



RESILIENT NJ NORTHEASTERN NEW JERSEY

ACTION PLAN

A ROADMAP TO RESILIENCE

OCTOBER 2022

VERSION 2022.1



RESILIENT
NORTHEASTERN
NEW JERSEY

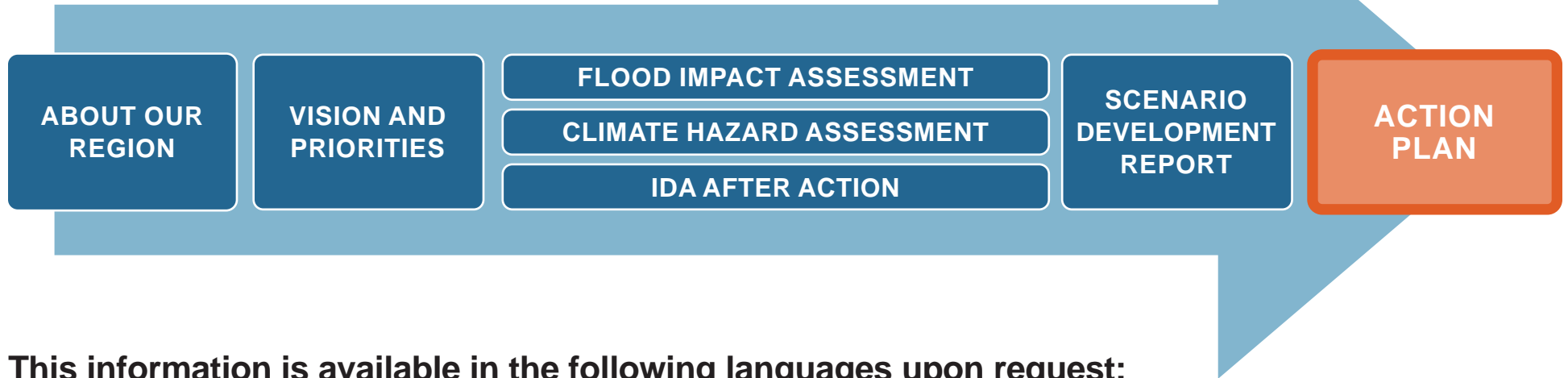
THIS PAGE INTENTIONALLY LEFT BLANK

SHARE YOUR FEEDBACK

Resilient Northeastern NJ is always seeking your feedback to guide the program and ensure it is reflective of perspectives and priorities from across the region. Please continue to share your feedback on the program and get in touch with us through either of the options below:

- BY EMAIL: ResilientNENJ@gmail.com
- BY SOCIAL MEDIA: @ResilientNENJ on Twitter & Facebook, @resilient_nenj on Instagram

Please visit our website at www.resilient.nj.gov/nenj to learn more about the program and what we've done so far.



This information is available in the following languages upon request:

Español • 中文:繁體版 • Việt-ngữ • 한국어 • Tagalog • Português • فيبرعلا • Kreyòl • ગુજ રાદી • Italiano • Polski

www.renewjerseystronger.org

TRANSLATION SERVICES

☐ English

Language translation assistance for limited or non- English speakers is available in eleven (11) languages. If you need to communicate in one of those languages, mark the box next to the language on this form and send the form along with your name, recovery program, and application number to Neda Hartman, 101 S. Broad St., PO Box 823 Trenton, NJ 08625.

You may also email or fax this form. Email to: neda.hartman@dca.nj.gov Fax to: 1-609-292-3726. Telephone assistance is available by calling 1-609-292-3750. When the agent answers the line, inform them of the appropriate language. The agent will either be able to immediately connect you with a translator or arrange for a translator to return your call at your convenience.

Name: _____

Program and application number: _____

☐ Arabic

تقدم المساعدة اللغوية من خلال توفير خدمات الترجمة بإحدى عشر (11) لغة للأشخاص الذين لا يتكلمون اللغة الإنجليزية أو لغتهم الإنجليزية محدودة. إذا احتجت إلى التواصل بإحدى هذه اللغات، فمُرِجى التأشير في المربع بجانب اللغة في هذا النموذج وإرسال النموذج مع اسمك وبرنامج التعافي من الكوارث ورقم الطلب إلى Neda Hartman, 101 S. Broad St., P.O. Box 823 Trenton, NJ 08625. ويمكنك أيضًا إرسال النموذج بواسطة البريد الإلكتروني أو الفاكس. لإرساله عن طريق

البريد الإلكتروني استخدم العنوان neda.hartman@dca.nj.gov. لإرساله بواسطة الفاكس استخدم الرقم 1-609-292-3726. تتوفر المساعدة التليفونية عن طريق الاتصال بالرقم 609-292-3750. عندما يرد الوكيل على مكالمتك، أبلغه باللغة التي تتأسبك. وسيقوم الوكيل بتوصيلك بمترجم على الفور أو ترتيب اتصال أحد المترجمين بك في موعد يناسبك.

الاسم: _____

البرنامج ورقم الطلب: _____

☐ Tagalog

Ang tulong sa pagsasalin ng wika para sa mga nakakapagsalita ng kaunting Ingles o hindi nakakapagsalita ng Ingles ay makukuha sa labing-isang (11) wika. Kung kailangan ninyong makipag-ugnayan gamit ang isa sa mga wikang iyon, markahan ang kahon sa tabi ng wikang nasa form na ito at ipadala ang form kasama ang inyong pangalan, programa para sa panunumbalik, at numero ng aplikasyon sa Neda Hartman, 101 S. Broad St., PO Box 823 Trenton, NJ 08625.

Maaari din ninyong i-email o i-fax ang form na ito. Mag-email sa: neda.hartman@dca.nj.gov. Mag-fax sa: 1-609-292-3726. Makakakuha ng tulong sa telepono sa pamamagitan ng pagtawag sa 1-609-292-3750. Kapag sinagot ng kinatawan ang telepono, ipaalam sa kanya ang naaangkop na wika. Maaari kayong maikonekta kaagad ng kinatawan sa isang tagapagsalin sa ibang wika o kaya naman ay maghahanap siya ng tagapagsalin sa ibang wika na siya namang tatawag sa inyo sa oras na gusto ninyo.

Pangalan: _____

Programa at numero ng aplikasyon: _____

☐ Vietnamese

Có sẵn dịch vụ hỗ trợ phiên dịch cho những người nói tiếng Anh có giới hạn hoặc không nói tiếng Anh trong mười một (11) ngôn ngữ khác nhau. Nếu cần truyền đạt bằng một trong các ngôn ngữ này, xin đánh dấu vào trong ô vuông kế bên ngôn ngữ trên mẫu này và gửi mẫu cùng với tên, chương trình phục hồi và số ghi danh của quý vị đến Neda Hartman, 101 S. Broad St., PO Box 823 Trenton, NJ 08625.

Quý vị cũng có thể gửi mẫu này qua điện thư (email) hoặc điện sao (fax). Gửi=Ửi điện thư đến: neda.hartman@dca.nj.gov. Gửi điện sao đến: 1-609-292-3726. Quý vị có thể gọi số 609-292-3750 để được hỗ trợ qua điện thoại. Khi đại diện trả lời điện thoại, xin cho người này biết ngôn ngữ thích hợp. Đại diện có thể kết nối với một thông dịch viên ngay cho quý vị, hoặc sắp xếp cho người thông dịch viên gọi quý vị vào giờ giấc tiện lợi cho quý vị.

Tên: _____

Chương trình và số ghi danh: _____

☐ Portuguese

O serviço de interpretação para quem fala pouco ou nada de inglês está disponível em onze (11) idiomas. Se precisar de comunicar em algum destes idiomas, assinala a caixa ao lado do idioma neste formulário e envie o formulário, juntamente com o seu nome, programa de recuperação e número de requisição, para Neda Hartman, 101 S. Broad St., PO Box 823 Trenton, NJ 08625

Também é possível enviar o formulário por e-mail ou fax. Por e-mail, envie para: neda.hartman@dca.nj.gov. Por fax para: 1-609-292-3726. O serviço por telefone está disponível, ligando para 609-292-3750. Quando o agente atender a chamada, indique o idioma pretendido. O agente estabelecerá imediatamente o contacto com um intérprete ou marcará com o intérprete para retomar a sua ligação num horário conveniente para si.

Nome: _____

Programa e número de requisição: _____

☐ Spanish

Está disponible el servicio de traducción en once (11) idiomas para las personas que no hablan inglés o que tienen dominio limitado de ese idioma. Si usted necesita comunicarse en uno de los idiomas enlistados en este formulario, marque la casilla del idioma de su preferencia y envíe el formulario, junto con los datos de su nombre, programa de recuperación y número de solicitud, a Neda Hartman, 101 S. Broad St., PO Box 823 Trenton, NJ 08625.

Usted puede también enviar el formulario por correo electrónico a neda.hartman@dca.nj.gov o, por fax, al 1-609-292-3726. Se brinda asistencia telefónica llamando al 1-609-292-3750. Cuando el representante responda a su llamada, infórmele sobre el idioma que necesita ayuda. El representante le pondrá en contacto con un traductor o cuando mejor le convenga a usted.

Nombre: _____

Programa y número de solicitud: _____

☐ Chinese (Traditional)

本公司以十一（11）種語言為英語能力有限或不諳英語的人士提供語言翻譯協助。倘若你需要使用以上其中一種語言溝通，請在此份表格中適當的方格做標記，標註所選語言，然後將表格連同你的姓名、計劃和申請編號郵寄至 Neda Hartman, 101 S. Broad St., PO Box 823 Trenton, NJ 08625.

你也可以用電子郵件或傳真發送此表格。請將電子郵件發送至：neda.hartman@dca.nj.gov. 請將傳真發送至：1-609-292-3726. 欲需要電話協助，請撥打 609-292-3750 要求協助。當職員以電話回覆，請告知職員你希望選用的語言。職員有可能立即為你接通翻譯員，也可能安排翻譯員在你方便時致電回覆你。

姓名 _____

計劃和申請編號： _____

☐ French Creole

Gen asistans tradikisyon nan onz (11) lang ki disponib pou moun ki pa pale Anglè oswa ki limite nan Anglè. Si ou bezwen kominike nan youn nan lang sa yo, tchèke bwatt ki akote lang nan fòm sa epi voye fòm lan ansanm ak non ou, pwogram rekouvèt lan ak nimewo aplikasyon ou an bay Neda Hartman, 101 S. Broad St., PO Box 823 Trenton, NJ 08625.

