Town of Barre

Municipal Vulnerability Preparedness
Summary of Findings
May 2020

With assistance from:

CMRPC
Central Massachusetts Regional Planning Commission

Executive Office of Energy and Environmental Affairs

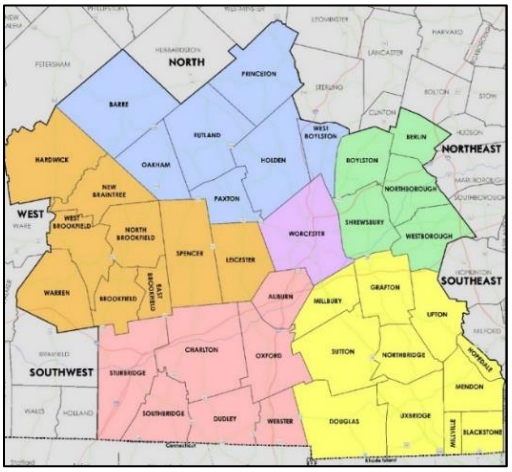
CMRPC Mission

The Central Massachusetts Regional Planning Commission is a regional partnership serving the planning and development interests of 40 member communities in southern Worcester County in Massachusetts. Our primary mission is to improve the quality of life for those who live and work in our region.

We do this by (1) addressing growth and development issues that extend beyond community boundaries; (2) maintaining the region's certification for federal transportation improvement funds; (3) providing technical knowledge an resources to assist local government in addressing specific land use, economic or environmental problems resulting from growth or decline, and (4) building strong working relationships with member communities, state and federal officials, as well as the range of area stakeholders.

Our History and Progress

Founded by the Massachusetts Legislature in 1963, the Central Massachusetts Regional Planning Commission (CMRPC) provides a variety of services to its constituencies and brings a regional perspective to planning and development. One of 13 regional planning agencies in Massachusetts, CMRPC serves the city of Worcester and 39 surrounding communities in the southern two-thirds of Worcester County. CMPRC's programs include Transportation, Regional Services, Geographic Information Systems (GIS), and Community



Federal Title VI/Nondiscrimination Protections

The Central Massachusetts Metropolitan Planning Organization (CMMPO) hereby states its policy to operate its programs, services and activities in full compliance with federal nondiscrimination laws including Title VI of the Civil Rights Act of 1964 (Title VI), the Civil Rights Restoration Act of 1987, and related federal and state statutes and regulations. Title VI prohibits discrimination in federally assisted programs and requires that no person in the United States of America shall, on the grounds of race, color, or national origin, including limited English proficiency, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity receiving Federal assistance. Related federal nondiscrimination laws administered by the Federal Highway Administration, the Federal Transit Administration, or both prohibit discrimination on the basis of age, sex, and disability. These protected categories are contemplated within the CMMPO's Title VI Programs consistent with federal and state interpretation and administration. Additionally, the CMMPO provides meaningful access to its programs, services, and activities to individuals with limited English proficiency, in compliance with US Department of Transportation policy and guidance on federal Executive Order 13166.

State Nondiscrimination Protections

The CMMPO also complies with the Massachusetts Public Accommodation Law, M.G.L. c272§§ 92a, 98, 98a, prohibiting making any distinction, discrimination, or restriction in admission to or treatment in a place of public accommodation based on race, color, religious creed, national origin, sex, sexual orientation, disability or ancestry. Likewise, CMMPO complies with the Governor's Executive Order 526, section 4, requiring all programs, activities and services provided, performed, licensed, chartered, funded, regulated, or contracted for by the state shall be conducted without unlawful discrimination based on race, color, age, gender, ethnicity, sexual orientation, gender identity or expression, religion, creed, ancestry, national origin, disability, veteran's status (including Vietnam-era veterans), or background.

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Executive Order 569 and the Massachusetts Municipal Vulnerability Preparedness program

In September 2016, Massachusetts Governor Baker signed Executive Order 569, directing multiple state agencies to develop and implement a statewide comprehensive climate adaptation plan with the best climate-change data available. Recognizing that many adaptation solutions are local in nature, a key commitment of Executive Order 569 is to assist local governments in completing their own assessments and resiliency plans. The MVP Grant and Designation Program represents the first step in fulfilling this commitment.

The MVP program provides planning grants to municipalities to complete vulnerability assessments and develop action-oriented resiliency plans. Funding is used by cities and towns to hire an MVP-certified consultant who is trained to provide technical assistance and complete a community's vulnerability assessment and resiliency plan using the Community Resilience Building (CRB) Framework. Towns and cities are free to choose the consultant of their choice from a list of certified MVP providers. The Town of Barre invited the Central Massachusetts Regional Planning Commission to lead them in this planning effort.

Communities that complete the MVP planning process become certified "MVP Communities" and are eligible for Action Grant funding and other opportunities through the Commonwealth.

https://www.mass.gov/news/governor-baker-signs-legislation-directing-24-billion-to-climate-change-adaptation

ACKNOWLEDGEMENTS

The Municipal Vulnerability Preparedness (MVP) program and Community Resiliency Building Workshop was funded by the Executive Office of Energy and Environmental Affairs. This Summary of Findings and CRB Workshop was prepared for the community of Barre by the Central Massachusetts Regional Planning Commission (CMRPC). Support from the Barre Board of Selectmen and the town officials was much appreciated, especially for allowing the workshop and listening session to take place in the Selectmen's Meeting Room.

The CMRPC would like to acknowledge the Town of Barre's Core Team for their time and hard work in participating in this project. These include, but are not limited to:

Andrew Golas, Town Administrator, Project Manager

Elisha Musgraves, Town Conservation Agent

Louisa Knowles, Barre Resident

Elaine Zuese, Barre Resident

The following individuals were directly and personally involved in planning and conducting the Barre Community Resilience Building Workshop:

Peter Peloquin, Associate Planner, CMRPC

Connor Robichaud, Regional Projects Coordinator, CMRPC

Mimi Kaplan, Associate Planner, CMRPC

Ian McElwee, Principal Planner, CMRPC

Andrew Loew, Project Manager, CMRPC

Andrew Smith, Regional Coordinator, EOEEA

BARRE: A PROFILE

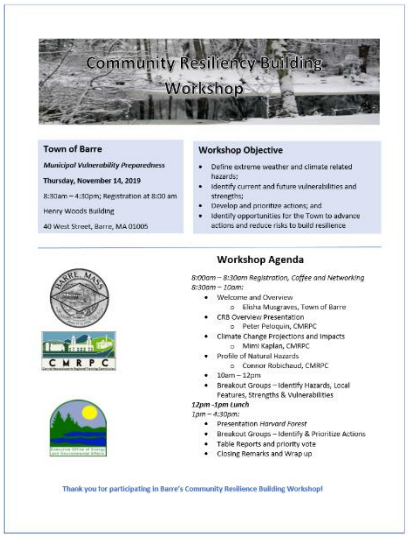
The Town of Barre, Massachusetts was incorporated in 1774. Barre is located on MA-122, 22 miles northwest of the City of Worcester and is largely a bedroom community. All of Barre lies within the Chicopee River Basin. Barre is bordered by Petersham on the west, Rutland on the east, Hardwick, New Braintree and Oakham on the south, and Hubbardston and Phillipston on the north. Barre has a total area of 44.6 square miles and a population of 5,491 (*2013-2017 American Community Survey Barre Town Report 2018*). Barre is a demographically stable community, with population growth slowing as much of the buildable land has been occupied following a 1990s surge. According to the Central Massachusetts Regional Planning Commission's (CMRPC) Long Range Transportation Plan, Mobility 2040, the Town of Barre is expected to experience low population growth over the next 25 years.

According to the *2013-2017 American Community Survey Barre Town Report 2018*, there were 5,491 people residing in the town. The population density was 115.3 people per square mile. Approximately 96.4% of its residents were Caucasian. The median age of residents was 44.8 with 22.4% of residents under the age of 18 and 13.4% over the age of 65. The median household income for the town was $69,432 with 5.7% of the population living below the poverty line.

The Town of Barre has an active population in its municipal buildings. Barre is home to the Henry Woods Building, the "Old" Town Hall, Police Department, Fire Station, DPW Building, Senior Center and the Woods Library. The Library and senior center are the social epicenters of the town with daily programs for all ages between the two buildings. The police department built a new building in 2017, while the fire department building is aging and becoming out of date. The Town belongs to the Quabbin Region School District and is also home to the Ruggles Lane Elementary School.

WORKSHOP SUMMARY

The Town of Barre's Municipal Vulnerability Preparedness (MVP) workshop was held on November 16, 2019 at the Henry Woods Municipal Building. The Town of Barre contracted with the Central Massachusetts Regional Planning Commission (CMRPC) to serve as the MVP provider, including completing the Community Resiliency Building (CRB) workshop. Through the Community Resilience Building (CRB) process, stakeholders actively engaged in an ongoing discussion to determine the top hazards related to climate change that currently impact or have the potential to impact Barre. A small group of Town officials and local residences convened on August 28, 2019 to form the 'Core Team' which, together with CMRPC staff, organized and planned the CRB Workshop over the course of four meetings.



Workshop Invitees and Participants

Name	Affiliation	Attended	Table #
Andrew Golas	Town Administrator, *Core Team, Table Facilitator*	Y	1
John Carbone	Chief of Police	Y	1
Robert Rogowski	Chief of Fire	N	X
Eileen Clarkson	Council on Aging	Y	3
Ellen Glidden	Town Clerk	Y	1
Mary Ann Gendron	Boards Clerk	Y	2
Tony Musnicki	Veterans Agent	N	X
Cynthia Henshaw	Executive Director	Y	3
Peter Gow	Marketing and Outreach Coordinator	Y	1
Inger Forland	Insight Meditation	N	X
Andrew Smith	EOEEA	Y	All
Elisha Musgraves	Conservation Agent, *Core Team, Table Facilitator*	Y	2
Louisa Knowles	Barre Resident, *Core Team, Table Facilitator*	Y	3
Elaine Zuese	Barre Resident, *Core Team, Table Facilitator*	Y	2
Lauren de la Parra	Coordinator, Shaping the Future Youth Community Program	N	X
Laura Nealson	Listening Wellness Center	N	X
Philip Hubbard	EQLT	Y	3
Peter Baker	Insight Meditation Society	Y	1
Douglas Martin	Barre Planning Board	Y	2
Jeannine Pimental	Tax Collector	Y	3
Paula Bartkus	Assessor/Cemetery	Y	1
Cynthia Kovach	Superintendent Quabbin Regional H.S.	Y	2
Janet Pierce	Executive Director, CMRPC	Y	2
Mary Markowski	Assistant Collector	Y	1
Sandy Hood	Admin. Assistant	Y	2
Sheila Muir	QRSD	Y	3
Riley Scherer	Student, Quabbin Regional H.S., *Scribe*	Y	2
Lane Misterkn	Student, Quabbin Regional H.S., *Scribe*	Y	2
Colin Brown	Student, Quabbin Regional H.S., *Scribe*	Y	1
Kathryn Keagle	Student, Quabbin Regional H.S., *Scribe*	Y	1
Maya Weiderman	Student, Quabbin Regional H.S., *Scribe*	Y	3
Peter Peloquin	Associate Planner, CMRPC, *Staff lead, Facilitator*	Y	All
Ian McElwee	Associate Planner, CMRPC, *Facilitator*	Y	3
Connor Robichaud	Regional Projects Coordinator, CMRPC, *Staff Assistant, Facilitator*	Y	2
Mimi Kaplan	Associate Planner, CMRPC, *Presenter, Facilitator*	Y	1

Core Team and Project Team

Name	Affiliation	Role
Andrew Golas	Town of Barre	Town Administrator, Core Team, Project Lead
Elisha Musgraves	Town of Barre	Town Conservation Agent, Core Team
Elaine Zuese	Town of Barre	Resident of Barre, Core Team
Louisa Knowles	Town of Barre	Resident of Barre, Core Team
Peter Peloquin	CMRPC	Lead Facilitator, Presenter
Connor Robichaud	CMRPC	Facilitator, Presenter
Mimi Kaplan	CMRPC	Facilitator, Presenter
Ian McElwee	CMRPC	Facilitator, Event Support

The Workshop's goal was to identify the top four natural hazards that impact Barre and develop strategies to enhance the town's resiliency related to climate change. Following the CRB work plan process, CMRPC facilitators and planners gave three presentations:

- Overview of the CRB process and the MVP program.
- A summary of climate change projections, impacts and mitigation strategies
- a detailed profile of natural hazards in the Town of Barre, including the top four hazards perceived by the core team.

Upon completion of the presentations, the group discussed the top four hazards that affect Barre. There was agreement between the Core Team and all participants that--in no particular order--***flooding, wind events, winter storms*** and ***extreme temperatures*** have the greatest effects and potential effects on the Town. Having identified these hazards, workshop attendees were then broken into three groups to work through the CRB program's matrix and mapping exercise. Table facilitators, along with CMRPC staff guided stakeholders in small groups to examine the resources throughout the Town and to Identify the Town's most serious concerns regarding natural and climate-related hazards that threaten their community.

After lunch, Clarisse Hart, Director of Outreach and Education of Harvard Forest, gave an overview presentation of the research Harvard Forest is conducting. Peter Peloquin presented examples of projects from other municipalities in the state that were funded by MVP Action Grants, providing inspiration for participants to:

- Develop and prioritize actions to reduce or mitigate threats.
- Identify opportunities for collaboration aimed at increasing the Town's resilience.

The groups then reconvened to build upon the morning work. The goal of the afternoon breakout session was to identify actionable items to reduce or mitigate the projected impacts of climate change. Once each table had completely filled out the matrix, all the groups reconvened and

table reporters gave a summary of findings. The workshop ended with each attendee voting for what they believed to be the top project in the infrastructural, societal and environmental categories.

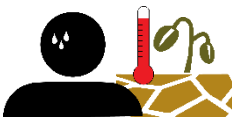
Thirty-one (31) people attended the CRB Workshop, including representatives from the town government, emergency services, the MVP Core team, Quabbin Regional High School, local business owners and concerned citizens of Barre. Students from Quabbin Regional High School acted as scribes and contributed their perspective.

A public listening session to discuss MVP results and recommendations for future actions was held on January 21, 2020 prior to a regularly scheduled Board of Selectmen's meeting. The listening session and Board of Selectmen's meetings were properly promoted across several avenues, with a combined eighteen (18) residents including all three selectmen in attendance. Between the two meetings, a total of forty-nine (49) people participated in the MVP process.

Top Hazards

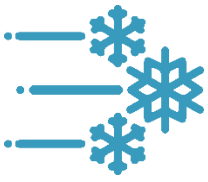
Following the presentations at the beginning of the workshop, a full-group discussion was held for approximately fifteen minutes to determine the top four hazards for breakout groups to further assess solutions. Taking climate change projections, critical infrastructure, and other considerations into account, workshop participants chose to focus on the four following hazards. They are presented in no particular order: **flooding**, **extreme temperatures**, **winter storms**, and **wind events**.

In 2016, Barre experienced extreme droughts along with the majority of the state of Massachusetts. Severe storms, including high winds and intense rainfall, have been increasing in frequency and impact. All of these have caused disruption to the town, including localized flooding, power outages, and calling upon mutual aid agreements. With climate change, all of these natural events are expected to increase in severity and frequency.



Extreme Temperatures

An increase of consecutive dry days is projected, with the driest periods in the summer and fall. This leads to increased risk and stress on drinking water systems and wildfire potential.



Winter Storms

Annual days below freezing will decrease with winter precipitation falling as rain or freezing rain. This increases risk for ice storms and flash flooding when rain falls on frozen ground.

Flooding

Expected increase in precipitation across all seasons. Heavy rainfall will become more frequent, increasing the risk for flash floods. Also increases non-point source pollution.

High Wind

Intensity of storm events is expected to increase due to the warmer atmosphere. This will lead to increased severe thunderstorm and hurricane activity with higher wind speeds.

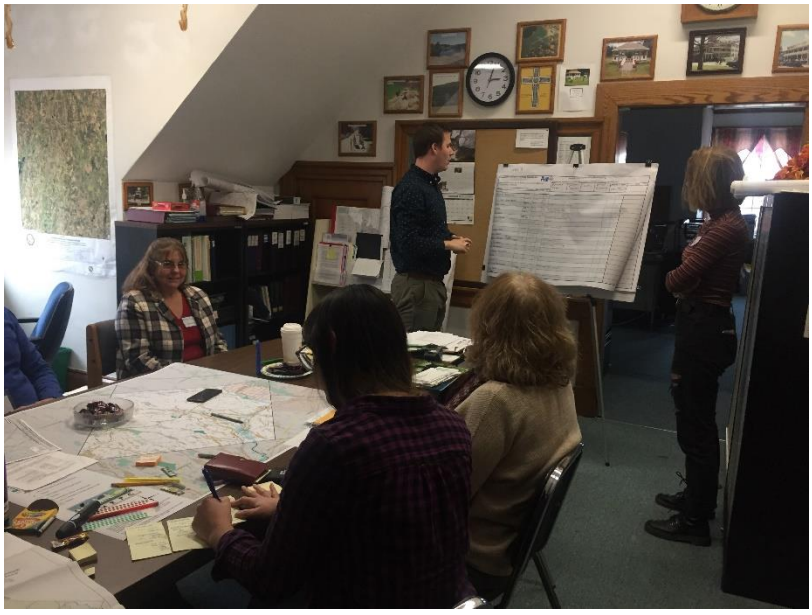
Flooding. Extreme weather in recent years demonstrates how the various hazards impact the town. There have been numerous flooding events over the years, and this threat is only going to increase as the majority of the town's developed land is along the Ware River and the various brooks and rivers that feed into it. Specific areas with critical infrastructure have been shown to be prone to flooding, thereby creating a variety of safety concerns. Areas with frequent drainage issues include Williamsville Road, Mechanic Street, and Route 62.

Winter Storms. Winter ice storms, a regional problem, are expected to be more intense and include more mixed precipitation which is highly damaging to trees, power lines and other infrastructure.

Extreme Temperatures. Wildfires are expected to increase due to the impact of prolonged droughts and extreme heat. Drier forests and wooded areas will be more combustible in drought conditions. Drought will also lead to water shortages that will impact the entire town whether or not residents and businesses rely on the town water supply or have wells.

High Wind. Heavy wind events are a serious concern. The town and the surrounding area have experienced a recent uptick in storms with hurricane-level winds. While this phenomenon can be linked to extreme temperatures and rising precipitation rates, workshop participants felt it was serious enough to be singled out as a hazard. Thus, the fourth hazard is focused primarily on the winds associated with these storms, leaving heavy rain events to be discussed under "Flooding." The workshop participants agreed that different hazards affect the town at different times of the year. Flexibility and comprehensive response by town officials is needed to ensure the safety of the citizens in different hazard situations exacerbated by climate change.

These concerns, which are largely inter-related, are based on data provided by the Massachusetts Climate Clearinghouse as well as watershed-specific data from the Northeast Climate Adaptation Science Center at the University of Massachusetts at Amherst. For the Chicopee River Basin, where Barre is located, projections show an expected increase in precipitation overall, with the greatest increase during winter. The number of days with more than 2" of rainfall, potentially leading to inland flooding, is also expected to increase with the average expected to be close to 15 days by the year 2100 compared with approximately 10 days now. Consecutive dry days and days



above 90 degrees Fahrenheit are expected to increase, leading to drought. Days at the wintery-mix level of cold are also expected to increase, leading to a greater likelihood of freezing rain in the winter. Higher wind in the summer and storm severity increases with warmer temperatures.

SUMMARY OF FINDINGS

Overall, the workshop was received positively by all in attendance. Following the presentations, participants were asked if they agreed with the core team's identification of, in no particular order, flooding, wind events, winter storms and extreme temperatures as the primary hazards facing Barre. All the participants agreed that these four hazards were the most relevant for Barre. The Town's public buildings and emergency management systems were described as strengths, along with the open spaces and recreation fields. Relationships between the Town and local churches and business were considered to be an overall strength for the town. Budget and tax burden were considered a vulnerability and a barrier to funding potential action items. Areas in and around the South Barre Village are considered vulnerable. The Barre Wool Mill and the Mill's associated canal and dam is a safety and public health hazard. The possibility of filling in the canal to create a green space was discussed, with a majority of support from the participants.

Another area that was widely seen as prospect for a restoration project was the former Miller's Beach. Miller's Beach is located on Powder Mill Pond, but has been closed for years due to contamination from the Ware River and a garbage dump that is directly across the pond. Other vulnerable areas mentioned were issues of overall tree health and tree maintenance systems, a lack of stormwater management and the need for back-up power in public buildings. There was extensive concern about the need for a higher level of emergency communication equipment. Recommendations included upgrading emergency communications systems and increasing cellular service throughout the Town.

