2023 ResilientMass Plan

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2023 ResilientMass Plan: Overview and Next Steps

- Background and context
- 2023 ResilientMass Plan
  - 2022 MA Climate Assessment Top Impacts
  - Vulnerability and Risk Assessment
  - Action Strategy
- Implementation Next Steps
- Q&A

2016

EXECUTIVE ORDER 569

Institutes a comprehensive approach to GHG emissions reduction and climate change adaptation

2018

ENVIRONMENTAL BOND

Allocates $2.4 billion with climate resiliency focus, and codifies E.O. 569, including MVP Program

2021

AN ACT CREATING A NEXT GENERATION ROADMAP FOR MA CLIMATE POLICY

Sets decarbonization goals statewide and for specific sectors, and creates Environmental Justice Council

2023

EXECUTIVE ORDER 604

Establishes role of Climate Chief, and Office of Climate Innovation and Resilience

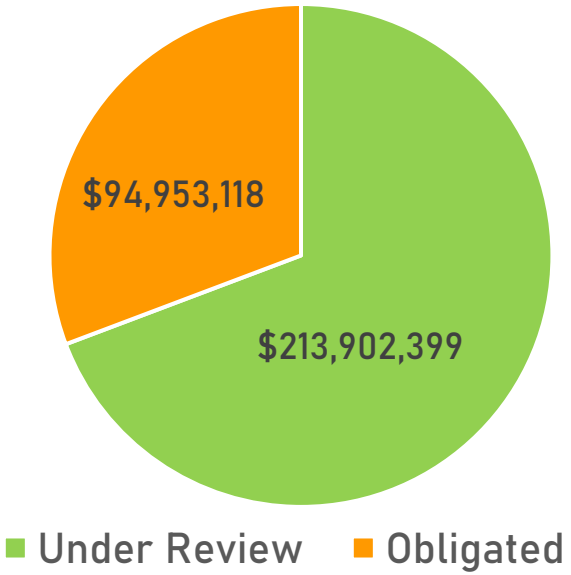
Benefits of Hazard Mitigation Planning and Climate Adaptation Plans

- **Limits** damage, disruption, and loss
- **Reduces** risk
- **Increases** ability to bounce back after disasters
- **Provides** a shared understanding
- **Helps** obtain funding

Why do we need a state hazard mitigation and climate adaptation plan?

HMA Funding History
~ $309M since 2010

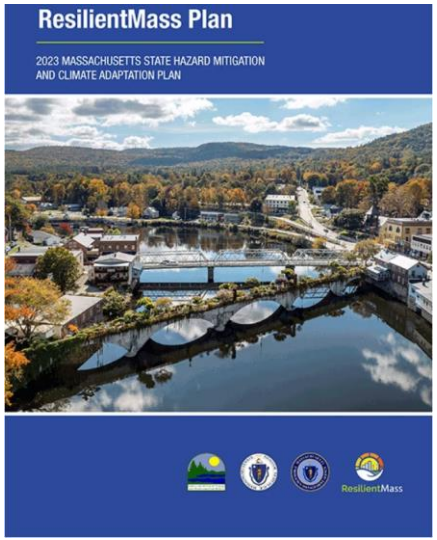
Total FEMA Funding Appropriated (since 2010)
$308,855,51



- Federal mandate to **maintain eligibility** for FEMA Hazard Mitigation Assistance (HMA)
- Plan must be **updated** every 5 years

What is the 2023 Resilient Mass Plan?

- ✓ Federally mandated update to the 2018 State Hazard Mitigation and Climate Adaptation Plan (SHMCAP)
- ✓ Identifies collaborative strategies and specific actions to increase resilience to climate change across the Commonwealth in accordance with Executive Order 569 - Establishing an Integrated Climate Change Strategy for the Commonwealth.
- ✓ Prioritizes projects that reduce risks from the priority impacts and high-consequence vulnerabilities across Massachusetts.
- ✓ Establishes 142 cross-government and state agency actions to address the impacts the Commonwealth faces due to climate change

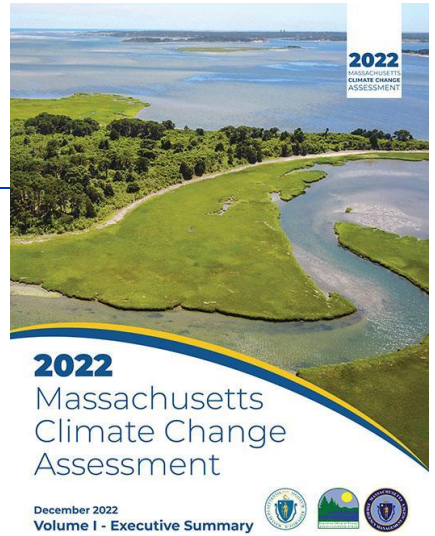


Read the full plan at resilient.mass.gov

Defining statewide climate impacts and priorities:
2022 MA Climate Change Assessment

