Massachusetts State Hazard Mitigation and Climate Adaptation Plan

Chapter 6: State Capability and Adaptive Capacity Analysis

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Prepared for:

Massachusetts Emergency Management Agency
400 Worcester Road (Route 9 East)
Framingham, MA 01702-5399

Massachusetts Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Prepared by:

AECOM
250 Apollo Drive
Chelmsford, MA 01824

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Acronyms and Abbreviations

ASCE	American Society of Civil Engineers
BBRS	Board of Building Regulations and Standards
BMPs	Best Management Practices
CDBG	Community Development Block Grant
CDBG-DR	Community Development Block Grant Disaster Recovery
CERT	Community Emergency Response Teams
CFR	U.S. Code of Federal Regulations
CMR	Code of Massachusetts Regulations
COSTEP MA	Coordinated Statewide Emergency Preparedness in Massachusetts
CRS	Community Rating System
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
DOER	Department of Energy Resources
EECC	Early Environmental Coordination Checklist
EOEEA	Executive Office of Energy and Environmental Affairs
EOPSS	Executive Office of Public Safety and Security
FEMA	Federal Emergency Management Agency
FHMP	Flood Hazard Management Program
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Studies
FMA	Flood Mitigation Assistance
FOA	First Order Approximation
FY	Fiscal Year
GHG	Greenhouse Gas
GIS	Geographic Information System
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
I-Codes	International Codes
IBHS	Institute for Business and Home Safety
ICC	International Code Council
IHP	Individuals and Households Program
IRC	International Residential Code
ISO	Insurance Services Office
LAMP	Levee Analysis and Mapping Procedures
LiDAR	Light Detection and Ranging
LiMWA	Limit of Moderate Wave Action
LSCSF	Land Subject to Coastal Storm Flowage
MAPC	Metropolitan Area Planning Council
MEMA	Massachusetts Emergency Management Agency
MGL	Massachusetts General Laws
MSBC	Massachusetts State Building Code
MVP	Municipal Vulnerability Preparedness
NESEC	Northeast States Emergency Consortium
NFIP	National Flood Insurance Program
PA	Public Assistance
PDM	Pre-Disaster Mitigation
PV	Photovoltaic
Risk MAP	Risk Mapping, Assessment, and Planning
SFHA	Special Flood Hazard Area
SHMCAP	State Hazard Mitigation and Climate Adaptation Plan
SHMT	State Hazard Mitigation Team
SMART	Solar Massachusetts Renewable Target
SRMP	Statewide Resilience Master Plan
USACE	U.S. Army Corps of Engineers
V Zone	Velocity Flood Zone
WPA	Wetlands Protection Act

6. State Capability and Adaptive Capacity Analysis

6.1 Introduction and Purpose

To develop a comprehensive and effective hazard mitigation and climate adaptation strategy, the Commonwealth of Massachusetts has done more than assess its current and future risk to potential impacts—it has also analyzed its current capability and capacity to address this risk through existing resources. The Commonwealth can use this information to determine improvement opportunities to incorporate into the plan. It can also better identify new ideas or innovative solutions that will further enhance the state's overall resiliency.

The capability and adaptive capacity analysis includes two integral components: (1) a *capability assessment* that evaluates the Commonwealth's existing capabilities to enable and implement hazard mitigation and climate adaptation activities on a statewide level; and (2) an *adaptive capacity analysis* that is more specific to individual state agencies.

As defined for the purposes of this plan, **state capabilities** include the authorities, laws, policies, programs, staff, funding, and other resources available to the Commonwealth to support hazard mitigation and climate adaptation efforts. **Adaptive capacity** is defined as the ability of state agencies (including their key assets, functions, missions, and services/programs) to adjust or

modify their operations, policies, or other functions to adapt to changing natural hazards and climate change impacts, both in the short- and long-term.

In combination with the risk assessment, this analysis serves as a background study to support the identification of specific actions to be included in the hazard mitigation and climate adaptation strategy, and the specific capabilities or resources required for implementation.

6.2 State Capabilities and Adaptive Capacity

6.2.1 Comprehensive Statewide Program

The Commonwealth has a long history of demonstrating its commitment to advancing risk reduction and resilience across the state. This encompasses a broad range of State-supported initiatives and activities that include a combination of outreach, training, technical assistance, funding, partnerships, regulatory codes and statutes, infrastructure projects, and other activities to increase statewide resilience. Some specific examples include the following:

- The Commonwealth actively manages a **statewide program of hazard mitigation and climate adaptation** through the development of legislative initiatives, multi-agency committees or councils, public/private partnerships, and/or other executive actions that promote hazard risk reduction and resilience. This includes the long-standing service of the State Hazard Mitigation Team (SHMT), and the more recent *Executive Order 569 Establishing an Integrated Climate Change Strategy for the Commonwealth*, which is described in this section.
- The Commonwealth has maintained a Federal Emergency Management Agency (FEMA)-approved **state hazard mitigation plan** since 1986, but its commitment to developing and implementing measures to reduce the impact of natural disasters dates back further than this. This commitment includes supporting the administration of the National Flood Insurance Program (NFIP) in coordination with participating communities since 1978. Even before that, Massachusetts became the first state to develop enabling legislation and programs for wetlands protection. Implementation of other risk reduction efforts has long been supported through the development and integration of various State laws, policies, and programs, in addition to support provided by nongovernment and private nonprofit agencies.
- The Commonwealth supports **local hazard mitigation and climate adaptation planning** by providing workshops and training, State planning grants, and other coordinated resource and capability development of local officials. This includes the technical support and coordination that is described in detail in *Chapter 10: Coordination of Local Hazard Mitigation and Climate Adaptation Planning*, and a variety of other state agency programs that are identified in Section 6.2.2.

- Most recently, the Commonwealth launched the Municipal Vulnerability Preparedness (MVP) grant program, as described in this section, which provides support for cities and towns in Massachusetts to begin or enhance the process of planning for resiliency to extreme weather and other natural or climate-related hazards.
- In May 2018, the Governor released the Administration's **Capital Investment Plan** for Fiscal Year (FY) 2019, providing a $2.34 billion investment for the Commonwealth's capital needs. The plan reinforces the major themes of previous capital plans, while incorporating climate change adaptation as a critical new component. The plan integrates climate change preparedness and resiliency, with all of its investments analyzed for climate impact, and more than $60 million to directly address climate change, including $12 million to repair and rebuild seawalls and inland dams, $11 million for MVP grants to help cities and towns plan for and protect against the impact of a changing climate, and $5 million for energy efficiency improvements in public housing.
- In 2017, the Commonwealth's Division of Capital Asset Management and Maintenance (DCAMM) developed a **Statewide Resilience Master Plan** (SRMP) to identify and address potential climate impacts to the State's portfolio of more than 8,300 facility assets. The purpose of the SRMP was to develop a process to identify potential climate exposures, evaluate risks and vulnerabilities, and implement adaptation strategies to achieve resilience against climate impacts. This supports the Commonwealth's comprehensive, multi-year strategy to mitigate the risks posed to existing State-owned buildings, including those that have been identified as necessary for post-disaster response and recovery operations.
- The Commonwealth uses its own Coastal Resilience Grant Program as a non-federal match for National Oceanic and Atmospheric Administration Regional Coastal Resilience Grant funds, and it provides 50 percent of the non-federal share of the costs of major local flood control projects developed in conjunction with the U.S. Army Corps of Engineers (USACE).
- Since 1991, the State has contributed more than $27 million as cost share to FEMA's Hazard Mitigation Grant Program (HMGP). This match has been accomplished through a combination of state fund grant programs, Community Development Block Grant (CDBG), and Legislative appropriations.
- The Commonwealth **requires local governments to use a nationally applicable model building code** that addresses natural hazards (including wind, flood, snow, seismic, and other hazards) as a basis for design and construction of new buildings and any State-sponsored mitigation projects. The 9th Edition of the State Building Code became effective October 20, 2017, and is based on modified versions of the 2015 International Codes (I-Codes), as published by the International Code Council (ICC). Under the 9th Edition, the design and construction of buildings and structures located in flood hazard areas

must be in accordance with American Society of Civil Engineers (ASCE) standards, which are consistent with, and in some cases, exceed minimum NFIP requirements.

- The Commonwealth routinely **integrates risk reduction into its post-disaster response and recovery operations**. To ensure this integration, the State's Disaster Recovery Manager at the Massachusetts Emergency Management Agency (MEMA) also oversees the Mitigation Unit, providing seamless coordination with the implementation of post-disaster mitigation and recovery programs, including FEMA's Hazard Mitigation Grant Program, Public Assistance (PA) program, and Individuals and Households Program. During Joint Field Office operations, the State Hazard Mitigation Officer is present for the duration of the recovery process.

State Agency Partnerships and Initiatives

As described in this section, the Commonwealth continues to take many steps to enhance its hazard mitigation and climate adaptation efforts. Some state agencies and offices routinely conduct hazard mitigation and resilience building as part of their organizational missions. Descriptions of many of the agencies' functions, including their enabling legislation and current resilience-building efforts, can be found in Table C-1 in Appendix C. Many of the Commonwealth's initiatives to strengthen resilience to natural hazards have been accomplished through partnerships and coordination between state agencies. This includes efforts to expand planning and programmatic development, provide funding opportunities, and develop policies and procedures to enhance resilience at a statewide level. Some notable examples of these interagency partnerships and initiatives are highlighted below.

State Hazard Mitigation Team

The SHMT consists of staff members employed by the Department of Conservation and Recreation (DCR) and MEMA, who work full-time on hazard mitigation planning, grants management, and project management. The team is co-chaired by the State Hazard Mitigation Officer at DCR and the Disaster Recovery and Mitigation Manager at MEMA. The team generally meets on a monthly basis—and on a more frequent basis after disasters—to coordinate team members' individual hazard mitigation work assignments, and to give progress reports on statewide mitigation plans, mitigation projects, and technical assistance.

Executive Order 569 – Establishing an Integrated Climate Change Strategy for the Commonwealth

In September 2016, building on the Commonwealth's leadership to mitigate and adapt to climate change, Governor Charlie Baker signed an Executive Order that lays out a comprehensive approach to further reduce greenhouse gas (GHG) emissions; safeguard residents, municipalities, and businesses from the impacts of climate change; and build a more resilient Commonwealth. *Executive Order 569 Establishing an Integrated Climate Change Strategy for the*

Commonwealth represents a collaboration between the Office of the Governor, the Executive Office of Energy and Environmental Affairs (EOEEA), the Executive Office of Public Safety and Security (EOPSS), and other key state, local, and environmental stakeholders.