There was agreement that the Town's water and sewer pumping stations needed to be replaced or upgraded and outfitted with alternate power sources to provide for the expansion of both water and sewer throughout the town. Many asked for the expansion of public education regarding water use, including promoting efficient home appliances, requiring annual inspections of septic tanks, and installing permeable pavements. It was observed that municipal facilities were a prime place for installing solar panels.

Attendees listen to the projected climate change presentation.

All three tables identified specific vulnerable locations that are already in need of attention and will likely face worsening impacts due to climate change. These include the South Barre Bridges, Barre mobile home park, the Barre Wool Mill Canal and Dam, and culverts throughout the town.

Current Concerns and Challenges Presented by Hazards and Climate Change

CMRPC, the MVP planning provider, had the unique advantage of preparing Barre's Hazard Mitigation Plan (HMP), which was adopted by the Town's Board of Selectmen and approved by FEMA in April 2019. Meetings with the MVP Core Team prior to the workshop as well as the HMP helped to identify past climate-related events that significantly impacted the Town. Disaster events of concern included frequent major winter storms (as in 2015 and 2018), ice storms (2008), severe rain events (2005, 2010, 2016), tropical storms (Irene, Sandy), infestations of invasive and otherwise undesirable species (Asian Longhorn Beetle, gypsy moths, aquatic invasive species, ticks), and extended periods of drought (2015 to 2016). Barre has some public water coverage and maintains five well sources. Advisedly, it will be important for the town to maintain a backup and response plan in the event that one or more wells is damaged by drought or storm and cannot be replenished at the prescribed rate of use.

At the workshop, CMRPC staff presented downscaled climate change data provided by Massachusetts's Executive Office of Energy and Environment Affairs (EOEEA) and the Northeast Climate Science Center at the University of Massachusetts, Amherst. Barre lies mostly in the Chicopee River Basin, and should projections for the watershed hold true, by mid-century, annual average temperatures will increase in the range of 3 to 6.4 degrees from the historical baseline. Hot days over 90 degrees will increase from 9 to 30 days annually; days below freezing will fall from, 19 to 38 days annually; annual precipitation will increase from 1.2 to 6.3 inches. Seasonal drought conditions will become more frequent as precipitation becomes more concentrated in extreme intensity events and winter snowpack is reduced. Some of the challenges of these projected changes – many of which are already being observed – were discussed in a presentation at the workshop focused on specific hazards in the Barre area.

Challenges highlighted in the presentations and/or discussed as a group or in the breakout groups:

- In general, attendees cited concerns that climate change will exacerbate problems that are already apparent and the town lacks the resources to address the following comprehensively – flooding and storm water management, vulnerable roads, ecological damage, and vulnerable populations, all within the context of a small community.
- An increase in hot and warm days and decrease in cold days will mean increased need for cooling and less need for heating, especially among vulnerable groups such as children and seniors. This concern was elevated because of the Town's relatively limited formal

shelter capacity and the lack of backup power at the Senior Center, an important resource for many of the town's senior population and other residents.

- Increased temperatures can also be expected to cause changes in the water cycle, leading to more intense rain events. Increased precipitation rates will lead to more frequent and severe flooding in areas outside of designated flood zones defined using historical data – particularly around South Barre Neighborhood and residences along Route 32 which is situated near existing wetlands.

- Increased storm intensity will likely cause more tree damage leading to power outages and road closures, higher peak river flows requiring new approaches to storm water management, and increased erosion of river and brook banks and nearby infrastructure. Severe storms will still likely damage and impact the power lines throughout the town, especially the overhead transmission lines owned and maintained by National Grid. Tree damage will occur from intense wind storms such as recent tornadoes or from heavy snow and ice storms.

- More frequent and severe droughts will challenge water supplies and increase risks from wildfire. Increased risk of wildfire can lead to a wide-range of ecological outcomes including increased damage to human property and life, removal of suitable habitat space, and changes in ecosystem services made available by forest cover.

- Invasive plant and animal species can impact public health through increasing numbers of disease carrying pests (e.g., ticks and mosquitoes) and by damaging key ecosystems such as forests and wetlands, thereby increasing wildfire and flood risks.

As the climate continues to change and natural disasters increase in frequency and strength the need to communicate with residents, businesses, and other institutions. Changing climate will dictate the need for enhanced communications systems and related infrastructure and flexible emergency response and evacuation plans. These flexible response and evacuation plans will be particularly important for the senior citizens who live alone and do not have access to a vehicle.

Vulnerable Areas

The locations in Barre identified by workshop participants during discussion as vulnerable to the hazards discussed include areas adjacent to water bodies, forested areas, roadways that frequently flood, and neighborhoods that are dense and difficult to access in case of emergency.

VULNERABLE AREAS

- Forested Areas
- Barre Wool Mill
- Localized Flooding
- Gaston Pond Dam
- Senior Housing
- Dams

Forested areas throughout town are vulnerable to increasing pressures from heat, drought, and invasive insect species. The aging tree population is of concern for the overall health of the forested area covering most of the Town. Roadside trees are also a vulnerability due to a lack of sustainable tree trimming programs and remove-and-replace programs.

Barre Wool Mill Canal and Dam has been identified as a vulnerable area for a number of reasons. The mill is privately owned and has been closed for several years. The mill's dam and canal system create two bridges that are falling into disrepair. The canal system is also a breeding ground for mosquitos and causes great concerns due to the recent EEE outbreaks. The site of the mill is located is now considered a brownfield site.

Localized flooding was identified along James St., Stetson Rd., Depot Rd. and Williamsville Rd. Higher density rainfall events coupled with undersized culverts are a major contributing factor.

Senior Housing was considered vulnerable by all groups during the breakout sessions. A lack of back of backup power was concerning for many due to the projected longer period of higher temperatures. In addition to better emergency planning, the availability of transportation for, and communications with, the senior population during these times is considered to be a key aspect of resiliency that needs upgrading and rethinking.

Town-wide Dams were of concern to many in attendance, especially the Gaston Pond Dam, Wheelwright Pond Dam, Powder Mill Dam and the Barre Falls Dam. It should be noted that the Town of Barre Conservation Committee recently received a consent order on the Gaston Pond Dam. The dams mentioned were thought to be ideal dams to study for removal or replacement.

Specific Categories of Concerns and Challenges

The following topics were identified by workshop attendees as concerns or challenges related to Barre's changing climate and natural hazards.

Infrastructure Concerns:

INFRASTRUCTURE

- Stormwater Management
- Dams
- Municipal Facilities
- Mobil Home Parks

Stormwater Management

While there is currently no comprehensive stormwater system management plan in Barre, there is a clear recognition of the need. For example, the reconstruction of the Town Common includes stormwater management. The town is not an MS4 community, meaning there is no mandate for them to perform the actions required by the MS4 Permit. This leaves a major gap in stormwater management as well as public education around stormwater best practices. Barre contains a number of brooks, small rivers, and FEMA-designated wetlands throughout the town with the Ware River as the key environmental feature in the southern part of town. With the increase in annual precipitation in the form of heavier and increasingly frequent storms inundating these natural resources beyond their capacity, the town will be faced with greater flooding. In fact, low lying areas already are experiencing flooding during heavy rain storms. The increased volume of storm water runoff will render most culverts inadequate to handle the amount of water. Spillage onto the roads and into developed areas will make streets impassable and cause property damage. Given the uncertainty about the amount of future rainfall, it appears that simply increasing the size of culverts and storm drains may be only a short-term fix. Barre must undertake additional study and planning to implement innovative solutions, such as low impact development (LID).

Municipal Facilities

An increase in the number of climate change-related disasters could damage the town's infrastructure and endanger all those who live in Barre. The community will need buildings and command centers that can effectively store equipment to maintain potential shelters and important departments and services. Additionally, all municipal buildings should be equipped with lightning rods to deflect lightning strikes and be ADA compliant to provide for residents with mobility issues thereby providing access for everyone to these safe shelters. The advisability for setting up microgrids in the Town Center for more efficient early response was discussed at length during the workshop.

According to sources, Barre's municipal buildings, school buildings and first responder sites require generator upgrades in order to produce the backup power required to serve as potential shelters. This limits their use in effectively reacting to severe weather events caused by climate change. Without these upgrades these buildings could be of little use during future natural

disasters. (At present, the Quabbin Region High School is the town's only designated emergency shelter.)

As these shelters could be required year-round, the town must ensure that each is equipped with the tools to respond to all severe weather events and is ready to host residents regardless of the reason. It is also important that these shelters are available in both the northern and southern sections of the town as some events could cause the Ware River to flood and make the South Barre Road Bridge, the shortest north-south link in the town, impassible.

Barre Mobil Home Park

Water Wheel Village is a mobile home park located along Route 122 in the North West section of town. This community depends on its own well system. The community houses some of the town's most vulnerable populations, including senior citizens and residents with mobility issues. Mobile homes are more susceptible to damage during severe storms than traditional houses, and the park is surrounded by woodlands which can become an issue during periods of high wind or extended drought when the threat of wildfires is higher. The location of the park in relation to the town's first responders makes it difficult to provide emergency services during natural hazard events. The majority of these residents have low to moderate incomes, which inhibits their ability to change homes or quickly recover in the event of a major climate event. This will put their health and safety at considerable risk as these events become more frequent in the future.

Societal Concerns:

SOCIETAL

- Felton Field
- Senior Housing
- Former Miller's Beach
- South Barre Apartments

Felton Field

Felton field is a publicly owned recreation facility. The field is home to a soccer field, two baseball fields, three tennis courts, a basketball court and a horseback riding ring. Students who attended the workshop informed us that it is a heavily used space by the town's youth population. It was also noted that there were extremely limited places for shelter from the elements. The field becomes obsolete in the winter when covered in snow and ice. A possible investment in community-based infrastructure like ice rinks, shaded benches and planting of shade trees throughout the park was suggested.

Senior Housing

The town has a number of vulnerable populations that need to be considered when forming emergency preparedness plans. Many local seniors do not have access to a vehicle and live alone. Environmental risks faced by everyone could be even more hazardous to these individuals, and destructive events such as flooding, storms, and longer periods of higher temperatures will require more immediate attention for seniors than other residents. This concentration of vulnerable parties in a potentially dangerous area will require town and emergency response

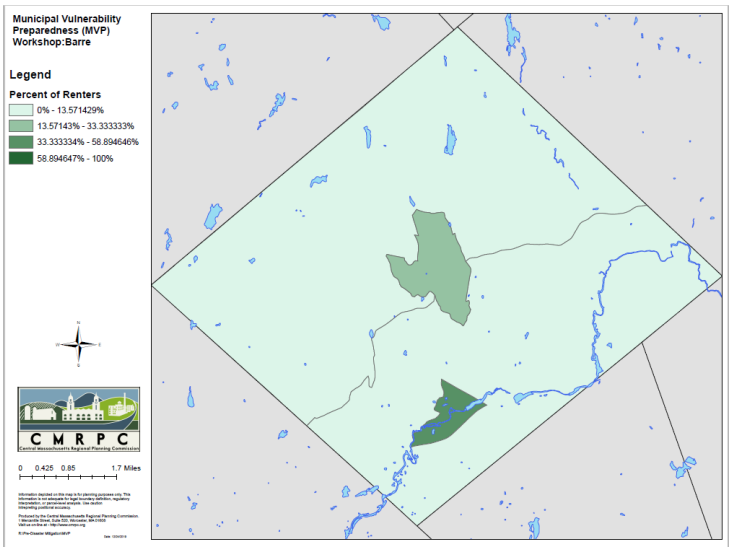
officials to periodically review and update management and evacuation procedures for the community, especially as flooding and wildfires become more common.

Former Miller's Beach

Each table identified the former Millers Beach as a place of missed recreation. The former beach has been shut down due to the close proximity of the dump and contaminant leaching into Powder Mill Pond. For years, the beach was a place of local recreation that is now unusable due to contamination from the dump and the Ware River. With projections of longer and hotter summers, the beach could again become a popular place for residents to cool off during the heat waves.

South Barre Apartments

South Barre presents many challenges with regard to climate resiliency. Most of the apartments in South Barre are former mill employee's aging housing stock. The demographic making up the South Barre population has limited income and means of transportation. With potentially longer periods of higher heat the nearest place of relief is the Senior Center. With no public transportation and possibly no personal transportation, a resident would have to walk nearly a mile to the Senior Center to be provided relief from the heat or protection from another type of weather-related disaster. Other concerns in the area are the Old Mill brownfield site, its problematic canals, and limited access to open space and recreation.



Environmental Concerns:

ENVIRONMENTAL

- Barre Wool Mill
- Former Miller's Beach
- Farmland Conservation
- Pesticide and Fertilizers
- Brownfield Mitigation
- Barre Transfer Station and Dump

Barre Wool Mill

The site of the former Barre Wool Mill is an environmental concern for multiple reasons. The mill is privately owned and is no longer in use. When the mill was operational, a dam and canal system was created. The canals and dam no longer serve the intended purpose. The canal system is becoming a breeding ground for insects, such as mosquitos, raising the concern for the spread of disease. The canal system also becomes a place for debris to build up and is constantly in need of resources to remove debris to prevent flooding. Past illegal dumping of the Mill's waste products on the property is worrisome due to concerns about this polluted water leaching back into the Ware river and public water supplies.

Former Millers Beach

Millers beach was once a thriving state-owned beach located on Powder Mill Pond. The beach has been closed to the public for many years, but still lingers in the memory of the middle-aged population in town. Contamination from a combination of the Ware River and the local dump, which is improperly capped, has led to the beach becoming abandoned. Having little to no control of what happens upstream on the Ware River and no ownership of the beach creates an obstacle to the Town's taking action to revitalize the beach and recreation facility.

Farmland Conservation and Chemical Usages

Barre has a substantial number of farms throughout the town. With each farm using fertilizers and pesticides, there is a growing concern for water contamination. With no policy or by-laws in place it is challenging to reduce or encourage alternate fertilizers and sprays.

Brownfield Mitigation

There are four DEP mapped 21e sites in South Barre, two of which are known or suspected brownfield sites. One site in particular is the previously mentioned Barre Wool Mill site. The mill site is a potential candidate for brownfield site grants. Challenges for cleanup arise due to private ownership of the property. The former Barre landfill, (locally known as the "old dump") located on Town Farm Road, is another potential site for cleanup and reuse. The "old" landfill is publicly owned, but funding the cleanup and reuse of the site is currently an obstacle. Due to its industrial history, other brownfields may be present in Barre, especially near railroad rights of way and rivers.

Barre Transfer Station and Dump

The transfer station and dump are a publicly owned and privately-operated facility, located along the banks of Powder Mill Pond. A man-made dam along the Ware River created the Powder Mill

Pond. The dump is riddled with drainage issues causing contamination of the pond and river. As stated before, the contamination issues have caused the closing of Miller's Beach.

Current Strengths and Assets

Barre has taken some steps to address natural hazards and climate change over recent years. Public opinion holds that the work that town officials have completed over the years, and their plans in the area for the future are a "societal strength" that will protect and strengthen the Barre community. Perceived environmental strengths focused mainly on the large and diverse number of natural resources that Barre residents can use and highlight now and in the future.

Infrastructure Strengths:

Municipal Buildings

Though some municipal buildings are aging, each building is able to provide services to the community. The Henry Woods building is host to town government, veterans' services, the teen community center and a multitude of other local services. The Senior Center and Library are staples in the community providing services needed on a daily basis. Communication among these centers is recognized as paramount and is executed at a high level to keep both employees, residents and surrounding communities informed. The current systems that are in place, such as social media, are great starting points and have the potential to grow.

INFRASTRUCTURE

- Municipal Buildings
- Public Safety

Public Safety

The town's emergency responders are highly trained and have the ability to quickly and safely respond to most events. The town is equipped to handle almost any situation related to the changing climate and has the ability to call upon local mutual aid when needed. In the case of a significant catastrophic event, Barre also has the ability to call upon the region's resources for specialized equipment.

Society Strengths:

Places of worship

Barre's places of worship provide services to members of the community. They also serve as networking and information sharing facilities. Many of the places of worship are prepared to assist the town and its residences during times of crises.

SOCIETAL

- Places of Worship
- Shelters
- Felton Field
- Barre Players Theater

Shelters

The Quabbin Regional High School serves as the large-scale sheltering site. The Senior Center, Library and Henry Woods building also serve roles as heating and cooling stations.

Felton Field

Felton Field is the largest place for active recreation in the town. The baseball and soccer fields are host to the community youth sports leagues. The basketball and tennis courts provide a space for both young and old members of the community to engage with one another. The field is also host to many large communities and 4H events throughout the summer.

Barre Players Theater

The Barre Players Theatre is a local non-profit organization hosting four productions a year. The theater also provides summer programming for youth and scholarships to graduating high school seniors. In a time of need, the theater, which is located in the town center, provides air conditioning, and is ADA accessible. The Barre Players Theater is a favorite for community meetings, in addition to its major role as a play house.

Environmental Strengths:

Central Mass Rail Trail

The Central Mass Rail Trail provides year-round outdoor recreation to residents and visitors to Barre. The trail promotes health and wellbeing along with environmental education.

ENVIRONMENTAL

- Central Mass Rail Trail
- Ware River Watershed
- Farmland and Forrest

Ware River Watershed

The Ware River Watershed is partly DCR owned land and is the watershed that provides most of the water to the MWRA diversion facility in Barre. The site serves as an education and recreation facility.

Farmland and Forest

In Barre, approximately 73% of the total land is forested. The forest is made up of town owned and state-owned properties. The fire department is equipped with some specialized equipment to combat any wildfires. The State and public forest provides year-round recreation for all to enjoy. Farmland was described as an integral part of Barre's infrastructure, society, and environment. There are 99 farms in Barre and these spaces provide local produce and help connect miles of wildlife habitat. Some of the most prominent farms in Barre are Carter Stevens Farm, Chase Farm, Many Hands Farm, Hartman's Herb Farm, Chabot Farm, Carl Lambs Farm, Dewhamel Farm, Angelista Farm, and Hillside Farm.

Recommendations to Improve Resilience

Workshop attendees at each table took the next step in completing the CRB Matrix by suggesting actions that would address vulnerabilities, or further bolster strengths they identified. The following actions are compiled from the matrices from all three tables at the Barre MVP Workshop. The completed Matrix for each table can be found in Appendix B of this document.

Infrastructure Actions

Improved **management of existing utilities** within town will be critical in building resilience. Tree branches and vegetation along roadways and powerlines should trimmed be more frequently.
And areas along Routes 122, 32, 62, and 67 are of particular concern. Critical water pipes should be replaced in South Barre.

INFRASTRUCTURE

- Utility Management
- Alternative Power Sources
- Emergency Services

Back-up generators and **alternative sources of power** should be secured for critical services and for vulnerable populations. Areas that could benefit from these secondary power sources are the Barre Mobile Home Park, the Senior Center, the Bradford Apartments, and the Fire, EMS, and Police Departments. It was also recommended to construct solar panels on schools, build a micro-grid for the Town Center, and have an alternative energy source for the private wells, town water, and town sewer.

With increased flooding, storm events, and other crises become more prevalent, providing **emergency communication and services** was identified as a major concern. A sound and reliable emergency communication system should be established, and will be especially beneficial to the town's vulnerable populations. In addition, an evacuation plan should be developed for Barre Mobil Home Park. Barre would also benefit by increasing cell coverage town-wide.

Societal Actions

With a portion of the populations having limited access to vehicles, **expanding transportation** services was seen as a priority town-wide. It was recommended to provide van services to the elderly and disabled populations and to establish transportation to schools and youth services. Emergency transportation in the times of crisis was also discussed.

SOCIETAL

- Expand Transportation
- Community-Based Services
- Emergency Services

Investing in **community-based services** was also discussed in order to build more unity and support. Devoting resources to community events, school volunteering, and even constructing

an ice rink at Felton Field could expand recreational services and opportunities. Additionally, capitalizing on the farm lands and expanding on the local food supply will not only support local business, but it will also provide healthier food options for residents.

In addition to being discussed as an infrastructural concern, **emergency services** were also thought of as a societal concern. Overall, participants discussed wanting to improve emergency communication. The Stetson School and the Insight Mediation Society retreat center are two isolated groups. This isolation, coupled with their potentially limited knowledge of the town and geography, was a concern for attendees. Emergency plans should be shared with the Stetson School and the Insight Mediation Society so that they are better prepared in times of crisis. Shelter protocol should also be established with churches throughout town.

Environmental Actions

ENVIRONMENTAL

- Resource Management
- Open Space Improvements

Participants felt that **natural resource protection and management** was lacking in town. Implementing Natural Resource Protection Zoning (NRPZ) will be able to provide regulatory protection to environmental resources and open space in town. Banning or reducing dangerous pesticides can help prevent neonicotinoids from negatively impacting bees and other pollinators in town. Creating a pollinator friendly policy or bylaw is recommended to enhance potential conservation measures. In addition, establishing a Public Shade Tree Committee that could perform a tree study could help the town identify at-risk trees and areas in need of regular trimming maintenance. Back roads that have many "widow maker" trees will benefit from a study that could advise debris management

Farmlands, forests, and land stewardship were thought of as strengths of the town. However, Barre could benefit from some **open space improvements**. The Barre Wool Mill and Rich's Pond were two areas of environmental concern. The canals and dams are no longer functioning properly at these two locations, causing insects to gather and debris to buildup. It was recommended to fill these canals, remove their bridges, and turn these areas into parks. These parks could be used to increase the connectivity of trails in town. Another area that could be improved upon is the former Miller's Beach. Revitalizing Miller's Beach and returning it to public use could expand on recreation opportunities in Barre.