Epitou ou ka voye fòm lan pa imèl oswa pa faks. Pa imèl nan: neda.hartman@dca.nj.gov. Pa faks: 1-609-292-3726. Asistans pa telefòn disponib lè ou rele nan 609-292-3750. Lè ajan an reponn, di yo ki lang ou bezwen. Ajan an pral kapab swa konekte ou touswit ak yon entèprèt oubyen fè aranjman pou yon entèprèt retounen apèl ou a nan lè ki pi bon pou ou.

Non: _____

Pwogram ak nimewo aplikasyon: _____

☐ Gujarati

મર્યાદિત અથવા બિન-અંગ્રેજી બોલનારાઓ માટે અગિયાર (11) ભાષાઓમાં ભાષાંતર સહાય ઉપલબ્ધ છે. જો તમને આ ભાષાઓ પૈકી કોઈ એકમાં કોમ્યુનિકેશન કરવાની જરૂર હોય તો, આ ફોર્મ પર તે ભાષાની સામે આપેલા બોક્ષમાં નિશાની કરો અને આ ફોર્મ તમારા નામ, રિકવરી પ્રોગ્રામ અને એપ્લિકેશન નંબર સાથે Neda Hartman, 101 S. Broad St., PO Box 823 Trenton, NJ 08625 ને મોકલી આપો.

તમે ફોર્મને ઈમેલ અથવા ફેક્ષ પણ કરી શકો છો. ઈમેલ કરો: neda.hartman@dca.nj.gov. ફેક્ષ કરો: 1-609-292-3726. ટેલિફોન સહાય 1-609-292-3750 પર કોલ કરવાથી ઉપલબ્ધ છે. જ્યારે એજન્ટ લાઈન પર જવાબ આપે, તો તેમને યોગ્ય ભાષા જણાવો. એજન્ટ કાં તો તરત જ તમને ભાષાંતરકાર સાથે જોડી આપશે અથવા વળતા કોલથી તમારી સગવડ પ્રમાણે ભાષાંતરકારની વ્યવસ્થા કરશે.

નામ: _____

પ્રોગ્રામ અને એપ્લિકેશન નંબર: _____

☐ Italian

Per coloro che parlano poco o niente inglese, è disponibile un servizio di interpretariato in undici (11) lingue. Se hai necessità di comunicare con il nostro ufficio in una di esse, segna su questo modulo la casella che corrisponde alla tua lingua e invialo corredato del tuo nome, programma di assistenza e numero di domanda a Neda Hartman, 101 S. Broad St., PO Box 823 Trenton, NJ 08625.

Se preferisci, puoi spedire il modulo per fax o per posta elettronica. L'indirizzo di posta elettronica è il seguente: neda.hartman@dca.nj.gov. Il numero di fax è 1-609-292-3726. Puoi ricevere assistenza telefonica nella tua lingua chiamando il seguente numero: 1-609-292-3750 e dicendo all'impiegato che hai bisogno di assistenza per la lingua italiana. L'impiegato ti metterà subito in contatto con l'interprete o prenderà accordi perché l'interprete ti richiami a un orario per te più comodo.

Nome: _____

Programma di assistenza e n. di domanda: _____

☐ Korean

영어에 미숙한 분들을 위해 11 개국 언어 통역을 도와드립니다. 해당 언어 중 한 언어의 의사소통이 필요하신 분은 이 신청서에 해당 언어 박스에 표시를 하신 후, 이름, 복구 프로그램 및 신청번호와 함께 ‘Neda Hartman, 101 S. Broad St., PO Box 823 Trenton, NJ 08625’로 우편으로 보내시기 바랍니다.

신청서를 이메일이나 팩스로 보내셔도 됩니다. 이메일의 경우 ‘neda.hartman@dca.nj.gov’, 팩스는 ‘1-609-292-3726’, 전화로 도움을 받고 싶으신 분은 ‘1-609-292-3750’으로 전화하십시오. 상담원과 연결 후에 도움을 받고 싶은 언어를 말씀하십시오. 상담원이 통역사와 즉시 연결해 드리거나 아니면 편리한 시간에 통역사가 전화를 드릴 것입니다.

이름: _____

프로그램과 신청 번호: _____

☐ Polish

Dla osób nieznających języka angielskiego lub dla osób znających go w ograniczonym stopniu dostępna jest pomoc tłumacza w jedenastu (11) językach. Jeżeli potrzebują Państwo porozumieć się w jednym z tych języków, prosimy zaznaczyć kratkę obok danego języka na formularzu, a następnie wysłać go wraz z imieniem, nazwiskiem, programem pomocy i numerem wniosku do Neda Hartman, 101 S. Broad St., PO Box 823 Trenton, NJ 08625.

Formularz można również wysłać emailem lub faksem. Adres email: neda.hartman@dca.nj.gov. Numer faksu: 1-609-292-3726 Pomoc telefoniczna jest dostępna pod numerem 609-292-3750. Kiedy agent odbierze telefon, prosimy podać język, w którym chcą się Państwo porozumiewać. Agent będzie mógł natychmiast połączyć Państwa z tłumaczem lub też tłumacz oddzwoni w dogodnym dla Państwa terminie.

Imię i nazwisko: _____

Program i numer wniosku: _____

REGION TEAM

Steering Committee Members

JERSEY CITY

City of Jersey City Office of Sustainability

NEWARK

Nathaly Agosto Filión, Robert Thomas,
and Juba Dowdell

HOBOKEN

Caleb Stratton, Jennifer Gonzalez,
Yasmine Pessar, and Ann Holtzman

BAYONNE

Suzanne Mack and Andrew Raichle

HUDSON COUNTY

Kevin Force and Francesca Giarratana

IRONBOUND COMMUNITY CORPORATION

Drew Curtis and Maria Lopez-Nuñez

HOPES CAP

Evelyn Mercado and Barbara Reyes

COMMUNITY ADVISORY COUNCIL

JERSEY CITY

Geoff Allen, Lilia Diaz, and Ray Baylon

NEWARK

Ayanna Gonzalez, James Young, and Violeta Duenas

HOBOKEN

Liz Ndoye, Daniel Perez, and Janet Larson

BAYONNE

Dan & Lisha Smerda, Ahmed Lack, and Nurdan Aydin

CONSULTANT TEAM

ARCADIS

ONE ARCHITECTURE & URBANISM

HGA

INGROUP

SAM SCHWARTZ ENGINEERING

SCAPE LANDSCAPE ARCHITECTURE

IRYS

Thank you to the many community-based organizations, community members, municipal leaders, agencies, and regional stakeholders that have contributed their time and expertise to the Resilient NENJ process to date.



RESILIENT NJ

NORTHEASTERN NEW JERSEY

ACTION PLAN

OCTOBER 2022

VERSION 2022.1



CONTENTS

LETTER OF SUPPORT & FOREWORD

ACRONYMS & DEFINITIONS

EXECUTIVE SUMMARY

10

1.0 ABOUT THIS REPORT

36

2.0 HOW DID WE GET HERE?

40

3.0 PREFERRED SCENARIO & RECOMMENDATIONS

78

3.1 Overview & Highlights

79

3.2 Actions That Will Change Our Built & Natural Environment

86

3.3 Actions That Will Change the Way We Work Together

182

4.0 IMPLEMENTATION PATHWAYS

256

5.0 ROADMAP

270

5.1 Roadmap for Capital Projects

273

5.2 Roadmap for Non-Capital Actions

321

6.0 CONCLUSION

340

LOOK OUT for this icon
throughout the report for quotes
and paraphrased feedback we've
heard from around the Region



APPENDICES

- A** Actions and Implementation
- B** Costs and Benefits Estimation
- C** Funding Sources
- D** Scenario Evaluations
- E** Policy Reviews
- F** Other Resilient NENJ Reports
- G** Summary of Long-Term Control Plans
- H** Resilient Transformation of Contaminated Sites
- I** Engagement Process
- J** Case Studies for Regionwide Coordination



LETTER OF SUPPORT

By the NJ Department of Environmental Protection (NJDEP)

Climate change is a global challenge, although its impacts—including flooding from sea-level rise, coastal storms, and extreme precipitation events—are experienced locally. Further, each community’s experience of these impacts is distinct and so requires a unique response consistent with, and driven by, the community members who are directly impacted. Integrating a proactive, climate-ready mindset into local and regional planning efforts is imperative to ensure that investments made today are designed to withstand the conditions of tomorrow.

To provide our communities with the assistance and resources to meet these challenges, the NJ Department of Environmental Protection (NJDEP) launched the Resilient NJ program, using funding from the U.S. Department of Housing and Urban Development’s National Disaster Resilience Competition. Resilient NJ is the preeminent planning program in the state to support local and regional climate resilience planning and serves as a model for other community resilience planning projects in New Jersey. Using the best available science on precipitation, sea-level rise, and coastal flooding, combined with a whole-community planning approach, Resilient NJ helps communities plan for how the changing climate may affect residents, businesses, and the natural and built environments.

The Resilient Northeastern NJ region is a dense and extremely diverse urban environment. It is bounded by rivers and bays, and flooding impacts a huge number of people and assets of local, regional, state, and national importance. This Regional Resilience and Adaptation Action Plan (Action Plan) is the result of a nearly two-year, whole community planning process. It presents a suite of innovative and implementable solutions that align with the community vision to increase climate resilience in both the short- and long-term.

New Jersey’s Statewide Climate Change Resilience Strategy defines “climate resilience” *as the ability of social and ecological systems to absorb and adapt to shocks and stresses resulting from a changing climate, while becoming better positioned to respond in the future. Resilience is not an end-state, but a dynamic state-of-being that will grow more difficult to attain as the climate continues to change. Resilience is perseverance with grace, strength in the face of adversity and hardship, resourcefulness to leverage what is available, and faith in the road that lies ahead.* The four initial Resilient NJ regional projects have met those high principles and have established a high bar by which all other resilience initiatives will be measured.

Sincerely,



Nicholas J. Angarone, PP/AICP
New Jersey Chief Climate Resilience Officer

FOREWORD

By the NENJ Steering Committee

Resilient Northeastern NJ (Resilient NENJ) seeks to build climate resilience while improving quality of life for the 700,000 people who live in Jersey City, Newark, Hoboken, and Bayonne, as well as those who work and play in the region. The program launched in the Spring of 2021 to develop a regional Resilience and Adaptation Action Plan (Action Plan) for addressing current and future flooding. Through community feedback, Resilient NENJ expanded to consider other climate-related hazards like heat, poor air quality, and drought. These hazards interact with vulnerability to impact our people, infrastructure, and environment. Our communities have already experienced these impacts from recent storms such as the remnants of Hurricane Ida in September 2021, less recent storms such as Hurricane Sandy which catalyzed attention to resilience across much of the northeast, and the prevalence of health disparities due to polluted air and heat waves.

