



# ResilientMass Plan

## 2023 MASSACHUSETTS STATE HAZARD MITIGATION AND CLIMATE ADAPTATION PLAN

EXECUTIVE SUMMARY | September 2023







## CONTENTS

Protecting and Advancing the Commonwealth's Resilience .....	1
2023 ResilientMass Planning and Engagement .....	3
Identification of Priority Climate Impacts .....	4
Risks and Vulnerabilities Across the Commonwealth .....	5
Hazard Mitigation and Climate Adaptation Strategy .....	10
ResilientMass: A Living Plan .....	15
Glossary .....	16

# Protecting and Advancing the Commonwealth's Resilience

The ResilientMass Plan is an innovative State Hazard Mitigation and Climate Adaptation Plan (SHMCAP) that was developed in a highly collaborative manner to fully integrate a hazard mitigation plan and a climate change adaptation plan.

The ResilientMass Plan identifies strategies and specific, measurable actions state agencies can take—individually or through interagency partnerships—to address risks to the human health and safety, communities, critical assets and infrastructure, natural resources, governance, and economy of the Commonwealth. The ResilientMass Plan aims to ensure the Commonwealth is prepared to withstand, rapidly recover from, adapt to, and mitigate natural hazard events.

## The ResilientMass Plan



Constitutes the federally mandated 5-year update to the 2018 Massachusetts State Hazard Mitigation and Climate Adaptation Plan (SHMCAP) to maintain federal pre- and post-disaster funding eligibility.



Prioritizes projects that reduce risks from priority impacts and high-consequence vulnerabilities across Massachusetts.



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.

**The full ResilientMass Plan  
can be found at  
[resilient.mass.gov](https://resilient.mass.gov)**



## KEY TERMS

**CLIMATE ADAPTATION:** Actions taken at the individual, local, regional, state, and national levels to reduce risks from changing climate conditions and prepare for impacts from additional changes projected for the future.

**CLIMATE RESILIENCE:** The ability to prepare for, recover from, and adapt to climate change and associated impacts.

## ENVIRONMENTAL JUSTICE (EJ) AND OTHER

**PRIORITY POPULATIONS:** Those meeting Massachusetts' definition of "environmental justice population" in addition to people or communities who are disproportionately impacted by climate change due to life circumstances that systemically increase their exposure to climate hazards or make it harder to respond.

**HAZARD MITIGATION:** Actions taken to reduce or eliminate the long-term risk to human life and property from hazards.

## ResilientMass Mission and Goals

Through the ResilientMass Plan, the Commonwealth is advancing its mission to increase its capacity for addressing natural and other hazards and climate impacts through preparation, mitigation, adaptation, and risk reduction.

The ResilientMass Plan includes the following goals, which were developed through a collaborative process involving the interagency **ResilientMass Action Team (RMAT)** and local, regional, and community partners. Refer to Chapter 7: State Strategy, Actions, and Implementation Plan for full descriptions of the goals.



**Collaboration, communication, funding, and engagement.** Strengthen collaboration, communication, and funding strategies between all levels of government. Work together to form strategic, effective, and inclusive policies, programs, funding, and projects that demonstrate a whole-of-government approach to address hazards. Ensure the accessibility of this plan to all populations across Massachusetts.



**Science-based and informed decision-making.** Develop programs to support, collect, and disseminate hazard and climate data and findings to improve the effectiveness of resilience and hazard mitigation strategies.



**Resilient state assets and services.** Reduce risks to critical natural and built state assets and services to preserve and enhance safety, cultural resources, and quality of life. Reduce risks to critical assets and lifelines from hazards—including high-hazard dams from inland and coastal flooding, wildfire, and extreme temperature—through improved building codes, resilient design and building standards, land use and zoning requirements, and targeted conservation, restoration, and land management strategies.



**Implementation of adaptation actions for communities and ecosystems.** Increase community resilience, environmental health, ecosystem functions, and biodiversity by implementing actions that can adapt over time to reduce increasing risks to the most vulnerable natural and human communities.