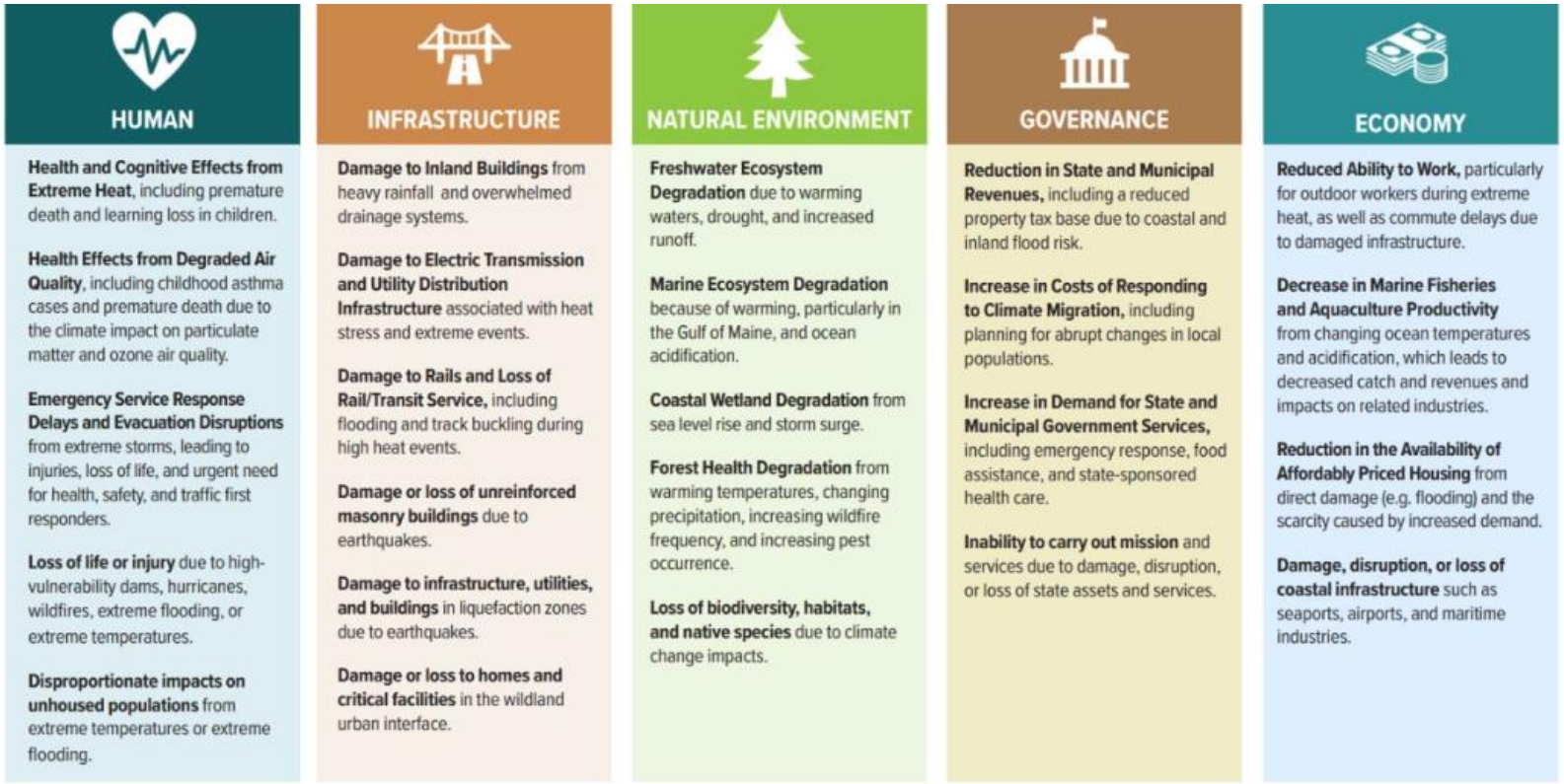
The 2022 MA Climate Change Assessment assigns **urgency rankings** to priority climate impacts across **five sectors** and **seven regions.**

MAGNITUDE OF CONSEQUENCE	+	DISPROPORTIONALITY OF EXPOSURE	+	ADAPTATION GAP	=	URGENCY SCORE
Extreme		Disproportionate Exposure		Extreme		High Priority
Major				Moderate		
Moderate		Potential for Disproportionate Exposure				Medium Priority
Minimal				Minimal		
Insignificant		Limited Disproportionate Exposure		Low		Lower Priority



Human | Infrastructure | Natural Environment | Governance | Economy

Urgent Climate Impacts by Sector



Climate Projections and Impacts in Massachusetts

RISING TEMPERATURES[1]

23–29 high heat days per year expected by **2050** and annual average temperature increase of **5.9 to 7.9°F.**

Those most likely to be affected from high heat include unhoused populations, those working outdoors, the elderly, infants, individuals with chronic diseases (e.g., asthma), and environmental justice and other priority populations.

Extreme temperatures are projected to increase annual transportation infrastructure maintenance costs by over **$140 million** by the end of the century.

CHANGES IN PRECIPITATION[2]

By **2070,** Massachusetts is expected to receive **12–42%** more winter precipitation.

Environmental justice and priority populations live near commercial and industrial buildings that have a **57% higher risk of flood** damage than the rest of the Commonwealth.

Annual economic flood damage is estimated to increase by **$9.3 million** by **2030** across the Commonwealth.

COASTAL FLOODING[3]

Massachusetts is planning for sea level rise by up to **2.5 feet by 2050** compared to present day (2008) if global emissions are not significantly reduced. Both tidal and storm-related flooding are projected to increase.

Risks and consequences from inundation will be more significant among sensitive assets such as hospitals, schools, prisons, care facilities, and underground and at-grade living quarters.

Coastal flooding is projected to cause over **$52 million** in damage annually to state-owned coastal properties, a **550%** increase from today.

