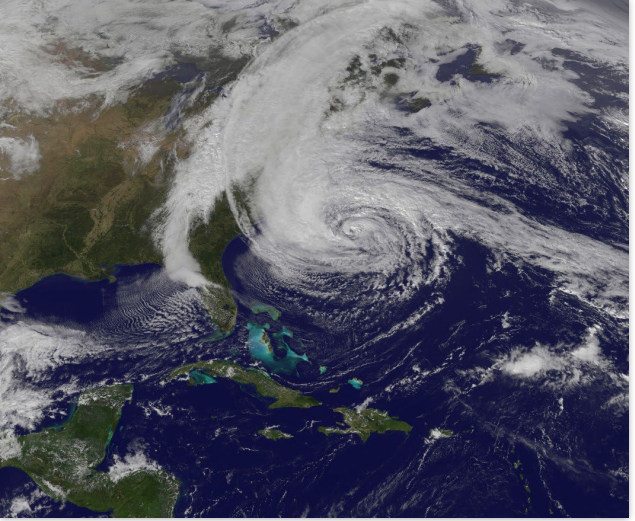


RI Climate Resilience Update

EC4 – June 2025

DEM
RHODE ISLAND

Rhode Island Climate Resilience

Statewide Collaboration

1. **Planning**
   - Statewide Planning: *Resilient Rhody 2.0* – 2024 State of Resilience Report, 2025 Statewide Coastal Resilience Plan
   - Local Planning: MRP Community Resilience Building Workshops, Municipal Annual Resilience Updates
2. **Implementation**
   - Resilience Technical Assistance (Project Scoping, Policy Development, Design & Engineering)
   - State + Federal Resilience Grants
3. **Capacity Building & Partnerships**
   - Resilience EC4 Subgroup
   - RI Resilience Partner Group
   - State Resilience Office (Regional Resilience Coordinators) – Three (3) Regional Coordinators
4. **Transparency & Information Sharing**
   - Resilience Web Resources
   - Annual *Rhode Island Resilience* Summit

Rhode Island Climate Resilience

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Regional Resilience Coordinators

Coastal, Urban, and Inland

- **Municipal & Community Assistance**
  - **Identify, prioritize, and advance** climate resilience projects (ex. Municipal Annual Resilience Updates)
  - Project **proposal development** for state and federal funding
  - **Project management**, reporting, and outreach
  - **Building capacity for** local climate resilience
  - Local **stakeholder & engagement meetings**
- **State Resilience Program Assistance**
  - **Communications to municipalities** regarding resilience funding opportunities & resources
  - Assist with post-award state resilience **funding program administration**
  - Inform climate resilience **policy discussions** through providing local priorities & perspectives
  - State climate **resilience planning** (ex. 2025 Statewide Resilience Plan and Coastal & Estuarine Land Conservation Plan)

Resilient Rhody 2025 Statewide Coastal Resilience Plan

R.I. Gen. Laws § 46-23.4-1 - Act on Coasts

Setting new goals, surveying our vulnerabilities, and determining our best practices for future investment.

Key Scope Components:

1. Gap Analysis & 2025 State Resilience Actions
2. Statewide Climate Vulnerability Assessment
3. RI Climate Resilience Priority Assets
4. Community Engagement
5. State Funding Investment Strategy
6. Addressing Resilience Data Gaps

2025 Statewide Coastal Resilience Plan - Schedule

Schedule

Task 1: Gap Analysis & State Resilience Goal Development
Outcome: 2025 Resilience Goals Defined

Task 2: Statewide Climate Vulnerability Assessment
Outcome: Qualitative Assessment of Climate Risk / Consequences for State Assets

