



# Municipal Vulnerability Preparedness Program and Nature Based Solutions June 9, 2020



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# Education



**SCHEDULE**

**THURSDAY, OCTOBER 23**

**6 am-6:45 am**  
Networking Breakfast with Exhibitors

**6:30 am-7:45 am**  
**CONCURRENT SESSIONS**



Impact of Emerging Technologies on Engineering Business

Paul Doherty, the digit group



Trends in Recruitment & Retention – the Next Generation of Engineers

Katy MacDonald, ExactSource; Christopher Staloch, Chartwell Capital Solutions



Climate-Smart Engineering Approaches to Disaster Risk

Stephen Long, The Nature Conservancy



Case Study – Infrastructure Funding and Other Innovations in Asset Management

Mike Baker, David Evans and Associates, Inc.



Addressing the Hidden Risks in Today's Design Contracts

Brian Stewart, Collins, Collins, Muir & Stewart; James Schwartz, Beazley; Rob Hughes, Ames & Gough

**7 am-8 am**

**“Wake Up” with ACEC/PAC:**  
Thank You for ACEC/PAC Major Donors  
By invitation only. RSVP required.  
More information on page 19.



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# Dam Safety



MASSACHUSETTS  
MUNICIPAL  
ASSOCIATION

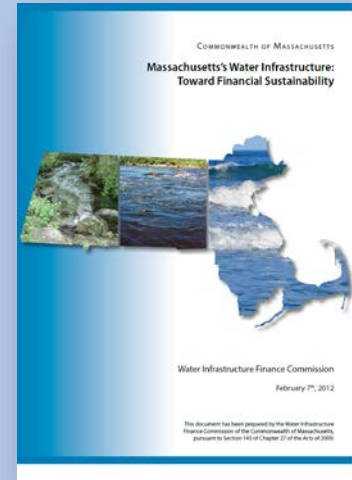


# Transportation Infrastructure





# Water Infrastructure



# Green Infrastructure Projects (MGL Ch 21, Sec 26A)

Wastewater systems

Water reuse

Low impact development

Conservation of natural landscape features that naturally filter and remove silt and pollution

Land acquisition and restoration

Mitigation of risks of flooding and erosion

*May be stand-alone and shall also be used to complement built water management infrastructure technologies such as pipes, dikes and treatment facilities.*



## Goals:

- Reduce the Commonwealth's vulnerability to the impacts of climate change.

## Who:

- business leaders, planners, engineers, architects, and energy and environmental organizations

## Strategy:

- Legislative: Funding and Policy
- Executive: Implementation
- Coalition: Growth
- Public Education & Outreach

## Messaging:

- Enhance Safety
- Avoid Costs
- Employ Nature-Based Solutions
- Advance Social Equity and Fairness

