by improving water quality, improving air quality, reducing the urban heat island effect, reducing energy use, and creating green jobs.

Goal: Provide good green and blue jobs

For workers, climate change presents both challenges and opportunities, with the expectation of a net creation of jobs.[107] Through the work of the Climate Justice Alliance[108] and many other advocates, policy platforms have been developed for a just transition to a green economy. In New York and New Jersey, climate commitments will involve the development of new jobs as we invest in building-scale retrofits and mega-projects like offshore wind. Through investments in adaptation and resilience, there will be additional job growth opportunities in particularly the construction and retrofit, maintenance, and social services sectors.

Beyond the value of increased employment, new adaptation-related jobs performing green infrastructure construction and maintenance create additional intangible benefits including intellectual stimulation, increased sense of accomplishment, and positive environmental attitudes and behaviors, as found in a study of a green-jobs program in New York City.[109]

Action: Develop good local green job opportunities

As the job market transitions, workforce development programs (including incorporation into public education programs) need to be developed and expanded to ensure that well-paying local job opportunities are available to local workers, particularly from low-income communities and communities of color.[110] Additionally, as little infrastructure exists to manufacture and install new technologies like wind power, investments are needed in local port assembly, staging, and manufacturing infrastructure to ensure the capability to produce turbines and equipment locally and provide local jobs. And finally, there is a growing need for maintenance of flood mitigation investments.

Legislative or programmatic paths:

Both states:

- Support Jersey Renews and New York Renews' requests for investments in workforce development to address climate job growth areas.
- Commit to project labor agreements ensuring adherence to local hiring for resilience projects.
- Fast-track the expansion of our port and manufacturing infrastructure to accommodate offshore wind development and commit to project labor agreements for wind development.
- Invest in the resilience of our port to ensure the protection of our 400,000 jobs that rely on the Port of New York and New Jersey.

Municipal, New Jersey: increase investments in maintenance jobs as flood risk reduction measures are expanded.

City of New York: Develop workforce development programs and establish a new maintenance team to regularly maintain and manage flood mitigation measures.

[107] International Labour Organization. 2018. The Employment Impact of Climate Change Adaptation. https://bit.ly/2Ot6gzN
[108] Climate Justice Alliance: https://movementgeneration.org/our-work/movementbuilding-2/cjaourpower/
[109] Raymond, Nancy F., Svendsen, Erika., Campbell, Lindsay. 2013. From job training to green jobs: A case study of a young adult employment program centered on environmental restoration in New York City, USA. Urban Forestry & Greening. https://doi.org/10.1016/j.ufug.2013.04.003
[110] National Center for Sustainable Transportation. 2017. Climate Adaptation and Resiliency Planning: Agency Roles and Workforce Development Needs.

Goal: Invest in ecological restoration, protection, and resilience

Investing in green infrastructure provides multiple benefits that improve overall community resilience to multiple environmental stressors.

Action: Restore ecological resilience

In the New York-New Jersey region, much of our natural capital that formerly protected our shores, ecosystems, and human health and vitality has been lost. More than 85% of our wetlands have been lost, as well as much of our forest cover and stream connectivity. Investments in natural infrastructure will not only affect the ability of these ecosystems to adapt (adaptive capacity), but also the health and well-being of our human communities. For example, allowing marshes to migrate inland along with sea levels through preserving and restoring natural floodplains can help to also provide habitat, reduce heat, absorb intense flooding, and more.

Legislative or programmatic paths:

All levels of government:

- By 2050, meet the goals established by the Hudson-Raritan Estuary Comprehensive Restoration Plan.

Federal:

- Fund the restoration of the 22 priority sites identified in the Hudson-Raritan Estuary Comprehensive Restoration Plan.
- Significantly increase resources available for green infrastructure (e.g. through FEMA's Building Resilient Infrastructure and Communities program).

State, New Jersey:

- Advance NJ Meadowlands district resilience and wetlands restoration plans.

State, New York:

- Protect existing and expand funding provided by the Environmental Protection Fund and the Hudson River Estuary Program, particularly investments in low income communities and communities of color.[111]
- Establish a state-level Climate Resilience Fund (see ***Funded*** section).

City of New York

- Integrate plans to meet NYC Nature Goals targets and refer to the City's wetlands management framework for comprehensive resilience planning, capital project development, and maintenance. Protect expanded dedicated funding for public parks and natural areas.