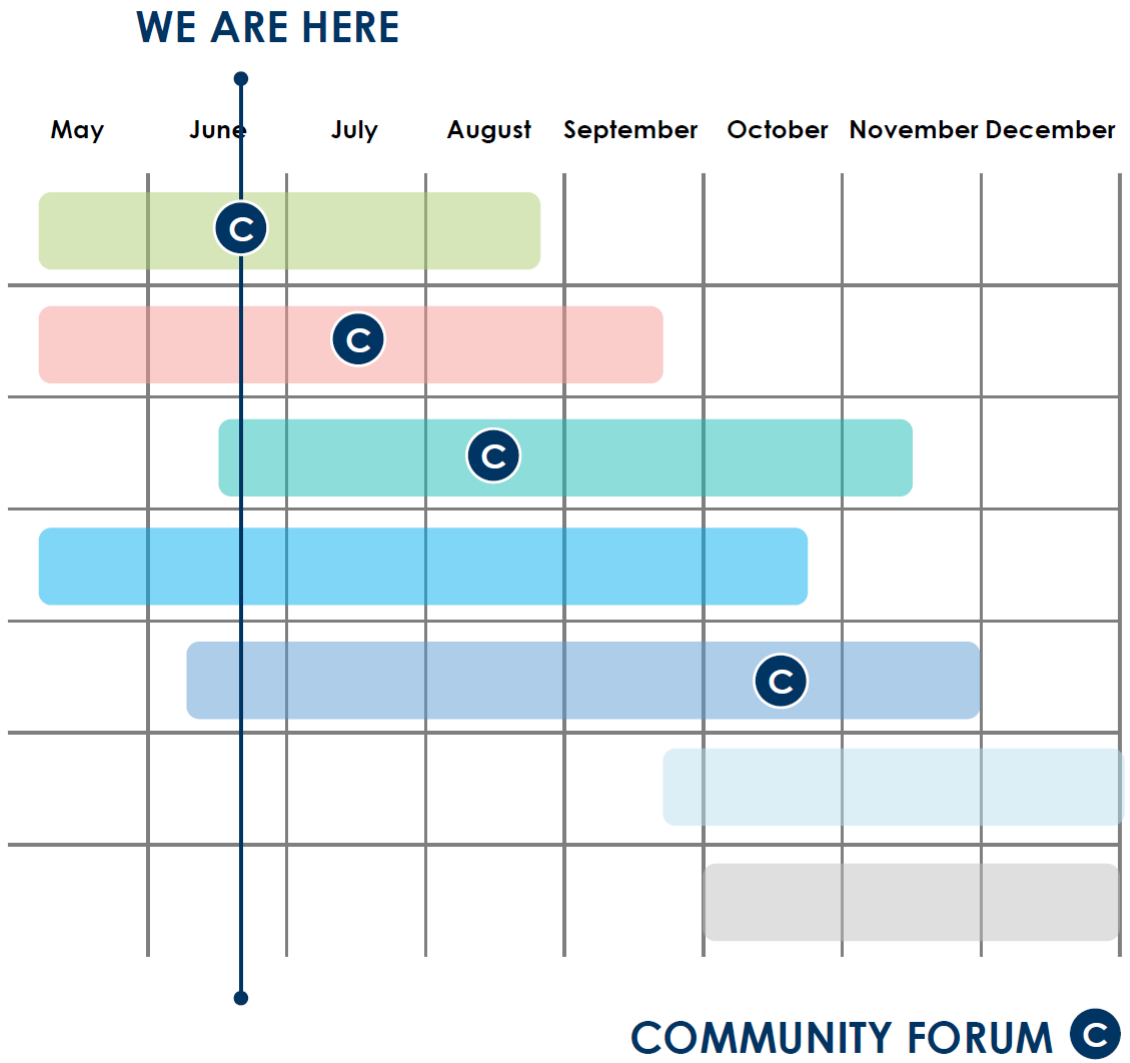
Task 3: RI Climate Resilience Priority Actions
Outcome: Identification of 10 Priority Assets, Conceptual Adaptation Solutions/Costs

Task 4: Community Engagement
Outcome: Integration of Community Input Throughout all Tasks

Task 5: Current and Future Investment Analysis and Strategy
Outcome: Clear Pathways to Obtain Funding for Climate Resilience Priority Actions

Task 6: Addressing Resilience Data Gaps
Outcome: Identification of Data Needs

Task 7: Statewide Coastal Resilience Plan
Outcome: Delivery of 2025 Statewide Resilience Plan



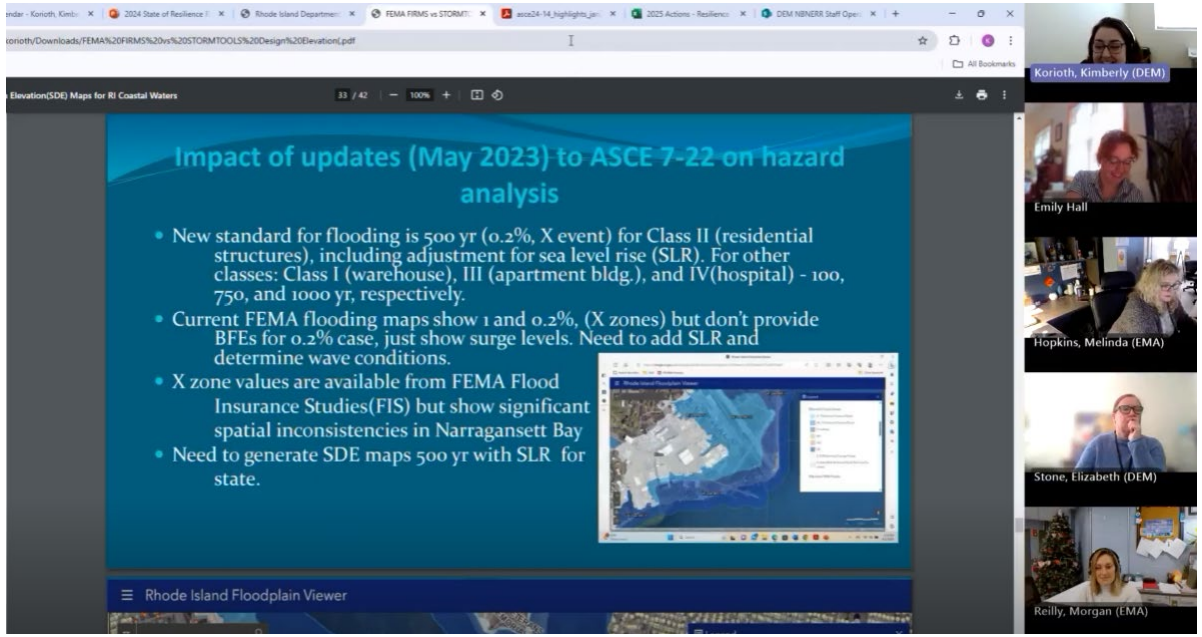
2025 Resilience Plan – 2025 *Resilient Rhody* Actions

Resilience EC4 Subgroup & RI Resilience Partner Group

1. **Proposed Additional Resilience Actions**
   - February 2025: Resilience Standards
   - March 2025: Resilience Initiatives & Funding
2. **Proposed Revisions to 2018 *Resilient Rhody* Actions**
   - May 2025: Review of 2018 Actions & Proposed Revisions

