



Climate Change & the Commonwealth

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Climate Change in Massachusetts

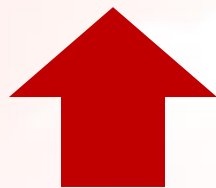
Observed

By the 2090s

Temperature

2.9°F

Since 1895 (Statewide)



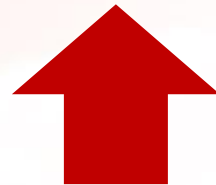
7.2°F

Average Annual; Range: 4 to 11 °F

90°F Days

11

Climate Ready Boston



25-90

Climate Ready Boston

Sea Level Rise

11 inches

Since 1922 (Boston)



4 to 10.2 feet

Relative to mean sea level - 2000

**Heavy
Precipitation**

55%

Since 1958



47%

Annual increase in 2" precipitation days

Executive Order 569 - 2016



- Comprehensive approach to reduce GHG emissions to combat climate change and prepare for the impacts of climate change
 - State Adaptation Plan
 - Climate Coordinators
 - Agency Vulnerability Assessments
 - Municipal Support

Environmental Bond - 2018



- \$2.4 billion bond bill with focus on climate change resiliency
- Over \$200 million authorized for climate change adaptation
- Codifies EO 569, including the MVP Program

Massachusetts State Hazard Mitigation and Climate Adaptation Plan (SHMCAP) - September 2018

14 hazards

Over \$9.1M in Inland flooding
damages/year,
2007-2014

Drought

Landslide

On average, Coastal flooding
6 events/ year,
2009-2018

Coastal erosion

Tsunami

Extreme temperatures

Wildfire

Invasive species

Hurricanes/ Tropical storms

200+ critical Severe winter storms / Nor'easters
facilities in Tornadoes
tornado
hazard zones

Other severe weather

Earthquakes

108 actions,
including:

Develop
climate
change
design
standards

Maintain
and
enhance
climate
change
projections

Incorporate
climate
effects into
capital
planning
functions

Create MA
Coastal
Flood Risk
Model



SHMCAP Implementation

Leading by example



ResilientMA Action Team (RMAT)

Local partnerships



Municipal Vulnerability
Preparedness Program (MVP)

Municipal Vulnerability Preparedness (MVP) Program



A state and local partnership to build resilience to climate change by building capacity to respond to climate effects at the local level and pilot innovative adaptation practice



Across the Commonwealth, cities and towns need financial and technical resources to prepare their residents, businesses, and aging infrastructure:

300 high-hazard dams

12,000+ culverts and small bridges needing replacement

1,100 municipally-owned coastal structures

MVP Principles

A community-led, accessible process that

- Employs local knowledge and buy-in
- Utilizes partnerships and leverages existing efforts
- Is based in best available climate projections and data
- Incorporates principles of nature-based solutions
- Demonstrates pilot potential and is proactive
- Reaches and responds to risks faced by EJ communities and vulnerable populations

Why nature-based?

Where appropriate, nature-based solutions can be more cost-effective, protect water quality and quantity, sustain lands that provide food and recreation opportunities, reduce erosion, and minimize temperature increases associated with developed areas and climate change.

MVP Resources

**Next funding round anticipated
Spring 2020 for projects
completed 7/1/20-6/30/21*



MVP Planning Grant

- \$15,000- \$100,000 per plan
- Some expanded scopes
- *\$1M available*



MVP Action Grant

- Open to MVP communities
- \$25,000- \$2M per project, up to \$5M for regional projects
- *\$10M available*

MVP Resources

www.resilientma.org



resilient **MA**

Climate Change Clearinghouse for the Commonwealth

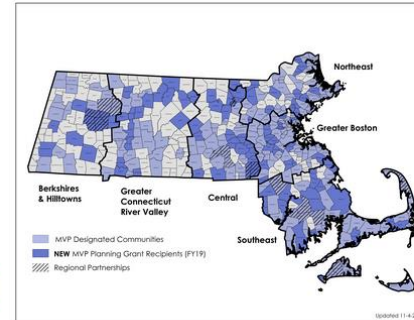
SEARCH



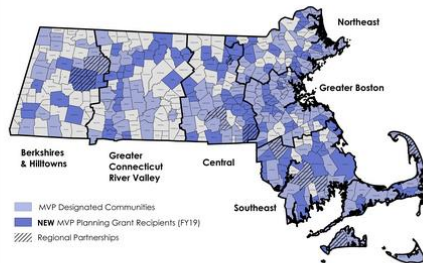
Municipal Vulnerability Preparedness

Our cities and towns are on the front lines of climate change. The new MVP program from the Executive Office of Energy and Environmental Affairs works with communities across the state to decrease risk, build resiliency, and identify strengths and opportunities through targeted planning and action.

