Town of Templeton

Community Resilience Building Workshop

Summary of Findings

February 2021

FUSS & O'NEILL

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Town of Templeton
Community Resilience Building Workshop
Summary of Findings

Overview

Extreme weather and natural and climate-related hazards are an increasing concern for the communities of Massachusetts, and there is a clear need to involve municipalities, corporations, organizations, and the State in increasing resilience at all levels. Recent storm events affecting the region have highlighted many of the vulnerabilities that towns and cities face. Hurricane Irene and Superstorm Sandy brought intense flooding to many municipalities and threatened (or destroyed) infrastructure across the state. Extreme temperatures at both ends of the spectrum have pushed the limits of communities' preparedness to protect both infrastructure and people. In coastal communities, the impacts of sea level rise are felt daily and further exacerbate the impacts of other extreme events. Current climate modeling indicates that all of these hazards are expected to increase in frequency and scale over the coming decades. The Municipal Vulnerability Preparedness (MVP) program provides support and a prescribed process for cities and towns in Massachusetts to plan proactively for resilience and implement key climate change adaptation actions.

In 2019, the Town of Templeton was awarded a $15,000 MVP grant to fund the planning stage of this process and conduct additional listening sessions specifically focused on engaging the populations served by Anna Maria College and the Senior Center. The Town partnered with Fuss & O'Neill, a state certified MVP Provider, to complete a comprehensive, baseline climate change and natural hazard vulnerability assessment and develop a list of priority actions for the Town. This process involved the formation of an MVP Core Team, which met on January 9, 2020 to determine initial concerns and worked to identify stakeholders within the municipality and set goals for the process. Those stakeholders were then invited to participate in a Community Resilience Building (CRB) workshop originally scheduled for March 17, 2020. However, due to limitations brought on by the global pandemic the CRB workshop was postponed several times and ultimately held on June 3, 2020, virtually to allow for social distancing while still engaging in a day-long, tried and tested process developed by The Nature Conservancy. The CRB methodology is an "anywhere at any scale" format that draws on stakeholders' wealth of information and experience to foster dialogue about the strengths and vulnerabilities within the Town. Due to the pandemic, the process was modified slightly. Workshop participants attended workshop sessions in two main groups and interacted at both large and small group levels, using an iterative process to gather input, synthesize ideas across groups, and ultimately develop a set of priority resilience and adaptation actions.

The CRB workshop's central objectives were to:

- Define top local natural and climate-related hazards of concern;
- Identify existing and future strengths and vulnerabilities;
- Develop prioritized actions for Templeton;
- Identify immediate opportunities to collaboratively advance actions to increase resilience.

Top Hazards and Vulnerable Areas

During the Community Resilience Building workshop, participants were asked to identify the top four natural hazards of concern for the Town of Templeton. Discussion of the top hazards built on earlier conversations that took place at the MVP Core Team Meeting and previous discussions that have informed the Town's Hazard Mitigation Plan. Flooding, resulting from extreme precipitation events, was identified as a hazard. Periods of drought, which can intensify fire risk, were identified as the second hazard. Extreme temperatures, both cold and heat, especially the increase in days over 90 degrees Fahrenheit, were identified as a hazard. Extreme weather events bringing severe wind were identified as the final hazard. The Town has already felt the impacts of these four hazards. As climate change proceeds, these hazards are expected to increase, with greater impacts to infrastructure, the environment, and the community. Specific hazards and areas of concern are identified below.

Top Hazards

- Heaving Precipitation (including Flooding)
- Drought and Fire Risk
- Extreme Temperatures
- Extreme Weather Events (Including Wind)

Areas of Concern

While many impacts are expected to be felt Town-wide, certain elements, locations, or community groups present particular concerns.

Neighborhoods/Communities
Baldwinville, Otter River, and East Templeton villages, Alliance Health Nursing Home at Baldwinville, Templeton Developmental Center

Facilities
Templeton Municipal Light Department, Templeton Elementary School, Narragansett Regional Middle and High Schools, Town Hall, Senior Center, Cottage Hill Academy, Boynton Public Library

Dams
Otter River Pool Dam, Brazel Pond Dam, Templeton Center Dam, Seaman's Dam, Depot Pond Dam, and other privately-owned dams

Infrastructure
Power grid, sewer pump stations, communication towers, roads (Baldwinville Road, Route 2, Route 2A, Route 31, Route 68, Route 202), water supply infrastructure, municipal sewer system, private septic systems, culverts and bridges town-wide

Current Concerns and Challenges Presented by Hazards

Major storm events have been a recurring threat to Templeton throughout its history, from hurricanes bringing wind, intense precipitation, and localized flooding, to winter storms delivering ice and snow. Recently, the Town has been experiencing an increase in regularity of storms, with the so-called 100 year storm now happening several times a year.

More intense storms delivering higher volumes of precipitation in a single event are expected to put significant pressure on dams, culverts, and other drainage infrastructure that were designed to handle smaller storms with more consistent distributions of precipitation. This problem manifests at points across the Town and is acute where the local drainage systems concentrate and discharge.

Like many cities and towns across the Commonwealth, Templeton was impacted by the extended drought of 2016 and also again in 2020. Long term, the Town has concerns about the resilience of the water supply since the Town relies exclusively on groundwater sources for drinking water.

Extreme temperatures are also a leading concern for the Town. Templeton has had to make greater use of heating and cooling shelters. Similarly, there is concern for student populations dealing with increased temperatures, specifically at the end of the school year, in buildings without available air-conditioning.

Vulnerable populations, especially seniors, are also a primary concern. They may have additional needs when it comes to transportation and sheltering in emergencies, including access to medication and electricity for oxygen pumps. Seniors may also be more difficult to reach during hazard events, as they may not have access to the internet or other common media used for emergency notification. Of particular concern is to what extent neighboring communities' senior populations rely on emergency services in Templeton and how the Town might coordinate those services with neighboring communities.

Specific Categories of Concerns and Challenges

Infrastructural

Culverts and Bridges
Culverts and bridges are a concern Town-wide, particularly as many of Templeton's developed areas are in close proximity to rivers, ponds, and wetlands. Existing culverts and bridges were designed to accommodate historic patterns of precipitation and runoff, but are rapidly becoming inadequate as a result of climate change. While design standards have changed, the Town's infrastructure largely predates such changes, and thus has not kept up with new standards. As precipitation events become

more intense and less predictable, aging and undersized culverts and bridges are expected to pose a greater threat of failure and flooding. Notably, several bridges, including those on Main Street and Stoney Bridge Road, are in need of significant repair or replacement and are closed or have lane reductions in place.

Water Infrastructure
Residents of Templeton's three villages are served by water from public wells. Water mains have been plagued by breaks. The replacement of these pipes and, in general, the aging water infrastructure, has been discussed as a priority for the Town.