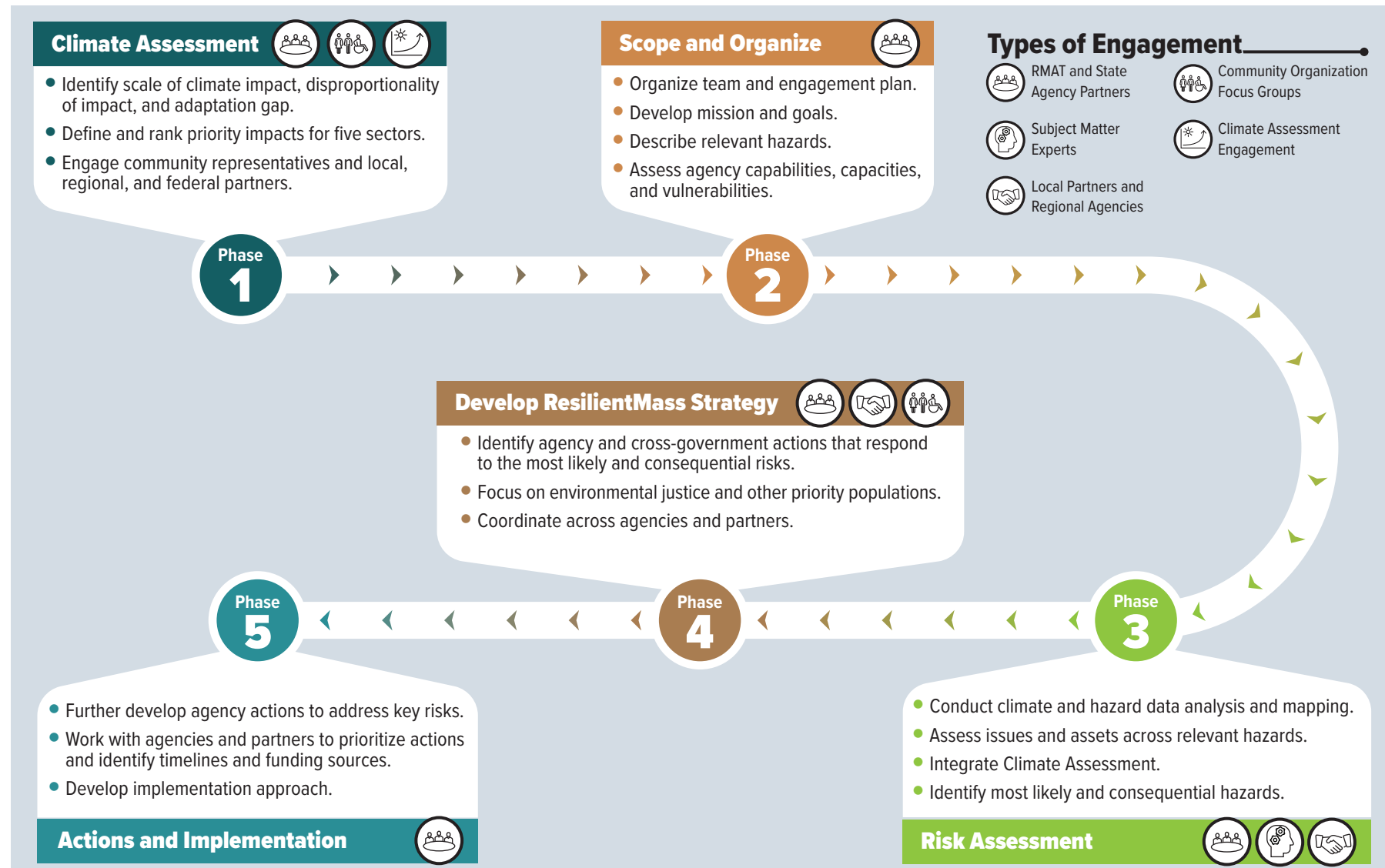
**Climate mitigation.** Ensure that actions to reduce hazard and climate risks consider greenhouse gas (GHG) reduction and carbon sequestration and storage measures. These measures can reduce climate change and, therefore, its risks and impacts, and are in alignment with the goals of the Commonwealth's 2025, 2030, and 2050 Clean Energy and Climate Plans. In addition, ensure that nature-based solutions are prioritized.



**Resilient and equitable infrastructure, ecosystems, and communities.** Promote meaningful and collaborative participation in and benefit from the ResilientMass Plan to ensure it that provides risk reduction for the communities and assets that are most at risk. Hazard mitigation and climate adaptation actions should result in equitable community and environmental resilience for the natural and built environments, improve community safety and wellbeing, and address past disproportionate provision of burdens and benefits.

# 2023 ResilientMass Planning and Engagement

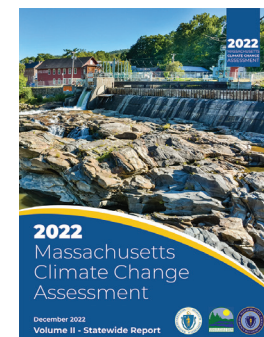
Over the course of 18 months, the RMA met as a working group and held meetings across Massachusetts to engage local, regional, and community partners. The ResilientMass Plan builds on the analysis, engagement, and findings of the 2022 Massachusetts Climate Change Assessment.










# Identification of Priority Climate Impacts

The ResilientMass Plan integrates the findings from the 2022 Climate Assessment with additional analysis on all current hazards that may impact the Commonwealth, as well as future risks that will increase the likelihood, frequency, and duration of hazards. The Climate Assessment evaluates 37 climate impacts across five sectors and considers the scale of the consequence, disproportionate impacts on environmental justice and other priority populations, and the actions currently underway to address the impacts. The ResilientMass Plan builds on the impacts identified in the 2022 Climate Assessment, furthers the analysis through additional assessments of risk, and uses the findings from both processes to identify the most likely and consequential risks to the Commonwealth.