More »



Municipal Vulnerability Preparedness Program



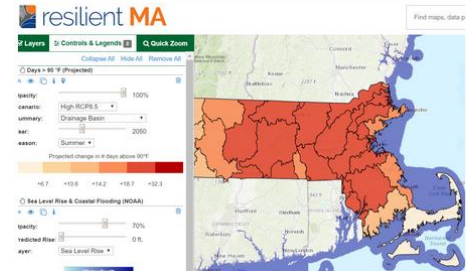
State Hazard Mitigation & Climate Adaptation Plan

Massachusetts State Hazard Mitigation and Climate Adaptation Plan

September 2018



ResilientMA Interactive Map



Three Years of MVP

MVP Designations

71% of the Commonwealth
249 communities

Action Grant Projects

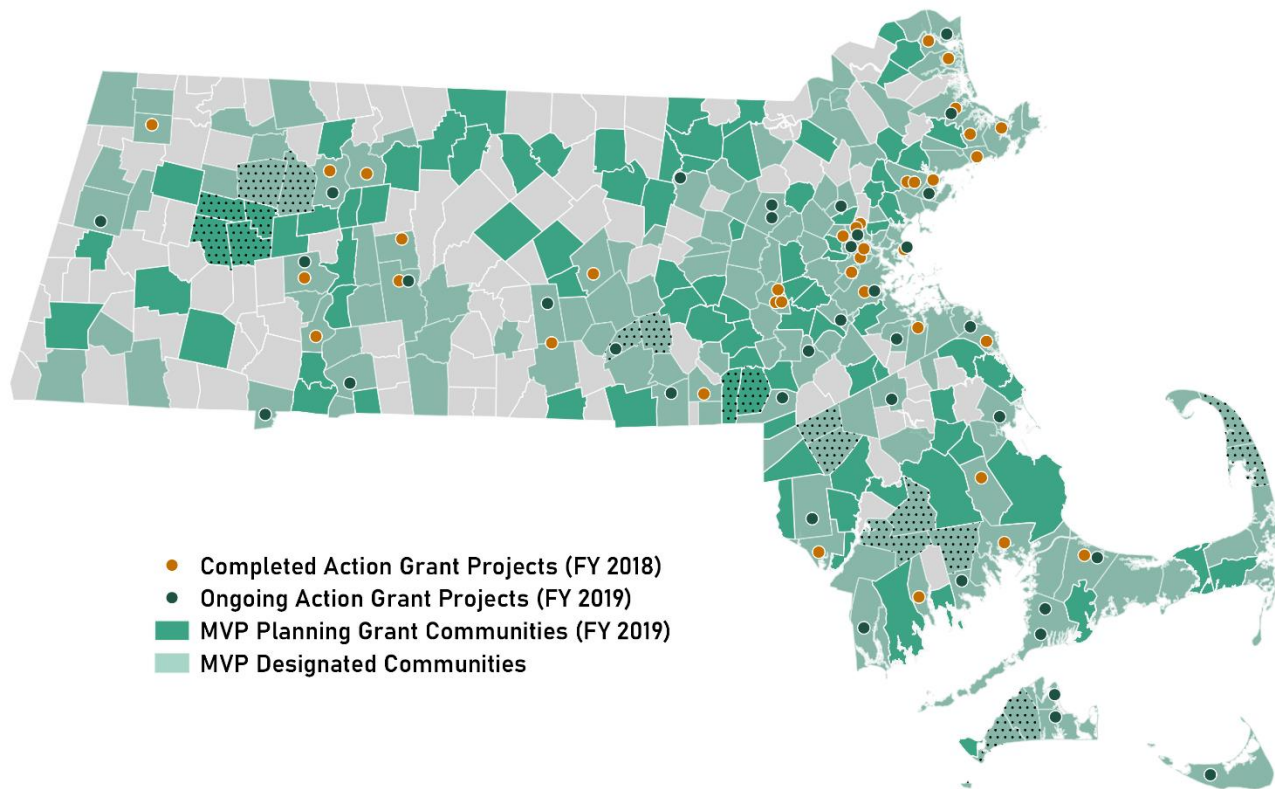
FY 18: 37

FY 19: 36

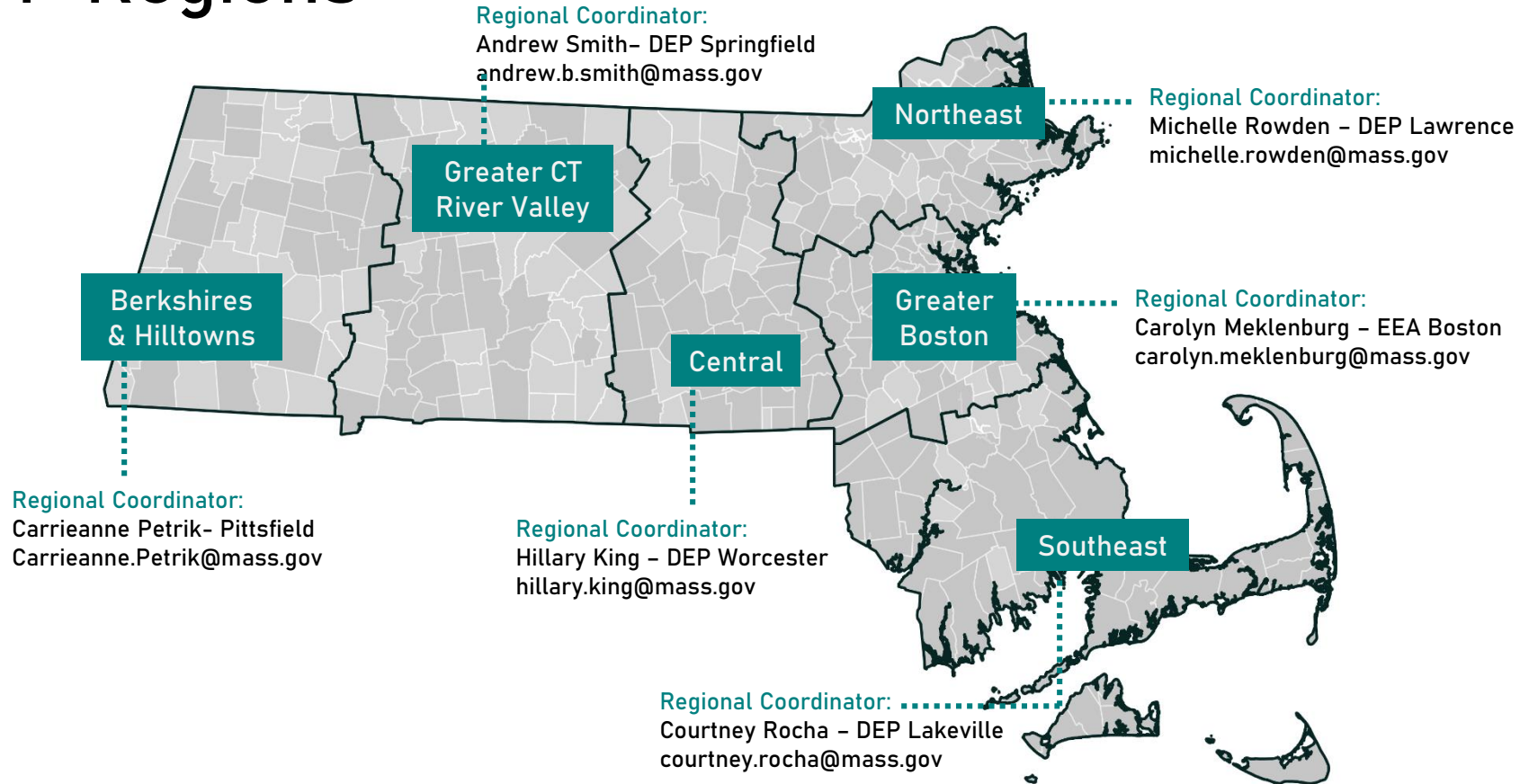
FY 20: 110 applications
received for a \$30M+
funding request