Drinking Water Supply
The Water Department serves approximately 50% of Templeton's population, with water drawn from 4 wells and the remainder of residents on private wells. Two wells are on land leased from the Army Corps of Engineers, and are occasionally unusable due to flooding. The Town is permitted to withdraw 920,000 gallons per day, but is currently operating between one-third and one-half of its capacity. Some private wells have run dry in the last five years. Alternatives to the current water supply during emergency situations were also discussed as a topic of concern, as there are currently no mutual aid agreements in place for the Town to receive water.

Water Supply for Fire Suppression
The Town does fire protection from several fire ponds around Town. Using these sources may not be feasible if drought events persist. The Town is looking to monitor fire pond levels more closely to determine the need or alternatives for emergency fire suppression needs. The Town is also looking to potentially make upgrades in several locations based on fire suppression needs.

Roads
Roads in Templeton are vulnerable to flooding as well as the impacts of snow and ice. Dynamic weather patterns due to climate change are increasing the difficulty of maintaining roadways. Potholes and sinkholes are becoming more problematic due to new patterns of freezing and thawing that occur repeatedly throughout the winter season. Participants noted that many roads are flat, which creates drainage issues during storms.

Schools
Templeton is part of the Narragansett Regional School District. Workshop participants noted that the middle and high schools do not have centralized air conditioning, leading to concern about the use of the middle school as an emergency shelter. The middle school also acts as an emergency shelter for the towns of Phillipston and Royalston. The elementary school and high school were recently upgraded.

Dams
Workshop participants identified one privately-owned dam, the Depot Pond Dam, as the primary dam of concern. The dam has recently been assessed as needing repairs and the dam owner is currently in prison. Some other dams are in need of maintenance, although the group was not specifically aware of any known structural issues affecting the condition of these dams, many of which are privately owned. There are additional private dams throughout the town where the condition of the dam is partially unknown. Understanding the Town's overall vulnerability to dam failure, where dam removals may be

possible, and where improvements can be made to public and privately-owned dams, especially significant-hazard dams, can increase the resilience of the Town during hazard events.

Septic Systems
More than half the Town is served by septic systems. Many of these septic systems are aging. Septic systems in Templeton are a concern due to the increased frequency of flooding and elevated groundwater levels (i.e., reduced separation distance) in areas served by septic systems. Inundation of septic systems by floodwaters, inadequate separation distance between the bottom of the leaching facility and the groundwater table, and leaking septic tanks can result in septic failures and discharges of san resilience itary waste to the environment, posing a threat to both human health and the environment. Participants noted some areas served by septic systems already have tight tanks to prevent groundwater intrusion. The Town is considering extending sewer service to these areas

Environmental

Forest/Open Space
Forests provide critical ecosystem services that help buffer the effects of climate change, from sequestering carbon, to increasing groundwater recharge, to modulating local temperature. Street trees are likewise critical for infiltration of rainwater and provision of shade. Overgrowth of trees adjacent to overhead utility lines can lead to power outages during storm events. Trees and forests are also threatened by climate change. Wind and storms cause blowdowns, drought can contribute to die-offs, new invasive pests that are spreading eliminating certain tree species, and others are in decline due to shifting temperature and precipitation regimes that favor more southerly species. Die-offs may contribute to additional fuel load for forest fires.

Aquatic and Terrestrial Invasive Species
Invasive plants and animals are a source of concern in Templeton, as they are throughout the Commonwealth. Critical invasive insect pests already in the region include the Asian Longhorned Beetle, Hemlock Wooly Adelgid, and Emerald Ash Borer, all of which have the potential to do serious damage (both environmental and economic) to Massachusetts' forests and trees. These and other species, such as Eurasian milfoil, purple loosestrife, and autumn olive already pose a significant challenge and have serious consequences for ecosystem health and resilience, and these impacts are likely to increase in response to climate change. Warming temperatures will also bring new invasive species to the area, and these will have an easier time gaining a foothold if the Town's natural ecosystems are simultaneously weakened due to changes in climatic conditions.

Beavers
Whereas the Town generally has some record of and control over man-made stream crossings or impoundments, beaver activity is often known only anecdotally and can cause unpredictable problems during heavy precipitation such as flooding in unexpected locations. The Town struggles with trying to keep beaver impoundments from inundating critical areas with water. For instance, beavers inhabited Baldwin Water Supply Pond Dam and erected a beaver dam in the primary spillway of the dam. The density of the debris led to clogging of the spillway, which could lead to overtopping if there was a significant precipitation event.

Open Space

Open space provides ecosystem services that help buffer the effects of climate change, from sequestering carbon, to increasing groundwater recharge, to modulating local temperature. Open space is also critical in floodplains for providing a buffer and increased flood storage, near public water supplies to maintain high water quality and promote recharge, and to maintain overall habitat connectivity that will be vital to allowing ecosystems and individual species to adapt to a changing climate. Open space includes an extensive network of parks, playgrounds and other open space that provides many social, environmental, and economic benefits to the Town. Open space also provides important recreational opportunities and relief from stress. Participant Julia Pingitore noted that while there are properties that the Town is interested in purchasing to preserve open space, these actions have been limited by a lack of funds.

Societal

Emergency Shelters
The Narragansett Regional Middle School is the main emergency shelter in Templeton. The Town also utilizes the Senior Center as a heating and cooling center based on need. While the training and staffing of emergency managers in Town is a strength there is some concern for unknown capacity needs based on reliance on emergency services by populations in neighboring Towns.

Local Agriculture
Unpredictable climate and weather conditions are taking a toll on agriculture locally and across the region. Climate change is expected to result in a longer growing season for New England, which can be beneficial for some crops but may lead to issues with others, for instance, by allowing additional time for blight or other crop diseases to develop. Early melt of snow pack, drought, excessive rain, and changing temperatures may all affect agriculture and livestock at varying scales. Although agriculture is not wide-spread in Templeton, participants noted that Valley View Farm and various orchards are a resource to the community.

Current Strengths and Assets

While the Town recognized a number of vulnerabilities, workshop participants identified key strengths as well. Templeton has a number of systems in place to facilitate emergency communications and information transfer, and the Town has obtained specialized equipment to help ensure that emergency services can be provided in a wide range of conditions. The Town has also established memorandums of understanding and mutual aid agreements that will support resilience during hazards.

- The **Templeton Municipal Light Department** is up-to-date and responsive, and provides up to 4.5MW of renewable energy generation within the Town
- Templeton recently constructed a **new elementary school**, which runs primarily on wood chips delivered from local foresters
- The **Middle School** is an emergency shelter
- The **Senior Center** also acts as a heating and cooling center

- Upgraded **high school**
- Sewer system
- **Old Growth Forest Stand**
- The **Community Emergency Response Team** (**CERT)** is very well trained and keeps emergency equipment in the old Fire Center.
- Animal shelters

Top Recommendations to Improve Resilience in Templeton

Participants at the CRB workshop identified a number of recommendations to address vulnerabilities and increase resilience in three main topic areas: infrastructure, environment, and society. The need for resilience efforts to keep roadways open, including preparing for and responding to closures driven by flooding, downed trees, or wind impacts, was a primary theme of the workshop that emerged in both the small and large group discussions. This concern is reflected in a divergent group of priorities that include improvements to and/or relocation of the DPW facility, tree and forest management, and infrastructure improvements. Providing sufficient protections and planning for vulnerable populations and municipal employees in the Town was a second major theme.

