

## Continuing Education Units | CEU's

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### Planning for Local Responses to Climate Change

November 16, 2023  
New Jersey League of Municipalities Conference

IG: Sustainable\_Jersey | Twitter: @SJ\_Program and @SJ\_Schools | FB: @SustainableJersey | LinkedIn: sustainable-jersey

Other questions, please consult the *League Staff at the Information Booth on Level 2*



# Planning for Local Responses to Climate Change

November 16, 2023

New Jersey League of Municipalities Conference



# Panel Speakers



**Mayor Janice Kovach**



**Meghan Leavey**



**Tanya Rohrbach**



**Anne Heasley**

# Town of Clinton

Mayor Janice Kovach





# Climate Resilience Planning in New Jersey

Overview of Planning Initiatives, MLUL CCRHVA Requirements & DEP Resources

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Meghan Leavey, PP, AICP, GISP

Lead Planner | Resilient NJ Program Coordinator

Office of Climate Resilience | Bureau of Climate Resilience Planning





## EXECUTIVE ORDER 89:

### Scientific Report on Climate Change

“The Climate and Flood Resilience Program, under the direction of the Chief Resilience Officer, shall **develop a Scientific Report on Climate Change** based on existing data and the best available science regarding the current and anticipated environmental effects of climate change in New Jersey.”

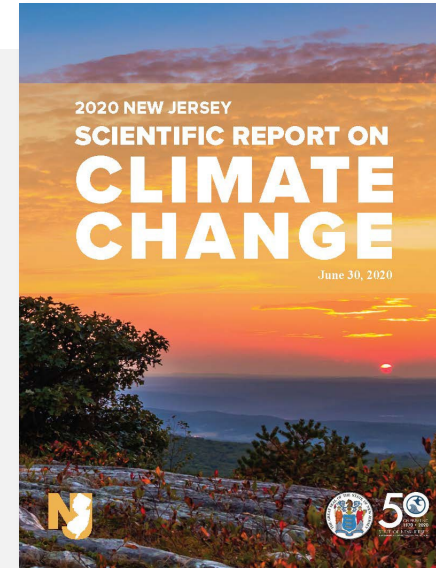
# SCIENTIFIC REPORT

## on Climate Change

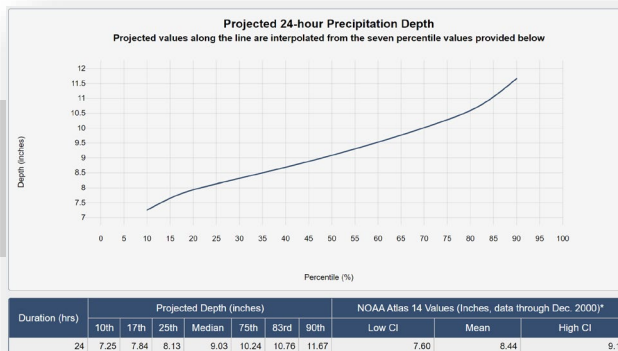
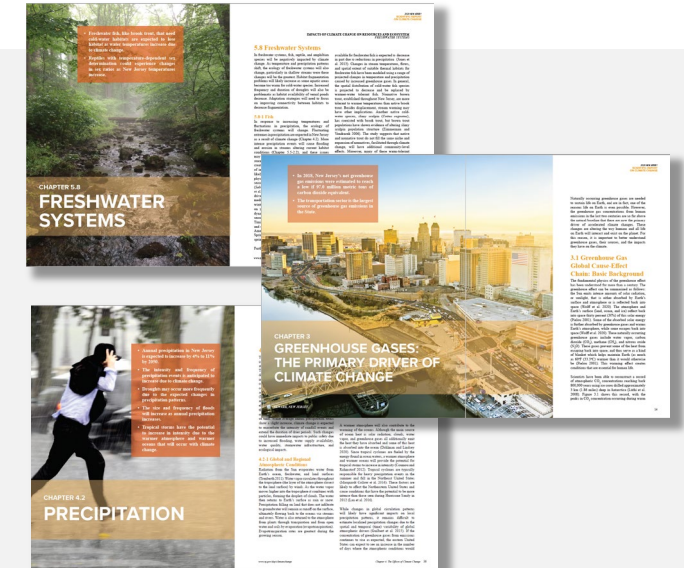
<https://dep.nj.gov/climatechange/resources/reports/>

### Overview

- Comprehensive effort to synthesize the latest and most reliable scientific information on the current and predicted future impacts of climate change.
- The report is one component of the State's comprehensive strategy to both reduce emissions of climate pollutants that fuel global warming, and proactively plan and prepare for the climate impacts that New Jersey cannot avoid.



Released June 30, 2020



Nov. 2021: Updated Atlas 14 data;  
Extreme Event Precipitation  
Projections & Projection Tool



Sept. 2022: Climate Change  
Impacts on Human Health &  
Communities Addendum released





## EXECUTIVE ORDER 89: Climate Change Resilience Strategy



**“A Statewide Climate Change Resilience Strategy to promote the long-term mitigation, adaptation, and resilience of New Jersey’s economy, communities, infrastructure, and natural resources throughout the State in a manner consistent with the Scientific Report on Climate Change.”**



# CLIMATE RESILIENCE

d e f i n e d

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.

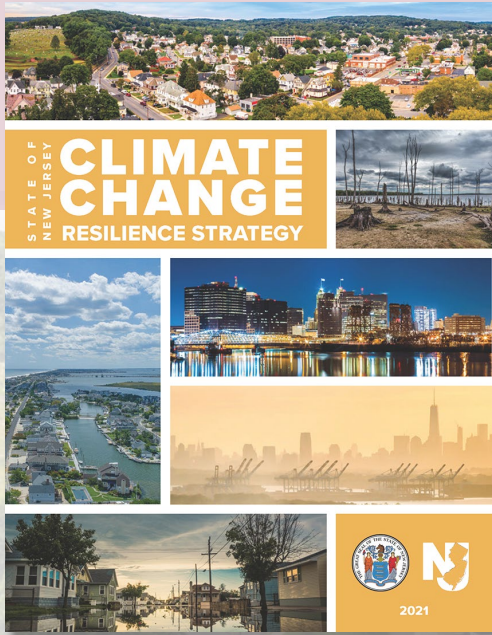


STATE OF  
NEW JERSEY

## CLIMATE CHANGE

RESILIENCE STRATEGY





**PRIORITY 1.  
BUILD RESILIENT  
AND HEALTHY  
COMMUNITIES**

1

**PRIORITY 2.  
STRENGTHEN THE  
RESILIENCE OF  
NEW JERSEY'S  
ECOSYSTEMS**

2

**PRIORITY 3.  
PROMOTE  
COORDINATED  
GOVERNANCE**

3

**PRIORITY 4.  
INVEST IN  
INFORMATION &  
INCREASE PUBLIC  
UNDERSTANDING**

4

**PRIORITY 5.  
PROMOTE CLIMATE-  
INFORMED  
INVESTMENTS &  
INNOVATIVE  
FINANCING**

5

**PRIORITY 6.  
COASTAL  
RESILIENCE  
PLAN**

6

- Integrate resilience into local and regional planning
- Increase technical assistance programs to address community resilience

- Protect valued natural lands and resources
- Incorporate natural and nature-based solutions for resilience

- Engage local governments and other partners to develop resilience solutions
- Incorporate equity and inclusion in resilience decision-making

- Incentivize and support community resilience planning
- Support movement to safer areas