The science to understand the complex role that climate change plays in the future of our region is constantly evolving through studies led by federal agencies, the New Jersey Department of Environmental Protection (NJDEP), and other academic and scientific entities. Nonetheless, sea level rise, higher intensity precipitation, declining air quality, increasing temperatures, invasive species, and other hazards will continue to affect quality of life in this region unless urgent action is taken. The flood impact assessment completed for this project estimates that losses from severe rainfall and coastal storm surge events could be in the billions and tens of billions of dollars, respectively. These hazards compound other challenges faced by this region, including a history of discriminatory housing practices, insufficient affordable housing stock, contamination, the consequences of the region's past and current industrial centers, and aging infrastructure.

The need for action is urgent. The time to act is now. Resilient NENJ will continue to lead, collaborate, and innovate on these issues. The Action Plan outlines clear measures such as policy changes, programs, and capital projects that can ease the financial and resource burdens of unmitigated climate-related risk, protect people and places from hazards, and foster connectivity and the capacity to adapt. The actions aim to advance efforts already ongoing in the region and to work alongside the **New Jersey Statewide Climate Change Resilience Strategy** and other statewide and local initiatives.

We can all play a role in increasing resilience, and the Action Plan provides calls to action for anyone who could be affected. Involvement from everyone in our region, especially those who could face the most significant impacts from climate change, will continue to be critical for successful implementation of the Action Plan's recommendations. By taking the next steps as charted in the Action Plan and working iteratively to improve and complete its recommendations, we can collectively build thriving communities in the region.

ACRONYMS

BAPC – Bergen Arches Preservation Coalition	EM – emergency management
BCRP – Bureau of Climate Resilience Planning	EMPG – Emergency Management Performance Grant, a FEMA grant program
BIPOC – Black, Indigenous, and People of Color	EO – executive order
BRIC – Building Resilient Infrastructure and Communities, a FEMA program	EPA – United States Environmental Protection Agency
BRIT – New Jersey’s Brownfield Redevelopment Interagency Team	EPC – Embankment Preservation Coalition
CAC – Community Advisory Council	FEMA – Federal Emergency Management Agency
CBO – community-based organization	FIRM – Flood Insurance Rate Map, a part of FEMA’s NFIP
CBP3 – community-based public private partnerships	FMA – Flood Mitigation Assistance, a FEMA program
CCATF – New York City Climate Change Adaptation Task Force	FTA – Federal Transit Administration
CCI – Community Collaborative Initiative, a NJDEP and NJEDA program	GI – Green Infrastructure
CCRUN – Consortium for Climate Risk in the Urban Northeast	HATS – New York & New Jersey Harbor and Tributaries Study, a USACE study
CDBG – Community Development Block Grant	HDSRF – Hazardous Discharge Site Remediation Fund
CDBG-DR – Community Development Block Grant Disaster Recovery program	HEP – New York & New Jersey Harbor & Estuary Program
CDBG-Mit – Community Development Block Grant Mitigation program	HMGP – Hazard Mitigation Grant Program, a FEMA program
CDC – Centers for Disease Control and Prevention	HUC – Hydrologic Unit Code
CEA – Classification Exception Area	HUD – United States Department of Housing and Urban Development
CERT – Community Emergency Response Teams	HVAC – heating, ventilation, and air conditioning
COG – Metropolitan Council of Governments	IAWG – New Jersey’s Brownfields Interagency Working Group
C-PACE – Garden State Commercial Property Assessed Clean Energy	I-Bank – New Jersey Infrastructure Bank
CRS – Community Rating System, a FEMA program	ICMA – International Capital Markets Association
CSO – combined sewer overflow	IECC – International Energy Conservation Code
CSS – combined sewer system	IIJA – Infrastructure and Investment Jobs Act
DEWS – drought early warning system	IPCC – International Panel on Climate Change
DRBC – Delaware River Basin Commission	ISRA – Industrial Site Recovery Act
EJ – environmental justice	JC – Jersey City
EJScreen – USEPA Environmental Justice Screening and Mapping Tool	JCMUA – Jersey City Municipal Utilities Authority
	LESO – Law Enforcement Support Organization

LIHEAP – New Jersey’s Low-Income Home Energy Assistance Program
 LPR UWFP – Lower Passaic River Urban Waters Federal Partnership
 LTCP – Long-Term Control Plans
 LWI – Louisiana Watershed Initiative
 MAP – Metropolitan Area Planning Forum
 MBTA – Massachusetts Bay Transportation Authority
 MOTBY – Military Ocean Terminal at Bayonne
 MOU – memorandum of understanding
 MPO – metropolitan planning organization
 MS4 – municipal separate storm sewer system
 NDRC - National Disaster Resilience Competition
 NENJ – Northeastern New Jersey
 NFIP – National Flood Insurance Program, a FEMA program
 NFWF – National Fish and Wildlife Foundation
 NHSA – North Hudson Sewerage Authority
 NJAC – New Jersey Administrative Codes
 NJBPU – New Jersey Board of Public Utilities
 NJDCA – New Jersey Department of Community Affairs
 NJDEP – New Jersey Department of Environmental Protection
 NJDOT – New Jersey Department of Transportation
 NJEDA – New Jersey Economic Development Authority
 NJIT – New Jersey Institute of Technology
 NJOEM – New Jersey Office of Emergency Management
 NJPACT – New Jersey Protecting Against Climate Threats
 NJSEA – New Jersey Sports Exposition Authority
 NJTA – New Jersey Turnpike Authority
 NJTPA – North Jersey Transportation Planning Authority
 NOAA – National Oceanic and Atmospheric Administration

NPCC – Northeast Power Coordinating Council
 NWS – National Weather Service
 OEM – Office of Emergency Management (used at various scales)
 OSHA – Occupational Safety and Health Administration
 P3 – public private partnership
 PA – Public Assistance, a FEMA program
 PANYNJ – Port Authority of New York and New Jersey
 PE&D – Por
 PI – parallel interceptor
 PM2.5 – fine particulate matter, equal to or smaller than two and a half microns in width
 PSE&G – Public Service Electric and Gas
 PVSC – Passaic Valley Sewerage Commission
 RBD – Rebuild by Design, a HUD competition program
 REAL – Resilient Environments and Landscapes, part of NJ PACT
 RICC – Regional Infrastructure Coordination Council
 RNJ – Resilient New Jersey
 ROSI – Recreation and Open Space Inventory
 RPA – Regional Plan Association
 SFHA – Special Flood Hazard Area
 STAP – Science and Technical Advisory Panel
 SVI – Social Vulnerability Index
 TAB – the NJIT Technical Assistance to Brownfield Communities program
 TFN – The Funders Network
 UHI – urban heat island
 USACE – United States Army Corps. of Engineers
 USDOE – United States Department of Energy
 WWTP – wastewater treatment plant

DEFINITIONS

Adaptation – The process of modifying behaviors, policy, or the built and natural environment to adjust to risk.

After Action – A document intended to capture observations of an event or exercise and make recommendations based on the outcomes of the event or exercise.

Alignment – Another word for the location along a linear stretch of land. This term can be used to refer to siting for solutions such as barriers or pipes.

All Hazards Actions – Actions that address other climate-related vulnerabilities and environmental justice needs, beyond flooding.

Allocation – Funding distributed by an entity (e.g., the state or federal government) for a particular purpose.

Areal Floods – Floods that occur when flooding develops more gradually and comes from sustained rainfall over a longer period. The NJDEP models use around 8 to 9 inches over 24 hours, which is similar to Ida or Irene, depending on the area.

Authority – A group with decision-making and enforcement power.

Base flood elevation – The flood height that must be considered and used in new developments and major improvements to existing properties in FEMA-defined special flood hazard areas.

Brownfields – Defined by the State (in the Brownfield and Contaminated Site Remediation Act) as “former or current commercial or industrial sites, currently vacant or underutilized, and on which there has been, or there is suspected to have been, a discharge of a contaminant.” The distinguishing features of brownfields are that they are specifically commercial and industrial sites, and that there only needs to be a perception of contamination for a site to be considered a brownfield.

Coastal Actions – In this Action Plan, actions that address coastal and tidal flooding

Coastal Storm Surge – Flooding that occurs when tropical storms, hurricanes, and nor’easters temporarily raise water levels along the coast.

Community Emergency Response Teams – These teams are volunteer “train the trainer” organizations that educate residents in disaster preparedness and response so that they can support other neighbors during emergencies.

Community Resilience – The capacity and capability of communities to respond, adapt, and transform in response to natural hazards and climate change.

Contaminated Sites – Properties where there is a known presence of hazardous substances.

Coordinating Body – A voluntarily established group without formal decision-making power.

Critical Asset – Places that are essential for a community to thrive. Examples are utilities and transportation infrastructure. Assets can include places where people gather, build relationships, and enjoy themselves.

Cut-sheet – In this Action Plan, a short section for each recommended action that provides information about issues the action will address, key considerations for implementation, evaluation criteria, and expected outcomes or changes, along with community feedback that contributed to the recommendations.

Design elevation – The elevation at which buildings must be constructed or floodproofed, equal to the base flood elevation plus a certain amount of freeboard (additional height as a safety factor).

Dig once – An intentional effort to facilitate the simultaneous construction of different projects at the same site, limiting repeated disruption.

Flash Floods – Floods that occur when there is a significant amount of rainfall over a short period of time. The NJDEP models use around 3.5 inches over two hours, which is a little worse than Floyd (1999), Irene (2011), and Henri (2021) in most places and not nearly as heavy as the worst of Ida in 2021.

Hazard Mitigation – Action to reduce long-term risk to life and property from hazard events.

Infrastructure – The system of structures and resources (systematic, natural, and human-built) that provide services to communities. Infrastructure can fall into five categories: physical, social, institutional/governance, economic, and environmental.

Level of Protection – The magnitude of flooding a coastal solution can manage.

Level of Service – The magnitude of rainfall a stormwater solution can manage.

Mean Higher High Water – High tides happen twice a day and one is usually higher than the other. Mean higher high water is the average height of the daily highest tide.

Outreach – The provision of services, communications, and engagement to the community at large including historically excluded groups.