Highest Priority

- **Bridges and culverts –**for increased flooding resilience 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. This effort would add to the limited number of assessments that the Town has already completed and allow for accurate prioritization of structures for repair or replacement, and update to accommodate increased future flows.
- **Water Supply** – Conduct study of future demand and available pumping capacity. Investigate alternatives when wells on ACOE land are affected by flood waters. Determine anticipated water demand and expansion potential of developing other well sites or surface water use.
- **Install Air Conditioning at Middle School and High School** – Generate plans to upgrade and/or retrofit schools with air conditioning.
- **Roads** – Evaluate poor condition roadways and upgrade overall condition including drainage infrastructure. Implement green infrastructure to reduce flooding.

- **Improve Emergency Coordination** – Obtain information from regional municipalities (Phillipston, Royalston, and Gardner) to understand needs and capacities of surrounding communities relative to Templeton's emergency management capabilities and build regional knowledge and capacity. Assess current emergency coordination agreements to ensure suitability for future emergency situations.

- **Upgrade sewer pump stations** – Upgrade existing pump stations in flood zone to increase resilience to flooding and replace aging or inadequate equipment.

- **Protect Old Growth forest stand** – Mitigate invasive species from negatively impacted the Old Growth Forest Stand.

- **Develop an inventory of privately-owned dams and conduct dam assessments** to identify where other aging dams may pose a threat of failure and flooding, or where removal may have significant positive impacts on stream habitat and aquatic organism passage or for increasing flood storage and flood control possibilities.

- **Senior Center Cluster** – Maintain as a heating and cooling center in case of emergency.

- **Fire protection** – Upgrade fire ponds to provide proper volume of water for emergencies.

- **Assess green infrastructure opportunities for stormwater management** – Develop a list of specific priorities, assess feasibility and cost, rank priority projects in terms of climate resilience potential, and develop concept designs for key projects. Review Town regulations and update as necessary to support green infrastructure and low-impact development and encourage green infrastructure to be incorporated into all roadway projects.

- **Develop a stormwater infrastructure retrofit plan -** to assess opportunities for water quality improvements, with a particular focus on reduced pollutants to reservoirs. Evaluate feasibility and cost, rank priority projects in terms of pollutant and stormwater runoff reduction potential, and develop concept designs for key projects.

- **Conduct a comprehensive assessment of sewer infrastructure**, including assessment of aging lines for replacement and extension of service to key areas of Town.

- **Conduct robust education and outreach to build awareness of Town resources** and make Town residents aware of the many planning efforts, sources of emergency information, mutual aid agreements, shelters, evacuation routes, etc. which are focused on making the Town more resilient to climate change impacts. Ensure that all residents have transportation options and know how to access these resources when they are needed.

- **Educate residents on self-sufficiency and appropriate expectations for emergency response**. Include information on FEMA's recommendations for self-sufficiency. Encourage preparedness and self-sufficiency of residents through resources such as emergency or 72-hour kits. Educate residents on timelines and processes for repairs to electrical infrastructure and

road clearing. Encourage smart decision making around staying off the road during winter storms.

- **Enter into formal agreements or MOUs** with neighboring towns to provide options for water supply during emergency situations.

- **Develop procedures and policies and conduct training** that focuses on the safety of employees, especially during hazard events or emergences. Purchase gear or equipment as necessary to protect employee safety.

Moderate Priority

- **Beaver Related Flooding** – Identify areas for beaver deterrent devices while balancing habitat and needs with flooding. Conduct routine assessments of discharge areas of dams for potential beaver dams and debris blockages.

- **Aquatic and Terrestrial Invasive Species** – Investigate various aquatic and terrestrial invasive species within local aquatic ecosystems. Develop a plan to remove invasive species and prevent spread.

- **Complete a town-wide tree survey** with a trained arborist for comprehensive tree management and to help identify, remove, and replace problem trees, preserve intact forests and street tree cover, and provide guidance and resources for gradually moving toward more climate-resilient trees and forest communities (e.g. species that will tolerate warmer temperatures). Build on the existing resource-sharing relationship among the six towns that currently utilize the bucket truck. Simultaneously plan for the removal of excess standing dead wood and selective thinning to create space for more evenly aged forest stands and greater long-term resilience resiliency, as well as to reduce the risk to electrical infrastructure.

- **Develop a comprehensive forest management program** to identify and remove hazard trees and to proactively manage trees and vegetation that impact power lines. Plan for the removal of excess standing dead wood and selective thinning to create space for more evenly aged forest stands and greater long-term resilience . Focus on increasing stormwater infiltration and aquifer recharge, developing forests as effective carbon sinks, and improving habitat for native species. Simultaneously evaluate existing land use regulations and develop requirements for new development to encourage appropriate plantings and limit tree removal.

Lower Priority

- **Light Department** – Maintain renewable energy generation.

- **Acquire open space** consistent with Town planning priorities and focused on areas that will create flood resilience through increasing storage capacity in floodplains and/or infiltration capacity in uplands. Explore funding options to allow for acquisition.

- **Test Town generators under load quarterly** to verify their capacity to function properly during emergency events.

- **Conduct outreach to residents regarding winter road maintenance** to build understanding of the impacts of deicing materials, encourage safe winter driving practices, and evaluate support for various alternative winter maintenance approaches.

- **Review Town bylaws related to residential solar** to evaluate options for decommissioning fees and to outline standard protocols for battery disposal.

- **Increase maintenance of catch basins and conveyances** and develop public education and outreach on appropriate operation and maintenance (O&M) of stormwater BMPs on private properties. Review and improve maintenance schedule and budgets, keep up with regular maintenance of publicly-owned structures, and increase frequency of street sweeping and catch basin cleaning as needed.

- **Educate owners of private septic systems** about the importance of having systems pumped out and keeping them in good working condition in order to prevent risks to public health and the environment from systems that become overwhelmed during periods of heavy precipitation.

- **Develop a neighbor-to-neighbor program** to facilitate identification of and support for vulnerable populations and promote assistance between neighbors, especially during emergencies and hazard events.

- **Identify funding opportunities for septic system owners** to replace aging systems, such as no-interest loans.

- **Increase alerts on local television** advising residents not to call 911 during certain events to reduce the load on emergency responders and the call center.

- **Pursue funding sources for cleanup of contaminated sites** where reuse or redevelopment may be possible but is currently hindered by environmental conditions.