# RESILIENT NJ

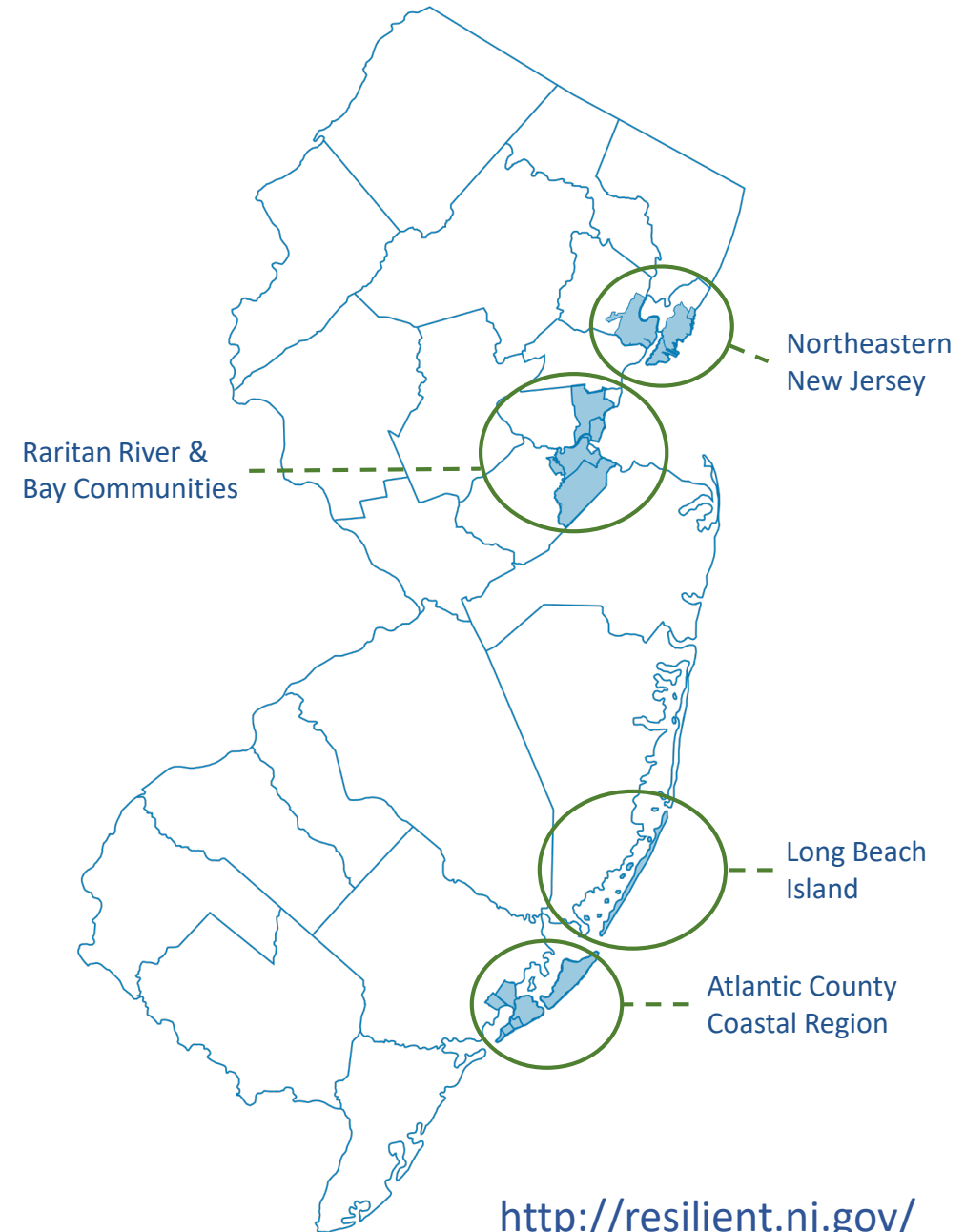
## REGIONAL PLANNING PROGRAM

Launched in 2020 by DEP

Goal: Produce community-led resilience & adaptation action plans

### Ongoing initiatives:

- Regional Planning Program in four regions (+ more planned for 2024)
- Municipal Assistance Program in five municipalities (+ over 15 more planned for 2024)
- Online toolkit for municipalities to conduct resilience planning on their own



<http://resilient.nj.gov/>



Goal: Produce community-led climate resilience & adaptation action plans

## REGIONAL PLANNING PROGRAM

Comprehensive resilience action plan development based on climate change criteria and high-level goals that deliver innovative responses to the identified vulnerabilities.

## MUNICIPAL ASSISTANCE PROGRAM

Direct resilience planning assistance to individual municipalities [in the coastal zone] for development of a local climate resilience strategy and/or climate change-related hazard vulnerability assessment.



*Providing Science and Data*



*Supporting Engagement*



*Assessing Vulnerability*



*Identifying Solutions*





# MUNICIPAL LAND USE LAW

CCRHVA Amendments

## Public Law 2021, Chapter 6 Signed in February 2021

Requires incorporation of a climate change-related hazard vulnerability assessment (CCRHVA) into any Master Plan Land Use Element adopted after the signing.

- CCRHVAs must rely on most recent projections and best available science.
- CCRHVAs must consider environmental effects associated with climate change and contain measures to mitigate reasonably anticipated natural hazards.
- DEP must provide technical assistance as practicable

# CLIMATE CHANGE RELATED HAZARD VULNERABILITY ASSESSMENT

## *Required Elements*

- Analysis of current and future threats to, and vulnerabilities of, the municipality associated with climate change-related natural hazards
- Build-out analysis of future residential, commercial, industrial, and other development in the municipality, and an assessment of the threats and vulnerabilities identified above related to that development
- Identification of critical facilities, utilities, roadways, and other infrastructure that is necessary for evacuation purposes and sustaining quality of life during a natural disaster, to be maintained, at all times, in an operational state
- Analysis of the potential impact of natural hazards on relevant components and elements of the master plan
- Identification of strategies and design standards that may be implemented to reduce or avoid risks associated with natural hazards
- A specific policy statement on the consistency, coordination, and integration of the climate-change related hazard vulnerability assessment with certain other plans adopted by the municipality
- Reliance on the most recent natural hazard projections and best available science provided by the New Jersey DEP



# WHAT DOES THE MLUL DEFINE AS A HAZARD FOR THE CCRHVA?

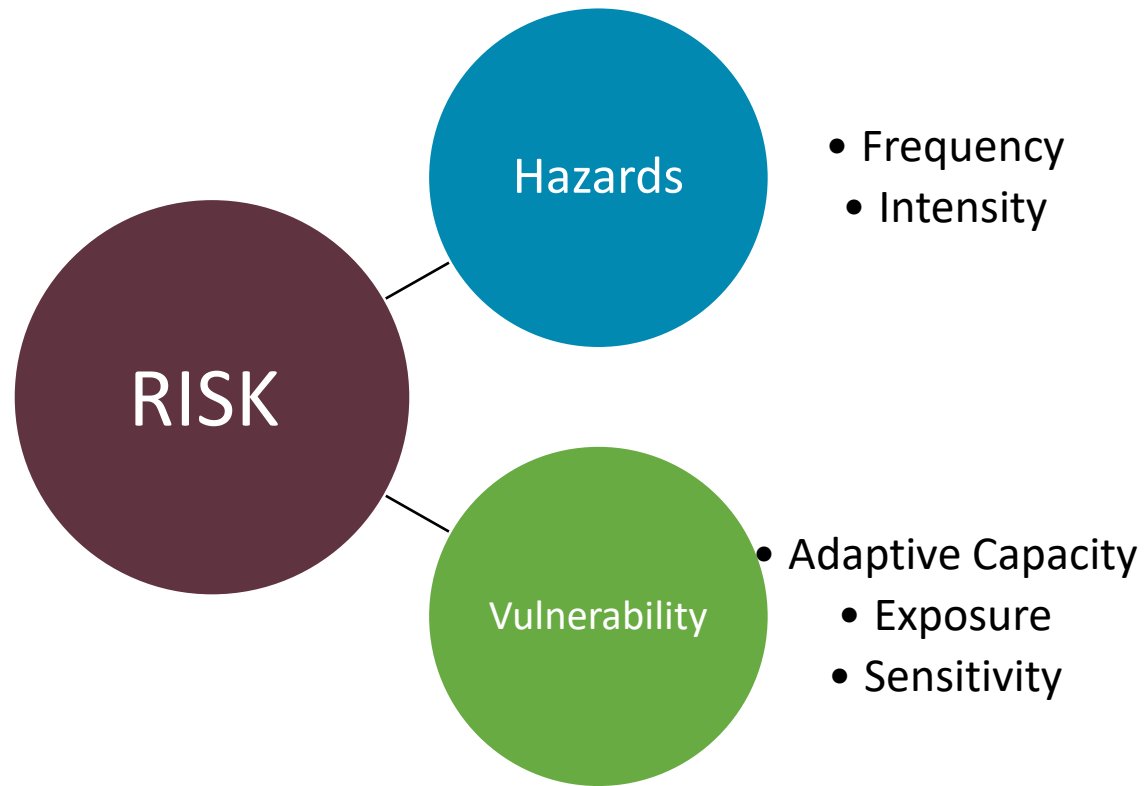
Type of Hazard	Types of Event
Flooding	Riverine Flooding
	Flash Flooding
	Urban Flooding
	<b>Coastal Flooding★</b> (Sea Level Rise & Hurricanes)
Hurricanes	<b>Storm Surge★</b> (Hurricanes)
	High Winds (Hurricanes)
Increased Temperatures	Wildfires
	Extreme Temperature
	Severe Storm Events (Hurricanes, Water Spouts, Derechos, Straight Line Winds, Nor'Easters)
Drought	Mudslides/ Landslides
	Heavy Snow & Ice
	Drought
Sea Level Rise	Vector Borne Disease
	<b>Salt Water Intrusion★</b>
	<b>Ocean Acidification★</b>

★ Applies primarily to coastal communities, but other communities may want to consider the regional impacts of these hazards, for example to local economies or resources.



# RISK, HAZARDS & VULNERABILITY

What does it mean to be Resilient?



## Vulnerability Assessments & Historic Assets

- Use in-depth analyses which include the 3 dimensions of vulnerability
- What are historic and culturally significant assets that may be affected negatively by climate impacts?
  - Locations
  - Structures
  - Artifacts
  - Archives
- What does it mean to their significance if...
  - They disappear/are destroyed?
  - Become inaccessible?
  - Are moved?
  - Are not properly chronicled?
- What does RESILIENCE mean to the History and Historic Preservation community?





# RESOURCES



## RESILIENT NJ: LOCAL PLANNING FOR CLIMATE CHANGE TOOLKIT

- Overview
- Initiate And Engage
- Understanding Your Vulnerability
- Develop A Strategy
- Track Your Progress

# II. UNDERSTAND YOUR VULNERABILITY



## WHAT IS A VULNERABILITY ASSESSMENT?

Vulnerability is the extent to which people, places, systems, or things are prone to, or are unable to cope with, adverse impacts of climate change.

There are three dimensions of vulnerability to climate change:

- **Exposure** is the degree to which a climate variation or change may affect people, places, or systems;
- **Sensitivity** is the degree to which they could be harmed by that exposure; and
- **Adaptive capacity** is the degree to which they could mitigate the potential for harm by taking action to reduce exposure or sensitivity.