Proposed Additions & Proposed Revisions Shared Documents

- Working documents from these meetings shared with these groups for further development, comment, and feedback



2025 Resilience Plan – 2025 *Resilient Rhody* Actions

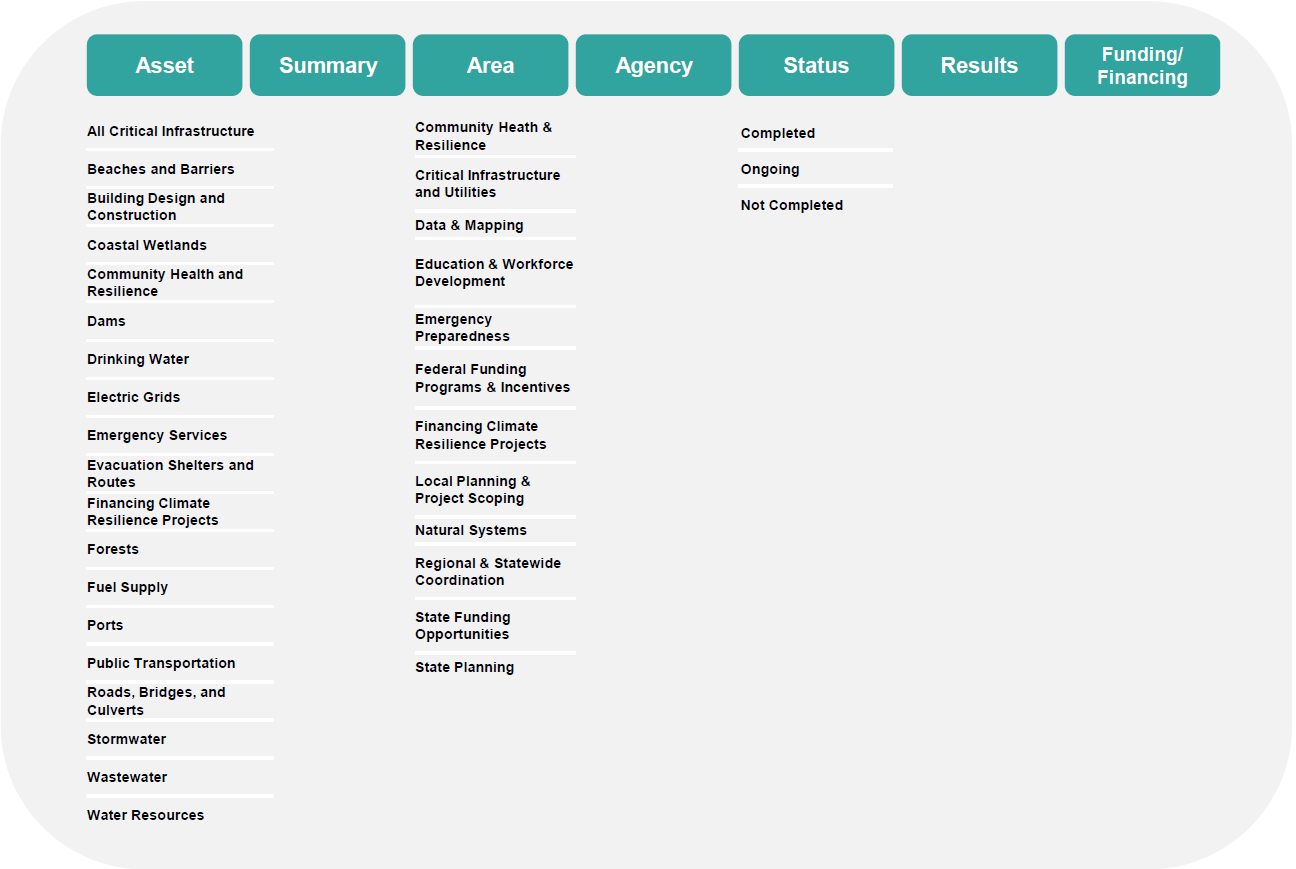
Resilience Actions and Initiatives Inventories

Task 1: Gap Analysis & State Resilience Goal Development

Goal: Review and convert RI lists of Resilience Actions and Initiatives into organized databases and interactive dashboards.

Deliverables:

- Database of Climate Resilience Actions
- Database of Climate Resilience Initiatives



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2025 Resilience Plan – 2025 *Resilient Rhody* Actions

Resilience Actions and Initiatives Inventories

Task 1: Gap Analysis & State Resilience Goal Development

Actions and Initiatives Collected: 273!

