

# Acushnet, MA

## Municipal Vulnerability Preparedness (MVP) and Community Resilience Building Workshop Summary of Findings

March 2021

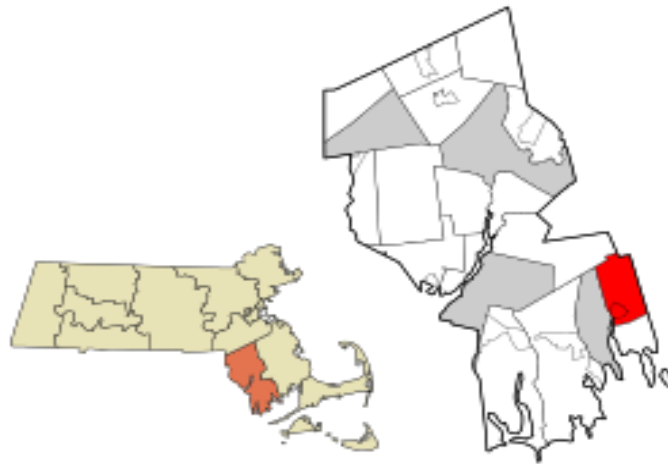


Submitted by:



## Overview

Originally an agricultural community embracing the headwaters of the Acushnet River, the residential town of Acushnet has retained its rural atmosphere, while also providing a home for various industries. Through the 1800s, the town was the site of water-powered factories and boat yards; in the 1990s, the town hosted construction, manufacturing and agriculture/aquaculture industries. It is the original home of the Titleist golf ball. Acushnet is a quiet, friendly community with a population of 10,607 people, with many miles of winding, country roads. Residents take great pride in the town's schools, openness, and feeling of family. Each Fall, during the well-known Apple/Peach Festival, Acushnet's growers, artisans, and Historical Society welcome visitors from far and wide.



Maps showing Acushnet in a regional context

Acushnet lies along the Acushnet River and its tributaries, including the Keene River and Squinn Brook, which feed the New Bedford Reservoir, which in turn feeds the Acushnet. The Acushnet River is the town line between Acushnet and New Bedford, south of Main Street. There are several other ponds in the town, including Hamlin's Mill Pond (along the Acushnet), East Pond, and a portion of Tinkham Pond, which lies along the Mattapoissett town line. The town lies within the coastal plain, mostly below 80 feet in elevation, with higher points around Mendon and Perry Hills in the southeast of town and in the Sassaquin area in the northwest corner of town, where the highest point in town rises 160 feet (49 m) above sea level. Most of the town's population lies along the New Bedford line, with the most populous area in the southwest corner of the town, near the town hall.

To help the town consider and prioritize actions to improve its climate resilience, the Town of Acushnet applied for and received a grant from the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) to become a Designated Municipal Vulnerability Preparedness (MVP) Community. Core members of the Resilient Taunton Watershed Network (RTWN) were tasked with developing and coordinating the Acushnet MVP workshops, specifically the Southeast Regional Planning and Economic Development

District (SRPEDD), who acted as Acushnet's MVP Provider. These planning workshops took place on two consecutive Fridays, March 12 and 19, 2021, conducted virtually, via Zoom, in compliance with Town and Agency protocol established in response to the COVID-19 pandemic.

Stakeholders from Acushnet were present as virtual workshop participants, including the Town Administrator and members of the Planning Board, Conservation Commission, Fire Department, Police Department, Building Department, the Department of Public Works, as well as citizens-at-large. Attendees identified critical features in Acushnet, visually through a map generated by an interactive Arc GIS mapping tool (Appendix A), and verbally, as documented on a corresponding matrix (Appendix B).

Each feature was related to hazards that the town is concerned about and participants determined whether a particular feature was considered a vulnerability or a strength in the face of these hazards. Each item listed on the matrix was numbered, and corresponded to a numbered dot placed on the virtual map. The meeting facilitator shared their screen in real-time, and placed dots in an editable ArcGIS online map as directed by town participants, recording supporting comments in the point attribute table. Three colors used on the map visually represented the different feature categories of infrastructural (red), environmental (green), and societal (blue).

Through facilitated discussion, workshop attendees:

- Defined top local natural and climate-related hazards of concern;
- Identified existing and future strengths and vulnerabilities;
- Developed prioritized actions for the community; and
- Identified immediate opportunities to collaboratively advance actions to increase resilience.

The four themes that emerged from the working groups were: (1) the need for **continued emergency planning**; (2) **aiding farmers in an effort to support local agriculture and stem the loss of local crops and farmland**; (3) assessing **detention basins and culverts**; and (4) assessing **cooling/heating station needs**.

An important takeaway from the workshops was the need for **public education** on multiple topics to ensure effective implementation of projects that were identified. Overall, good interdepartmental relationships within Acushnet was identified as a community strength and basis for successfully following up on this planning effort.

## Top Hazards and Vulnerable Areas

Participants discussed past hazards they have experienced and came to a consensus on the top four natural hazards to their community. Natural hazards were presented to the workshop participants as observable impacts of climate change. Hazards of highest concern included:

- Flood/Drought Cycle
- Heavy Precipitation
- Unique Weather Events (things such as tornadoes, winter hurricanes, waterspouts, and microbursts that have occurred within the past twenty-five years)
- Extreme Temperatures

**Flood/Drought Cycle** describes concerns about the trend toward increased volume of precipitation during fall and winter months, impacting the local river, stream, lake, and pond systems as well as built infrastructure. Even after a wet fall, winter, or spring, drought during summer months can limit available public water. Acushnet still has a significant agricultural community which is impacted by all of this, and by changes to the length, timing, and weather variability of the growing season. Increased precipitation causes infrastructure and water quality issues, while droughts threaten adequate availability. Both are intensified over time by climate change.

**Heavy Precipitation** addresses the infrastructure strain and public safety concerns related to large rain and snow events. Acute storms or rain events are bringing increasingly high volumes of precipitation over shorter periods of time, creating flood conditions. Aging dams and culverts struggle to manage large volumes of water and runoff from precipitation events. This flooding contributes to nitrogen loading to lakes, rivers, streams, and some public water resources as on-going non-point source pollution.

**Unique Weather Events** are a concern because trees frequently fall and limit road access for residents and emergency personnel. High wind also threatens existing power infrastructure, and though Acushnet's municipal power provider responds consistently to outages, the town would like to avoid future disruptions caused by tree fall. Townspeople also remembered the concentrated area of damage caused by a microburst and the impacts of recent winter hurricanes.

**Extreme Temperatures** refers to an increasing number of days over 90 degrees as well as cold snaps during winter and in early spring. This hazard relates somewhat to flood-drought cycle changes with distinct impacts to limited public water availability during droughts, damage to local farmland/crops as well as native habitat, the threat of fire/wildfire, and the strain on populations with limited access to seasonal heating/cooling locations during extreme cold and extreme heat.

## Categories of Concern and Current Challenges

Several locations and features in town were identified as important strengths, notable vulnerabilities, and some could be considered both a strength and a vulnerability. Infrastructure and resource disruptions are the outcomes about which MVP participants are most concerned.

Prioritization (high, medium, low) and time anticipated to address each concern is indicated in the digitized matrices (*Appendix C*). Groupings of concerns discussed at length by participants include:

### **Infrastructure: Dams, Bridges, Detention Basins, and Culverts throughout town**

Acushnet possesses a mix of updated and aging infrastructure. To ensure safe and optimal function of the various dams, bridges, detention basins, and culverts, the town must identify which features need updating through a comprehensive assessment. Dams were not a major issue according to workshop participants. Culverts and detention basins that attendees stressed as highly vulnerable to flooding and backup included: Culverts on Lake Street (New Bedford owned); Culvert near Driving Range (Meadowbrook Culvert); Mattapoissett Road Culvert; Leonard Street; Hamlin Street; Mendall Road; the sand filters between Slocum and Main Streets.

Aside from culverts, other infrastructure concerns related to flooding include:

- The Main Street retaining wall, adjacent to the Acushnet River, is a chronic concern in terms of structural integrity and potential impacts associated with failure.
- There is flooding issue on Hebert Road/Pond which has no drainage other than country drainage. It is also a dirt road, and not a road that the town maintains.
- The area near the Library, at 232 Middle Road, has a blind storm drain adjacent to a brook. Every couple of years it will get flooded. At these times, vehicular traffic must turn around or risk getting stuck in the waters. These events indicate that the drain may not be able to handle the volume of water in the heavy storms and requires evaluation.
- Diggles Curve, near the transmission lines area (444 Main Street), gets stormwater flows that run down from Perry's Hill. There are also wetlands in the area with multiple culverts.

As for Detention Basins: Archers Way needs attention; Blacksmith Drive; Reservoir Estates needs attention; Cheshire Ave. needs attention. In general, all town detention basins need mapping and assessment.