A vulnerability assessment combines these three dimensions to illustrate how significant the impacts of a climate change or variation will be on any given population, place, or system. A *risk* assessment takes this analysis one step further by including the probability that the event would occur. A vulnerability assessment provides the basis for understanding what actions should be taken to enhance resilience by reducing exposure and risk to hazards, as well as building capacity and reducing sensitivity to all climate impacts. For certain hazards, such as flood, following the vulnerability assessment with a more thorough risk assessment is critical to help inform prioritization of actions. Questions to consider when assessing vulnerability:

- How is your community exposed to climate change today and in the future?
- How sensitive are the people, places, and infrastructure to this exposure?
- Who or what is most vulnerable and least able to adapt?



## WHAT IF I ALREADY HAVE A VULNERABILITY PLAN?

Hazard mitigation plans are an important foundation for building resilience by helping communities prepare for the hazards they may experience in the near future. However, most recent hazard mitigation risk assessments in New Jersey do not look at climate change projections and therefore will not meet the requirements of the climate change vulnerability assessment outlined in the Municipal Land Use Law or the specifications to meet Plan Endorsement. If you are preparing for a Hazard Mitigation Plan update, you can include future conditions. When thinking about how climate change will impact your community over time, it is important to consider other assets, such as ecosystems or redevelopment planning areas that are not generally included in hazard mitigation plans, as well as other impacts, such as water quality, that may affect municipal operations and quality of life.



# DEP BUREAU OF GIS

## GIS Open Data

NJDEP Bureau of GIS

## NJDEP Open Data

Mapping the Present to Protect New Jersey's Future

View All Data

Explore Data by Category

Welcome to the Open Data site for the New Jersey Department of Environmental Protection's Bureau of GIS

Discover and explore web maps and mapping applications that are associated with environmental interests and concerns in New Jersey and export (download) GIS data that you may use in your own analysis. You can search for GIS datasets to download, view the dataset's metadata (to see if it will suit your needs), and download the complete set of features, or filter in order to download a subset of features located in your area of interest.

## GIS Application Gallery

Home Gallery Map Scene Groups

Gallery for NJDEP Bureau of GIS

Climate

- Item type
- Date modified
- Location
- Tags
- Status

1-10 of 10

Sort by: View count

Application	Date
New Jersey Public Electric Vehicle (EV) Charging Locator	Mar 1, 2022
New Jersey Community Solar PV Siting Tool	Aug 22, 2023
Resilient NJ Local Planning For Climate Change Toolkit	Jun 5, 2023
New Jersey Flood Risk Indicator Tool	Jul 26, 2023
NJ County Solar PV Dashboard	Mar 8, 2023
New Jersey RGGI Climate Investment Dashboard	May 24, 2023

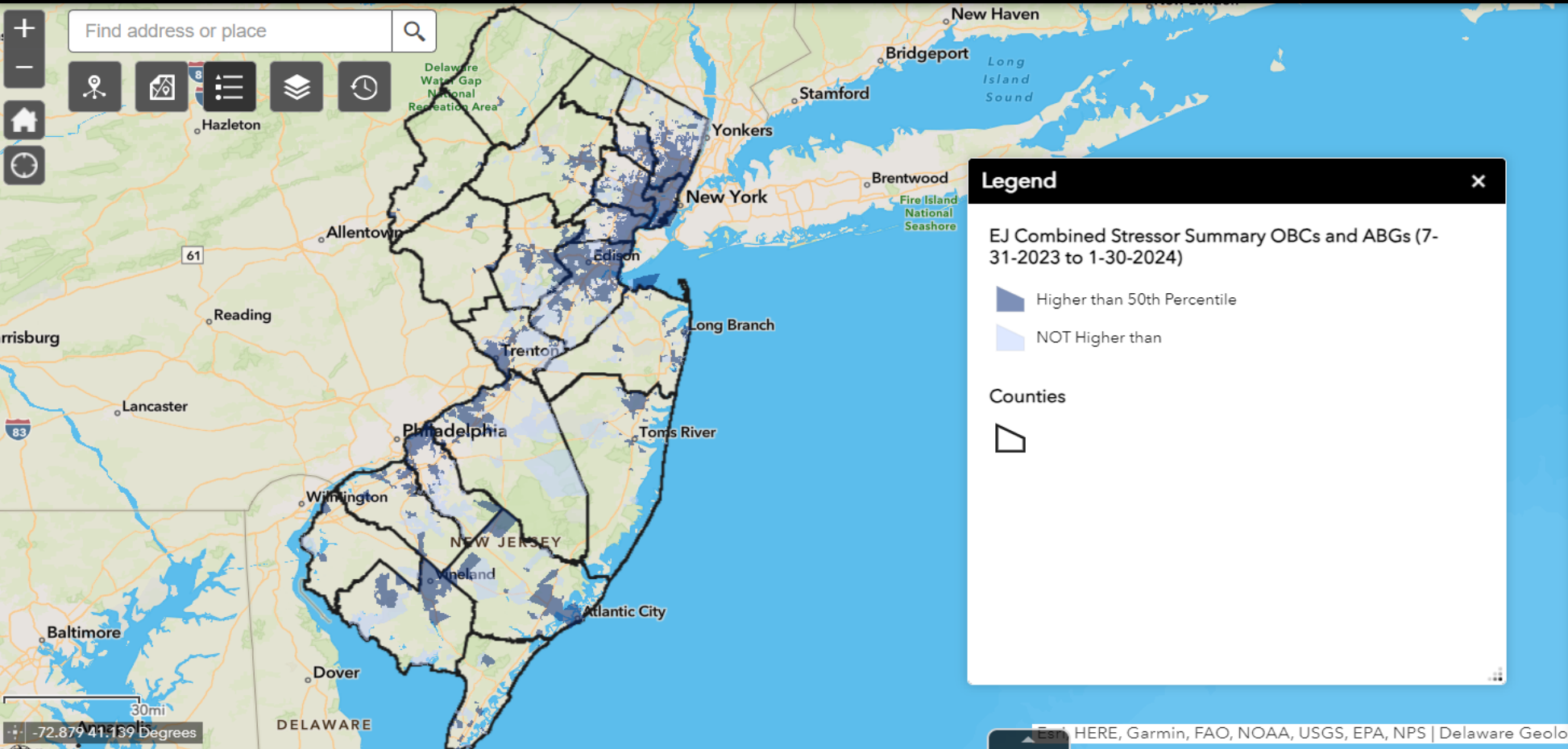
# ENVIRONMENTAL JUSTICE MAPPING, ASSESSMENT AND PROTECTION TOOL (EJMAP)



## Environmental Justice Mapping, Assessment and Protection Tool (EJMAP)

- Introduction
- Overburdened Communities
- Facilities
- Stressor Summary

Stressor Summary NJDEP Home NJDEP EJ Home



### Legend

EJ Combined Stressor Summary OBCs and ABGs (7-31-2023 to 1-30-2024)