SEVERE WEATHER[4]

Includes strong winds, tornadoes, extreme precipitation, and droughts. Precipitation amounts from the heaviest storms in the Northeast has increased by **55%** since **1958.**

High winds are of particular concern to coastal areas, where wind speeds can reach **110+ miles per hour.**

Populations living or working outdoors will be increasingly exposed to dangers of more frequent and increasingly severe weather.

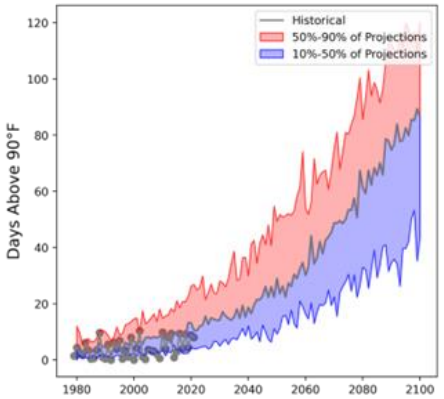
Lightning was responsible for **$20.4 million** in damage in Massachusetts between 2002 and 2022.[5]

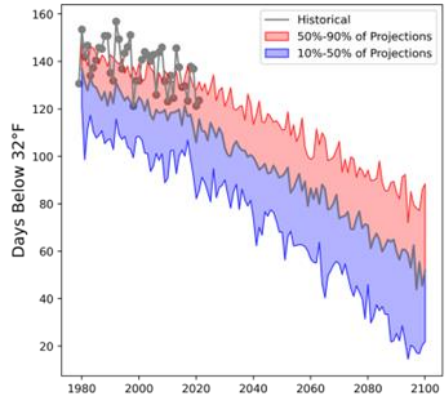
Risk and Vulnerability Assessment

- **Hazards included** *(draws from Climate Assessment vs new analysis):*
  - Inland flooding
  - Dam overtopping
  - Drought
  - Coastal flooding and storm surge
  - Coastal erosion
  - Average and extreme temperatures
  - Wildfires
  - Invasive species
  - Hurricanes/tropical storms
  - Winter storms/Nor'easters
  - Groundwater rise
  - Tsunami
  - Landslides
  - Tornados
  - Other Severe Weather
  - Earthquake

- **Concepts covered for each hazard:**
  - **Location:** geospatial reach
  - **Likelihood**: of occurrence, considering changing climate
  - **Magnitude of Consequence**: of impact and ability to respond
  - **Qualitative**: adaptive capacity and disproportionate impacts
  - **Vulnerability** by sector

- **Example hazard: *Average/Extreme Temperatures***
  - Occurrences and Frequency
    - 2010-2022 had 7 of 10 warmest summers on record; 2 hottest summers on record are 2020 and 2022
    - Certainty in increase in high, low, average temperatures, and humidity
      - 2050 summer temps like MD; 2090 like GA
  - Vulnerability by sector
    - ***Human***: Health effects from extreme heat and degraded air quality
    - ***Governance***: Increase in demand for services; adaptation coordination
    - ***Infrastructure***: Damage to rails and loss of rail service; Damage to electric transmission and distribution infrastructure
    - ***Natural Environment***: Freshwater and marine ecosystem degradation; Forest health degradation
    - ***Economy***: Reduced ability to work

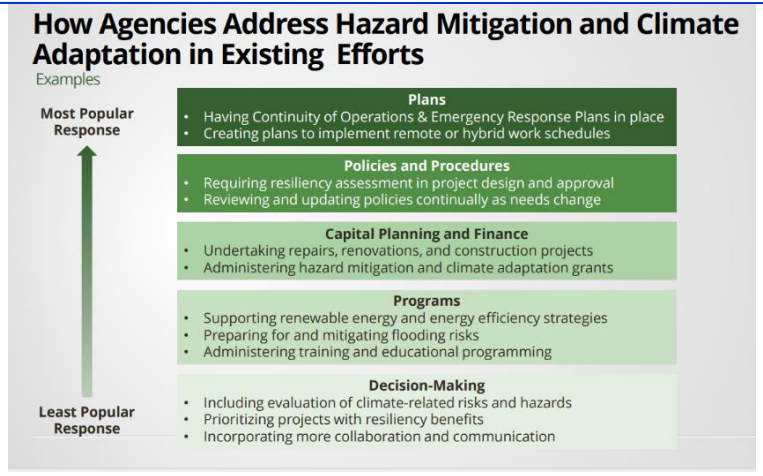


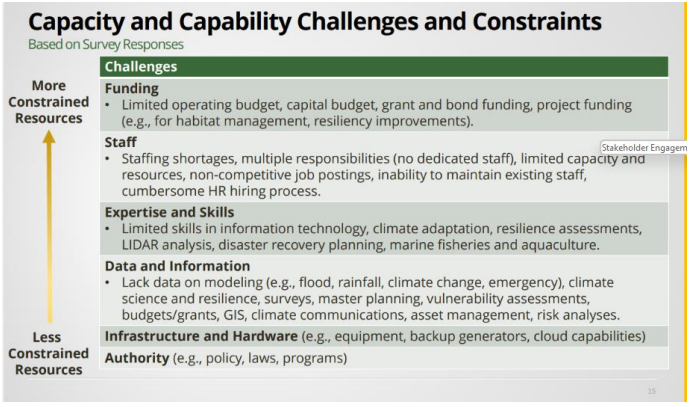


State Capability and Adaptive Capacity Analysis

- **Inventory and evaluation of the Commonwealth's existing capabilities and key challenges for agencies to implement hazard mitigation and climate adaptation actions:**
  - 81 agency survey responses (11 no responses) that identified 182 existing capabilities to reducing hazard risk and vulnerability
    - E.g. regulatory jurisdiction; coastal management programs, energy resilience initiatives; data; planning
  - and 90 new capabilities since the 2018 update, including:
    - ***New coordinating structures***: RMAT launch, DOER LBE
    - ***New data and tools***: Development of Climate Assessment, Drought Management Plan, and RMAT Resilience Tool
    - ***New funding sources***: SHMCAP Implementation Funding, MVP expansion