There is a need to improve GIS capabilities; this could help locate vulnerable populations for emergency response situations, and could also be used for locations of pump stations and other public utilities.

## **Environment: Local Water, Wastewater, and the Town's Network of Water Bodies and Wetlands**

One overarching goal that came out of the MVP sessions is to preserve the Acushnet River Valley for its ecological service and inherent ability to maintain and enhance community resilience to climate hazards like flooding and drought. Maintaining these lands can also serve a significant carbon storage function in town. Some of the key actions related to preservation and enhancement of green infrastructure systems include:

- Acquisition to secure open space necessary to increase/enhance local resilience and to protect local green infrastructure (wetlands, forests, waterways and water bodies, carbon critical soils) and the services that it provides.
- The Comprehensive Wastewater Management Plan needs funding so that sections of town that are in critical need may have access to sewer service, thus protecting natural waterbodies from septic-generated nutrient loading.
- The Town should look to secure land up in the Zone II Aquifer underlying the Robinson Road and Quaker Lane well.
- There is a need for a town-wide assessment of forestry holdings, with invasive vegetation taking over the native vegetation becoming noticeable in spots (Perkins Lane trees are being choked by poison ivy).
- The Lake Street Pond area needs a clean-up to address water quality issues and make it usable again. There is also some concern about the ongoing maintenance of the dam at the lower end of the pond.
- There is need for an overall assessment of the of the Acushnet River and the Acushnet River Valley to catalogue the resilience level of the area's natural systems. This inherent resilience could be further communicated to the public through a proposed Riverwalk be completed in order to be able to enjoy the beauty of the Acushnet River and the area. This could also help people become more environmentally aware of the stewardship needs of the river.

## **Society: Resident Safety from Hazards**

Much of the MVP social resilience discussion was centered around public health and combating the primary and secondary impacts of climate change that pose a physical danger to residents. Heat is a major concern. As with many New England towns that were built in an era where this area did not necessarily require air conditioning in summer, older homes were not built equipped with central air conditioning. Residents many need to seek shelter during heat waves if they do not have AC in their residence.

The Council on Aging (COA) does have air conditioning (AC), and a fleet of vehicles available to get people to heating/cooling stations as needed. The COA is a resource that

can be utilized for its programming, availability, and can function as a cooling shelter, when necessary, as well. Cooling shelters are particularly critical to residents who cannot acquire a cooling system at home, and for aging residents whose health can be quickly impacted by extreme heat.

Workshop participants believed that pets were not allowed within the shelter at the COA. The fact that animal caretakers are not able to shelter with their pets will be an important issue to address. Ensuring that pet owners will not fail to seek shelter if pets are not welcome could put emergency personnel and first responders at risk if they have to return to areas from which people refused to evacuate. The need for establishing a network capable of sheltering livestock in an agricultural community is also an important topic of discussion.

Cooling/AC is also needed for schools in town so that they can be used as cooling shelters when necessary. Schools have AC only in specific areas, such as the main and administrative offices. Long term planning is needed to better prepare school buildings and enhance their utility for future events such as hurricanes.

Participants also expressed a need for additional technical assistance (County, state, non-profit) to address the growing problem of vector borne disease.

## **Current Strengths and Assets**

Acushnet is well acquainted with the many strengths it leverages to manage the risks that natural hazards pose. Bolstering and further supporting existing assets into the future will build local resilience and increase local capacity to address vulnerabilities. The following list of local strengths were brought up in the workshop discussions as assets that will help Acushnet adapt to the impacts of a severe flood/drought cycle, unique weather events, strong storms, and extreme temperatures:

### **Infrastructural Strengths**

- The Slocum Street bridge over the Acushnet River. (The bridge looks good now, but want to keep an eye on it; is state inspected every year.)
- The Robinson Road Culvert. (DOT recently replaced it.)
- Eversource does annual tree trimming, and the company has a very good relationship with the town.
- Most of the town has town water service.
- All municipal buildings have new generators.
- The town has a new Comprehensive Wastewater Management Plan (funding is currently needed to address priority areas).
- The town has strong working relationships with neighboring communities.

## **Environmental Strengths**

- Decades of ongoing land protection work has been done to preserve water quality in the Mattapoisett River Valley Aquifer.
- Acushnet has retained a good amount of conservation/open land.
- Open land at the end of Weldon Road, Quaker Wells, Perkins Way, Lanterns Lane, Nestles Lane, Kelleher Conservation Areas, Acushnet River Conservation, Hathaway Forest, Town Forest, and areas near the quarry support environmental resilience.
- Retention of agricultural land is on-going (although some land has been lost to solar development, retirement, and crop reduction).
- Community volunteerism to the agricultural community by certain individuals was cited as a strength. (Whereas the loss of Cooperative Extension Services to the County, several years ago, was cited as a loss to the agricultural community).
- The partnership with the Buzzards Bay Coalition helps to maintain open space / conservation properties.
- Work with UMass Amherst bestowed pollinator certifications on the specific pollinator fields.
- Work with neighboring communities (Freetown, Rochester, Fairhaven) to solve flooding issues is on-going.
- There is community consciousness of environmental assets and the benefits of conservation.

## **Societal Strengths**

- The Town has made provisions for emergency shelters for vulnerable populations and for transport to these shelters during emergencies. The Fire Chief and the Council on Aging have made great efforts at providing these services.
- Despite the fact that a river separates the town, there is at least one ambulance on each side of the river in order to keep emergency response times down.
- Emergency Planning, and access to emergency personnel, is seen as a huge strength; they are always around town and available to help the residents.
- Police presence is strong and positive within the town.
- Eversource, the local electricity provider, is also seen as a strength and a valuable partner. An example was cited when Eversource made plans to provide the town with cots and blankets for short-term care within the schools during emergencies.
- Most of the town has town water service.



- The town has a Comprehensive Wastewater Management Plan (funding is currently needed to address priority areas) and is looking at a sewer expansion.
- The town has done very well repurposing existing buildings. Good craftsmanship went into building town facilities. There are some buildings in town that could pick up the slack if something were to happen to another facility.
- There are partners who are willing to help with stewardship, and people who are willing to donate land or allow their land to be used by the public in and around the Acushnet River Valley.
- The Life Stream Supportive Care Facility. It is serviced by water and sewer from New Bedford, and has good access from either New Bedford or Acushnet in case of emergency.
- The Residential Living Facility on Garfield Street, a living facility for people with disabilities, is well-maintained by the Housing Authority and the state. The employees-to-residents ratio is great, and it has wonderful access for emergency response.
- The Group Home at 205 Perry Hill Road provides social supports.

A complete list of strengths and assets can be found in *Appendix C* in the digitized feature matrices.

## Top Recommendations to Improve Resilience

Two days of discussion yielded several thematic priorities that workshop participants agreed were needed in order to improve Acushnet’s resilience. Proposed actions were generated and related to the list of strengths and vulnerabilities, after which the group identified their top three actions to the facilitator. Facilitators then led a discussion with all attendees in an effort to best incorporate the group’s suggestions into common themes.

Participants were encouraged to consider action items that mitigated hazards through strengthening natural systems and processes, to complement technological or built fixes. An action that limits damage from natural hazards through conserving existing lands, integrating benefits of nature where they are critically needed (e.g. flood storage, air quality improvements) into ongoing construction, or restores an ecosystem where it has been disrupted, is referred to as a **Nature-Based Solution**. Nature-Based Solutions (NBS) are a category of emerging strategies in climate adaptation and their exploration is of interest to the Commonwealth of Massachusetts as a national leader in comprehensive hazard mitigation. Effectively implementing NBS requires community planning to integrate built infrastructure and the natural environment in mutually reinforcing ways.

Ultimately the group identified and prioritized (High, Medium, or Low), specific vulnerabilities that need to be addressed through many incremental short-term, long-term, and ongoing actions. These are also presented in the matrices in Appendix C:

## Top Ranked Priorities

### Infrastructural

1. Main Street Retaining Wall
  - 1a. Mendall Road Flooding (additional, equally ranked)
  - 1b. Implement the town's Comprehensive Wastewater Management Plan (additional, equally ranked)

### Environmental

1. Climate Related Crop Loss
  - 1a. Assessment of Detention Ponds (additional, equally ranked)

### Societal

1. Technical assistance addressing vector-borne diseases
  - 1a. Cooling at the schools (additional, equally ranked)

## Additional High Priority Actions

Participants felt strongly about the inclusion of certain high priority projects in each category (Infrastructural, Environmental, and Societal), and voted to add a "1a." priority project to each category. Two of these additional high priority sites were flagged for their strategic management needs, specifically, Mendall Road for its flooding problems, and the need for a town-wide mapping and assessment of town-owned detention ponds. Mendall Road has been a chronic problem in need of mitigation, and the detention ponds, if in total disrepair, could lead to local flooding, spread of invasives, or mosquito problems. Outreach and education around vector-borne diseases carried by ticks and mosquitos are another priority for Acushnet, and is something that can be folded into the detention pond project.