- Higher than 50th Percentile
- NOT Higher than

Counties

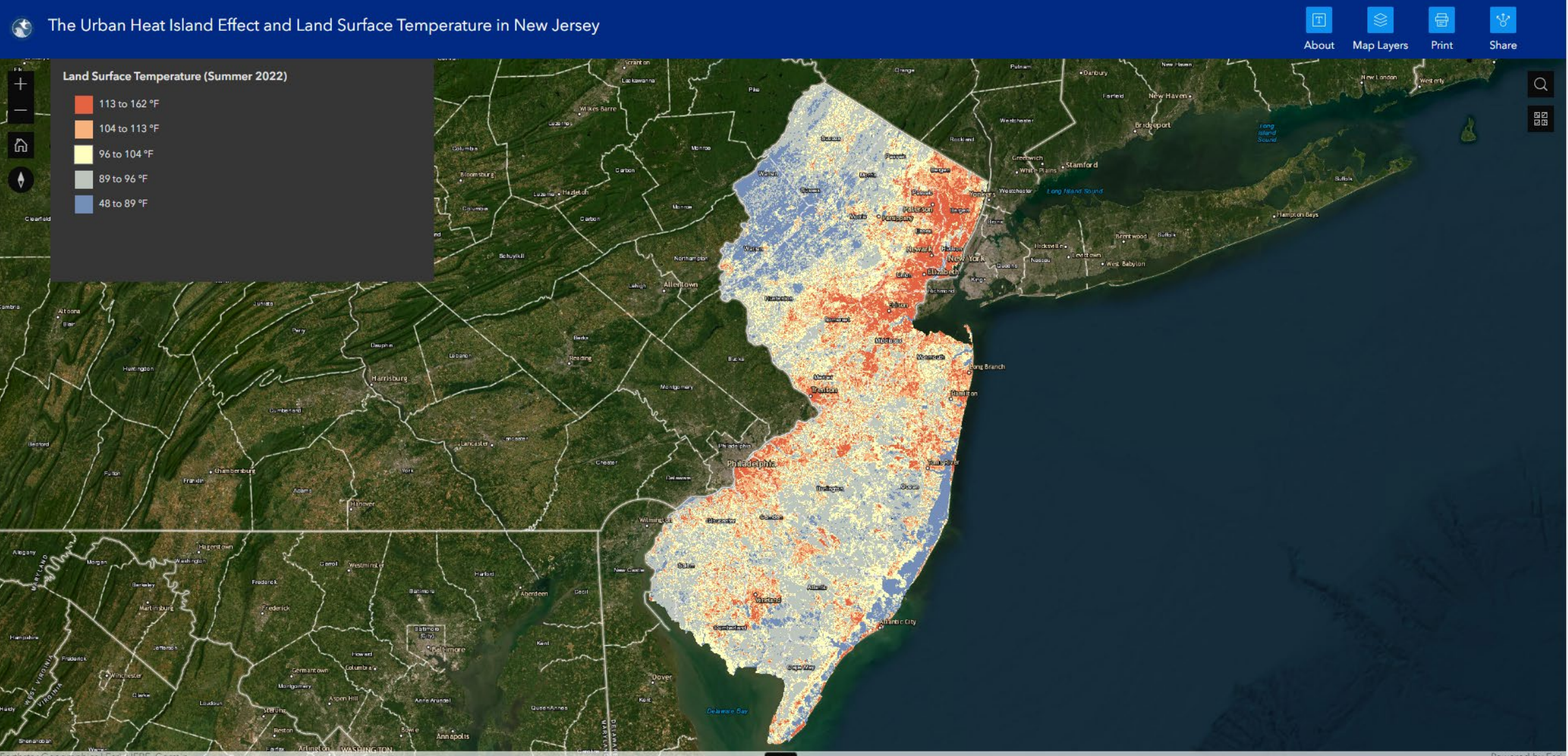
### About

The Stressor Summary tab presents the block group-level data for each of the 26 environmental or public health stressors and the Combined Stressor Total (CST), as well as the Geographic Points of Comparison (GPC) for each. The Geographic Point of Comparison is the lower of the 50th percentile of the State or relevant County Non-OBC block groups. For these calculations, ABGs are included in the non-OBC totals.

The table below shows the GPC values and identifies the GPC used the CST comparison. Using this approach, approximately 2973 out of 3496 OBC block groups (87%) are considered subject to adverse cumulative stressors ("higher than"). OBC block groups that are considered "higher than" account for 57% of the land area where OBC block groups are covered. Clicking any block group brings a pop up with a link to a table with all the relevant information for that specific area.

County	County Non-OBC 50th Percentile	State Non-OBC 50th Percentile	Geographic Point of Comparison
Atlantic	10	13	10
Bergen	15	13	13
Burlington	13	13	13
Camden	14	13	13
Cape May	11	13	11
Cumberland	11	13	11
Essex	15	13	13
Gloucester	11	13	11
Hudson	17	13	13
Hunterdon	11	13	11
Mercer	12	13	12

# URBAN HEAT ISLAND EFFECT & LAND SURFACE TEMPERATURES IN NJ



# Coastal Ecological Restoration and Adaptation Planning (CERAP) Explorer



## Coastal Ecological Restoration and Adaptation Planning (CERAP) Explorer

Layer Selection

Layer Control

Legend

Select Basemap

Find Location

Feedback

Get Help

Filter Areas

Filter Projects

### Filter Projects

If you choose an option and then choose another option from the same dropdown, the filter statement at the bottom includes both items. Choose as many as you would like. To close this panel, click on Filter Projects in the action bar.

[Reset Filters](#)

Filter By Project Status

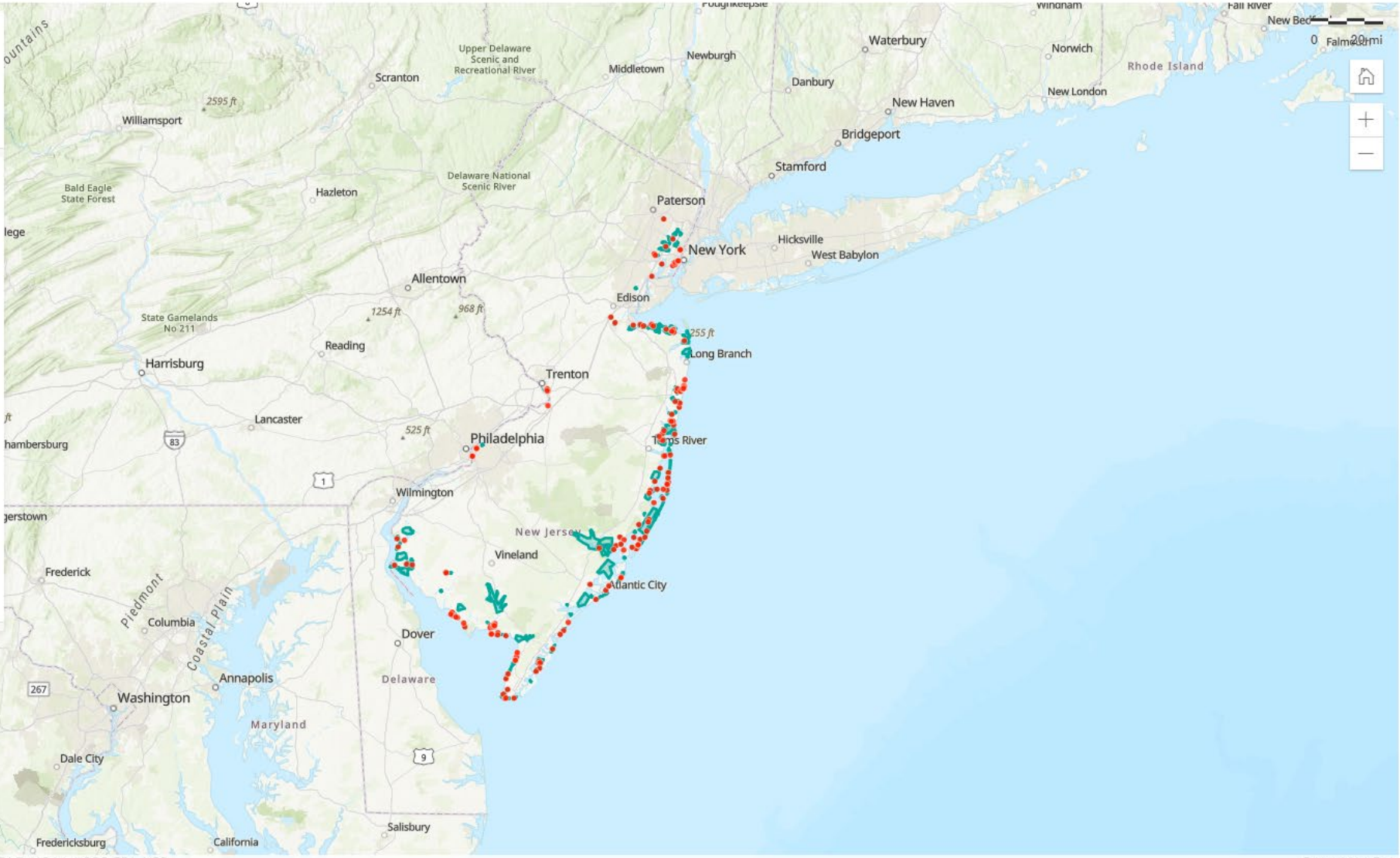
Filter By Funding Status

Filter By Goal

Filter By Tactic

[Show Projects Table](#)

[Export CSV](#)





# Climate Change

<https://dep.nj.gov/climatechange/#>

- Home
- Climate Science
- Curbing Our Emissions
- Preparing for Climate Impacts
- Resources**
- All Topics
- Contact

## Climate Change in New Jersey: Impacts & Effects

Some effects on our state are greater than the average for the country or world. [Learn more](#)



### TEMPERATURE

in NJ has increased 3.9°F since 1895.

[Learn more about heat.](#)

Heat-related hospitalizations in NJ increased 156% from 2004 to 2013.

[Learn more about human health.](#)



### ANNUAL PRECIPITATION

in NJ is expected to increase from 6% to 9% by 2100.

[Learn more about precipitation.](#)



### SEA-LEVEL RISE

could meet or exceed 1.4 feet by 2050. There is a 50% chance.

[Learn more about sea-level rise.](#)



### TROPICAL STORMS

have the potential to increase in intensity due to the warmer atmosphere and oceans that will occur with climate change.

[Learn more about storms.](#)



### EXTREME RAIN

in the Northeast increased by 55% between 1958 and 2016.

[Learn more about extreme rain.](#)



### BIRD SPECIES

are vulnerable to climate change. 29% of all NJ birds will be affected.

[Learn more about birds and wildlife.](#)







# Strategic Climate Action Plan

<https://dep.nj.gov/strategic-climate-action-plan/>

Home

NJDEP wrote the **Strategic Climate Action Plan** in response to [Executive Order No. 100](#) and [Administrative Order No. 2020-01](#), which directed the Department to identify specific rules, guidance documents, and other regulatory mechanisms that will better integrate climate change considerations into the Department's regulatory and permitting programs.

This report sets the course for the Department's next phase of climate action by looking across all its programs to identify additional opportunities to meaningfully prepare the State for the impacts of climate change.

The **Strategic Climate Action Plan** public comment period closed on October 19, 2023.