## Most Urgent Priority Impacts

 <b>HUMAN</b>	 <b>INFRASTRUCTURE</b>	 <b>NATURAL ENVIRONMENT</b>	 <b>GOVERNANCE</b>	 <b>ECONOMY</b>
<p><b>Health and Cognitive Effects from Extreme Heat</b>, including premature death and learning loss in children.</p> <p><b>Health Effects from Degraded Air Quality</b>, including childhood asthma cases and premature death due to the climate impact on particulate matter and ozone air quality.</p> <p><b>Emergency Service Response Delays and Evacuation Disruptions</b> from extreme storms, leading to injuries, loss of life, and urgent need for health, safety, and traffic first responders.</p> <p><b>Loss of life or injury</b> due to high-vulnerability dams, hurricanes, wildfires, extreme flooding, or extreme temperatures.</p> <p><b>Disproportionate impacts on unhoused populations</b> from extreme temperatures or extreme flooding.</p>	<p><b>Damage to Inland Buildings</b> from heavy rainfall and overwhelmed drainage systems.</p> <p><b>Damage to Electric Transmission and Utility Distribution Infrastructure</b> associated with heat stress and extreme events.</p> <p><b>Damage to Rails and Loss of Rail/Transit Service</b>, including flooding and track buckling during high heat events.</p> <p><b>Damage or loss of unreinforced masonry buildings</b> due to earthquakes.</p> <p><b>Damage to infrastructure, utilities, and buildings</b> in liquefaction zones due to earthquakes.</p> <p><b>Damage or loss to homes and critical facilities</b> in the wildland urban interface.</p>	<p><b>Freshwater Ecosystem Degradation</b> due to warming waters, drought, and increased runoff.</p> <p><b>Marine Ecosystem Degradation</b> because of warming, particularly in the Gulf of Maine, and ocean acidification.</p> <p><b>Coastal Wetland Degradation</b> from sea level rise and storm surge.</p> <p><b>Forest Health Degradation</b> from warming temperatures, changing precipitation, increasing wildfire frequency, and increasing pest occurrence.</p> <p><b>Loss of biodiversity, habitats, and native species</b> due to climate change impacts.</p>	<p><b>Reduction in State and Municipal Revenues</b>, including a reduced property tax base due to coastal and inland flood risk.</p> <p><b>Increase in Costs of Responding to Climate Migration</b>, including planning for abrupt changes in local populations.</p> <p><b>Increase in Demand for State and Municipal Government Services</b>, including emergency response, food assistance, and state-sponsored health care.</p> <p><b>Inability to carry out mission</b> and services due to damage, disruption, or loss of state assets and services.</p>	<p><b>Reduced Ability to Work</b>, particularly for outdoor workers during extreme heat, as well as commute delays due to damaged infrastructure.</p> <p><b>Decrease in Marine Fisheries and Aquaculture Productivity</b> from changing ocean temperatures and acidification, which leads to decreased catch and revenues and impacts on related industries.</p> <p><b>Reduction in the Availability of Affordably Priced Housing</b> from direct damage (e.g. flooding) and the scarcity caused by increased demand.</p> <p><b>Damage, disruption, or loss of coastal infrastructure</b> such as seaports, airports, and maritime industries.</p>

# Risks and Vulnerabilities Across the Commonwealth

The ResilientMass Plan integrates the latest climate data and information for 15 hazards impacting the Commonwealth now and in the future. Many of these natural hazards will intensify due to climate change, particularly rising temperatures, sea level rise, changes in precipitation, and extreme weather.

## Climate Projections and Impacts

### RISING TEMPERATURES<sup>1</sup>



**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<sup>2</sup>



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

Environmental justice and other 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<sup>3</sup>



Massachusetts is planning for sea level rise by up to **2.5 feet by 2050** compared to 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.



By 2070, coastal flooding is projected to cause over **\$52 million** in damage annually to state-owned coastal properties, a **550%** increase from 2023.

### SEVERE WEATHER<sup>4</sup>

Includes strong winds, tornadoes, extreme precipitation, and droughts. Precipitation amounts from the heaviest storms in the Northeast have 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.<sup>5</sup>



<sup>1</sup> Refer to Section 5.2, Average/Extreme Temperatures, for additional information.

<sup>2</sup> Refer to Section 5.8, Flooding from Precipitation and Assessment of Dam Overtopping, for additional information.

<sup>3</sup> Refer to Section 5.5, Coastal Flooding, for additional information.

<sup>4</sup> Refer to Section 5.12, Other Severe Weather, for additional information.

<sup>5</sup> <https://www.ncdc.noaa.gov/stormevents/>



## Key Findings: Risk Assessment

The greatest risks faced by the Commonwealth are posed by the following hazards:

### Coastal Erosion<sup>1</sup>



Parts of the coast experience long-term average erosion rates of 10 feet per year and may experience up to 23 feet per year if no action is taken. Sea level rise, more intense storms, and development are likely to increase rates of erosion.



Coastal erosion can damage or result in the loss of wetlands, salt marshes, mudflats, dunes, and natural uplands that support natural communities and native species and provide buffers from storm surge.



The Commonwealth has over 1,500 miles of coastline that includes a range of coastal landforms, habitats, developed lands, and infrastructure that are susceptible to coastal erosion, including 130 state-owned assets (not including publicly owned shore protection structures) within 50 feet of the coast.

### Coastal Flooding and Sea Level Rise<sup>2</sup>



Approximately 43% of the Commonwealth's population resides in coastal communities, with populations expected to increase in most coastal communities.



Coastal salt marshes provide ecosystem services including wildlife habitat, buffering capacity from storms, and carbon capture. The Commonwealth is projected to lose 250 acres of salt marsh by 2030 and over 24,000 acres by 2100.

<sup>1</sup> Refer to Section 5.4, Coastal Erosion, for additional information.

<sup>2</sup> Refer to Section 5.5, Coastal Flooding, for additional information.