Preparedness – The continuous cycle of planning, organizing, training, equipping, exercising, evaluating, and taking corrective action to ensure effective coordination during response.

Rainfall Flooding – Flooding as a result of excessive rainfall, including stormwater flooding, areal flooding, and flash flooding.

Recovery – The phase following a disaster focused on restoring infrastructure that was affected.

Resilience Hub – A multi-functional place for people to access information and go before, during, and after climate events, such as to shelter from flooding or extreme heat. Depending on the site, resilience hubs can also directly reduce hazards by providing stormwater storage or increasing green infrastructure and green space.

Resilience infrastructure – Infrastructure that increases the resilience of other entities, infrastructure, or communities.

Resilient infrastructure – Infrastructure that can withstand shocks and stresses that might otherwise disrupt an asset's ability to meet its mission.

Response – As defined by FEMA, the ability to, “respond quickly to save lives, protect property and the environment, and meet basic human needs in the aftermath of a catastrophic incident.”

Scenario – In this Action Plan, “Scenario” refers to a suite or package of solutions to increase resilience. In other climate contexts, the term may refer to different projects for climate conditions depending on various factors.

Scenario 0 – An inventory of existing planning initiatives/completed actions that are already working to increase resilience in the region, this is a baseline scenario that imagines what risk would look like with completion of all in-progress projects.

Single source of truth – A centralized resource of aggregated data to facilitate the development consistent understandings and actions across locales and entities.

Sinking Fund – A common method to fund infrastructure improvements made necessary through development over time. The model could apply to redevelopment areas or areas of private ownership and shared risk, in particular.

Social Vulnerability – The degree to which a community's people are challenged when faced with significant disruptions, such as natural disasters or disease. Social vulnerability is often used as a metric in planning processes to ensure that actions benefit those people who might need additional support.

Special flood hazard area – Shown on a FEMA Flood Hazard Boundary Map, this is “an area having special flood, mudflow, or flood-related erosion hazards” that put it at greater risk. In general, these areas have a 1% chance of being inundated in any given year under current conditions.

Stormwater Actions – Actions that address stormwater flooding

Stormwater Flooding – Flooding that occurs when rainfall overwhelms drainage systems.

Tidal Flooding – The inundation of low-lying areas with high tides, which occurs independently from storm surge events.

Urban Heat Island effect – Increased temperatures in urban areas compared to nearby rural areas as a result of human structures (i.e. buildings and roads) and activities.

Vertical Evacuation – Temporarily moving residents upward and away from hazards (e.g., flooding), such as within a tall resilient structure.



An aerial photograph of a coastal city, likely San Francisco, with various areas highlighted in green and orange. The city is situated on a peninsula, with a large body of water to the right and a bay to the left. The green areas are mostly in the central and northern parts of the city, while the orange areas are more concentrated along the waterfront and in the southern part. The text "EXECUTIVE SUMMARY" is overlaid on the right side of the image.

EXECUTIVE SUMMARY

WHO CREATED THIS PLAN AND FOR WHOM?

WHAT IS RESILIENT NJ?

Resilient NJ is a planning program, administered by the New Jersey Department of Environmental Protection (NJDEP) Bureau of Climate Resilience Planning (BCRP), that supports local and regional climate resilience planning. Resilient NJ brings together resilience experts, local leaders, community organizations, residents, and regional infrastructure entities to address flood and climate-related hazards at a regional scale, while ensuring local community input in developing recommendations, particularly from underserved and socially vulnerable populations.

Resilient NJ received initial funding through the U.S. Department of Housing and Urban Development (HUD) National Disaster Resilience Competition (NDRC). This funding supported pilot planning projects to develop Regional Resilience and Adaptation Action Plans (Action Plans) in four regions in New Jersey, including Northeastern NJ (NENJ).

WHAT IS RESILIENT NENJ?

Resilient Northeastern NJ (Resilient NENJ) is one of four pilot projects and focuses on developing solutions to reduce risk and build resilience in Jersey City, Newark, Hoboken, and Bayonne. These four municipalities, Hudson County, and two community-based organizations, Ironbound Community Corporation and HOPES CAP, Inc., comprise the Resilient NENJ Region Team. Representatives from each of these entities sit on a Steering Committee that leads the project.

RESILIENT NENJ MISSION STATEMENT

Resilient NENJ will provide a clear vision and roadmap for reducing flood risk and impacts from climate-related hazards through collaboration between local and state governments and community-based organizations along with valuable input from the public and other stakeholders. The Action Plan will support regional investment, information, and resource sharing to help our people and places thrive in the decades to come. The Action Plan will be driven by best available data, technical evaluation, and inclusive and equitable engagement. It will leverage best practices to create social, environmental, and economic benefits and bring value to those who live in the region now and for future generations.



The Resilient NENJ Team on a site visit in Jersey City.

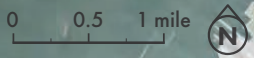
Image Source: Resilient NENJ

Resilient Northeastern NJ Region



LEGEND

- Municipalities
- Counties



A PLAN CREATED WITH COMMUNITY MEMBERS

Implementation of this Action Plan will change the built and natural environment and the way that people work together to build resilience. As such, it is critical that the Action Plan reflects the perspectives and needs of those who could be affected, and especially the most vulnerable and historically underrepresented. The planning process has centered community members and community feedback from the start. Other stakeholders, such as elected officials, emergency managers, and infrastructure and utility entities, also participate to help guide the process and to share input related to specific processes and assets.

This timeline shows key dates of meetings and other direct engagement where feedback supported Action Plan development. **Appendix I** includes additional detail on the engagement planning process, engagement materials, promotion methods, and other engagement with municipal and state agencies.

The 12-member Community Advisory Council (CAC), made up of a diverse group of residents from each of the four municipalities, has met roughly quarterly throughout the process to provide feedback on materials, plan engagement, and ensure inclusion of historically underrepresented people.

Resilient NENJ gathered feedback iteratively in waves to correlate with key project milestones: visioning, risks and tools, solution scenarios (optional pathways to resilience), and draft recommendations. Each wave coincided with a regional community meeting to report out on progress and gather feedback, with additional city-specific community meetings in March and April of 2022.

Resilient NENJ also engaged “partner organizations,” or groups such as community-based organizations, neighborhood and block associations, and environmental groups who already have strong connections and working relationships with community members. Gathering feedback from and conducting outreach through these partner organization multiplied engagement while strengthening existing relationships and empowering local leaders to take ownership.

Engagement materials included a range of paper and digital approaches, and Resilient NENJ also gathered “anytime” feedback through the website, social media, email, a voicemail hotline in five languages, and the Irys engagement app.

KEY ENGAGEMENT STRATEGIES

WAVES OF ENGAGEMENT

- Each major milestone included its own engagement process with different investigations partnered with questions to the community and stakeholders
- Continuous integration of feedback

LEADERSHIP BY THE COMMUNITY

- 12 person Community Advisory Council guides the engagement process and provides early feedback
- Steering committee includes community based organizations

MULTIPLYING ENGAGEMENT

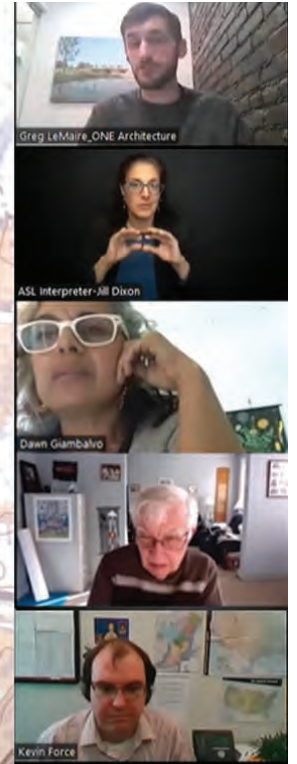
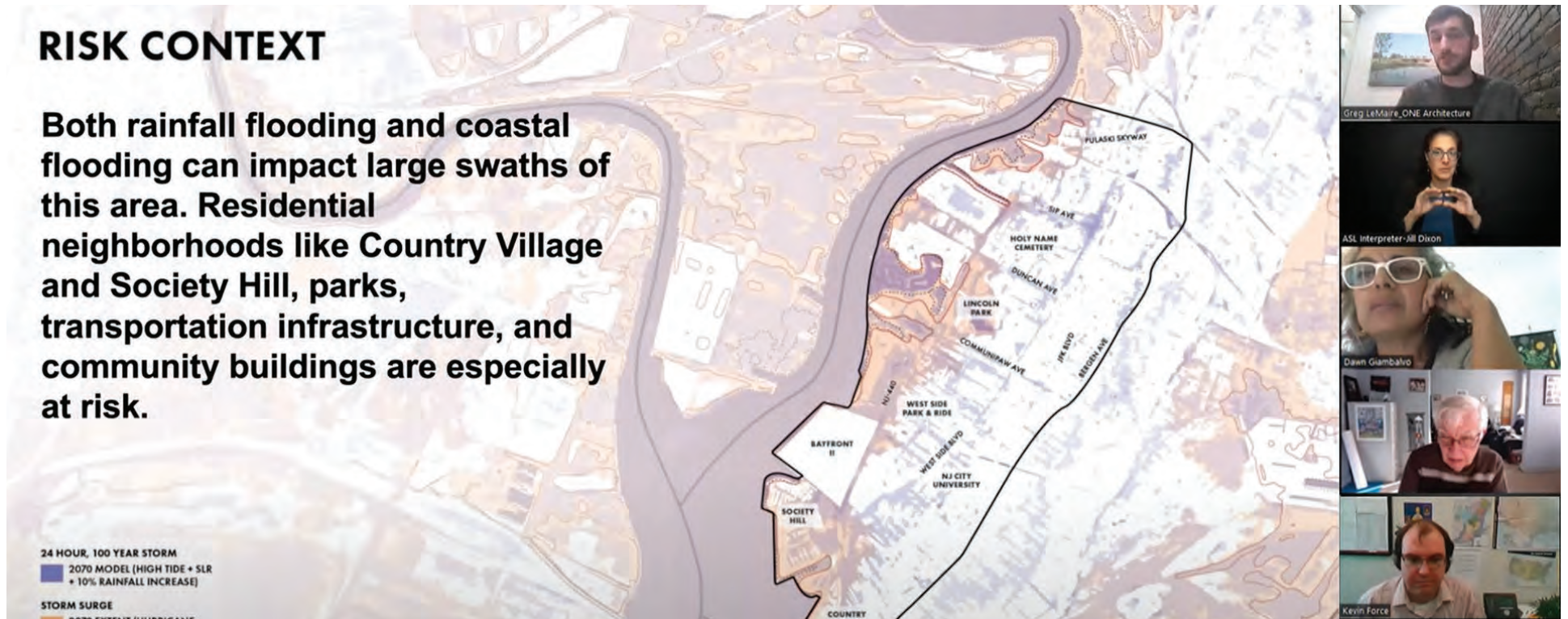
- Working with partner organizations who are already working in communities to help spread the word and share their perspectives

A VARIETY OF ENGAGEMENT CHANNELS

- Anytime engagement opportunities (eg social media)
- Project hotline in multiple languages
- In person events
- Paper and digital surveys
- Irys App
- And more...