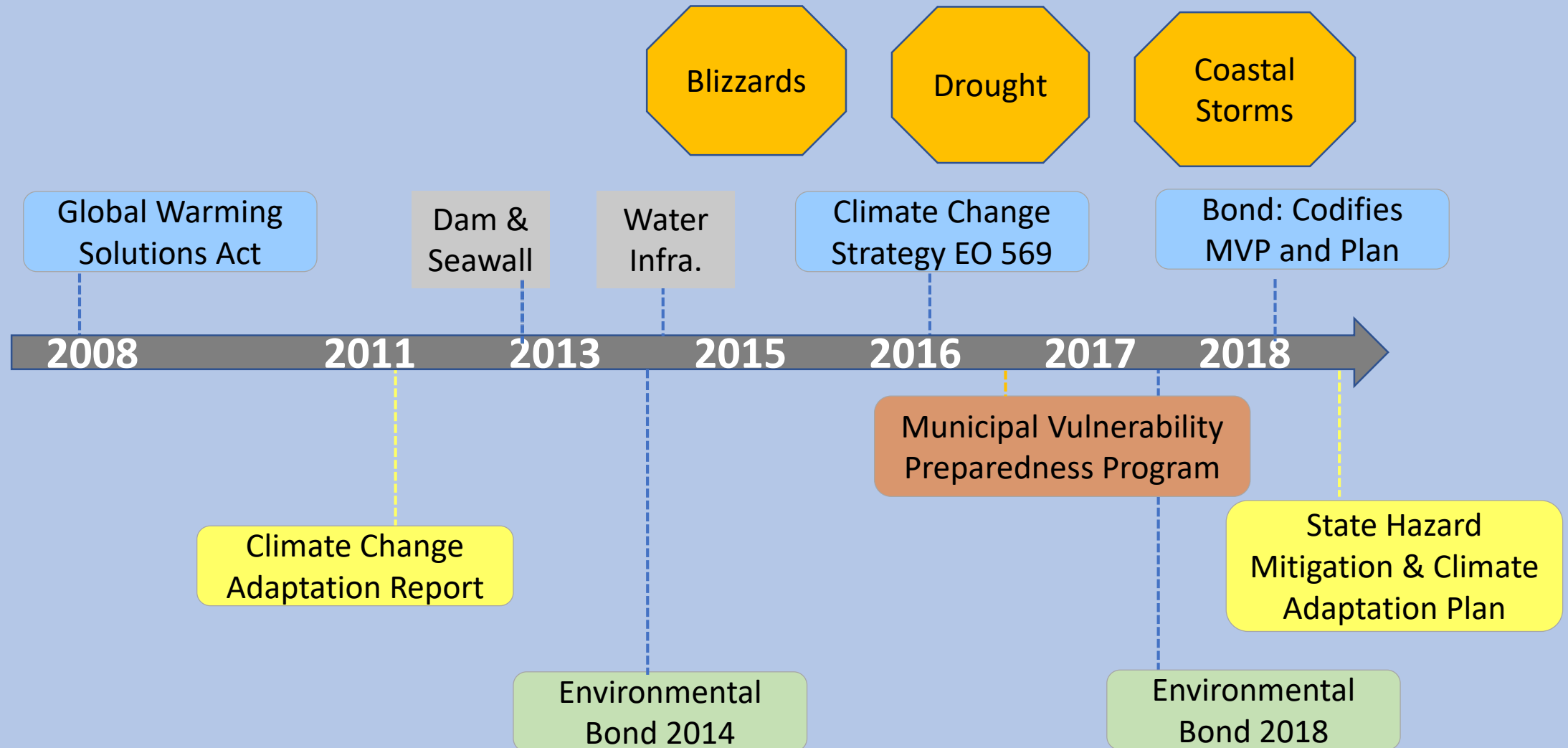
# Adaptation Outcomes

- Resilient MA Clearinghouse: Science & Data
- Statewide Integrated Hazard Mitigation and Climate Adaptation Plan
- Municipal Vulnerability Preparedness Program





# TNC and ACEC Collaboration AND Adaptation History



# Works in Progress

- Coastal Restoration/Living Shorelines: Five-State NOAA Project
- Greenworks Legislation: Municipal Loan and Grant Programs
- Natural Climate Solutions: Carbon Sequestration/Storage



# Attachment D: MVP Yearly Progress Report Template

## MUNICIPAL VULNERABILITY PREPAREDNESS PROGRAM FY 21

### MVP ACTION GRANT

### RFR ENV 21 MVP 02



## Executive Office of Energy and Environmental Affairs

### Municipal Vulnerability Preparedness Program Yearly Progress Report

**July 1, 2019-June 30, 2020 Reporting Period**

Date: Click here to enter text.

Municipality: Click here to enter text.

Local MVP Contact Name: Click here to enter text.

2. Has your Core Team reconvened since your Listening Session? If so, describe the process and any revisions or updates your team made to the original MVP Report. Please list your MVP Core Team members and note any new members.

<https://www.commbuys.com/bsa/external/bidDetail.sdo?bidId=BD-20-1042-ENV-ENV01-50652&parentUrl=activeBids>



# Nature-Based Solutions

Projects that **protect, restore, and/or manage** an existing ecological system or mimic natural processes to **protect public health** and **clean water**, to **increase natural hazard resilience**, and to **sequester carbon**.