Total Awards

\$17M+ in planning and
action grants to date

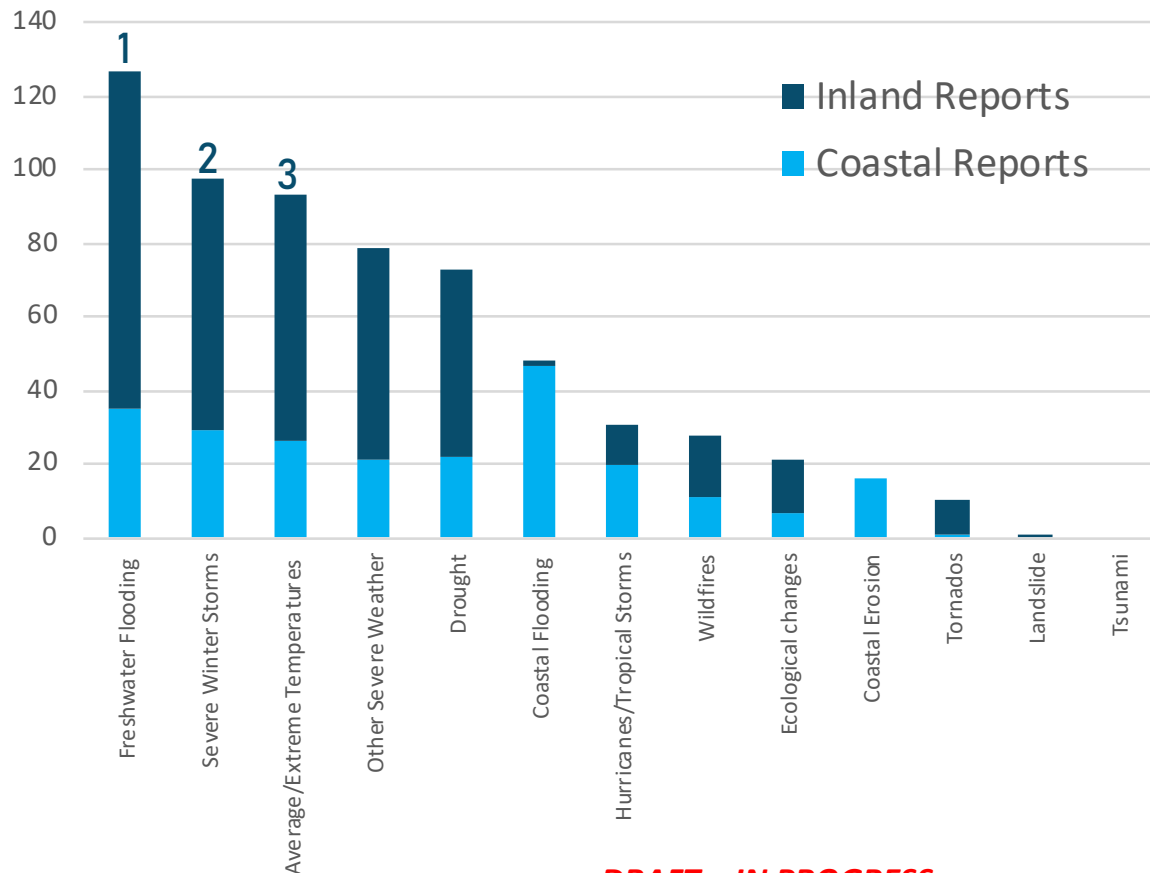


MVP Regions



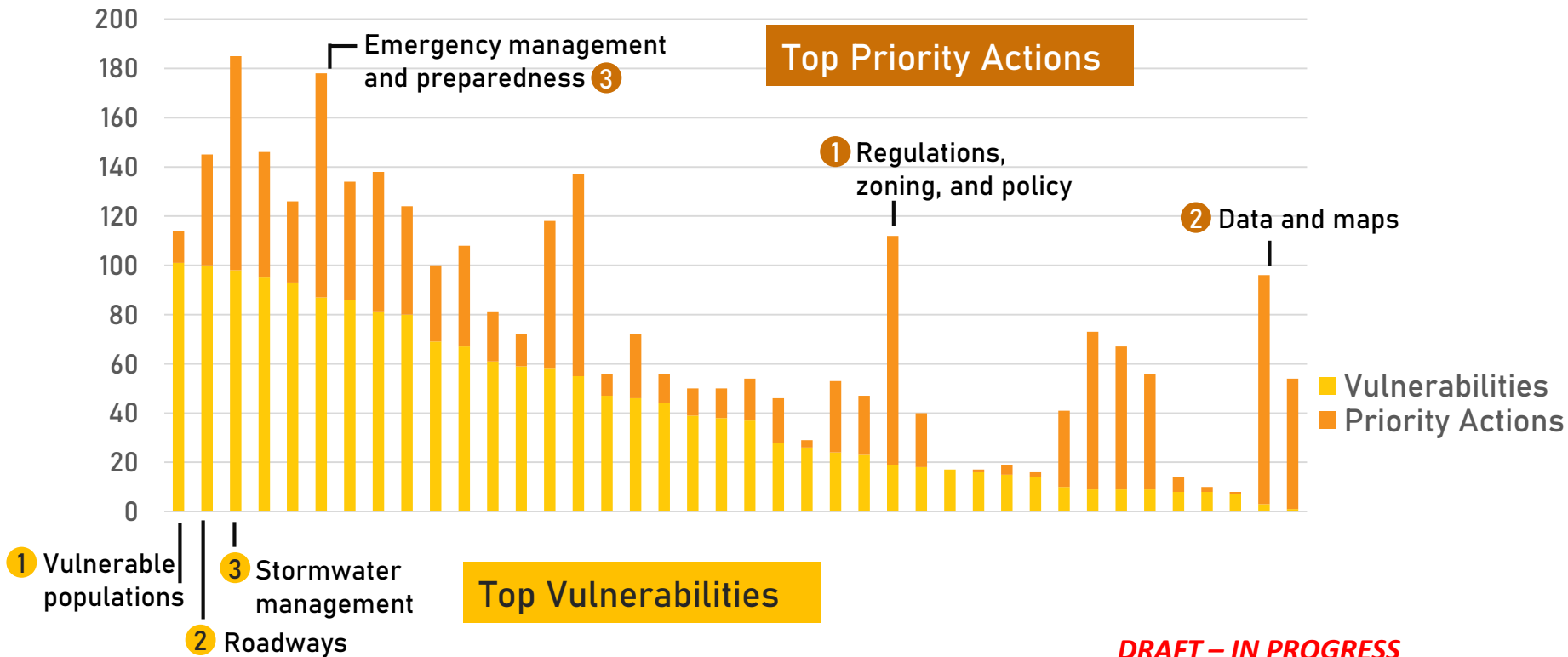
Top Hazards

- 1 Freshwater flooding**
Extreme precipitation and precipitation-induced flooding, ice jams, dam failures
- 2 Severe winter storms**
Snow/Ice storms, Nor'easters
- 3 Extreme/ higher temperatures**
Extreme heat, extreme cold, average higher temperatures



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Municipal Priorities



MVP Action Grants: Project Types

- 1 Detailed Vulnerability and Risk Assessment
 - Community Outreach and Education
 - Local Bylaws, Ordinances, Plans, and Other Management Measures
- 2 Nature-Based Flood Protection, Drought Mitigation, Water Quality, and Water Infiltration Techniques
- 3 Redesigns and Retrofits
 - Nature-Based, Infrastructure and Technology Solutions to Reduce Vulnerability to Extreme Heat and Poor Air Quality



- 1 Most common project type
- 2 Second-most common project type
- 3 Third-most common project type

MVP Action Grants: Project Types (cont.)