Action: Integrate natural and nature-based approaches and preservation into policy, practice, and capital infrastructure development

As strategies are implemented to resist, accommodate, and retreat from rising seas, natural and nature-based approaches should be maximized to reap multiple benefits. Prioritization of these approaches can be built into public plans and capital projects development, and through

[111] See WE ACT for Environmental Justice's 2019 Policy Agenda, page 7 "Protect the Environmental Protection Fund" https://www.weact.org/wp-content/uploads/2019/04/2019-Policy-Agenda-042219abbrv.pdf

incentives.[112] Funding and maintenance need to be critically considered in all decisions. See also ***Managed, Codify resilience into regulation, practice, and incentives***. Given the logistical and cost challenges encountered with retrofits in the public right-of-way, motivating private property owners to install green infrastructure is critical to meeting water quality requirements, and achieving broader sustainability goals.

CASE STUDY: THE NEW SHORELINE: PROVIDING PATHWAYS FOR WETLANDS

Just like human communities, tidal wetlands are at significant risk from the impacts of climate change. While wetlands are by nature adaptive, sea levels are rising at a faster rate than they can adjust. To make matters more complicated, there is so much development around wetlands that many of them have no room to move. Their migration path is cut off by roads and buildings and other hard infrastructure. In a study of sea level rise and its effects on tidal wetlands in the tri-state region, the Regional Plan Association maps out the pathways (and current blockages to pathways) for wetlands migration. In the region, there are currently 72,000 acres of tidal wetlands, around half of which are at risk of drowning by 2100. Rethinking existing policy mechanisms will be critical for preserving tidal wetlands and the benefits they provide. The report identifies recommendations for conservation and expansion of these pathways through integration into federal and state coastal management policies, updating local planning and zoning to factor in pathways, and expanding buyout programs to include criteria that prioritize pathways and areas for wetland restoration.[113]

Legislative or programmatic paths:

All levels of government:

- Pass acts of legislation with specific, codified requirements for integration of climate resilient design and prioritization of green infrastructure approaches into all capital infrastructure planning and development (as was proposed through America's Transportation Infrastructure Act of 2019).
- Expand buffer areas to accommodate wetlands migration in master plans.

And also

State, New Jersey:

- Establish a state-level Climate Resilience Fund (see ***Funded*** section)
- Revise and expand the Blue Acres program to more seamlessly pair habitat and floodplain restoration with buyout programs (see also ***Equitable & Just***).

State, New York:

- Implement specific requirements for state agencies to integrate climate resilient design and prioritization of green infrastructure as described above.
- Remove barriers for the Green Roof Tax Abatement.

Municipal:

- Conserve vulnerable natural resources (e.g. wetlands pathways) through a resilient zoning overlay (see also ***Managed*** section).

[112] NYC Green Infrastructure Plan (DEP 2010), 139, available at http://www.nyc.gov/html/dep/pdf/green_infrastructure/NYCGreenInfrastructurePlan_LowRes.pdf. Note: more than 50% of the land area that New York City has targeted for green infrastructure is privately owned

[113] Calvin, E., R Freudenberg, S McCoy. 2018. The New Shoreline: Integrating Community and Ecological Resilience around Tidal Wetlands. Regional Plan Association. http://library.rpa.org/pdf/RPA-Wetland-Migration-Report.pdf

Goal: Address pollution sources and health risks to environmental justice communities

The effects of climate change exacerbate multiple existing pollution sources plaguing urban communities. In both New York and New Jersey, bad air quality, combined sewer overflows, toxic chemical and heavy metal exposure, urban heat, lack of green infrastructure, and other impacts disproportionately affect low-income communities and communities of color in urban areas.[114]

Action: Update policies to address changing pollution risks facing low-income communities and communities of color

As sea levels rise, the risk of exposure to pathogens and toxic chemicals is increased due to flooding, as has been demonstrated by the New York City Environmental Justice Alliance's Waterfront Justice Project and map.[115,116] The worsening effects of climate change threaten at least 60% of Superfund sites.[117] Through policy, the prioritization of multi-beneficial approaches in public infrastructure investments, transparent communication about multiple risks, and changes to practice, our governments can better address pollution sources and prioritize communities that are affected most:

Legislative or programmatic paths:

Federal

- Programmatically, through the USEPA Superfund Program, incorporate the recommendations of the US Government Accountability Office to address and prioritize investments in Superfund areas, extending relevant controls to hazardous bulk storage sites that address risks posed by climate change.
- Pass the Environmental Justice Act of 2019, S 2236 or equivalent.
- Finalize Superfund designation for the lower Hackensack River.

Both states:

- Overseen by environmental justice advisory councils, integrate potential impacts to frontline communities into agency practice.

