Municipal Vulnerability Preparedness Program
Municipal Staff Training for Planning Grants

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MA Executive Office of Energy and Environmental Affairs
Agenda

- Why and How MVP was created
- MVP Basics
- Becoming MVP Certified
- Planning Process Variations
- What’s Next? MVP Action Grants
- Contact Us
- Questions
How Summer Temperatures Will Feel Depending on Future Greenhouse Gas Emissions

- 1960-1999
  - Recent Heat Index
- Current
- 2070-2099
  - Lower “Paris Agreement” Emissions
- 2070-2099
  - Higher “Business as Usual” Emissions
Spring in January: Boston reaches record-high temperatures

With temperatures reaching up to 70 degrees Saturday, Boston set a record high for the month as the city has only been that warm in January ...

1 week ago

April 2019 Saw The Most Days With Rain In Boston Since 1872

April 2019 Saw The Most Days With Rain In Boston Since 1872. May 02 ... This year, Boston had the most days of rain in any month since record-keeping began in 1872. ... April 2019 had 21 days of measurable rainfall.

May 2, 2019

Remnants of Hurricane Florence soak Berkshires, prompt flooding

Messy 2-Day Ice Storm Set to Blast New England

Messy 2-Day Ice Storm Set to Blast New England ... Northeastern Massachusetts may see some snow before it transitions over to an icy mix.

3 weeks ago

Worcester To Hit 100 Degrees For First Time Since 1911

WORCESTER, MA — Record-breaking temperatures are expected in the city and across ... The infamous heat wave of 1911 lasted 11 days.

Jul 19, 2019
Rising Temperatures Bring More Rain/Ice/Snow

To understand why, you need only consider your morning coffee.

More Heat

More evaporation

More fuel for storms

More precipitation

Rising Temperatures Bring More Rain/Ice/Snow
Local Climate Change Impact Stories
Stormwater Flooding in Pittsfield

MVP Action Grant: Churchill Brook and West Street Culvert Replacement Project

Highest Priority

- Implement priority projects from the City’s existing field inventory of culverts, and bridges for increased flooding resiliency and storm-hardening, including design of priority re-sizing or replacement projects. Green infrastructure, Low-Impact Design, and other nature-based solutions should be integrated with hard-infrastructure improvements to establish approaches that will be robust in the face of natural hazards and climate-change scenarios and that will meet the Massachusetts stream crossing standards.
Local Climate Change Impact Stories
Climate Migration to Holyoke

- Conduct a public education campaign, which includes: (3 groups)
  - A two-way education event to learn from the experiences of people that fled Hurricane Maria and now live in Holyoke and
  - Creating a neighborhood level marketing engagement and training program to ensure that everyone in the community understands what they need to do to be resilient.

MVP Action Grant | The City of Holyoke's Response to Climate Change Displacement: The Case of the Post-Maria Migration of Puerto-Ricans
It's getting hotter... so what?

#ClimateChange

**WHETHER YOU LIVE IN A...**

- Rural village
- Small island or coastal town
- Big city

**CLIMATE CHANGE THREATENS YOUR HEALTH**

- **Drought**, floods and heat waves will increase.
- **Vector-borne diseases**, like malaria and dengue virus will increase with more humidity and heat.

**Basic necessities will be disrupted...**

- **FOOD**
  - Hunger and famine will increase as food production is destabilised by drought.

- **AIR**
  - Pollution and pollen seasons will increase leading to more allergies and asthma.

- **WATER**
  - Warmer waters and flooding will increase exposures to diseases in drinking and recreational waters.

Between **2030** and **2050** climate change is expected to cause **250 000 ADDITIONAL DEATHS PER YEAR** due to malaria, malnutrition, diarrhoea and heat stress.
Changing Energy Use and Demand

More Warm Winter Days, Less Heating Demand
(based on annual Heating Degree-Days, base 65)

26.2% by the 2090s

1971-2000 Average: 6839 Heating Degree-days

More Warm Summer Days, More Cooling Demand
(based on annual Cooling Degree-Days, base 65)

178% by the 2090s

1971-2000 Average: 457 Cooling Degree-days

Source: Northeast Climate Adaptation Science Center, ResilientMA.org, accessed 2018.
Impacts from Changing Precipitation Conditions