- [1. TABLE OF CONTENTS >](#)
- [2. Executive Summary >](#)
- [3. Introduction: An Urgent Call to Sustained Climate Action >](#)
- [4. Road to 80x50 >](#)
- [5. Resilience >](#)
- [6. Natural & Working Lands >](#)
- [7. Climate Equity >](#)
- [8. Updating Science & Economic Information >](#)
- [9. Sustainable Waste Management & Recycling >](#)
- [10. Community Investment & Economic Revitalization >](#)



# Contact

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Lead Planner, Bureau of Climate Resilience Planning

[meghan.leavey@dep.nj.gov](mailto:meghan.leavey@dep.nj.gov) | <https://www.nj.gov/dep/bcrp/resilientnj/>

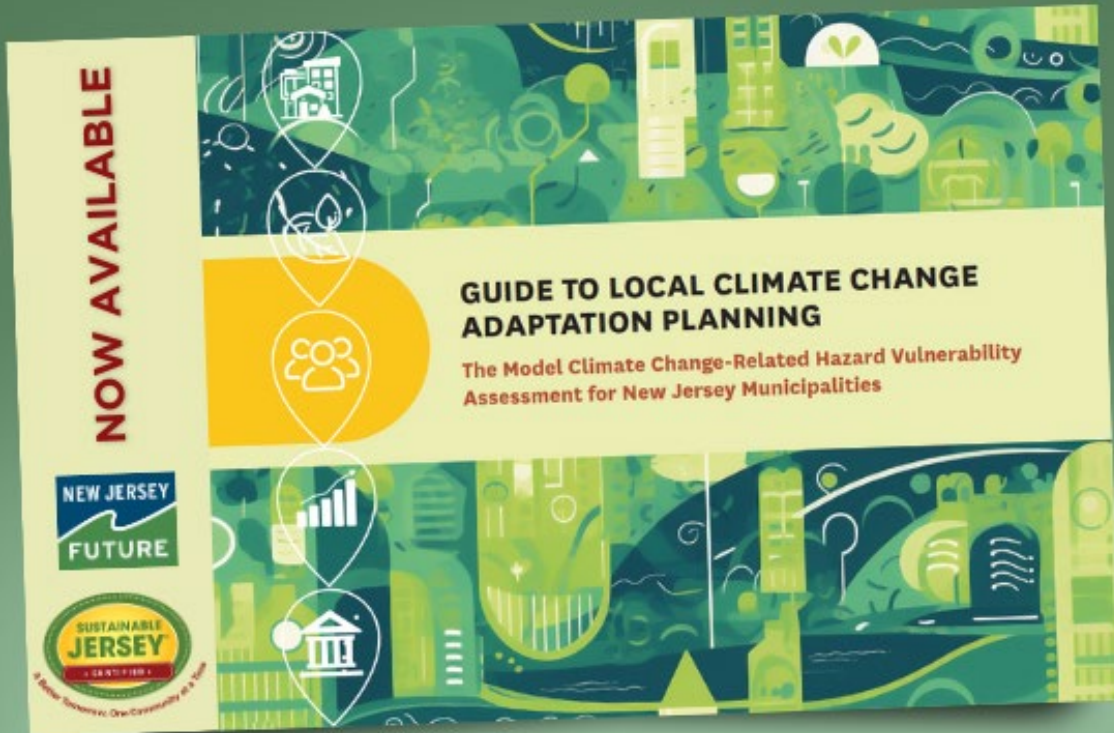


# **Planning for Local Responses to Climate Change**

New Jersey League of Municipalities Conference

November 16, 2023

Tanya Rohrbach



- **Practitioner's Guide**
  - Ask your planner to help you figure out the best approach for your community.
  - Detailed worksheets and methodologies through links within the guide.
- **Process Guide**
  - Flexible approach, but comprehensive in information.
- **Practical Guide**
  - Specifies steps that meet the MLUL.
  - Provides a pathway for going beyond the MLUL.



<https://www.njfuture.org/ccrhva/>

# Inside the Guide

## Gearing up and Scoping

## Analyzing and Prioritizing

## Maintaining and Tracking

PHASE  
**1**

### INITIATE

- 1.1 Designate a lead individual or core team
- 1.2 Understand principles of climate adaptation planning

PHASE  
**2**

### EXPLORE

- 2.1 Compile and review planning documents
- 2.2 Identify partners
- 2.3 Identify community stakeholders and resources

PHASE  
**3**

### ACTIVATE

- 3.1 Form a project team
- 3.2 Develop and implement a community engagement plan

PHASE  
**4**

### ANALYZE

- 4.1 Identify climate hazards, development patterns, and system features
- 4.2 Analyze and characterize the vulnerability of the features and systems supporting the community

PHASE  
**5**

### STRATEGIZE

- 5.1 Facilitate community visioning for climate adaptation
- 5.2 Identify strategies and design standards
- 5.3 Create the plan of action

PHASE  
**6**

### IMPLEMENT

- 6.1 Maintain and monitor actions
- 6.2 Update and sustain climate readiness

# Inside the Guide



BUILT  
SYSTEM



NATURAL  
SYSTEM



SOCIAL  
SYSTEM



ECONOMIC  
SYSTEM



GOVERNANCE  
SYSTEM



PHASE  
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- 6.1 Maintain and monitor actions
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**WORKSHEET** **4.1.c CLIMATE READINESS ACTIONS LIST**

**Objective:** Use this worksheet as a resource to record actions that are currently occurring, or are proposed as new actions, to improve the climate readiness of municipal governance to reduce hazard vulnerability. Assessing vulnerability involves analyzing the adaptive capacity of the community to address identified impacts of climate hazards. This analysis is done intentionally in Step 4.2.c; however, recognition of opportunities or existing capacities can occur throughout the process of conducting the climate change-related hazard vulnerability assessment (CCRVA). Having a place, or "parking lot," to record governance capacities will be helpful in developing strategies, which is provision (v) of the Municipal Land Use Law (MLUL), planning actions, and integrating the outputs of the CCRVA with the municipal master plan and other planning documents.

**How to Use This Form:** Continue to add actions to this list throughout the CCRVA planning process so that you can use it as a reference when considering adaptation strategies and design standards to pursue. Add rows and columns as needed. It is worth noting that actions taken to mitigate hazards are different in nature from actions taken to adapt to climate change, which is why two distinct resources are provided for listing these types of actions separately. Add hazard mitigation projects to [Worksheet 4.1.c Mitigation Projects List](#).

Action	Implementation Status (New, Ongoing)	Implementation Category (Code Enforcement, Land Use Ordinance, Program, Protocol or Procedure, Study, Staff and Administration, Funding)	Priority (High, Medium, Low)

**A MODEL CLIMATE HAZARD VULNERABILITY ASSESSMENT FOR NJ MUNICIPALITIES**

# Climate Readiness Actions List

**WORKSHEET** **4.1 MITIGATION PROJECTS LIST**

**Objective:** Use this worksheet to record new project ideas or for tracking existing projects as you work through the process of analyzing climate hazard vulnerability. Although the main purpose of the climate change-related hazard vulnerability assessment (CCRVA) process is not intended to generate, discuss, or review specific projects, these will likely surface in conversations and investigations. Having a place, or "parking lot" for those ideas and discussions will be helpful in developing strategies, which is provision (v) of the MLUL, planning actions, and integrating the outputs of the CCRVA with the municipal master plan and other planning documents.

**How to Use This Form:** This form is formatted to include information provided for planning hazard mitigation projects. Continue to add projects to this list throughout the CCRVA planning process so that you can use it as a reference when considering resilience projects to pursue. Add rows and columns as needed. It is worth noting that actions taken to mitigate hazards are different in nature from actions taken to adapt to climate change, which is why two distinct resources are provided for listing these types of actions separately. These projects should be coordinated with the multi-jurisdictional and local hazard mitigation plans that include risk assessments for the municipality.

Project Name	Project Status (New, Ongoing)	Project Category (Mitigation-Risk Reduction, Mitigation-Improving Function, Maintenance / Response / Recovery, Administrative)	Priority (High, Medium, Low)

**A MODEL CLIMATE HAZARD VULNERABILITY ASSESSMENT FOR NJ MUNICIPALITIES**

# Mitigation Projects List

# Strategies and Design Standards List

**WORKSHEET** **5.2 STRATEGIES AND DESIGN STANDARDS**

**Objective:** Use this document to record identified strategies and design standards to achieve reductions in potential climate hazard impacts and enhancements in municipal capacity.

**How to Use This Form:** Based on the specific information learned by analyzing exposure, sensitivity, and adaptive capacity regarding climate hazards, certain vulnerabilities are likely present in the community. Considering the information gathered through stakeholder participation and community engagement sessions, formulate goals the community would like to achieve to reduce vulnerability to climate hazards. Use the first column to list the goals. Use [Resource Document 1.2 Implementation Goals](#), along with perspectives provided during community engagement sessions and other stakeholder input, to identify strategies and design standards to help achieve each goal. Some goals may be associated with more than one strategy and/or design standard. Then use the two "forces" columns as a space to consider existing capacity or resources to support the strategy or design standard, and any potential challenges or obstacles that may hinder achievement of that goal. Indicate a timeframe for implementation by prioritizing strategies as short- or long-term. Add additional rows as needed.

Hazard Impact Reduction or Capacity Enhancement Goal	Strategy or Design Standard	Forces Supporting the Strategy or Design Standard	Forces Opposing the Strategy or Design Standard	Priority (short-term or long-term)

**A MODEL CLIMATE HAZARD VULNERABILITY ASSESSMENT FOR NJ MUNICIPALITIES**

# Part I: Scoping



- **What depth should the CCRHVA go into?**
  - Minimal, moderate, comprehensive
- **What's the end product?**
  - Separate component attached to the Land Use Plan Element
  - Integrated into the Land Use Plan Element
- **Who should be involved?**
  - Who will lead the process - staff?
  - Who will produce the deliverable – planner?
  - Roles of participants - Level and type of volunteer and community engagement?