RISK CONTEXT

Both rainfall flooding and coastal flooding can impact large swaths of this area. Residential neighborhoods like Country Village and Society Hill, parks, transportation infrastructure, and community buildings are especially at risk.



(top) Discussion session at a NENJ virtual community meeting. Source: Resilient NENJ

(bottom) left - Residents gathered for the STEAM URBAN Earth Week Event at Kaboom Playground in Newark; right - Resilient NENJ speaking with a Newark community member as he discusses the height of the floodwaters during inundation from Hurricane Ida. Source: Resilient NENJ

ENGAGEMENT TIMELINE

TIMELINE LEGEND

- Community Meeting
- CAC Meeting
- Stakeholder Meetings & Engagement
- Outreach & Education
- Report Release
- Site Visits



POST-IDA

What was helpful, and what was needed?

HIGH SCHOOL ENGAGEMENT

Guidance to students on challenge projects related to climate change and resilience

2/2

CAC MEETING

Feedback on Community Meeting #4 structure and draft solutions

EARTH WEEK EVENTS

Tabling at various local community events, including STEAM URBAN Earth Week activities

FACES OF RESILIENCE CAMPAIGN

Spotlights of community organizers and local leaders who are working to increase resilience

EDUCATIONAL VIDEO SERIES

Videos on risk, resilience, and how to get involved (early stages of a Resilience 101 campaign)

2/9

COMMUNITY MEETING #4

Overview of physical and non-physical solutions being evaluated and how they could shape the region

HIGH TECH HIGH SCHOOL WORKSHOPS

Resilience planning workshops with juniors and seniors

WINTER

2022

SPRING

SUMMER

GOING FORWARD

COORDINATION FOR FUNDING APPLICATIONS

Coordination with municipal departments and utilities on FEMA BRIC funding applications

COMMUNITY MEETING #3

Interactive presentations from technical experts on flood preparedness, recovery, and individual mitigation actions

CITY-SPECIFIC COMMUNITY MEETINGS

Solutions being considered in each city and how they fit with the community and risk contexts

IVY HILL SITE VISIT

Site visit and meeting with residents in the flood-prone Ivy Hill neighborhood

4/24

6/8

COMMUNITY MEETING #5

Overview of draft recommendations that will change our built environment and how we work together

6/1

CAC MEETING

Feedback on Community Meeting #5 structure, public art project, ad campaign, and Faces of Resilience

JUN 2022

SEP 2022

IN-PERSON EVENTS

MUNICIPAL ENGAGEMENT

ADVERTISING CAMPAIGN

ENGAGEMENT PARTNER MEETINGS

CAC MEETINGS

PUBLIC ART PROJECTS



FLOOD IMPACT ASSESSMENT



CLIMATE HAZARDS



SCENARIO DEVELOPMENT



IDA AFTER ACTION

WHY IS THIS ACTION PLAN IMPORTANT?

WHAT MAKES THIS REGION UNIQUE AND IMPORTANT?

The Resilient NENJ project region includes the cities of Jersey City, Newark, Hoboken, and Bayonne, an area home to 700,000 people. This region is lively, densely populated, and heavily urbanized. It is interconnected through transportation and maritime networks, water bodies, cultures, commerce, and workers. The region is home to infrastructure and transportation systems that support the movement of goods and people to and from Newark-Liberty International Airport and the Port of New York and New Jersey, connect the region to New York City and the Northeast Corridor, and drive the economy of these areas and the country.

Many community members shared that they value the mobility these systems offer, as well as the strong sense of community and home in the region. Community members also identified the region's parks, festivals, cultural centers, places of worship, and diverse small businesses as important community places, among others (see more in the **Vision and Priorities** report).

See Resilient NENJ's **Flood Impact Assessment** and **Climate Hazards Assessment** for more on climate-related risk.

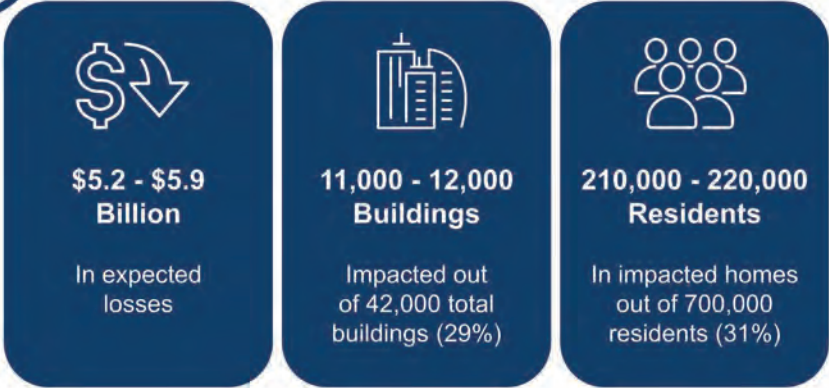


Liberty State Park wetlands
Image Source: Hudson County Division of Planning



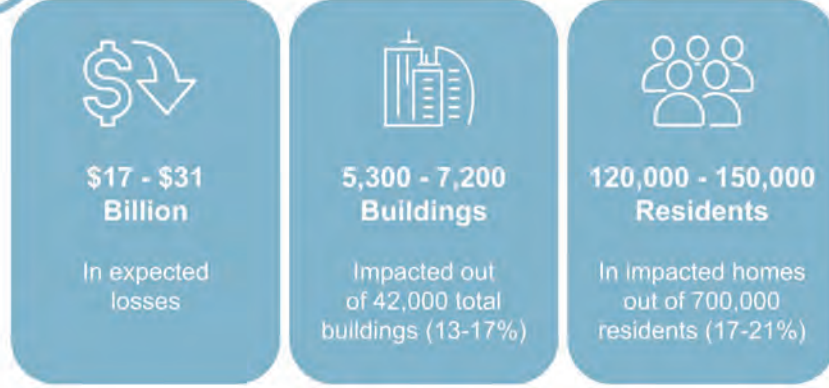
Rainfall Areal Flood

Range indicates change from present to future modeled flood events



Coastal Storm Surge

Range indicates change from present to future modeled flood events



Faces of Resilience



RESILIENT NENJ'S *FACES OF RESILIENCE* SERIES

NENJ is an extraordinary place with a lot to be treasured, celebrated, and preserved. It is a diverse region that many people are proud to call home. At the same time, NENJ communities face challenges and risk today that stem from historical and continued inequities. For example, effects of the region's history of racially discriminatory housing practices can still be felt today in economic and health disparities. These practices, such as redlining¹, led to the settling of marginalized and minority communities – especially Black and Brown communities – in areas with high industrial activity.

In addition to Black and Brown people—due to a long history of discriminatory practices—low-income, non-English speaking, elderly, children, homeless, or physically disabled people are also more likely to need support to prepare, respond to, or recover from a flood or other disastrous event, as they are more likely to have limited financial and physical resources.

Today, these same communities face high exposure to flooding and other hazards, such as high concentrations of contaminated sites, high rates of urban heat island, and poor air quality. Because of their experience and demonstrated resilience, Resilient NENJ community members have built-in expertise on how flooding and other hazards manifest across the region, and how a program like Resilient NENJ can help ease the burden. Resilient NENJ's most socially vulnerable continue to persevere through past challenges and daily inequities, and there are extraordinary leaders in these communities helping to drive change.

It is therefore critical that Resilient NENJ centers the needs and perspectives of people who could be most affected by the outcomes of this Action Plan. The ongoing Faces of Resilience series is one example of Resilient NENJ's efforts to highlight the voices and experiences of community members. In this series, leaders in the resilience space and people who have demonstrated resilience to climate hazards share their stories on social media, the Resilient NENJ website, and public art. More work is needed to empower and lift these voices, and Resilient NENJ welcomes criticism and support to continue toward this goal.

¹ Redlining is a practice seen in the early- to mid-twentieth century that involved classification of areas that were predominantly Black and Brown as riskier areas for investment, making it more difficult for people in these areas to access financial services to support home ownership. Today, redlining is often used more broadly to refer to discriminatory housing practices.

THE RISK: CLIMATE-RELATED HAZARDS AND HOW THEY IMPACT THE REGION

The NENJ region faces a complex array of challenges associated with hazards like flooding, heat, and contamination, and the impacts on the region's people, environment, and infrastructure will continue to worsen without significant investment. The climate is changing to increase the frequency and magnitude of climate hazard events. Meanwhile, changes to the built and natural environment over time have made NENJ communities more vulnerable.

The region has a storied and complex relationship with water as a source of both vitality and destruction. It is a coastal region and much of its land was formerly wetlands that supported the Lenape people. Through colonization and industrialization, the Lenape people were displaced and the wetlands were filled, which destroyed natural ecosystems and weakened people's relationship with water while making the region more vulnerable to flooding and heat at the same time. The waterfront today, for example, offers open space, economic opportunity, and sweeping views of the Manhattan skyline, while also presenting risks like those exposed during Hurricane Sandy in 2012, the remnants of Hurricane Ida in 2021, and the heat waves of 2022.

Resilient NENJ's detailed Flood Impact Assessment investigated current and future flooding conditions and estimated the potential financial losses that the region could face from various types of flooding. As described in the Flood Impact Assessment report, the region stands to lose an estimated \$6 billion from future areal (extended rainfall) flooding. Now and in the future, NJDEP models show that flooding from an intense rainfall event will be widespread and most concentrated in areas like the Ironbound in Newark and southwest Hoboken. The region is densely populated with increasing amounts of impervious surfaces, such as concrete and asphalt. As NENJ continues to grow, combined sewer systems designed for past population and rainfall levels are undersized, further contributing to flooding from rainfall and water quality and public health concerns.