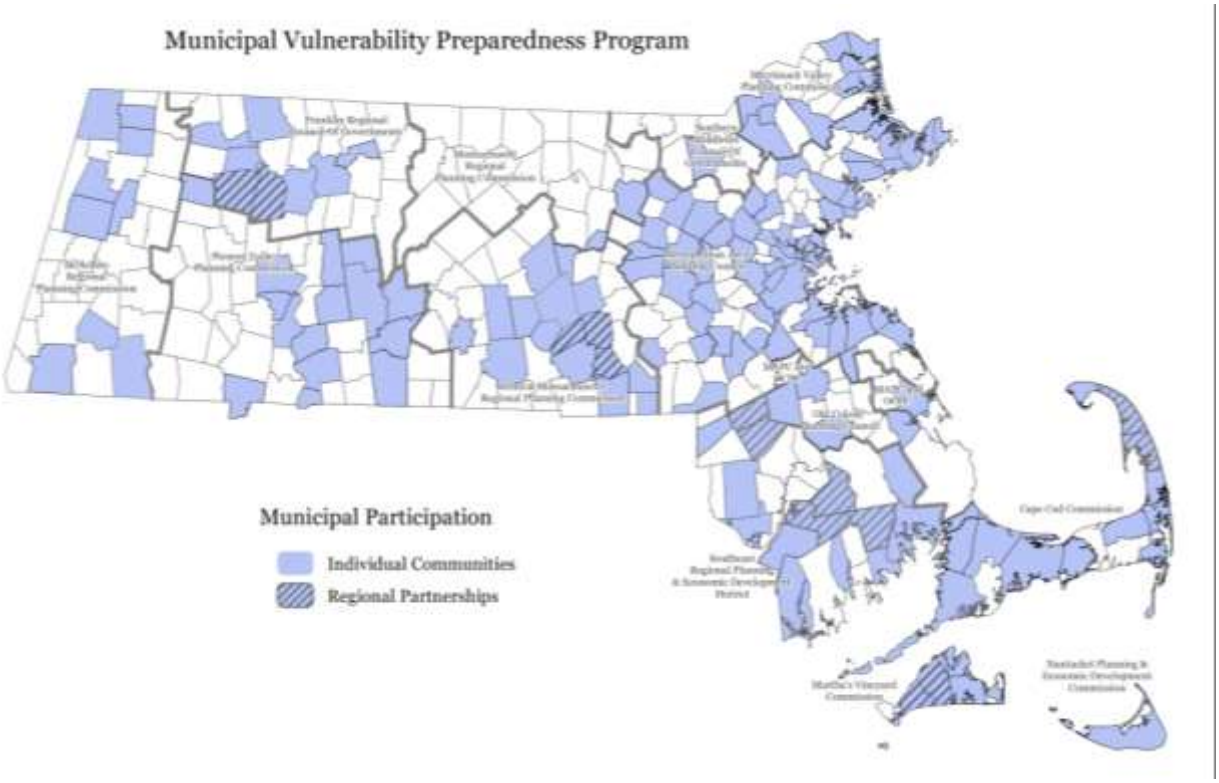
The Executive Order ensures that Massachusetts will continue to lead by example and collaborate across State government to reduce GHG emissions and build resiliency within government operations. The Executive Order also directs EOEEA and EOPSS to lead the development and implementation of a statewide comprehensive climate adaptation plan that will provide a blueprint for protecting the built and natural environment of the Commonwealth, based on the best available data on existing and projected climate change impacts. Additionally, each Executive Office in the Baker-Polito Administration was required to designate a Climate Change Coordinator to work to complete a vulnerability assessment for each office, and assist with implementation and coordination of adaptation and mitigation efforts across State government. This State Hazard Mitigation and Climate Adaptation Plan (SHMCAP), along with the separate vulnerability assessment reports created for state agencies as part of the plan development process, have been developed pursuant to the Executive Order's framework.

Municipal Vulnerability Preparedness

Launched in 2017 in support of Executive Order 569, the Municipal Vulnerability Preparedness Program (MVP) grant program provides support for cities and towns in Massachusetts to begin the process of planning for resiliency. Under the MVP planning program, the Commonwealth awards funding to communities to complete vulnerability assessments and develop action-oriented resiliency plans. The program helps communities: (1) define extreme weather and natural and climate-related hazards; (2) identify existing and future vulnerabilities and strengths; (3) develop and prioritize actions for the community; and (4) identify opportunities to take action to reduce risk and build resilience. Communities that complete the MVP planning program become designated as an MVP community and are eligible for follow-up grant funding to implement actions in their resiliency plans.

In 2017, more than $1 million in MVP planning grant funding was awarded to 71 towns and cities across the Commonwealth. In addition, more than 250 people, including 23 state employees, were trained in workshops across the state to provide technical assistance to communities in completing their assessment and resiliency plans using the Community Resilience Building workshop guide developed by The Nature Conservancy, which is now used in more than 200 communities across the country. In 2018, more than $2 million in MVP planning grant funding was awarded to an additional 82 communities, and an additional $3 million was awarded for MVP action grants to help communities implement priorities identified through their MVP planning process. Figure 6-1 identifies all of the communities enrolled in the MVP program as of June 2018.

Figure 6-1: Map of Municipal Vulnerability Preparedness Communities



Although administered primarily through EOEEA, the MVP program is supported by other state agencies, including MEMA, DCR, the Department of Environmental Protection (DEP), and the Office of Coastal Zone Management (CZM). External partners include the Nature Conservancy and Mass Audubon, who provide voluntary support, outreach, and content for the program. For example, MEMA mitigation staff work closely with EOEEA to ensure opportunities to leverage existing mitigation planning efforts and resources are effectively coordinated at both the State and municipal levels. This includes promoting the integration of MVP with existing processes to develop or update local hazard mitigation plans. Other providers include representatives from regional planning agencies, local municipalities, nonprofit organizations, academia, and private-sector companies.

Silver Jackets

The Massachusetts Silver Jackets Team launched in 2016 in conjunction with the USACE national program. The goal of the Massachusetts Silver Jackets Team is to reduce the risk of flooding and other natural disasters by bringing together multiple federal and state agencies. The interagency team facilitates a collaborative process of strategic and integrated mitigation actions to reduce the threat, vulnerability, and consequences of flooding in the Commonwealth of Massachusetts. Through the process of sharing and combining resources, funding, programs, and technical expertise, the team works toward the goal of proactively reducing flood risk.

In 2017, the Commonwealth of Massachusetts was awarded an Interagency Flood Risk Management Project from the USACE for the Town of Charlemont. To help extend its capacity and deal with significant flood risks, Charlemont worked in partnership with the Silver Jackets Team to integrate existing and new data to assess its vulnerabilities and develop a Flood Risk Action and Evacuation Plan. This plan has improved the Town's preparation for future flood events, and its capabilities to launch a coordinated response between numerous entities, including the Town, Sewer District, and local industries.

Floodplain Management Initiatives

Federal Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands) require that federal agencies avoid direct or indirect support of development in the floodplain, and work to minimize harm to floodplains and wetlands. State agencies reviewing federally funded projects or receiving federal grants for projects must take these Executive Orders into consideration.

Federal Executive Order 13690 (January 2015) established a higher level of federal flood risk management, requiring the use of one of three alternatives for federal development activities that could not be located outside of the floodplain. The Commonwealth adopted these practices when considering floodplain requirements for projects under federal mitigation grants. In August of 2017, however, the Federal Administration rescinded the Order. While no longer a requirement, the Commonwealth continues to regard this as a best practice.

Numerous state agencies are involved in the review of state and federal projects in the floodplain, as well as the implementation of the following Massachusetts state laws and policies regarding floodplain management:

- Massachusetts Executive Order 149 (1978), State Coordination and Participation with the Federal Administration under the National Flood Insurance Act, designates the Massachusetts Water Resources Commission as the state agency to implement floodplain management programs in Massachusetts. The Office of Water Resources in DCR provides technical and staff support, including scientists, hydrogeologists, and water policy specialists who undertake activities of the Commission.
- Massachusetts Executive Order 181 (1980), Barrier Beaches, recognized the vulnerability of development on barrier beaches and the important role natural barriers play in providing storm damage prevention and flood control. To mitigate future loss of life and property, Executive Order 181 prohibited new development in velocity zones or primary dunes, as well as seawalls and revetments on barrier beaches. It constrains the use of state funds and federal grants for construction projects that could encourage growth and development in barrier beach areas. CZM was tasked with barrier beach policy coordination, and continues to provide technical assistance to local and state agencies on barrier beach management.

- Massachusetts was one of the first states in the nation to pass wetlands protection laws, in the early 1960s. The Wetlands Protection Act (WPA) (Massachusetts General Laws [MGL] Chapter 131, Section 40) was codified as 310 Code of Massachusetts Regulations (CMR) Section 10.00. These regulations protect wetlands functions and their public interests, including flood control, prevention of pollution and storm damage, and protection of water supplies and other natural resources and habitats. Multiple state agencies review proposed work that may alter these resources, including wetlands, all floodplains, lands under water, waterways, salt ponds, fish runs, and the ocean.
- Enacted in 1996, the Massachusetts Rivers Protection Act amends the WPA to provide protection to rivers and implements hazard mitigation by regulating activities within a 200-foot-wide resource area called the Riverfront Area.
- The Massachusetts Building Code (further described below) is a statewide mandated construction code that is updated periodically, based on the ICC's recommended codes; it includes most of the federal construction requirements listed in the U.S. Code of Federal Regulations (CFR) Title 44, Section 60.3 for floodplains as defined by FEMA Flood Insurance Rate Maps (FIRMs) under the NFIP. Other NFIP development requirements are included in the WPA or in the Commonwealth's Title V (310 CMR 15) requirements for sewage treatment and disposal. Finally, remaining NFIP standards can be found in the State's model floodplain ordinance; these must be adopted at the community level, typically through municipal zoning bylaws. The State monitors changes to the local codes as they pertain to mapped floodplain changes or related local practices.

Massachusetts Building Code Update and Enhancement

The State Board of Building Regulations and Standards (BBRS) administers the Massachusetts State Building Code (MSBC, found at 780 CMR), which consists of a series of international model codes and any state-specific amendments adopted by the BBRS during the promulgation process. The BBRS regularly updates relevant provisions of the MSBC as new information and technology become available, and a change is warranted.

The Commonwealth requires mandatory enforcement, and does not allow local amendments to the residential code. In addition, the Commonwealth adopts a plumbing and electrical code. The Commonwealth also has a program in place for code official certification, which includes taking code classes prior to examination and certification, requires continuing education, and allows consumers to file complaints against inspectors. Massachusetts also requires licensing of general, plumbing, electrical, and roofing contractors; requires licensing candidates to pass an examination prior to licensing; and requires continuing education.