- **Key opportunities to address challenges raised include:**
  - Staff capacity and subject matter expertise
  - Authority and bureaucracy
    - Data access and consistent use, filling gaps
    - Resilience standards and capital planning evaluation
  - Increased funding and metrics
  - Consistent collection and use of data
  - Increased inter-agency coordination and local capabilities





Agency Action Strategy: Bridging Hazards, Impacts, and Actions

Governance Sector: Urgent Impact #1

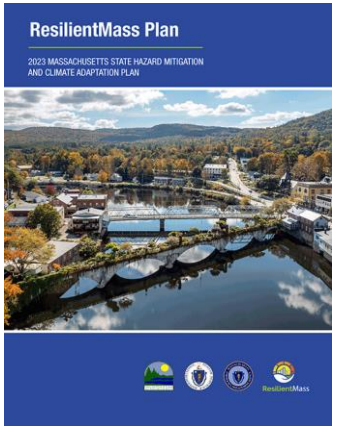
Reduction in State and Municipal Revenues

State and municipal revenue streams impacted through property tax loss following structure damage of any type, from any hazard, and income and sales tax losses associated with business interruptions or effects on industrial activities.

Major Level of Consequence	Disproportionate Exposure	Moderate Adaptation Gap
• Massachusetts municipalities could experience $104 million in lost revenues from a 3 ft sea level rise (1.4 percent of current property taxes in 89 coastal municipalities).	• Lost property tax value from coastal structures is the largest category of expected impact, and could disproportionally impact municipalities with higher proportions of population in EJ block groups.	• Adaptation actions focused on reducing property damage (particularly from coastal flooding) will help to mitigate this impact.

Identification of impact and magnitude in MA Climate Change Assessment

State agency actions in ResilientMass Plan



https://resilient.mass.gov

ACTION 1a: Acquisition/Buyout program study

MEMA will hire a vendor to study other successful state buyout programs such as NJ, OH and districts in NC as well as Florida's Wind Mitigation Program to understand best practices, gaps and opportunities of improvement. The study will result in a set of recommendations that best suits Massachusetts government structure to help us identify properties and create a program that best supports coastal and riverine cities and towns making it easier for them to obtain funding.
Acquisition/Buyout programs are one method of property acquisitions in which private lands are purchased, existing structures demolished, and the land maintained in an undeveloped state for public use in perpetuity. Acquisition of a property in a floodway is intended to reduce the risk of future flooding for the property and/or those adjacent. A voluntary property acquisition/buyout program can enable homeowners to leave high-risk areas. This can be an especially important option for EJ and other priority populations who may not have the financial means to move or to repair/rebuild after floods.

Scale	Lead(s) & Partner(s)	Hazard(s) Addressed
Statewide, Local, Site-Specific	Lead: MEMA Partners: DCR, State Floodplain Manager, local communities	All hazards
Goal(s) Addressed		**Timeframe**
1, 2, 3, 4, and 6		Less than 3 years

ResilientMass Plan Agency Actions - Example actions focused on flooding

*Actions can address multiple risks

Develop a coastal resilience strategy
Leads: EEA and CZM; Timeframe: 5+ years

Launch acquisition/buyout program study
Lead: MEMA; Timeframe: Less than 3 years

Enhance consideration of resilience in the building code
Leads: EEA and EOED; Timeframe: 5+ years

Floodplain regulatory and coordination framework
Lead: EEA; Timeframe: 5+ years

ResilientMass Plan Agency Actions – Example actions, continued

Extreme storms

- **MBTA design standards update** with new standards that include climate resilience considerations for all MBTA new construction and retrofits. (Lead: MBTA; Timeframe: Less than 3 years)
- **Statewide emergency management training needs assessment** to ensure emergency preparedness of state public safety officials to natural hazards, especially climate change-exacerbated hazards. (Lead: MEMA; Timeframe: Less than 3 years)

High heat

- **Develop and implement a new Heat Flag system** in alignment with NOAA's Heat Advisory Criteria for New England, to identify days of extreme heat and alert people to risks, particularly children and the elderly. Lead: HHS; Partners: LWD, DPH, MEMA; Timeframe: 5+ years)
- **Identify and assess opportunities to promote cooling** in residential buildings and mitigate extreme-heat risks to renters and remote workers. (Lead: EOED; Partners: HHS, HLC, LWD; Timeframe: Less than 3 years)
- **Expand DCR's Greening the Gateway Cities program into additional EJ communities and** increase tree-planting efforts across low-canopy-cover EJ neighborhoods to mitigate heat island effects, combat adverse effects of climate change, reduce energy costs, absorb and filter pollutants, and decrease water runoff. (Lead: DCR; Partners: Municipalities; Timeframe: 3-5 years)