**Protect**

**Restore**

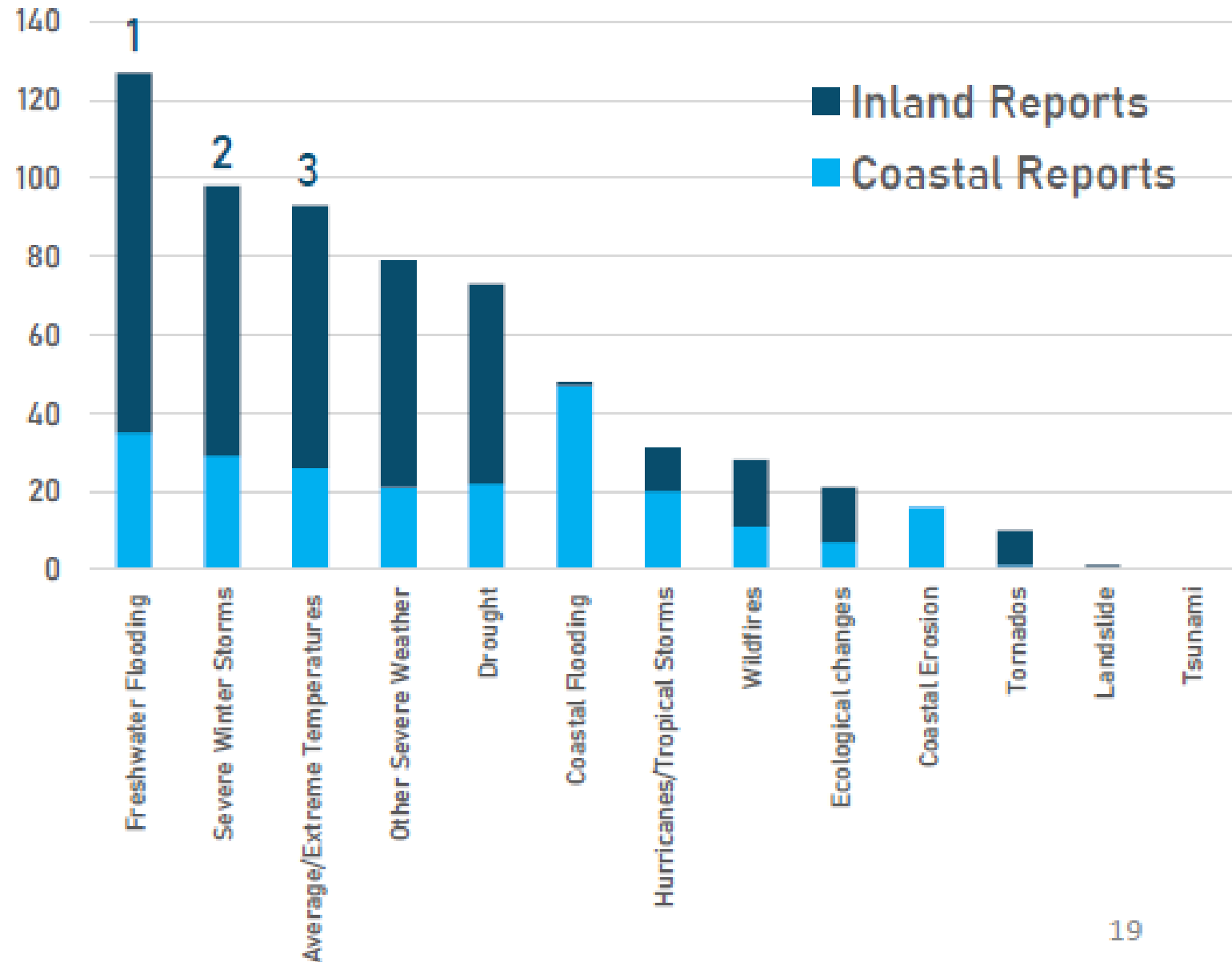
**Manage**



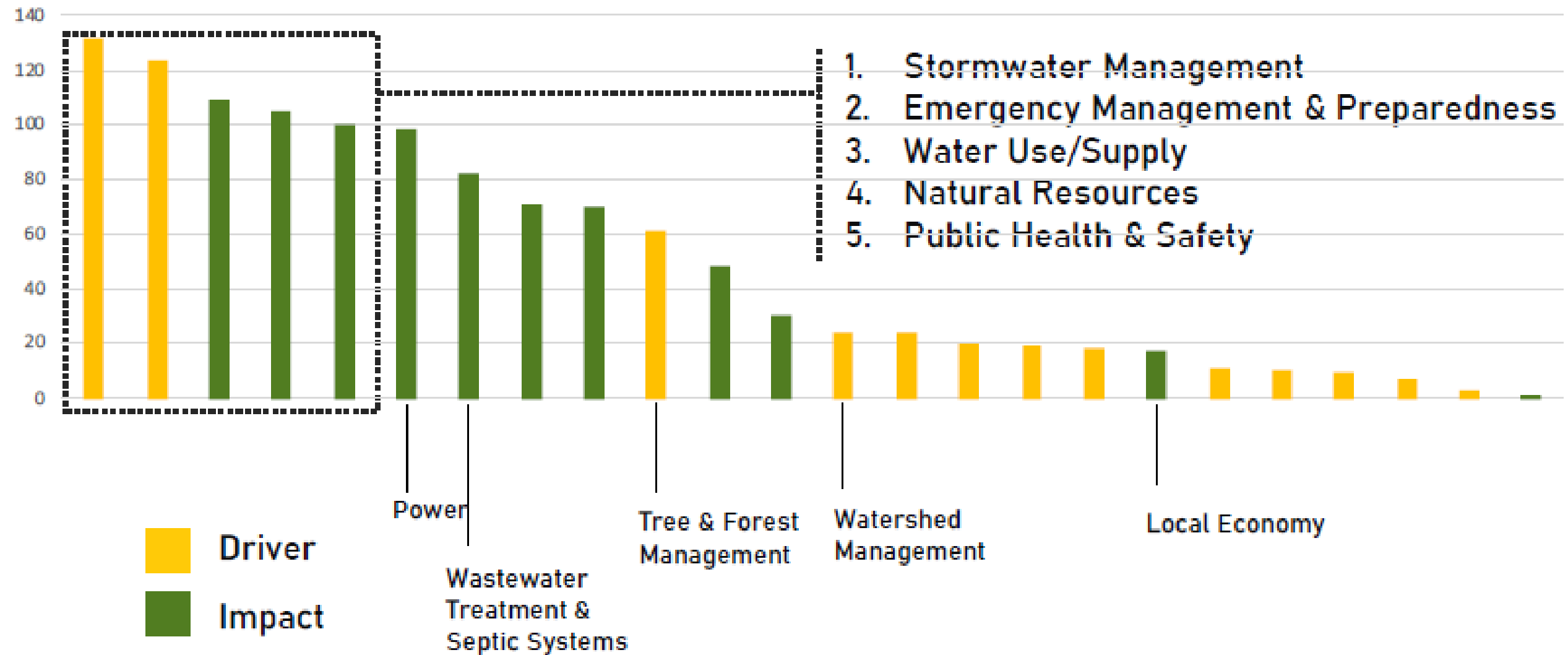


# Top Hazards

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

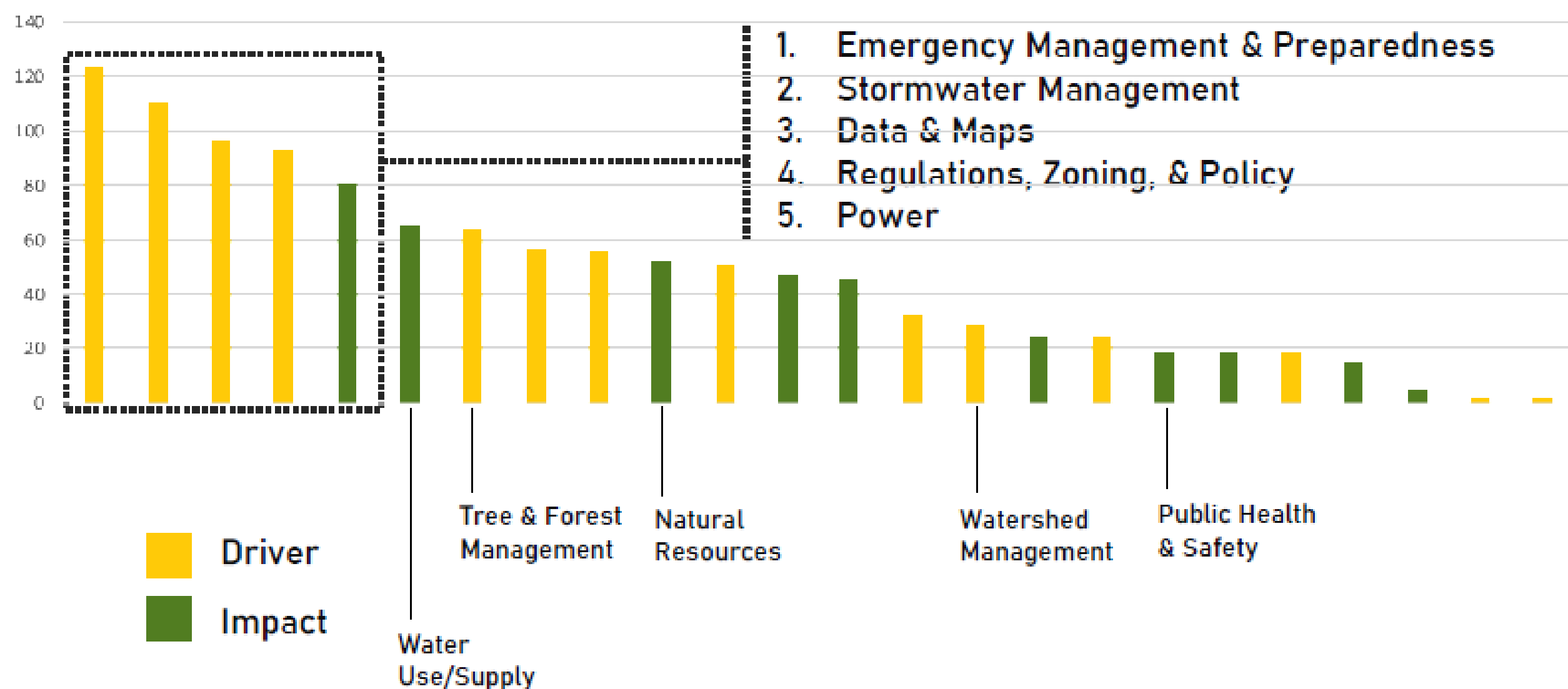


# Top Vulnerabilities

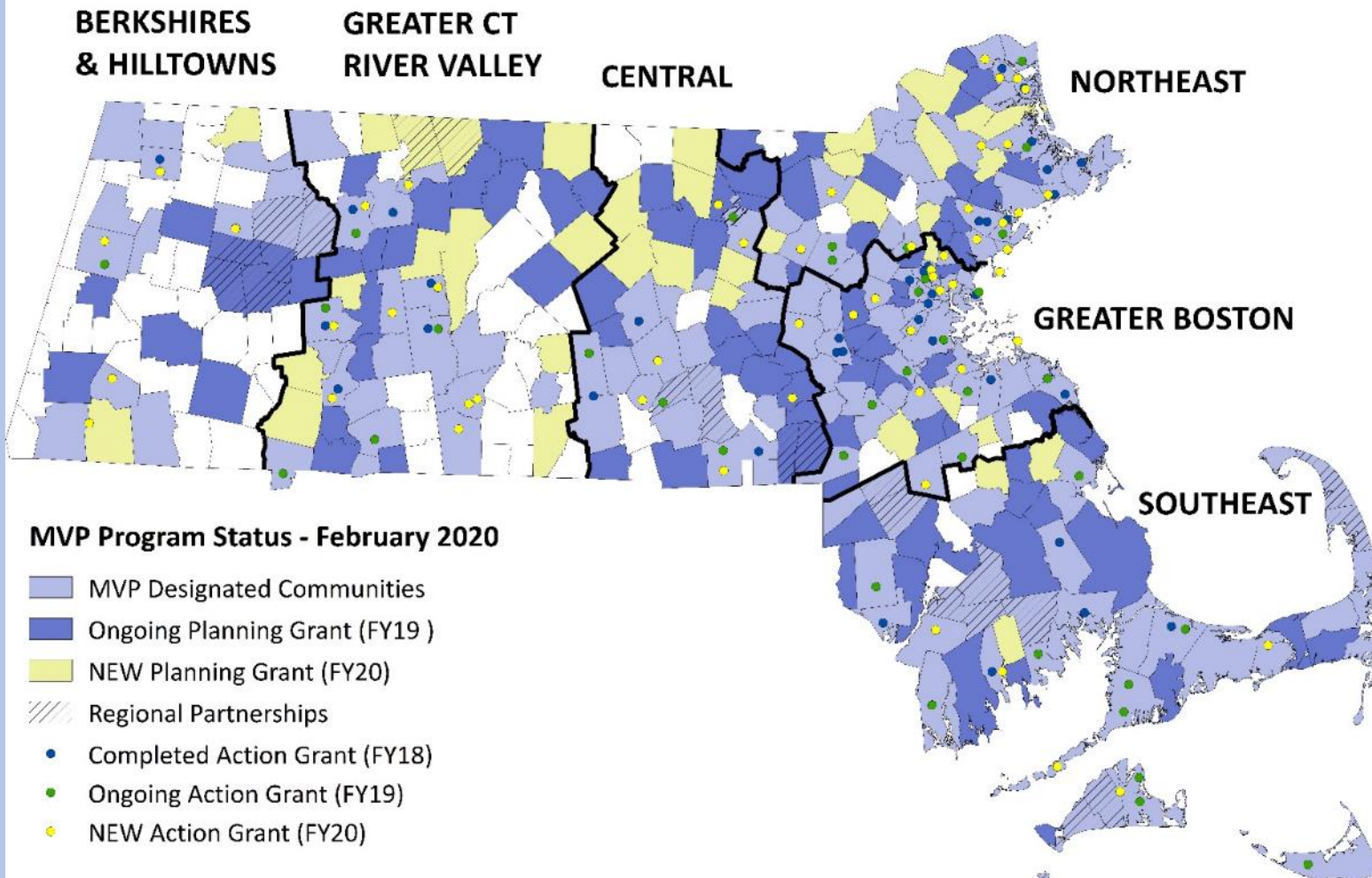




# Top Priority Actions



# Municipal Vulnerability Preparedness (MVP) Program



## Community Resilience Building Process:

- 82% of municipalities (287) enrolled in planning grant program as of Feb 5 2020.
- 54 NBS funded for \$16. million.