The current 9th Edition of the MSBC (2017) is based on the 2015 ICC's recommend codes (I-Codes), and contains a series of requirements for flood-resistant design and construction that are

in accordance with the ASCE 24 standard, which incorporates—and in certain areas exceeds—FEMA's NFIP construction standards. Highlights of ASCE 24 that complement the NFIP minimum requirements include requirements for building performance; flood-damage-resistant materials, utilities and service equipment, and siting considerations. Specific requirements for design flood elevations and the use of flood-resistant materials may be found in the ASCE Tables included in 780 CMR Section 1612.4. Additional state-specific higher standards for flood-resistant construction in coastal dunes may be found in Appendix G of the MSBC. For example, the State requires the use of pilings in coastal dune areas, even if the areas are not in a mapped Velocity flood zone (V Zone), and has higher elevation requirements than the NFIP (the lowest floor must be built to at least 2 feet above a dune).

Specific changes to the Building Code that affect development and redevelopment in coastal flood zones include: (1) in new or substantially improved buildings in V Zones, utilities can no longer be located below the FEMA base flood (1 percent annual chance) elevation; and (2) new or substantially improved buildings in A Zones have to be elevated so that the lowest floor surface is at least 1 foot above the FEMA base flood elevation. New or substantially improved buildings in V Zones must continue to be elevated so that the lowest floor is at least 2 feet above the FEMA base flood elevation.

Coastal Management Initiatives

With more than 1,500 miles of coastline, including some areas that are considered most vulnerable to natural hazards, climate change, and extreme weather, the Commonwealth's coastal management initiatives are especially important to highlight. CZM is the lead policy, planning, and technical assistance agency on coastal issues in EOEEA. Similar to MEMA and DCR, natural hazard mitigation and climate change adaptation are fundamental to CZM's mission and program areas, which play a strong role in various risk reduction activities at State, regional, and local levels. Some of the more notable recent initiatives include the following:

- *StormSmart Coasts* – This national model developed by CZM is designed to help communities and homeowners address coastal erosion, storm damage, flooding, and related issues. The StormSmart Coasts website includes information on available grants and on assessing the vulnerability of coastal properties to erosion and flooding; tools for local officials to improve coastal floodplain management; options for coastal property owners to effectively reduce erosion and storm damage while minimizing impacts to shoreline systems; landscaping options for controlling erosion and storm damage; interactive maps of erosion along the Massachusetts coast; and more.
- *Coastal Resilience Grant Program* – Massachusetts coastal communities face significant risks from coastal storms, flooding, erosion, and sea level rise—challenges that are exacerbated by climate change. To help address these issues, CZM administers the Coastal Resilience Grant Program to provide financial and technical support to the Commonwealth's

78 coastal communities and certified 501(c)(3) nonprofit organizations with vulnerable coastal property for local efforts to increase awareness and understanding of climate impacts, identify and map vulnerabilities, conduct adaptation planning, redesign vulnerable public facilities and infrastructure, and implement nonstructural (or green infrastructure) approaches that enhance natural resources and provide storm damage protection.

- *Sea Level Rise and Coastal Flooding Viewer* – CZM developed this online tool to support the assessment of coastal flooding vulnerability and risk for community facilities and infrastructure, consistent with Governor Baker's Executive Order 569. This viewer includes interactive maps of flooding extents and water level elevations associated with sea level rise scenarios, current coastal flood zones, and hurricane storm surge. It also includes location data for a wide range of public facilities and infrastructure to assist state, regional, and local planners and other stakeholders in conducting general vulnerability assessments to these coastal hazards.
- *Coastal A Zone Mapping:* To improve coastal flood hazard mapping in Massachusetts, DCR and CZM recently partnered to map the delineation of Limit of Moderate Wave Action (LiMWA) for 15 coastal communities. LiMWA is the inland limit of the area expected to receive 1.5-foot or greater breaking waves during the 1 percent annual chance flood event. FEMA FIRMs that went into effect in 2009-2013 for Massachusetts coastal counties were based on studies initiated in 2005, and did not include LiMWA lines. The addition of the LiMWA to FIRMs allows communities and individuals to better understand the flood risks to their property. To make the most accessible and accurate information on Coastal A Zone boundaries available, DCR and CZM use information on Coastal A Zone boundaries for the entire Massachusetts coast from FEMA's published Flood Insurance Studies (FIS). Through this initiative, the LiMWA was mapped based on the coastal storm surge and wave modeling data from the most recent FEMA coastal FIS for coastal communities. The data have since been approved and incorporated into FEMA's National Flood Hazard Layer.
- *Increasing Resilience through Application of Nature-Based Infrastructure:* CZM is participating in a regional effort to increase resilience to sea level rise in New England that is focused on increasing the effective use of nature-based infrastructure for reduced erosion and enhanced wave attenuation. The team is developing region-specific information on suitable natural infrastructure types (i.e., "living shorelines"), and is working with several communities to implement and monitor a range of nature-based coastal infrastructure projects. The experience and lessons gained through this project will help to identify successful approaches and models to reduce erosion.

These and other capabilities and resources relevant to the Commonwealth's management of hazardous coastal areas are included in Section 6.2.2.

Energy Resilience Initiatives

The Massachusetts Department of Energy Resources (DOER) develops and implements policies and programs aimed at ensuring the adequacy, security, diversity, and cost-effectiveness of the Commonwealth's energy supply to create a clean, affordable, and resilient energy future for all residents, businesses, communities, and institutions. These are:

- Continued Support of Energy Assurance Initiatives and Planning
  - Support FEMA Region I in the development of a Power Outage Incident Annex.
  - Support National Association of State Energy Officials initiatives for Petroleum Shortage Response Planning.
  - Provide support during emergencies or disasters to the State's emergency management team via Emergency Support Function #12 – Energy.
  - Update and maintain Energy Assurance Plans.
  - Maintain Hours of Service Waiver Guidance to ensure the availability of delivered fuels during an emergency or disaster.
- The Community Clean Energy Resiliency Initiative is designed to help address service interruptions at critical infrastructure caused by severe weather. The $40 million grant program funds technical assistance, as well as project implementation, for police and fire dispatch, emergency shelters, hospitals, and critical water infrastructure facilities to use clean energy technologies; including combined heat and power, solar photovoltaic (PV), and energy storage, to mitigate and address the impacts of climate change.
- The Energy Storage Initiative is a $20 million grant program designed to demonstrate how energy storage can improve grid operations, reduce energy costs, provide backup power through storms, and benefit the local economy.
- The Clean Energy Plan examines a varied portfolio of energy pathways that seek to balance a clean, affordable, and reliable energy future while investigating the impact of policies over a long-term planning horizon.
- The Solar Massachusetts Renewable Target (SMART) Program incentivizes the continued development of distributed solar PV electricity generation across the Commonwealth. The SMART Program is the nation's first to incorporate an incentive to pair energy storage with the solar resource. The addition of energy storage with distributed solar generation can enable the solar resource and the stored energy to continue to serve on-site loads through the outage, improving the facility's energy resilience.
- Energy Diversification through DOER's clean energy procurements (hydroelectric and offshore wind) will decrease the Commonwealth's reliance on natural gas and oil, which are

delivered on long supply chains across multiple national and state lines. The long supply chains are vulnerable to severe weather events anywhere along the chain.

- Leading by Example demonstrates energy best practices at state facilities, including initiatives to identify energy vulnerabilities and demonstrate clean technologies to improve facility resilience.
- Energy Efficiency reduces demand for electricity and fuels. Reducing demand, particularly coincident with system peaks, increases reliability by reducing thermal stresses on the system. Energy efficiency reduces peak demand, but also decreases the high costs and emissions associated with peak demand. The American Council for an Energy-Efficient Economy has ranked the Massachusetts Energy Efficiency Program #1 in the nation for the past 7 consecutive years.

Transportation Resiliency Initiatives

In 2015, MassDOT conducted a Climate Change Summit to begin charting a course to identify and adapt to climate-related threats to its key assets and infrastructure. The breakout sessions conducted during the summit and subsequent discussion at the Summit Leadership Session generated numerous ideas to enhance MassDOT's climate preparedness and mitigation efforts. Of the many initiatives identified, MassDOT selected nine for implementation, and has since been working in conjunction with many partner agencies to further develop and implement them. These initiatives include the following:

- Capture and document institutional knowledge on vulnerabilities from staff through interviews and the Mapping Our Vulnerable Infrastructure Tool.
- Incorporate climate change adaptation into the MassDOT Highway Division asset management system and process, and coordinate asset management across divisions and partner agencies.
- Use the Boston Harbor Flood Risk Model and data from the vulnerability assessments to identify current and future high-risk areas, and strengthen emergency management with local, state, and federal agencies.
- Leverage permit-granting authority and ability to influence Section 61 findings and mitigation.
- Coordinate with state and federal agencies to evaluate environmental regulation and permitting processes to address current roadblocks in climate change adaptation; identify opportunities to streamline permitting.
- Pilot the Deerfield Watershed Stream Crossing Resilience Program.

- Develop adaptation design guidance and other resources, and provide training for project managers and design teams.
- Require a holistic evaluation of all vulnerability, environmental, transportation, and social data sets in the earliest project planning phases.
- Incorporate sustainability and resiliency review items into the Early Environmental Coordination Checklist (EECC), which is a required document for all MassDOT Highway Division roadway and bridge construction projects. The EECC requests information related to the environmental aspects of a project, such as nearby sensitive resource areas, and helps MassDOT Environmental Services scope the project for permitting needs and potential design considerations.

Recovery Planning Initiative

MEMA staff attends semi-annual Recovery and Mitigation meetings to discuss important aspects of the programs, changes in priorities, and lessons learned from disaster events. In addition, Mitigation staff provide support to the Recovery Unit during immediate post-disaster operations, such as attending applicants' briefings for PA and other administrative duties. In 2018, the Commonwealth initiated the development of a new State Disaster Recovery Plan to be consistent and compliant with the National Disaster Recovery Framework, and to update the Massachusetts ESF-14 Recovery Annex to the Massachusetts Comprehensive Emergency Management Plan. It is also aiming to establish a formal State Disaster Recovery Committee that will include the State Hazard Mitigation Officer as an appointed member.

6.2.2 Existing State Capabilities

The Commonwealth of Massachusetts has a wide range of policies, programs, and other capabilities to mitigate natural hazards and adapt to a changing climate. Many of these capabilities do so explicitly (e.g., providing funding for specific mitigation/adaptation projects), while others do so more implicitly (supporting the protection of natural resources in ways that provide ancillary or co-benefits of risk reduction).