Documents Reviewed:

- Resilient Rhody: An Actionable Vision for Addressing the Impacts of Climate Change in Rhode Island – 2018
- Resilience Rhody: Three Year Impact Report – 2021
- Resilient Rhody: State of Resilience Report – 2024
- State of Rhode Island Hazard Mitigation Plan - 2024

2025 Resilience Plan – 2025 *Resilient Rhody* Actions

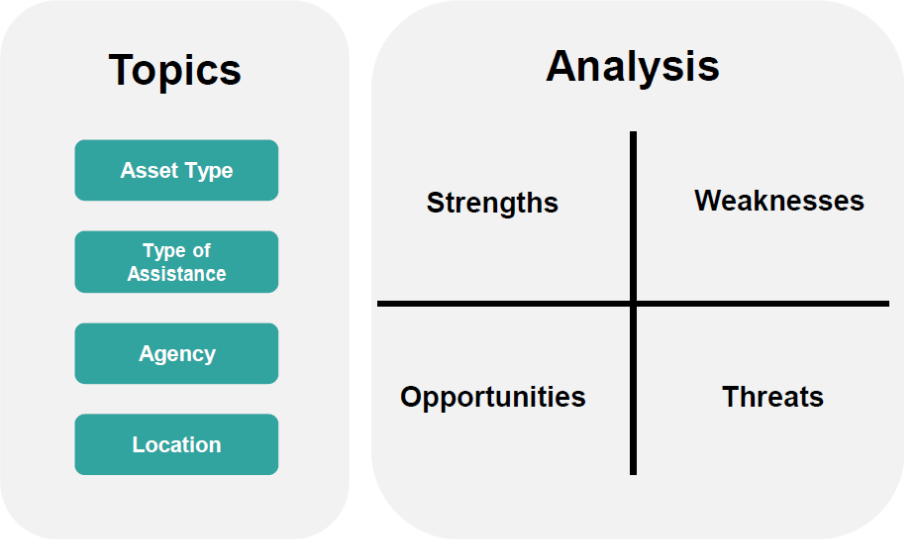
Gap Analysis Methodology

Task 1: Gap Analysis & State Resilience Goal Development

Goal: Compile and evaluate the status of statewide Resilience Actions, conduct a gap analysis of Resilience Initiatives, and incorporate stakeholder feedback to identify gaps in climate resilience efforts.

Deliverables:

- Identify statewide climate resilience initiative gaps, impediments, and priorities
- Gap Analysis draft (report and power point presentation)



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2025 Resilience Plan – 2025 *Resilient Rhody* Actions

Gap Analysis Methodology

Task 1: Gap Analysis & State Resilience Goal Development

Step 1: Review the compiled inventory of initiatives and actions to identify broader trends and identify current strengths and weaknesses or gaps in initiatives - based on the information summarized in the inventory database.

Step 2: Assess trends based on the following categories:

- Asset Gaps
- Hazard-Specific Gaps
- Population Gaps
- Policy and Regulatory Gaps
- Capacity Gaps
- Information and Knowledge Gaps
- Monitoring and Evaluation Gaps
- Coordination Gaps

Step 3: Identify barriers to successful implementation of current initiatives or developing future initiatives:

- Financial constraints
- Institutional barriers
- Limited community engagement
- Technological limitations
- Data availability and accessibility

Step 4: Identify the opportunities for enhancing/completing the existing initiatives and future initiatives based on the strengths and gaps identified. This may include:

- Scaling up successful existing initiatives
- Strengthening partnerships and collaborations
- Integrating climate resilience into broader development planning
- Financial opportunities

2025 Resilience Plan – Community & Municipal Engagement

Community Engagement

Upcoming Meetings

Community Forum 01 – June 18th @ 5:30pm

Providence Public Library, Mural Room

Virtual Option Available

Municipal Stakeholder Meeting 01 – June 20th

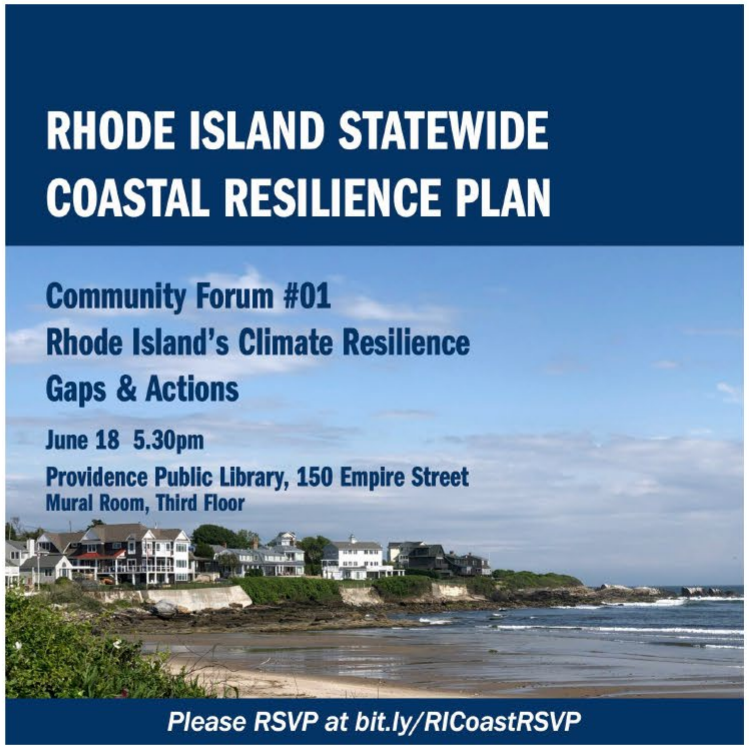
Virtual Meeting

Upcoming Meetings:

Meeting 02 – Week of July 14th
Input on Task 2: Statewide Climate Vulnerability Assessment

Meeting 03 – Week of August 11th
Input on Task 3: Climate Resilience Priority Actions

Meeting 04 – Week of October 6th
Input on Task 5: Current and Future Investment Analysis and Strategy



2025 Resilience Plan – Vulnerability Assessment

Purpose

Task 2: Statewide Climate Vulnerability Assessment

Goal:

Develop Rhode Island's Statewide Climate Vulnerability Assessment methodology, based off the *Resilient Rhody 2018* categories, using a semi-quantitative approach to compare multi-hazard risks across various asset types and incorporate stakeholder input.