<sup>3</sup> Refer to Section 5.12, Other Severe Weather, for additional information.

<sup>4</sup> Refer to Section 5.8, Flooding from Precipitation and Assessment of Dam Overtopping, for additional information.



Currently, annual average damage to coastal buildings in Massachusetts is ~\$185 million. Damage is projected to nearly double by 2030 due to changes in sea level and storm surge.

### Extreme Storms<sup>3</sup>



Environmental justice and other priority populations are most susceptible to severe weather based on various factors, including their physical and financial ability to prepare for, respond to, and recover from a severe weather event.



Widespread winds can uproot watershed forests and create serious water quality disturbances, damaging public drinking water reservoirs.



The most common problem associated with severe weather is damage to utility infrastructure resulting in disruption to energy services.



### Flooding from Precipitation<sup>4</sup>



Over 400,000 Massachusetts residents live within the FEMA flood zone, with Bristol, Worcester, and Plymouth counties having the largest populations in the flood zone.



Intense precipitation and associated flooding threaten freshwater ecosystems through increased sediment delivery, nutrient loadings and contaminants, and scouring of riverbeds, which could increase with climate change.



In March 2010, three extreme precipitation events resulted in flooding throughout eastern Massachusetts, causing an estimated \$38.4 million in damages to residential properties.

## High Heat<sup>5</sup>



Nineteen annual premature deaths could be attributed to extreme temperatures. If no actions are taken, an additional 400 annual premature deaths could occur by the end of the century.



Stress on forests, including stress from rising temperatures, may diminish the ecosystem services they provide, like carbon sequestration and water filtration.



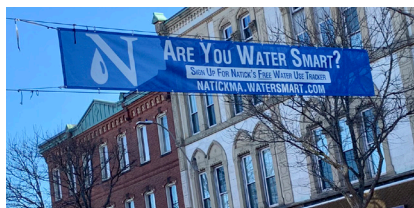
Annual rail repair costs from increased temperature in the Commonwealth are projected to increase by \$6 million by 2050 and \$35 million by 2100.

Climate change is increasing the frequency and intensity of hazards to the Commonwealth's assets and resources, including wildfire, invasive species, and changes in groundwater.

## Changes in Groundwater<sup>6</sup>



Changes in groundwater levels may reduce the availability of freshwater for drinking, agriculture, and other beneficial uses.



Less groundwater in the ecosystem can result in drought and heat conditions, which increase the risk of wildfire, invasive species, and damages to native species.



Changes in groundwater can result in damage, disruption, or loss to below-grade or at-grade utilities, infrastructure, roads, and transit due to flooding or unstable soils.

<sup>5</sup> Refer to Section 5.2, Average/Extreme Temperatures, for additional information.

<sup>6</sup> Refer to Section 5.3, Changes in Groundwater, for additional information.

<sup>7</sup> Refer to Section 5.10, Invasive Species, for additional information.

<sup>8</sup> Refer to Section 5.16, Wildfire, for additional information.

## Invasive Species<sup>7</sup>



As of December 2022, over 100 terrestrial and aquatic species have been listed as invasive, likely invasive, or potentially invasive in Massachusetts. These and other invasive species degrade water quality and habitat, pose threats to public health, and damage agriculture and aquaculture productivity.



Climate change is predicted to increase the abundance of invasive species and expand their habitat ranges. Ecosystems that are stressed (due to climate change associated with drought, increased temperatures, wildfires, and other risks) will be more susceptible to invasive species.



Japanese knotweed is known to decrease streambank stability, contribute to erosion and flood damage, and crowd roadways, increasing roadway maintenance and safety issues.



## Wildfire<sup>8</sup>



In the Commonwealth, over 1 million people live in moderate wildfire hazard zones.



Drought, high heat, land use, and non-native species may increase the risk of high-intensity wildfires, threatening forests across Massachusetts.



The Commonwealth has critical energy, waste management, recreational, and water resource facilities in addition to over 1,200 state-owned buildings located within moderate wildfire hazard areas.



## Agency Vulnerabilities and Adaptive Capacities

The Commonwealth continues to be committed to building resilience through a collaborative, whole-of-government approach that assesses risk and builds capacity to adapt to a changing environment. The ResilientMass Plan assessed Massachusetts' current capacity to complete climate resilience work and adapt to changing conditions over time. See Chapter 4: State Capabilities and Adaptive Capacity Analysis for more information.

The Commonwealth has undertaken notable efforts to bolster climate resilience, including:

- Identifying **over 180 existing capabilities and approaches** to reducing hazard risk and vulnerability.
- Increasing funding, support, technical assistance, outreach, and education to local jurisdictions to **strengthen community capacity** to implement local climate adaptation and hazard mitigation projects.
- Adding **over 90 new capabilities and approaches** to reducing hazard risk and vulnerability since 2018, such as developing the RMAT, conducting a climate change assessment, adopting more resilient building codes and planning tools, establishing new climate and clean energy policies, expanding the Municipal Vulnerability Preparedness (MVP) grant program, and others.



### KEY TERMS

**STATE CAPABILITIES:** The authorities, laws, policies, programs, staff, funding, and other resources supporting the Commonwealth's hazard mitigation and climate adaptation efforts.