Table C-1 in Appendix C summarizes the Commonwealth's primary hazard mitigation and climate adaptation capabilities (see excerpt in Figure 6-2). This table has been updated for the 2018 SHMCAP with the most current information on hazard mitigation capabilities, and it has been amended to include additional capabilities to support climate adaptation. Other notable changes since the 2013 State Hazard Mitigation Plan include the following:

Figure 6-2: Screenshot of Table C-1 (2018 State Capability Assessment Summary) in Appendix C

Existing Capability	Lead / Responsible Agency	Description of Capability	Effectiveness for Reducing Risk and Vulnerability	2018 Update Notes / Opportunities for Improvement	Related 2018 Plan Goal(s)
Planning and Regulatory					
Massachusetts State Building Code (780 Code of Massachusetts Regulations (CMR))	BBRS	Massachusetts State Building Code (MSBC) covers the entire state, applies to both public and private construction, and is administered through the local building inspectors with state oversight. The Code addresses multiple natural hazards including wind, seismic, snow, and flood hazards. Section 1612 of the MSBC contains most of the NFIP construction requirements related to buildings or structures.	NFIP standards are an integral section of the MSBC, ensuring that all new construction and substantial improvements meet national flood resistant standards. Many communities have enacted stricter standards under their local floodplain ordinances. Allows for the application of NFIP standards on all new construction of buildings and structures throughout the Commonwealth.	Updated. In 2017 the MSBC was updated based on the ICC's most recent (2015) model codes (I-Codes). Significant improvements were made to the design and construction requirements for buildings and structures in flood hazard areas. The new 9th Edition of the MSBC became effective on October 20, 2017.	3
The Massachusetts Public Waterfront Act - Chapter 101 Program; (MGL Ch. 91)	CZM	Protects the coastal tidal area for public open space purposes and regulates new and expanded construction within this area.	Very effective tool for risk reduction by restricting development along coastal shores, which are high hazard areas.	Although it includes language regarding sea level rise, Chapter 101 only requires sea level rise projections to be based on historical data and does not require specific actions for adaptation.	3

- The column previously titled "Existing Mitigation Efforts" was renamed "Existing Capability" and includes information on hazard mitigation and climate adaptation efforts.
- Existing capabilities have been reorganized under five categories, which are described below:
  - **Planning and Regulatory** – State laws, regulations, executive orders, enabling legislation, plans, policies, strategies, and guidelines that support risk reduction for the built environment and natural systems.
  - **Administrative and Technical** – State staff and technical resources or programs, including the expertise, data, tools, and other capabilities that support institutional capacity building.
  - **Capital Projects and Asset Management** – Capital improvement programs or other investments that support risk reduction for key state assets or critical infrastructure.
  - **Financial** – Grants, capital projects/improvements, land acquisition, and other monetary investments by the State that support risk reduction for the built environment and natural systems.
  - **Education, Outreach, and Capacity Building** – Technical assistance, training, education and awareness initiatives, public-private partnerships, and nonregulatory incentives that support external capacity building.

- Existing capabilities are listed in alphabetical order according to the lead or responsible agency.
- A new column titled "Related 2018 Plan Goal(s)" was added to the matrix to identify the specific goals of this plan that are most relevant to the listed capability.

6.2.3 Adaptive Capacity of State Agencies

In addition to the assessment of existing State capabilities, this study also included an analysis of the adaptive capacity of individual state agencies. Adaptive capacity is defined as the ability of state agencies (including their key assets, functions, missions, and services/programs) to adjust or modify their operations, policies, or other functions to adapt to changing natural hazards and climate change impacts, both in the short- and long-term. For purposes of this plan, the adaptive capacity analysis relied heavily on the agency-specific self-assessments that were completed as part of the state agency vulnerability assessment survey process in support of the risk assessment (see Section 9.5 in *Chapter 9: Planning Process* for additional information).

In response to the state agency vulnerability assessment survey, the following information was collected and reviewed for each specific agency as it relates to their adaptive capacity. A summary of the key findings from the analysis of this information is provided in Section 6.4.1.

- **Overall Capacity Rating** – Self-assessment rating of the agency's overall ability to withstand natural hazards and climate impacts in terms of potential physical damage or disruption to its assets, mission, functions, staff, and the public. Ratings were identified in response to a closed-ended survey question with the following potential ratings:
  - *Excellent (very unlikely to result in damage/disruption)*
  - *Good (unlikely to result in damage/disruption)*
  - *Satisfactory (may result in damage/disruption)*
  - *Fair (likely to result in damage/disruption)*
  - *Poor (very likely to result in damage/disruption)*
- **Incorporation of Hazard Mitigation / Climate Adaptation** – Description of the agency's current efforts to incorporate natural hazard mitigation and climate change adaptation into existing programs.
- **Current Obstacles, Challenges, or Needs** – Summary narrative description of existing barriers to improving or maintaining the agency's ability to withstand natural hazards and climate impacts.

- **Examples / Additional Comments on Adaptive Capacity** – Notable examples or additional comments on specific agency capabilities, plans, policies, or other available resources that relate to adaptive capacity.
- **Opportunities for Improvement** – Identification of any noted opportunities for improving the agency's adaptive capacity, especially as it relates to critical agency plans, policies, regulations, or procedures that could be adjusted to better consider climate change.

Additional data collected as part of the state agency vulnerability assessment process included information on the functionality and continuity of agency operations during an extreme weather event (including remote operation capability), as well as emergency response measures that have been identified to intervene and reduce the vulnerability of the agency's at-risk critical assets, function, or population groups.

6.2.4 Administration of FEMA Mitigation Programs

The Commonwealth's administration of the federally established NFIP, Community Rating System (CRS), Hazard Mitigation Assistance (HMA), and Risk Mapping, Assessment, and Planning (Risk MAP) programs is directly related to the Commonwealth's commitment and capability to manage and implement sustained risk reduction initiatives across the state. The administration of these programs is routinely coordinated through the SHMT, a joint effort between MEMA and DCR. The SHMT consists of the staff in MEMA and DCR who work full-time on hazard mitigation programs, projects, and planning. Descriptions of these programs follow.

NATIONAL FLOOD INSURANCE PROGRAM

The NFIP is a federal program administered by FEMA that makes flood insurance available in communities that agree to adopt floodplain management regulations that will reduce future flood damage. The program is intended to be a partnership between the Federal Government, states, and participating local jurisdictions. Congress created the NFIP in 1968 through the National Flood Insurance Act, which was passed to address the fact that homeowner's insurance does not cover flood damage, leaving much of the burden of flood recovery to general taxpayers through federal disaster relief programs. NFIP flood insurance is available anywhere, with limited exceptions (e.g., buildings entirely underground or entirely over water are not insurable), in an NFIP participating community, regardless of the flood risk zone. Federal law requires that flood insurance be purchased as a condition of federally insured financing used for the purchase of buildings in an identified Special Flood Hazard Area (SFHA), which is the area subject to inundation from the 1 percent annual chance flood (also known as the base flood or the 100-year flood).

Currently, 341 out of 351 Massachusetts communities participate in the NFIP. As of March 2018, there were more than 63,000 NFIP policies in place, with total insurance coverage of $16.2 billion, and $78.2 million in annual premiums paid. Since 1978, there have been more than 33,000 total claims, and nearly $382 million has been paid for insured flood losses.

The DCR Flood Hazard Management Program (FHMP) in the Office of Water Resources is the state coordinating office for the NFIP. Program staff work with FEMA and officials from NFIP-participating local communities to implement the NFIP in Massachusetts. The FHMP is a technical assistance program and has no regulatory authority, but staff provide a range of assistance to local communities in support of their local floodplain management efforts. This assistance includes, but is not limited to, the following activities:

- Conducting Community Assistance Visits and Community Assistance Contacts in coordination with FEMA.
- Providing support in reviewing and developing required ordinances for NFIP compliance.
- Conducting and/or supporting technical workshops and training events for local officials.
- Providing on-call and as-needed assistance to all interested parties on issues such as the NFIP, floodplain management, floodplain building requirements, floodplain mapping, flood mitigation, and flood insurance.

FHMP staff also routinely support and work with other state agencies to develop and implement the Commonwealth's laws regulating the program. This includes supporting any ongoing mapping initiatives, State model ordinance updates, and revisions or improvements to the adoption and enforcement of applicable State regulations, such as the State Building Code and WPA. Program staff also serve on the SHMT and work closely with MEMA on hazard mitigation planning and project activities across the state.

Flood Insurance Rate Maps

FEMA produces FIRMs based on technical studies that identify and map the SFHAs where development is regulated. As described above, the SFHA determines where flood insurance is required as a condition of a federally insured loan through the NFIP mandatory purchase requirement. The risk zones and flood elevations shown on the FIRMs in the SFHA are used to determine flood insurance rates. The geographic boundaries of the SFHA determine where NFIP floodplain management requirements must be enforced by communities that participate in the program. These include design and construction standards as codified in State regulations, and per local flood damage prevention ordinances in compliance with minimum NFIP standards. In addition to the NFIP, the FIRMs have taken on additional uses. They are used in FEMA's individual and public disaster assistance programs and in FEMA's mitigation grant programs,

and for emergency management purposes. In Massachusetts, the FIRMs are predominantly used to identify areas where certain State Building Code and WPA regulations are to be applied.

FIRMs are made available to view through online mapping viewers or downloadable files provided through municipal websites, publicly accessible computer stations, and/or links to FEMA's Map Service Center website. These maps can be amended or revised to reflect existing topography or changes in flood characteristics. The Letter of Map Amendment process is often used to challenge a lender's determination that a building is in the floodplain.

Risk Mapping, Assessment, and Planning

Risk MAP is a FEMA program that builds on the products of the Flood Map Modernization Program. FEMA began Risk MAP in 2009 with funding from the National Flood Insurance Fund and congressional appropriations for flood hazard mapping. Risk MAP is expected to integrate and align individual risk analysis programs into a more effective unified strategy:

> *"[Risk MAP] provides communities with flood information and tools they can use to enhance their mitigation plans and take action to better protect their citizens. Through more precise flood mapping products, risk assessment tools, and planning and outreach support, Risk MAP strengthens local ability to make informed decisions about reducing risk" (FEMA, 2012).*

FEMA's Risk MAP product development is ongoing. FEMA's other mapping efforts include the following:

- Map Modernization activities are ongoing in Chicopee, Middle Connecticut, and Westfield Watersheds. This includes the processing of basemaps and topographic data (light detection and ranging [LiDAR]) for the purpose of developing a digital FIRM database. The hydrology and hydraulics, as well as the resulting approximate Zone A floodplain mapping, have been reviewed, and will be incorporated into the database for use in future flood study projects. Discovery activities are under way, with Discovery Meetings projected to take place late November/early December 2018. Field survey will commence once Discovery is completed and study miles are prioritized.