Deliverable:

Methodology to assess climate hazards, exposure, vulnerability, and consequences

Vulnerability

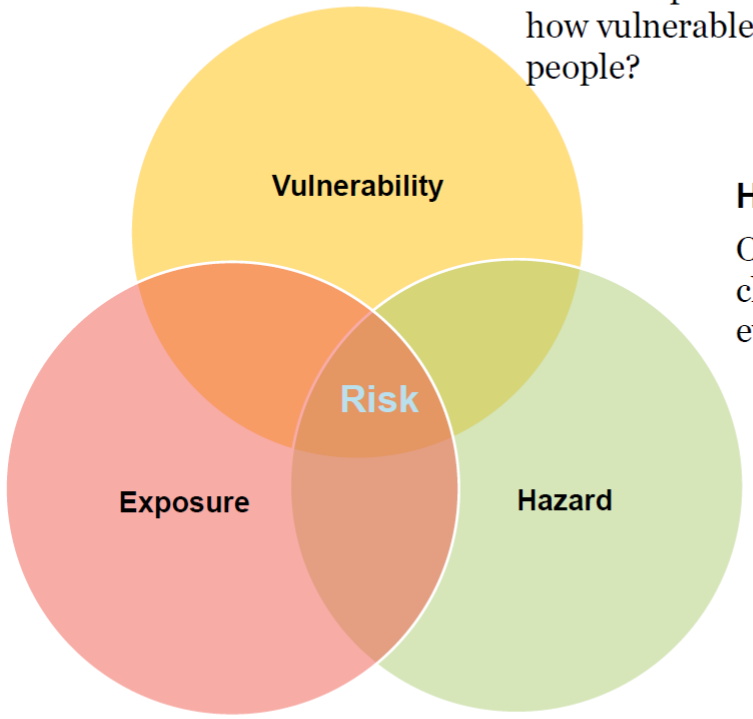
How susceptible to damage are the exposed assets and how vulnerable are the people?

Hazard

Occurrence of climate-related events

Exposure

How likely is a hazard event to occur and what is the intensity?



Components of Climate Risk

2025 Resilience Plan – Vulnerability Assessment

Overview

Hazard | Exposure | Vulnerability | Risk

1. Hazard

Collect hazard data for relevant climate hazards across the state into a GIS database. Consider multiple future climate change scenarios and time horizons where data permits to understand how hazards are expected to change.

2. Exposure

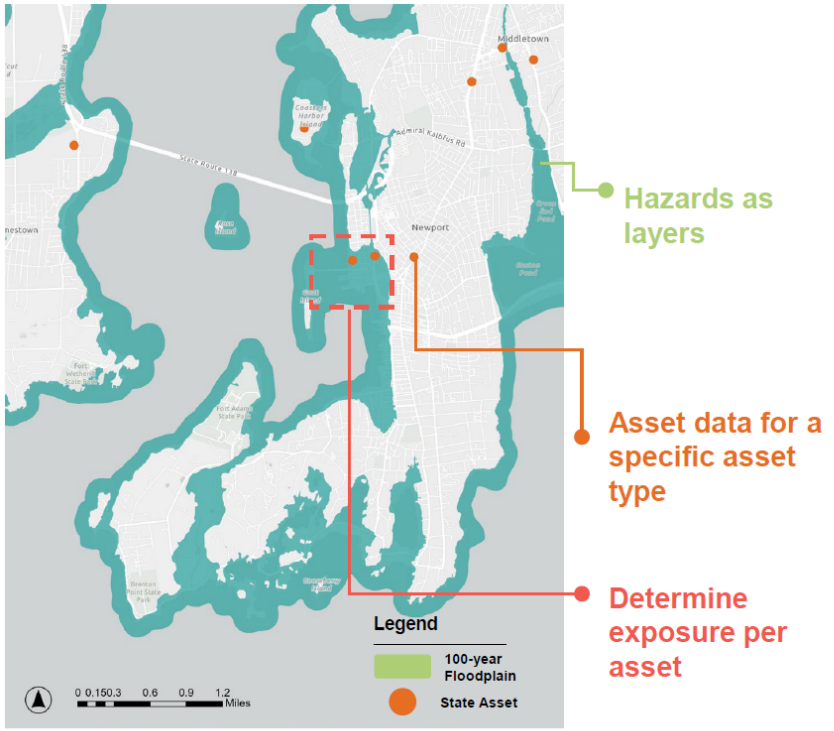
Collect state-wide asset data for priority asset types into a GIS database. For each individual asset, use its geographic location to determine exposure to each relevant climate hazard using GIS overlays.

3. Vulnerability

For each exposed asset, use asset characteristics to determine its vulnerability to the hazard(s) to which it is exposed.

4. Risk

Combine the asset's hazard exposure and vulnerability characteristics to produce a qualitative evaluation of asset risk. Asset risks will be comparable within asset types for the purposes of identifying highest risk assets in an asset type.