Participants also felt strongly about the need to address the AC needs throughout the schools in order to provide a more comfortable learning environment as well as to increase the utility of these buildings in high heat/emergency situations.

## High Priority Actions Identified Through the Listening Session

In addition to the working group's addition of the "1a." items listed above, comments received after the Listening Session, conducted on 6/30/21, focused primarily on the wastewater infrastructure. While commenters agreed that the existing wastewater infrastructure (having portions of the town sewerred) was currently a strength, they also pointed out that it is aging, in need of expansion in some areas to mitigate nitrate pollution, and that parts of it will soon be in need of repair/replacement. They also reiterated the need to fund the priority recommendations associated with the town's Comprehensive Wastewater Management Plan. Addressing these issues should be a priority action for the town to address sooner, rather than later, and thus is reflected in the priority action list as category "1b."

## CRB Workshop Participants

<u>Name</u>	<u>Affiliation</u>
Call-in participant	General Public
Call-in participant	General Public
Call-in participant	General Public
Henry Young**	Acushnet Planning Dept.
Jim Marot*	Acushnet Building Dept.
Pam Labonte	Town Clerk
Kevin Gallagher*	Acushnet Fire Dept.
Merilee Kelly*	Conservation Agent
Kathy Silva	Department of Public Works - Highway
Christopher Richmond*	Acushnet Police Dept.
Julie Hebert*	Town Administrator

**\* = Core Team Member**

**\*\* = Core Team Meeting only**

## Citation

*Town of Acushnet (2021) Community Resilience Building Workshop Summary of Findings. Resilient Taunton Watershed Network. Acushnet, MA*

## Acknowledgements

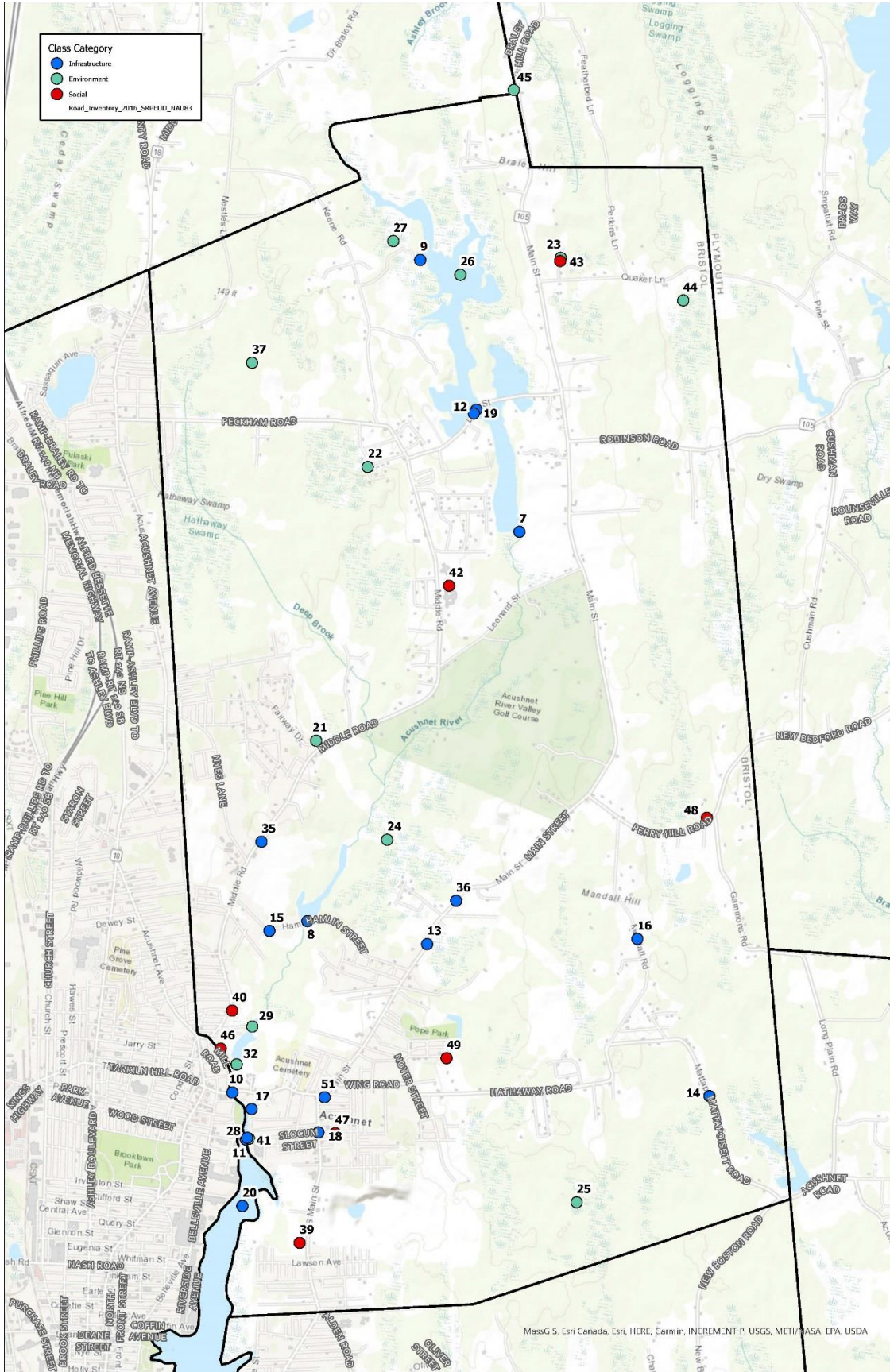
*The Acushnet Core Team and Facilitation Team would like to thank the following for their contributions to the MVP Workshop process: Acushnet Town staff; the Commonwealth of Massachusetts, EEA, Municipal Vulnerability Preparedness Program for their funding support for these workshops, and; all of those who participated in the workshops and contributed to the plan resulting from these workshops.*

# Appendices

## **Appendix A**

### **Map of Acushnet**

The following page contains a map of Acushnet with points of interest (POI) highlighted in different colors. During the workshop discussions, participants worked with SRPEDD facilitators to mark these POI on a map to show the spatial distribution of features that are listed on each of the CRB matrices (shown in *Appendix B*). Points marked with red dots indicate infrastructural features, green indicates environmental, and blue indicates societal. POI from both working group sessions are combined on one map.



## **Appendix B**

*These tables below represent the matrices developed in conjunction with the interactive GIS Map in Appendix A, and are reformatted for convenient data entry. Features are characterized as a vulnerability (V), strength (S), or both (V/S).*

Digitized Feature Matrices

<u>Action ID</u> <u>from GIS</u> <u>(no</u> <u>order)</u>	<u>Features</u>	<u>Location</u>	<u>Ownership</u>	<u>V or S</u>	<u>Flooding</u>	<u>Drought +</u> <u>High</u> <u>Temps</u>	<u>Storms +</u> <u>Wind</u>	<u>Vector</u> <u>Borne</u> <u>Disease</u>	<u>Priority</u>	<u>Time</u>
<b><u>Infrastructural</u></b>									<u>HML</u> (high, med, low)	<u>SLO</u> (short, long, ongoing)
7	The Lake Street Dam	On Lake Street over the New Bedford Reservoir	City of New Bedford	V/S	No acute issues, but worth starting a conversation with NB about the dam.				M	O
8	Hamlin Street Bridge	101 Hamlin St Acushnet, MA	Town	V/S	Bridge in poor shape but State is working on replacement and widening by 2022 / V for now S once fixed				H	S
9	Hebert Street Flooding	Hebert Rd, Acushnet, MA 02743	Private	V	Floods during excessive storm events				M	O
10	Main Street Retaining Wall	reet, Achus	Private	V	Retaining wall in danger of collapse				H	S
11	Slocum Street Bridge	1 Slocum Street, Achusnet, MA	Town	S	Dot placed for awareness / potentially jointly owned with new bedford				L	O
12	Lake Street Culvert		Town	V	culvert never exposed, hard to assess				M	L
13	Meadowbrook Culvert		Town	V	Needs Assessment				M	O
14	Mattapoisett Rd Culvert		Town	V	Needs assessment				M	O
15	Hamlin St Icing/Flooding	Hamlin Street, Achusnet, MA		V	Lack of drainage / plan exists in town but not funded				H	O
16	Mendall Rd Flooding	Mendall Road, Achusnet, MA	Town	V	flooding, frequent calls here / plan exists without funding				H	O
17	Stormwater Sand Filter Plan			S	Implement stormwater plan from Horsley Witten				H	S
18	Potential Sidewalk with Nature Based Solutions			S	Sidewalks in downtown area could be enhanced by NBS				M	O
19	Lake Street Icing/Flooding	Lake Street, Achusnet, MA		V	Road can ice / flood over				M	O