- 65 projects funded for \$14 million focused on hydrology or watershed management.

**Total Awards:**  
**\$28M+ to date**



# MVP CORE PRINCIPLES

1. Furthering a community identified priority action to **address climate change impacts**.
2. Utilizing **best available climate change data for a proactive solution**. Data from local-level climate change vulnerability studies may also be used.
3. Committing to **monitoring** project success and **maintaining** the project into the future.



*Essex Causeway/Main Street and businesses showing inundation from the Essex River.  
Photo credit: Abby Manzi, DeRosa Environmental*



# MVP CORE PRINCIPLES

## 4. Employing nature-based solutions.



With Permission: from *The Curious Garden*, by Peter Brown

### Why NBS?

Projects that **restore, protect, and/or manage** natural systems and/or mimic natural processes to address hazards like flooding, erosion, drought, and heat islands in ways that are **cost-effective, low maintenance, and multi-beneficial** for public health, safety, and well-being.

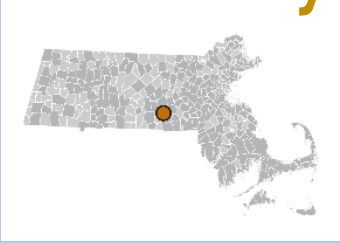
From - **Conserving Land** - to -  
**Restoration and green stormwater management** - And anything in between!