- **Support the Light Department in developing a plan for disposal of hazardous materials** including used transformers and creosote-containing poles as these are replaced and upgraded**.** Coordinate with the Commonwealth to determine if there are resources, protocols, or a list of recommended vendors that handle disposal.

CRB Workshop Participants

All workshop invitees are listed below; attendees are indicated with an asterisk.

Name	Position/Organization
Carter Terenzini*	Previous Town Administrator
Adam Lamontagne*	Town Administrator
Laurie Wiita*	Development Services
Bob Szocik*	DPW Director
Tom Berry*	Light Department
Ron Davan	Templeton Water
David Dickle	Templeton Fire
Michael Bennett*	Templeton Police
Ron Amidon	Commissioner – Fish and Game
Richard Valcourt	Green Natural Resources Management
Mark Danielson*	DPW Foreman
Randy Brown*	Water Department Foreman
Rick Moulton*	School Maintenance Superintendent
Susan Lajoie	Council On Aging Representative
Rich Curtis*	Emergency Manager
Chuck Robinson	Sewer Department Foreman
Greg Haley	Electric Department Foreman
George Andrews	Conservation Commission Chair
Kirk Moschetti	Planning Commission Chair
Diane Haley	Select Board
Mike Currie*	Select Board
Jeff Bennett*	Select Board
Julie Richards	Select Board
Terry Griffis*	Select Board

*** indicates attendees**

Citation

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CRB Workshop Core Team

Name	Organization	Role
Adam Lamontagne	Town Administrator	Core Team Member/Project Coordinator
Laurie Wiita	Development Services	Core Team Member/Project Coordinator
Bob Szocik	DPW Director	Core Team Member
Tom Berry	Light Department	Core Team Member
Ron Davan	Templeton Water	Core Team Member
David Dickle	Templeton Fire	Core Team Member
Michael Bennett	Templeton Police	Core Team Member
William Guenther	Fuss & O'Neill	MVP Lead Facilitator
Arnold Robinson	Fuss & O'Neill	MVP Facilitator

Acknowledgements

Many thanks to the MVP Core Team members, CRB workshop participants, and to Laurie Wiita and Adam Lamontagne who acted as the local Project Coordinators.

Funding for the CRB Workshop was provided through a Massachusetts MVP grant.

Appendix A

Final Risk Matrix

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

H-**M**-**L** priority for action over the **S**hort or **L**ong term (and **O**ngoing)
V = Vulnerability S = Strength

Features	Location	Ownership	V or S	Heavy Precipitation (Including Flooding)	Drought and Fire Risk	Extreme Temperatures	Extreme Storm Events (Including Wind)	Priority H - M - L	Time Short Long Ongoing
Infrastructural									
Bridges	Main Street	Municipal	V	Identify bridges that may require upgrades to accommodate future precipitation event size and intensity. Green infrastructure, low-Impact Design, and other nature-based solutions should be integrated with hard-infrastructure improvements				H	S
	Hamlet Mill	Municipal	V						
	Stone Bridge Road	Municipal	V						
Dams	Templeton Center Dam	Municipal	V	Update dam assessments, identify privately-owned dams, and study feasibility and cost-benefit of dam removals where other aging, public or privately-owned dams may pose a threat of failure and flooding, or where removal may have significant positive impacts on stream habitat and aquatic organism passage or for increasing flood storage and flood control possibilities. Identify owners of private dams throughout Town. Identify candidates for removal, engage owners and perform feasibility analyses			Mine Phase I info or aerials to determine which might be more susceptible to wind impacts, trees growing on embankments.	H	S
	Seamans Dam	Private	V						
	Depot Pond Dam	Private	V						
	Partridge Pond Dam	Private	V						
	Baldwin Water Supply Pond Dam	Private	V						
	Wetmore Pond Dam	Private	V						
	Ridgley Pond Dam	Private	V						
	Graves Pond Dam	Private	V						
Road Stream Crossings	Gardner Road(Route 101)	Municipal	V/S	Evaluate and prioritize road stream crossings for repair and replacement			Update the field inventory of bridges and culverts to rank and prioritize projects for increased flood resilience and storm-hardening, including design of priority re-sizing or replacement projects. Integrate green infrastructure, Low-Impact Design and other nature-based solutions with hard-infrastructure improvements.	H	L
Septic Systems	Town-wide, Patridgeville Road	Private	V	Identify septic systems located in areas with poor drainage and systems utilizing tight tanks. Identify and prioritize areas of town to receive upgraded sewer service. Upgrade sewer service and replace aging systems. Determine capacity to expand and identify any needed treatment upgrades needed for expansion.				H	S
Sewer Pump Stations, at least one in a flood zone	Mapel Street, Baldwinville	Municipal	V	Upgrade existing pump station to be resilient to flood waters or relocate pump station out of the flood zone.			Replace aging and inadequate pump station equipment and structures.	H	L
Roadways, many aging roads with poor drainage	various, Route 2A	Municipal/State	V	Identify poor condition roadways and upgrade overall condition and drainage infrastructure. Look for opportunities to implement Green Infrastructure to reduce flooding				H	L
Sewer System, looking to expand service and reduce use of septic in areas that are poorly drained	less than half of the community		S					H	L
Water Supply, town system plagued by water main breaks	50% of town on private wells		V		Complete groundwater study and investigate current conditions of the aquifer. Identify candidates for receiving town water as a replacement for private wells.			H	O
Water Supply, 4 total wells, 2 of which are on ACOE property that is leased		Municipal	V	Wells on ACOE land are not useable during flood conditions. Look for alternative sites to reduce dependence on wells on ACOE land. Identify flood events that prevent use of Army Corps of Engineer wells. Develop emergency plan water distribution during flood events.	Determine anticipated water demand and expansion potential of developing other well sites or surface water use.			H	L
Schools, recently built elementary school, upgraded high school		Municipal	S					L	O
Light Department is up to date and responsive			S	Up to date and responsive, providing up to 4.5 MW of renewable energy generation to the town				L	O