- Increased total rainfall
- More intense downpours
- Changes to rainfall and snowfall patterns
Impact Example: Public Health

Warmer Lake Temperatures → Stronger Storms → More Runoff → Greater Nutrient Loading → Algal Blooms, Fish Kills

West Monponsett Pond, Halifax, Massachusetts
## MVP: Policy Context

<table>
<thead>
<tr>
<th>Year</th>
<th>Act/Order</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2008 | **Global Warming Solutions Act (GWSA)** | To set economy-wide greenhouse gas emission reduction goals for Massachusetts that will achieve:  
- 25% reduction in GHG emissions by 2020  
- 80% reduction in GHG emissions by 2050  
(www.mass.gov/2050RoadMap) |
| 2008 | **Green Communities Act** | A comprehensive reform of the Massachusetts energy marketplace that will greatly improve the state's ability to meet the GWSA targets |
| 2016 | **Executive Order 569** | A comprehensive approach to reduce GHG emissions to combat climate change and prepared for the impacts of climate change with:  
- A State Adaptation Plan  
- Agency Climate Coordinators & Vulnerability Assessments  
- Municipal Support |
| 2018 | **Environmental Bond Bill** | $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)

Acknowledges that climate change is already worsening natural hazards, integrating information and planning elements for 14 natural hazards that affect the Commonwealth

Implementation

• *State*: Resilient MA Action Team (RMAT)
• *Local Partnerships*: Municipal Vulnerability Preparedness (MVP) Program
Municipal Vulnerability Preparedness (MVP) Program

State and Local Partnership

Financial and Technical Resources to Address Critical Municipal Needs:

- 12,000+ culverts and small bridges needing replacement
- 1,100 municipally-owned coastal structures
- 300 high-hazard dams
- 96% DHCD housing developments to see 5.4°C increase in max temperature by 2070
MVP Regional Coordinators...

- Manage MVP Grants
- Conduct Outreach + Education on MVP
- Provide Technical Support
- Work to Improve MVP Program
Three Years of MVP

MVP Designations
71% of the Commonwealth
249 communities

Action Grant Projects
FY 18: 37
FY 19: 36
FY 20: TBA

Total Awards
$17M+ in planning and action grants to date
MVP Grants

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
• 25% (non-state) match required
• $10M available annually

https://www.mass.go/municipal-vulnerability-preparedness-mvp-program
MVP Principles

A community-led, accessible process that:

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

• Who
• Priorities
• Obstacles to Involvement
• Existing Partnerships
• Experienced Vendors

Be Creative!
Climate change is felt amongst all populations, but it is most acutely felt within populations that have emitted the fewest GHG emissions.

Yet, the data we have from the program does not indicate that these voices have been incorporated into planning projects.

Our Definition of Resiliency is Evolving

- Very young, by definition they have done the least
- Low Income
- Indigenous Communities, 80% or world’s intact ecosystems are managed by indigenous communities
- Minority groups (as defined in the North American context)
- Differently-abled
- Incarcerated
- Queer community
- Unhoused

Thousands of conversations have happened around the Commonwealth around the topic of Climate Change Mitigation and Adaptation...this is inherently good.

But we can bring in different voices.
Municipal Staff Conducted CRB Workshop

Heard specific concerns from stakeholder about barriers to participation

- Drove outreach process to people living in public housing
- Identified public housing residents who could serve as translators
- Arranged childcare and food for additional workshops

Town opted to hire this stakeholder as a Community Liaison

Town held two workshops that reached beyond "frequent flyer" participants

Resulted in fundamental reappraisal of planning process

- Applied for a FY 2020 Action Grant specifically designed to address equity

Not deliberate, but it worked!!!
Nature Based Solutions

Why nature-based?

- Cost-effective
- Protects water quality and quantity
- Provides food and recreation opportunities
- Reduces erosion
- Minimizes temperature increases associated with developed areas and climate change

Low Impact Stormwater Design

Forest Management
What are Nature-based Solutions?