# Example Action Grant Projects

Nature-Based Flood Protection, Water Quality, and Water Infiltration Techniques

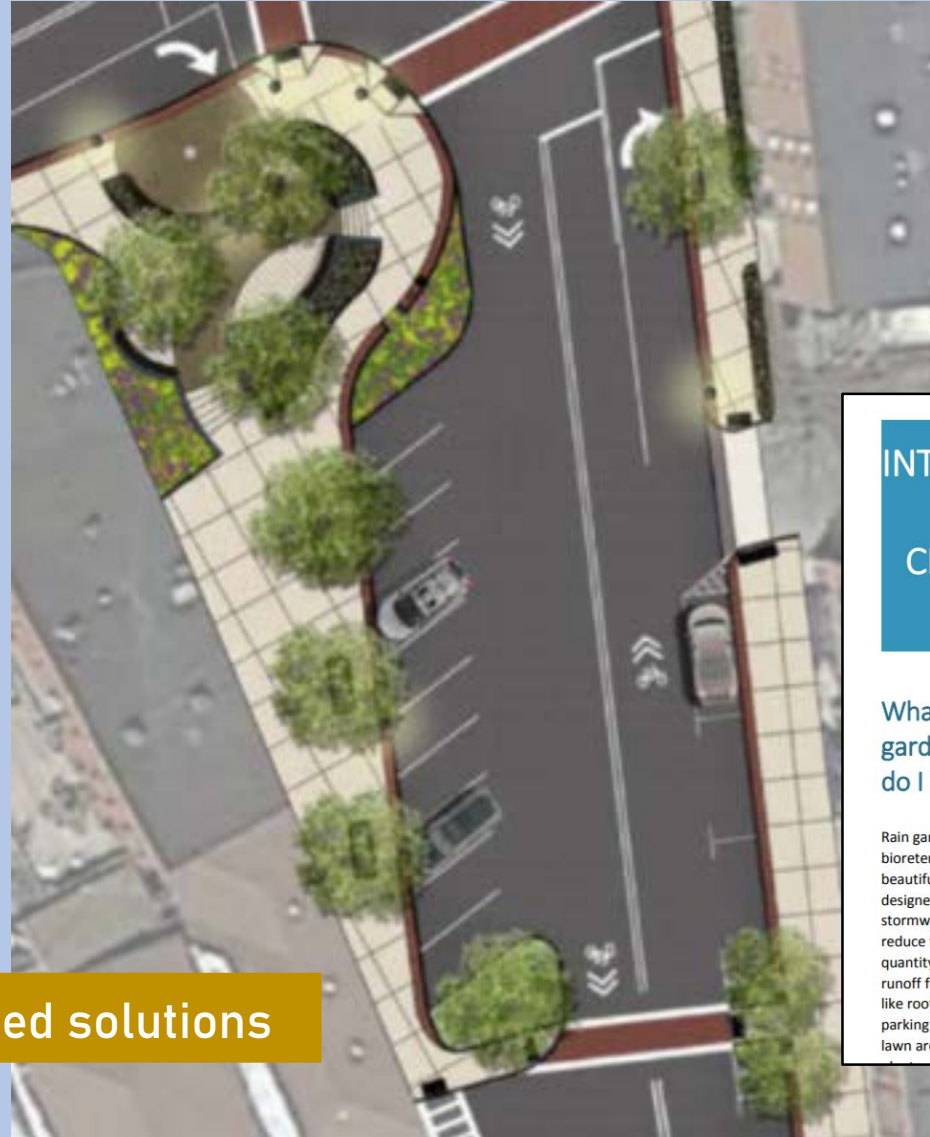
## Millbury



### Armory Village Green Infrastructure Project

FY19 Grant Award:  
\$1,000,000

Nature-based solutions



Designing **green infrastructure** to reduce heat island effects, improve water quality, and minimize the quantity of water impacting the Blackstone River.

INTERESTED IN DOING YOUR  
PART?  
CLEAN WATER CAN START  
WITH YOU

MILLBURY  
MASSACHUSETTS

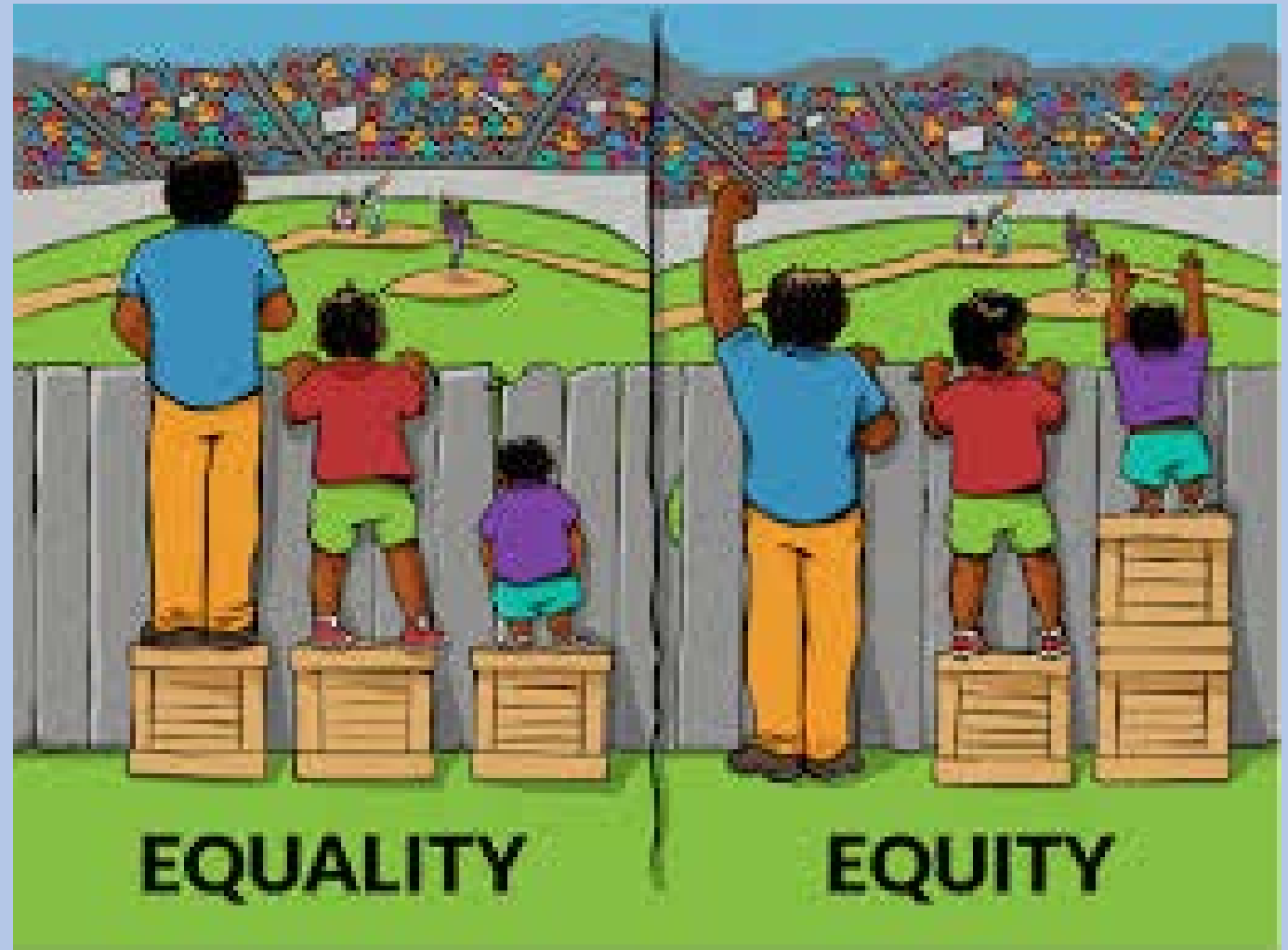
#### What is a rain garden and how do I build one?