Flooding from precipitation

- **Enhance consideration of resilience in the building code** with key partners; integrating above-code flood standards into the statewide building code could enable municipalities to voluntarily adopt more resilient standards for construction in their communities. (Leads: EEA and EOED; Partners: DCR, OPSI, DOER; Timeframe: 5+ years)
- **Farm Climate Resiliency Program** expansion will support farmers and the state agricultural system with grants including free "climate audits" for risk reduction, as well as support for climate-smart measures. (Lead: MDAR; Timeframe: Less than 3 years)
- **Protect 30 percent of land and ocean by 2030 (to align with the global 30x30 goal),** implementing EEA's Resilient Lands Initiative, incorporating the Healthy Soils Action Plan, and taking a statewide approach to increase resilience and provide carbon sinks for GHG mitigation. (Lead: EEA and DCR, Partners: DMR, DER, DMF, DFG, MDAR; Timeframe: 5+ years)

ResilientMass Plan Action Tracker

State agencies identified over 100 initial priority actions to increase resilience and reduce the Commonwealth's risks and vulnerabilities related to natural hazards and projected climate changes. This tracker is maintained by the inter-agency ResilientMass Action Team (RMAT) and contains a list of actions identified through the 2023 ResilientMass planning process. All actions address at least one of the primary statewide climate change impacts identified in the 2022 Massachusetts Climate Change Assessment. This tracker will be updated periodically to reflect progress in implementing these actions.

Search Clear All

Apply filters

- Executive Office
- Lead Agency
- Priority
- Actions By Sector
- Status
- Completion
- Category
- Scale
- Cross-Government Actions

Viewing 142 of 142 Actions

High

Acquisition/Buy-out Program Study

Executive Office: EOPSS Lead Agency: MEMA

Category: Assessment, research, and mapping | Status: In Progress | Completion: Less than 3 years

High

Address impacts of flooding to infrastructure, natural resources and groundwater through better understanding of climate change drivers

Executive Office: EOEEA Lead Agencies: EEA DCR-OWR

Category: Assessment, research, and mapping | Status: In Development | Completion: 3-5 years