Top Recommendations

TOP RECOMMENDATIONS

- Miller's Beach Restorations
- Barre Wool Mill Canal Greenspace and Rail trail Connector
- Low Impact Development Bylaw
- Emergency Planning

Prioritization of recommendations was achieved through four steps: 1) informal discussion at each breakout table during the workshop; 2) voting using stickers placed on the participant's table's CRB matrix. Each attendee was given five stickers to select his/her top priority actions, with at least one sticker required to be used for each general topic area; 3) summaries were given from each table to the full audience to discuss and discern consensus priorities; and 4) final review and reconciliation of duplicate priorities. Several tables mentioned similar concerns and suggested similar ways to address them, but each table had a unique perspective on the challenges Barre faces. These recommendations were organized on a large sheet to enable participants to see the overlap between tables and to learn about suggestions not discussed at their table.

The top recommendation for Societal Actions is to continually build upon Emergency planning. Environmental Actions resulted in a tie with ten votes each. One action is to complete a feasibility study, an engineering study and an assessment of the possibility of the **Barre Wool Mill Canal Greenspace and Rail trail connector**. The other is to work towards implementing **Low Impact Development (LID)** in to the town bylaws and to create a comprehensive stormwater system. Similarly, the top priority for Infrastructure is to restore **Miller's Beach** as a public recreational facility.

MVP workshop participants voted for their top action items; this helped prioritize items in the final report.

At the end of the workshop, Peter Peloquin thanked attendees for giving their time and attention, and announced several of the actions with the most votes. The following top recommendations were compiled based on those actions reported out by each table and those actions that participants voted for. Actions are organized by priority and project type.

Community Resilience Building Risk Matrix

Priority Level	Infrastructural	Summary of Actions
High	Power Supply	Trim tree branches by power lines; Back-up generators and alternative power source (i.e. solar) for critical services and for housing of vulnerable populations such as mobile home park, Senior Center/housing, and LI housing;
	Emergency and Communication Services	Back-up generator for Fire, EMS, and Police Department; Establish emergency communication system; Increase cell coverage
	Water, Sewer, and Stormwater	Replace critical water pipes in South Barre; alternate energy source for private wells, town water and sewer; monitor water quality in town wells; promote water efficient appliances; Public education and assistance for yearly inspections; address sewer leaks; improve current facility, expand sewer network; consider alternative sewage treatments. Improve/redesign James and Stetson St. culverts. Remove/relocate beavers.
	Municipal Facilities and Resources	Micro-grid/resiliency hub for Town center; Back-up generators; Solar panels on schools; permeable paving in parking lots.
Medium	Dams	Remove Wheelwright Pond Dam; Replace Gaston Pond Dam; Possibly remove/rebuild dam at Old Reservoir
	Roadways and Bridges	More frequent tree trimming and vegetation management on Rtes. 122, 32,62, and 67
	Housing	Establish evacutation area for Barre Mobile Home Park; Back-up generator for Bradford Apartments.
Low	Private fuel providers (EP Wine, RJ McDonald, Bentley; Gas Stations)	Monitor quality and usage; Develop cleanup plans;
Priority Level	**Societal**	**Summary of Actions**
High	Elderly and disabled populations	Back up generator/solar power for Senior Center and group homes; Provide van services; Improve emergency communications
	Health Care Services	Plan for emergency services and supplies, emergency transport
	Schools and Youth Services	Share emergency plans; update communications, transport, shelters, volunteer hours;
Medium	Religious/spiritual institutions	Establish shelter protocol with churches, IMS; tree planting and maintenance; restoring headstones in cemetery
	Agriculture and local food/other businesses	Expand local food supply; engage businesses in planning efforts and increase communication
	Recreational Services/Opportunities	Invest in community-based services and infrastructure- ice rink, community events, student volunteers
Priority Level	**Environmental**	**Summary of Actions**
High	Improvement of health and accessibility of water bodies and waterways	Miller's Beach- Work with state to address impairments, return to public use, and create boat access for recreation and emergency. Reassess boundaries of Ware river watershed; Increase setbacks for wetlands and flood plains;
	Stormwater Management	Incorporate Low Impact Development (LID) across Town, and create more open space for stormwater and recreation
	Natural Resource Protection/Management	Implement Natural Resource Protection Zoning (NRPZ); Ban/reduce dangerous pesticides; Polinator-friendly policy or bylaw; Tree Study; Establish Public Shade Tree Committee; Species reintroduction; Establish bat rookery;Educate about farmland conservation and put conservation policies in place.
Medium	Hazardous site/material management	Evaluate Barre Wool site and remove building; Soil testing in old mill areas; Establish debris management plan; Study environmental impacts at Barre Dump/Transfer Station, capture methane and fix drainage issues.
	Increase/Improve open space areas	Barre Wool Canal System and Rich's Pond - Fill in canals, remove bridges, and turn into parks; Increase connectivity of trails

APPENDIX

A. Recommended Actions Reported Out
B. Agendas and Sign-in Sheets
C. MVP Program Information
D. Workshop Base Maps
E. Workshop CRB Risk Matrices
F. Photographs of CRB Risk Matrices
G. Photographs of Workshop CRB Maps
H. Workshop Presentation
I. Listening Session Presentation

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Barre Municipal Vulnerability Preparedness (MVP)
Pre-Kickoff Meeting

Date/Time: **August 28, 2019 10 AM**
Location: **Barre Town Hall, 40 West Street, Barre, MA 01005**

AGENDA

- Introductions
- MVP Program Background
- Roles & Responsibilities
  - CMRPC
    - Organize and lead Core Team meetings
    - Organize and lead workshop, including preparation of presentations and other materials (maps, handouts, etc.)
    - Organize and lead public listening session; assist with outreach
    - Prepare and submit summary of findings report
  - Town
    - Assemble Core Team (participates in prep meetings, workshop and listening session)
    - Identify stakeholder to invite to workshop and lead invitation/RSVP process
    - Lead outreach for public listening session
    - Provide feedback on summary of findings report
    - Grant reporting and documentation of in-kind match
- Workshop Agenda/Structure
  - Welcome speaker(s) (Town)
  - Content speakers (CMRPC)
  - Table facilitators (generally Town or other local stakeholders; CMRPC will assist)
  - Table reporters (Town or other local stakeholders)
  - Scribes (generally students/seniors)
  - Food (can be funded through grant)
- Nuts and bolts
  - Workshop location options
  - Estimated date

Other/next meeting:

C M R P C
Central Massachusetts Regional Planning Commission

Meeting Name: MVP Pre-Kickoff Community: Barre Location: Town Hall

Date: August 28, 2019 Meeting Time: 10AM

Participant Name	Organization	Title	E-Mail
Andrew Golas	Barre	Town Admin	
PETE PELOQUIN	CMRPC	ASSOCIATE PLANNER	

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Barre Municipal Vulnerability Preparedness (MVP)
Kickoff Meeting

Date/Time: **September 25, 2019 10 AM**
Location: **Barre Town Hall, 40 West Street, Barre, MA 01005**

AGENDA

- Introductions
- MVP Program Background
- Core Team Timeline
  - Core Team Meetings 1 and 2
  - Pre-Workshop call and Workshop
  - Listening Session
- Workshop Agenda/Structure **November 14th Town Hall**
- Workshop roles & responsibilities for CMRPC & Town
  - Welcome speaker(s) (Town)
  - Content speakers (CMRPC)
  - Table facilitators (Town w/ CMRPC support)
  - Table reporters (Town)
  - Scribes (Town)
- Nuts and bolts
  - Logistics and IT situation
  - Food
  - Outreach plan(s)
    - Invitations
    - Stakeholders
- Presentations and maps to be developed
  - MVP Program; Climate Change Data; Profile of Local Hazards
  - Barre Base Map; potential reference maps
    - Zoning, Dams, Evacuation Routes and Shelters, Land Use, Water/Sewer Systems, other
- Listening Session
  - Tentative dates **January 7th or 22nd**
- Climate Concerns and Priorities
  - Focus hazards
- Match Documentation
- Other/next meeting **October 16th or 23rd**

Meeting Name: MVP Kickoff | Community: Barre | Location: Town Hall

Date: September 25, 2019 | Meeting Time: 10AM

Participant Name	Organization	Title	E-Mail
Andrew Golas	Town of Barre	Town Admin	AGolas@townofbarre.com
EUSHA MUSGRAVES	ConCom	ASSOCIATE	EMUSGRAVES@CEIENGINEERS.com
Louisa Knowles	Town of Barre	Associate	louisaknowles1@gmail
Elaine Zuese	Town of Barre	Associate	elan2012@gmail.com
James D. Vieira	Barre Fire Dept.	LT	JDVIEIRA@TOWNOFBARRE.COM
Robert Rogowski	Barre Fire	Fire chief / EMD	RRogowski@townofbarre.com
PETE PELOQUIN	CMRPC	ASSOCIATE PLANNER	
Connor Robichaud	CMRPC	Regional Projects Coordinator	CRobichaud@cmrpc.org

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Barre Municipal Vulnerability Preparedness (MVP)
Kickoff Meeting

Date/Time: **October 16, 2019 10 AM**
Location: **Barre Town Hall, 40 West Street, Barre, MA 01005**

AGENDA

- Introductions
- MVP Program Background
- Core Team Timeline
  - Core Team Meeting 2 (today)
  - Pre-Workshop meeting
  - Workshop
  - Listening Session Tentative dates **January 7th or 22nd**
- Workshop Agenda/Structure **November 14th Henry Woods Building**
- Workshop roles & responsibilities for CMRPC & Town
  - Welcome speaker(s) (Town)
  - Content speakers (CMRPC)
  - Table facilitators (Town w/ CMRPC support)
  - Table reporters (Town)
  - Scribes (Town)
- Nuts and bolts
  - Logistics and IT situation
  - Food
  - Outreach plan(s)
    - Invitations
    - Stakeholders
- Presentations and maps to be developed
  - MVP Program; Climate Change Data; Profile of Local Hazards
- Climate Concerns and Priorities
  - Four Focus hazards
- Match Documentation
- Other/next meeting **1st week of November**

CMRPC
Central Massachusetts Regional Planning Commission

Meeting Name: MVP **Community: Barre** **Location: Town Hall**

Date: October 16, 2019 **Meeting Time: 10AM**

Participant Name	Organization	Title	E-Mail
Conner Rohrbach	CMRPC	Reg. Project Coord.	
ELISHA MUSGRAVES	ConCom	ASSOCIATE MEMBER	ESMUSGRAVES@GMAIL.COM
Louisa Knowles	citizen		★ Louisaknowles81@gmail - new email
Andrew Golas	Town	Town Administrator	AGolas@townofbarre.com
Elaine Zuese	citizen	Associates Member	elan2012@gmail.com

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Barre Municipal Vulnerability Preparedness (MVP)
Pre-Workshop Meeting

Date/Time: **November 5, 2019 10 AM**
Location: **Barre Town Hall, 40 West Street, Barre, MA 01005**

AGENDA

- Introductions

- Core Team Timeline
  - Pre-Workshop meeting (today) 3rd meeting
  - Workshop **November 14th Henry Woods Building**
  - Listening Session Tentative dates **January 7th or 22nd**

- Workshop Agenda/Structure

- Climate Concerns and Priorities
  - Four Focus hazards

- Workshop roles & responsibilities for CMRPC & Town
  - Welcome speaker(s) (Town)
  - Content speakers (CMRPC)
  - Table facilitators (Town w/ CMRPC support)
  - Table reporters (Town)
  - Scribes (Town)

- Nuts and bolts
  - Table set up
    - Number of tables
    - Matrix set up
  - Logistics and IT situation
  - Food provider
  - Outreach plan(s)
    - Confirmed guests
    - Invitations
    - Stakeholders

- Match Documentation

- Other/next meeting

Meeting Name: MVP **Community: Barre** **Location: Henry Woods Building**

Date: November 4, 2019 **Meeting Time: 10AM**

Participant Name	Organization	Title	E-Mail
Claire Juess		Core Team	elan2012@gmail.com
Louisa Knowles		Core team	louisaknowles81@gmail
ELISHA MUSGRAVES	ConCom	CORE TEAM	EMUSGRAVES@CEIENGINEERS.com
Andrew Golas	Barre	TA	Agolas@Townofbarre.com
Connor Robichaud	CMRPC		
PETER PELOQUIN	CMRPC	ASSOCIATE PLANNER	

Town of Barre

Municipal Vulnerability Preparedness

Thursday, November 14, 2019

8:30am – 4:30pm; Registration at 8:00 am

Henry Woods Building

40 West Street, Barre, MA 01005

Workshop Objective

- Define extreme weather and climate related hazards;
- Identify current and future vulnerabilities and strengths;
- Develop and prioritize actions; and
- Identify opportunities for the Town to advance actions and reduce risks to build resilience

Workshop Agenda

8:00am – 8:30am Registration, Coffee and Networking
8:30am – 10am:

- Welcome and Overview
  - Elisha Musgraves, Town of Barre
- CRB Overview Presentation
  - Peter Peloquin, CMRPC
- Climate Change Projections and Impacts
  - Mimi Kaplan, CMRPC
- Profile of Natural Hazards
  - Connor Robichaud, CMRPC
- 10am – 12pm
- Breakout Groups – Identify Hazards, Local Features, Strengths & Vulnerabilities

12pm -1pm Lunch

1pm – 4:30pm:

- Presentation *Harvard Forest*
- Breakout Groups – Identify & Prioritize Actions
- Table Reports and priority vote
- Closing Remarks and Wrap up

Thank you for participating in Barre's Community Resilience Building Workshop!

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Central Massachusetts Regional Planning Commission

MEETING NAME:	MVP Workshop
MEETING DATE:	11/14/2019
MEETING LOCATION:	Henry Woods Building, Barre, MA 01005
COORDINATORS:	CMRPC

#	NAME	ORGANIZATION/ADDRESS	SIGNATURE
1	Andrew Golas 1	Town Administrator	
2	John Carbone 2	Police Chief	
3	Robert Rogowski	Fire Chief/EMD	
4	Eileen Clarkson 3	COA Director	
5	Ellen Glidden 1	Town Clerk	
6	Mary Ann Gendron 2	Boards Clerk	
7	Tony Musnicki	Veterans Agent	
8	Cynthia Henshaw 3	Executive Director	
9	Peter Gow 1	Marketing & Outreach Coordinator	
10	Inger Forland	Insight Meditation	
11	Andrew Smith	MVP Coordinator	
12	Elisha Musgraves 2	Conservation	
13	Louisa Knowles 3	Resident	
14	Elaine Zuese 2	Resident	
15	Lauren de la Parra	Coordinator, Shaping the Future of Your Community Program	
16	Zach Koziol	Barre Falls Dam	
17	Laura Nealson	Listening Wellness Center	
	~~Colleen Gray~~		
	PHILIP HUBBARD 3	RESIDENT / BCLT	
	Peter Baker 1	Insight Meditation Society	
	Douglas Martin 2	Barre Planning B.	
	Jeannine Pimental 3	fire / tax collect	
	Paula Barkus 1	assessors / cemetery	
	Louisa Knowles 3	MVP	
	Cynthia Konach 2	QRHS -	

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Central Massachusetts Regional Planning Commission

MEETING NAME: MVP Workshop
MEETING DATE: 11/14/2019
MEETING LOCATION: Henry Woods Building, Barre, MA 01005
COORDINATORS: CMRPC

#	NAME	ORGANIZATION/ADDRESS	SIGNATURE
1	Janet Pierce	CMRPC	Janet A Pierce
2	Mary Markowski 1	Asst Collector	Mary Markowski
3	Sandy Hood 2	Admin Assist.	Sandra L Hood
4	Andrew Smith	EEA	
5	Sheila Muir	QRSD	
6	Riley Scherer	QHRS	
7	Lane Misterka	QRHS	
8	Colin R Brown	QRHS	Colin R Brown
9	Kathryn Heagle	QRHS	
10	Maya Weiderman	QRHS	
11	Lily Franklin	QRHS	
12	PETER PELOQUIN	CMRPC	
13	Jan McElwee	CMRPC	
14	Connor Rosenwood	CMRPC	
15		CMRPC	
16			
17			

Municipal Vulnerability Preparedness (MVP)

Program Information

In September 2016, Governor Charlie Baker signed Executive Order 569, instructing state government to provide assistance to cities and towns in Massachusetts to complete climate change vulnerability assessments and resiliency planning.

The Municipal Vulnerability Preparedness grant program (MVP) provides support for cities and towns to begin the process of planning for resiliency. The MVP program provides support for communities to address the challenges of climate change, and to prioritize climate adaptation practices actions at the local level in order to create a safer and more resilient future.

The state awards communities with funding to complete vulnerability assessments and develop action-oriented resiliency plans. MVP-certified providers across the state have been trained to provide technical assistance in completing the assessments and resiliency plan using the Community Resilience Building Framework. Municipalities work with a MVP-certified provider through a community-led process to identify key climate-related hazards, vulnerabilities and strengths, develop adaptation actions, and prioritize next steps.

The MVP Program is led by a Project Coordinator from the community with a Core Team of town staff and volunteers representing town planning departments, emergency managers, conservation commissioners, economic councils, the business community, and other key stakeholders who care about the future health and resilience of the community.

The MVP program helps communities to:

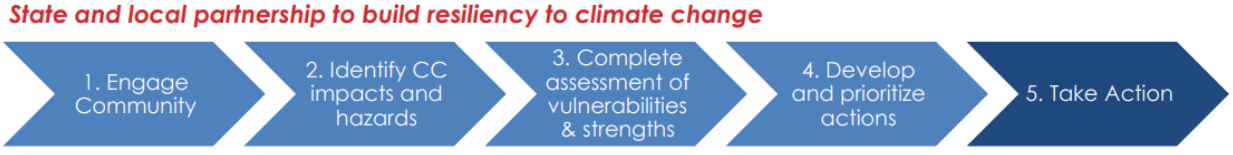
- Define extreme weather and natural and climate related hazards
- Identify existing and future vulnerabilities and strengths
- Develop and prioritize actions for the community
- Identify opportunities to build resiliency and reduce risk

Results of the workshops and planning efforts will be incorporated into existing local plans, grant applications, budgets, and policies in order to ensure that resilience is a community priority. One area of focus will be using the findings to inform Master Plans, Hazard Mitigation Plans, Open Space Plans, and other comprehensive planning processes.

Upon successful completion of the program, communities will be designated as a "*Municipal Vulnerability Preparedness (MVP) Program Community"* and are eligible for MVP Action Grant funding and other opportunities.

All MVP-certified communities will acquire priority status for follow-up state grant funding.

Flip page to learn more about MVP grant opportunities →



Municipal Vulnerability Preparedness (MVP)

Program Information

The MVP Program offers two grant programs for municipalities or groups of municipalities to either

1) conduct community resilience-building workshops and develop resiliency plans, OR

2) for communities that have already completed the MVP process, to implement priority projects.

MVP PLANNING GRANTS

To participate in the MVP program, communities first apply for Planning Grants, *which are used to complete a community-based workshop and prioritize next steps to address climate change impacts.* Applications may be for single communities or may be regional, with a single community serving as the fiscal agent. Municipalities with no current local hazard mitigation plan (HMP), or those with plans expiring in 2019 or 2020 are eligible for additional funding to complete or update a full draft of the HMP for MEMA review. Please note that an in-kind match is required for the MVP Planning Grant. All projects are required to provide quarterly reporting as well as a Final Report. All proposals must provide the following:

- A signed letter of support from the chair of the board of selectmen, mayor, a town administrator, or similar city or town official
- A short statement of the community's commitment to taking on this grant and planning for the impacts of climate change in the city or town
- The name of a qualified employee of the municipality, committee member or volunteer who can serve as the local project manager and point of contact for the grant
- A summary of community support and any project partners and letters of support from all relevant local boards, departments, commissions, businesses, organizations and other partners
- A description of any ongoing planning efforts such as local hazard mitigation plans, open space plans, master plans, etc.
- A description of the community's need to address climate change, expected impacts, and any ongoing climate-change related projects within the community or region
- If the community wishes to expand the scope of the planning grant provide a description of the additional work you intend to complete.

MVP ACTION GRANTS

Already a MVP Community? Apply for an Action Grant to implement priority projects identified at your community workshop and in your resiliency plan. *MVP Action Grants are available only to designated "MVP Communities" to implement key priorities and projects identified through the MVP planning process.* The MVP Action Grants allow municipalities to implement crucial measures to prepare for the effects of climate change while strengthening community engagement and collaboration among town departments.