Societal									
Seniors - Bridge Street Cluster (Senior Center and Senior Housing)			S			Acts as heating and cooling center.		H	L
Middle School Emergency Shelter - Backup generator - CERT team			S					L	O
Emergency Operations Planning			V				Obtain information on outlying communities from Region 2 Planning Commission. Establish working group with local communities to better understand capacities and services and allow for better technology transfer.	H	S
High School and Middle School have no AC			V			Generate plans to upgrade and/or retrofit schools without air conditioning, secondary benefit of being better cooling centers.	Investigate extent of outlying communities depending on emergency services and capacity of Templeton's schools (Phillipston)?	H	S
Senior Center is used as Heating and Cooling Center			S					L	O
CERT is very well trained, has equipment in EMCenter in old Fire Station			S				Build regional knowledge and capacity (Gardner, etc.).	L	O
Environmental									
Drinking Water Supply			V	Study drinking water sources to understand future impact on wells.			Land acquisition, well acquisition and or development of new storage facilities, expanded distribution system.	H	L
Aquatic and Terrestrial Invasive Species			V	Investigate various aquatic and terrestrial invasive species within local aquatic ecosystems. Develop plan to mitigate or remove invasive species to prevent spread during flood conditions.		Monitor warming temperatures and potential for new invasive species.		M	L
Forest/Open Space			V		Identify potential areas at risk for forest fires during extreme drought conditions		Work with local utility services to keep lines clear .	L	L
Beaver related flooding	Various	N/A	V	Proactively identify areas for beaver deterrent devices, balancing habitat creating and needs with flooding, drainage and septic. Conduct routine assessments of discharge areas of dams.				M	L
Old Growth Forest stand			S	Investigate potential invasive species that could harm the Old Growth Forest Stand and implement a plan to mitigate such species.				H	L
Increased fuel load			V						
Build-out Scenarios, wastewater/Water supply			V						
Emergency Fire Ponds around town and at Otter River			V		Monitor fire pond levels during drought conditions and evaluate alternatives for fire water withdrawal during droughts. Upgrade fire ponds to provide proper discharge during emergency.				

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Appendix B

CRB Workshop Base Map

TEMPLETON, MA

MUNICIPAL VULNERABILITY PREPAREDNESS PROGRAM

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- Town Hall
- Police Station
- Fire Station
- Hospital
- Health Center, Hospital
- Long Term Care Residences
- Dams
- Community Groundwater Source
- Surface Water Intake
- Non-Community Groundwater Source
- Underground Storage Tanks

Oil and/or Hazardous Material Sites

Chapter 21E Tier Classification

- TIER I
- TIER II
- TIER1D
- Activity and Use Limitation Sites
- Railroads - Active Service
- Powerline
- Landing Strip/Airport
- Perennial or Intermittent Stream
- Shoreline
- Ditch/Canal
- Pond, Lake, Ocean
- Reservoir
- Wetland
- Inundated Area
- Wellhead Protection Zone I
- Wellhead Protection Zone II

N W E S

0 0.25 0.5 0.75 1

Miles

Data sources:
MassGIS - Infrastructure, Hydrology, Environmental, and Administrative Data
ESRI - World Topographic Map - Base Map

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Appendix C

CRB Workshop Outputs:
Participatory Mapping Exercise & Risk Matrices

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

Templetown Morning session

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

H-**M**-**L** priority for action over the **S**hort or **L**ong term (and **O**ngoing)
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Features	Location	Ownership	V or S	Heavy Precipitation (Including Flooding)	Drought and Fire Risk	Extreme Temperatures	Extreme Storm Events (Including Wind)	Priority H - M - L	Time Short Long Ongoing
Infrastructural									
Failing bridges	Main Street, Hamlet Mill, Stoney Bridge	Town and State	V	Stoney bridge in progress (recreational bridge), Main Street needs Town $,				H	
Water system (breaks)	Village centers	Private	V-S			Transient pipe becomes very brittle			
Private Wells (50% town)	Village centers	Private	V-S		Some droughts (5 years ago)				
S			S						
Sewer system	(less than 1/2 of co mmunity)	Public/private	S						
Roadways	Route 2A	State and local govt	V	Many roads flat with no pitch for runoff, potholing					
Road stream crossings	Gardner Road (Route 101)	V-S (70% ok		Winter storm events and blockages					
Dams - 9 listed in HMP. Some in really poor shape	Brazell Pond at Brooks Village	Private		Templetown Pond Dam, Depot dam					
Stony Bridge Road OUT at Stone Bridge Pond		Town							
Septic systems	Townwide (Patridgeville Road)			Town wants to improve aging septic in high water table areas					
Schools - new elementary school. Runs off biomass			S						
Societal									
Seniors	Bridge Street cluster								
Middle school is shelter - backup generator - CERT staffs		Town	S						
Emergency Operations Plan - with Phillipston		Town							
CERT is very well-trained, has gear in EMCeter in old Fire Center		Town/State					Build regional knowledge and capacity (Gardner, etc.)		
Senior Center is heating/cooling shelter		Town							
Schools - new elementary school. Runs off biomass						Install air-conditioning in schools?			
Animal shelters									
Environmental									

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

H-**M**-**L** priority for action over the **S**hort or **L**ong term (and **O**ngoing)
V = Vulnerability S = Strength

Features	Location	Ownership	V or S	Extreme Weather Events	Flooding	Extreme Temperatures	Drought and Fire Risk	Priority H - M - L	Time Short Long Ongoing
Infrastructural									
failing bridges, main street, hamlet Mill, stoney bridge, Second session mentioned bridges in general			V		Upgrade bridges to accommodate future precipitation			H	short, ongoing
water system has breaks fairly regularly, five or six in the last three weeks, route 68/Dudley Road Area, some upgrades but still needs work, old transiet pipe near Barry road	Private Enterprise, Light and Wate		V					H	ongoing
Light Dept has up to date system and power outages are rare and short in duration, 1.5 mw wind turbine, 3mw solar, not much room for more generation.			S	Continue proper maintenance and routine work to keep lines clear				M	ongoing
sewer is maintaining service levels, recently replaced a pump station in Bladwinville, people would like to see expanded,		Local	S		Look to expand sewer service to areas with more active localized flooding. More general planning related to sewer expansion			H/M	long
roads, a lot of roads are in poor condition, even state roads route 2a not touched in 20 years, recent road planning effort									ongoing
culvert issues, 70% ok, a lot of jetting of culverts and stormwater, deteriorating crossing								L	long
Follow up with Sewer to identify areas for improvements, Templeton Fish and Game									
Dams, 9 listed in hazard mitigation plan, some in really poor state, templeton center, seimans dam, depot pond dam		believed to be all private		•engage dam owners to improve compliance with state regs •several in poor shape that may be candidates for removal					
Dam on Brazel Pond is a concern due to localized flooding, Drury Road, Primary Dam is kept up pretty well, secondary dam					work with dam owner to improve maintenance and have more regular maintenance, look at ways to reduce beaver activity in the area			M	long
Getting rid of old schools, just built a new elementary school, snow removal is a concern									
Water wells feed water towers, recent replacement of a water tower in town, 50/50 public vs private wells, 4 barrel packed wells, 2 on ACOE land, ACOE management causes flooding of wells and makes these wells unavailable for periods in the Spring			V				Make sure public and individual wells have adequate access during drought periods, Hubbardston road has had dry wells in the past •Look for opportunities to put in new wells and relieve the dependency on wells on ACOE land •	M/L	
Societal									
Middle school as emergency shelter and emergency response building, CERT, Emergency operations plan needs to be updated in a year or so			S			working on the planning process to improve overall Town response and resilience (Rich Curtis) •		H	Ongoing
Understanding Templeton capacity and also capacity and location of similar services in neighboring towns, communicate with neighboring towns on their capacities, strengths and weeknesses •at least one written agreement with regional Cotttage Hill Academy, hasn't been updated in years. Royalston and Phillipston are invited to use schools in Templeton				Get info on outlying communities from Region 2 Planning Commission. Create working group with local communities to better understand capacities and services and allow for better tech transfer					
high school/middle school have no AC, new elementary is partially air conditioned, some IEP classrooms have AC, hard to compete with wealthier communities that have these ammenities						look into air conditioning for all schools classrooms. Explore ways to reduce the needd for airconditioning (length of school day)			
dehumidifiers run at the high school									
animal shelter by the highway department									
Gilman-Waite facility, recreation, future splash pad?									