- Discovery activities are under way in the Deerfield Watershed, with Discovery Meetings projected to take place early 2019.

- Discovery activities are under way in the Miller Watershed, with Discovery Meetings projected to take place early 2019. Field survey will commence once Discovery is completed and study miles are prioritized.

- A Coastal Erosion Hazard Mapping pilot study was completed in Nantucket, as well as areas of the shoreline in Salisbury up to the New Hampshire state border. The methodology developed during this pilot study is being used in the FY 2017 study to map coastal erosion

hazard potential in other vulnerable areas such as Barnstable, Dukes, and other parts of the Nantucket coastlines. Community outreach to discuss the coastal erosion hazard mapping in Nantucket took place on June 26, 2018. FEMA's consultants are reviewing the comments provided by Nantucket on August 6, 2018. Data collection and initial analysis of areas in Barnstable and Dukes are currently under way.

- Field survey and hydrologic analysis of the Quinebaug Watershed were completed at the end of 2017. Hydraulic analysis of the Quinebaug Watershed is ongoing, and projected to be completed in September 2018. Floodplain mapping will commence in October 2018. This study has been funded through the issuance of Preliminary FIRMs and the FIS.

- The Canton Levee study is ongoing, with Floodplain Mapping. Compass is coordinating with the U.S. Geological Survey on the Charles River Watershed study, which encompasses the Canton Levee study footprint. Compass met with the Town of Canton at the work map meeting for the Charles River Watershed on July 9, 2018. Compass will address comments from the community prior to finalizing the levee mapping in fall 2018.

- Levee Analysis and Mapping Procedures (LAMP) have commenced in the Town of Southbridge with a Webinar to explain the LAMP process on July 19, 2018. There will be an in-person meeting with the community in September/October once the Natural Valley analysis of the levee is conducted.

- LAMP studies for the levees in the Towns of Adams, North Adams, and Hatfield will start with community outreach activities in November 2019. A webinar for these communities will be held in early 2019.

- Upcoming Regional Standard Ops studies – 2D Rain on Grid Large Scale Automated Engineering will be conducted for the Narragansett Watershed over the next year (fall 2018 – summer 2019). The engineering results will be used to map the approximate Zone A's in future studies.

- Charles Watershed – Community work map review meeting occurred July 9 and 10, 2018. Comment period was scheduled to end on August 10, 2018. Several communities have requested and were granted extensions for providing comments.

- Merrimack Watershed – Surveying and hydrology are completed. Hydraulics for enhanced studies is almost complete. Base-level engineering will be completed in August 2018. Floodplain mapping will begin immediately afterward, and is scheduled for completion in October 2018. Draft work maps will be reviewed by FEMA, Massachusetts, and New Hampshire in late-fall 2018. Community outreach for work map review meeting will proceed approximately 6 weeks later.

- Cape Cod Watershed – A review of mapping data is under way, and Federal Register publication of preliminary maps is anticipated in August 2018. The 90-day appeal period will begin in September 2018, and conclude in December 2018. Additional quality review will take place in December 2018 in preparation for Letter of Final Determination in January 2019, and effective date in July 2019.
- Nashua Watershed – Surveying and base-level engineering are completed. Hydrology and hydraulics are under way, and are scheduled to be completed in fall 2018.
- Lower Connecticut Watershed – Priority reach selection is complete and final Discovery packages should be mailed out in September 2018.
- Blackstone Watershed – Discovery is complete and surveying has started.
- Housatonic Watershed – Discovery meetings were held in May 2017. Community input is completed. Selection of priority reaches is on hold until First Order Approximation (FOA) is completed. FOA (base-level engineering) is on hold until LiDAR for Connecticut is released, and LiDAR for Massachusetts is repaired (both likely in September 2018). No date is available for this release at this time.
- Shetucket Watershed – Selection of priority reaches is completed and through review. Discovery was completed in the Mapping Information Platform in March 2018. Field surveying began in June 2018.

COMMUNITY RATING SYSTEM

The CRS is a voluntary program within the NFIP that encourages floodplain management activities that exceed minimum NFIP requirements. Flood insurance premiums are discounted to reflect the reduced flood risk resulting from community actions to meet the CRS goals of reducing flood losses, facilitating accurate insurance rating, and promoting awareness of flood insurance.

For participating communities, flood insurance premium rates are discounted in increments of 5 percent. For example, a Class 1 community receives a 45 percent premium discount, and a Class 9 community receives a 5 percent discount. Class 10 communities are those that do not participate in the CRS; they receive no discount. The CRS classes are based on 19 activities in the following categories:

- Public Information Activities
- Mapping and Regulations
- Flood Damage Reduction Activities
- Warning and Response

CRS activities can help to save lives and reduce property damage. Communities participating in the CRS represent a significant portion of the nation's flood risk; more than 69 percent of the NFIP's policy base is located in these communities. Communities receiving premium discounts through the CRS range from small to large; and represent a broad mixture of flood risks, including both coastal and riverine flood risks. The Insurance Services Office (ISO) administers the CRS program under FEMA contract.

Currently, there are 20 Massachusetts communities actively participating in the CRS program, as listed in Table 6-1. These communities represent approximately 27 percent of the flood insurance policy base in the Commonwealth. The CRS classifications range from a Class 9 (5 percent discount) to Class 7 (15 percent discount). These classifications are updated by FEMA bi-annually in May and October of each year. The total annual flood insurance premium discount for the Commonwealth as of September 10, 2018 was $1,785,398. This represents an average savings of $96.00 per NFIP policy in participating CRS communities, and 2.24 percent of the total annual premiums paid in the Commonwealth.

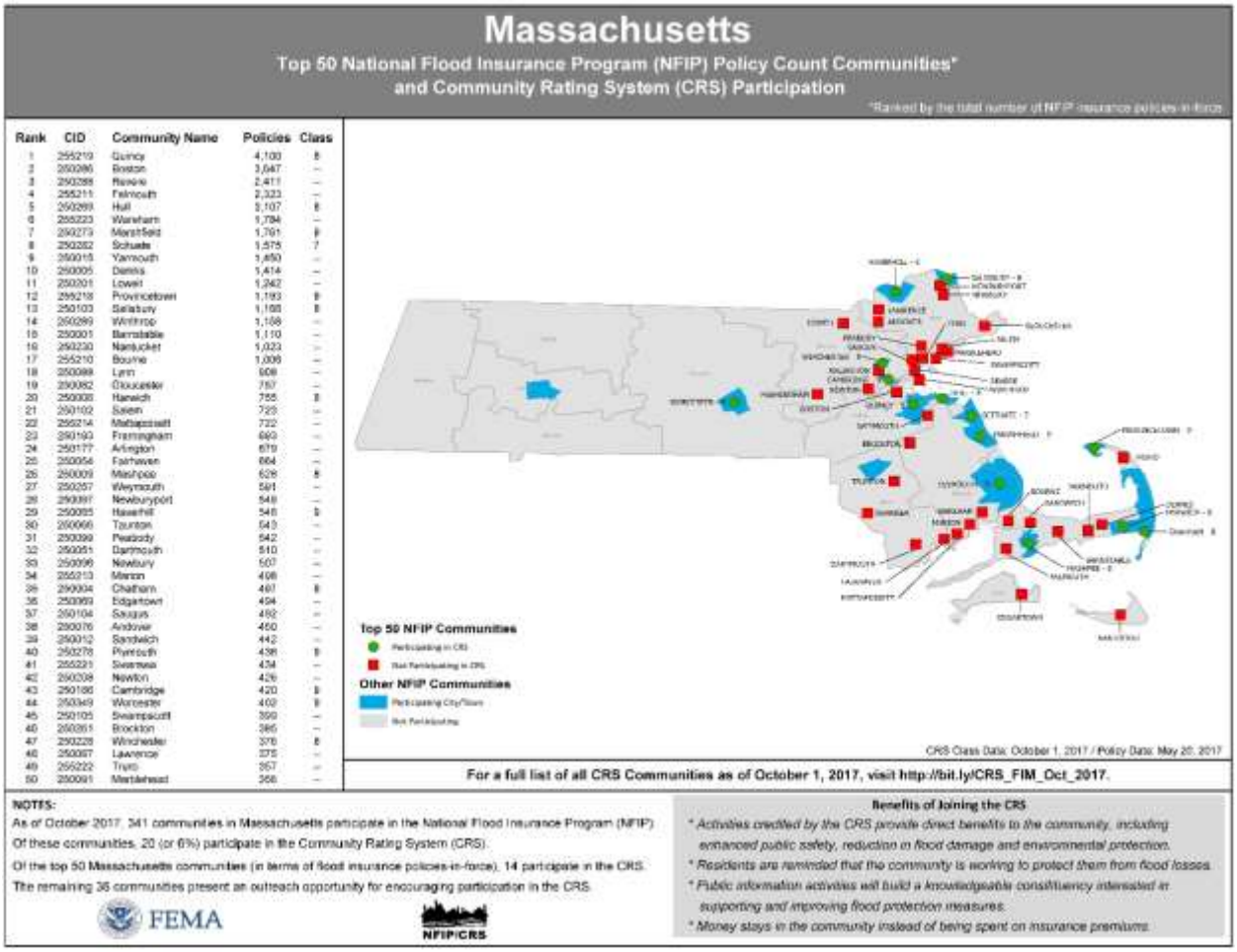
Table 6-1: Massachusetts Participating CRS Communities

NFIP #	Community	CRS Entry Date	Current Effective Date	Current Class	% Discount for SFHA	% Discount for non-SFHA
250233	Braintree	10/1/92	05/1/18	8	10	5
250186	Cambridge	10/1/15	10/1/15	9	5	5
250004	Chatham	10/1/92	10/1/93	8	10	5
250006	Eastham	10/1/17	10/1/17	8	10	5
250008	Harwich	10/1/95	10/1/15	8	10	5
250085	Haverhill	10/1/92	10/1/92	9	5	5
250269	Hull	05/1/08	05/1/08	8	10	5
250273	Marshfield	10/1/15	10/1/15	9	5	5
250009	Mashpee	10/1/17	10/1/17	8	10	5
250167	Northampton	05/1/17	05/1/17	8	10	5
250060	Norton	10/1/91	10/1/91	9	5	5
250010	Orleans	10/1/93	10/1/93	9	5	5
250278	Plymouth	10/1/91	10/1/91	9	5	5
255218	Provincetown	10/1/11	10/1/11	9	5	5
255219	Quincy	10/1/93	10/1/12	8	10	5
250103	Salisbury	05/1/16	05/1/16	8	10	5
250282	Scituate	10/1/91	05/1/17	7	15	5
250014	Wellfleet	05/1/17	05/1/17	8	10	5
250228	Winchester	10/1/13	05/1/18	8	10	5
250349	Worcester	10/1/95	10/1/95	9	5	5

CRS = Community Rating System; NFIP = National Flood Insurance Program; SFHA = Special Flood Hazard Area

Figure 6-3 shows the location of participating CRS communities, in addition to those communities identified by FEMA as having the highest number of NFIP policies.