Applicants may request up to $2,000,000 in funding and awards are expected to range from $25,000–$2,000,000. Regional proposals may request up to $5,000,000. Note that exceptions may be made at EEA's discretion. These projects include follow-up vulnerability assessments, design studies, local bylaws and ordinances, redesigns and retrofits, natural infrastructure and storm protection, and education and outreach. Projects should be proactive, and applicants should clearly demonstrate how the projects have been redesigned, re-evaluated, or reconsidered to better respond to changing climate conditions and to incorporate new climate change data. 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.

Please note that a 25% in-kind/cash match is required for the MVP Action Grant.

Municipal Vulnerability Preparedness (MVP) Workshop: Barre

Reference Map: Table Map

Legend

- Town Boundary
- Town Halls
- EOC
- Local Police
- State Police
- Fire Station
- Schools (Pre-K through High School)

Dams

- High Hazard
- Significant Hazard
- Low Hazard
- N/A

- Major Road
- Local Road
- Active Service Railroads
- Water Bodies
- Streams
- MassDEP Wetlands
- High Slope (15% and above)

FEMA Q3 Flood Zones

- 100yr Flood Zone
- X500

CIH (Points)

- Vulnerable Critical Infrastructure
- Non-vulnerable Critical Infrastructure
- Hazard

- Vulnerable Critical Infrastructure
- Hazard

- Vulnerable Critical Infrastructure
- Non-vulnerable Critical Infrastructure
- Hazard

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0 0.1 0.2 0.4 0.6 0.8 1 Miles

N W E S

Flooding data source: FEMA's Digital Flood Insurance Rate maps(DFIRM). Other data sources include: MassGIS, MassDOT, and CMRPC Information depicted on this map is for planning purposes only. This information is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analysis. Use caution intrepreting positional accuracy.

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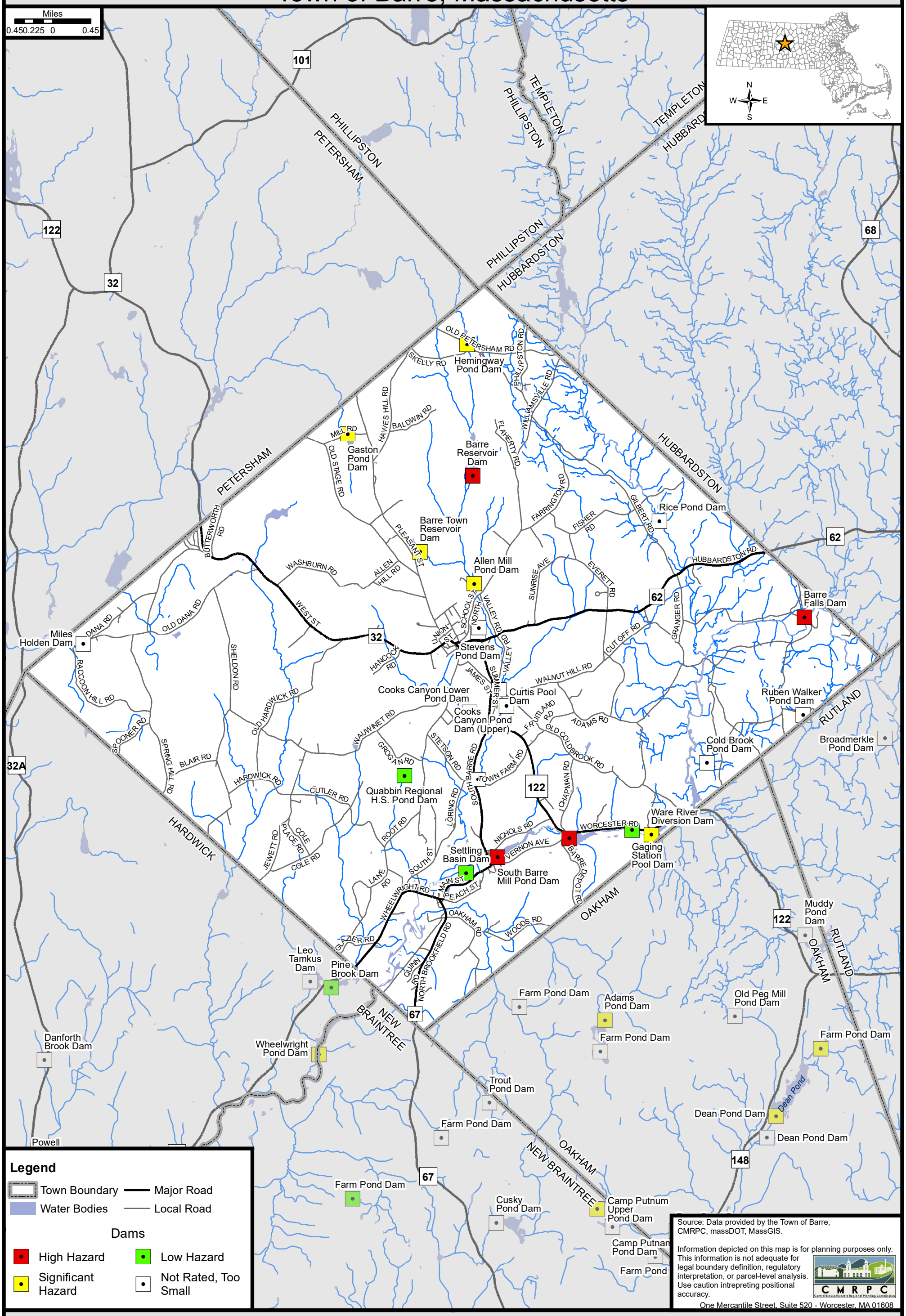
PHILLIPSTON
PETERSHAM
HUBBARDSTON
HARDWICK
NEW BRAINTREE
OAKHAM
RUTLAND
Barre Town
Barre Town Reservoir
Old Reservoir
Moose Brook Pond
Carter Pond
Carter Hill Pond
Connor Pond
East Branch Swift River
Brown Pond
Town Barn Beaver Pond
Quabbin Reservoir
Nichewaug Pond
Raccoon Hill Pond
Lee Cranberry Pond
Pine Hill Brook Pond
Ware River
Powder Mill Pond
Ped Mill Pond
Adams Pond
Dean Pond
Muddy Pond
Natty Pond
East Branch Ware River
Petersham Center School
Petersham Police Department
Hubbardston Center School
Hubbardston Police Department
Ruggles Baine School
Quabbin Regional High School
Quabbin Regional Middle School
Eagle Hill School
Oakham Center
Oakham Police Department
62
122
67
32
148

Date: 11/4/2019 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp_2019\mvpp_021_Table_Map_36x44.mxd

Reference Map: Dams

Town of Barre, Massachusetts



Legend

- Town Boundary
- Water Bodies
- Major Road
- Local Road

Dams

- High Hazard
- Significant Hazard
- Low Hazard
- Not Rated, Too Small

Source: Data provided by the Town of Barre, CMRPC, massDOT, MassGIS.

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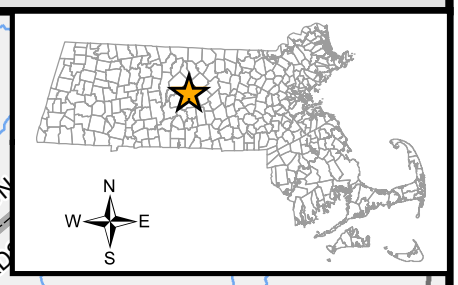
Municipal Vulnerability Preparedness (MVP) Workshop

Date: 10/15/2019 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp_maps\mvpp_ref_Dams_11x17.mxd

Reference Map: Evacuation Routes & Shelters

Town of Barre, Massachusetts

Miles
0.55 0.275 0 0.55



PETERSHAM
PHILLIPSTON
TEMPLETON
HUBBARDSTON
HARDWICK
NEW BRAINTREE
OAKHAM
RUTLAND

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148

Quabbin Regional Mid/hs
Oakham Center School
Forbes Memorial Library
First Congregational Church
Town Hall
Pine Acres Lodge
Camp Putnam
Ruggles Hill School
Town Hall
Congregational Church
New Braintree Congressional Church
Town Hall
Mass State Police Academy
New Braintree Grade School

Dean Pond

Legend

- Town Boundary
- Water Bodies
- Shelter
- Major Road
- Local Road
- Locally Identified Shelter

Evacuation Routes

- Highway
- Secondary
- Primary
- Tertiary

Source: Data provided by the Town of Barre, CMRPC, massDOT, MassGIS.

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Municipal Vulnerability Preparedness (MVP) Workshop

Date: 11/6/2019 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp_2019\mvpp_ref_Evac_Routes_11x17.mxd

Reference Map: Land Use (2016)

Town of Barre, Massachusetts

Miles
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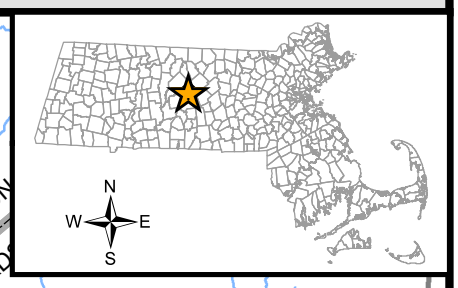

PETERSHAM
HUBBARDSTON
HARDWICK
OAKHAM
RUTLAND
NEW BRAINTREE
PHILLIPSTON
TEMPLETON

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BUTTERWORTH RD
WASHBURN RD
WEST ST
DANA RD
OLD DANA RD
RACCOON HILL RD
SHELDON RD
SPOONER RD
SPRING HILL RD
BLAIR RD
OLD HARDWICK RD
HARDWICK RD
CUTLER RD
JEWETT RD
PLACE RD
COLE
COLE RD
MILL RD
OLD STAGE RD
HAWES HILL RD
BALDWIN RD
PLEASANT ST
ALLEN HILL RD
HANCOCK RD
WAUWINET RD
GROGAN RD
ROOT RD
LAKE RD
WHEELWRIGHT RD
GLAZIER RD
SKELLY RD
OLD PETERSHAM RD
PHILLIPSTON RD
WILLIAMSVILLE RD
FLAHERTY RD
FARRINGTON RD
FISHER RD
GILBERT RD
SUNRISE AVE
EVERETT RD
HUBBARDSTON RD
CUT OFF RD
GRANGER RD
SCHOOL ST
NORTH
VALLEY RD
UNION ST
SUMMER ST
JAMES ST
VALLEY RD
WALNUT HILL RD
FRUITLAND RD
ADAMS RD
OLD COLDBROOK RD
SIETSON RD
SOUTH BARRE RD
TOWN FARM RD
CHAPMAN RD
WORCESTER RD
LORING RD
NICHOLS RD
VERNON AVE
BARRE DEPOT RD
SOUTH ST
MAIN ST
PEACH ST
OAKHAM RD
WOODS RD
QUINN RD
NORTH BROOKFIELD RD
Dean Pond

Source: Data provided by the Town of Barre, CMRPC, massDOT, MassGIS and the Massachusetts Audubon Society.

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Land Use

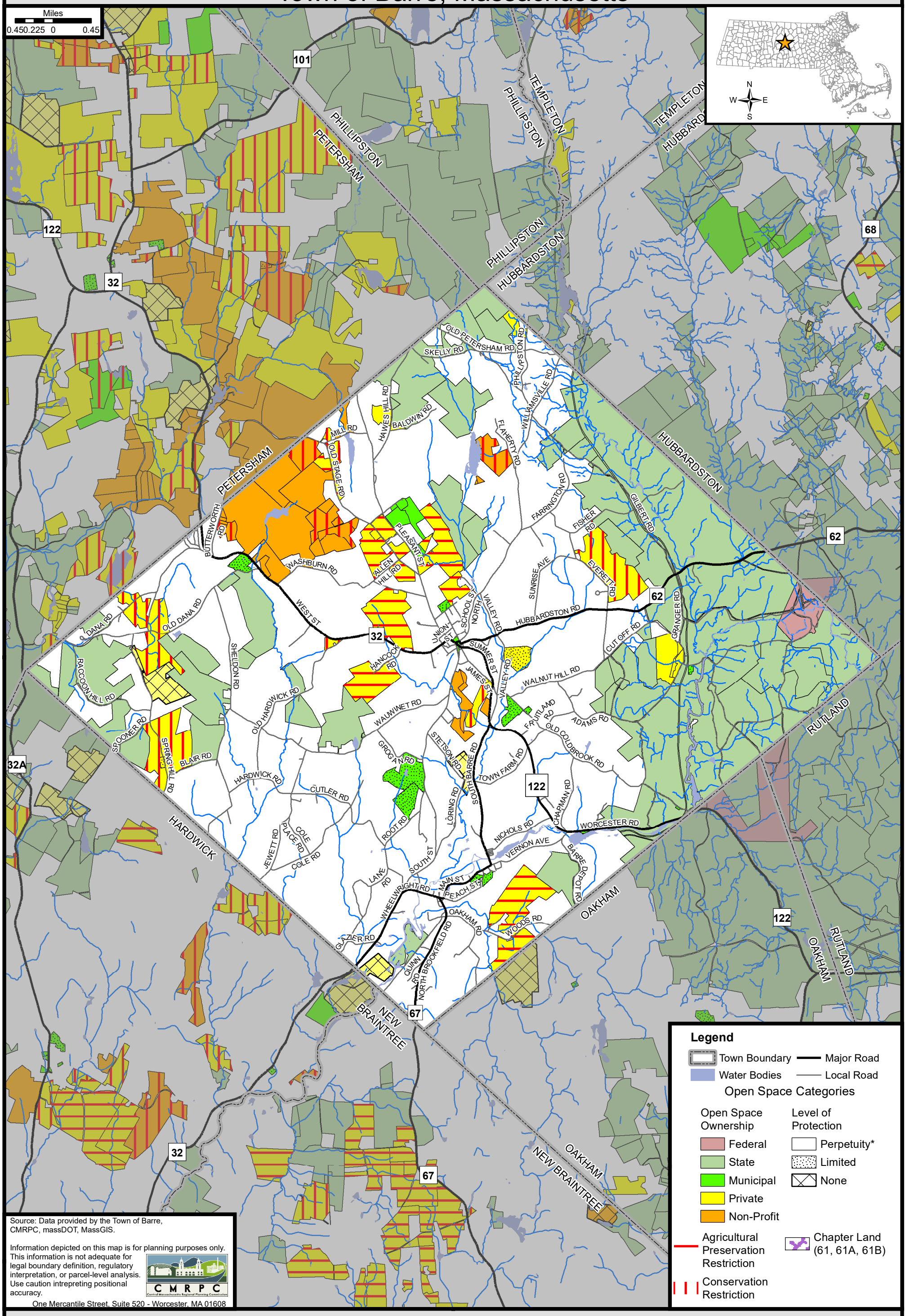
- Residential
- Residential - Multi-Family
- Commercial
- Industrial
- Urban Public/Instit...
- Pasture/Hay
- Cultivated
- Forest
- Scrub/Shrub
- Bare Land
- Forested Wetland
- Non-forested Wetland
- Water
- Unconsolida... Shore
- Aquatic Bed
- Other Impervious
- Developed Open Space
- Right-of-way
- Orchard
- Nursery

Municipal Vulnerability Preparedness (MVP) Workshop

Date: 10/15/2019 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp_maps\mvpp_ref_Landuse_2016_11x17.mxd

Reference Map: Open Space

Town of Barre, Massachusetts



Source: Data provided by the Town of Barre, CMRPC, massDOT, MassGIS.

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Legend

- Town Boundary
- Major Road
- Water Bodies
- Local Road

Open Space Categories

Open Space Ownership	Level of Protection
Federal	Perpetuity*
State	Limited
Municipal	None
Private	
Non-Profit	

- Agricultural Preservation Restriction
- Conservation Restriction
- Chapter Land (61, 61A, 61B)

Municipal Vulnerability Preparedness (MVP) Workshop

Date: 10/15/2019 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp_maps\mvpp_ref_Open_Space_11x17.mxd

Reference Map: Orthophoto (2017)

Town of Barre, Massachusetts

Miles
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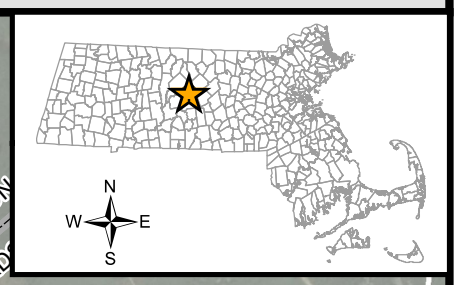

PETERSHAM
HUBBARDSTON
PHILLIPSTON
TEMPLETON
HARDWICK
NEW BRAINTREE
OAKHAM
RUTLAND
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PETERSHAM
PHILLIPSTON
TEMPLETON
HUBBARDSTON
OLD PETERSHAM RD
SKELLY RD
PHILLIPSTON RD
WILLIAMSVILLE RD
HAWES HILL RD
BALDWIN RD
MILL RD
OLD STAGE RD
FLAHERTY RD
FARRINGTON RD
GILBERT RD
FISHER RD
BUTTERWORTH RD
PLEASANT ST
WASHBURN RD
ALLEN HILL RD
SUNRISE AVE
EVERETT RD
WEST ST
SCHOOL ST
NORTH VALLEY RD
HUBBARDSTON RD
GRANGER RD
CUTOFF RD
DANA RD
OLD DANA RD
SHELDON RD
UNION ST
SUMMER ST
HANCOCK RD
JAMES ST
VALLEY RD
WALNUT HILL RD
RACCOON HILL RD
OLD HARDWICK RD
WAUWINET RD
FRUITLAND RD
ADAMS RD
OLD COLDBROOK RD
SPOONER RD
SPRING HILL RD
BLAIR RD
CROCIANI RD
STETSON RD
SOUTH BARRE RD
TOWN FARM RD
HARDWICK RD
CUTLER RD
LORING RD
CHAPMAN RD
WORCESTER RD
NICHOLS RD
VERNON AVE
BARRE ROAD
JEWETT RD
PLACE RD
COLE
COLE RD
ROOT RD
SOUTH ST
LAKE RD
MAIN ST
PEACH ST
WHEELWRIGHT RD
OAKHAM RD
WOODS RD
GLAZIER RD
QUINN RD
NORTH BROOKFIELD RD

Source: Data provided by the Town of Barre, CMRPC, massDOT, MassGIS, Imagery (C) Google.

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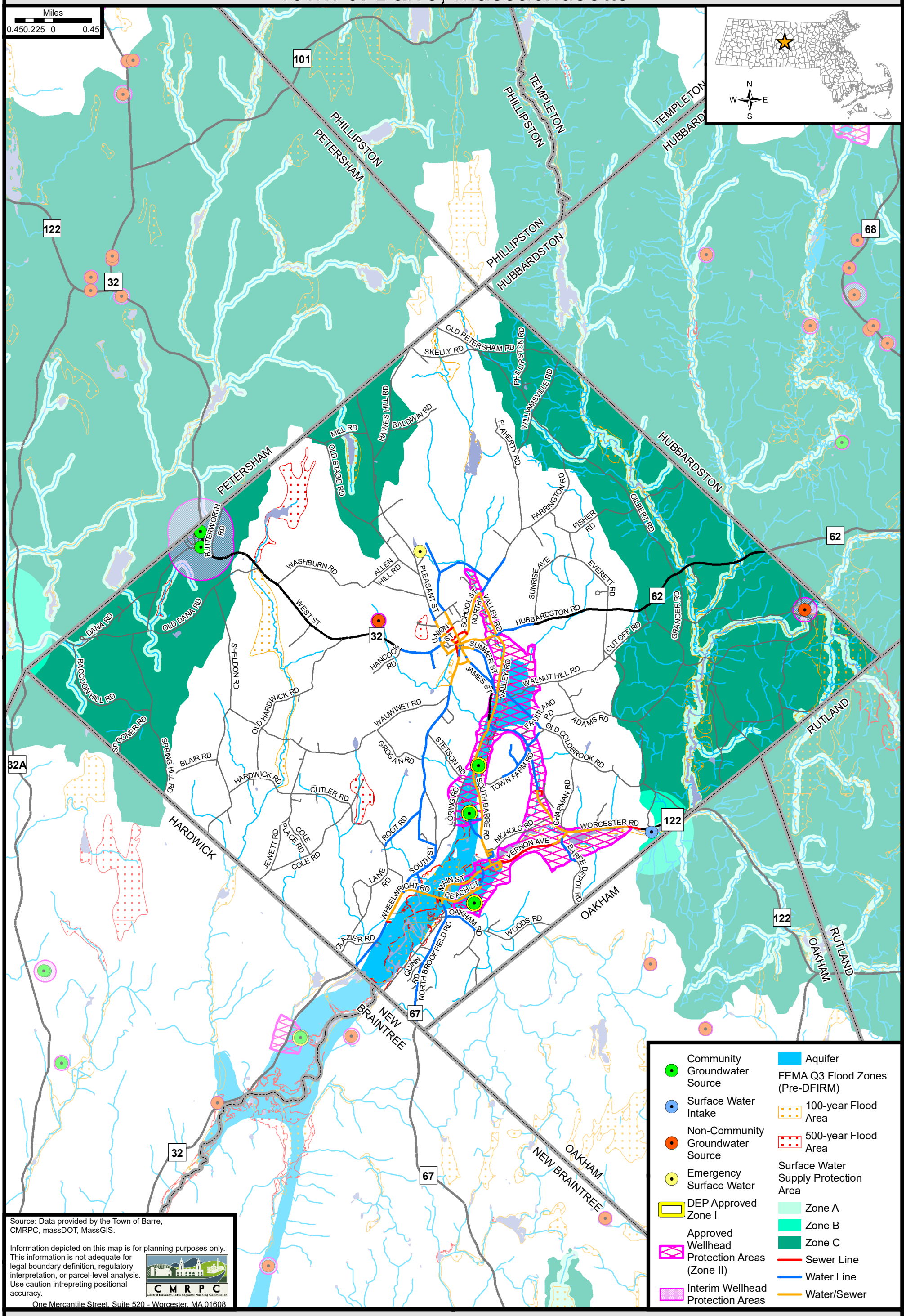
Municipal Vulnerability Preparedness (MVP) Workshop

Date: 11/4/2019 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp_2019\mvpp_ref_Ortho_11x17.mxd

Reference Map: Water Resources

Town of Barre, Massachusetts



Source: Data provided by the Town of Barre, CMRPC, massDOT, MassGIS.