Baldwinville Nusery Home, 70 and 99 bridge st. EMD has keys and they have backup generator.									
DDS, Development Dept. Services?, facility on King Philip Trail, essentially closed, some farming operations and									
Environmental									

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

H-**M**-**L** priority for action over the **S**hort or **L**ong term (and **O**ngoing)
V = Vulnerability S = Strength

Features	Location	Ownership	V or S	Heavy Precipitation (Including Flooding)	Drought and Fire Risk	Extreme Temperatures	Extreme Storm Events (Including Wind)	Priority H - M - L	Time Short Long Ongoing
Infrastructural									
Bridges	Main Street	Municipal	V	Identify bridges that may require upgrades to accommodate future precipitation event size and intensity				H	Short
	Hamlet Mill	Municipal	V						
	Stone Bridge Road	Municipal	V						
Dams	Templeton Center Dam	Municipal	V	Engage dam owners to improve compliance with state regulations Identify candidates for removal, engage owners and perform feasibility analyses				H H	Short Short
	Seamans Dam	Private	V						
	Depot Pond Dam	Private	V						
	Partridge Pond Dam	Private	V						
	Baldwin Water Supply P	Private	V						
	Wetmore Pond Dam	Private	V						
	Ridgley Pond Dam	Private	V						
	Graves Pond Dam	Private	V						
Road Stream Crossings	Gardner Road(Route 101)	Municipal	V/S	Evaluate and prioritize road stream crossings for repair and replacement				M	L
Septic Sytems	Town-wide, Patridgeville Road	Private	V	Many septic systems located in areas with poor drainage, some even have tight tanks to prevent failure. Upgrade sewer service and replace aging systems Identify and prioritize areas of town to receive upgraded sewer service •Determine capacity to expand and identify any needed treatment upgrades needed for expansion					
Sewer Pump Stations, at least one in a flood zone	Mapel Street, Baldwinville	Municipal	V	•Adapt pump station to be resilient to flood waters or relocate pump station out of the flood zone			Replace aging and inadequate pump equipment and structures		
Roadways, many aging roads with poor drainage	various, Route 2A	Municipal/State	V	•upgrade and improve roads and drainage •look for opportunities for Green Infrastructure to reduce flooding					
Sewer System, looking to expand service and reduce use of septic in areas that are poorly drained	less than half of the community		S						
Water Supply, town system plagued by water main breaks	50% of town on private wells		V						
Water Supply, 4 total wells, 2 of which are on ACOE property that is leased		Municipal	V	•Wells on ACOE land are not useable at times due to flooding. Look for alternative sites to reduce dependence on wells on ACOE land	•Determine anticipated water demand and expansion potential of developing other well sites or surface water use.				
Schools, recently built elementary school, upgraded high school		Municipal	S						
Light Department is up to date and responsive			S						
Bridges- Placeholder									
Societal									
Seniors - Bridge Street Cluster (Senior Center and Senior Housing)									
Middle School is Shelter - Backup generator - CERT team			S						
Emergency Operations Planning			V				•Get info on outlying communities from Region 2 Planning Commission. •Create working group with local communities to better understand capacities and services and allow for better tech transfer		
High School and Middle School have no AC			V			Make plans to upgrade and/or retrofit schools with air conditioning, secondary benefit of being better cooling cneters	•How much are outlying communities depending on emergency services and capacity of Templeton's schools (Phillipston)?		
Senior Center is used as Heating and Cooling Center			S						
CERT is very well trained, has equipment in EMCenter in old Fire Station			S				Build regional knowledge and capacity (Gardner, etc.)		

Environmental									

Appendix D

CRB Workshop Presentation Materials

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Boston Firefighters, January 4, 2018 (Reuters)

Taunton River

Municipal Vulnerability Preparedness Program
Climate Resilience Building Workshop
Town of Templeton

June 3 and 4, 2020

Community Resilience Building Workshop

Agenda

- **CRB Team and participant introductions**
- **Introduction to Massachusetts Municipal Vulnerability Preparedness Program (MVP)**
- **Introduction to Climate Change and the Town of Templeton**
- **Discussion by Templeton representatives on status of current planning**
- **Introduction to CRB Workshop process**
- **Large group**
    - Review top four hazards

- **Small work groups (Using Risk Matrix)**
    - Identify Templeton's vulnerabilities and strengths
    - Prioritize response actions

- **Lunch**

- **Large group**
    - Report out from small groups
    - Determine overall priority actions for the Town

- **Discussion on next steps**
- **Conclusion**

MVP Workshop Agenda

Welcome – Carter Terrenzini

Introductions

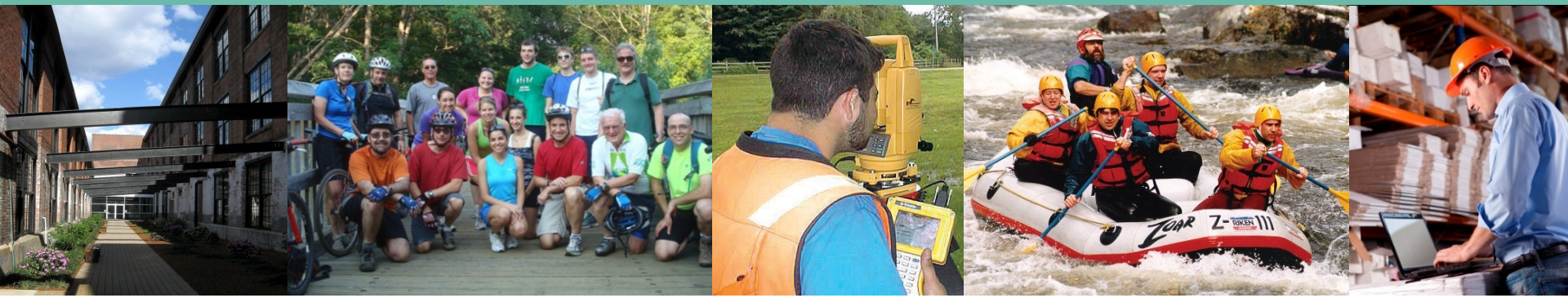
Templeton's MVP Program Process

Climate Change, Natural Hazards and Templeton

CRB Workshop
- **Four Top Hazards Facing Templeton**
- **Risk matrix**

Next steps:
- **CRB Workshop Report**

Fuss & O'Neill Overview



Fuss & O'Neill is a leading MVP consultant in assisting Massachusetts communities secure grant assistance, achieve designation as a Massachusetts Municipal Vulnerability Preparedness (MVP) community, and execute their MVP priority projects.