Rain gardens, also called bioretention facilities, are beautiful landscaped areas designed to treat and infiltrate stormwater runoff. They reduce the flow rate, total quantity, and pollutant load of runoff from impervious areas like roofs, driveways, walkways, parking lots, and compacted lawn areas. Rain gardens rely on



# MVP CORE PRINCIPLES

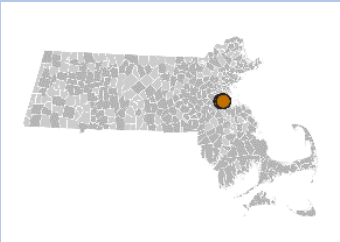
5. Achieving **broad** and multiple community benefits.
6. Involving Environmental Justice Populations in **meaningful decision-making**, as defined and outlined in the 2017 EEA EJ Policy, and giving special consideration to Climate Vulnerable Populations.



# Example Action Grant Projects

Redesigns and Retrofits

## Boston



Moakley Park - Resilience Preliminary Design, Technical Analysis, and Pre-Permitting

FY19 Grant Award:  
\$1,500,000

Nature-based solutions  
Community co-benefits



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.





# Population of top 10 counties for disasters: 81% minority

Thomas Frank, E&E News reporter • Published: Monday, June 8, 2020



## 10 counties most vulnerable to natural disasters and pandemics

County	Minority population
Brooks County, Texas	94%
Dimmit County, Texas	91%
Duval County, Texas	91%
Luna County, N.M.	70%
Zavala County, Texas	95%
Cibola County, N.M.	80%
Presidio County, Texas	86%
Imperial County, Calif.	89%
Evangeline Parish, La.	33%
Culberson County, Texas	76%

A New Orleans orphanage abandoned after Hurricane Katrina remains empty 15 years later. Communities of color are vulnerable to the effects of climate change.

Mediadrumimages/Abandoned Sout/Zuma Press/Newscom

[https://www.eenews.net/climatewire/2020/06/08/stories/1063347205?utm\\_medium=email&utm\\_source=eenews%3Aclimatewire&utm\\_campaign=edition%2Bz%2B%2FftFV%2B2LxUfHtN5bxJQ%3D%3D](https://www.eenews.net/climatewire/2020/06/08/stories/1063347205?utm_medium=email&utm_source=eenews%3Aclimatewire&utm_campaign=edition%2Bz%2B%2FftFV%2B2LxUfHtN5bxJQ%3D%3D)