Figure 6-3: Top 50 NFIP Policy Count Communities and CRS Participation, FEMA



State-Based and Other Potential Credit

The CRS provides credit to communities for certain state laws, regulations, and standards that support floodplain management within a state, and have proven effective in reducing flood damage. State-based credit is awarded to communities for activities that are implemented and enforced by the state (e.g., mandatory flood hazard disclosure laws for developers, realtors, or sellers). This type of CRS credit is verified by ISO annually, and does not require any further information or documentation from the community.

Additional potential credit is available to communities for state-mandated or common state activities implemented and enforced at the local level. A summary of applicable CRS activities for other potential credits is provided in Table 6-2, but individual communities must determine which credits may apply to their specific jurisdiction in coordination with ISO.

Table 6-2: Summary of Activities for Potential CRS Credit

CRS Activity	CRS Element
430 – Higher Regulatory Standards	Development Limitations (DL)*
430 – Higher Regulatory Standards	Building Codes (BC)*
430 – Higher Regulatory Standards	Local Drainage Protection (LDP)*
430 – Higher Regulatory Standards	State-Mandated Standards (SMS)
450 – Stormwater Management	Stormwater Management Regulations (SMR)
450 – Stormwater Management	Erosion and Sediment Control (ESC)
450 – Stormwater Management	Water Quality (WQ)
630 – Dams	State Dam Safety (SDS)
430 – Higher Regulatory Standards	Development Limitations (DL)*

* Indicates potential state-mandated credits
CRS = Community Rating System

6.2.5 Hazard Mitigation Assistance

Currently, there are three programs available to states through FEMA that provide funding for eligible mitigation planning and projects that reduce disaster losses and protect life and property from future disaster damages. The three programs are the HMGP, the Pre-Disaster Mitigation (PDM) program, and the Flood Mitigation Assistance (FMA) program. HMGP assists in implementing long-term hazard mitigation planning and projects following a major Presidentially Declared Disaster. The PDM and FMA programs provide funds for mitigation planning and projects on an annual basis, with the latter focused on reducing flood hazard risks to buildings that are insured under the NFIP. HMGP funding is generally 15 percent of the total amount of federal assistance provided to a state, territory, or federally recognized Tribe following a major disaster declaration. PDM and FMA funding depends on the amount Congress appropriates each year for those programs.

Although FEMA's HMA programs are federally funded and managed, they must be administered by the State (Grantee), which in turn coordinates with local applicants (Subgrantees). FEMA must certify that the Commonwealth of Massachusetts has demonstrated that it has the capability to effectively manage FEMA-funded hazard mitigation grant programs.

Since 1991, Massachusetts has supported more than 400 hazard mitigation projects and plans with more than $120 million in federal funding from pre-disaster and post-disaster hazard mitigation grant programs, as summarized in Table 6-3 and Table 6-4. The Commonwealth emphasizes effectiveness in hazard mitigation, in part by marketing the grant programs to all eligible applicants and then working with them to develop the best possible projects. For the

Table 6-3: Summary of Mitigation Projects Funded through Post-Disaster Grant Program

Disaster Event	Disaster Number	Federal Funding	# of Projects	Status
Hazard Mitigation Grant Program				
Hurricane Bob, Aug-91	914	$651,881	17	Closed
Winter Storm, Oct-91	920	$626,406	10	Closed
Winter Storm, Dec-92	975	$400,943	7	Closed
Flooding, Oct-96	1142	$12,262,500	37	Closed
Flooding, Jun-98	1224	$1,769,145	22	Closed
Flooding, Apr-01	1364	$1,562,356	17	Closed
Flooding, Apr-04	1512	$243,225	1	Closed
Flooding, Oct-05	1614	$763,899	4	Closed
Flooding, May-06	1642	$2,600,528	14	Closed
Nor'easter, Apr-07	1701	$1,364,794	5	Closed
Ice Storm, Dec-08	1813	$8,325,842	26	Closed
Flooding, Mar-10	1895	$13,280,510	34	Open
Snowstorm, Mar-11	1959	$3,805,002	14	Open
Tornadoes, Jun-11	1994	$7,044,043	11	Open
Tropical Storm Irene, Sep-11	4028	$5,481,585	6	Open
Snowstorm, Jan-12	4051	$10,776,528	20	Open
Hurricane Sandy, Oct-12	4097	$2,094,349	4	Open
Snowstorm, Feb-13	4110	$7,748,110	23	Open
Snowstorm, Jan-15	4214	$13,277,200	TBD	Open
Nor'easter, Mar-18	4372	TBD	TBD	Open
Nor'easter, Mar-18	4379	TBD	TBD	Open

Table 6-4: Summary of Mitigation Projects Funded through Non-Disaster Grant Programs

Grant Type	Fiscal Year (FY)	Federal Funding	# of Projects	Status
Flood Mitigation Assistance (FMA)				
FMA	FY 97	$286,544	4	Closed
FMA	FY 98	$238,428	3	Closed
FMA	FY 99	$457,367	6	Closed
FMA	FY 00	$240,713	5	Closed
FMA	FY 01	$307,201	8	Closed
FMA	FY 02	$173,081	3	Closed
FMA	FY 03	$221,100	2	Closed
FMA	FY 04	$291,601	3	Closed
FMA	FY 05	$143,250	2	Closed
FMA	FY 06	$1,119,737	3	Closed
FMA	FY 07	$634,335	5	Closed
FMA	FY 09	$240,889	1	Closed
FMA	FY 10	$65,369	1	Closed

Grant Type	Fiscal Year (FY)	Federal Funding	# of Projects	Status
FMA	FY 13	$2,155,932	1	Closed
FMA	FY 15	$675,410	1	Open
FMA	FY 16	$360,501	2	Open
FMA	FY 17	$ 168,478	1	Pending
Pre-Disaster Mitigation (PDM)				
PDM	FY 02	$352,990	4	Closed
PDM	FY 03	$222,497	4	Closed
PDM-C	FY 03	$483,272	3	Closed
PDM-C DRU	FY 04	$199,750	2	Closed
PDM-C	FY 05	$4,346,890	13	Closed
PDM-C	FY 06	$255,750	2	Closed
PDM-C	FY 07	$162,000	1	Closed
PDM-C	FY 08	$3,000,000	1	Closed
PDM-Earmark	FY 08	$100,000	1	Closed
PDM-C	FY 09	$516,421	4	Closed
PDM-Earmark	FY 09	$100,000	1	Closed
PDM-C	FY 10	$949,583	4	Closed
PDM-C	FY 11	$335,764	4	Closed
PDM-C	FY 13	$274.448	5	Closed
PDM-C	FY 14	$907,381	7	Open
PDM-C	FY 15	$119,206	4	Open
PDM-C	FY 16	$623,910	3	Open
PDM-C	FY 17	$469,855	2	Open
Severe Repetitive Loss (SRL) Program				
SRL	FY 08	$653,166	1	Closed
SRL	FY 12	$295,209	1	Closed
Community Development Block Grant (CDBG)				
CDBG	FY 97	$3,977,889	12	Closed
CDBG	FY 98	$1,494,878	2	Closed

HMGP, the Commonwealth typically receives applications for amounts far in excess of the amount of available funding. The Commonwealth selects and recommends for funding only the most cost-effective projects, as further described below.

Massachusetts has had a FEMA-approved Administrative Plan for HMGP since the federal program was authorized in 1988. Most recently updated in 2018, the plan details the process and criteria for prioritizing post-disaster mitigation funding of local mitigation projects. Massachusetts uses similar criteria to prioritize pre-disaster grant applications (PDM and FMA). Chapter 10 provides more information on the eligibility, selection, and prioritization of local assistance; and the State Grants Administrative Plan provides specific criteria for prioritizing hazard mitigation grants.

To facilitate the effective administration of these hazard mitigation grant programs, the SHMT provides technical assistance to state agencies, local jurisdictions, and Tribes for mitigation planning and project applications. The staff generally provide any assistance requested by sub-applicants to complete a successful application. More information on the technical assistance provided in support of these programs can be found in Chapter 10.

Since 1997, the SHMT has been providing grant funding for local mitigation plans, formerly flood mitigation plans, along with technical support and assistance. Today, the State's mitigation planner and other members of the SHMT help communities working on developing or updating hazard mitigation plans that may be funded through any of FEMA's mitigation grant programs. More details on the types of assistance provided can be found in Chapter 10.

In 1999, the SHMT developed a comprehensive database to track and monitor all open and completed hazard mitigation project and planning grants funded under the HMGP, FMA, PDM, and U.S. Department of Housing and Urban Development programs. This tool has allowed the Commonwealth to track and monitor project and plan timelines and completion dates. It allows the Commonwealth to track projects and plans by a specific grant program, by community, by project type, by project cost balances, and by other related data. For instance, the database allows tracking by project type, such as dam improvements, stormwater management, and elevation.

MITIGATION IN POST-DISASTER RECOVERY OPERATIONS

Hazard mitigation is an integral part of the Commonwealth's post-disaster recovery operations. Following Presidential Disaster Declarations, staff from the MEMA Mitigation and Recovery Unit co-locates with mitigation staff from FEMA at joint field offices, in addition to staff from other state agencies that may have an interest or jurisdiction in recovery operations. State and FEMA staff work to identify mitigation opportunities to be leveraged through the Individuals and Households Program (IHP) and the PA program, in addition to the subsequent HMGP program.

During post-disaster recovery operations, program staff members often provide mitigation information to disaster survivors. State and federal mitigation staff work together to identify public education needs or opportunities, and will use existing materials or develop new materials specific to the hazard and disaster event. PA program staff encourage potential project applicants to identify mitigation elements in repair and restoration projects, including through PA Section 406. Mitigation and PA program staff often jointly conduct applicant briefings to discuss mitigation opportunities through both PA and HMGP. State mitigation staff quickly disseminate letters of intent and information on the HMGP to potential applicants, and provide technical assistance to potential applicants on the grant application process. In addition, MEMA staff attend semi-annual Recovery and Mitigation meetings to discuss important aspects of the programs, changes in priorities, and lessons learned from disaster events.