The MVP team is experienced in local government, environmental services, civil site engineering, stormwater management, and emergency management.

Fuss & O'Neill assisted new MVP communities secure more than $3.15 million in MVP Action Grants in the program's first and second funding rounds.

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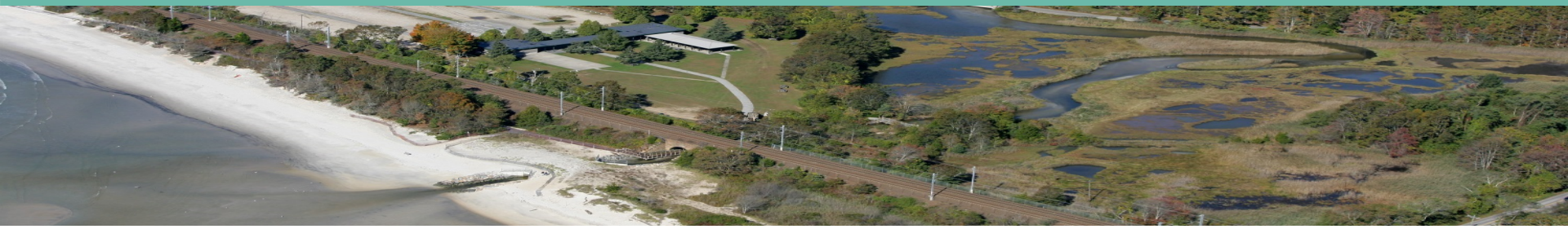
MVP Project Team



Arnold Robinson is Regional Director of Planning has been practicing in the fields of community planning, historic preservation and urban design for than 30 years. His practice focuses on effectively engaging residents, officials and diverse stakeholders in the planning and review process. serves as a liaison between the municipality and the project team.

Bill is an Environmental Scientist in Fuss & O'Neill's Water and Natural Resource Planning Department. His principal areas of expertise include watershed and stormwater management, water quality monitoring and evaluation, Illicit Connection Detection and Elimination (IDDE) surveys, structural and non-structural stormwater BMP selection, and Harmful Algal Blooms (HABs).

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Templeton's MVP

Grant Supports Climate Change Vulnerability Assessments, Resiliency Planning and Local Hazard Mitigation Planning

MVP Comprehensive Approach

- Infrastructure
- Society
- Environment

MVP Designation Leads to Enhanced Standing in Future Funding Opportunities

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MVP Action Grant **NEW**

- **Grant supports priority actions identified at Community Resilience Building Workshop**
- **$10,000 - $400,000 available**
- **Local match of 25% - can be in-kind**
- **Next funding round anticipated**

Only those communities which have completed the CRB workshop are eligible to apply

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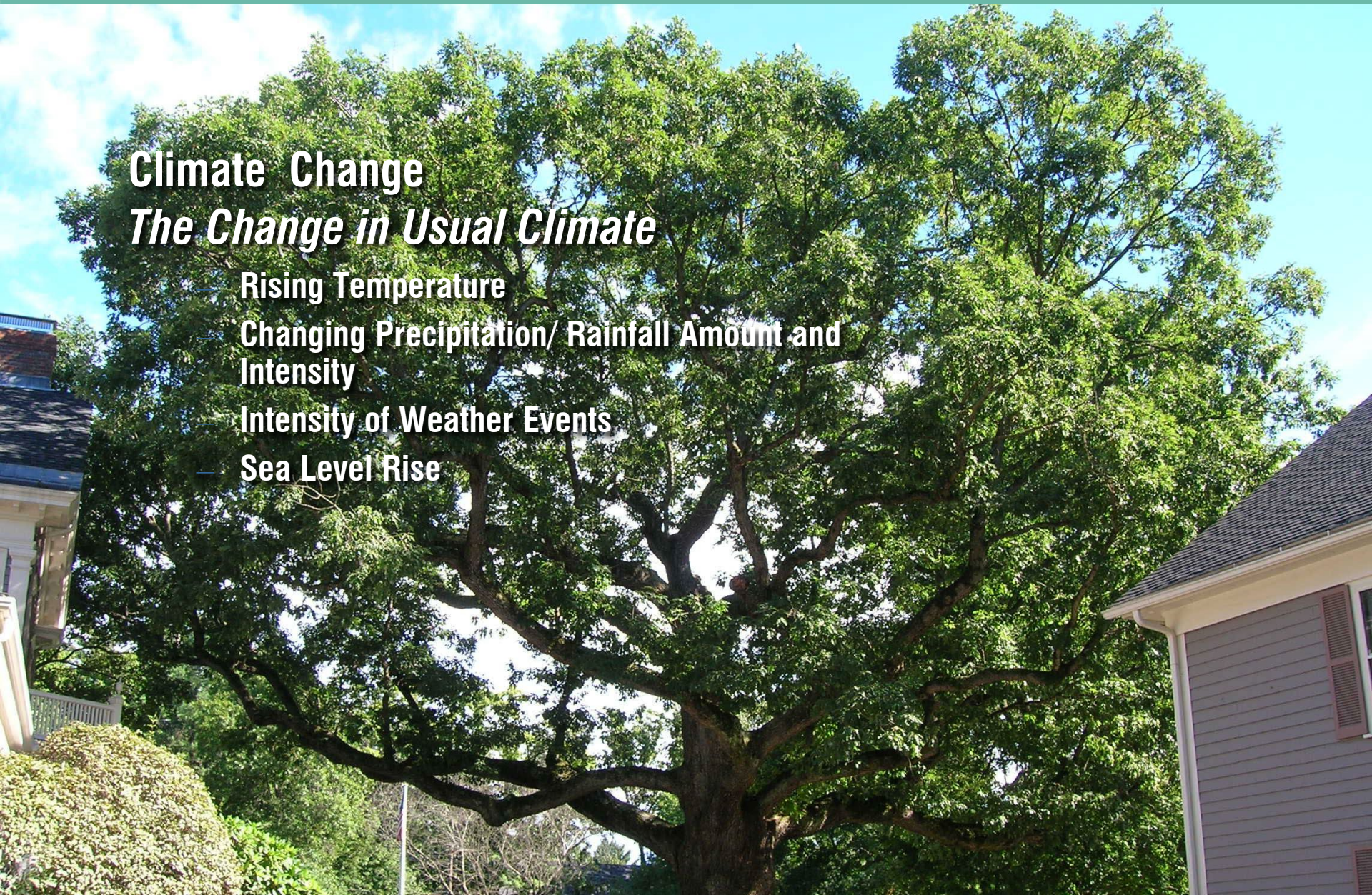
Overview of Municipal Vulnerability Preparedness (MVP) Planning