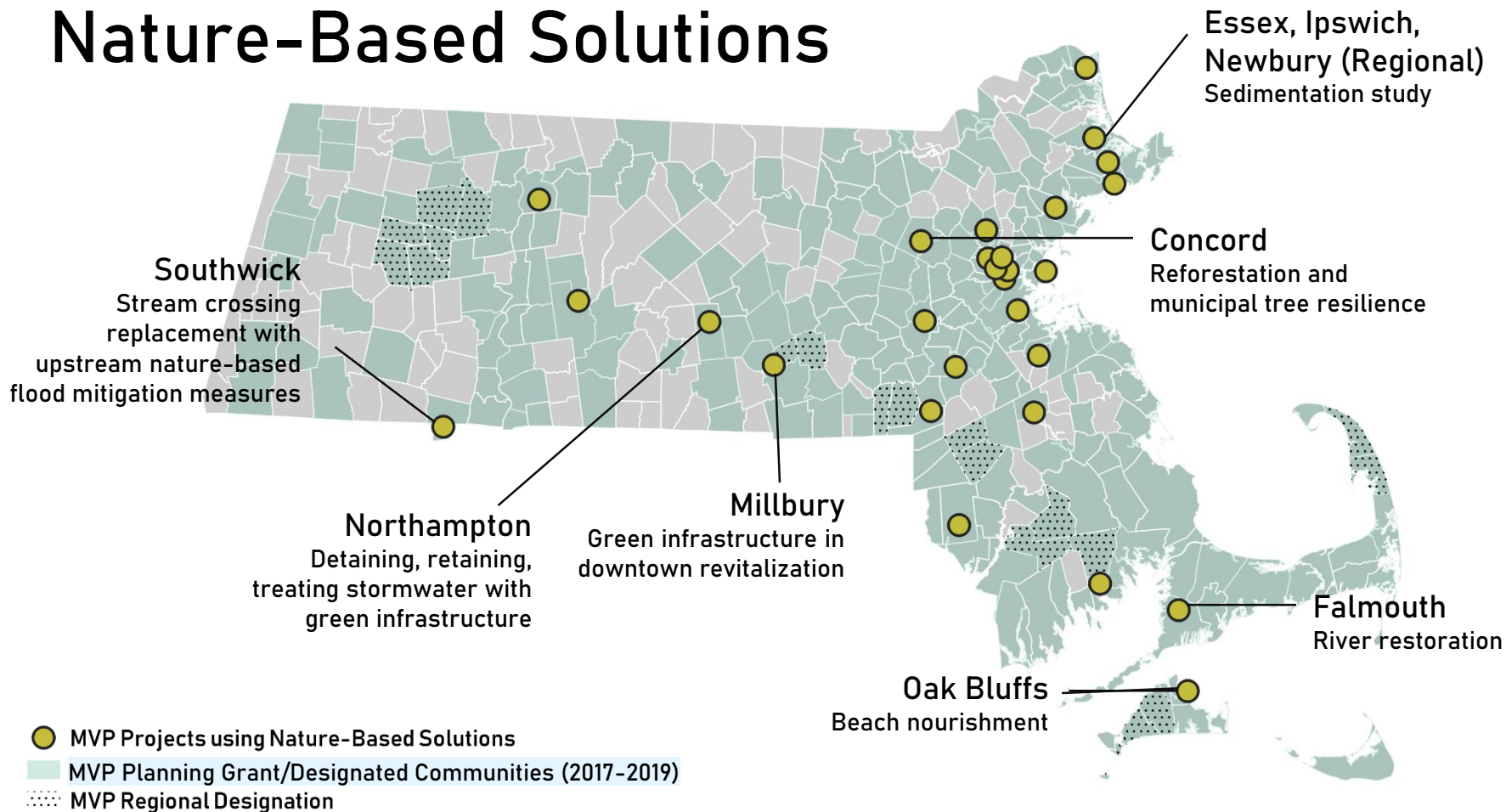


- Nature-Based Solutions to Reduce Vulnerability to other Climate Change Impacts
- Ecological Restoration and Habitat Management to Increase Resiliency

NEW IN 2019

- Energy Resilience
- Chemical Safety
- Land Acquisition for Resilience
- Subsidized Low-Income Housing Resilience Strategies
- Mosquito Control Districts
- + Expanded eligibility of project location

Nature-Based Solutions



Example Action Grant Projects

Boston

PROJECT TYPE: Local Bylaws, Ordinances, Plans, and Other Management Measures

Developing its first ever resilient building code so that development in the future floodplain is prepared for at least three feet of sea level rise, the likely scenario by late century.



Proactive

Pilot potential

PROJECT TYPE: Redesigns and Retrofits

Retrofitting a major waterfront park into a legacy park that uses nature-based solutions to address climate vulnerabilities while providing important access to recreation for residents.



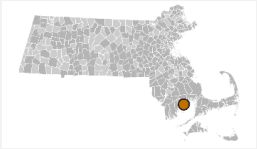
Nature-based solutions

Community co-benefits

Example Action Grant Projects

Land Acquisition for Resilience

Mattapoisett



Purchasing 120 acres of forest, streams, freshwater wetlands and coastal salt marsh as conservation land to prevent development in vulnerable areas



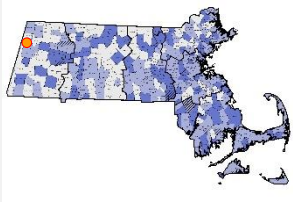
Data utilization

Proactive

Example Action Grant Projects

Redesigns and Retrofits

Pittsfield



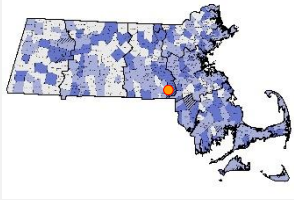
Implementing a priority culvert replacement and right-sizing project for increased flood resilience

Proactive approach

Design & Construction



Mendon



Integrating low impact development standards into local bylaws and subdivision regulations

- Parking areas shall be strongly encouraged to be designed to include landscaping to include low impact development techniques.
- Surface parking lots with over 15 parking spaces serving uses located in Highway Business or General Business Districts must have at least one shade tree (minimum two-inch caliper) for every 15 provided parking spaces.
- Total impervious area on any given site shall be minimized as possible through the use of natural plantings and construction of Low Impact Development best management practices

MVP Next Steps

- 1 Municipal MVP trainings**
1/23 Webinar (POSTED ON MASS.GOV)
2/4 Holyoke, MA
2/13 Pittsfield, MA
- 2 Regional Coordinator Support**
Pre-application meetings
Case studies and best practices to be MVP-competitive
- 3 Development of improved project evaluation criteria**
For social and resilience impact
- 4 Spring 2020 Funding Round**
Anticipated for projects beginning 7/1/20 through 6/30/21