In the future, NJDEP models show that storm surge flooding will affect large areas along the Hudson River, New York Bay, Newark Bay, Passaic River, and Hackensack River, and estimate \$31 billion dollars in losses from this flooding. Overall, the NJDEP models predict that 280,000 residents will have their homes exposed to either rainfall or coastal storm surge flooding, representing over 40 percent of the population in the region (2 out of every 5 residents). Of these residents, half live in areas of high social vulnerability, according to the Center for Disease Control's Social Vulnerability Index (SVI). The SVI looks at fifteen different factors, such as income, language, and age to identify people who are more likely to need support to prepare, respond to, or recover from a flood or other disastrous event.

Exposure to other hazards, such as heat and poor air quality, poses risks to the health of the region's people and environment. For example, the region ranks high in the State and nation for cancer risk from air toxics and proximity to hazardous waste. Groundwater often rises along with sea level rise, and risk of groundwater rise in contaminated sites must be better understood.

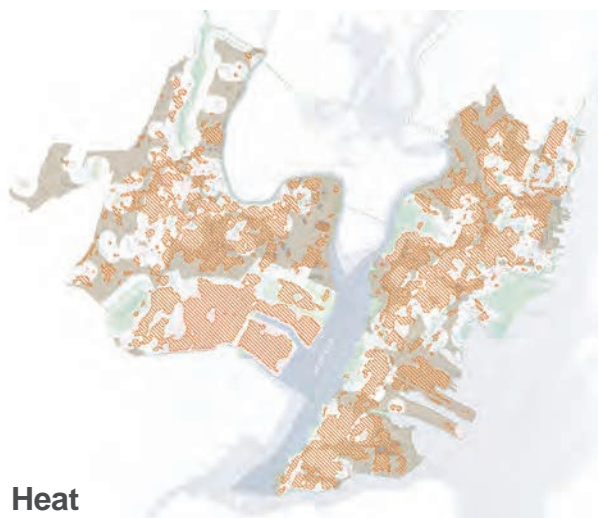
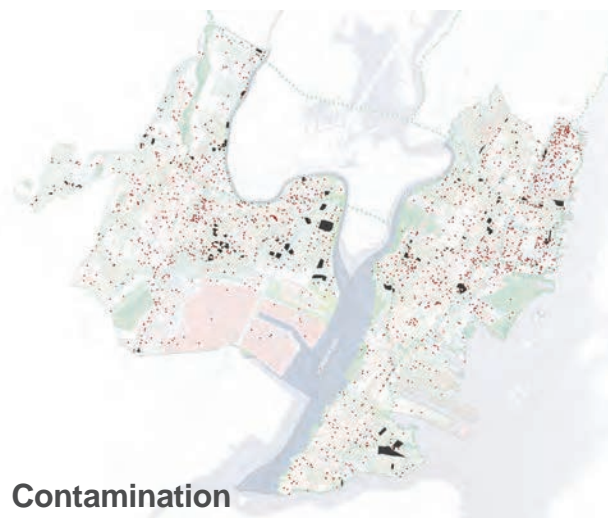
Climate-related hazards are not the only important issues for the region, which also grapples with challenges that span beyond its boundaries, such as the lingering COVID-19 pandemic, housing and affordability issues that are linked to broader economic challenges, and concerns over access and quality of education and healthcare. People in positions to address these issues must decide how to prioritize their time and resources. Fortunately, many actions that aim to increase climate resilience also address other issues.

THE SCIENCE BEHIND THE PLANNING

Resilient NENJ used best available scientific information about climate-related hazards and how they might change, including:

- New flood models that NJDEP developed for the Resilient NJ program.
 - These models incorporated sea level rise projections from the **2019 New Jersey's Rising Seas and Changing Coastal Storms Report by the Science and Technical Advisory Panel (STAP)**.
- Climate change projections from the **2020 New Jersey Scientific Report on Climate Change**
- Climate change projections and data available in reports from the **International Panel on Climate Change (IPCC)**
- Information on climate-related hazards and impacts through data available in the **NJfloodmapper.org** tool developed by Rutgers University (in collaboration with others)

As new data becomes available about our changing risk context, the Resilient NENJ team will need to integrate those data to ensure sound decision making over time. The **Flood Impact Assessment** and **Climate Hazards Assessment** also include recommendations for the State related to closing data gaps and for tools to address non-flooding climate hazards.



*Mapped Resilience factors to be considered when siting Green Infrastructure, see **Section 3.2.3** for more details on climate hazards.*

Data Sources: NJGIN Open Data Known Contaminated Site List Layer - Heat severity dataset by TPL, accessed through ESRI - Parcels and MOD-IV Composite of NJ; Impervious Surface of NJ from Land Use/Land Cover (2012)

WHAT DO OUR RECOMMENDATIONS FOR INCREASING RESILIENCE INCLUDE?

THE VISION

Through the community engagement process, Resilient NENJ asked people what they love about their communities and how they would like their communities to change in the future. This feedback helped establish a regional community vision, organized by pillars of resilience (environmental, economic, social, physical, and governance). Resilient NENJ developed the resilience strategy, described on **page 23**, and the recommendations in this Action Plan with the goal of aligning with the community vision while addressing the region's unique challenges and risks.

REGIONAL COMMUNITY VISION FOR THE FUTURE

ENVIRONMENTAL



- More green space and trees
- Use of green infrastructure
- Less trash in the streets
- Cleaner water bodies

ECONOMIC



- New high-quality green jobs, and training for those jobs
- Economic diversity and preservation of small businesses

SOCIAL



- Preserve sense of home, community, and cultural diversity
- Improved cleanliness, health & safety, food access
- More affordable housing
- More parks and public spaces

PHYSICAL



- Improved access to transportation
- Improved pedestrian & biker experiences

GOVERNANCE

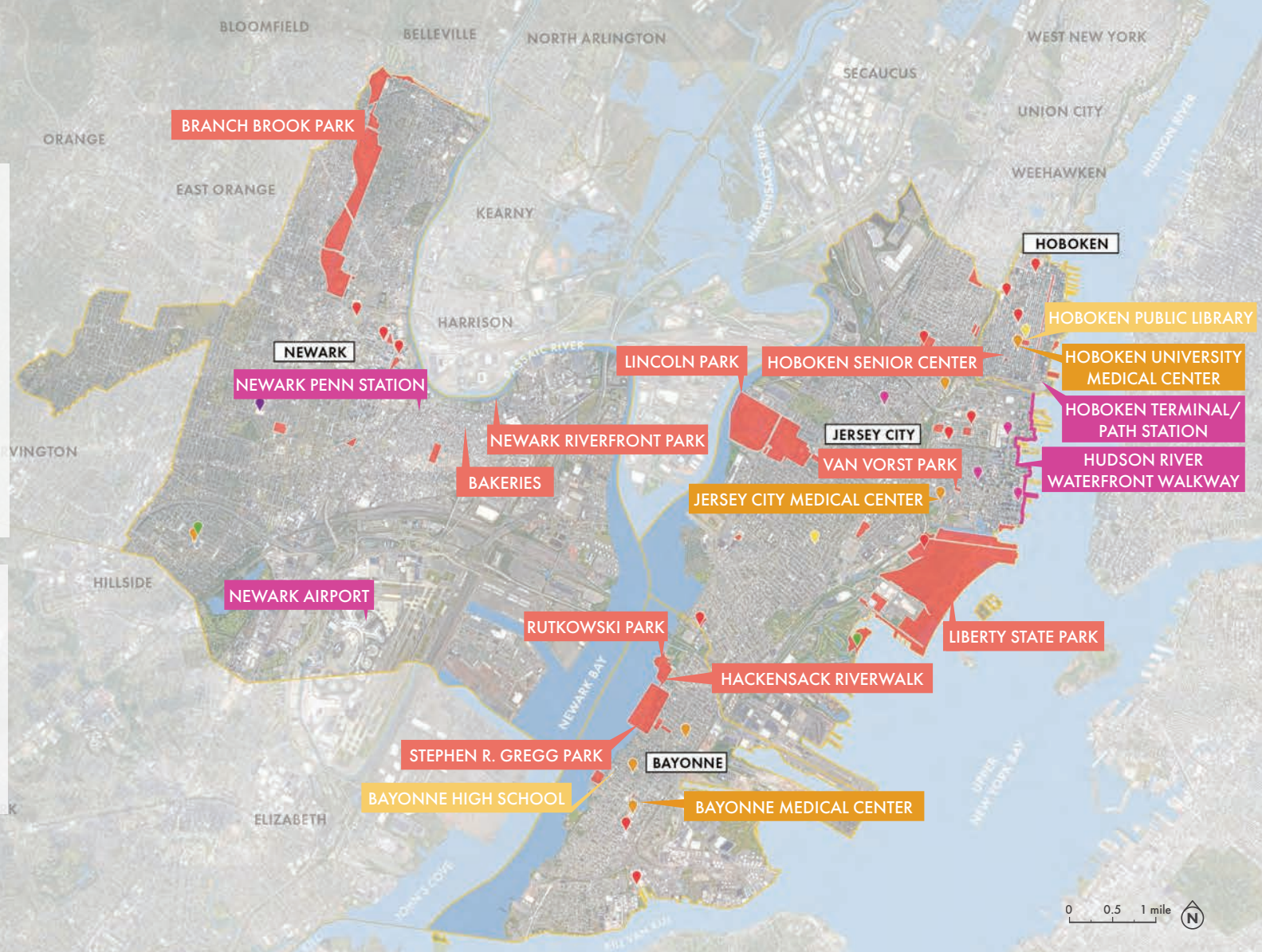


- Greater transparency in government
- Greater public involvement and investment in relationship between government & community members

Community Identified Assets

-  **Ecosystem and environmental health** (natural areas, critical habitats, etc.)
-  **Health, safety, and emergency response** (hospitals, police, fire, etc.)
-  **Industry and business** (industrial sites, private businesses, major employers, etc.)
-  **Infrastructure** (public transit stations and routes, airports, utilities, etc.)
-  **Public services and institutions** (schools, community centers, libraries, etc.)
-  **Quality of life and culture** (parks, restaurants, festivals, etc.)

We heard about many places and services that are important to community members like parks, community centers, and transportation services. This map shows assets that were specifically called out to give us a general picture of the types of places that matter most.



We asked: What do you value most about your community?

"It's both a village and a city" – Hoboken resident

"I see faces like mine" – Jersey City resident

"Diversity of family-owned businesses! I love being able to shop local and support minority-owned businesses" – Newark resident

"Looking out for each other" – Bayonne resident

"Family-friendly feel and inclusivity" – Jersey City resident



THE STRATEGY

The Action Plan's strategy revolves around themes of EASE, PROTECT, CONNECT, THRIVE, and REGENERATE. The region's ability to THRIVE and REGENERATE should arise from pursuing the first three themes through actions that EASE, PROTECT, and CONNECT.