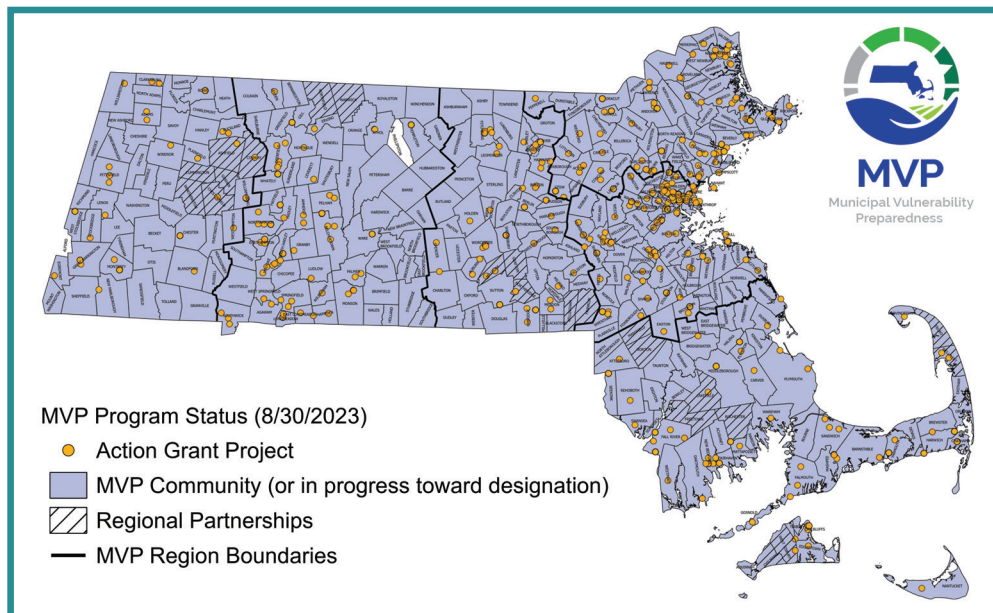
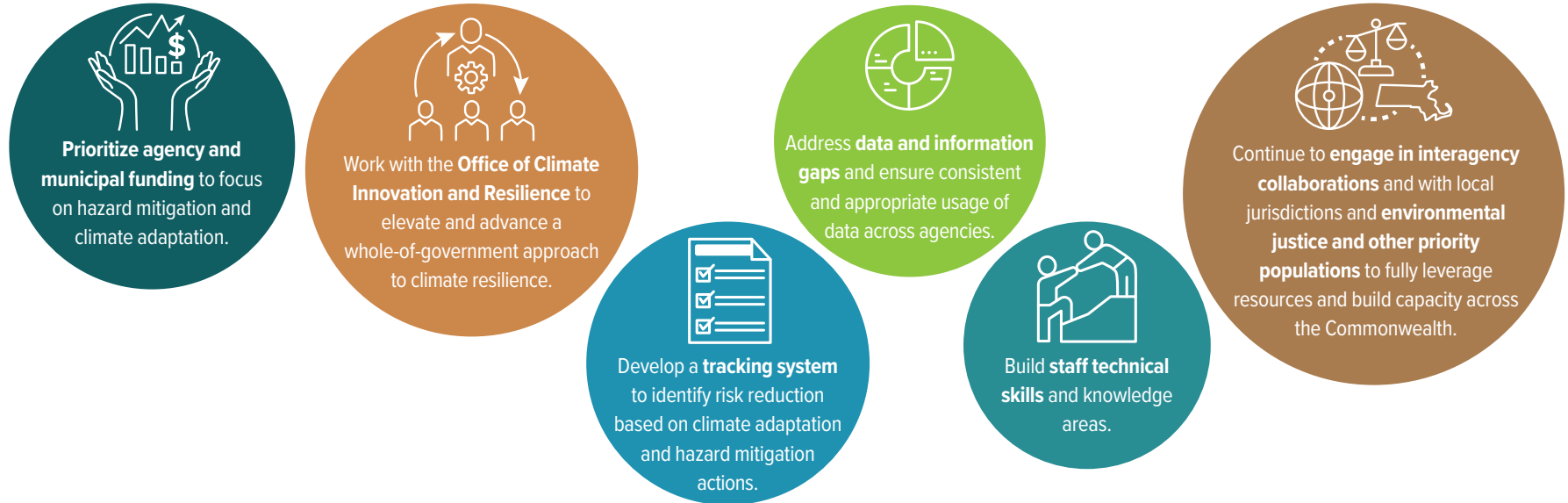
**ADAPTIVE CAPACITY:** The ability of state agencies to adjust or modify operations, policies, and other functions in response to hazards and climate change now and in the future.

Under Executive Order 604, Governor Healey established the **Office of Climate Innovation and Resilience** led by the Climate Chief (the nation's first such position at the cabinet level) to direct and advance climate innovation, mitigation, adaptation, and resilience policies.



## Continuing to Make Progress and Build Capacity

The Commonwealth is making significant strides in advancing climate adaptation. Key opportunities to increase adaptive capacity in order to mitigate risks and build resilience include:



### Massachusetts' Municipal Vulnerability Preparedness Program

The Commonwealth's MVP grant program supports cities and towns in completing vulnerability assessments and implementing action-oriented resiliency plans. Since the program's launch in 2017, MVP has contributed over \$100 million to support resilience efforts in communities. As of August 2023, MVP has over 349 communities and regional partnerships participating in the program, representing 99% of Massachusetts.