Problems facing towns

- Riverine flooding
- Coastal flooding
- Coastal erosion
- Stormwater flooding
- Heat island effects

Nature-based solutions

- Open space preservation
- Ecosystem restoration
- Low Impact Development

Additional benefits

**Infrastructure benefits**
Nature-based solutions can save $5 on every $1 spent, increase property value by up to $20, and create local jobs and capital inflows.

**Societal benefits**
Natural areas can reduce the likelihood of obesity by 40%, improve air and water, and draw people together to strengthen community ties.

**Environmental benefits**
Most natural systems rely on linkages with others. By prioritizing natural solutions, communities can provide restored links that augment biodiversity.
BUILDING CLIMATE RESILIENCE IN THE COMMONWEALTH

**RESILIENCE**
The ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner.

**MITIGATION**
Aims to reduce the causes of climate change

**ADAPTATION**
Involves modifying our decisions, activities and ways of thinking to adjust to a changing climate

Definitions taken from the Massachusetts 2018 State Hazard Mitigation and Climate Adaptation Plan and Canada in a Changing Climate report (Adaptation.NRCan.gc.ca)
Becoming MVP Certified
MVP Process

MVP Planning Grant

Define and characterize hazards using latest science and data

Identify existing and future community vulnerabilities and strengths

Develop and prioritize community adaptation actions

Identify opportunities to take action

Conduct community engagement

Receive MVP designation

MVP Action Grant

Implement priority adaptation actions identified through planning process
Who's Involved?

EEA (MVP Regional Coordinator)

Municipality

Core Team

Consultant
Community Resilience Building Workshop

Your Opportunity To:

- Gather stakeholders
- Start the climate conversation
- Brainstorm priority resilience actions for future funding
Stakeholder Mapping

Sectors?
Scale?
Internal + external?
Equitable representation?

- Advocacy groups
- Community Leaders or Champions
- Human + Social Services
- Local community-based organizations
- Parks + Rec/Cultural Resources
- Researchers + scientists
- Elected or appointed officials
- Student clubs
- Correctional facilities representatives
- EJ community representatives
- State + Federal Agencies
- Transportation
- Planning
- Utilities
- Community + economic development
- Building + housing
- Education
- Environment
- Public Safety

Corrections Facility

Community + economic development

Equitable representation?
## Community Resilience Building Workshop Risk Matrix

### Top 4 Hazards
- Tornado, floods, wildfire, hurricanes, snow/ice, drought, sea level rise, heat wave, etc.

### Features

<table>
<thead>
<tr>
<th>Features</th>
<th>Location</th>
<th>Ownership</th>
<th>V or S</th>
<th>Coastal Flooding SLR/Storm Surge</th>
<th>Inland Flooding and Rain Events</th>
<th>Ice and Snow</th>
<th>Wind</th>
<th>Priority</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elderly Citizens (facilities)</td>
<td>Multiple</td>
<td>Private</td>
<td>V</td>
<td>Assess and identify vulnerabilities to determine residents needs during emergencies; Coordinate emergency planning efforts; Conduct routine evacuation drills</td>
<td></td>
<td></td>
<td></td>
<td>H</td>
<td>S</td>
</tr>
<tr>
<td>Neighborhood Cooperation</td>
<td>Town-wide</td>
<td>Private</td>
<td>V</td>
<td>Assist associations in identifying and conducting best practices to reduce risk; Advance a “Neighbor helping Neighbor” Program through Community Center training</td>
<td></td>
<td></td>
<td></td>
<td>H</td>
<td>S</td>
</tr>
<tr>
<td>Faith-based Organizations</td>
<td>Multiple</td>
<td>Private</td>
<td>V</td>
<td>Coordinate organizations in identifying and conducting best practices amongst members to reduce risk</td>
<td></td>
<td></td>
<td></td>
<td>H</td>
<td>S</td>
</tr>
<tr>
<td>Homeless Population</td>
<td>Town-wide</td>
<td>Town</td>
<td>Y</td>
<td>Extreme weather flyers and communications about available services</td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>Vulnerable Neighborhoods</td>
<td>South side</td>
<td>Town/Private</td>
<td>Y</td>
<td>Identify level and location of vulnerable units; Develop longer term plan to reduce vulnerability</td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>Coordinated Evacuation Plan</td>
<td>Town-wide</td>
<td>Town/State</td>
<td>Y</td>
<td>Reconfigure evacuation routes; Update signage along critical routes</td>
<td></td>
<td></td>
<td></td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Sheltering Facility (upgrades)</td>
<td>Town/Region</td>
<td>Town/State</td>
<td>Y</td>
<td>Conduct feasibility analysis for regional sheltering facility. Seek to construct over next 15 years.</td>
<td></td>
<td></td>
<td></td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Shelter Management Plan</td>
<td>Town-wide</td>
<td>Town</td>
<td>S</td>
<td>Review and update as needed on annual basis; More resources required (cots, shampoo, etc.)</td>
<td></td>
<td></td>
<td></td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td>Lower Household Expenses (flood insurance)</td>
<td>Town-wide</td>
<td>Town</td>
<td>S</td>
<td>Continue enrollment in FEMA Community Rating System (CRS); Reduced number flood insurance rate payers through volunteer buyouts/relocation</td>
<td></td>
<td></td>
<td></td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td>Volunteer Fire Department</td>
<td>Town-wide</td>
<td>Town</td>
<td>S</td>
<td>Continue support (well equipped and experienced) to further strengthen services - volunteer outreach</td>
<td></td>
<td></td>
<td></td>
<td>Ongoing</td>
<td></td>
</tr>
</tbody>
</table>