Example GIS-based Exposure Assessment

2025 Resilience Plan – Vulnerability Assessment

1. Hazard

Hazard | Exposure | Vulnerability | Risk

Method

In the hazard assessment, we will:

1. **Identify relevant climate hazards** for inclusion based on the six manifestations of climate change outlined in *2018 Resilient Rhody*
2. **Identify present and future climate conditions** under which to evaluate those hazards
3. **Collect state-wide geospatial hazard data** into a GIS database for the purposes of conducting an asset exposure assessment

Hazards Covered

- Coastal Flooding
- Stormwater Flooding
- Riverine Flooding
- Extreme Heat
- Extreme Wind

Time Horizons

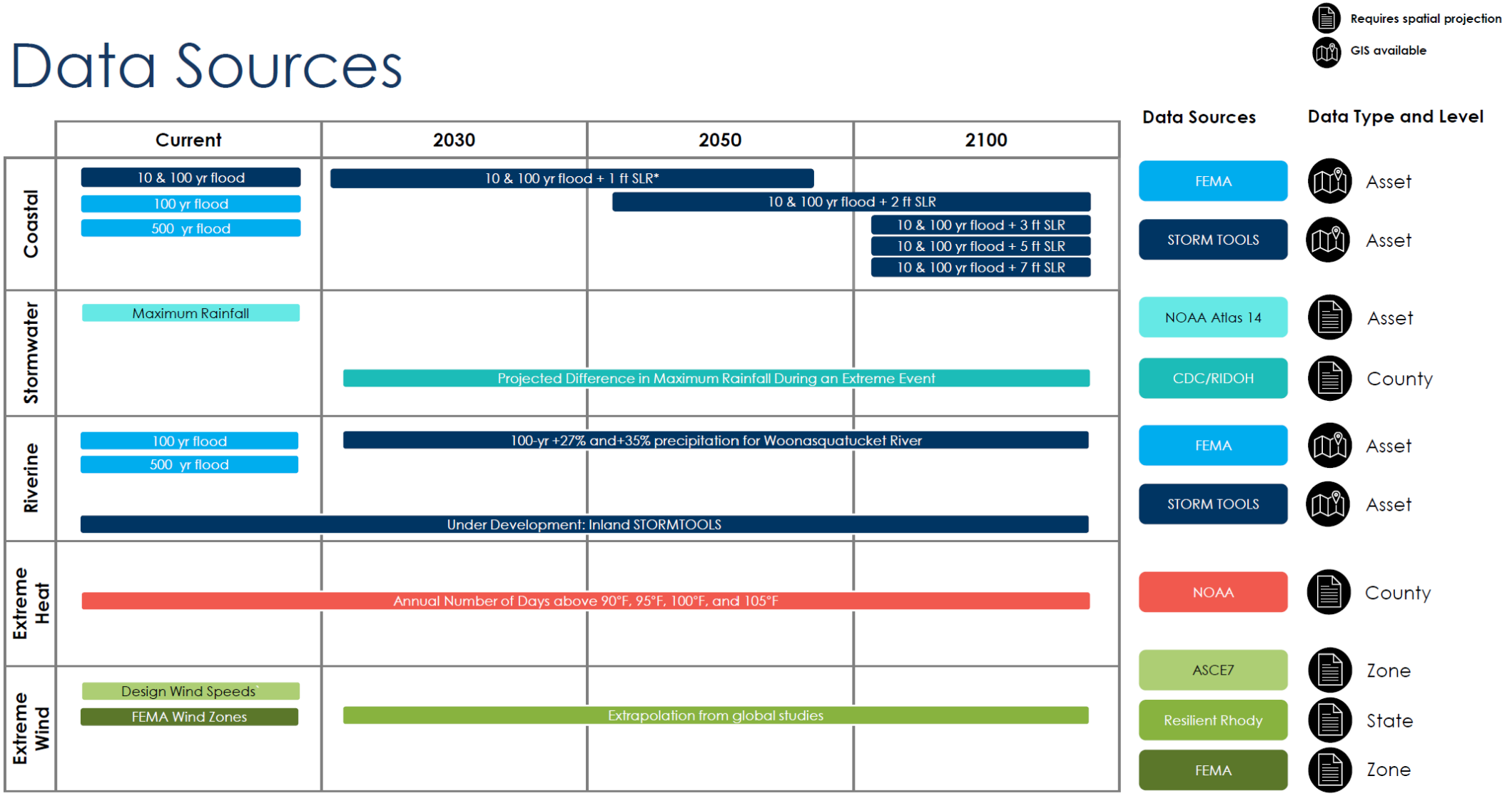
- Present: Current Conditions
- Future: 2030, 2050, 2100

Climate Scenarios

- **SSP2-4.5:** Intermediate emissions scenario
- **SSP2-8.5:** Very High emissions scenario

2025 Resilience Plan – Vulnerability Assessment

Data Sources



*The 50-yr + 1 ft SLR will be used if data is not available for 100-yr + 1 f SLR.