Municipal, both states:

- Through vulnerability assessment and resilient zoning overlay, incorporate and place requirements on controls for hazardous storage sites within the 500-year floodplain. If control strategies involve elevation, require designs to meet 100-year base flood elevation plus a sea level rise adjustment.

City of New York:

- Through an act of legislation or programmatically, address the priorities of the NYC Environmental Justice Alliance's Climate Justice Agenda for supporting resilient industrial waterfronts.

[114] In New York City and Philadelphia, neighborhoods within a half-mile (0.8 km) of combined sewer overflow sites tend to have unusually high percentages of poor and non-white residents (Figures 1 and 2). - Breitzer, R. 2018.Institutional Roadblocks to Achieving Environmental Justice Through Public Participation: The Case of CSO Control in US Cities. Metropolotiques. https://www.metropolitiques.eu/spip.php?page=print&id_article=1185

[115] Bautista, E; E Hanhardt; J Camilo Osorio, and N Dwyer. 2014. New York City Environmental Justice Alliance Waterfront Justice Project. Local Environment: The International Journal of Justice and Sustainability.

[116] Broderick, B; M Honig; J Nader Saliani; E Bautista; J Gilmore; A Hernandez. 2018. New York City Environmental Justice Alliance and Science Action and Advocacy Network. https://scaan.net/waterfrontmap/

[117] United States Government Accountability Office. 2019. Superfund: EPA Should Take Additional Actions to Manage Risks from Climate Change. https://www.gao.gov/assets/710/702158.pdf

Action: Address combined sewer overflows and prioritize green infrastructure investments in communities that need them most

As temperatures rise, urban heat island effects and air quality will worsen. As rain storms increase in volume and frequency, so too will combined sewer overflows (CSO). According to the NYC Panel on Climate Change, our region can expect to see a 1 – 8% increase in precipitation by the 2020s, and 4 – 11% increase by the 2050s. Combined sewer overflow discharges are the largest ongoing source of pollution in New York and New Jersey waterways.[118],[119] Sewage and stormwater pollution reduces the quality of life for those who want to swim, fish, boat, and recreate safely, and also damages wetlands and natural systems that provide flood protection and wildlife

habitat. See New Jersey's Sewage Free Streets and Rivers Climate Ready CSO Solutions. Green infrastructure mechanisms for management provide multiple benefits to communities and ecosystems (reduction of urban heat and flooding, habitat), and should be prioritized to the maximum extent feasible (and include adequate maintenance funding), acknowledging that gray solutions are also part of the suite of solutions.

Legislative or programmatic paths:

Federal

- Play a stronger and more proactive role in coordinating efforts across state lines so that water quality standards and advisories are consistent.

Both states:

- Ensure that Long Term Control Plans, MS4 (municipal separate storm sewer system) water quality improvement programs, and other environmental plans are responsive to community input and needs.
- Require future precipitation trends to be accounted for in stormwater rules and infrastructure investments.

Municipal, both states:

- Maximize use of green infrastructure to address CSOs, prioritizing the needs of low-income communities and communities of color.[120,121]
- Require future precipitation trends to be accounted for in stormwater rules and infrastructure (see ***NYC Climate Resilient Design Guidelines***).

City of New York:

- Reform water rate structure for equity and green infrastructure investments by larger polluters, accompanied by a robust public engagement process.[122,123]
- Improve the City's water quality management plans, including neighborhood drainage conditions, to reduce local flooding
    - Ensure CSO Long Term Control Plans to ensure a more holistic and integrated approach to reducing the volume and frequency of events and address all pollution

[118] NRDC Catalyzing Green Infrastructure on Private Property, Recommendations for a Green, Equitable, and Sustainable New York City. page 7
[119] Letter from C. Strickland, NYC DEP, to J. DiMura, NYS DEC, dated Oct. 19, 2011, (presenting technical analysis for 2012 Consent Order), 6, available at http://www.dec.ny.gov/docs/water_pdf/csowp2011.pdf.
[120] NYC Environmental Justice Alliance, 2018
[121] Natural Resources Defense Council and NYU Stern. 2017. Catalyzing Green Infrastructure On Private Property: Recommendations for a Green, Equitable, and Sustainable New York City."
[122] SWIM Coalition. Stormwater Finance. https://www.swimmablenyc.org/stormwater-finance
[123] SWIM Coalition. Stormwater Finance. 2019. Public Engagement Recommendations for DEP Water Rate Study.

sources that make the waters unsafe to touch.[124]
  - Strengthen the MS4 program by devising additional, tailored pollution controls for each impaired waterway.
  - Find alternatives to chlorination.
- Aim for no net increase in CSO discharges in new development and redeveloped sites by prohibiting new impervious areas, encouraging green infrastructure, and funding long-term maintenance.