RMAT: Resilient MA Action Team

Responsible for the **State Hazard Mitigation and Climate Adaptation Plan (SHMCAP)** implementation, monitoring, and maintenance, with representatives from each Secretariat and key state agencies

Climate Change Coordinator Responsibilities:

- Participate in quarterly meetings, annual and post-disaster plan reviews, and 5-year updates
- Coordinate completion of required actions for each Executive Office
- Ensure new data is incorporated into the SHMCAP
- Increase general understanding of the SHMCAP through outreach, engagement, socializing the CC Clearinghouse
- Build collaborative partnerships to implement the SHMCAP
- Lead the SHMCAP's 5 year update



Massachusetts **State Hazard Mitigation & Climate Adaptation Plan**

FULL PLAN ▼

PLAN HIGHLIGHTS ▼



A First-of-its-Kind Integrated State Plan

The 2018 **State Hazard Mitigation and Climate Adaptation Plan (SHMCAP)** expands upon the previous planning efforts of the Commonwealth's 2013 State Hazard Mitigation Plan and the 2011 Massachusetts Climate Change Adaptation Report. It accounts for projected changes in precipitation, temperature, sea level rise, and other climate-related risks to the Commonwealth's infrastructure, communities, and the environment.



RMAT: The first year

www.resilientma.org



Massachusetts State Hazard Mitigation & Climate Adaptation Plan

[Full Plan](#) [Plan Highlights](#) ▾

SHMCAP Action Tracker

State agencies identified over 100 initial priority actions to increase resilience and overcome the Commonwealth's risks and vulnerabilities related to natural hazards and projected climate changes. SHMCAP actions can be sorted and viewed in multiple ways. The tracker is maintained by the State and contains a list of actions identified through the 2018 SHMCAP planning process as well as through the ongoing SHMCAP implementation process led by the Resilient Massachusetts Action Team (RMAT). Included are "global" actions that are intended to reduce risk across State government and the Commonwealth. All actions address at least one of the primary climate change interactions and associated climate change impacts identified in the risk assessment. Each action includes specific details, such as completion time frame, lead agency, agency priority score, and possible funding sources.

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[Global Action](#)

[Completion Timeframe](#)

[Action Type](#)

Actions

107 Results [Page 1 of 4](#) ▸

A&F: Budgeting, coordinating administrative functions, and planning.

Incorporate climate change vulnerability, resiliency, and adaptation standards into budgeting, coordination, and capital planning. [Read More..](#)

DCAMM: Incorporate hazard and climate change vulnerability into capital planning, master planning, and facilities management functions.

Incorporate climate change vulnerability, resilience, and adaptation standards into capital planning for new projects: refer to agency climate change vulnerability assessments in master



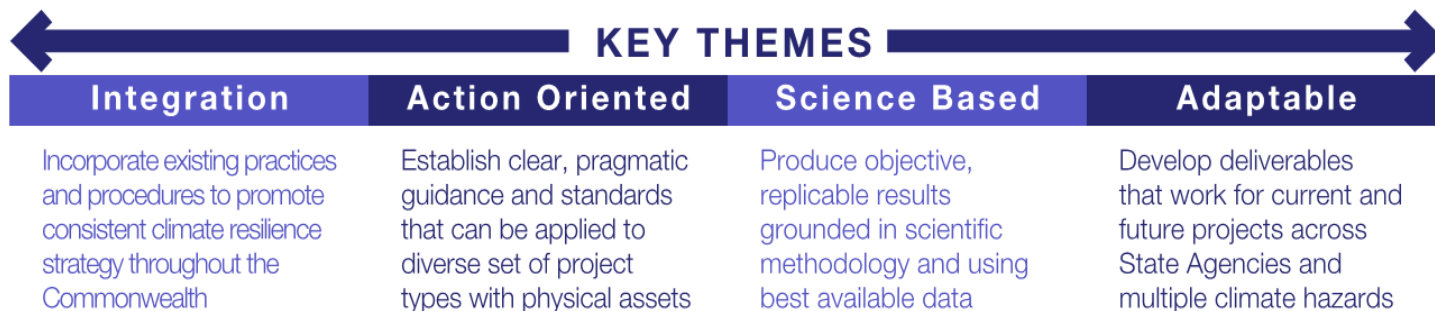
Climate Resilience Standards & Capital Planning Tools for State Agencies