# Hazard Mitigation and Climate Adaptation Strategy

Based on the findings of the risk assessment and a collaborative action development process, the ResilientMass Plan presents two types of actions: **cross-government actions**, which are to be implemented across various state agencies and partners and reduce risk across the Commonwealth, and **state agency actions**, which are to be implemented by state agencies to reduce risk within their respective areas of responsibility. Together, the actions present a strategy for reducing risk and increasing climate resilience throughout the Commonwealth.

## Framework for All ResilientMass Actions

Throughout development of the ResilientMass Plan, the process focused on a need to reduce risks to environmental justice and other priority populations who are most likely to be disproportionately impacted by climate change.

Many actions relate to conservation, restoration, and management strategies to reduce risks and provide social and ecological benefits. In addition to risk reduction, actions addressing natural and working lands can reduce GHG emissions through compact development patterns, carbon storage and sequestration, and reduced energy and water demands.



Collaboration among state agencies and localities was a major theme throughout ResilientMass Plan development. To communicate the need for and commitment to partnership and collaboration, many of the actions are organized under action topics. These topics show how different agencies work to address the same risks and hazards.

The ResilientMass Plan focuses on the most consequential hazards across the Commonwealth and identifies actions that directly respond to inland flood risk caused by extreme precipitation, coastal flood risk caused by storm surge and sea level rise, and extreme heat.

The 15 cross-government actions and 127 state agency actions presented in the 2023 ResilientMass Plan address critical issues such as affordable housing, coastal resources, the reliability of state assets, climate migration preparedness, food security, mental health impacts of climate change, assistance to local and regional partners, and education and outreach to communities and people of all ages. Many actions address multiple hazards. The following selection of cross-government and state agency actions highlights how actions are aligned with mitigating key hazards, and how others address some of the state's key levers for action. Each action includes the lead agency, main partner agencies, and a timeframe for action completion. Refer to the Glossary at the end of this document for definitions of state agency actions. Refer to Chapter 7 and the Action Tracker on [resilient.mass.gov](https://resilient.mass.gov) for the full list of actions.

## Addressing Major Climate Challenges: Examples of Cross-Government and State Agency Actions

### Coastal Flooding and Coastal Erosion

- **Develop a coastal resilience strategy.** Consider climate-resilient development and standards in vulnerable areas, develop best practices for coastal adaptation, and explore managed retreat. (Leads: EEA and CZM; Partners: HLC, DOT, DMF, DER; Timeframe: 5+ years)
- **Launch an acquisition/buyout program study.** 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. (Lead: MEMA; Partners: DCR, local communities; Timeframe: Less than 3 years)
- **Develop best practices for redesign of seawalls and revetments.** An interdisciplinary team will review design plans for at-risk or recently repaired/reconstructed structures, recommend best practices for critical coastal structure redesigns that account for sea level rise and storm surge, and engage communities. (Lead: CZM; Partners: EEA Dam & Seawall Grant Program, DCR Waterways; Timeframe: Less than 3 years)
- **Resilient siting of new or modified jurisdictional transmission facilities.** Ensure that facilities are designed, built, and operated for resiliency regarding flooding/sea level rise, severe weather events, and physical/cyber security threats. (Lead: DPU; Partners: MEPA, DEP, CZM; Timeframe: Less than 3 years)



### Extreme Storms

- **Update the MBTA's emergency response plans and GIS viewer for real-time storm response.** Updates to the Comprehensive Emergency Management Plan, Severe Weather Operations Plan, and Snow + Ice Plan will reflect the latest climate science and account for all climate hazards, verify resource availability, increase cooperation among MBTA departments, and incorporate a new GIS real-time response tool. (Leads: MBTA and DOT; Timeframe: 3-5 years)
- **MBTA design standards update.** New standards will include climate resilience considerations for all MBTA new construction and retrofits, such as designing for extreme temperatures, managing stormwater for both improved water quality and resilience, addressing coastal flooding, and designing for high winds. (Lead: MBTA; Timeframe: Less than 3 years)
- **Statewide emergency management training needs assessment.** To ensure emergency preparedness of state public safety officials, MEMA will assess training gaps and necessary enhancements related to natural hazards, especially those exacerbated by climate change such as extreme storms, for revisions to its training curriculum. Climate migration should also be considered within the assessment. (Lead: MEMA; Timeframe: Less than 3 years)

### Consideration of Climate Change Mitigation

All actions in the ResilientMass Plan will evaluate the opportunity to reduce GHG emissions and select options that have the lowest GHG emissions possible.