# Part II: Analyzing

PHASE

4

**ANALYZE**

4.1 Identify climate hazards, development patterns, and system features

4.2 Analyze and characterize the vulnerability of the features and systems supporting the community

PHASE

5

**STRATEGIZE**

5.1 Facilitate community visioning for climate adaptation

5.2 Identify strategies and design standards

5.3 Create the plan of action

## Step 4.1

- Identification of climate hazards
- Development analysis – compare climate hazards to zoning
- Identify critical facilities and other important features



# Part II: Analyzing

**Vulnerability = Exposure x Sensitivity x Adaptive Capacity**



## Step 4.2

- **Analyze exposure and sensitivity of features**
  - Not binary – Use a qualitative vulnerability key.
  - Types of Data to use – GIS/mapping, interviews, documents review, lived experiences.
  - Worksheet 4.2.a Analysis Workflow – provides a methodology, including links to data and tools, what to do for the analysis, what outputs you should put in the CCRHVA, and what those outputs can tell you about vulnerability.
- **Analyze adaptive capacity**
  - Worksheet 4.1.c Municipal Governance – to analyze adaptive capacity of the municipality.

## Phase 5

- **Steps to identify strategies and prioritize them** to do something with the information learned in the CCRHVA.



### Scoring the Impact of Climate Hazards on Features

- After working through [Worksheet 4.2.a Analysis Workflow](#) to analyze the indicators of system features (and specific individual features, if applicable) in relation to specific hazards, use the outputs from the analyses to score the potential impact due to exposure and sensitivity of each indicator of a system feature (and specific individual features, if applicable) to the hazard based on the below **Hazard Impact Key**. Refer to information from the community, project advisors, and other stakeholders to deliberate the scoring of hazard impacts your community could experience. For each indicator, there should be an impact score for exposure and an impact score for sensitivity.

Hazard Impact Key		
Impact Score	Exposure The extent people, places, or systems are touched by or in contact with or disturbed by a hazard.	Sensitivity The extent that people, places, or systems can experience harm or dysfunction from exposure to a given hazard.
Negligible	Exposure is unlikely to occur.	There is no noticeable physical damage or functional disruption to a feature or system. There is no noticeable change to public health, safety, or system viability.
Low	Exposure is somewhat likely to occur.	There is minor physical damage or functional disruption to a feature or system. There is some noticeable change to public health, safety, or system viability.
Moderate	Exposure is likely to occur.	There is intermediate physical damage to a feature or system. There is potential for chronic stress and reduced functional reliability. Services may be entirely disrupted on occasion or for extended periods of time. There is a detectable decline in public health, safety, or system viability. There is a potential for long-term effectiveness and sustainability of the system to be degraded.
High	Exposure is highly likely to occur.	There is significant physical damage or functional disruption to a feature or system. Services may be limited and unable to meet needs frequently or permanently. There is a significant decline in public health, safety, or system viability. The long-term effectiveness and sustainability of the system may be degraded.
Very High	Exposure is certain or nearly certain to occur.	There is substantial physical damage or functional disruption to a feature or system. The ability to provide services is destroyed. There is substantial or severe harm to public health, safety, and system viability. The long-term effectiveness and sustainability of the system is degraded.

### Scoring Adaptive Capacity

- Use the output from the analysis of potential impact on the master plan and consistency with other planning efforts and the community's adaptive capacity (Steps 4.2.b & 4.2.c), to score the capacity of the community to address each assigned hazard impact score in [Worksheet 4.1.c Vulnerability Matrix](#) based on the below "Adaptive Capacity Key."

Adaptive Capacity Key	
Adaptive Capacity Score	Observed Community Adaptation Potential
Low	The community is not able to anticipate impact, respond to impact, and proactively avoid impact from climate change-related hazards. The public is generally unaware of specific changes that are needed to adapt to impacts. Planning documents generally do not consider the impacts beyond minimum federal, state, or regional regulatory requirements. There is no mechanism to manage implementation of climate planning strategies and continuously monitor adaptation to impacts. Major changes to local policies and practices are needed.
Moderate	The community is somewhat able to anticipate impact, respond to impact, and proactively avoid impact from climate change-related hazards. There is some public awareness of changes that are needed to adapt to impacts. Planning for impacts is considered in most local planning documents beyond minimum federal, state, or regional regulatory requirements. There may be a mechanism to manage implementation of climate planning strategies and continuously monitor adaptation to impacts. Some local policies and practices are in place or under consideration, but significant changes to local policies and practices are needed.
High	The community is highly able to anticipate impact, respond to impact, and proactively avoid impact from climate change-related hazards. Most of the public are aware of changes that are needed to adapt to impacts. Planning for impacts is considered in all local planning documents beyond minimum federal, state, or regional regulatory requirements. There is an effective mechanism to manage implementation of climate planning strategies and continuously monitor adaptation to impacts. Several local policies and practices are in place and under consideration. Continuation of changes to local policies and practices is sufficient to occur at a similar pace compared to the present.

		Hazard Impact Score Matrix				
		Exposure				
		Negligible	Low	Moderate	High	Very High
Sensitivity	Negligible	1	2	3	3	3
	Low	2	2	3	3	4
	Moderate	2	3	3	4	4
	High	3	4	4	4	5
	Very High	4	4	4	5	5

		Vulnerability Score Matrix				
		Hazard Impact				
		1 Negligible	2 Low	3 Moderate	4 High	5 Very High
Adaptive Capacity	Low	Moderate	Moderate	Moderate	High	High
	Moderate	Low	Moderate	Moderate	High	High
	High	Low	Moderate	Moderate	Moderate	High

1 Work through the Resource Document 4.2.a Analysis Workflow to  
 2 complete this worksheet. Use the worksheet to assign vulnerability  
 scores.

			REQUIRED MLUL HAZARDS				ADDITIONAL HAZARDS											
SYSTEM	SYSTEM FEATURE	FEATURE INDICATOR	Increased / Extreme Temperature	Drought	Flooding	Severe Weather	Saltwater Intrusion	Ocean Acidification	Mudslides / Landslides	Wildfires	Vector-Borne Disease	Ecological Disease / Agricultural Pests	INDICATOR ALL-HAZARD IMPACT SCORE SUM Sum of All Hazard Impact Scores (Exposure + Sensitivity)	INDICATOR ASSIGNED ALL-HAZARD IMPACT SCORE (1-5)	FEATURE ASSIGNED ALL-HAZARD IMPACT SCORE (1-5)	FEATURE ADAPTIVE CAPACITY SCORE (LOW, MODERATE, HIGH)	FEATURE VULNERABILITY SCORE (LOW, MODERATE, HIGH)	DESCRIPTION OF HAZARD VULNERABILITY FOR FEATURE
Built	Facilities and Infrastructure	Physical Damage										0						
Built	Facilities and Infrastructure	Operational Damage										0						
Built	Housing Stock and Businesses	Residential and Commercial Structures										0						
Built	Housing Stock and Businesses	Public and Affordable Housing Siting										0						
Natural	Natural Lands Resources	Protected Natural Lands and Buffers for Their Migration										0						
Natural	Natural Lands Resources	Biodiversity and Connectivity										0						
Natural	Natural Lands Resources	Urban Ecology										0						
Natural	Water Source Resources	Water Quality										0						
Natural	Water Source Resources	Water Quantity										0						
Natural	Air Quality	Air Pollution										0						
Social	People	Public Health										0						
Social	People	Vulnerable Populations										0						
Economic	Sustainable Economic Development	Jobs										0						
Economic	Sustainable Economic Development	Non-Residential Tax Base										0						
Economic	Working Lands	Farming										0						
Economic	Outdoor Recreation	Eco-tourism										0						
Economic	Outdoor Recreation	Agri-tourism										0						





**Objective:** Use this editable template to draft the municipality’s climate change-related hazard vulnerability assessment (CCRHVA). The CCRHVA needs to be in the Land Use Plan Element of the municipal master plan to be in compliance with [NJS 40:55D-28.b.\(2\)\(h\)](#) (the Municipal Land Use Law, or MLUL). Refer to the [Municipal Climate Resilience Planning Guide](#) from the NJ Office of Planning Advocacy for a summary of the law.

**How to Use This Form:** Insert the relevant content that was developed by working through the CCRHVA planning process into the appropriate sections of this template. A provision of the MLUL states that the CCRHVA must “rely on the most recent natural hazard projections and best available science provided by the New Jersey Department of Environmental Protection,” and this template also includes a section to cite the data sources referenced for the community’s CCRHVA. Working through the six phases of the CCRHVA guide will ensure the appropriate data are used, and additional data that was used by the community to conduct the CCRHVA can be added as needed.