### More examples of actions:
- Strengthen volunteer opportunities for residents
- Increase hazard awareness in high risk areas through education and outreach
- Foster a neighbor-helping-neighbor program across the community

### When prioritizing, consider factors such as:
- Funding availability and terms
- Agreement on outstanding impacts from recent hazard events
- Necessity for advancing longer-term outcomes
- Contribution towards meeting existing local and/or regional planning objectives

### Examples of urgency:
- A current regional sheltering and shared services agreement is an ongoing (O) action.
- A communication campaign on hazard impacts implemented in next six months is a short-term (S) action.
- Relocating affordable housing from high-hazard areas is a long-term (L) action.
Develop action items based on each categorized feature.
Public Listening Session

Opportunity to receive public feedback!

Return to your stakeholder map: who wasn't represented at your workshop?

How can you reduce or eliminate barriers that would prevent residents from attending?

Consider multiple points of engagement
Summary of Findings

https://www.mass.gov/info-details/municipal-vulnerability-preparedness-mvp-program-planning-reports
MVP Planning Grant: Municipal Role

120-200 Hours of Staff Match Time To:

- Select MVP Vendor and Core Team
- Plan and Host CRB Workshop
  - Stakeholder outreach
  - Data gathering
  - Logistics
- Conduct Follow-up Outreach
  - Public listening session
- Communicate with EEA
  - Progress and spending reports
  - Summary of Findings
  - Yearly progress report
MVP Planning Grants: Provider Role

Certified MVP Providers will work with municipal project manager to:

- Select Core Team
- Scope the project
- Gather data and community information
- Plan for and Facilitate CRB Workshop
  - Basemaps
  - Climate data
  - Existing Plans
  - Risk Matrix
- Communicate with EEA
MVP Planning Process: Variations
Regional Planning

• Take advantage of regional partnerships
• Towns/cities increase capacity by working together
• More voices and perspectives = comprehensive outcome

Expanded Scope

• Translational services or other targeted outreach
• Childcare services during meetings/workshops
• Additional listening sessions
MVP and Hazard Mitigation Integrated Plans

MVP

Assemble Core Team

Local Stakeholder Process

Identify Risks and Prioritize Actions

Future climate driven hazards

Mapping

Outreach

HMP

Include neighboring municipalities, local and regional agencies

Vulnerability Assessment ALL natural hazards, structure counts, development trends and loss estimates