[124] SWIM Coalition. 2019. New Legislation Introduced Calling on the NYC Dept. of Environmental Protection to Rethink Its Flawed Sewer Overflow Plans.

Appendix A:

New Jersey Rules and Regulations and Climate Resilience

The following are a list of rules and regulations that should be revised to incorporate climate resilience.

New Jersey Department of Environmental Protection	7:1B	Waiver of Department Rules (Waiver Rule)
	7:7	Coastal Zone Management Rules (NJSA 12:5-3; NJSA 13:9-1; NJSA 13:9A-1)
	7:7A	Freshwater Wetlands Protection Act Rules (NJSA 13:9B)
	7:8	Stormwater Management
	7:13	Flood Hazard Area Control (NJSA 58:16A-50)
	7:14A	Pollutant Discharge Elimination System
	7:19	Water Supply Management Act Rules
	7:20	Dam Safety Standards
	7:38	Highlands (NJSA 13:20-1)
Pinelands Commission	CMP	Pinelands Protection Act (NJSA 13:18A)
New Jersey Department of Community Affairs	5:21	Residential Site Improvement Standards (Act)
	5:23	Uniform Construction Code (NJSA 52:27D-119)
New Jersey Sports and Exposition Authority	19:6	Meadowlands District Regulations
Department of State	5:85	State Planning Rules
Department of Transportation	27	Highways

Glossary

Adaptation	The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate harm and pursue beneficial opportunities. For frontline communities, this means addressing the sources of existing vulnerabilities as well as exposures, which may include financial risk, housing insecurity, cumulative health and pollution impacts, among other factors. In natural systems, human intervention may facilitate adjustment to expected climate and its effects.[1]
Adaptive capacity	The potential, capability, or ability of an entity, system, or infrastructure to possess the planned, necessary flexibility to adapt to climate change stimuli or their effects or impacts.
Disaster risk	The likelihood over a specified time period of severe alterations in the normal functioning of a community or a societ y due to hazardous physical events interacting with vulnerable social conditions, leading to widespread adverse human, material, economic, or environmental effects that require immediate emergency response to satisfy critical human needs and that may require external support for recovery.[2]
Frontline communities	Communities that are impacted "first and worst" by the consequences of climate change. They are predominantly communities of color and low-income communities, whose neighborhoods often lack basic infrastructure and who are increasingly vulnerable; native communities, whose resources have been exploited; and laborers, whose daily work or living environments are polluted or toxic.[3,23]
Hazard	The potential occurrence of a natural or human-induced physical event that may cause loss of life, injury, or other health impacts, as well as damage and loss of property, infrastructure, livelihoods, service provision, or environmental resources
LEED (Leadership in Energy and Environmental Design)	LEED (Leadership in Energy and Environmental Design) is the most widely used green building rating system in the world. Available for virtually all building types, LEED provides a framework for healthy, highly efficient, and cost-saving green buildings. LEED certification is a globally recognized symbol of sustainability achievement and leadership.[4]
PACE	A Property Assessed Clean Energy (PACE) loan is a type of financing that's available for energy-efficient upgrades or the installation of renewable energy sources for commercial, industrial, and private residential properties. Launched in 2010, the PACE Program, which is overseen by the U.S. Department of Energy (DOE), allows local and state governments, as well as inter-jurisdictional authorities authorized by state law, to provide funding for the cost of energy improvements on qualifying properties, repaid over time by the property owner.[5]

[1] IPCC, 2012: Glossary of terms. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press, Cambridge, UK, and New York, NY, USA, pp. 555-564.

[2] IPCC, 2012.

[3] Ecotrust. 2019. Centering Frontline Communities. t

[4] US Green Building Council. What is LEED. Retrieved online July 20, 2020

[5] Segal, Troy. 2019. Property Assessed Clean Energy Loan. Investopedia

Resilience	The capacity of any entity or system to absorb disruption and manage stresses while maintaining the same basic structure and function, the capacity of self-organization, and the capacity to learn from these disruptions and stresses, improving over time.
Stressor	Stressor: external stimuli that cause chronic or acute negative impacts on people and natural and built systems
Vulnerability	Vulnerability: The propensity or predisposition to be adversely affected.
WEDG	WEDG (Waterfront Design Guidelines) is a rating system and set of guidelines to create resilient, ecological, and accessible waterfronts.[6]

[6] Waterfront Alliance. WEDG (Waterfront Edge Design Guidelines). Retrieved online July 20, 2020.