# Impervious Surfaces in Holyoke

Why the City is looking at impervious surfaces and why they matter

City of Holyoke and Milone & MacBroom | May 22, 2020

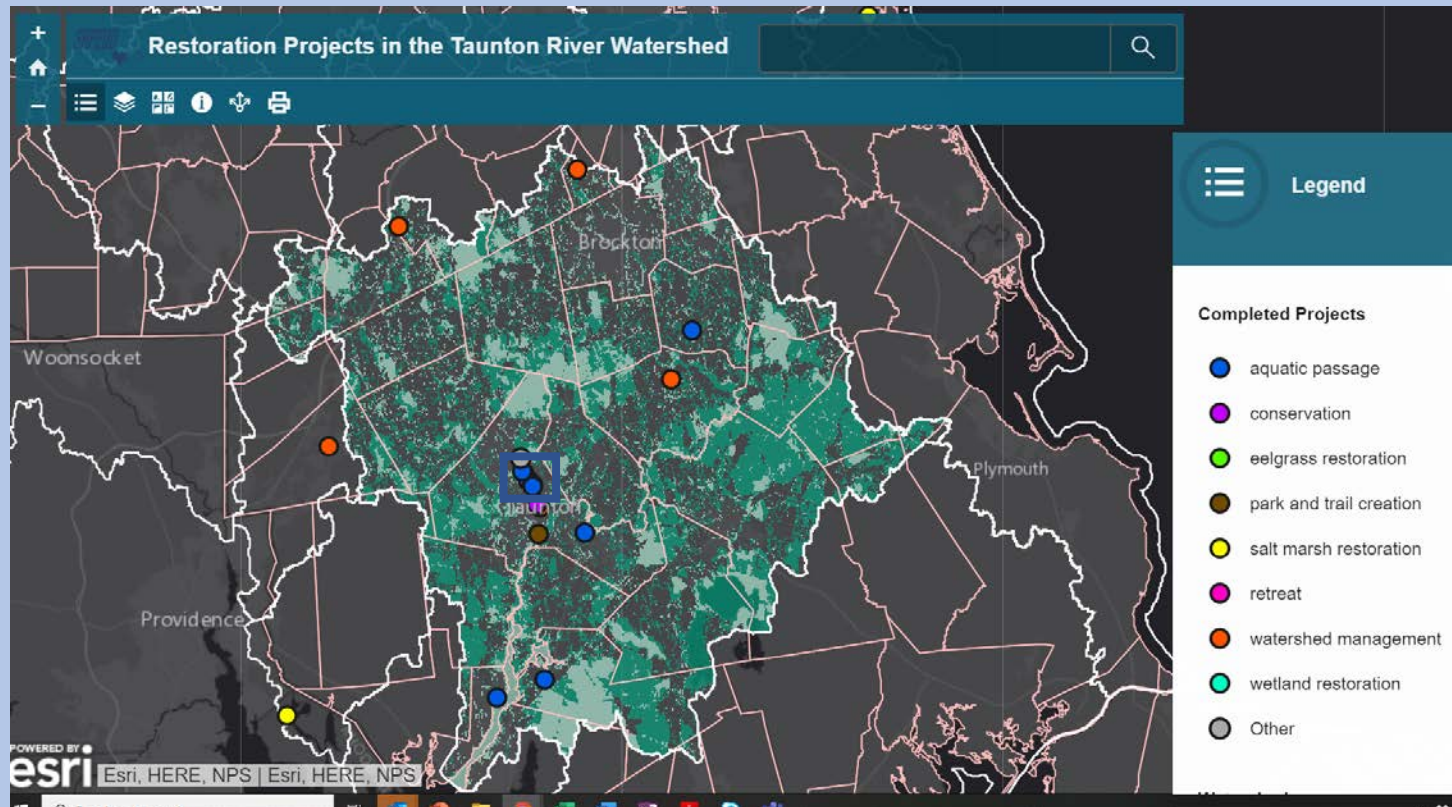


**Impervious Surface Mitigation Plan**



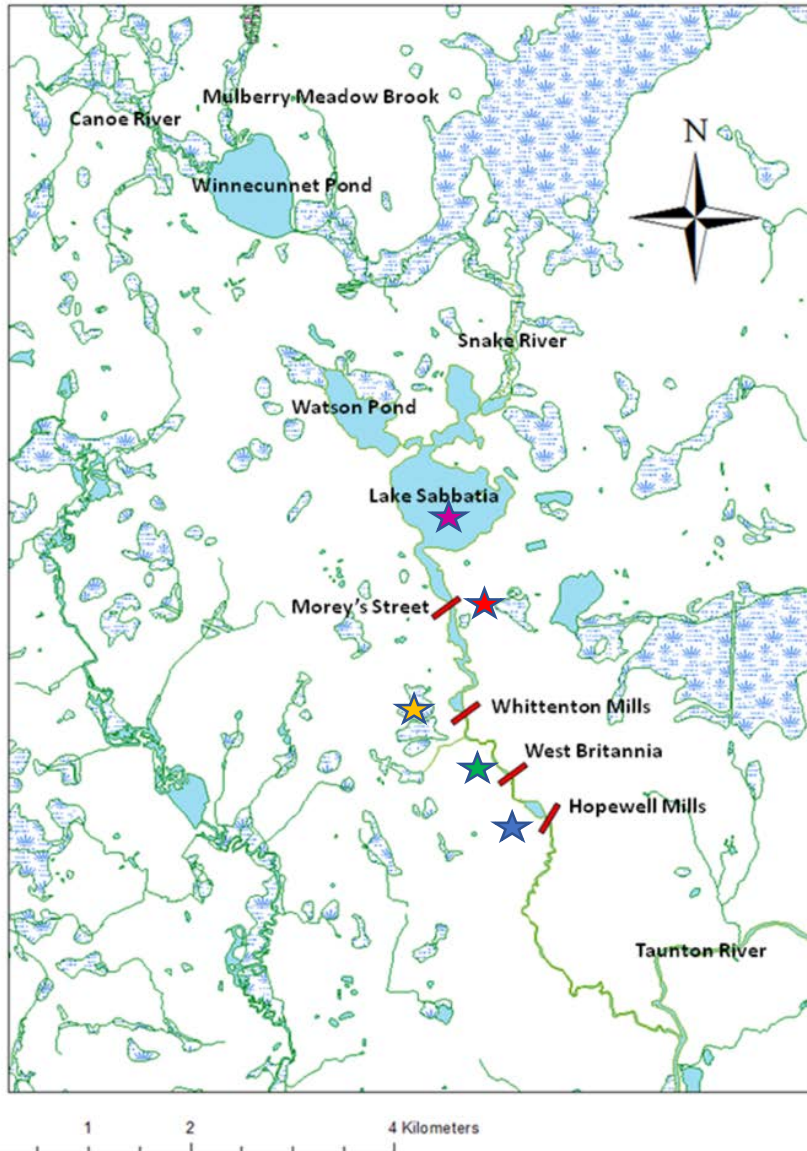
# MVP CORE PRINCIPLES

- Utilizing regional solutions toward **regional** benefit.
- Pursuing approaches from which other MVP communities and the state can **learn**.





# Mill River Restoration, South Eastern Massachusetts, USA



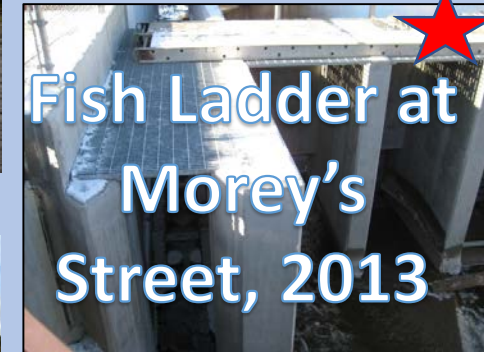
Dam, 2012



Dam, 2013



Dam, 2018





An aerial photograph of the Mackinac Island Bridge spanning Lake Michigan. The bridge features a long approach viaduct on the left, followed by a suspension span with two tall white towers, and then a series of trestle spans supported by numerous piers extending towards the right. The water is a deep blue, and the sky is filled with scattered white clouds. In the distance, the shoreline of Mackinac Island and the city of Mackinaw are visible.

# Thank You

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