Development of Hazard Maps

Emphasis on EJ and vulnerable populations
# Climate Data

NOAA Regional Climate Center


## Maximum 3-Day Mean Max Temperature

<table>
<thead>
<tr>
<th>Rank</th>
<th>Value</th>
<th>Ending Date</th>
<th>Missing Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100.7</td>
<td>2011-07-23</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>100.3</td>
<td>2010-07-07</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>99.3</td>
<td>1948-06-28</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>99.0</td>
<td>2011-07-22</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>98.3</td>
<td>2010-07-06</td>
<td>0</td>
</tr>
<tr>
<td>-</td>
<td>98.3</td>
<td>1948-08-27</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>98.0</td>
<td>2010-07-08</td>
<td>0</td>
</tr>
<tr>
<td>-</td>
<td>98.0</td>
<td>2006-08-03</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>97.7</td>
<td>2019-07-21</td>
<td>0</td>
</tr>
<tr>
<td>-</td>
<td>97.7</td>
<td>2012-07-18</td>
<td>0</td>
</tr>
</tbody>
</table>

Period of record: 1948-06-01 to 2020-01-07

## Daily Temperature Data – WESTFIELD BARNES MUNICIPAL AP, MA


- **Observed temperature range (2019)**
- **Normal temperature range**
- **Record Max**
- **Record Min**

Powered by ACIS
Climate Projections

ResilientMA.org Climate Data Grapher
Social Data

- Massachusetts Environmental Justice Mapper
- US Census Bureau / American FactFinder
- Massachusetts Environmental Public Health Tracking
- Regional Planning Agency (RPA)
What's Next?
MVP Action Grants
MVP Action Grant Project Types

- Vulnerability and Risk Assessment
- Community Outreach and Education
- Local Bylaws, Ordinances, Plans, and Other Management Measures
- Redesigns and Retrofits
- Nature-Based Flood Protection, Drought Mitigation, Water Quality, and Water Infiltration Techniques
- Nature-Based Infrastructure and Technology Solutions to Reduce Vulnerability to Extreme Heat and Poor Air Quality
- Nature-Based Solutions to Reduce Vulnerability to Other Climate Change Impacts
- Ecological Restoration and Habitat Management to Increase Resiliency
- Energy Resilience
- Chemical Safety
- Land Acquisition for Resilience
- Subsidized Low-Income Housing Resilience Strategies
- Mosquito Control Districts
Nature-Based Solutions

- Millbury
  Green infrastructure in downtown revitalization

- Concord
  Reforestation and municipal tree resilience

- Essex, Ipswich, Newbury (Regional)
  Sedimentation study

- Falmouth
  River restoration

- Oak Bluffs
  Beach nourishment

- Northampton
  Detaining, retaining, treating stormwater with green infrastructure

- Southwick
  Stream crossing replacement with upstream nature-based flood mitigation measures

- Southwick
  Stream crossing replacement with upstream nature-based flood mitigation measures

MVP Planning Grant/Designated Communities (2017-2019)

MVP Projects using Nature-Based Solutions

MVP Planning Grant/Designated Communities (2017-2019)

MVP Regional Designation
Projects that are NOT MVP-competitive:

- Maintenance
- Diesel generators
- Tree removal
- Emergency preparedness
- Hard infrastructure without core MVP components/priorities
Example Action Grant Projects
Nature-Based Flood Protection, Drought Prevention, Water Quality, and Water Infiltration Techniques

Utilizing green infrastructure like stormwater planters, bioretention bump outs, rain gardens, and other measures like porous pavers and pervious pavement to reduce heat island effects and stormwater runoff into the Blackstone River.
Example Action Grant Projects
Redesigns and Retrofits

Salisbury

Increasing the resilience of the neighborhood of Ring’s Island by *raising its access/egress roads* and by improving tidal flushing through *culvert replacements*.
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.
Example Action Grant Projects
Local Bylaws, Ordinances, Plans, and Other Management Measures

Boston

Developing its first ever resilient design guidelines for new buildings so that development in the future floodplain is prepared for at least three feet of sea level rise, the likely scenario by late century.
Municipal Vulnerability Preparedness Program Action Grant Projects

Find a summary of all FY18 action grant projects as well as detailed deliverables below.

FY18 MVP Action Grant Summary

To view more examples of MVP Acton Grant Projects: https://www.mass.gov/info-details/municipal-vulnerability-preparedness-program-action-grant-projects
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△ Office Locations
MVP Designated Communities
NEW MVP Planning Grant Recipients (FY19)
Regional Partnerships

Updated 12-16-2019
QUESTIONS ANSWERED HERE EVEN THE SILLY ONES