2025 Resilience Plan – Vulnerability Assessment

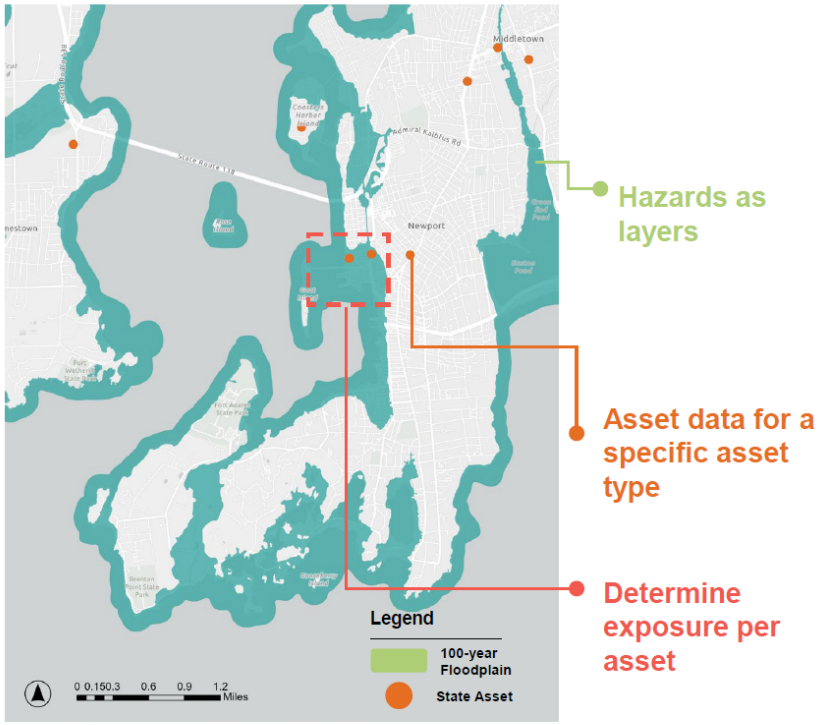
2. Exposure

Hazard | **Exposure** | Vulnerability | Risk

Method

To determine asset exposure to climate hazards, we will:

1. **Collect asset data** (including geospatial location) across the state for priority asset types identified in *2018 Resilient Rhody*
2. **Overlay asset geospatial data with climate hazard geospatial data** to determine hazard severity at each individual asset (as shown in graphic to right)



Example GIS-based Exposure Assessment

2025 Resilience Plan – Vulnerability Assessment

2. Exposure

Hazard | Exposure | Vulnerability | Risk

Asset Data

Asset data will be collected for assets within priority asset types as determined in *2018 Resilient Rhody*, inclusive of

- **Critical Infrastructure and Facilities**
- **Community & Emergency Preparedness Structures**
- **Natural Systems**

In addition to location, asset data will include details that help determine each asset's vulnerability to exposed climate hazards, such as age and condition.

Asset Category	Asset Type
Critical Infrastructure and Facilities	Drinking Water Systems
	Wastewater Treatment Facilities
	Dams
	Seawalls & Tidal Gates
	Stormwater Infrastructure
	Ports
	Electric Grid
	Fuel Supply
	Roads, Bridges, and Culverts
	Public Transportation
Community & Emergency Preparedness Structures	Schools
	Housing
	Municipal Buildings
	Evacuations Shelters & Routes
	Emergency Services (Hospitals, Emergency Operations Centers, Food Systems)
Natural Systems	Coastal Wetlands
	Beaches & Barriers
	Forests
	Water Resources (Rivers & Streams, Lakes & Ponds, Wetlands)

Assets from 2018 Resilient Rhody

2025 Resilience Plan – Vulnerability Assessment

3. Vulnerability

Hazard | Exposure | Vulnerability | Risk

Method

In order to understand the risk level of assets that are exposed to climate hazards, we will conduct a vulnerability assessment that combines hazard exposure with asset characteristics to determine the resulting risk. This consists of the following steps:

1. **Identify asset-hazard pairs** that have the potential to cause significant consequences, and determine those primary consequences
2. **Develop a vulnerability model** for each identified asset-hazard pair that translates hazard exposure to consequence severity. This will be done based on literature review previous Rhode Island vulnerability assessments.

2025 Resilience Plan – Vulnerability Assessment

3. Vulnerability

Hazard | Exposure | Vulnerability | Risk

Asset-Hazard Pairs

We anticipate the following asset-hazard pairs will be identified as vulnerable.
Asset-hazard pairs identified as rugged are deemed less susceptible to negative consequences.

Asset		Hazard				
Asset Type	Asset Category	Coastal Flooding	Stormwater Flooding	Riverine Flooding	Extreme Heat	Extreme Wind
Critical Infrastructure and Facilities	Drinking Water Systems					
	Wastewater Treatment Facilities					
	Dams					
	Seawalls & Tidal Gates					
	Stormwater Infrastructure					
	Ports					
	Electric Grid					
	Fuel Supply					
	Roads, Bridges, and Culverts					
	Public Transportation					
Community & Emergency Preparedness Structures	Schools					
	Housing					
	Municipal Buildings					
	Evacuations Shelters & Routes					
	Emergency Services (Hospitals, Emergency Operations Centers, Food Systems)					
Natural Systems	Coastal Wetlands					
	Beaches & Barriers					
	Forests					
	Water Resources (Rivers & Streams, Lakes & Ponds, Wetlands)					

Rugged | Vulnerable

2025 Resilience Plan – Vulnerability Assessment

3. Vulnerability

Hazard | Exposure | Vulnerability | Risk

Consequences

We propose the following consequences be considered when developing asset-hazard pair vulnerability models.

Consequence	Description
Damage	Physical damage experienced by an asset resulting in inability to function as required. This captures a range of outcomes from disrupted operations with minimal damage to complete loss of asset.
Disruption	Disruption of critical functionality resulting from hazard demand on infrastructure systems exceeding their capacity or leading to deterioration of natural systems.
Life Safety	Negative human health outcomes that are not attached to physical damage of other assets but pose a direct risk to life safety of asset occupants.

Question: does this list cover the primary consequences of concern?