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- Community Groundwater Source
- Surface Water Intake
- Non-Community Groundwater Source
- Emergency Surface Water
- DEP Approved Zone I
- Approved Wellhead Protection Areas (Zone II)
- Interim Wellhead Protection Areas
- Aquifer

FEMA Q3 Flood Zones (Pre-DFIRM)

- 100-year Flood Area
- 500-year Flood Area

Surface Water Supply Protection Area

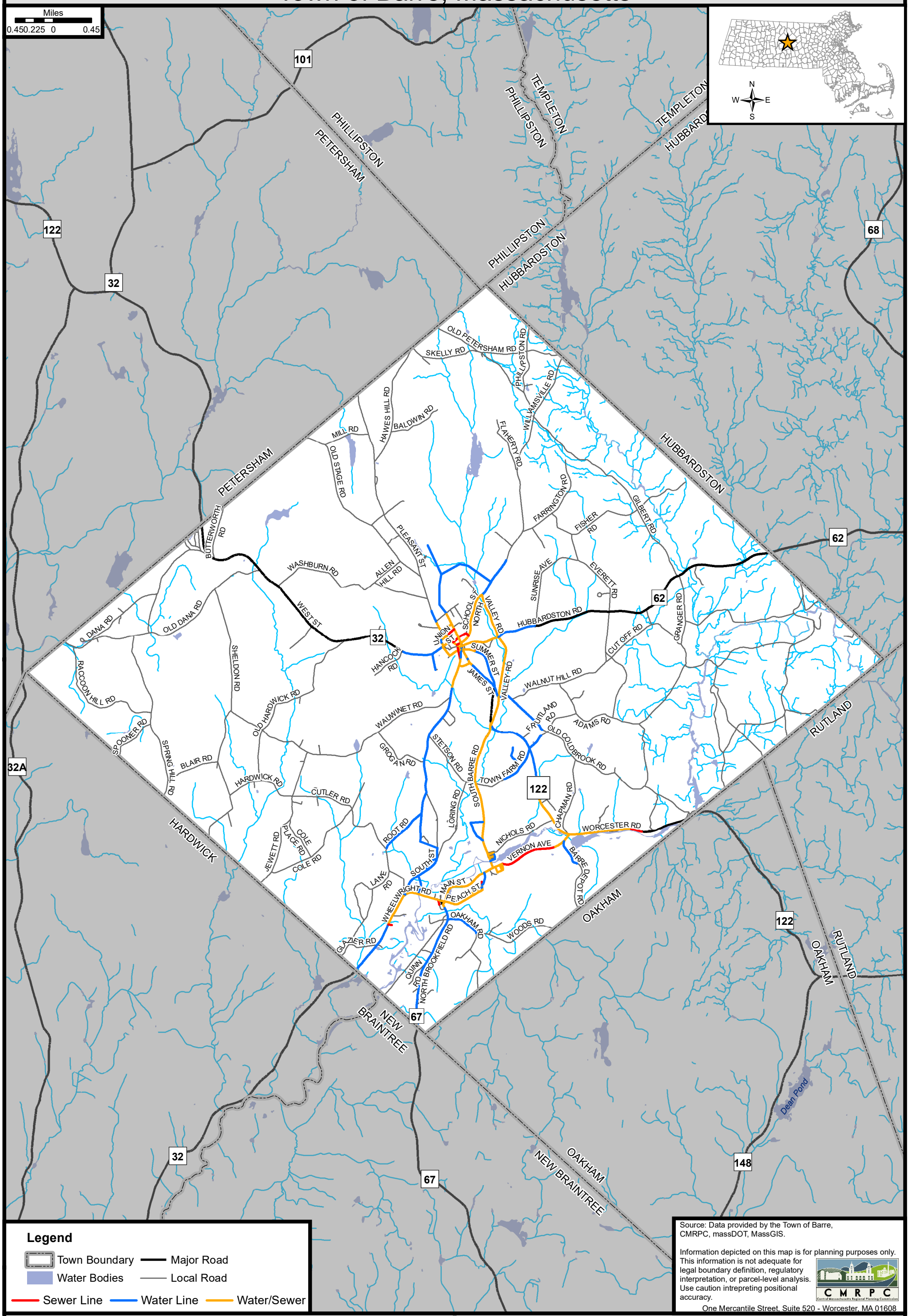
- Zone A
- Zone B
- Zone C
- Sewer Line
- Water Line
- Water/Sewer

Municipal Vulnerability Preparedness (MVP) Workshop

Date: 11/4/2019 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp_2019\mvpp_ref_Water_Res_11x17.mxd

Reference Map: Utility Infrastructure

Town of Barre, Massachusetts



Municipal Vulnerability Preparedness (MVP) Workshop

Date: 10/15/2019 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp_maps\mvpp_ref_Water_Sewer_11x17.mxd

Reference Map: Zoning

Town of Barre, Massachusetts

Legend

Town Boundary
Major Road
Water Bodies
Local Road

Miles
0.450.225 0 0.45
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W E
S

PETERSHAM
PHILLIPSTON
TEMPLETON
HUBBARDSTON
HARDWICK
NEW BRAINTREE
OAKHAM
RUTLAND

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OLD PETERSHAM RD
SKELLY RD
PHILLIPSTON RD
WILLIAMSVILLE RD
HAWES HILL RD
BALDWIN RD
MILL RD
OLD STAGE RD
FLAHERTY RD
FARRINGTON RD
GILBERT RD
FISHER RD
BUTTERWORTH RD
PLEASANT ST
WASHBURN RD
ALLEN HILL RD
SUNRISE AVE
EVERETT RD
WEST ST
SCHOOL ST
NORTH VALLEY RD
HUBBARDSTON RD
DANA RD
OLD DANA RD
UNION ST
SUMMER ST
JAMES ST
CUT OFF RD
GRANGER RD
HANCOCK RD
SHELDON RD
RACCOON HILL RD
WALNUT HILL RD
VALLEY RD
OLD HARDWICK RD
WAUWINET RD
FRUITLAND RD
OLD COLDBROOK RD
ADAMS RD
SPOONER RD
SPRING HILL RD
BLAIR RD
GROGAN RD
STETSON RD
SOUTH BARRE RD
TOWN FARM RD
HARDWICK RD
CUTLER RD
LORING RD
CHAPMAN RD
WORCESTER RD
NICHOLS RD
VERNON AVE
BARRE DEPOT RD
JEWETT RD
COLE PLACE RD
COLE RD
ROOT RD
LANE RD
SOUTH ST
MAIN ST
PEACH ST
WHEELWRIGHT RD
OAKHAM RD
WOODS RD
GLAZIER RD
QUINN RD
NORTH BROOKFIELD RD
Dean Pond

Zoning Districts

- B-C BUSINESS & COMMERCIAL
- B-L LIMITED BUSINESS
- IND INDUSTRIAL
- R-15 GENERAL RESIDENCE
- R-20 OPEN RESIDENCE
- R-80 RURAL RESIDENCE

Source: Data provided by the Town of Barre, CMRPC, massDOT, MassGIS.

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Municipal Vulnerability Preparedness (MVP) Workshop

Date: 11/4/2019 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp_2019\mvpp_ref_Zoning_11x17.mxd

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

Barre Table 1

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	Flooding	Wind	Winter Storms	Extreme Temps	Priority H - M - L	Time Short Long Ongoing
Infrastructural									
Senior Center	5547 S. Barre Rd	Town	Both	Back up generator; van services; Improved communication				H	S
Barre Mobile Home Park	30 Dana Rd	Private-Waterwheel	V	Establish evacuation area				M	O
Cold Brook	864 Old Cold Brook Rd	Private	Both					M	O
Grand View Terrace	146 Ruggles Lane	Town	V	Back up generator				H	L
S. Barre critical water pipes	S. Barre	Town	V	Replacement				H- priority	S
Well Heads	S. Barre Rd.	Town	Both	Review Zoning				L	O
Dams	Townwide	Private and Town	Both	Remove or replace				M	O
Bradford Apartments	39 Main Street	Town	V	Back up generator, alternate power source				H	S
Stetson School	455 South St	Private	S	Back up generator, alternate power source				H	L
Electric Grid	Townwide	National Grid	Both	Trim trees, better communication				H	S/O
Cell Towers		Private	Both	More coverage				M	O
Police Department	South St	Town	S	Micro-grid for town center; Back up generator				L	L
Fire/EMS	School St, Main St.	Town	S	Micro-grid for town center; Back up generator				H	S
DPW	Wheelwright	Town	S	Micro-grid for town center; Back up generator					S
EP Wine	West St.	Private	S						
RJ McDonald	Worcester Rd	Private	S						
WR Bentley	West St.	Private	S						
Rtes 122, 32, 67 and 62	Townwide	State	Both	Vegetation Management;					
Brown's Trucking	337 Valley Rd	Private	S						
Roach Construction	Barre Depot	Private	S						
Palmer Paving	Valley Rd	Private	S						
Henry Woods	West St.	Town	S						

Wastewater Treatment Plant	Wheelwright Rd	Town	Both	Improvement to current facilities; expansion of sewer network; alternative treatments	H	S
Mass Central Railroad	S. Barre Rd.	Private	S			
Transfer Station	Vernon	Town/Private	Both			
Lack of Public Transportation			V	Shared Local Transportation	H	S/O
Societal						
Senior population	Townwide		Both			
Group Homes	West St, South Barre	State and Private	V	Back up Generator; Alternate power source	H	L
IMS	112 Pleasant Lane	Private	S	Back up well	M	S
Ruggles Lane	Ruggles Lane	Town	Both	AC, Backup generator, Solar or Wind Power	H	O
Quabbin HS	800 South St	Town	Both	AC, Backup generator, Solar or Wind Power	H	O
Health Center	Worcester Rd	Umass	S	Emergency Services and Supplies; Emergency transport	H	O
Pharmacy	Worcester Rd	Private	Both	Micro-grid for town center	L	L
Town Hall	2 Exchange St	Town	S			
School Buses	Various	Town	S			
Horse rescue	South St	Private	Both		M	O
Cemeteries	Townwide	Town	V	Tree maintenance, replanting, restoring headstones		
Bank	Common St, summer St.	Private	S			
Gas station	Summer St.	Private	S			
Churches	South St, Vernon St, Main St.	Private	S			
High Tides restaurant	West St	Private	S			
Carter and Stenens Farm	West St	Private	S			
Barre Foods	Summer St.	Private	S			
Village Market	Main St	Private	S			
Funeral Home	S. Barre Rd.	Private	S			
Environmental						
Old Reservoir	Old Worcester Rd	Undetermined	V	Possibly remove/rebuild	L	O
Powder Mill Dam and Pond	Worcester Rd	State	V			
Beaver Dams	Townwide		V	Beaver relocation/removal; Improve culverts	H	S/O

Rail Trail	122 Worcester Rd	East Quabbin Land Trust	S			
State Forest Trail	East Barre	State	S			
Protected forests	Townwide	State/Town/Private	S			
Felton Field	Old Coldbrook Rd	Town	S			
Cooke's Canyon	South St	Private	S			
Barre Falls Dam	Old Coldbrook Rd	Army Corps	V			
Ware River	South and East Barre		Both	Boat access for recreation and emergency	M	S
Rod and gun club	Hardwick	Private	S			
Barre Wool canal system	S. Barre	Private	V	Fill in canals, turn into park, remove bridges		
Rich's pond	S. Barre	Private	Both	Fill in canals, turn into park, remove bridges		
Farms	Townwide	Private	Both			

Table 1

Municipal Vulnerability Preparedness (MVP) Workshop: Barre

Reference Map: Table Map

Legend

- Town Boundary
- Town Halls
- EOC
- Local Police
- State Police
- Fire Station
- Schools (Pre-K through High School)

Dams

- High Hazard
- Significant Hazard
- Low Hazard
- N/A

- Major Road
- Local Road
- Active Service Railroads
- Water Bodies
- Streams
- MassDEP Wetlands
- High Slope (15% and above)

FEMA Q3 Flood Zones

- 100yr Flood Zone
- X500

CIH (Points)

- Vulnerable Critical Infrastructure
- Non-vulnerable Critical Infrastructure
- Hazard

- Vulnerable Critical Infrastructure
- Hazard

- Vulnerable Critical Infrastructure
- Non-vulnerable Critical Infrastructure
- Hazard

C M R P C
Central Massachusetts Regional Planning Commission

0 0.1 0.2 0.4 0.6 0.8 1 Miles

N W E S

Flooding data source: FEMA's Digital Flood Insurance Rate maps(DFIRM). Other data sources include: MassGIS, MassDOT, and CMRPC. Information depicted on this map is for planning purposes only. This information is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analysis. Use caution intrepreting positional accuracy.

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PETERSHAM
PHILLIPSTON
HUBBARDSTON
RUTLAND
HARDWICK
NEW BRAINTREE
OAKHAM
62
122
67
32

TABLE 1
MEMZ

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Backup for Pub Facilities 1

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

Features	Location	Ownership	V or S	Flooding	Extreme Temps	Wind Events	Winter Storms	Priority H-M-L	Time Short Long Ongoing	VOTE
INFRASTRUCTURAL										
Senior Center	5547 South Barre Road	town	V/S	Back up Genuratar, Van serves Improved comunicain oncall nerce				H	S	
Barre moble home park	30 Dana road	waterwheel private	V	establish a avacuation area				M	O	
Cold brook	864 old Cold Brook road	private	V/S					M	O	
group homes	west street South barre wheel wright (Willaims ~~son~~ will?)	1 state rest private	V	Alternet Power solce				H	L	
I, M, S	~~120~~ 112 Plesent lane/ 47 lockwood Road	private	S	Back up Generater				M	S	
grand ~~view~~ terrace	146 Ruggles Lane	town own	V	Back up, well				H	L	
South barre critick water pipes 2	South Barre	town	V	~~RC~~				H	S	
Well heads ~~dams~~	1 South Barre rd	town	V/S	Replacement R				L	O	
dams	town wide	private & town & federal own	V/S	Reveiw Zoneing				M	O	
Bradeford Aparments	39 main street	town Own	V	Remove of Replasment				H	S	
straten School	455 South streets	private	S					H	~~O~~ L	
Eletric grid 3	town wide	national grid	V/S	Trimming trees Better commuacan				H	S O	
Cell towers		private	V,S	more coverage				M	O	
Quabbin acuadute	South Barre	state own	V	~~Aif condion~~				L		
Ruggles Lane	Ruggles Lane	town	V/S	AIC Back up Genurater solar or wind				H	S	
Quabbin HS	800 ~~School~~ South street	town	S					H	O	
Health center	Worcester rd	umass	S	Amergecy Serves And Suppley's Amergecy transport				H	O	
pharmacy	worcester rd	private	S/V	micro grid - Town Center				L	L	
polic department	Suth Street	town	S	Back up Generater				H	S	
Fire EMS DPW	- School street, main street, ~~Whitmanton~~ Wheelwright	town	S/S						S	

Table 1 MIMI

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

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

Features	Location	Ownership	V or S	Flooding	Extreme Temperature	Wind Events	Winter Storms	Priority H-M-L	Time Short Long Ongoing	VOTE
~~SOCIETAL~~ Infrastructure										
E.P Wire	- West St	private	S							
R.J Mcdonalds oil,diesel Construction heating Fuels	- Worcester rd	Private	S							
W.R Bentley	West St.	private	S							
Rt 122, 32&7, 62	Town-Wide	State	S/V	Vegatashen manament Improved & local Bylaws				M	O	
Browns trucking	337 Valley Rd.	Private	S							
Roach construction	Barre depot	Private	S							
Palmer Paving	Valley Rd.	Private	S							
Henery Woods	to West st.	Town	S							
Town Hall	2 Exchang St.	Town	S							
Lack of public transportation			V	Local transportation — Shared				H	S/O	
School buses	Various	Town	S							
Waste-water treatment	Wheelright rd.	Town	V/S	Improvement to current facilities, expansion of sewer networks. alternative treatments				H	S	
Transfer Station	Vernon	Town/private	V/S							

Move to Societal

TABLE 1
MEMI

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

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, sea level rise, heat wave, etc.)

Flooding	Extreme Temps	Wind Events	Winter Storms

Features	Location	Ownership	V or S		Priority H-M-L	Time Short Long Ongoing	VOTE
ENVIRONMENTAL							
old resivor	old worcester rd	Un-determined	V	possible removal/rebuild	L	O	
Powder mill dam and Pond	- worcester rd	State ~~Private~~	V				
Beaver ~~B~~ Dams 2	Town-Wide		V	improve culverts, beaver relocation/removal	H	S/O	
Rail trail	East Quabbin Land trust 122 Worcester Rd. →		S				
State Forest trail	East Barre	State	S				
protected Forests	Town-Wide	State/town/ Private	S				
Felton Field	- old Coldbrook rd	Town	S				
Cook's canyon	- South St	Private	S				
E.P wire	- west Street						
Barre Falls Dam	old Coldbrook rd.	Army core	V				
Ware river 3	South/east Barre		S/V	Boat access for recreation & emergency	M	S	
Rod & gun club	Hardwick	Private	S				
Barre wool canal system 1	South Barre	Private	V	Fill in canals, turn into parks, remove bridges ↓	H	L	
Rich's Pond	South Barre	Private	S/V		H	L	
Farms	Town-Wide	~~Private~~	S/V				

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

TABLE 1
MIMI

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

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, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Flooding	Extreme Temperatures	Wind Events	Winter Storms	Priority H-M-L	Time Short Long Ongoing	VOTE
SOCIETAL										
Senior Population	-evergreen town wide		V/S							
Group homes	- See infastructure									
IMS	See infrastructure									
horse rescue	South ST	private	V/S							
Cemetaries	town wide	town	V	Tree maintenence, replanting, restoring headstones				M	O	
Bank	- common st - Summer st	private	S							
Gas Station	- Summer st	private	S							
churches	- South st - Park st - Vernin st - Main st	private	S							
High Tides (Restaurant)	- West st.	private	S							
Carter & Stevens (Farm)	- West st.	private	S							
Barre Foods	- Summer st.	private	S							
Village Market	- Main st.	private	S							
Railroad	- South Barre rd	private	S							
Funeral Home	South Barre rd.	Private	S							

Move to Societal

Mass Central Group

(1)

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

Barre Table 2

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	Flooding	Wind	Winter Storms	Extreme Temps	Priority H - M - L	Time Short Long Ongoing
Infrastructural									
Private wells and septics	Townwide	private	Both	Public Education/Assistance funds for yearly inspections				H	S
Sewage treatment plant		Town	Both						
Henry Woods		Town	S						
Roads		Town/State	Both						
Electrical Supply		Private- N. Grid	Both						
Fire Station		Town	S						
Gas stations		Private	S						
Shelters		Town, QRSD	S						
Regulatory mechanisms		Town	Both	Ban dangerous pesticides; NRPZ laws				H	S
Barre wholesome market		Private	S						
Restaurants		Private	S						
Barre Family pharmacy		Private	S						
DPW		Town	S						
Cold Brook campground		Private	Both						
Sidewalks		Town							
Barre Plains Theater		?	S						
Millers Beach		State		Coordinate with State to address impairments				H	L
Schools		Town/QRSD		Permeable pavement in parking lot; Solar panels				H	S
Town Hall		Town							
Societal									
Agricultural professionals	Multiple	Private	Both	Town provided educational documents				H	S
Barre Health Center (Umass)	Worcester Rd	Umass	Both						
Senior Center	S. Barre Rd	Town	Both	Emergency/Transportation Planning /Shelter				H	S
Schools	Ruggles Lane, QRSD, Stetson	QRSD, 7 Hills	Both	Share emergency plans, update communications, transport, shelters, volunteer hours					
Daycares	South Street	Private	S						

Senior Housing	Grandview Mobile Park	Private	V	Emergency/Transportation Planning	H	S
Scouts		Private	Both			
IMS		Private	Both	Potential shelter protocol	H	S
Listening Center		Private	Both			
Saint Francis		Private	S			
Stetson School	South St.	7 Hills	V	Share emergency plans	H	S
Fire Department		Town	S	Emergency planning	H	S
Police Department		Town	S			
First Congregational Church		Private	S			
Food Bank		?	S			
Assembly of God		Private	S			
South Barre Apartments		Private	V	Expand shelter locations and education	H	M
American Legion		?	Both			
Felton Field		Town Rec. Comm	Both	Invest in community-based infrastructure; ice rink; community events; student volunteers	H	M
Environmental						
Stormwater system	Williamsville Rd, 62, Barre Falls Dam	Town	Both	Incorporate stormwater BMPs across town (LID)	H	S
Unmanaged overgrowth	62, High Plains	Town, private, state	V	Education and enforcement, debris management, tree study, public shade tree committee	H	S
State forest	Barre Depot	State	Both	Tree study	H	S
Ware River watershed			Both	Reassess boundaries of watershed	M	L
Barre Falls Dam/Dams		State	Both			
Wetland and flood plains			Both	Increase setbacks	H	S
The Dump (old)	Town Farm Rd	Town	V	Increase setbacks	H	S
Transfer station	Barre Depot Rd.	Town	Both	Increase setbacks	H	S
Former Millers Beach		State	V	Return to public use	H	L
Rail Trail		State (DCR)	V	Increase connectivity to other trails; Include public education	H	S

S. Barre contamination (mill area)	Wildwood Reload	Private	V	Increase setbacks, soil testing	H	S

TABLE 4

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

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, sea level rise, heat wave, etc.)