20	New Bedford Overflow Stormwater Strategy			V	New Bedford storm sewer water can affect water levels in river on Acushnet side, If NB Hurricane Barrier is closed, will that affect Acushnet	H	L
35	Drainage and Flooding North of Library	N 232 Middle Road	Town	V	Roadway / town storm drain flooding - first responder access cut off / Drain well maintained, it's a capacity issue. Brook that crosses Middle Road.	H	S
36	Roadway Flooding Diggles Curve	362 - 444 Main Street	Town	V	Flooding during even relatively minor storm events in this stretch of the roadway / wetland areas surround - multiple culverts	H	S
41	Pump Stations / Water Sewer Infrastructure	Townwide	Town	V/S	The existing infrastructure is a strength - the town has some sewer areas and is tied into New Bedford. There is a program in place to change out water lines and most of town is already served by water. The town just completed 20 year Comprehensive Wastewater Master Plan. The vulnerability lies in the portions of the town that are unsewered. Expansion is needed to control nitrate pollution into the Acushnet River, but costs are high and there is a high social vulnerability to those that can access a hookup and those who do not have the financial resources to do so.	H	O
51	GIS Infrastructure / Increased Capabilities	Townwide (townhall base)	Town	V	Increase access to local GIS data - incredibly helpful in emergency planning, preparedness and response	H	O

Action ID from GIS (no order)	Features	Location	Ownership	V or S	Flooding	Drought +	Storms +	Vector	Priority	Time
						High Temps	Wind	Borne Disease		
<b>Environmental</b>									HML (high, med, low)	SLO (short, long, ongoing)
21	Detention Ponds	Town-wide		V		ponds can be overgrown and need cleaning / need to locate and assess detention ponds			H	S
22	Arches Way Detention Pond	Arches Way	Town	V		Holding for now, but a lot of vegetative growth. Needs to be cleaned and			M	S
23	Blacksmith Drive Detention Basin	2, Blacksmith Dr, Acushnet, MA 02743	Town	S		Model of a basin that was well-designed and easy to maintain.				
24	General Open Space Protection	Townwide	Varies	S		Real strength in working with partners, like the Buzzards Bay Coalition				
25	Town Forest Land Assessment	Townwide	Town	V		Need to walk these forests to determine health of trees, impacts of invasive species / Russian Olive / Poison Ivy Issues			M	S / O
26	Lake Street Pond	Lake Street	City of New Bedford (pond) / Acushnet (land surround)	S / V		Current committee working on making pond more usable - clean-ups, walks, access / Water quality is still a major issue - aquatic invasive growth / Will need on-going stewardship			H	S / O
27	Floodplain Development around Hebert Road	Near Hebert Road / Pond	Private	V		Look at how floodwater can be better handled here. Currently no drainage on dirt road aside from traditional "country drainage" / Pond-front neighborhood slowly growing.			L	O
28	Acushnet River Valley Riverwalk	Acushnet River Valley - Fairhaven / Sawmill to Reservoir	Varies	V / S		Riverwalk as opportunity for resilience or nature education / River, impact on the Bay, health impacts, and other environmental features. / Build off Sawmill Project / The health of the river itself and surrounding floodplain				L
29	Acushnet River Assessment	River	Varies	V / S						

32	Fairhaven Line to Sawmill Park Resilience Education River Corridor	Segment of Acushnet River Valley	Varies	V / S	<p>Titillist parking lots may become available for river access, and may be other private land owners who would be similarly willing (lends itself to high priority action now) / Coalition reclaimed bridge through Presidential Terrace across Main Street into Riverview park - planned riverwalk on both sides./ Restore wildlife and habitat in river valley / Protect floodplain areas - which are not static and will change with climate change</p>	H	S (next steps) / L (project completion) / O
37	Climate-Related Crop Loss impacts Local Food System	Farmland townwide	Private (land) / Town (in terms of Ag Comm)	V	<p>in recent years, there have been crop losses - different pests (disophia worms on raspberries for ex), intensity of sunlight and drought, deer / early spring with late front - wipes out blossoms year after year (apricots, for example) / having to adjust cultural planting practices in terms of varieties and planting or harvesting times / Bristol County Agricultural Extension - REACTIVATE!! Are there master gardeners in town? Volunteer network?</p>	H - town is agricultural in character	O
44	Mattapoisett River Valley Aquifer Zone II	along Rochester town line	Varies	V	<p>Work with partners and neighbors to purchase and protect aquifer land / Water supply area where you wouldn't want a lot of development and impervious surface</p>	M	O
45	Upstream Watershed Management	Northern Acushnet	Varies	V / S	<p>work with neighbors to analyze the headwaters of the reservoir</p>	M	O

<u>Action ID</u> <u>from GIS</u> <u>(no</u> <u>order)</u>	<u>Features</u>	<u>Location</u>	<u>Ownership</u>	<u>V or S</u>	<u>Flooding</u>	<u>Drought +</u> <u>High</u> <u>Temps</u>	<u>Storms +</u> <u>Wind</u>	<u>Vector</u> <u>Borne</u> <u>Disease</u>	<u>Priority</u>	<u>Time</u>
<b>Societal</b>									<u>HML</u> (high, med, low)	<u>SLO</u> (short, long, ongoing)
39	Council on Aging	59 S Main St, Acushnet, MA 02743	Town	S		Have fleet for getting senior population to heating stations / Overlap between COA and EMA leadership / New generator at COA - COA also has AC and can serve as a cooling station / Consider an option that is pet-friendly?				O
40	Police Response is a Strength	64 Middle Rd, Acushnet, MA 02743	Town	S		have rapid response and strong positive presence				O
42	Cooling for Schools	Middle Street	Town	V		Schools do not yet have AC - need for students as hot period extends into fall / long-term possibility for multi-use as emergency shelter (thinking of large hurricane events)		M		O
43	Vector Borne-Disease (Connection with Drainage Basins)	Townwide	Town	V		Keeping basins dry ties into limiting the impacts of mosquito breeding areas / Threat of mosquito diseases have closed down parks, library, COA programming - taking a social toll / / Additional technical assistance from the state		H		S / O
46	Lifestream Supportive Day Care Facility	70 Mill Rd, Acushnet, MA 02743	Private	S		Well resourced and run facility that would be served by either Acushnet or New Bedford in an emergency				O
47	Resident Living Facility	Garfield Street	Housing Authority / State Operated	S		good emergency response access				O
48	Group Home Facility (Lifestream as well)	Perry Hill Road	Private	S		good access to emergency response even further out from town center				O
49	Group Home Residence	Frank Street	Private (Lifestream)	S		No emergency access issues				O

# **Appendix C**

MVP Workshop Presentation Slides

# Acushnet MVP Planning Workshop



Resilient Taunton Watershed Network (RTWN)



**SRPEDD**

Southeastern Regional Planning  
& Economic Development District



manomet  
Seeking Solutions. Grounded Science.