EASE

Recommendations seek to EASE the technical, financial, resource, and health burdens associated with climate hazards, and to “take the edge off” the highest risks and people while improving quality of life. For example, increasing green infrastructure, depending on the area and design, can help ease frequent flooding from rainfall, urban heat, and quality of water and air and can improve access to green space.

PROTECT

Recommendations lean mostly into the PROTECT strategy for flood hazard. This means keeping water out or removing it, rather than using an approach like retreat, due to the density of the region and the nature of the risk. Retreat would be a challenging strategy in this region due to the concentration of people and critical infrastructure systems, and an approach such as protect allows communities to stay intact in the near-term, while also providing ways to get people out of harm's way during emergencies.

CONNECT

The recommendations focus on CONNECTivity – this includes walkability and access to the waterfront and green space, as well as improving collaboration, consistency, and access to information and resources.

THRIVE

By starting with our areas of most need and opportunity, by having multiple options in case a first line of defense fails, and by focusing on improvements that can connect our communities more effectively to themselves, we will position ourselves to build trust and momentum, adapt, and build capacity to THRIVE in the coming century, in alignment with the identified community vision.

REGENERATE

Thriving requires that we continue to adapt, to work away at the risk, and REGENERATE our communities, as well as advance the living plan as more information becomes available.



EASE

PROTECT

CONNECT

THRIVE

REGENERATE

THE PLAN

There is no silver bullet to adapt the region for climate change. The region needs different types of actions to address various sources of risk, at multiple scales, led by a range of stakeholders. Due to the sheer magnitude of risk, actions are needed on both public and private properties. The actions require a strategic array of funding sources and must be phased over time. Through extensive community and stakeholder collaboration, technical analyses, and with guidance from NJDEP, Resilient NENJ developed a multi-pronged strategy for increasing resilience.

This Action Plan proposes a range of types of actions that align with the community vision and address risk. The actions fall into one or more of five categories for solution types. Further, each action increases resilience through changes to the built environment or changes to the way that people work together. Actions can also be classified into capital projects (actions that will change the built or natural environment through construction of physical and nature-based solutions) and non-capital actions (actions that will change the way we work together through policy and governance;

TOOLBOXES

Action Plan recommendations build off various toolboxes developed and evolved through engagement. The Flood Resilience Toolbox is available in the **Vision & Priorities** report and the Climate Hazard Resilience Toolbox is available in the **Climate Hazards Assessment** report.

ACTIONS THAT CHANGE OUR PHYSICAL ENVIRONMENT

Physical & Nature-Based Solutions page 86



Recommended Changes to Policy & Governance page 186



CAPITAL PROJECTS

outreach, education, and capacity building; service and program development; and emergency preparedness or will change the built or natural environment through policies or programs). Within actions that change the built environment, actions may primarily address coastal flooding, stormwater flooding, or other climate-related hazards. **Pages 27 and 28** show the actions recommended by Resilient NENJ, which are further described in **Section 3.0**. **Section 3.0** also shows where actions align with the themes of EASE, PROTECT, and CONNECT.

The recommended actions leverage, continue, expand, and multiply efforts already completed or underway within the region. Resilient NENJ documented projects, plans, and initiatives that exist separately from the program, and integrated recommendations related to these other efforts as relevant (see **Appendix A**).

Outreach, Education, & Capacity Building page 206

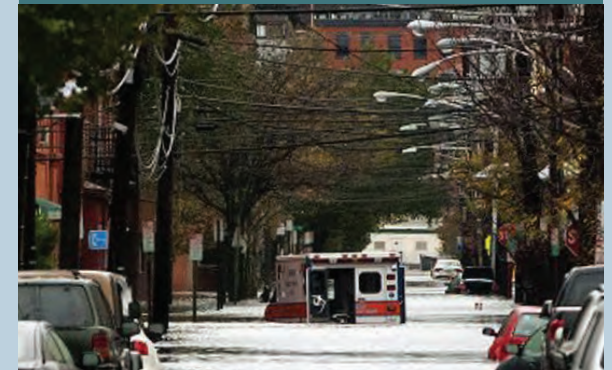


Service & Program Development* page 230



ACTIONS THAT CHANGE THE WAY WE WORK TOGETHER

Emergency Response & Preparedness* page 244



*includes some capital project aspects

NON-PHYSICAL ACTIONS

THE ACTIONS

THAT WILL CHANGE OUR BUILT AND NATURAL ENVIRONMENT

Coastal	Actions that address coastal and tidal flooding (Section 3.2.1)
Stormwater	Actions that address stormwater flooding (Section 3.2.2)
All Hazards	Actions that address other climate-related and environmental justice needs (Section 3.2.3)

Section 3.2.1: Actions that address coastal and tidal flooding

- Coastal-01:** Add physical flood barriers to ease flooding and protect communities
- Coastal-02:** Raise existing infrastructure to act as barriers and protect communities
- Coastal-03:** Integrate flood protection into parks, walkways & boardwalks
- Coastal-04:** Provide flood protection at the site and building scale
- Coastal-05:** Take action to restore the coastal environment
- Coastal-06:** Adopt additional land use policies to reduce flood risk
- Coastal-07:** Update flood damage prevention ordinances

Section 3.2.2: Actions that address stormwater flooding

- Stormwater-01:** Separate stormwater to safe, dedicated outfalls
- Stormwater-02:** Direct stormwater to deep storage and conveyance infrastructure
- Stormwater-03:** Improve natural drainage corridors
- Stormwater-04:** Reduce stormwater volume through stormwater management sites
- Stormwater-05:** Reduce impervious surface and improve conveyance through green infrastructure
- Stormwater-06:** Provide guidance to more quickly integrate stormwater management in open space
- Stormwater-07:** Update stormwater management ordinances

Section 3.2.3: Actions that address other climate-related and environmental justice needs

- All Hazards-01:** Provide green space and green infrastructure where it can have the most impact
- All Hazards-02:** Reduce risk from and incorporate resilience into contaminated sites
- All Hazards-03:** Incorporate resilience in new development, public space, and infrastructure

THAT WILL CHANGE THE WAY WE WORK TOGETHER

Policy	Policy and Governance (Section 3.3.1)
Outreach	Outreach, education, and capacity building (Section 3.3.2)
Service	Service and program development or enhancement (Section 3.3.3)
EM	Emergency preparedness and response (Section 3.3.4)

Section 3.3.1: Actions that improve policy and governance

Policy-01: Continue and advance regional collaboration

Policy-02: Increase coordination on infrastructure investments

Section 3.3.2: Actions that support outreach, education, and capacity building

Outreach-01: Provide a “single source of truth”

Outreach-02: Expand leadership and capacity to manage climate risk

Outreach-03: Conduct a Resilience 101 Campaign

Outreach-04: Increase availability of project-related information on websites

Outreach-05: Improve outreach to and emergency planning for vulnerable and at-risk populations

Outreach-06: Conduct youth engagement

Outreach-07: Leverage community expertise and advance real-time understanding of hazard conditions

Outreach-08: Improve systems for post-disaster recovery funding

Section 3.3.3: Actions that develop or enhance services and programs

Service-01: Create resilience hubs

Service-02: Reduce waste impacts

Service-03: Increase resident access to resilience-related resources

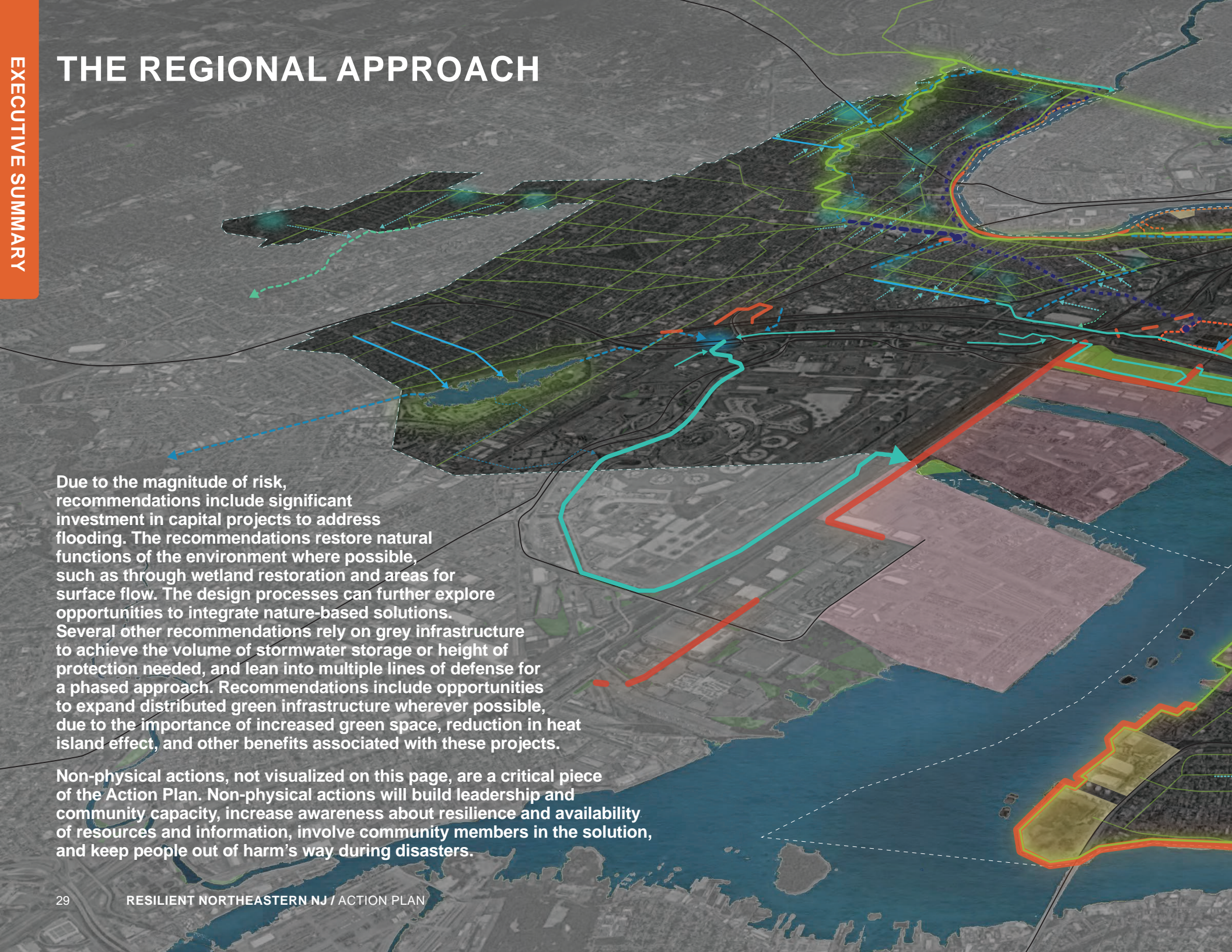
Section 3.3.4: Actions that support emergency preparedness and response

EM-01: Improve community preparedness through communication and warning systems

EM-02: Support scalable response to flood events and other climate emergencies

EM-03: Improve availability and access to financial assistance systems for recovery

THE REGIONAL APPROACH



Due to the magnitude of risk, recommendations include significant investment in capital projects to address flooding. The recommendations restore natural functions of the environment where possible, such as through wetland restoration and areas for surface flow. The design processes can further explore opportunities to integrate nature-based solutions. Several other recommendations rely on grey infrastructure to achieve the volume of stormwater storage or height of protection needed, and lean into multiple lines of defense for a phased approach. Recommendations include opportunities to expand distributed green infrastructure wherever possible, due to the importance of increased green space, reduction in heat island effect, and other benefits associated with these projects.