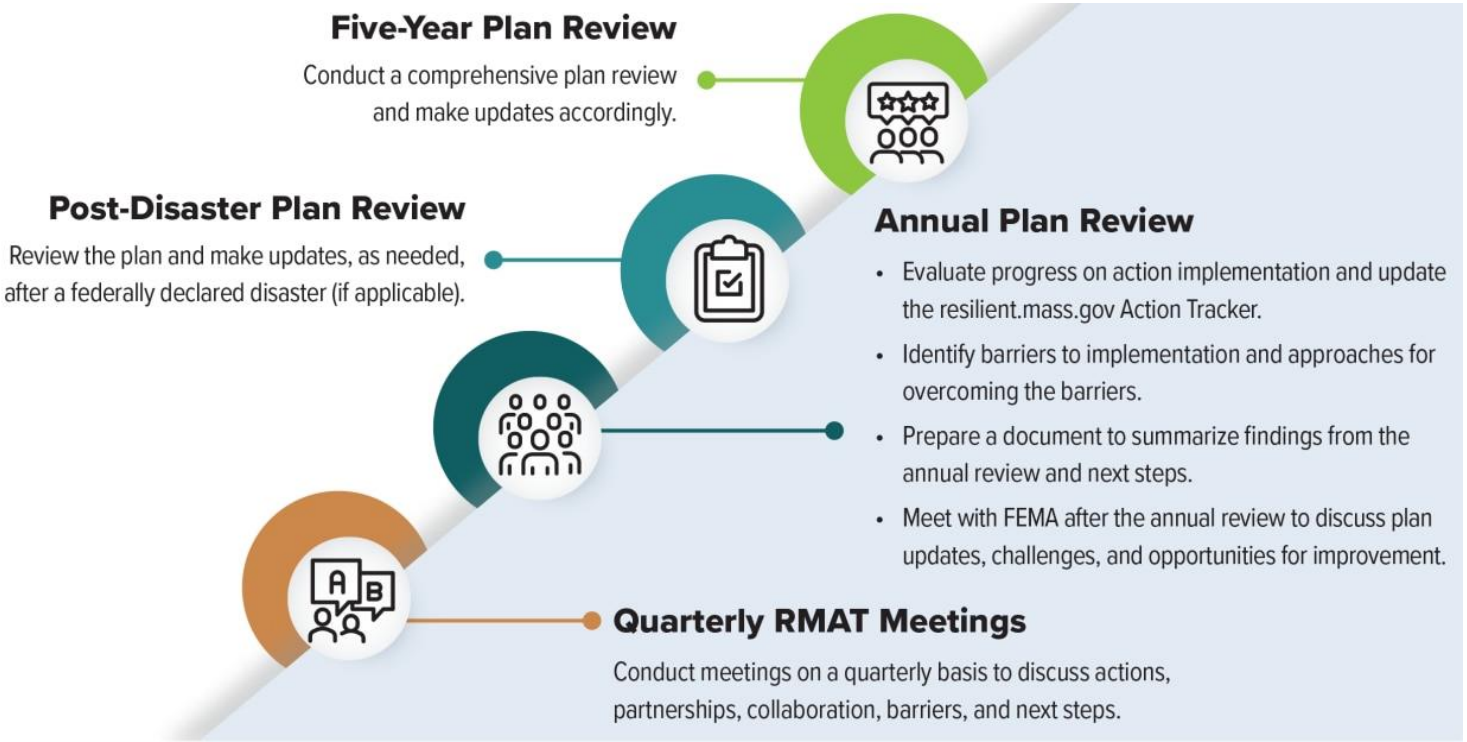
Medium

Address the risk of extreme heat to building occupants

Executive Office: A&F Lead Agency: DCAMM

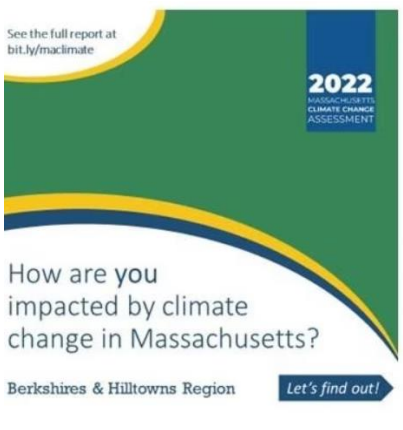
Category: Capital planning | Status: In Progress | Completion: Greater than 5 years

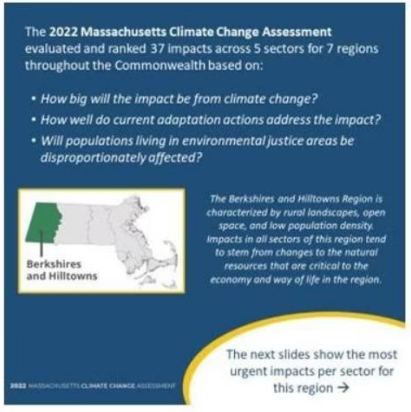
A Living Plan

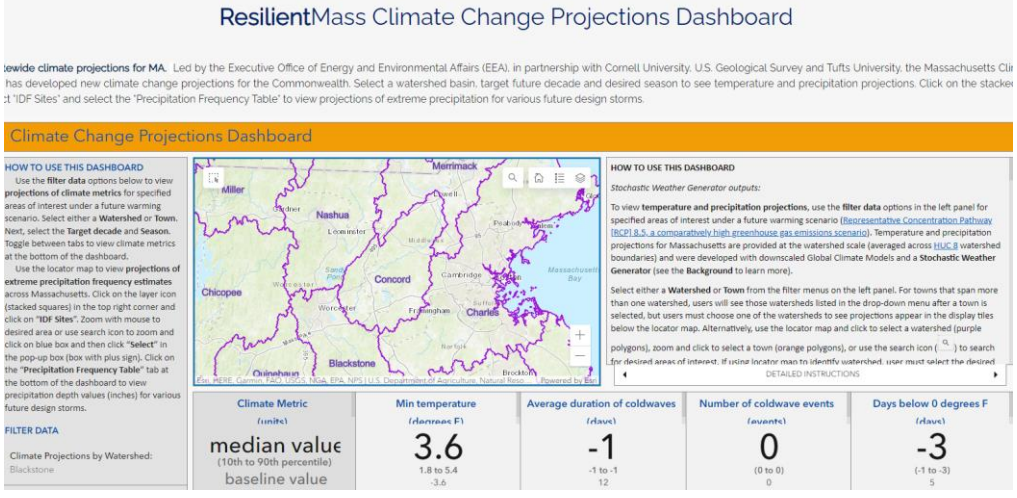


Applying the Findings: Tools and Data

- Regional findings sample slide decks and social media content: bit.ly/2022maclimate
    - Summary slides and materials to help partners and organizations share findings in their own networks
- [ResilientMA.mass.gov Maps and Data Center](): Ongoing and growing resource for Massachusetts-specific best available climate information for users
    - Local and regional planning
    - Funding applications and resource prioritization
    - Communication and advocacy tools

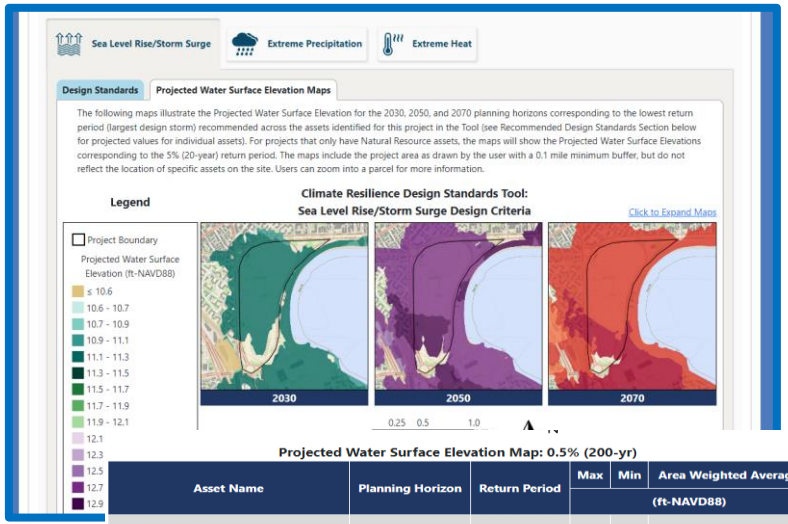






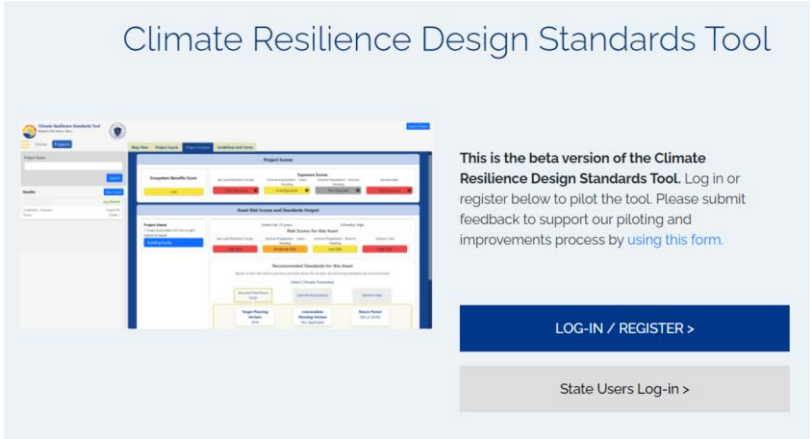
Applying the Data: Climate Resilience Design Standards Tool