Extreme Temp	Winter Storms	Flooding	Wind Events

Features	Location	Ownership	V or S		Priority H-M-L	Time Short Long Ongoing	VOTE
SOCIETAL							
Agricultural Professionals	Multiple	Private	V/S	Town provided educational documents	H	S	
Barre Health Center (UMASS)	Worcester Rd	UMASS	V/S				
Senior Center	Valley Rd South Barre Rd	Town	V/S	Emergency/Transportation Planning Shelter	H	S	
Schools	Ruggles lane → QRSD QRHS → QRSD Stetson School → 7 Hills		V/S	Share emergency Plans Update communications Transfer ? shelters | volunteer hours			
Day care's	South ST	Private	S				
Senior Housing	Grand view Mobile Park	Private	V	Emergency/Transportation Planning	H	S	
Scouts		Private	V/S				
IMS		private	V/S	Potential Shelter Protocall	H	S	
Listening Center		private	V/S				
Saint Francis		Private	S				
Stetson School	South St 540 People 120 Staff 120 students the rest is faculty	7 Hills	V	Share emergency Plans	H	S	
Fire Department		Town	S	Emergency Planning	H	S	
Police Department		Town	S				
First congregational church		private	S				
Food Bank		?	S				
Assembly of God		private	S				
South Barre Apartements		private	V	Expand Shelter locations & education	H	M	
American legion	South Barre	?	V/S				
Felton Field		Town Recreation comitee	V/S	Invest in community based infrunstructure Ice Rink, community events, student volunteers	H	M	

TABLE 4

Community Resilience Building Risk Matrix

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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, sea level rise, heat wave, etc.)

					Priority	Time	VOTE
					H - M - L	Short Long Ongoing	

Features	Location	Ownership	V or S				
INFRASTRUCTURAL							
Private wells and septics		Private	V/S	Public education assistant funds for yearly inspections	H	S	
Sewage Treatment Plant		Town	V/S				
Henry Woods		Town	S				
Roads	Williamsville Nichols Rd Barre Depot Kendall and James	Town State	V/S				
Electrical Supply		Private Nat'l Grid	V/S				
Fire Station	South Barre Barre Plains School St North	Town	S				
Gas Station	town center	Private	S				
Shelters	QAHS Senior center? Insight medication?	Town QRSD	S				
Regulatory Mechanisms		Town	V/S	Ban dangerous Pesticides NRPZ Laws	M	S	
Barre Wholesome Market		Private	S				
Restaurants		Private	S				
Barre Family Pharmacy		Private	S				
DPW		Town	S				
Cold Brook Campground		Private	V/S				
Side Walks		Town					
Town Hall		Town					
Barre Players Theatre		?	S				
Millers Beach		State		Coordinate w/ State to address impairments	H	L	
Schools		QRSD Town		Pervious in Parking lot Solar Panels	H	S	

TABLE 4

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

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, sea level rise, heat wave, etc.)

				Extreme Temps	Winter Storms	Flooding	Wind Events	Priority	Time	VOTE
Features	**Location**	**Ownership**	**V or S**					**H-M-L**	**S**hort **L**ong **O**ngoing	
ENVIRONMENTAL										
Storm Water System	Williamsville Rd 62 Barre Falls Dam	Town	V/S	Incorporate Stormwater BMPs across town (LID)				H	S	
Unmanged Overgrowth	62 High Plains	Town private State	V	Education & enforcement debris management Tree Study Public shade tree comitee				H	S	
State Forest	Barre Depot	State	V/S	Tree Study				H	S	
Ware River Watershed		-	V/S	Reassess boundries of watershed				M	M/L	
Barre Falls Dam/Dams		State	V/S							
Wetlands and Flood plains			V/S	Increase setbacks				H	S	
The Dump (old)	Town Farm Rd	The town	V	Increase setbacks				H	S	
Transfer Station	Barre Depot Rd	Town	V/S	Increase setbacks				H	S	
Former Millers Beach	town	State	V	Return to Public use				H	L	
Rail Trail	DCR	State (DCR)	V	Increase connectivity to other trails Include public education				H	S	
South Barre contamination (mill area)	Wild wood Reload	Private	V	Increase set backs Soil testing				H	S	

TABLE 4 Common A

Municipal Vulnerability Preparedness (MVP) Workshop: Barre

Reference Map: Table Map

Legend

- Town Boundary
- Town Halls
- EOC
- Local Police
- State Police
- Fire Station
- Schools (Pre-K through High School)

Dams
- High Hazard
- Significant Hazard
- Low Hazard
- N/A

- Major Road
- Local Road
- Active Service Railroads
- Water Bodies
- Streams
- MassDEP Wetlands
- High Slope (15% and above)

FEMA Q3 Flood Zones
- 100yr Flood Zone
- X500

CIH (Points)
- Vulnerable Critical Infrastructure
- Non-vulnerable Critical Infrastructure
- Hazard

- Vulnerable Critical Infrastructure
- Hazard

- Vulnerable Critical Infrastructure
- Non-vulnerable Critical Infrastructure
- Hazard

CMRPC
Central Massachusetts Regional Planning Commission

0 0.1 0.2 0.4 0.6 0.8 1 Miles

N W E S

PETERSHAM
PHILLIPSTON
HUBBARDSTON
HARDWICK
RUTLAND
OAKHAM
62
67
32
122

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

Barre Table 3

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	Flooding	Wind	Winter Storms	Extreme Temps	Priority H - M - L	Time Short Long Ongoing
Infrastructural									
Water Wheel Village Pump	Varney Lane	Private	B (Both)	Suggest alternative energy					
Town Wells	S. Barre, Ruggles Lane	Town	B	Monitor water quality; Water efficient appliances				H	O
Private Wells		Private	B	Alternative energy source				H	O
Septic System		Private	B						
Sewer		Town	B	Develop alternative energy source; Examine issues, leaks				M	
Gas Station (gasoline)	Summer St.	Private	B	Monitor quality and usage; develop cleanup plans					
EP Wine (propane)	West St	Private	B	Monitor quality and usage; develop cleanup plans					
RJ McDonald (oil/gas)	122A	Private	B	Monitor quality and usage; develop cleanup plans					
Bently (oil/pellets)		Private	B	Monitor quality and usage; develop cleanup plans					
Barre Wool Factory	S. Barre	Private (?)	V	Take building down; Brownfield evaluation; Evaluation of what could do with space				H	S/O
Barre Reload (Wildwood Reload)	S. Barre		B						
Allen's Foundry			B						
Emergency Communication System/Reel Code			S						
Gaston Pond Dam	Mill Rd	Town/Private	V	Replace dam and crossing					S
Wheelwright Pond Dam	Hardwick/New Braintree	Raitto Industrial Park	V	Dam removal				H/L	L
James Street	See map	Town of Barre	V	Redesign culvert; Look into changing/fixing drainage				M	S/L
Stetson Road	See map	Town of Barre	V	Redesign culvert				M	S/L
Power Lines		National Grid	B						
Societal									
Senior Housing	Ruggles Lane	Town	B	Install Generator; Resiliency Hub				H	S
Barre Health Center	Worcester Rd	UMASS	S	Solar panels;Battery backups;water efficiency					
Ruggles Lane Elementary	Barre	QRSD/Town	S	Solar panels;Battery backups;water efficiency				H	O
Quabbin Regional	Barre	QRSD/Town	S	Solar panels;Battery backups;water efficiency				H	O
Henry Woods Building	West St	Town	S	Solar panels;Battery backups;water efficiency					
Senior Center	S. Barre Rd	Town	B	Alternate power source				H	O
Town Hall	Exchange St.	Town	S	Water efficient appliances					

Bradford Apartments	Main St	Town	S	Resiliency hub/supply system/alternate power source		
Stonecow Brewery	West St	Private	S	Encourage townwide education/cleanup efforts	M	O
IMS	West St	Private	S	Encourage townwide education/cleanup efforts	M	O
BCBS	Lockwood Rd	Private	S	Encourage townwide education/cleanup efforts	M	O
Water Wheel Village	Dana Rd	Private	B	Encourage townwide education/cleanup efforts	M	O
Listening Center	South St.	Private	B	Encourage townwide education/cleanup efforts	M	O
Farmland Conservation	Barre		B	Local produce to schools etc./Create larger food supply locally/Bylaws	M	O
Emergency shelters	High school and middle school	Town	B			
Barre Business Association	Barre	Town	S	Engage businesses in planning efforts/Increase communication	H	O
Environmental						
Coldbrook Campsite	Coldbrook Rd	Private	S	Encourage Townwide education/cleanup efforts	M	O
Barre Dump/Transfer station	Depot Rd.	Town/privately run	B	Fix drainage issues/capture methane/study environmental impacts and educate public		
Disease vectors	Barre		V	Reintroduce species/Establish a bat rookery	H	O
Ware River	District wide		B	Study the river and what may cause problems	H	S
Barre Falls Dam	Rte 62	ACOE	S			
Cemeteries	Barre	Both	B			
Cookes Canyon	South St.	MAS	S			
Felton Field	Coldbrook Rd	Town	S			
Stone Cow	West St	Private	S			
Brook E1	Williamsville Rd		V	Larger Drainage System	M	L
Gallway Brook	S. Barre Rd		V			
Ware River Watershed	E. Barre	Comm. Of Mass	S			
Spraying of Chemicals			V	Evaluate options and alternatives		
Farmland Conservation			B	Encourage conservation/Put policies in place/Educate about conservation/Best Management Practices	H	O
Neonicitoids			V	Pollinator friendly policy/Bylaw		
Land Stewardship			S		H	O

Municipal Vulnerability Preparedness (MVP) Workshop: Barre

Reference Map: Table Map

Table 3

Legend

- Town Boundary
- Town Halls
- EOC
- Local Police
- State Police
- Fire Station
- Schools (Pre-K through High School)

Dams
- High Hazard
- Significant Hazard
- Low Hazard
- N/A

- Major Road
- Local Road
- Active Service Railroads
- Water Bodies
- Streams
- MassDEP Wetlands
- High Slope (15% and above)

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- 100yr Flood Zone
- X500

CIH (Points)
- Vulnerable Critical Infrastructure
- Non-vulnerable Critical Infrastructure
- Hazard

- Vulnerable Critical Infrastructure
- Hazard

- Vulnerable Critical Infrastructure
- Non-vulnerable Critical Infrastructure
- Hazard

CMRPC
Central Massachusetts Regional Planning Commission

0 0.1 0.2 0.4 0.6 0.8 1 Miles

N W E S

Flooding data source: FEMA's Digital Flood Insurance Rate maps(DFIRM). Other data sources include: MassGIS, MassDOT, and CMRPC. Information depicted on this map is for planning purposes only. This information is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analysis. Use caution interpreting positional accuracy.

Produced by the Central Massachusetts Regional Planning Commission
1 Mercantile Street, Suite 520, Worcester, MA 01608

PETERSHAM
PHILLIPSTON
HUBBARDSTON
HARDWICK
NEW BRAINTREE
OAKHAM
RUTLAND

62
122
67
32

Barre Center Baptist Society
Senior Housing
Flood Zone
Low-income Senior Housing
Pump

TABLE 3

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

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

Features	Location	Ownership	V or S	flooding	extreme ~~weather~~ Temperature	winter storms	wind events	Priority H-M-L	Time Short Long Ongoing	VOTE
SOCIETAL ~~Senior Center~~										
Senior Housing	Ruggles Lane	Town	B	-install generator -resiliancy hub				H	S	
Barre Health Center	worcester road	UMASS	S							
Ruggles Lane Elementary	QRSD ↔ Barre Town		S	solar panels / battery backups / water efficiency				H	O	
Quabbin Regional	QRSD ↔ Barre/Town		S					H	O	
HenryWoods ~~Building~~	west street	Town	S							
ENV Barre Dump/Transfer Station	depot RD.	Town/priv. own	B	fix drainage issues / capture methane - study environmental impacts + educate others publically						
Senior Center	South Barre Road	Town	B	alternate power source				H	O	
Town Hall	exchange street	Town	S	water efficient appliances						
Bradford Apartments	main. st	Town	S	resiliancy hub / supply system / alternate power source						
ENV ~~Cemetaries~~										
ENV ColdBrook CampSite	coldbrook rd.	Private	S	encourage townwide education / cleanup efforts				M	O	
StoneCow Brewery	west st.	private	S							
INS	pleasant st.	private	S							
BCBS	lockwood road	private	S							
Waterwheel village	dana RD	private	B							
Listening Center	south st.	private	B							
~~Mobil Home Center~~										
Farmland conservation	BARRE		B	local produce input to schools etc. create larger food supply locally				M	O	
ENV Disease Vectors	BARRE		✓							
Emergency shelters	high school + middle school	Town	B							
Barre Business Association	BARRE	Town	S	engage businesses in planning efforts / increase communication				H	O	

TABLE 3

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

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, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	flooding	wind	winter storms	extreme temp.	Priority H-M-L	Time Short Long Ongoing	VOTE
INFRASTRUCTURAL										
Water Wheel Village Pump	Varney Lane	Private	B	-Suggest alt. energy						
Town Wells	South Barre Ruggles Ln.	Pub. Town of Barre	B	-Monitor water quality -water efficient appliances				H	O	
Private Wells		Private	B	-Alternative energy source				H	O	
Septic System		Private	B							
Sewer		town	B	Develop alt. energy source Examine issues/leaks				M		
Gas Station (gasoline)	Summer ~~St~~.	private	B	↑						
EP Wind (propane)	West St.	private	B	Monitor quality + useage develop cleanup plans						
RJ McDonald (oil/gas)	122A	private	B	↓						
[redacted] Bently Oil/pellets	[redacted]	private	B							
Barre Wool Factory	S. Barre	Private(?)	V	-Take building down -Evaluate what the space could become -Brown field eval.				H	S/O	
Barre Reload			B							
Allen's ~~Fabric~~ Foundary			B							
Emergency Communication System/ ~~Cool~~ Reel Code			S							
Gaston Pond Dam	Mill Rd	Town/Priv.	V	-Replace dam + crossing					S	
Wheelwright Pond Dam	Hardwick/ New Braintree	Raitto Industrial Park	V	-Dam removal				H/L	S/L	
James St	See map	Barre	V	-Redesign culvert -Look into changing/fixing drainage				M	S/L	
Stetson RD	See map	Barre	V	-Redesign culvert				M	S/L	
Power lines		National Grid	R							

TABLE 3

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V = Vulnerability **S** = Strength

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

				flooding	extreme temp.	wind events	winter storms	Priority	Time	VOTE
Features	**Location**	**Ownership**	**V or S**					H-M-L	Short Long Ongoing	
ENVIRONMENTAL										
Ware River	District wide		B	-Study the river and what may cause problems				H	S	
Barre Falls Dam	Rt. 62	ACOE	S							
Cemetaries	Barre	Both	B							
~~Cold Brook Campsite~~										
Cookes Canyon	South ST	~~MASS~~ MAS	S	[redacted]						
Felton Field	Coldbrook	Town	S							
Stone Cow Brook E1	West St.	private	S							
	Williamsville Rd.		V	-Larger draincage system				M	L	
Galluxy Brook	@S. Main Barre Rd.		V							
Ware River Watershed	E. Barre	Commonwealth	S							
Spraying Chemicals			V	-Evaluate options and alternatives						
Farmland Conservation			B	-Encourage conservation -Education on conservation -Put policies in place -Best Management Practices				H	O	
Neonictitoids			V	-Pollinator friendly policy -Bylaw						
Land Stewardship			S					~~H~~		
Disease Carrying Insects			V	-Reintroduce species -Establish a bat rookery				H	O	

- Emergency Power for Municipal Facilities + Schools
- ~~South Bare Water Pipes~~
- Oversee Nat'l Grid Tree Trimming
- Maintain + Improve Water Infrastructure
- Brownfields Mitigation (2nd)
- ~~Millers~~ Beach Restoration
- Regulatory Mechanisms

Environmental

(2nd) Barre Wool Canal Greenspace + Trails

- Beaver Dam Management

Ware River Boat Ramp

Farmland Conservation

⚠ Stormwater Mgt + LID

Societa

- Cemetary Maintenance
- Engage Business Community of Barre
- Emergency Planning
- Felton Field Events + improvements
- Student Volunteer Engagement (incl)

Community Resilience Building Risk Matrix

Priority Level	Infrastructural	Summary of Actions
High	Power Supply	Trim tree branches by power lines; Consider implementing back-up generators and alternative power sources (i.e. solar) for critical services and for housing of vulnerable populations such as mobile home parks, Senior Center/housing, and LI housing.
	Emergency and Communication Services	Consider implementing back-up generator for Fire, EMS, and Police Department; Establish emergency communication system; Increase cell coverage.
	Water, Sewer, and Stormwater	Replace critical water pipes in South Barre; Employ alternate energy source for private wells, town water and sewer; Monitor water quality in town wells; Promote water efficient appliances; Employ public education and assistance for yearly inspections; address sewer leaks; improve current facility, expand sewer network; consider alternative sewage treatments. Improve/redesign James and Stetson St. culverts. Remove/relocate beavers.
	Municipal Facilities and Resources	Initiate a micro-grid/resiliency hub for Town center; Install back-up generators, solar panels on schools, and permeable paving in parking lots.
Medium	Dams	Remove Wheelwright Pond Dam; Replace Gaston Pond Dam; Possibly remove/rebuild dam at Old Reservoir.
	Roadways and Bridges	Plan for more frequent tree trimming and vegetation management on Rtes. 122, 32,62, and 67
	Housing	Establish evacutation area for Barre Mobile Home Park; Back-up generator for Bradford Apartments.
Low	Private fuel providers (EP Wine, RJ McDonald, Bentley; Gas Stations)	Monitor quality and usage; Develop cleanup plans.

Priority Level	Societal	Summary of Actions
High	Elderly and disabled populations	Install back up generator/solar power for Senior Center and group homes; Provide van services; Improve emergency communications.
	Health Care Services	Plan for emergency services, transport, and supplies.
	Schools and Youth Services	Share emergency plans; Update communications, transport, shelters, volunteer hours.
Medium	Religious/spiritual institutions	Establish shelter protocol with churches; Perform tree planting and maintenance, and restoration of headstones in cemetery.
	Agriculture and local food/other businesses	Expand local food supply; engage businesses in planning efforts and increase communication.
	Recreational Services/Opportunities	Invest in community-based services and infrastructure (ice rink and community events) using student volunteers.
Priority Level	**Environmental**	**Summary of Actions**
High	Improvement of health and accessibility of water bodies and waterways	Miller's Beach- Work with state to address impairments, return to public use, and create boat access for recreation and emergency. Reassess boundaries of Ware river watershed; Increase setbacks for wetlands and flood plains;
	Stormwater Management	Incorporate Low Impact Development (LID) across Town, and create more open space for stormwater and recreation.
	Natural Resource Protection/Management	Implement Natural Resource Protection Zoning (NRPZ); Ban/reduce dangerous pesticides; Polinator-friendly policy or bylaw; Tree Study; Establish Public Shade Tree Committee; Species reintroduction; Establish bat rookery;Educate about farmland conservation and put conservation policies in place.
Medium	Hazardous site/material management	Evaluate Barre Wool site and remove building; Soil testing in old mill areas; Establish debris management plan; Study environmental impacts at Barre Dump/Transfer Station, capture methane and fix drainage issues.
	Increase/Improve open space areas	Improve Barre Wool Canal System and Rich's Pond by filling in canals, removing bridges, and turning them into recreational facilities; Increase connectivity of trails.