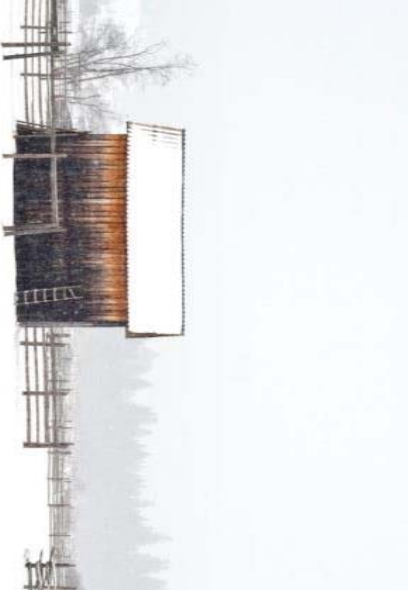
nature.org



Mass Audubon



# Municipal Vulnerability Preparedness (MVP)



State and local partnership to build resiliency to climate change



# Today's Agenda

**9:00 – 9:45** Welcome & Program Overview

**9:50 – 10:00** ID Top Priority Hazards Impacting Acushnet

**10:00 – 10:10** Break

**10:15 – 12:00** Small Group ID of Vulnerabilities and  
Strengths

**12:15 –** Report out from Groups and Wrap-up



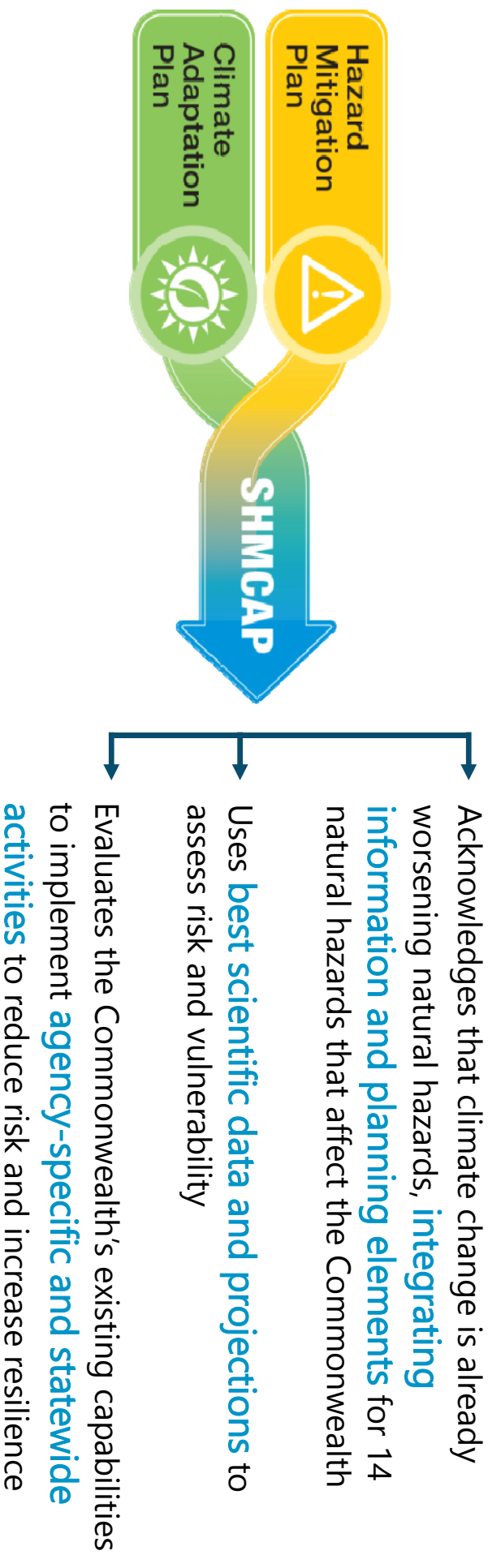
## **MVP approach is a fluid**

### **process that:**

- Is locally led and collaborative
- Accessible
- Utilizes partnerships
- Mainstreams climate change
- Informs local planning efforts and promotes local innovation
- Positions municipalities for funding opportunities in a coordinated statewide effort

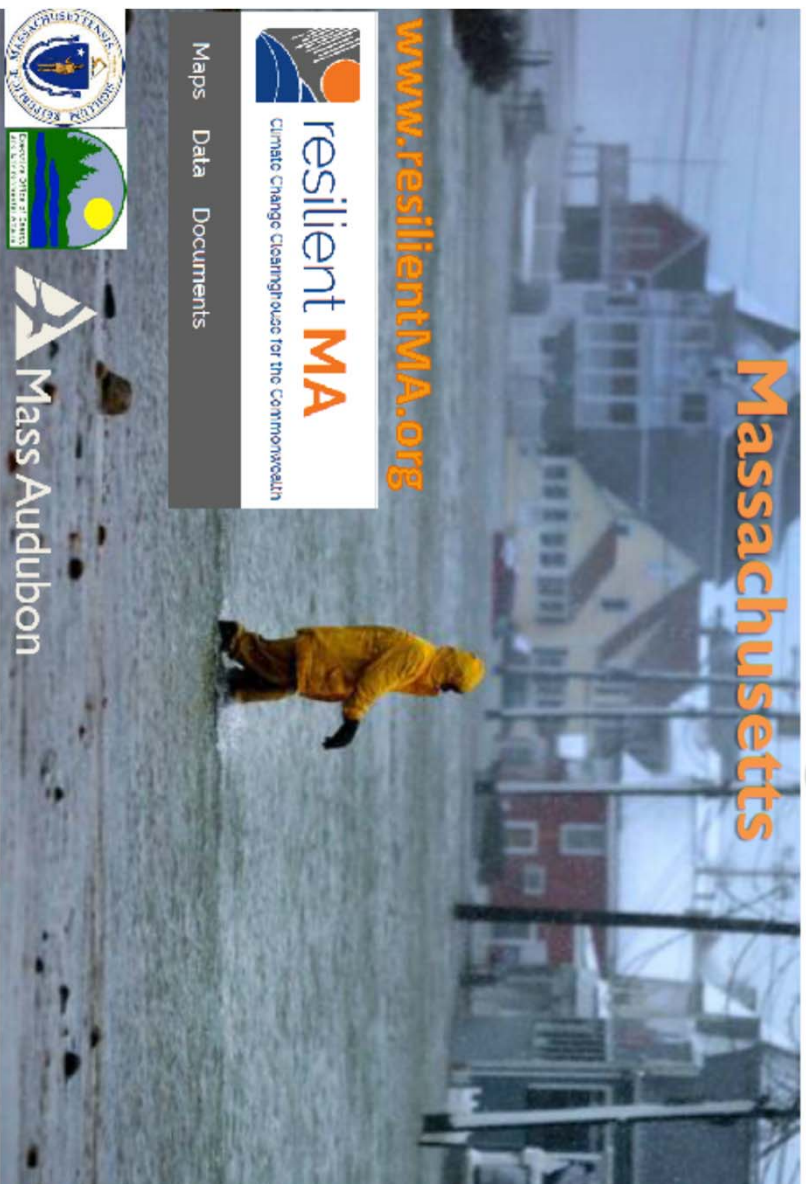


# Massachusetts State Hazard Mitigation and Climate Adaptation Plan (SHMCCAP) - September 2018



# Climate Change in

# Massachusetts



[www.resilientMA.org](http://www.resilientMA.org)



resilient **MA**

Climate Change Clearinghouse for the Commonwealth

Maps Data Documents

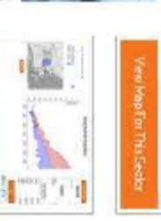


Mass Audubon

# Municipal Vulnerability Preparedness

The Resilient MA preparedness plan sets the foundation for the state's long-term resilience plan. It provides a framework for the state to build resilience and prepare for the future. The plan is based on the state's assessment of its vulnerability to climate change and the need to take action to reduce that vulnerability.

The plan is based on the state's assessment of its vulnerability to climate change and the need to take action to reduce that vulnerability. The plan is based on the state's assessment of its vulnerability to climate change and the need to take action to reduce that vulnerability.



View Map for This Sector

There are many ways to prepare for the future. The plan is based on the state's assessment of its vulnerability to climate change and the need to take action to reduce that vulnerability.

## Resources for MYF Communities

**My City at Vulnerability**  
29 municipalities are participating in the My City at Vulnerability program.

**Community Outreach - Building Knowledge**

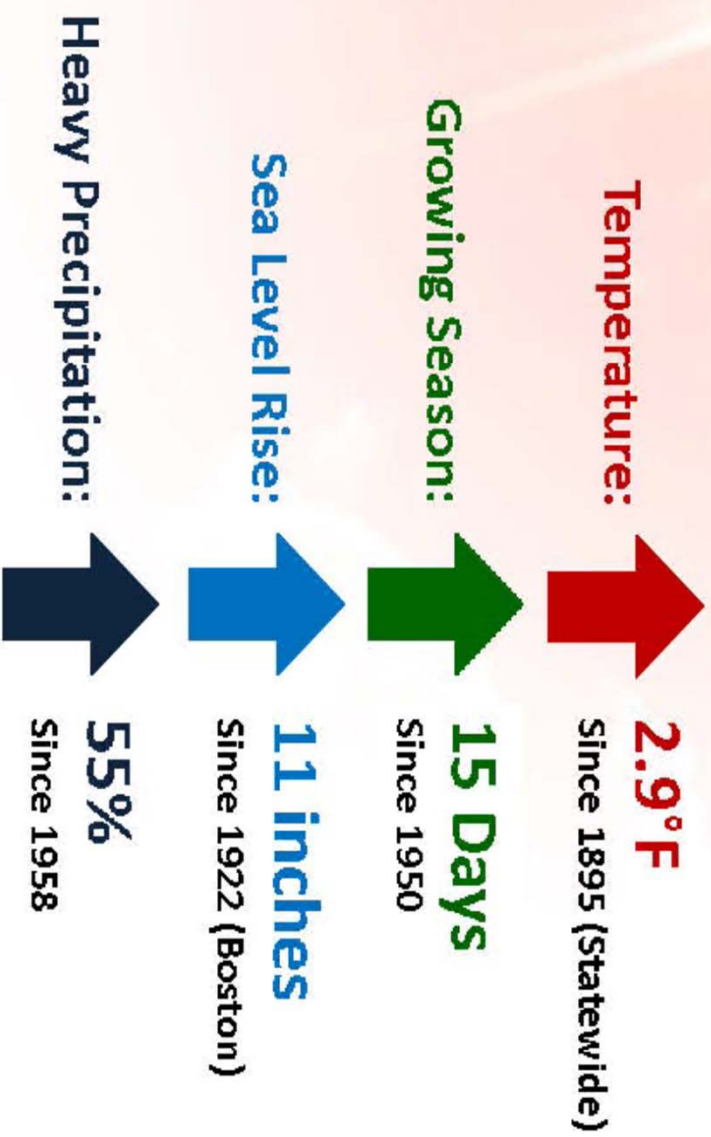
**Working Series - Meetings - Addressing My City at Vulnerability - A Specialized Program**