## Flooding From Precipitation

- **Floodplain Regulatory and Coordination Framework.** Focus on increasing coordination, resources, data, and technical support on inland flooding across agency and external partners. The framework will identify opportunities for municipalities to increase resilience standards, advance opportunities for resilience within the building code, and prioritize statewide actions to address and mitigate floods and their impacts. (Lead: EEA; Partner: DCR; Timeframe: 5+ years)
- **Enhance consideration of resilience in the building code.** Work with key partners to advance implementation. Develop an appendix of above-code flood standards for integration to the statewide building code that municipalities may adopt to prescribe more resilient standards for construction in their communities. (Leads: EEA and EOED; Partners: DCR, OPSI, DOER; Timeframe: 5+ years)
- **Farm Climate Resiliency Program.** Expanding this program will support farmers and the state agricultural system. Grants will include free “climate audits” to help agricultural operations identify and reduce risks, as well as support for planning and implementation of measures such as energy efficiency, resource conservation, and climate-friendly management practices. (Lead: MDAR; Timeframe: Less than 3 years)
- **Protect 30 percent of land and ocean by 2030 (to align with the global 30x30 goal).** Implement EEA’s Resilient Lands Initiative and incorporate the Healthy Soils Action Plan. Develop a statewide approach and collaborative efforts to preserve and enhance forest health and conservation to increase resilience and provide carbon sinks for GHG mitigation, including coastal sources. (Leads: EEA and DCR, Partners: DER, DMF, DFG, MDAR; Timeframe: 5+ years)
- **Integrate DCR’s stormwater best management practices (BMPs) into DCR’s design review process.** Incorporate BMPs from DCR’s 2022 Stormwater Design Handbook to ensure all DCR projects consider and manage stormwater to respond to the threat that anticipated increased precipitation from climate change poses to freshwater ecosystems under DCR’s stewardship. (Lead: DCR; Timeframe: 3-5 years)



## High Heat

- **Develop and implement a new Heat Flag system.** 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 to urge preparedness and caution to people outdoors, particularly children and the elderly. (Lead: HHS; Partners: LWD, DPH, MEMA; Timeframe: 5+ years)
- **Identify opportunities to improve cooling standards in buildings to address extreme heat impacts.** A multi-agency team will assess opportunities to promote cooling in residential buildings and mitigate extreme-heat risks to renters and remote workers. (Lead: DPH; Partners: HHS, HLC, LWD; Timeframe: Less than 3 years)
- **Increase energy resilience of critical assets identified in the State Energy Security Plan.** In addition to critical state-owned physical assets, consider including non-state assets with critical statewide functions such as schools, hospitals, and public safety agencies. Fund vulnerability assessments for critical facilities and identify high-priority energy resilience projects to fund and implement. (Lead: EEA; Partner: DOER; Timeframe: 3-5 years)
- **Inventory, categorize, and strategically improve shade shelters and cooling structures on DCR sites, prioritizing EJ communities.** DCR will leverage its Asset Management Modernization Program to carry out this work, prioritizing EJ communities that experience disproportionate exposure to extreme heat. (Lead: DCR; Timeframe: Less than 3 years)
- **Expand DCR’s Greening the Gateway Cities program into additional EJ communities.** The program will expand into additional cities with EJ communities and low urban canopy cover, and increase tree-planting efforts across EJ neighborhoods in Gateway Cities 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)

## Leveraging the Government Tool Box: Examples of Cross-Government and State Agency Actions



### Provide Funding and Technical Assistance

- **Increase funding to support municipal and agency resilience actions and funding.** Identify new and sustainable revenue streams. Develop a “one-stop” funding portal for climate resilience-related state grant programs. (Leads: EEA, A&F; Partner: DPH; Timeframe: 5+ years)
- **Expand evaluation of climate resilience for state capital investments.** Expand utilization of the RMAT Resilience Design Standards Tool to ensure climate vulnerability and resilient design are included as evaluation criteria in determining state capital planning and grantmaking processes. (Lead: A&F; Partners: EEA, MEMA, EOED, DOT; Timeframe: 5+ years)
- **Develop a strategy to identify resilience funding needs and leverage federal funding to support adaptation projects.** Collaboratively standardize approaches to identifying resilience needs for state capital planning and leveraging federal resources. (Leads: A&F; Partners: DCAMM, MEMA, EEA, OCIR, Governor’s Office Director of Federal Funds and Infrastructure, DOT, EOED; Timeframe: Less than 3 years)
- **Provide municipal and local health climate equity training and technical support.** Produce a Massachusetts-specific training module for local health officials to increase awareness about the disproportionate health impacts of exposure to climate change hazards, including impacts on mental health and unhoused populations, leveraging DPH’s existing relationships with local public health officials, and meaningfully engaging communities most vulnerable to climate impacts. (Lead: DPH; Partners: DOC, MDAR; Timeframe: 3-5 years)

### Convene, Communicate, and Prioritize

- **Launch an 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. (Lead: EEA; Partners: TSS, DOT, DMF; Timeframe: 5+ years)
- **Convene a climate resilience stakeholder working group.** Create a RMAT subgroup to increase external stakeholder engagement and partnership for resilience programs. (Leads: EEA and MEMA; Timeframe: 5+ years)
- **Launch a statewide Climate Communications Campaign.** Target climate actions for decarbonization and resilience, key findings from statewide reports, and access to resources to take critical action. (Lead: EEA; Timeframe: 5+ years)
- **Update school curriculum to include climate science and green workforce development.** Pilot clean energy innovation pathways for high school students focused on helping students gain applied learning experience in the renewable energy sector. (Lead: EOE; Partners: HLC, LWD, HHS; Timeframe: 5+ years)