**Land Use Plan Element Climate Change-Related Hazard Vulnerability Assessment for [Municipality, County]**

**I. Policy Statement of Consistency with Other Planning Efforts** *(meets NJS 40:55D-28.b.(2)(h)(vi))*

*Insert a policy statement on the consistency, coordination, and integration of the climate change-related hazard vulnerability assessment with any existing or proposed natural hazard mitigation plan, floodplain management plan, comprehensive emergency management plan, emergency response plan, post-disaster recovery plan, or capital improvement plan.*

**II. Background**

*Describe the purpose of the CCRHVA, including general information about the community and general implications of climate change and vulnerabilities for the community.*

**III. Description of Process and Community Participation**

*Insert a description of the planning process to conduct the CCRHVA, including details of community engagement and participation in the process and in development of adaptation strategies.*

**IV. Characterization of Community Systems, Features, and Hazard Vulnerabilities** *(meets NJS 40:55D-28.b.(2)(h)(i))*

*First, indicate all critical infrastructure that was identified for the CCRHVA. Then, insert the results of the CCRHVA for each feature that was analyzed, including an overall assessment of vulnerability (e.g. score of low, medium, or high), into the appropriate sections below. These sections should not be finalized until after an inclusive community engagement and stakeholder process has been conducted. Each of the analysis outputs or sections should be accompanied by a brief and easily interpreted narrative that describes the feature, the extent that it is vulnerable to a given hazard (i.e. climate-related threat impacting the feature), and how the vulnerability of the feature impacts the functioning and sustainability of the corresponding system to support the municipality and any other jurisdictions evaluated. Brief descriptions should be used to the extent possible to convey results of the analysis, limiting lengthy text descriptions and employing graphics, if possible. Within each system outlined below, the order can be arranged to suit a particular narrative of the community. If an indicator or feature was not analyzed, indicate the reason (e.g. why it is not a relevant feature or indicator, lack of specific data/information or other resources, community self-assessment rationale, etc.).*

**i. List of Critical Facilities and Infrastructure** *(meets NJS 40:55D-28.b.(2)(h)(iii))*

*Insert the full list of critical facilities and infrastructure features identified by the community.*

**ii. Built System Vulnerability Analysis**

1. Vulnerability of Built Facilities and Infrastructure
2. Vulnerability of Housing Stock and Businesses
3. Vulnerability of Public and Affordable Housing

**iii. Natural System Vulnerability Analysis**

1. Vulnerability of Natural Lands Resources
2. Vulnerability of Water Source Resources
3. Vulnerability of Air Quality

**iv. Social System Vulnerability Analysis**

1. Vulnerability of Public Health
2. Vulnerability of Vulnerable Populations

**v. Economic System Vulnerability Analysis**

1. Vulnerability of Sustainable Economic Development
2. Vulnerability of Working Lands
3. Vulnerability of Outdoor Recreation

**V. Potential Impact on the Master Plan, Other Planning Efforts, and Municipal Capacity**

**i. Development Analysis** *(meets NJS 40:55D-28.b.(2)(h)(i)&(ii))*

*Insert the completed development analysis, which includes a build-out analysis and an evaluation of current zoning in relation to current and projected hazards.*

**ii. Governance System and Adaptive Capacity Vulnerability Analysis** *(meets NJS 40:55D-28.b.(2)(h)(i))*

*Insert the completed municipal governance worksheet.*

**iii. Impact on the Master Plan and Other Plans** *(meets NJS 40:55D-28.b.(2)(h)(iv))*

*Insert the completed planning documents review worksheet.*

**VI. Strategies And Design Standards** *(meets NJS 40:55D-28.b.(2)(h)(v))*

*Insert the completed strategies and design standards worksheet.*

**VII. Description of Implementation of Strategies, Standards, and Ongoing Climate Adaptation**

*Describe how the community plans to implement the strategies and design standards identified in this assessment. The description should include administrative, financial, timing, monitoring, and other aspects relevant to achieving the actions necessary to apply the strategies and design standards identified to reduce vulnerability to climate hazards. Alternatively, the community may wish to develop a separate Climate Adaptation Action Plan that points to the CCRHVA in a section of the plan (as shown in the action plan outline worksheet provided with this guide) and refer to that plan in this section of the CCRHVA.*

**VIII. Climate Hazards Descriptions**

*Insert maps, tables, and narratives depicting current and projected climate change-related hazards that may impact the community. Describe all hazards, including those for which a vulnerability score of “Low” was determined through the CCRHVA process.*

**IX. Appendix**

**i. Data Sources** *(meets NJS 40:55D-28.b.(2)(h)(viii))*

**ii. Vulnerability Matrix / Scoring Worksheet**

**iii. Communications Materials and Additional Community Engagement and Project Team Descriptions**

**iv. Climate Readiness Actions List**

**v. Mitigation Projects List**



# Part III: Implementation

## Phase 6

- **Implement strategies and design standards**
- **Integrate the CCRHVA throughout the master plan, with the CIP, and other plans**
  - Use the outputs of the CCRHVA in the description of current conditions and then set goals for future conditions while addressing hazard vulnerabilities identified in the CCRHVA.
  - Sample policy statement on consistency, coordination, and integration of the CCRHVA with other plans (in Phase 4).



PHASE  
**6**  
**IMPLEMENT**

6.1 Maintain and monitor actions

6.2 Update and sustain climate readiness



# GUIDE TO LOCAL CLIMATE CHANGE ADAPTATION PLANNING

The Model Climate Change-Related Hazard Vulnerability  
Assessment for New Jersey Municipalities

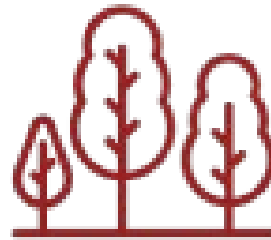
## Protect and Strengthen Your Community



**PUBLIC  
HEALTH**



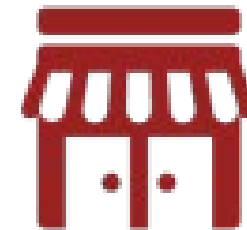
**FACILITIES,  
INFRASTRUCTURE,  
AND HOMES**



**ECOSYSTEM  
SERVICES AND  
NATURAL HABITATS**



**AGRICULTURE**



**BUSINESSES**



**LIVELIHOODS**

# Provide Feedback

- Download the guide

<https://www.njfuture.org/ccrhva/>



- Email me

[trohrbach@njfuture.org](mailto:trohrbach@njfuture.org)





# Planning for Local Responses to Climate Change

November 16, 2023

Anne Heasley, Program Manager for Policy and Planning

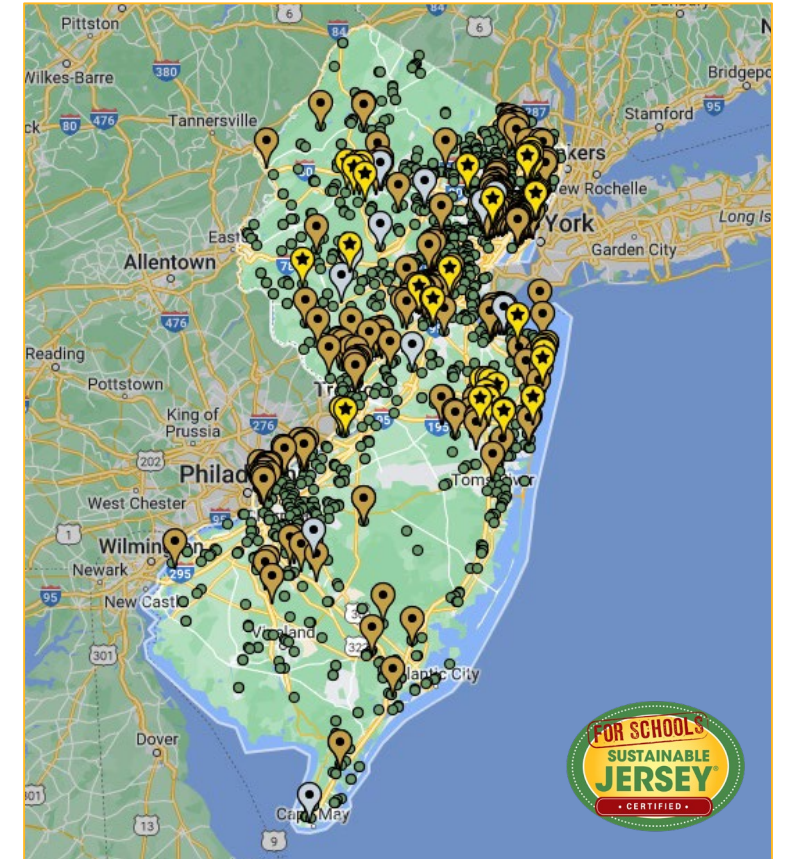


# Statistics

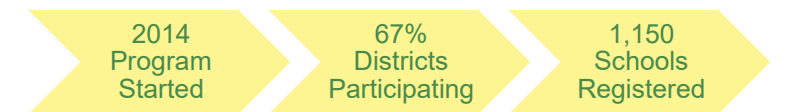
**25,569**  
Actions  
Implemented



Sustainable Jersey



Sustainable Jersey for Schools





# Interim Guidance

## Sustainability and Resiliency: Guidance on Creating Climate-Ready Communities



### PREFACE

This guide presents 10 strategies that municipalities can implement to foster climate-resilient communities. These strategies are Sustainable Jersey "actions" that score points in the [municipal certification program](#). These actions make sense to implement now - and will still be relevant in the future as a new, more comprehensive climate resilience framework is being developed by the New Jersey Department of Environmental Protection. This guide goes beyond the traditional reactive mindset in emergency management and encourages municipalities to prepare for the worst of climate change impacts and adapt as seen necessary by the community as a whole.