MEMA's fiscal department ensures that all disaster and non-disaster FEMA funding is obligated and spent in accordance with all State and local regulations. Having a singular contracting and fiscal approval process ensures proper fiscal management. With the recent reorganization at MEMA, the Disaster Recovery Manager now also oversees the Mitigation Unit, providing a seamless coordination with the implementation of FEMA PA, IHP, and mitigation programs.

6.3 Local Capabilities and Coordination

The local capability assessment is an opportunity for the State to examine the effectiveness of local and Tribal governments with mitigating risk. The State supports local and Tribal governments with mitigating risk by providing training, technical assistance, and funding. This section aims to provide a view of local capabilities across the state.

Massachusetts has 351 cities and towns and two American Indian Reservations, each of which develops and enforces local laws and policies related to hazard mitigation and climate adaptation. The General Laws of Massachusetts, Title VII, Cities, Towns and Districts outlines the powers and duties of cities and towns. Included in MGL Chapter 40 are powers related to public authority for construction of public works, growth and development policy committees, public safety mutual aid agreements, municipal waterways improvement and maintenance funds, prevention of forest fires, purchase of land conditions and limitations, protection of the water supply, and building permit restrictions.

In preparing local hazard mitigation plans, many local governments use the following four categories to assess their capabilities, strengths, and weaknesses: (1) planning and regulatory; (2) administrative and technical; (3) financial; and (4) education and outreach (see Table 6-5). For the purposes of the SHMCAP, the State has examined local capabilities in terms of these four categories. The NFIP is included in the planning and regulatory description for this local assessment. Currently, there is no requirement or standard for local or tribal governments to quantify their ability to adapt to climate change.

Table 6-5: Categories of Local Capability

Categories of Local Capability	Description
Planning and Regulatory	Includes capabilities based on the jurisdiction's implementation of ordinances, policies, local laws and State statutes, and plans and programs that relate to guiding and managing growth and development.
Administrative and Technical	Includes capabilities associated with the jurisdiction's staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions.
Financial	Refers to the fiscal resources that a jurisdiction has access to or is eligible for to fund mitigation actions.
Education and Outreach	Refers to education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

6.3.1. Planning and Regulatory

A city or town's planning and regulatory policies related to growth and development generally relate to land use, economic development, stormwater management, open space, and coastal zone management, among others. Depending on the city or town, they may have one or more of the following plans in place: Comprehensive or Master Plan, Open Space and Recreation Plan, Harbor Plan, Economic Development Plan, Stormwater Management Plan, Historic Preservation Plan, Coastal Zone Management Plan, and a Climate Change Adaptation Plan.

City or town planning departments and planning boards have the general authority to implement the laws related to planning and zoning, which can be used along with other regulatory incentives for hazard risk reduction purposes. For example, the Town of Hull created a freeboard incentive program to encourage the elevation of flood-prone buildings above currently predicted floodwater levels to address the risk from future coastal storm events and sea level rise. This program was developed through the support of the State's Office of Coastal Zone Management and the Town's Building Commissioner, and it enables the Town to credit up to $500 for permit fees to builders who elevate their new or renovated structures 2 feet above the highest Federal or State requirement (Mass.gov, n.d.).

Planning boards typically oversee the preparation of comprehensive plans or master plans. They also often coordinate the hazard mitigation planning process and the implementation of hazard mitigation plans. These boards provide professional expertise in plan development, bylaw drafting, and grant application. A review of local hazard mitigation plans received by the State indicates that most local governments minimally include hazards and hazard mitigation in their local comprehensive or master plan. In recent years, communities have begun to develop coastal resilience and climate adaptation plans. For instance, in addition to its recently completed citywide master plan, the City of Boston prepared a comprehensive *Climate Ready Boston*

report, and is working with the community and other partners to become more prepared for and resilient to the impacts of climate change.

A planning board is the primary local vehicle to ensure that new development incorporates federal and state best management practices (BMPs). Planning boards maintain floodplain bylaws and ordinances to address current floodplain issues, and update them to ensure compliance with state and federal regulations. Planning boards may propose, review, make recommendations or hold hearings on zoning ordinances and zoning changes. Regulations may be included in building codes, zoning bylaws, subdivision regulations, floodplain regulations, open space preservation, and wetlands regulations.

To encourage the adoption of BMPs by communities, state agency programs provide technical assistance and funding to municipalities. Examples include:

- The MVP Program, which provides municipalities with planning and action grants to implement adaptation and resiliency strategies.
- The Community Compact Program, in which communities agree to adopt and implement BMPs in a wide range of municipal services, and receive State assistance.
- DOER's Green Communities Program, which provides municipalities with funding and technical assistance for energy conservation and efficiency projects to reduce the energy demand of municipal facilities, and require communities to adopt ordinances and bylaws for renewable energy siting and the stretch building code.
- DEP's Municipal Recycling Program, which provides recycling equipment to those communities that reduce waste, such as by providing recycling access for all residents.

The City of Salem developed the *Ready for Tomorrow: The City of Salem Climate Change Vulnerability Assessment and Adaptation Plan*, which "focuses on steps the city can take to remain a livable city with a strong economy and tourism sector in the face of climate change impacts." Key expected climate change impacts for Salem include extreme heat events, extreme precipitation events, sea level rise, and storm surge. The report addresses these impacts across the priority sectors of critical building infrastructure, water, energy, stormwater, transportation, and vulnerable populations.

Zoning regulations under MGL Chapter 40A give cities and towns the authority to adopt ordinances and bylaws to regulate the use of land, buildings, and structures. Planning boards may recommend land use regulations to protect public health, safety, and welfare, including measures for hazard mitigation and climate adaptation.

MGL 40R encourages "smart growth" to preserve open space, while increasing affordable housing. A planning board is able to adopt its own subdivision rules and regulations without an

action at the town meeting. Cities and towns may not adopt higher standards than the 9th Edition of the State Building Code, which limits cities and towns from mitigating risk.

Cities and towns have local boards of health and municipal conservation commissions. Each provides planning and regulatory responsibilities, as well as administrative and technical responsibilities. Each local community determines the roles of its board of health; some may manage school health programs or assist with community-based health improvement planning, policy, and program development, or prevention activities.

The local Board of Health implements the State Environmental Code, including Title 5 relating to sewage disposal. Title 5 protects public health and mitigates losses due to adverse effects of improper sewage treatment in high hazard areas.

Local conservation commissions are required to review development with potential impacts on any type of river, stream, pond, or wetland. These commissions play a role in enforcing regulations that minimize flood impacts.

Conservation commissions have primary responsibility for implementing the Massachusetts Rivers Protection Act (MGL Chapter 258, 310 CMR 10.58) and the Massachusetts WPA (MGL Chapter 131, Section 40; 310 CMR 10.00). A conservation commission reviews, approves, or denies applications for any project in the regulatory 100-year floodplain, in the floodplain of a small water body not covered by a FEMA study, or within 100 feet of any wetland or 200 feet of any river or stream (except in the case of densely developed urban areas, where buffers may extend only 25 feet from a river or stream). The WPA, enacted in 1972, significantly increased the responsibilities of these commissions, and requires a more advanced level of expertise than commissioners had needed previously. The Massachusetts Association of Conservation Commissions has guidebooks and model bylaws for local governments to use when enforcing or strengthening their adherence to the WPA.

The Green Communities Act, Chapter 169, signed into law July 2, 2008, increases opportunities for energy efficiency and renewable generation, aligns the Massachusetts State Building Code with the International Energy Conservation Code, and provides new programs for municipal clean energy development. The Massachusetts Department of Energy Green Communities Division provides grants, technical assistance, and local support from Regional Coordinators to help municipalities reduce energy use and costs by implementing clean energy projects in municipal buildings, facilities, and schools.

Current Challenges / Opportunities

Many of the local governments that have submitted FEMA-approved hazard mitigation plans have the required government infrastructure for planning in place. However, many of the smaller locales often have staff serving in more than one role, and do not have the ability to author and

adopt specific planning mechanisms such as economic development plans, stormwater plans, or disaster-specific plans. The majority of local hazard mitigation plans include a list of mitigation projects or activities for the community to pursue. For instance, the 2018 Town of Fairhaven Hazard Mitigation Plan identifies 38 mitigation actions in order of priority. However, many communities struggle with the implementation of these proposed mitigation measures due to limited administrative or financial capabilities, as further described in this section.

The responsibility of local conservation commissions, public health boards, and planning boards to mitigate risk provides an opportunity for the State to support these boards with additional forms of education and technical assistance.

6.3.2. Administrative and Technical

The Administrative and Technical category examines a local government's ability to mitigate risk and adapt to climate change based on the capabilities of their staff and technical resources.

Each Massachusetts community is required to appoint an emergency manager (Chapter 639 of the Acts of 1950) who is primarily responsible for local preparedness, mitigation, response, and recovery, as well as mutual aid for natural and human-caused hazards. Emergency managers play a primary role in developing local comprehensive emergency management plans required by Massachusetts state law, as well as other plans required by MEMA and FEMA. The State frequently looks to the emergency management director as the key point of contact for MEMA- or FEMA-related business. This is a key link for outreach and involvement in mitigation planning and grants. The designation of an emergency management director is frequently a duty or responsibility assigned to an existing full-time employee of the community, rather than a separate full-time position.

Public works departments or water and sewer departments, which are primarily responsible for municipal drainage and stormwater management systems, take the lead in ensuring communities' compliance with the U.S. Environmental Protection Agency's Phase II Stormwater Regulations (National Pollutant Discharge Elimination System). Because stormwater is one of the major flood hazards in Massachusetts, ongoing maintenance and upgrading of local stormwater systems by public works departments is important to reducing flood risks. Public works staff are integral in implementing local hazard mitigation plans, especially in identifying and implementing local hazard mitigation projects related to infrastructure. Communities have varying degrees of capabilities, although many do maintain a significant level of engineering or public works capability through their own municipal staff, master services agreements, and/or other contractual arrangements with service providers.

The building inspector implements and enforces the Massachusetts State Building Code (specifically, Section 3107, "Flood Resistant Construction"), which incorporates NFIP construction standards. The State Building Code includes sections on wind, snow, structural

loads, and seismic retrofitting; and ensures that NFIP standards and other mitigation standards are applied uniformly statewide. The building inspector also enforces local bylaws, especially to prevent floods. For instance, the building inspector is responsible for administering municipal zoning ordinances, including those addressing floodplains. Building inspectors may find problems or violations of the State Building Code related to other hazards in addition to flooding. According to the review of local mitigation plans, the administration of the NFIP may fall to building inspectors, but also conservation commissions, public works staff, or local planning departments.

According to the review of local mitigation plans, the administration of the NFIP may fall to conservation commissions, building inspectors, or engineers.