TOWN OF BARRE

Municipal Vulnerability Preparedness (MVP)

Community Resilience Building Workshop

November 14, 2019

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AGENDA

1. Welcome
2. Introductions – What has drawn you to this meeting? What is your connection?
3. Workshop Overview (Pete Peloquin)
4. Climate Change Projections, Impacts (Mimi Kaplan)
5. Profile of Natural Hazards & Critical Infrastructure, (Connor Robichaud)
6. Mitigation, Nature Based Solutions
7. Small Team Breakout Step 1 + 2

LUNCH

8. Small Team Breakout Step 3
9. Small Teams Report Back and Vote
10. Wrap Up, Next Steps, Closing Remarks

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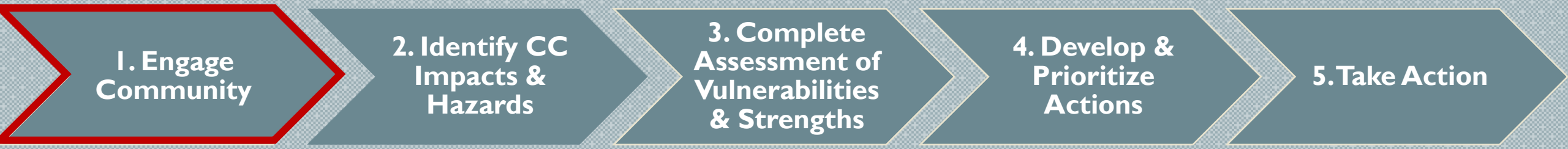
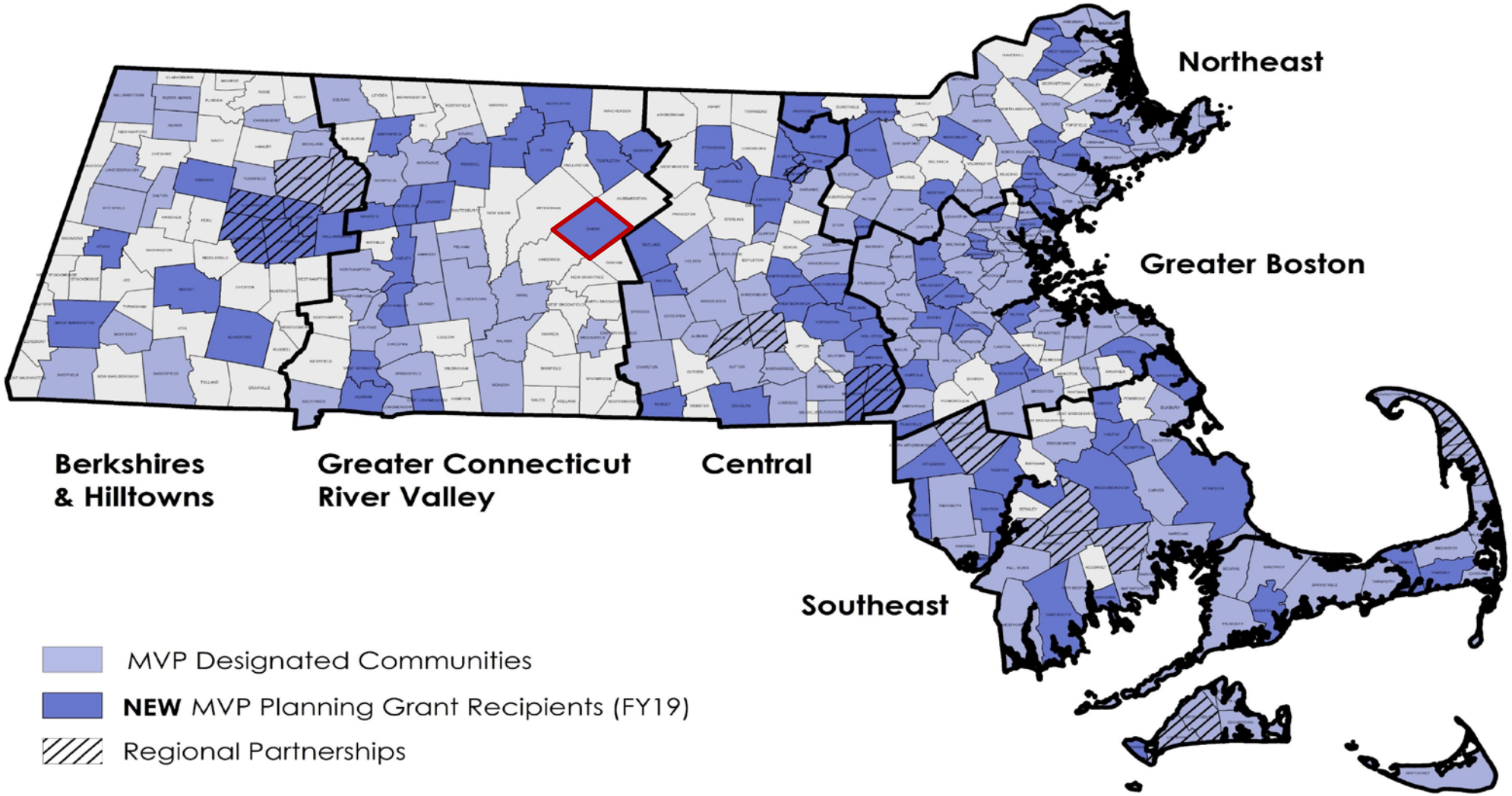
MUNICIPAL VULNERABILITY PREPAREDNESS (MVP)

- State grant program to support cities and towns to begin the process of planning for climate resiliency.
- MVP Planning Process includes CRB Workshop, Report, Listening Session and Annual Reporting
- Communities who complete the MVP Planning Process become certified as an MVP Community
- Designated communities become eligible for MVP Action Grant funding



Municipal Vulnerability Preparedness (MVP) Program



Updated 09-23-2019

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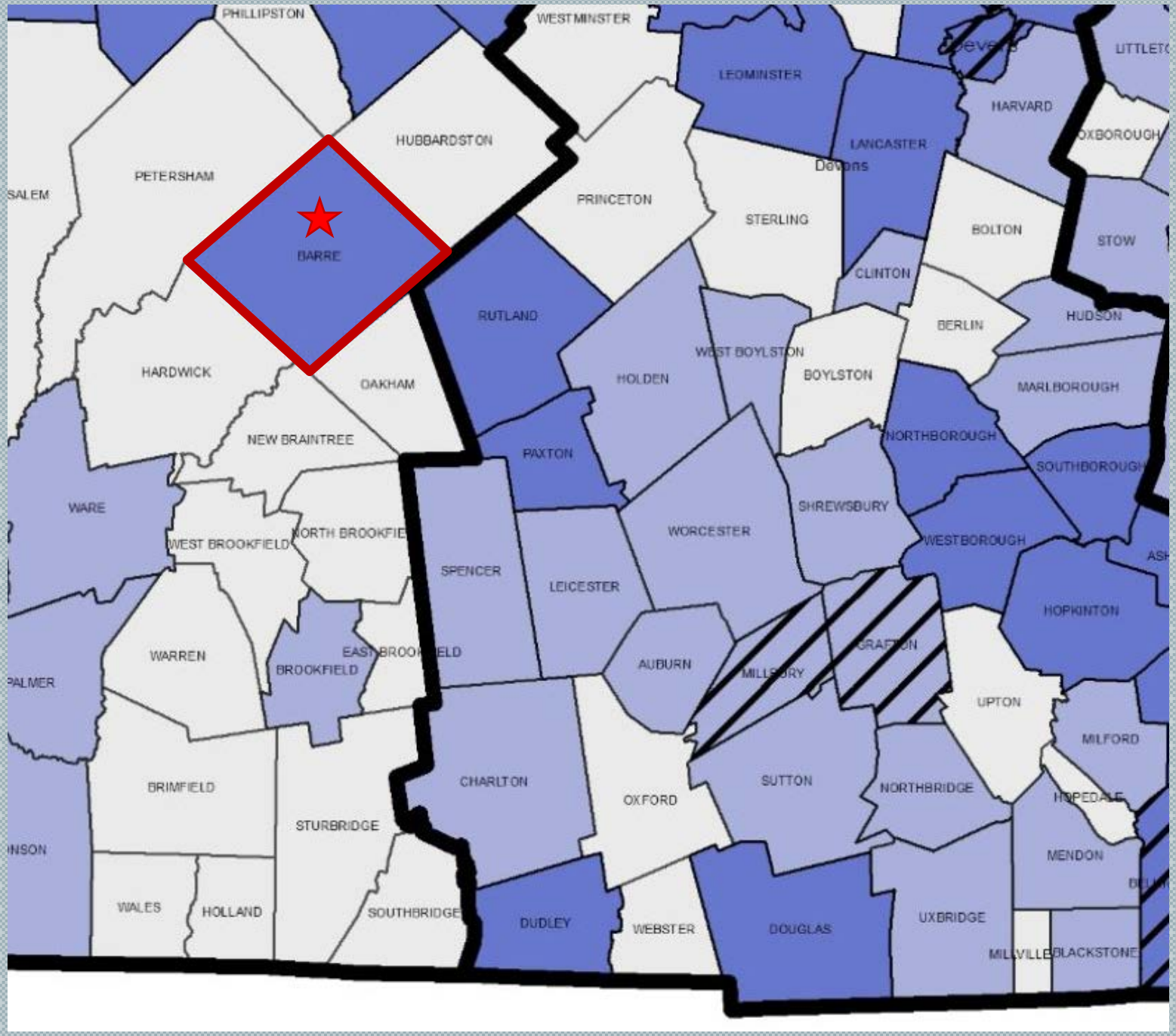

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HOW TOWN GOT HERE?

- Awarded Planning Grant
- Core Team Meeting
- Invitation from Core Team

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COMMUNITY RESILIENCE BUILDING WORKSHOP OBJECTIVES

- Define extreme weather and climate-related hazards
- Identify current and future vulnerabilities and strengths
- Develop and prioritize actions for the community and broader stakeholder networks, and
- Identify opportunities for the community to advance actions to reduce risks and build resilience

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BREAKOUT GROUPS

- Tables of 5-8 individuals
- Three focus sections
  - Infrastructural
  - Societal
  - Environmental
- Tools and Resources
  - Matrix, Maps, Markers, Dots, & Each Other

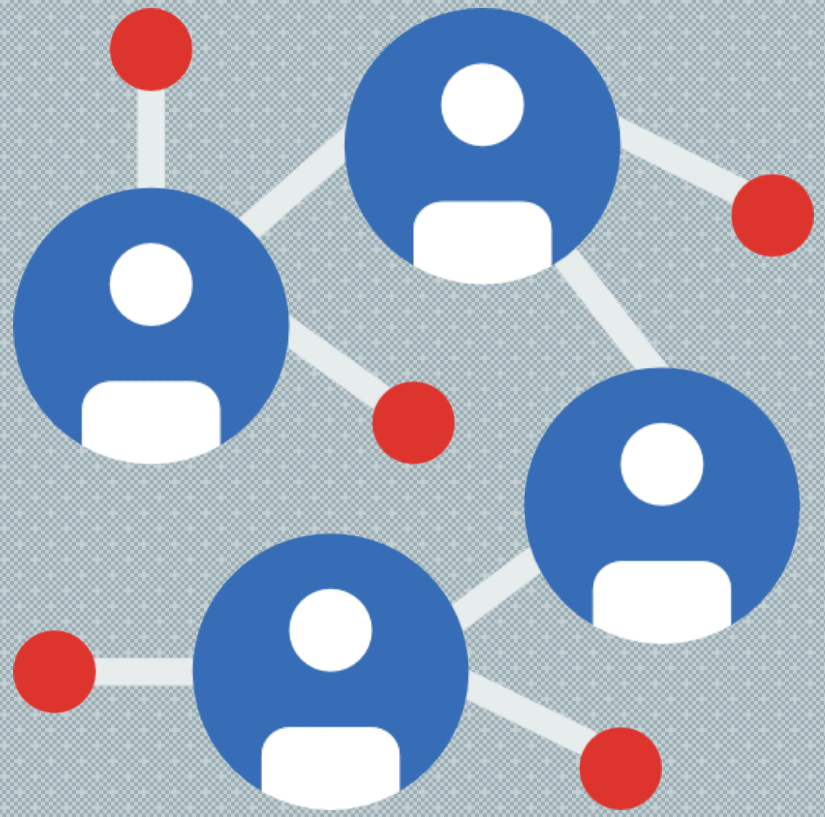

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TABLE ROLES AND RESPONSIBILITIES

- Table Facilitator directs the discussion and keeps the dialogue moving
- Scribes filling in matrix
- Participants - All of you
- CMRPC resource person
- Table spokesperson for Report Out

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CLIMATE PROJECTIONS AND IMPACTS

1. Engage Community
2. Identify CC Impacts & Hazards
3. Complete Assessment of Vulnerabilities & Strengths
4. Develop & Prioritize Actions
5. Take Action

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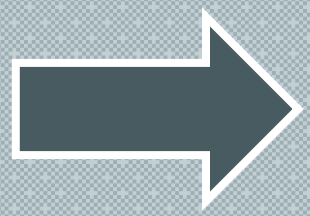
CLIMATE CHANGE PROJECTIONS

Climate projections

- Precipitation
  - Annual
  - Large events
  - Changes in "___ year storms"
- Temperature
  - Consecutive dry days



Natural Hazards

- Winter Storms
- Heavy Rainfall and Flooding
- Drought, Wildfire, and Heat

OUR CLIMATE IS ALREADY CHANGING

Temperature:	↑	**1.8° F Since 1895**
Growing Season:	↑	**5 Days Since 1895**
Sea Level Rise:	↑	**8 inches Since 1922**
Strong Storms:	↑	**55% Since 1958**

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EXAMPLES OF IMPACTS OF CLIMATE CHANGE

- **Agriculture**

  Impact on crops from more extreme temperature and precipitation

- **Human Health**

  More frequent, extreme and longer heat waves will impact vulnerable populations.

- **Transportation**

  Increased precipitation and flooding can disrupt traffic, delay construction, and weaken or wash out soil and culverts that support roads, tunnels, and bridges.

- **Energy**

  Increase in summer peak electricity demand in most regions of the United States.

- **Ecosystems**

  Range shifts can lead to extinction.

- **Forest**

  Shifting geographic ranges of some tree species.

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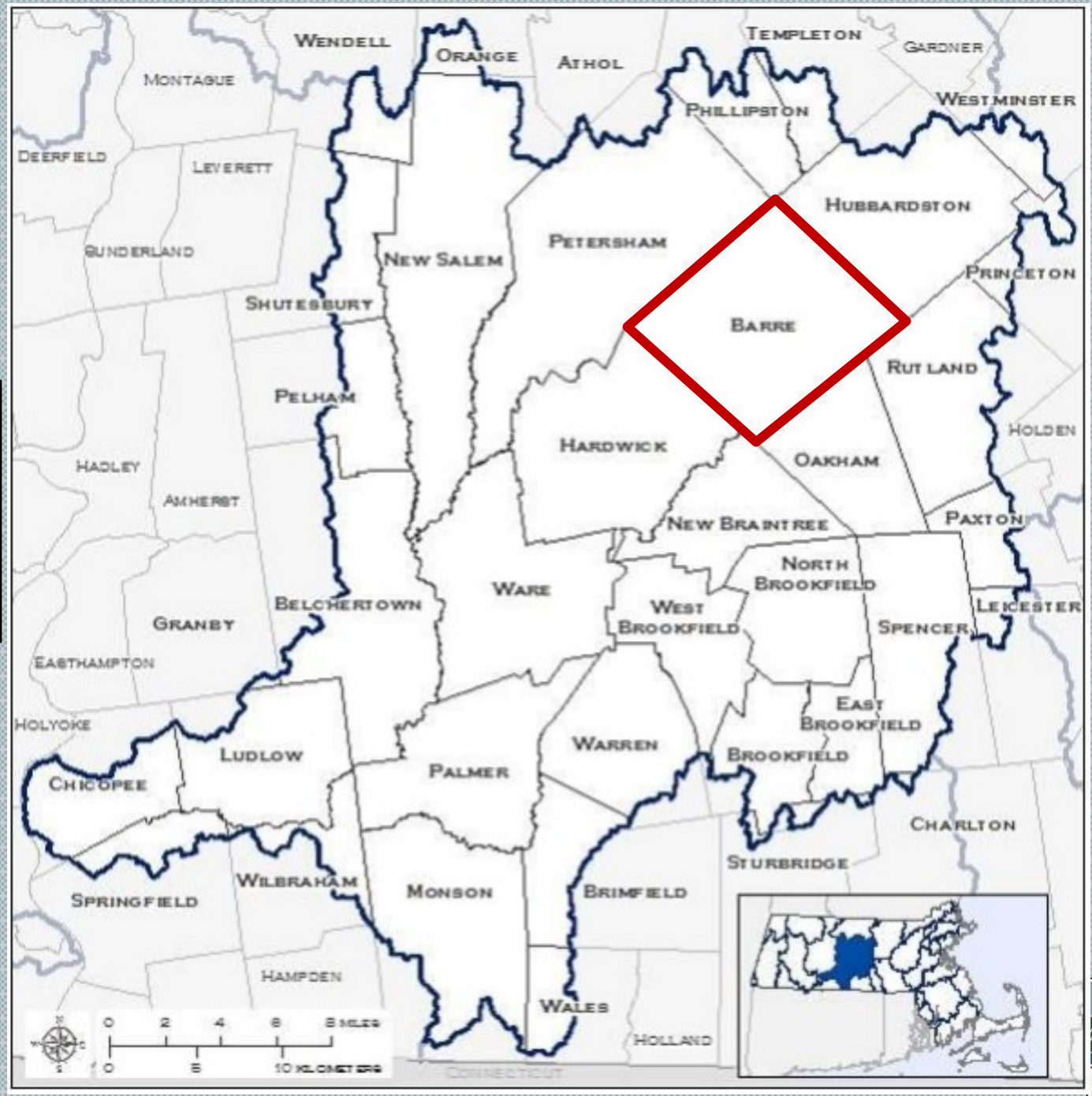
CHICOPEE RIVER BASIN



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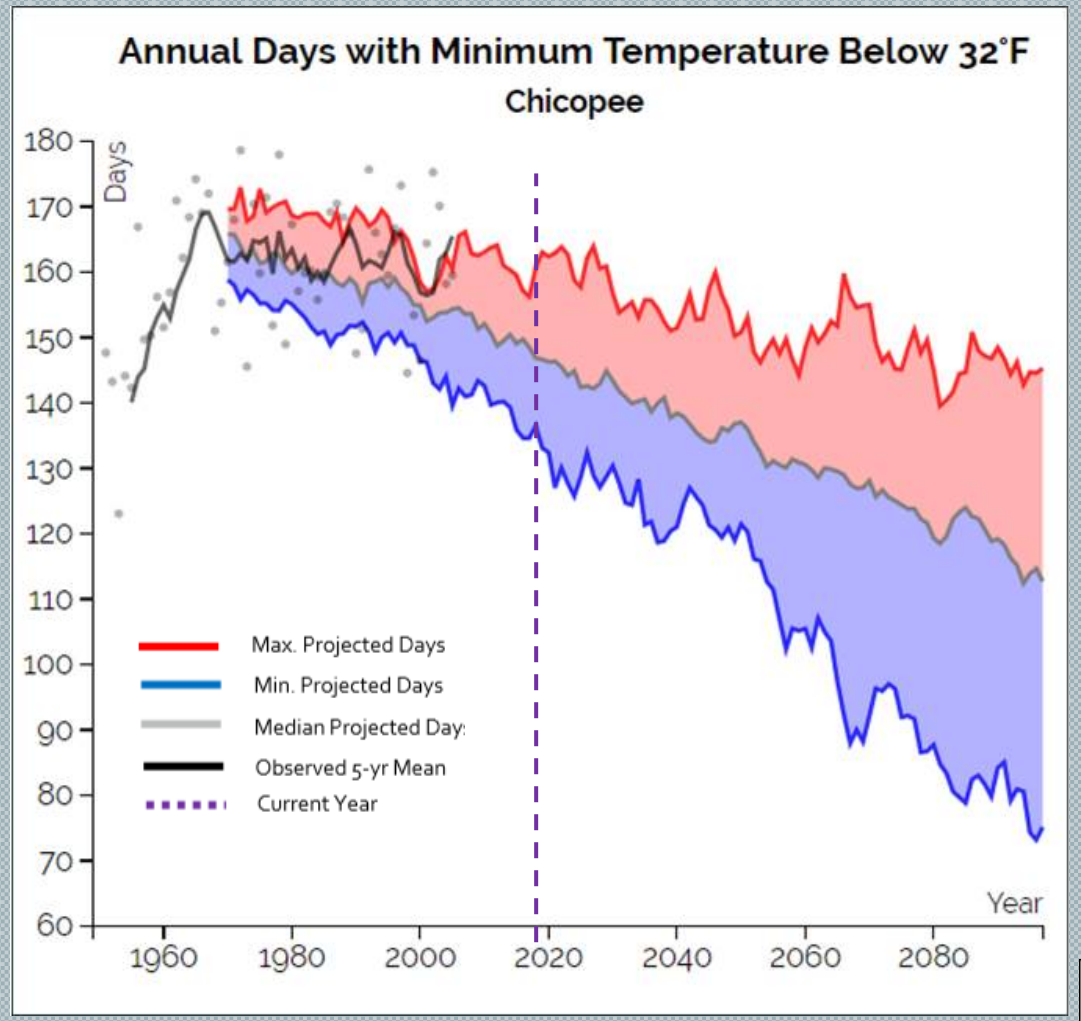
WINTER STORMS