- Community Resilience Building
  - Identify impacts using available data including new climate projections developed by the Commonwealth
  - Hold CRB workshop to engage stakeholders
    - *Identify community strengths and vulnerabilities from community input*

Terminology



Rising Temperature

Millers	Observed Baseline 1971-2000	Projected Change in 2030s			Projected Change in 2050s			Projected Change in 2070s			Projected Change in 2090s		
Average Annual Temperature Temperature (°F)	44.7	2.2	to	4.5	3.0	to	6.3	3.5	to	8.9	3.9	to	10.8
Annual Days with Maximum Maximum Temperature over over 90°F (Days)	4	5	to	16	8	to	30	10	to	51	12	to	70
Annual Days with Minimum Minimum Temperature below below 32°F (Days)	177	-11	to	-28	-19	to	-35	-22	to	-49	-22	to	-58

Rising Temperature

Chicopee	Observed Baseline 1971-2000	Projected Change in 2030s			Projected Change in 2050s			Projected Change in 2070s			Projected Change in 2090s		
Average Annual Temperature Temperature (°F)	46.2	2.2	to	4.5	3.0	to	6.4	3.6	to	9.0	4.0	to	11.0
Annual Days with Maximum Maximum Temperature over over 90°F (Days)	3	5	to	15	8	to	29	9	to	49	11	to	69
Annual Days with Minimum Minimum Temperature below below 32°F (Days)	162	-11	to	-28	-19	to	-38	-22	to	-52	-23	to	-63

Climate Change Impacts - Temperature

- **Economic**
  - Winter Recreation
  - Snow and Ice
- **Agricultural**
  - Longer Growing Season
- **Health**
  - Increased Pests
  - Heat Stroke
- **Infrastructure**
  - Road Buckling
  - More Potholes
  - Power Outages
- **Environment**
  - Change in Habitat

Changing Precipitation

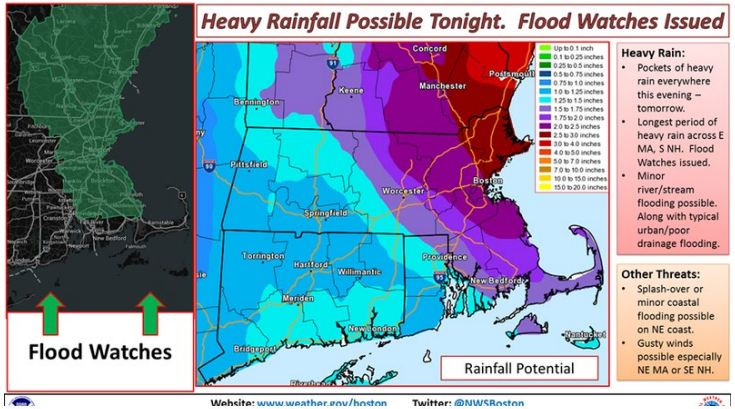
Millers	Observed Baseline 1971-2000	Projected Change in 2030s	Projected Change in 2050s	Projected Change in 2070s	Projected Change in 2090s
Total Annual Precipitation (Inches)	46.6	-0.2 to 4.7	1.1 to 6.0	1.8 to 7.0	1.4 to 7.7
Annual Consecutive Dry Days (Days)	16	-1 to 1	-1 to 2	-1 to 2	-0 to 3

Changing Precipitation

Taunton Basin	Observed Baseline 1971-2000	Projected Change in 2030s	Projected Change in 2050s	Projected Change in 2070s	Projected Change in 2090s
Total Annual Precipitation (Inches)	45.6	-0.2 to 4.6	1.0 to 5.9	1.4 to 7.0	1.3 to 7.4
Annual Consecutive Dry Days (Days)	16	-0 to 2	-1 to 2	-1 to 2	-0 to 2

Climate Change Impacts – Precipitation

- **Economic**
  - Dangerous Floods
  - Lost work time
- **Agricultural**
  - Excessively Wet Spring
  - Drought
- **Health**
  - Flood/High Water-related Deaths
  - Emergency Response Delays
- **Infrastructure**
  - Road Washout
  - Environment
  - Sewer System Overflows
  - Compromised Bridges
- **Changes in Habitat**



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Risk Matrix – Determine Top Four Hazards

Community Resilience Building Risk Matrix  **www.CommunityResilienceBuilding.com**

H-**M**-**L** priority for action over the **S**hort or **L**ong term (and **O**ngoing)
V = Vulnerability **S** = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S					Priority H - M - L	Time Short Long Ongoing
Infrastructural									
Societal									
Environmental									

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MVP Sectors

- **Infrastructure**
  - Evacuation routes
  - Schools
  - Roads, bridges, dams
  - Water and wastewater
  - Septic systems
  - Hospitals
  - Commercial Buildings, churches
  - Utilities: electric, gas
  - Emergency management facilities

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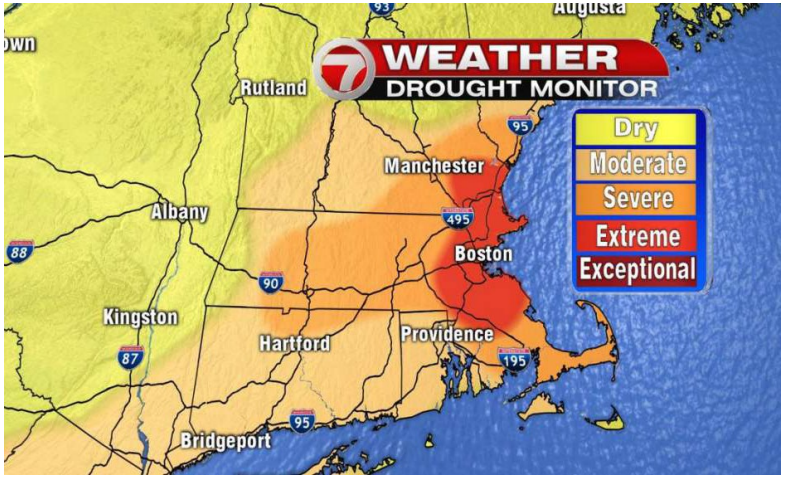
MVP Sectors

- **Societal**
  - Emergency shelters
  - Senior housing
  - Schools and campuses
  - Economically challenged populations
  - Evacuation plans
  - Animal shelters
  - Hospitals, pharmacies
  - Grocery stores
  - Utilities: electric, gas
  - Homeless
  - Other



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MVP Sectors

- **Environmental**
  - Drinking water supply
  - Rivers and streams
  - Parklands
  - Agriculture
  - Title V systems
  - Stormwater management
  - Open spaces
  - Flood plains
  - Forest
  - Other

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Top Four Hazards:

- Extreme Weather Events
- Flooding
- Extreme Temperatures
- Drought and Fire Risk

MVP Program Next Steps

- **Community Resilience Building Workshop**
- **Summary of Findings**
- **Listening Sessions**
- **Move Forward**

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Questions?