When drafting hazard mitigation plans, most communities request a list of repetitive loss and severe repetitive loss properties from DCR. They are then able to include these structures, or their general vicinities, in local risk assessments; and identify flood mitigation actions to prevent future losses. Some communities identify and evaluate the need to acquire, elevate, or otherwise floodproof these structures; and many will encourage residents to retrofit structures that suffer repeated flood damages.

The Northeast States Emergency Consortium (NESEC) offers no-cost technical assistance to communities to understand and mitigate their risk from natural hazards; using programs such as HAZUS, they can model impacts of earthquakes, hurricanes, floods, and coastal storm surge. Agencies or organizations interested in obtaining NESEC's assistance with multi-hazard risk mapping can find an application online.

In addition, the regional planning agencies frequently support communities with hazard mitigation and climate adaptation planning, and many of them have extensive GIS capabilities. For example, the Metropolitan Area Planning Council (MAPC) has worked extensively with the 101 cities and towns in its jurisdiction to mitigate risk and adapt to climate change. MAPC has supported its communities with development of master plans, hazard mitigation plans, open space plans, and zoning and land use regulations.

Universities in Massachusetts are also partners in hazard mitigation and climate adaptation by providing technical expertise. For example, the University of Massachusetts has developed hazard mitigation plans for each of their campuses. They have also participated in the planning process for the communities in which they are located.

Current Challenges / Opportunities

Municipalities in Massachusetts have a fairly high degree of technical and administrative capability, with many local governments supported by experienced staff, citizen volunteers, and external service providers such as regional planning agencies, non-profit organizations, and

private-sector businesses. However, it is also generally recognized that local communities may lack the overall capacity to more fully engage in resiliency planning and implementation, given competing priorities or activities, coupled with the fact that municipal staff are often tasked with multiple local roles and responsibilities. The Commonwealth's MVP program is helping to address this challenge through the engagement and leveraging of additional community stakeholders, as well as the provision of technical assistance and other resources. More education is needed concerning the benefits of hazard mitigation and climate adaptation, but this is also something the MVP program is beginning to address through its planning and actions grants. In the future, there may be more opportunities for the Commonwealth to provide additional training to local building inspectors concerning new hazard mitigation measures, or increasing the local enforcement and encouragement of sound building practices.

6.3.3. Financial

Financial capabilities generally refer to the monetary resources available to local governments to help fund hazard mitigation or climate adaptation actions. The costs associated with implementing these actions may vary greatly, because some measures such as public outreach and communication could require little to no costs other than staff time and existing operating budgets. Other actions, such as open space preservation, infrastructure adaptation, or other capital projects could require funding from local, state, and/or federal funding sources.

Massachusetts municipalities have access to recurring sources of revenue through local property taxes, and some may have sources beyond that (such as local option taxes; e.g., meals tax, and utility-, special purpose-, or development-related fees). The municipal budget process is the means by which local government decides on how and where available municipal funds shall be spent. For many communities in Massachusetts, all appropriations for the upcoming fiscal year must be voted on and approved by town meeting in advance of setting a tax rate.

Although the annual budget focuses mainly on operating expenses, most communities are able to use these general municipal funds to support local hazard mitigation or climate adaptation efforts independently, or as the local match or cost-share often required for external grant funding. However, in most communities, there are also constant and competing demands for new or expanded services. The MVP program and local hazard mitigation grants attempt to address some of these funding challenges by providing direct funding to communities, and also guidance on how to better include these priorities in the overall municipal budgeting process.

In addition to general funds, many municipalities in Massachusetts have developed a capital improvement program to address major costs that have a multi-year impact on the finances of the municipality. A capital item is usually something that has a high acquisition cost, but also has an economic life of several years. Buildings, fire engines, and dump trucks are common examples of capital items—as are larger infrastructure developments or improvements such as schools or

roadways. Structural hazard mitigation or climate adaptation projects such as dams, seawalls, stormwater systems, or other flood protection measures are also often included as capital items. Most capital improvement programs plan for 5 or 6 years into the future, and schedule the acquisition of capital items sequentially to be least disruptive to any given annual budget.

For large capital expenses, many communities will seek to leverage external grant funding and/or borrow money through debt financing to pay over multiple years. Municipalities wishing to borrow money for extended periods of time issue bonds to investors, which are repaid over time with interest. State laws regulate the purposes for which municipalities may borrow, and how long such loans may last. Some cities and towns in Massachusetts typically use debt service for only a small percentage of their budgeting process, opting to maintain a structurally balanced budget, where operating revenues meet or exceed operating expenses.

State and federal grants, private funding, and other community resources are also available to communities for specific types of hazard mitigation or climate adaptation projects, depending on various eligibility requirements. The most common sources of state and federal grant funding for these projects in Massachusetts are identified in Appendix C ("Financial" category in Table C-1) and Appendix D (*Section 4: Funding Sources for Hazard Mitigation and Climate Adaptation Actions*). These include, but are not limited to, the Commonwealth's MVP program administered by EOEEA, Community Coastal Resilience Grant Program administered by CZM, and FEMA's HMA programs administered by MEMA.

In addition to coordination with state agencies, local communities in Massachusetts also routinely work cooperatively with their regional planning agencies, neighboring municipalities, or other partners on the pursuit of external funding. This often includes the application for and use of financial sources that can be leveraged for the implementation of projects or activities that provide the benefit of hazard risk reduction on a regional or multi-jurisdictional scale.

Current Challenges / Opportunities

Although most communities in Massachusetts have participated—and continue to participate—in local resiliency planning efforts, many still rely heavily on external funding sources for the implementation of hazard mitigation or climate adaptation projects. Those with the capacity to develop and submit competitive applications for grant programs can be successful, but there are many municipalities with limited numbers of staff or other resources to compete for these grants that require additional support. The Commonwealth continues to work to increase awareness and accessibility of guidance, grant funding, and technical assistance to local communities where it is needed most.

6.3.4. Education and Outreach

The Education and Outreach category looks to programs in local communities related to hazard mitigation, climate adaptation, and emergency preparedness. These programs may be citizen groups focused on sustainability or emergency preparedness, or they may be ongoing public education campaigns or school-related safety programs. They also may include public participation in State-funded projects such as the MVP program. For example, the Town of Hingham announced in May 2018 that they are preparing for climate change by entering the MVP program. They previously had developed a hazard mitigation plan, and have a Climate Change Vulnerability, Risk Assessment and Adaptation Study from 2015 (Wicked Local Hingham, 2018). To date, 71 communities have participated in the MVP program, as identified earlier in this chapter.

Many communities in Massachusetts have Community Emergency Response Teams (CERT). The CERT "program educates volunteers about disaster preparedness for the hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. CERT offers a consistent, nationwide approach to volunteer training and organization that professional responders can rely on during disaster situations, which allows them to focus on more complex tasks. Through CERT, the capabilities to prepare for, respond to and recover from disasters is built and enhanced" (Ready.gov, n.d.).

Two national programs that offer local communities the opportunity to prepare and mitigate risk are the StormReady program and the Firewise USA program. The StormReady program operates as part of the Weather-Ready Nation program of the National Weather Service. The program is about preparing communities for the increasing vulnerability to extreme weather and water events. To date, 15 cities and towns in Massachusetts have the StormReady designation, including the City of Boston (City of Boston, 2016b). In addition, five universities have this designation; Boston College, Boston University, Harvard University, Tufts University, and the University of Massachusetts at Amherst.

Cuttyhunk Island and Hopps Farm Road Association are the two communities in Massachusetts that have received the Firewise USA designation. Firewise USA is a program of the National Fire Protection Association. The program teaches communities how to adapt to living with wildfire, and encourages neighbors to work together and take action now to prevent losses. Cuttyhunk Island, located in Gosnold, Massachusetts, is home to 60 people. Cuttyhunk Island has been a recognized Firewise USA site since 2014. To date, they have invested more than $17,700 towards reducing their wildfire risk. Hopps Farm Road Association, located in West Tisbury, Massachusetts, is home to 32 people. Hopps Farm Road Association has been a recognized Firewise USA site since 2010. To date, they have invested more than $11,269 towards reducing their wildfire risk (NFPA, n.d.).

Current Challenges / Opportunities

The opportunity for the State to continue to support and increase the availability of outreach and education program will benefit local communities. These programs do not have to be tailored to a specific jurisdiction, which gives the State a greater opportunity to provide regional or even statewide educational opportunities. Current programs like MVP and CZM's coastal resiliency grants that provide funding, technical support, educational materials, supplemental webinars, outreach, and education are good examples of state programs that go beyond grant funding alone to boost overall municipal capacity.

6.4 Conclusions

The Commonwealth of Massachusetts has a high degree of capability to address the risks it faces from natural hazards and climate change. The Commonwealth has a long history of demonstrating its commitment to advancing risk reduction and resilience through a variety of policies, programs, and other capabilities; and in recent years, has bolstered this commitment even more through a series of new and innovative State-led initiatives. The Commonwealth is making significant investments in scientific research and data collection, such as the development of downscaled climate projections, as well as increased support and capacity building at the state and local level through technical assistance, training, funding, and other activities to increase statewide resilience. The development of this integrated SHMCAP exemplifies these advances in State capabilities and resources to lead by example on climate change adaptation and natural hazard mitigation.

The Commonwealth also maintains a strong institutional capacity to adapt to changing future conditions related to natural hazards and climate change impacts, both in the short- and long-term. The results of the state agency self-assessments described in Section 6.2.3 suggest that the agencies are well-positioned to adjust or modify their operations, policies, or other functions to protect their key assets, accomplish their missions, and deliver their services or programs in the face of increasing threats from natural hazards and climate change. For some state agencies, these threats are significant; but for others, they do not pose any major risks or vulnerabilities of concern. Regardless, the SHMCAP provides a framework for State government to continue to evaluate risk, assess vulnerability, and work across all agencies to adapt and maintain their resiliency to changing natural hazards and the impacts of climate change.

To ensure continued access to information and provide communities with the resources needed to improve their own resilience, the State will continue to invest in providing the best available science and data on expected climate changes, working with communities to track information on local vulnerabilities and resiliency strategies through the MVP program, and providing education and outreach related to grant programs and technical assistance available from the State.

The Commonwealth will also continue seeking ways to leverage emerging capabilities and opportunities to facilitate actionable hazard mitigation and climate adaptation strategies. Most notably, this includes implementation of the $2.4 billion Environmental Bond Bill signed into law in August 2018, which dedicates over $500 million to climate change resiliency efforts, and stipulates that such investments must be consistent with the SHMCAP. This extraordinary commitment promotes climate change adaptation and the importance of investing now for the future resilience of the Commonwealth.

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