2025 Resilience Plan – Vulnerability Assessment

4. Risk

Hazard | Exposure | Vulnerability | Risk

Method

In order to produce risk ratings for each asset, asset type-specific **qualitative risk rating systems** will be developed. These rating systems will be based on hazard and consequence severity at the asset and are intended to be used to understand risk distribution across the asset type.

These risk ratings will enable an understanding of the scale of risk across each asset type and to identify priority assets for further attention.

		Impact				
		Insig.	Minor	Signific.	Major	Severe
Hazard	Rare	Low	Low	Low	Low-Medium	Low-Medium
	Unlikely	Low	Low	Low-Medium	Low-Medium	Medium
	Moderate	Low	Low-Medium	Low-Medium	Medium	Medium-High
	Likely	Low-Medium	Low-Medium	Medium	Medium-High	High
	Almost certain	Low-Medium	Medium	Medium-High	High	High

Example Qualitative Risk Rating Matrix

Example rating

2025 Resilience Plan – Vulnerability Assessment

Task 2.3 Develop State Asset Inventory

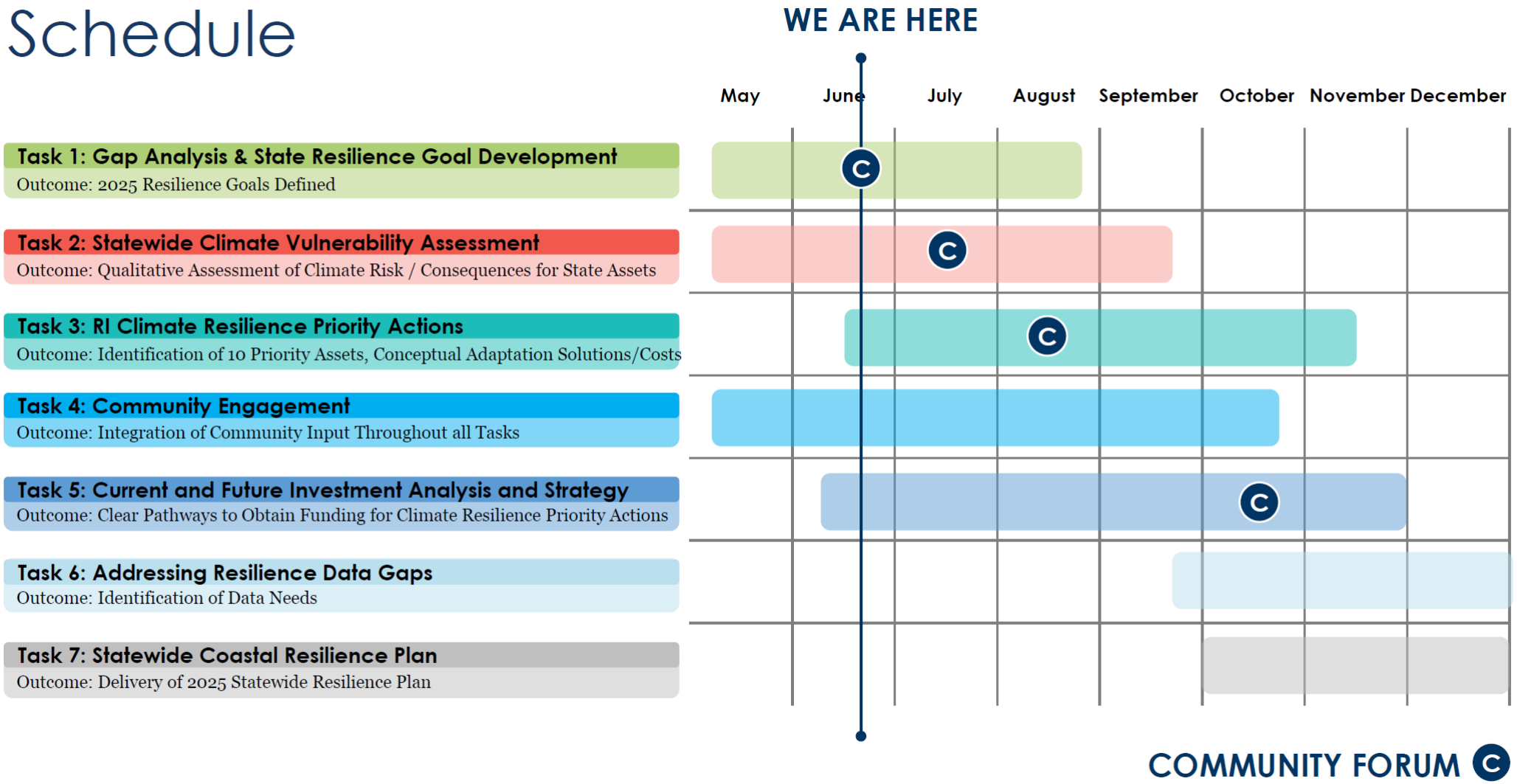
We have data representing each asset type (21)!

Beaches & Barriers
Biodiversity*
Coastal Wetlands
Dams
Drinking Water Systems
Electric Grid
Emergency Services
Evacuations Shelters & Routes
Forests
Fuel Supply
Historic Preservation*
Housing
Municipal Buildings
Ports
Public Transportation
Roads, Bridges, and Culverts
Schools
Seawalls & Tidal Gates
Stormwater Infrastructure
Wastewater treatment facilities
Water Resources

*Additional asset/dataset

2025 Statewide Coastal Resilience Plan – Next Steps

Schedule



Contact Information

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