**Massachusetts Climate Change Resilience - Sustainable and for Major Damage Events**

**Massachusetts Municipal Vulnerability Preparedness (MVP) program resources**

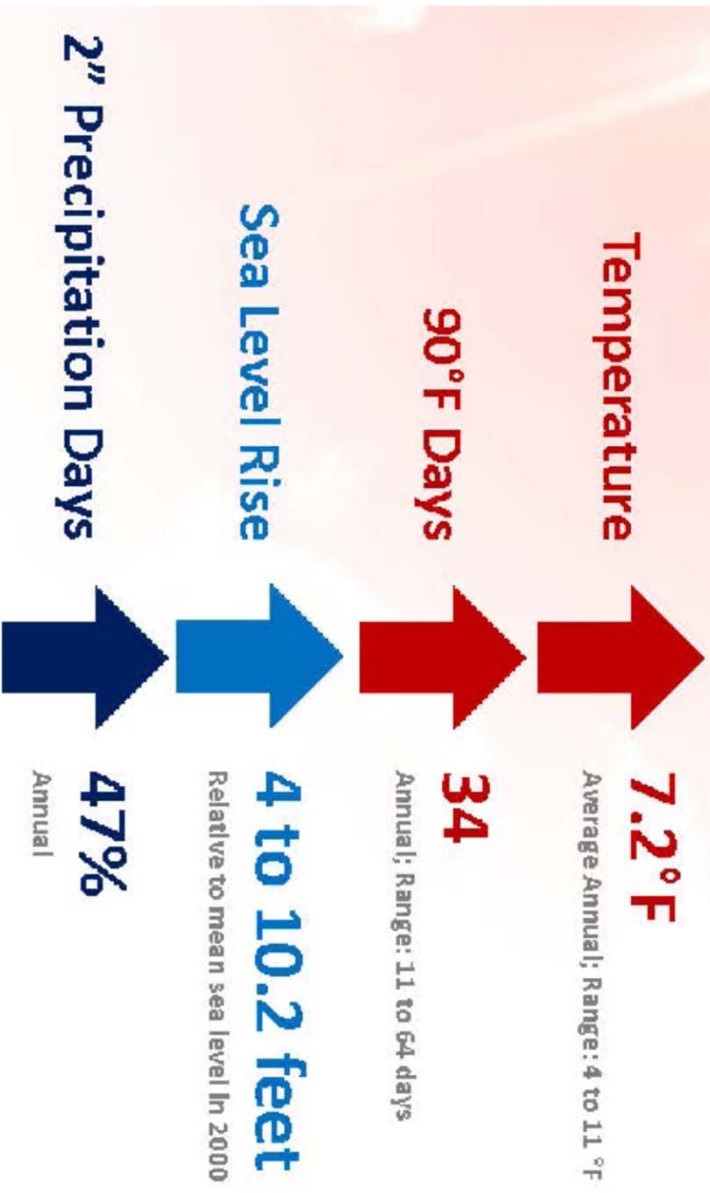
- Strongest Resilience
- How do I become an MVP community?
- Do you like to be an MVP community?
- Funding opportunities for MVP communities

# Massachusetts Observed Climate Changes



Source: Climate Science Special Report, 2017; NOAA NCEI nClimDiv; NOAA Ocean Service

# Massachusetts Climate Changes Projected by the 2090s



Source: Northeast Climate Adaptation Science Center

# Changing Energy Use and Demand

## More Warm Winter Days, Less Heating Demand

(based on annual Heating Degree-Days, base 65)



**26.2%**

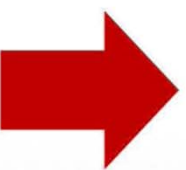
by the 2090s

**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

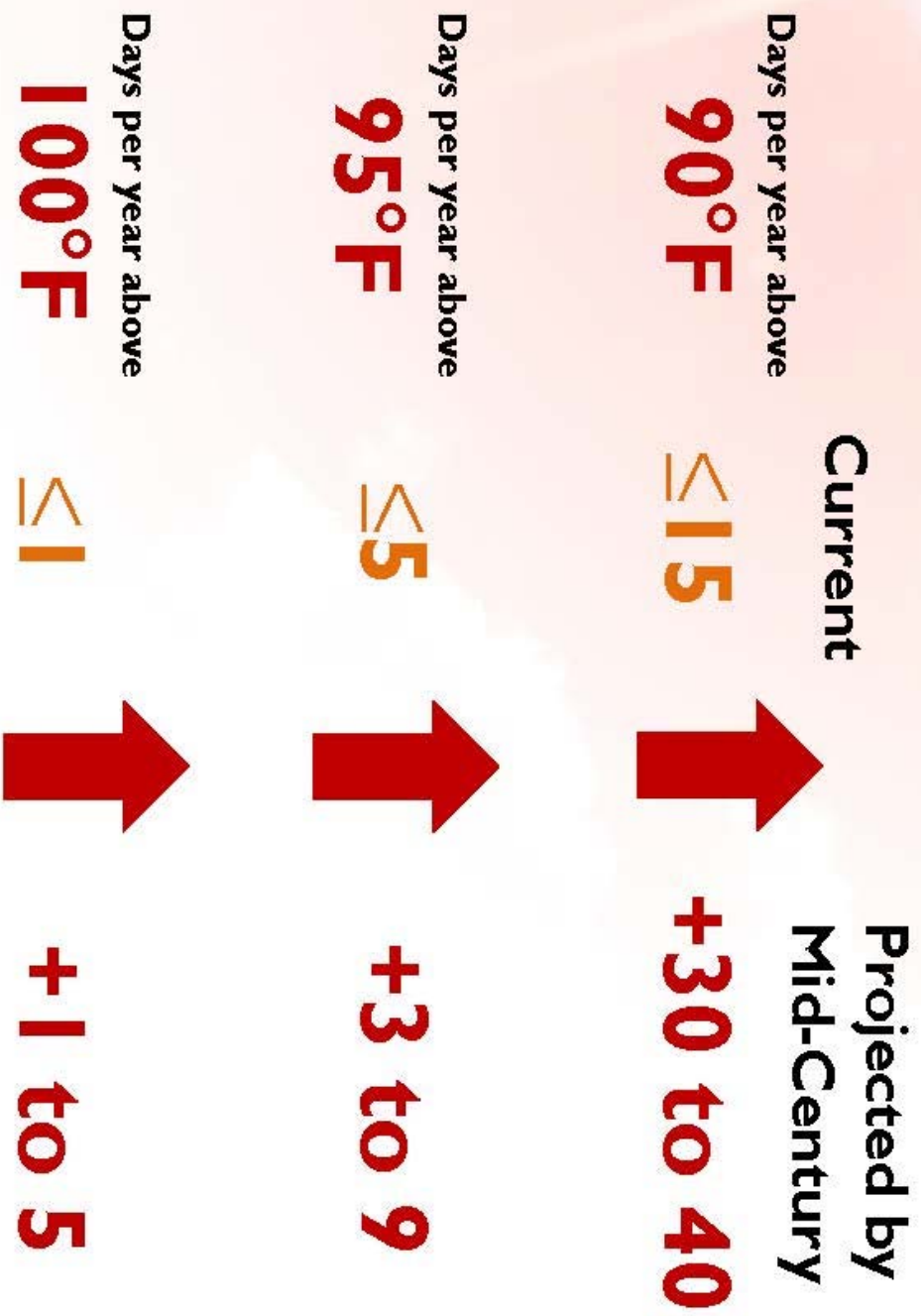
**1971-2000 Average:**

457 Cooling Degree-days

Photo © Daniel Brown

Source: Northeast Climate Adaptation Science Center, ResilientMA.org, accessed 2018.