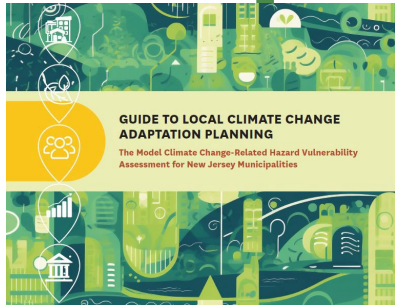
Sustainable Jersey has numerous Emergency Management & Resiliency actions to help municipalities prepare for and respond to climate change. They address a variety of climate hazards, including sea level rise, increased precipitation, and extreme heat. These impacts damage infrastructure, overwhelm utility systems, and disrupt vital ecological and agricultural processes, which, as they progress in severity, will only increasingly impact New Jerseyans' everyday lives. Thus, communities are turning to these actions - now more than ever - as climate change progresses in the Garden State and around the world.

Municipalities stand at the forefront of climate change adaptation. New Jersey's Home Rule Act (1917) grants municipal governments authority to enact ordinances and regulations to promote and improve environmental public health. Municipalities are in charge of land use practices, stormwater management, and energy. They also possess the ability to address social inequality and create mechanisms that foster equitable and resilient communities.

### CLIMATE CHANGE POLICY ENVIRONMENT IN NEW JERSEY

In 2020, Governor Phil Murphy signed Executive Order No. 100 asking the New Jersey Department of Environmental Protection (NJDEP) to begin a regulatory reform effort to help reduce greenhouse gas and other climate pollutant emissions while making the natural and built environments more resilient to the impacts of climate change.

# Guide to Local Climate Change Adaptation Planning



**Municipal master plans are now required by legislation to include a CCRHVA.** This guide will help your town meet all the requirements of the law, while launching a process to build long-term adaptive capacity and resilience.



**BUILT  
SYSTEM**



**NATURAL  
SYSTEM**



**SOCIAL  
SYSTEM**



**ECONOMIC  
SYSTEM**



**GOVERNANCE  
SYSTEM**



# Audience Poll

Raise your hand if:

- your community develops a capital improvement plan.
- And keep hand up – if you think that list includes climate adaptation projects.

Funded Capital Projects Summary FY 2015/16		
Capital Projects	FY 2015/16 Budget	5-Year Total Budget
<b>Streets &amp; Sidewalks</b>		
Downtown Streetscape Improvement Project (Specific Plan)	115,000	390,000
Sidewalk Repair Program	300,000	1,500,000
Street Resurfacing	600,000	12,700,000
<b>City Buildings</b>		
City Buildings (Minor)	325,000	1,700,000
<b>Traffic &amp; Transportation</b>		
High Speed Rail Coordination	50,000	150,000
Sand Hill Road Signal Modification Project	125,000	125,000
<b>Environment</b>		
Community Zero Waste Policy Draft	50,000	50,000
<b>Water System</b>		
Sharon Heights Pump Station	200,000	200,000
<b>Parks &amp; Recreation</b>		
Bedwell Bayfront Park Electrical Panel Upgrade	100,000	100,000
Belle Haven Pool Deck Lighting	30,000	30,000
Jack Lyle Park Restrooms - Construction	40,000	240,000
Library Landscaping	200,000	200,000
Measure T Funds Evaluation/Project Ranking	125,000	125,000
Nealon Park Sports Field Sod and Irrigation System Replacement	250,000	250,000
Park Improvements (Minor)	150,000	810,000
Relocation of Dog Park at Nealon Park	250,000	250,000
Tennis Court Electronic Key Upgrade	100,000	100,000
Willow Oaks Dog Park	250,000	250,000
<b>Stormwater</b>		
Bay Levee Project	90,000	180,000
Storm Drain Improvements	115,000	595,000
Willow Place Bridge Abutment Repairs	250,000	250,000
<b>Technology &amp; Other</b>		
Cost of Service/Fee Study	100,000	100,000
Radio Infrastructure Replacement	100,000	100,000

# Audience Poll

Raise your hand if:

- your community has a designated staff person that is responsible to continually assess the municipalities vulnerability to climate hazards;
- and is this person responsible for implementing adaptation projects.



# Audience Poll

Raise your hand if

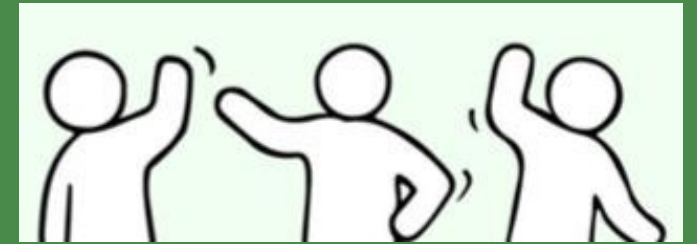
- your municipality has staff trained on climate hazard impacts – in addition to emergency response; understands the impact to the economy, social networks, natural systems; or
- If your municipality has someone focused on updating municipal policies and practices to reduce the impacts of climate change.



# Audience Poll

Raise your hand if:

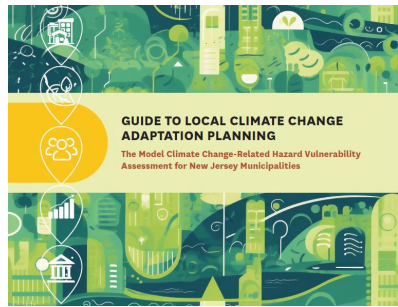
- there are any examples of your community working across municipal boundaries or with other entities – federal, state, county – to reduce hazard vulnerability in your town or region.
- are examples beyond working on the Hazard Mitigation Planning process?







# Guide to Local Climate Change Adaptation Planning



**Objective:** This resource provides a list of 45 governance actions that municipalities can take to improve climate hazards.

**How to Use This Form:** In Step 4.1.c, use this form as a resource to understand and begin to think about capacity to adapt to climate hazards through better governance. Throughout the climate hazard vulnerability assessment, refer to identified municipal actions that can be added [Worksheet 4.1c Climate Readiness Action](#)

In Step 4.2.c, after analyzing the impact of climate hazards on community features, municipalities can record capacity relative to identified hazard impacts, and the narrative describing things the municipality is doing. This completed form, along with a review of planning documents (done in Step 2.1) is used to assign a score. This completed form, along with Worksheet 4.1c Climate Readiness Actions List, can also inform strategies under Municipal Land Use Law (MLUL).

If desired, this form can be used to apply an adaptive capacity score to [Worksheet 4.1.c. Vulnerability Assessment](#). Record the number of “yes” responses and compare the number to the below table, which shows the total number of “yes” responses analyzed in the climate hazard vulnerability assessment. Also consider the information entered into the table of municipal actions. Then, use the “Adaptive Capacity Key” in [Resource Document 4.2.a. Vulnerability Assessment](#) based on the level of adaptive capacity recorded in this form and in [Worksheet 2.1 Planning Documents](#) information and deliberation.

## 4.1.c MUNICIPAL GOVERNANCE



WORKSHEET

## 3.1 PROJECT TEAM SELECTION

**Objective:** If the municipality plans to designate a project team, use this worksheet to record prospective project team candidates. Project team members should be selected based on the perspective they bring to the process and outcomes. Effort should be made to include diverse perspectives from representative demographic groups and knowledge or expertise backgrounds. The project team will be responsible for guiding the process and informing decisions along the way. Members should be committed to the long-term health and sustainability of the entire community and the systems that support the community. Project teams are typically limited to approximately ten individuals. Additional partners and stakeholders identified in Phase 2 of this guidance should also be included in the process in advisory and/or engagement capacities. Intentional effort should be made to consider the equity implications of the project team composition.

**How to Use This Form:** Review the table included with this form that describes examples of potential perspectives to include on the project team. Record information on individuals who may be suitable for the project team on this worksheet, including the perspective they would add and whether their area of expertise is focused on the built, natural, economic, social, or governance systems that support the community. Base the selection of prospective project team members on information learned in Phases 1 and 2—relevant climate hazards, socially vulnerable populations, and key partners and stakeholders—and by considering the expertise most relevant to the community, the capacity of specific individuals or departments, and that there is representation from each system. Check off the individuals you plan to solicit to be on the project team in the last column, and prepare to conduct outreach to them using the draft solicitation letter also provided in this step ([Template 3.1 Project Team Solicitation](#)).

Name of Individual	Entity (Organization, Department, Association, Role in the Community, etc.)	Perspective Added to Project Team	System Expertise (Built, Natural, Economic, Social, Governance)	Invite to Project Team
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



# Questions

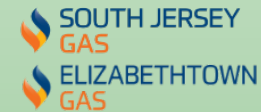
- Mayor Janice Kovach, Town of Clinton, [jkovach@Clintonnj.gov](mailto:jkovach@Clintonnj.gov)
- Meghan Leavey, Lead Planner, Climate Resilience Planning, Office of Climate Change, NJDEP, [meghan.leavey@dep.nj.gov](mailto:meghan.leavey@dep.nj.gov)
- Tanya Rohrbach, Community Planning Manager, New Jersey Future, [trohrbach@njfuture.org](mailto:trohrbach@njfuture.org)
- Anne Heasley, Program Manager for Policy and Planning, Sustainable Jersey, [heasleya@tcnj.edu](mailto:heasleya@tcnj.edu)

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## Corporate Sponsors





# Thank You

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