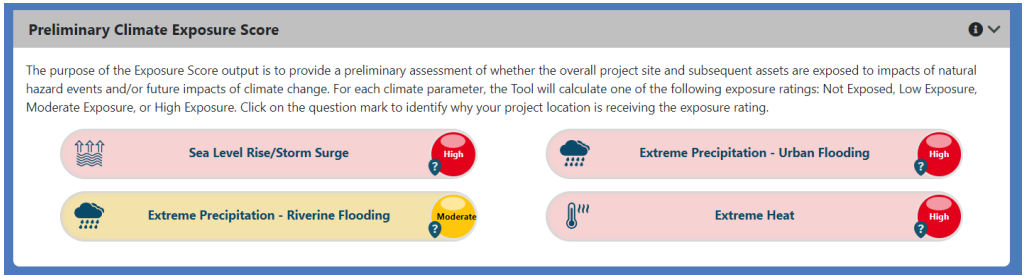
An interactive web-based tool that automates the Commonwealth's available climate change data and provides a preliminary climate exposure screening and planning recommendations for projects



Projected Water Surface Elevation Map: 0.5% (200-yr)

Asset Name	Planning Horizon	Return Period	Max	Min	Area Weighted Average (ft-NAVD88)
Flood Barrier - South Boston Protection	2030	0.5% (200-yr)	11.3	10.6	11.1
	2050	0.5% (200-yr)	12.9	12.7	12.8
	2070	0.5% (200-yr)	14.7	14.6	14.6

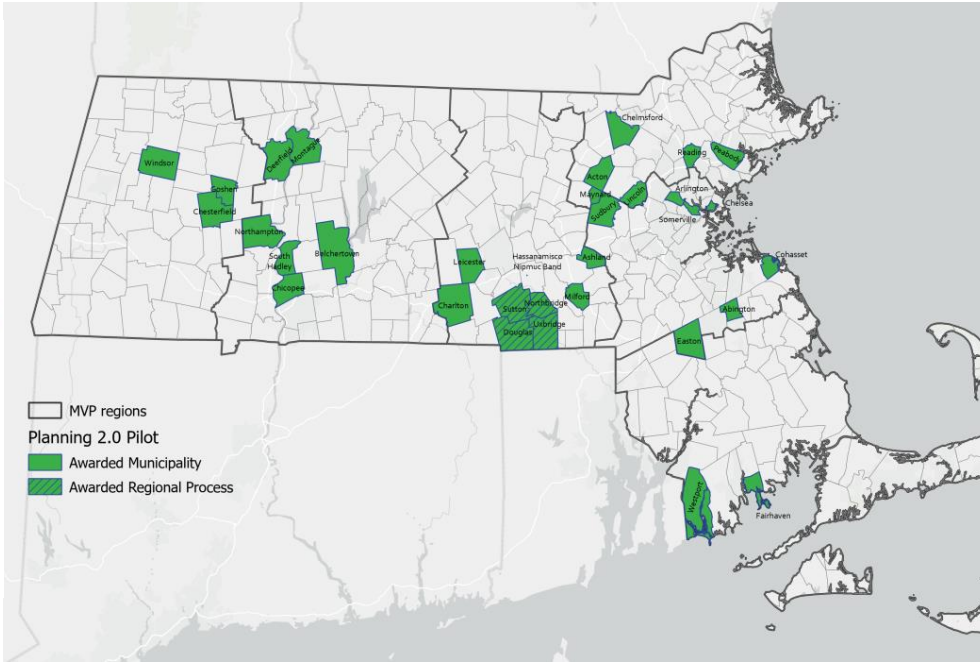




https://resilient.mass.gov/rmat_home/designstandards/

Implementing ResilientMass: MVP 2.0

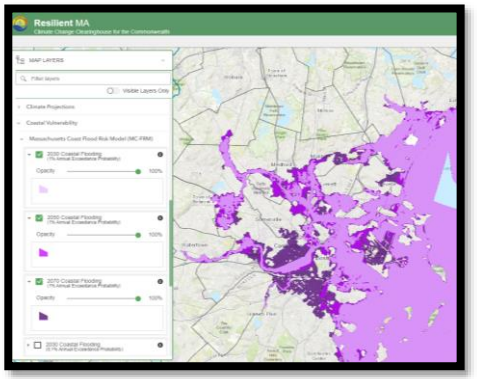
For MVP communities at the 5-year mark, MVP Planning 2.0 will build on the work done to date, and will support communities with new processes, tools, and resources for inclusive and actionable climate resilience planning.