# Extreme Heat in Massachusetts



Source: NOAA NESDIS





## Impacts from Increasing Temperatures

- Public health
  - Increase in heat-related illnesses and mortality
  - Urban residents face greater risks
- Health of plants, animals, and ecosystems
  - Increased pests
  - Changes to growing seasons
- Economic sectors
  - More sick days due to heat-related illnesses
  - Reduced crop production and impacts to livestock and fisheries
- Infrastructure
  - Larger demands on energy systems
  - Stress on train tracks, roads and bridges, and other critical infrastructure



# Impacts from Changing Precipitation Conditions

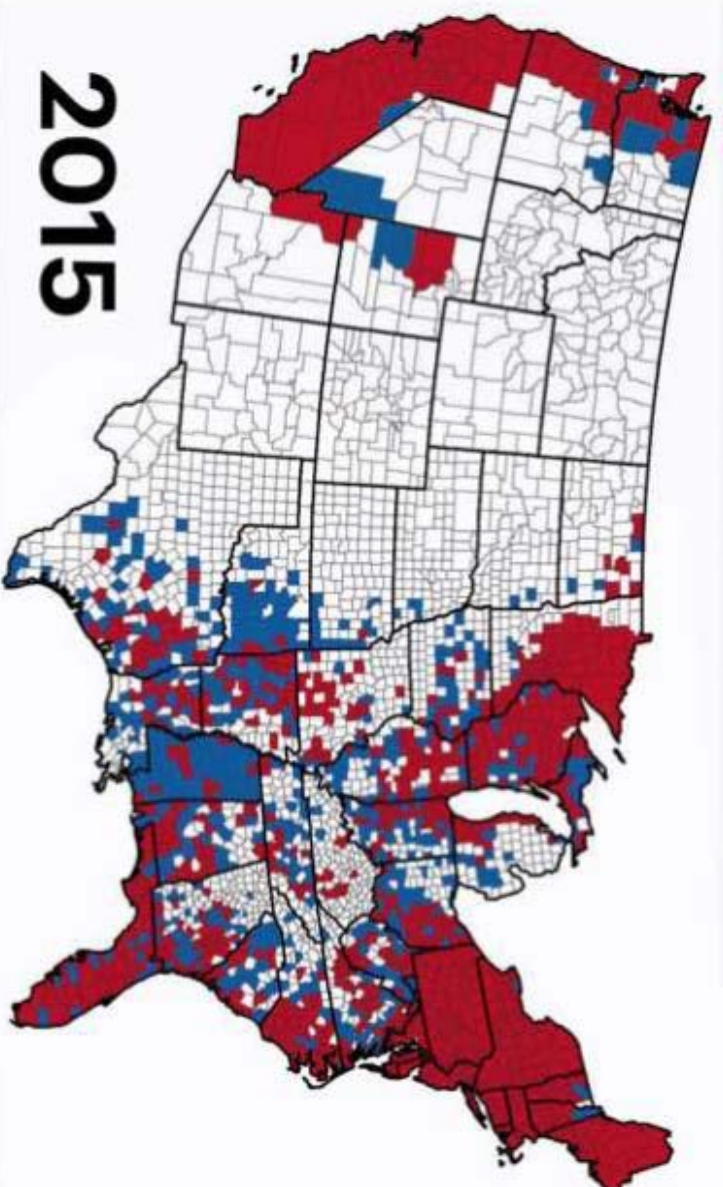
- Increased total rainfall
  - Impact on the frequency of minor but disruptive flooding events
  - Impact agriculture, forestry, and natural ecosystems
- More intense downpours
  - Increased risk of flooding
  - Increased damage to property and critical infrastructure
  - Impacts to water quality
- Changes to rainfall and snowfall patterns
  - Impacts to certain habitats and species with specific physiological requirements
  - Reduced snow cover for recreation and tourism
  - Potential increase in frequency of episodic droughts



## Impacts from Sea Level Rise

- Local impacts shaped by:
  - Ocean currents
  - Wind patterns
  - Land and shoreland elevations
  - Subsidence and accretion rates
  - Tidal zones
- Will exacerbate many existing coastal hazards including:
  - Severe storms and storm surge
  - Tidal inundation
  - Salt water intrusion
- More regular flooding of developed and natural low-lying coastal areas
- Increased erosion of existing coastal landforms
- Damage to coastal buildings and infrastructure

**Public Health:  
Ticks and Lyme Disease**



# Nature-based Solutions

**Nature-Based Solutions** use natural systems, *mimic* natural processes, or *work in tandem* with traditional approaches to address natural hazards like **flooding**, **erosion**, **drought**, and **heat islands**.



**Green  
Infrastructure**



**Low Impact  
Development (LID)**

# Nature based solutions at every scale

## Rural, suburban, or urban

**Conserve** available  
open space providing  
ecosystem services



**Integrate** concepts into  
new development at  
neighborhood scales

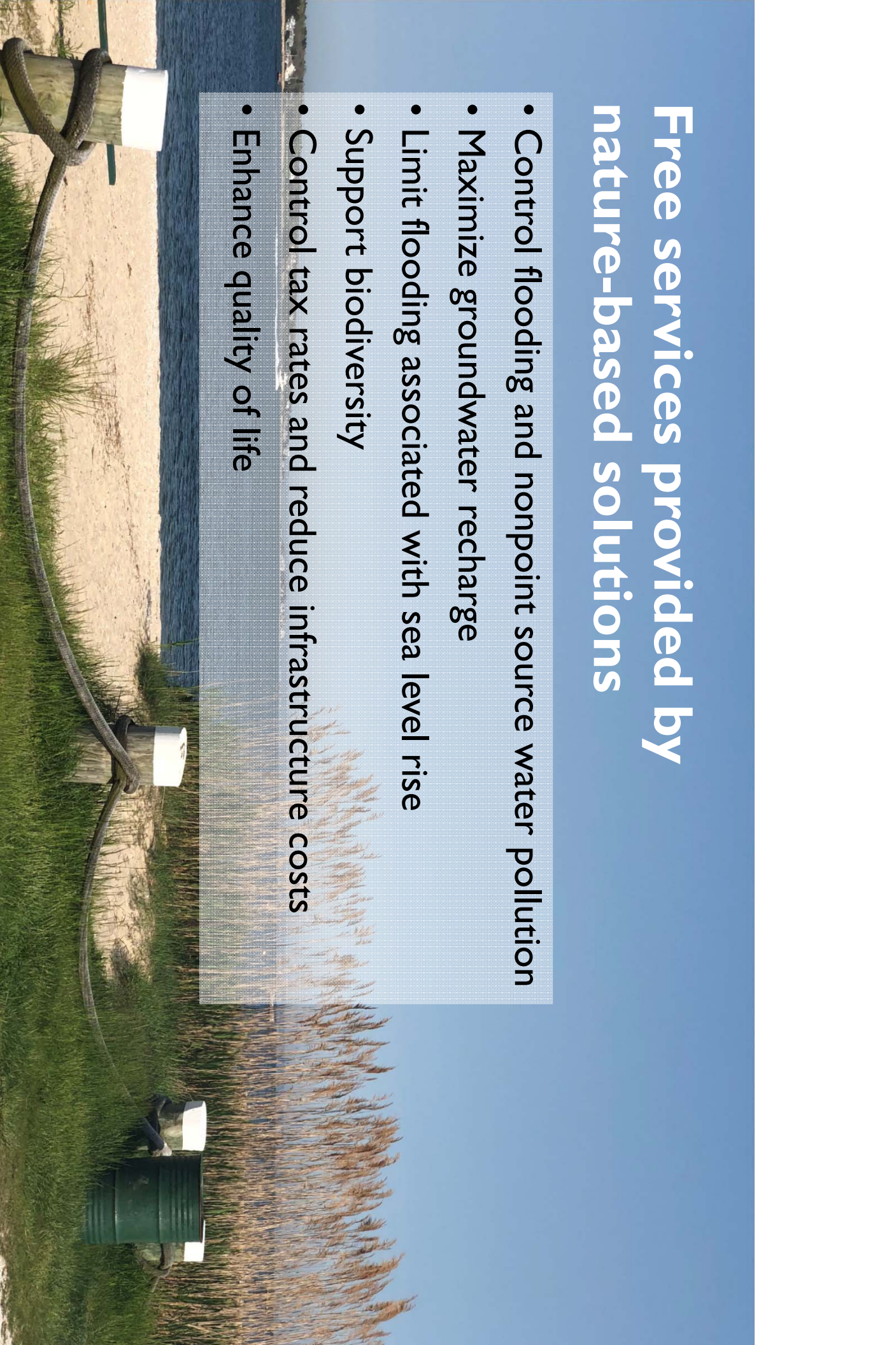


**Restore** resilience in  
urban areas at site  
specific scale



# Free services provided by nature-based solutions

- Control flooding and nonpoint source water pollution
- Maximize groundwater recharge
- Limit flooding associated with sea level rise
- Support biodiversity
- Control tax rates and reduce infrastructure costs
- Enhance quality of life