## Plan, Regulate, and Demonstrate

- **Implement a resilience strategy at state-aided public housing.** Develop feasibility studies to prepare for and request grant funding for climate resilience projects at state-aided public housing, including five in-progress projects. Utilize funding to support projects incorporating resilient design practices into routine capital projects. (Lead: HLC; Partners: EEA, MEMA, DPH; Timeframe: Less than 3 years)
- **Develop a framework for statewide resilience progress tracking.** Through an engagement process, identify statewide climate resilience goals and associated metrics that the Commonwealth can use to track progress statewide. These metrics should inform agency and municipal funding strategies and environmental permitting and reviews, including the Massachusetts Environmental Policy Act. (Lead: EEA; Partners: DCR, DOT, EOED; Timeframe: 5+ years)
- **Incorporate climate resilience into the Commonwealth's sustainable development principles.** Further integrate resilience goals into EOED funding programs that support housing production and economic growth, including capital grant programs offered through the Community One Stop for Growth. (Lead: CPRO; Timeframe: Less than 3 years)
- **Update Chapter 91 regulations to improve resiliency of public tidelands and waterways.** Ensure potential impacts of sea level rise are considered in the project review and licensing process. MassDEP may collaborate with other state agencies to develop building codes, zoning, and regulations designed



to reduce risks from hazards and climate change. (Lead: DEP; Partners: CZM, waterfront institutions, nonprofit organizations, developers; Timeframe: 3-5 years)

- **Formalize MEPA resilience policy to ensure consideration of climate change.** Expand application of RMA Resilience Design Standards Tool to environmental permitting and reviews through the MEPA process. (Lead: EEA; Partners: DCR, DOT, EOED; Timeframe: 5+ years)
- **Conduct a climate migration assessment.** The Commonwealth's lower relative climate risks may result in increased human migration to Massachusetts. Assess the scale, impacts, and timing of climate migration to Massachusetts and identify opportunities, challenges, and approaches to preparing for in-migration. (Lead: EEA; Partners: OCIR, MEMA, EOED, HHS; Timeframe: Less than 3 years)



\* Actions can address multiple risks.

# ResilientMass: A Living Plan

To continue improving resilience now and into the future, the **ResilientMass Plan is a living document** that will evolve as actions are implemented and new data and information are incorporated into the planning process. The ResilientMass Plan will continue to be effective through implementation and maintenance conducted by RMAT, state agencies, and partners over the next five years.



## Implementation

Over the next five years, each of the state agencies identified as leads, partner agencies, and other collaborators will implement the actions presented in Chapter 7: State Strategy, Actions, and Implementation Plan. The Commonwealth will use the **Action Tracker** to monitor the implementation status of each action. For more information on the ResilientMass Plan and the Action Tracker, visit [resilient.mass.gov](https://resilient.mass.gov).

## Maintenance

The RMAT and partners will perform the following activities to ensure the ResilientMass Plan is implemented and updated, as needed, to remain effective at reducing risk and increasing resilience across the Commonwealth:

### Five-Year Plan Review

Conduct a comprehensive plan review and make updates accordingly.

### Post-Disaster Plan Review

Review the plan and make updates, as needed, after a federally declared disaster (if applicable).

### Annual Plan Review

- Evaluate progress on action implementation and update the [resilient.mass.gov](https://resilient.mass.gov) Action Tracker.
- Identify barriers to implementation and approaches for overcoming the barriers.
- Prepare a document to summarize findings from the annual review and next steps.
- Meet with FEMA after the annual review to discuss plan updates, challenges, and opportunities for improvement.

### Quarterly RMAT Meetings

Conduct meetings on a quarterly basis to discuss actions, partnerships, collaboration, barriers, and next steps.



# Glossary

The following acronyms for state agencies are used within the Executive Summary. This does not represent a complete list of Massachusetts state agencies or a complete list of lead and partner agencies for all 2023 ResilientMass Plan actions.

**A&F:** Executive Office of Administration and Finance

**CPRO:** Community Programs and Resources Office

**CZM:** Office of Coastal Zone Management

**DCAMM:** Division of Capital Asset Management and Maintenance

**DCR:** Department of Conservation and Recreation

**DEP:** Department of Environmental Protection

**DER:** Division of Ecological Restoration

**DFG:** Department of Fish and Game

**DMF:** Division of Marine Fisheries

**DOC:** Department of Correction

**DOER:** Department of Energy Resources

**DOT:** Massachusetts Department of Transportation

**DPH:** Department of Public Health

**DPU:** Department of Public Utilities

**EEA:** Executive Office of Energy and Environmental Affairs

**EOE:** Executive Office of Education

**EOED:** Executive Office of Economic Development

**HHS:** Executive Office of Health and Human Services

**HLC:** Executive Office of Housing and Livable Communities

**LWD:** Executive Office Labor and Workforce Development

**MBTA:** Massachusetts Bay Transportation Authority

**MDAR:** Massachusetts Department of Agricultural Resources

**MEMA:** Massachusetts Emergency Management Agency

**MEPA:** Massachusetts Environmental Policy Act Office

**OCIR:** Office of Climate Innovation and Resilience

**OPSI:** Office of Public Safety and Inspections

**TSS:** Executive Office of Technology Services and Security

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#### Examples of Cross-Government and State Agency Actions

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### Pages 13 and 14 – Leveraging the Government Tool Box:

#### Examples of Cross-Government and State Agency Actions

- Provide Funding and Technical Assistance: I. Draksic
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