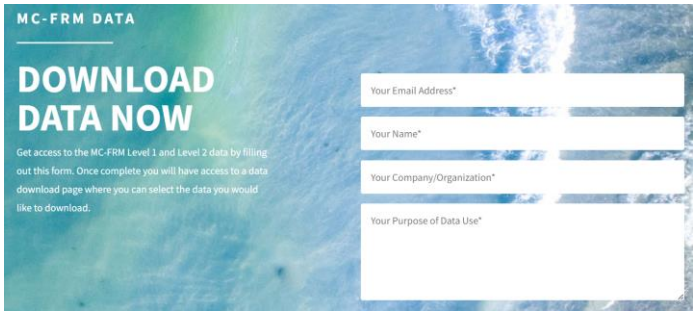


Implementing ResilientMass: Coastal Resilience

- CZM developing a coastal resilience strategy in partnership with coastal municipalities & other coastal stakeholders to guide state & local coastal resilience policy & management actions
  - Develop vision, goals and metrics for a resilient coast
  - Delineate “coastal resilience districts”
  - Identify climate resilient development standards & best practices for coastal adaptation
  - Develop recommendations for management of vulnerable areas at state & local levels

- MA Coast Flood Risk Model data available for download and on CZM and Resilient.mass.gov viewers
  - Recorded training series accessible at "MassEEA" YouTube channel





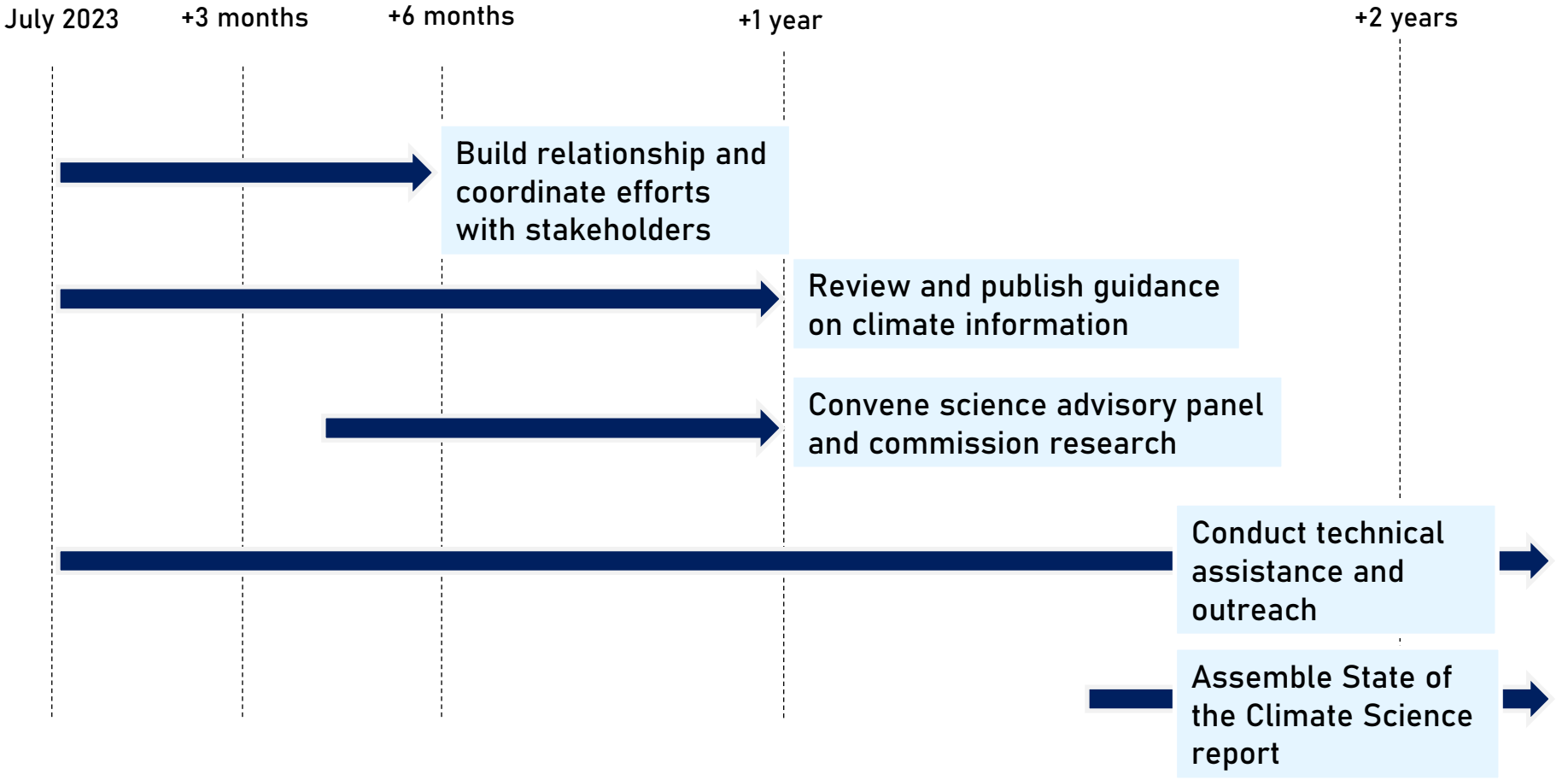
Implementing ResilientMass: EEA Office of Climate Science

- Serve as an authoritative resource, and provide subject matter experts on statewide climate data and models, and support consistent application across agencies.

- Convene the academic climate science community and identify opportunities to partner with universities on climate science needs and next steps.

climatescience@mass.gov

EEA Office of Climate Science Workplan



Thank you!

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