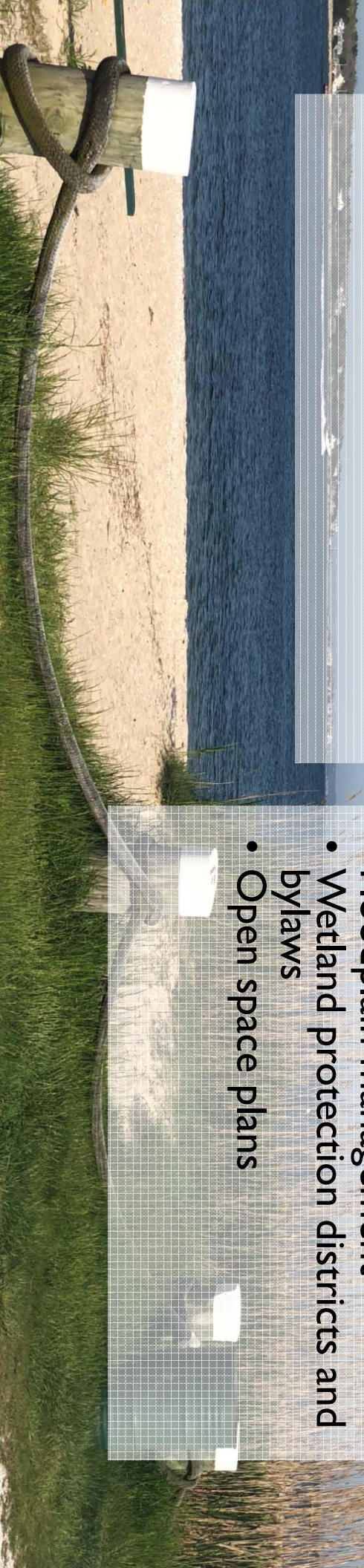
# Linking Local and Regional

## Benefits:

- Contribute to watershed-scale approach to addressing water balance, water quality and flooding concerns
- Maximize the utility of local conservation planning

## How to link:

- Comprehensive plans
- Open space residential development
- Transfer of development rights
- Water resource protection overlay districts
- Floodplain management
- Wetland protection districts and bylaws
- Open space plans





# Baker Administration's Support

## EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS

Matthew A. Beaton, Secretary

Grant Announcement

Community Bid # BD-18-1042-ENV-ENVY01-25921

Request for Response (RFR) ENVY 18 POL 03

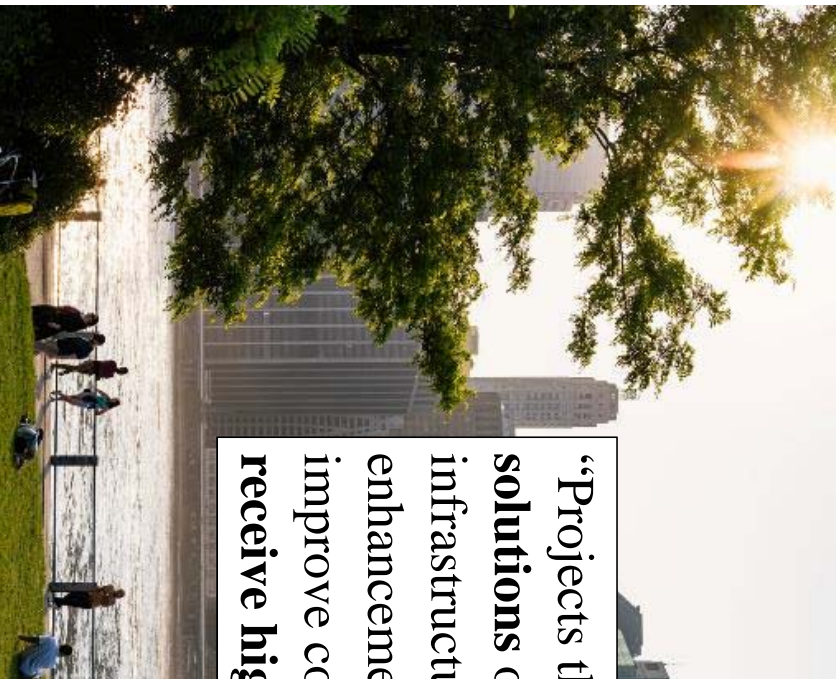
Dated: April 13, 2018

### MUNICIPAL VULNERABILITY PREPAREDNESS GRANT PROGRAM (MVP) IMMEDIATE NEEDS ROUND FY 18 MVP ACTION GRANT

“Projects that propose **nature-based solutions** or strategies that rely on green infrastructure or conservation and enhancement of natural systems to improve community resilience will receive **higher scores.**”

implement best practices and projects identified through the MVP Planning Grants.

**C. ELIGIBLE PROJECTS:** Funding is to advance priority climate adaptation actions identified by “MVP Communities” to address climate change impacts resulting from extreme weather, sea level rise, inland and coastal flooding, severe heat, and other climate impacts. (See further detail on eligible projects in Section 2B). Projects that propose nature-based solutions or strategies that rely on green infrastructure or conservation and enhancement of natural systems to improve community resilience will receive higher scores.



# MVP Resources

## COMMUNITY RESILIENCE BUILDING WORKSHOP(S)

Define and characterize hazards using latest science and data

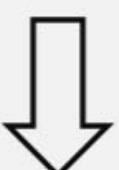
Identify existing and future community vulnerabilities and strengths

Develop and prioritize community adaptation actions

Identify opportunities to take action

Receive MVP designation

MVP  
Planning  
Grant



MVP Action Grant

Implement priority adaptation actions identified through planning process

# Funding

## Certified MVP Communities Receive Priority Ranking

- Action grants are only available to MVP certified communities
- MA Clean Water State Revolving Fund Program (CWSRF)
- MA Office of Coastal Zone Management (CZM)
- MA Department of Agricultural Resources (MDAR)
- MA Executive Office of Energy and Environmental Affairs (EEA)
- MA Department of Environmental Protection (DEP)
- Mass Environmental Trust (MET)
- MA DCS LAND and PARC Grants



 Environmental  
Protection



# **MVP Action Grants: Project Types**

- Detailed 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

## **MVP Action Grants: Project Types (cont.)**

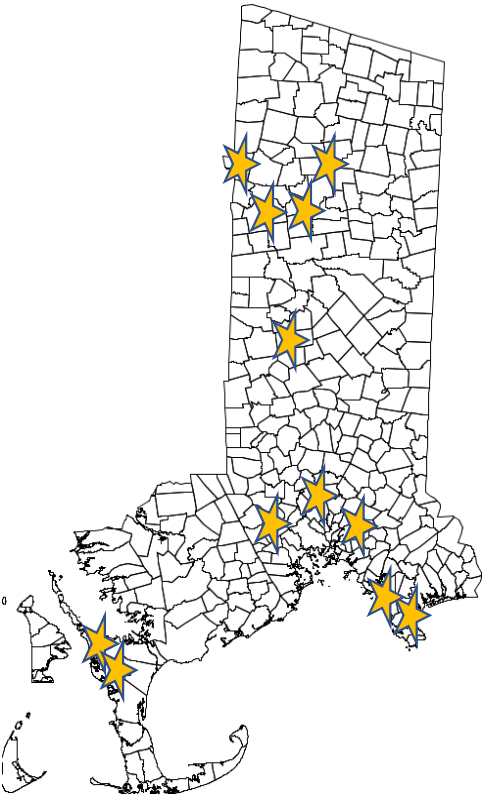
### **ADDED IN 2019**

- Energy Resilience
- Chemical Safety
- Land Acquisition for Resilience
- Subsidized Low-Income Housing Resilience Strategies
- Mosquito Control Districts



## Example Nature Based Solutions for Resilience

- Living Shoreline Feasibility
- Cranberry Bog restoration
- Watershed Land Protection
- Salt Marsh Restoration
- Brook Stabilization
- Tree Planting for Heat Island and reduced runoff
- Design with Nature for Flood
- Nature Based Road Stream Crossing
- Floodplain Restoration
- Green Infrastructure
- Forestry for Emergency Management and Environmental Conditions



<https://www.mass.gov/files/documents/2018/10/19/2017-2018-planning-grant-report-essex.pdf>  
<https://static1.squarespace.com/static/596be1e04c326dc7d7bf01c7/5b9eb329e40e995063154ede/1542140578345/EGAN+MP+2+Essex.pdf>

## Example Action Grant Projects

Land Acquisition for Resilience

### Mattapoisett



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



Data utilization  
Proactive

**So, what do we do next?  
Next . . . We Plan !!!**



# Overview of the Process (Steps & Tasks)







## **But first . . . what are our Top Priority Hazards?**

**Drought or Flood/Drought Cycles**

**Extreme Precipitation/Storm Events**

**Hurricanes**

**Wildfire**

**Sea Level Rise/Coastal Flooding**

**Wind**

**Extreme Temperature**

**Earthquake**

**Tornado**

**Other(s)**