Non-physical actions, not visualized on this page, are a critical piece of the Action Plan. Non-physical actions will build leadership and community capacity, increase awareness about resilience and availability of resources and information, involve community members in the solution, and keep people out of harm's way during disasters.



LEGEND

Coastal Actions

- Road Raising
- Flood Barrier
- Bulkhead Barrier
- Planned Land Raising
- Areas for Adaptation
- Green Street Corridor
- Wetland/Living Shoreline
- Greenways

Drainage Solutions

- Deep Tunnel
- New Parallel Interceptor
- New Main
- New Drainage Line
- Sewer Separation
- Ditch Drainage
- Retention Sites
- Detention Sites

HOW TO GET THIS DONE

Climate-related risk affects everyone in NENJ, directly or indirectly. Just as climate risk is ubiquitous, implementation requires coordinated action across many different types of actors at multiple scales and dedicated funding from a variety of different sources. Everyone has a part to play, but someone will always need to take the lead. The leader will vary depending upon the action.

Advancing the recommendations will involve reconfiguring existing capital and operational programs to focus on resilience elements. The region may need new funding sources, programs, and departments or entities dedicated to resilience measures.

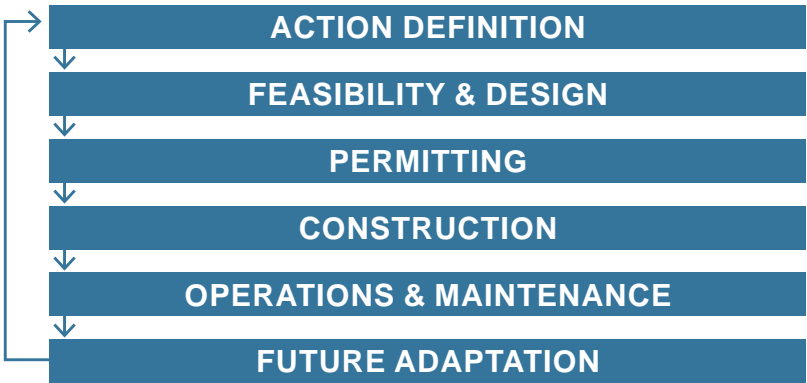
Implementation costs will vary significantly for each action. Some actions, such as providing additional information on websites, require little to no additional allocation of funds. Other actions, such as hiring additional staff dedicated to resilience, may not have high price tags but will require new allocations of funds. Costs for other actions, such as physical flood barriers, could vary significantly depending on the location and be upwards of hundreds of millions of dollars to design and build.

Feasibility studies will refine approach, design, costs, and schedule for major capital investments recommended in this Action Plan. Implementation of other projects, political will and public support, and funding availability will also affect factors such as cost and schedule. Further, Resilient NENJ exists in a dramatically changing risk context that scientists, planners, engineers, and others are all actively working to understand and anticipate. As new data and science emerge, and the people, places, and needs of the region evolve, new and different actions may be needed. As such, Resilient NENJ's Action Plan should be considered a living document.

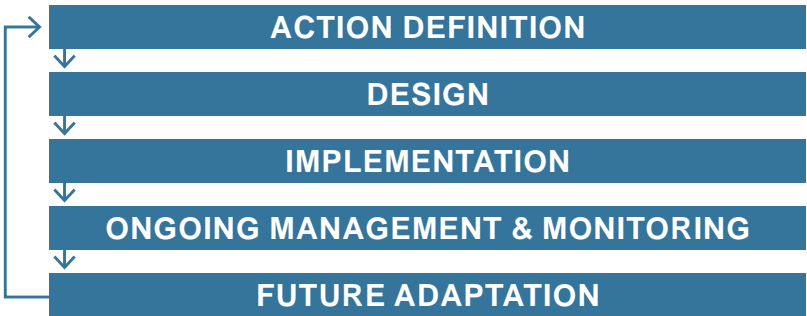
The Action Plan summarizes individual actions, providing high level cost estimates, roles by stakeholder, and information about key considerations and evaluation criteria for each (see Section 3.0). The roadmap outlines timelines for implementation and ideal sequences, identifies responsible parties and support needs, projects year-over-year cost needs, and ties actions to funding sources (see Section 5.0).

What are the stages of implementation for...

An action that will change the built or natural environment through construction?



An action that will change the way we work together or a policy or program that will affect the built and natural environment?



This Action Plan covers a large geographic area and a broad range of solutions. Physical and nature-based solutions that involve construction will need feasibility studies and conceptual and detailed design before progressing to construction. Next steps for non-physical solutions may include more detailed program development, writing of ordinances or codes, or planning and implementation of engagement.

THE RESILIENT NENJ REGION BY THE NUMBERS

4 municipalities

700,000 residents here today

46 square miles

65 miles of coastline

Over \$81B in total economic output with 385,800 employees²

40% of existing land is fill

About 20% of the region's population lives below poverty level.³ 2/3 of the population lives in the highest quartile of social vulnerability, and 1/3 lives in census tracts above the 90th percentile of social vulnerability, based on the Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI).⁴

>1,800 known contaminated sites

>\$30B in expected losses from a future Hurricane Sandy⁵

>\$5.2B - 5.9B in expected losses from a major rainstorm⁶

Approximately \$13B in projected new investment regionwide needed over the next 20 years

Recommended reassessment every 5 years

² Based on 2019 IMPLAN data

³ Based on 2021 US Census Bureau Population Estimates Program data

⁴ 2018 CDC Social Vulnerability Index

⁵ Hurricane Sandy 2012 high water marks with 2.4 feet of sea level rise

⁶ 8.3 – 9.2 inches of rainfall over 24-hours

IMPLEMENTATION OF THE RESILIENT NENJ ACTION PLAN WILL REQUIRE

LEADERSHIP

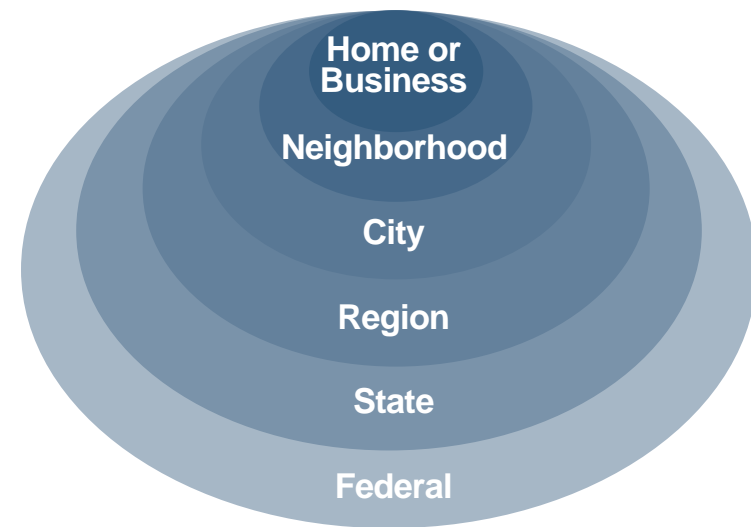
COORDINATION

FUNDING

FROM WHO?



AT WHAT SCALES?



BY WHAT MEANS?

- Continuation of Resilient NENJ as a coordinating and leadership body
- Local, regional, and state subgroups to provide focus and drive specific initiatives forward
- Direct funding allocations, grants, staff resource allocation, refinement and refocusing of existing planned investment, and possibly new revenue generation.

WHEN?

The time for action is now. Resilient NENJ proposes implementing these initial recommendations over the next 20 years, with significant activity around capacity building, funding, and initial next steps over the next three years. This is because most of the recommended actions are needed now based on current climate risk in the region. Resilient NENJ recommends reassessing and updating the plan every 5 years, with ongoing coordination toward implementation.

THE NEXT THREE YEARS

This Action Plan and the other efforts that are ongoing in the region are just the beginning of the process to create a more resilient NENJ. In the near term, priorities to continue advancement of this Action Plan include:

- 1 Creation of resilience committees at different levels of government and infrastructure agencies (including creation of an Infrastructure Coordination Council) and coordination between representatives of each and Resilient NENJ
- 2 Allocation of funding at the federal, state, regional, and local scales to support advancement of recommendations and increased staff capacity
- 3 Coordination on funding programs and approvals processes at the State level to facilitate advancement of multi-functional projects
- 4 Alongside #3, creation and advancement of a pipeline of parks, contaminated sites, vacant lots, or other sites to convert to green space and other uses with flood mitigation and climate resilience components
- 5 Program development and continuation of outreach initiatives as a collaboration between Resilient NENJ, the municipalities, community-based organizations, and academia
- 6 Advancement of the capital projects and strategies identified in **Section 3.0** and **Section 5.0** of the roadmap, while striving for a “dig-once” approach to construction

WHAT YOU CAN DO NEXT

- Share this Action Plan with your friends, family, neighbors, and colleagues
- Reach out to elected officials to advocate for actions you want to see happen
- Continue to carefully review the Action Plan and stay informed about and involved in the implementation process to the extent that works for you
- Learn more about your own risks and take steps to improve your preparedness, and spread the word



NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION



RESILIENT
NORTHEASTERN
NEW JERSEY