translate
climate science
into **actionable
resilience
standards**

provide an
**accessible web-
based tool** for
use by various
audiences

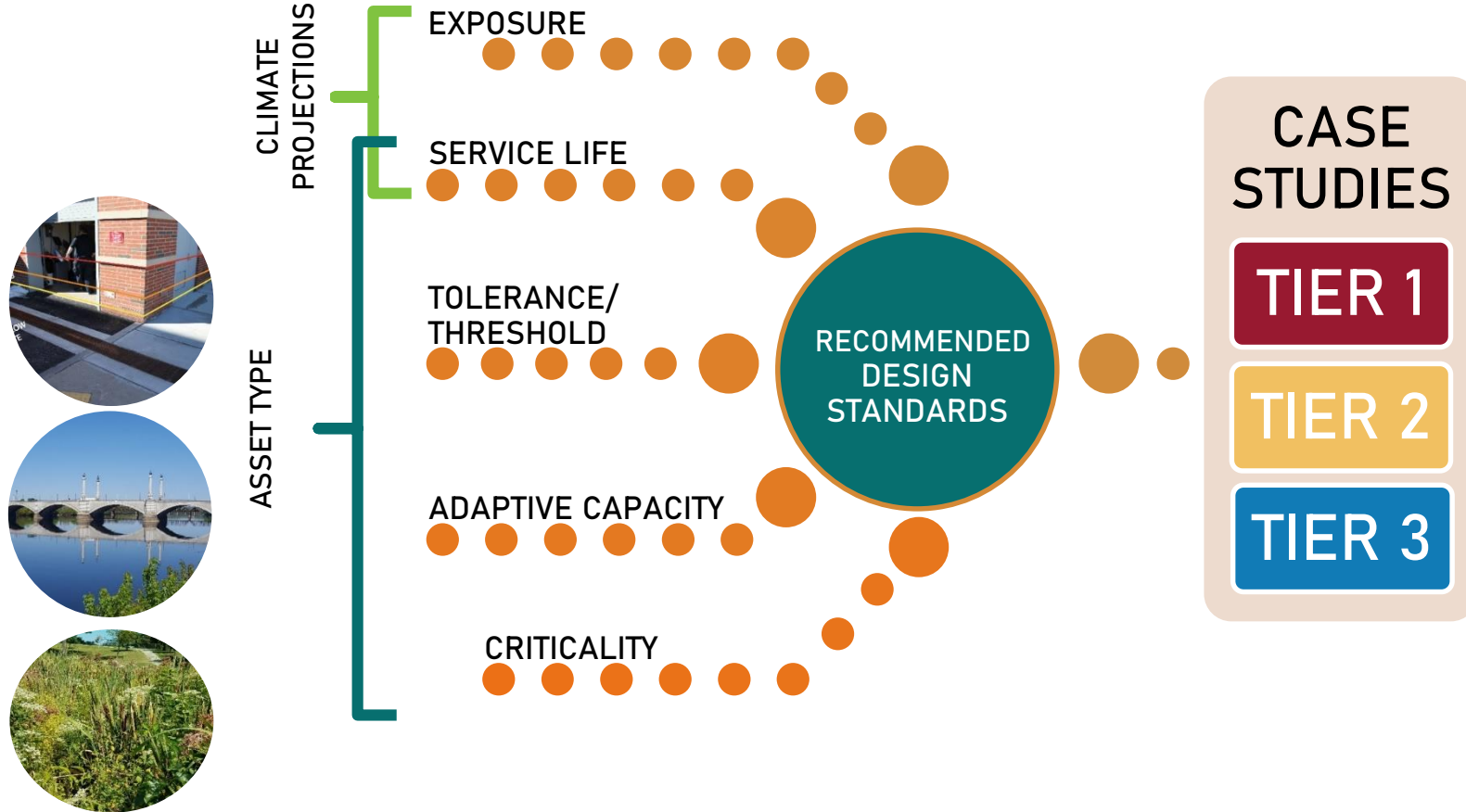
integrate
resiliency benefits
into capital
planning process
throughout
agencies

provide a
**replicable
methodology** and a
framework that
can adapt over
time



Developing climate resilience standards

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PROJECT TIMELINE

PROJECT START



Stakeholder Engagement Legend



Working Groups



Technical Advisory Group Workshop (TAG)



Public Comment Period



Web-Based Tool Training

Next Steps

Bill S.10:

An Act for Climate Change Adaptation Infrastructure Investments in the Commonwealth

- Building on success of existing programs like MVP: Proposed new source of revenue for loans, grants, and technical assistance to municipalities and regional partnerships for priority adaptation projects
 - Proposed deeds excise increase → est. \$137M annually to the Global Warming Solutions Trust Fund
 - Recurring, long-term revenue stream for multi-year project feasibility





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<https://www.mass.gov/municipal-vulnerability-preparedness-program>