- Annual days below freezing will decrease
- Rising temps → more winter precipitation to fall as rain or freezing rain
- Lower snowfall accumulation
- Winter - Highest projected increase in precipitation
- Storms that do occur may be worse - proximity to Atlantic Ocean increases risk of large storm events



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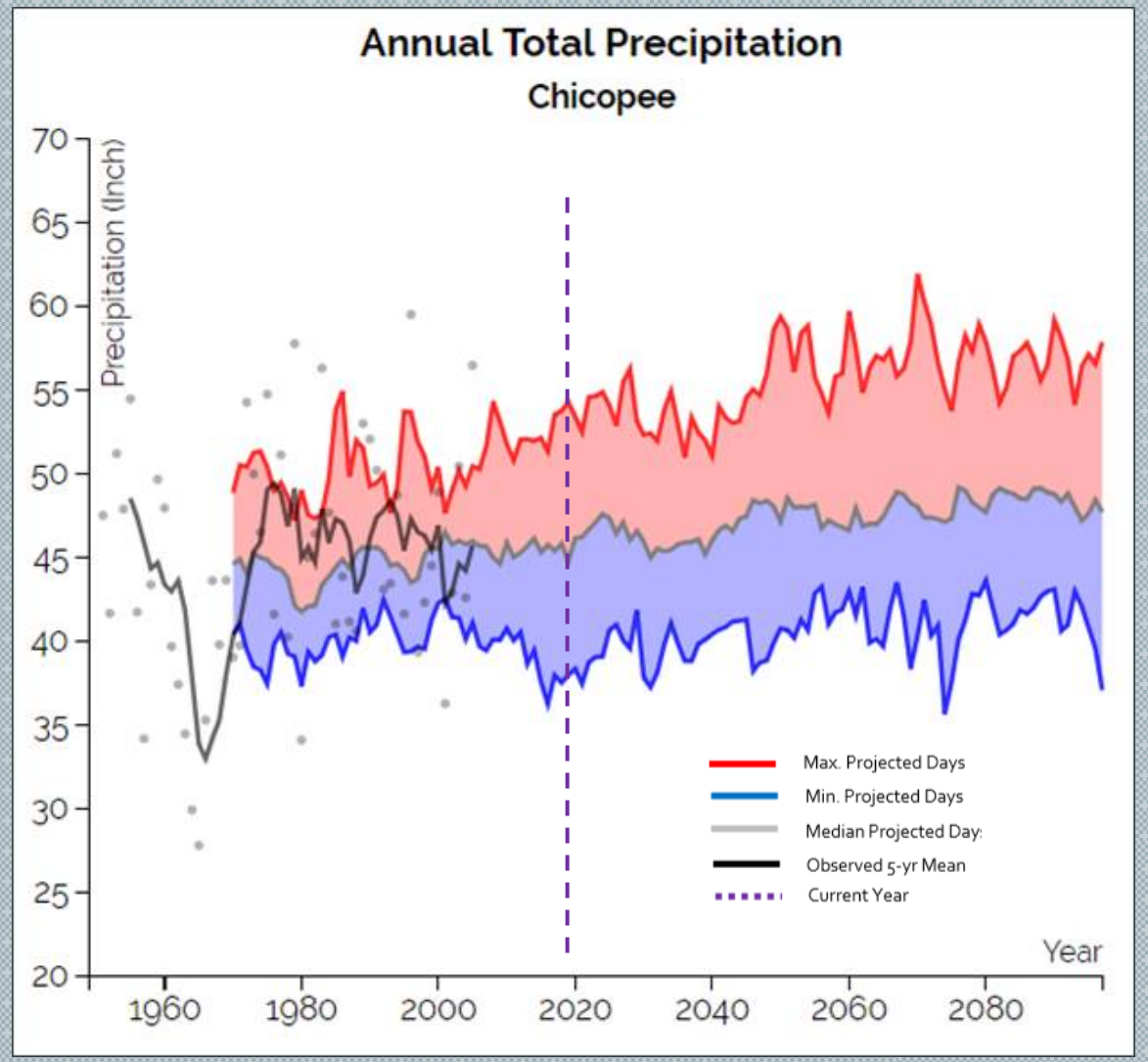
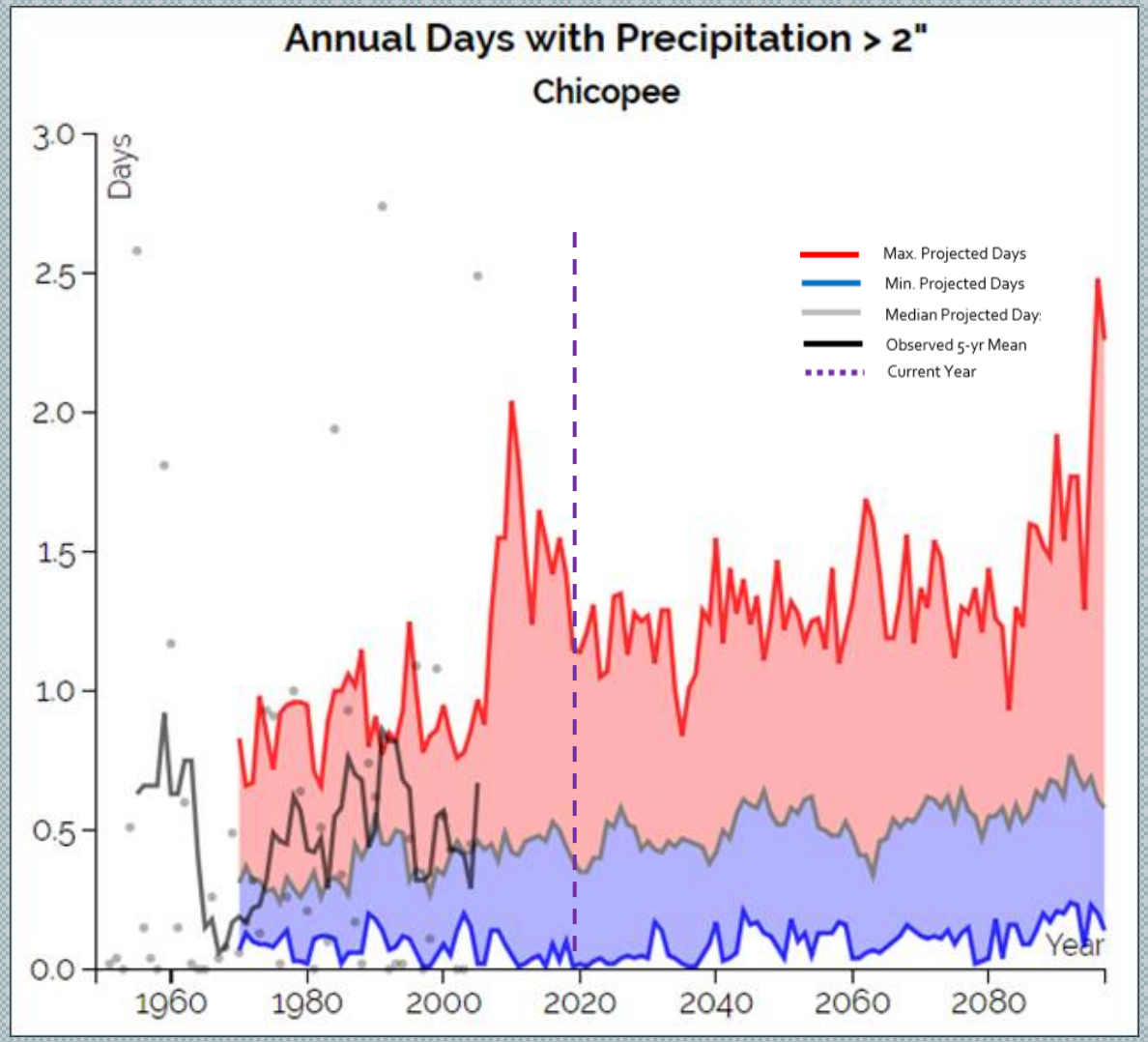
HEAVY RAINFALL AND FLOODING

Seasonal

- **Winter** – Largest increase expected, up to .6 to 3.9 inches by end of century
- **Spring** – Expected increase of .2 to 2.8 inches by end of century
- **Summer** – Possible decrease of 1.2 inches to increase of 2.0 inches by end of century
- **Fall** – Possible decrease of 1.7 inches to increase of 1.5 inches by end of century



HEAVY RAINFALL AND FLOODING



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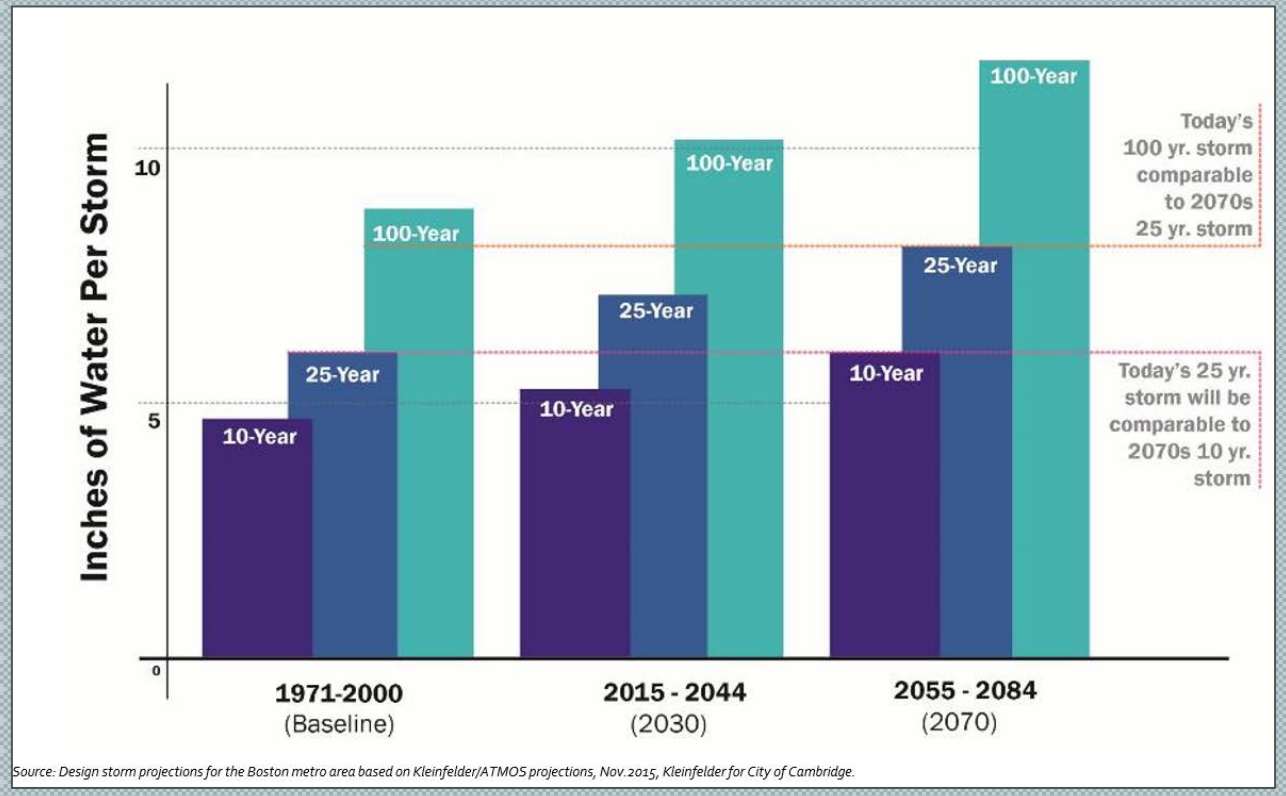
HEAVY RAINFALL AND FLOODING



Source: Design storm projections for the Boston metro area based on Kleinfelder/ATMOS projections, Nov. 2015, Kleinfelder for City of Cambridge.

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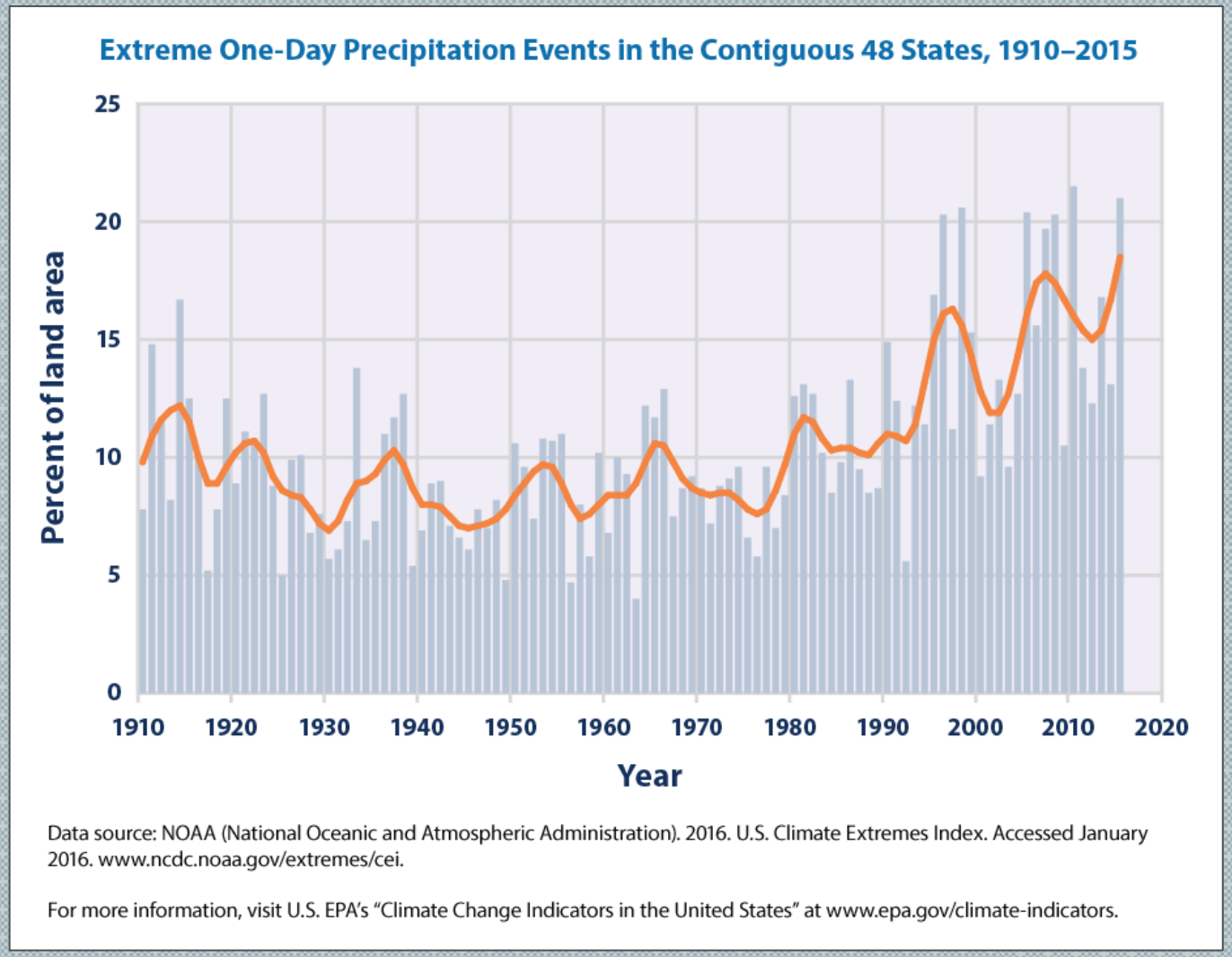
HEAVY RAINFALL AND FLOODING

- Precipitation will increase across all seasons
- Total annual rainfall will increase
- Heavy rainfall events will become more frequent
  - Overbank flooding from rainfall and snowmelt
  - Piped Infrastructure backup and or failure
- Water quality impact from flooding
  - Erosion
  - Nonpoint source pollution

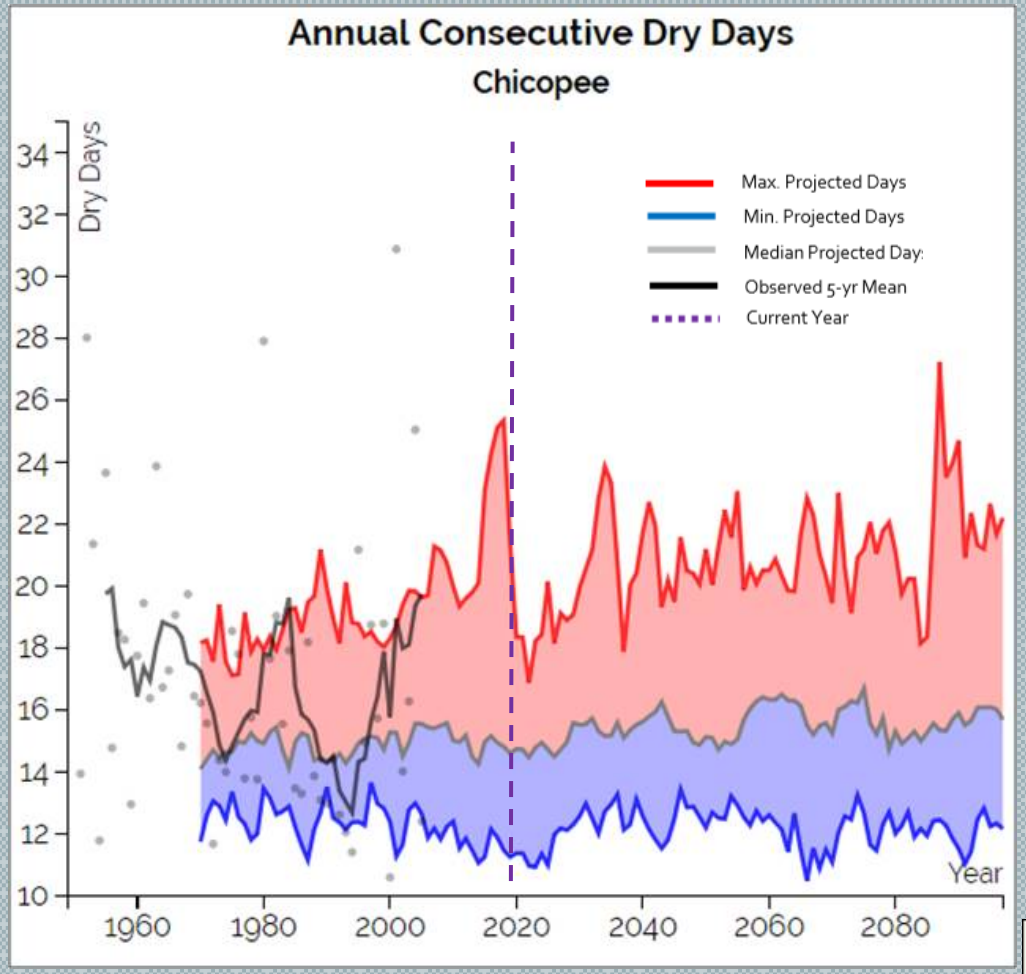


IMPACTS OF INCREASED PRECIPITATION

- More disruptive flooding events, especially with undersize stormwater infrastructure
  - Increased inland flooding
  - Soils become saturated
  - River flows rise
  - Capacity of urban SW infrastructure is exceeded
  - Impacts to property and critical infrastructure
- Increased non-point source pollution
  - Ecological damage to nearby waterbodies

DROUGHT IMPACTS

- More consecutive dry days
- Highest number of consecutive dry days in summer and fall.
- Increase of up to 3 additional consecutive dry days by the end of the century



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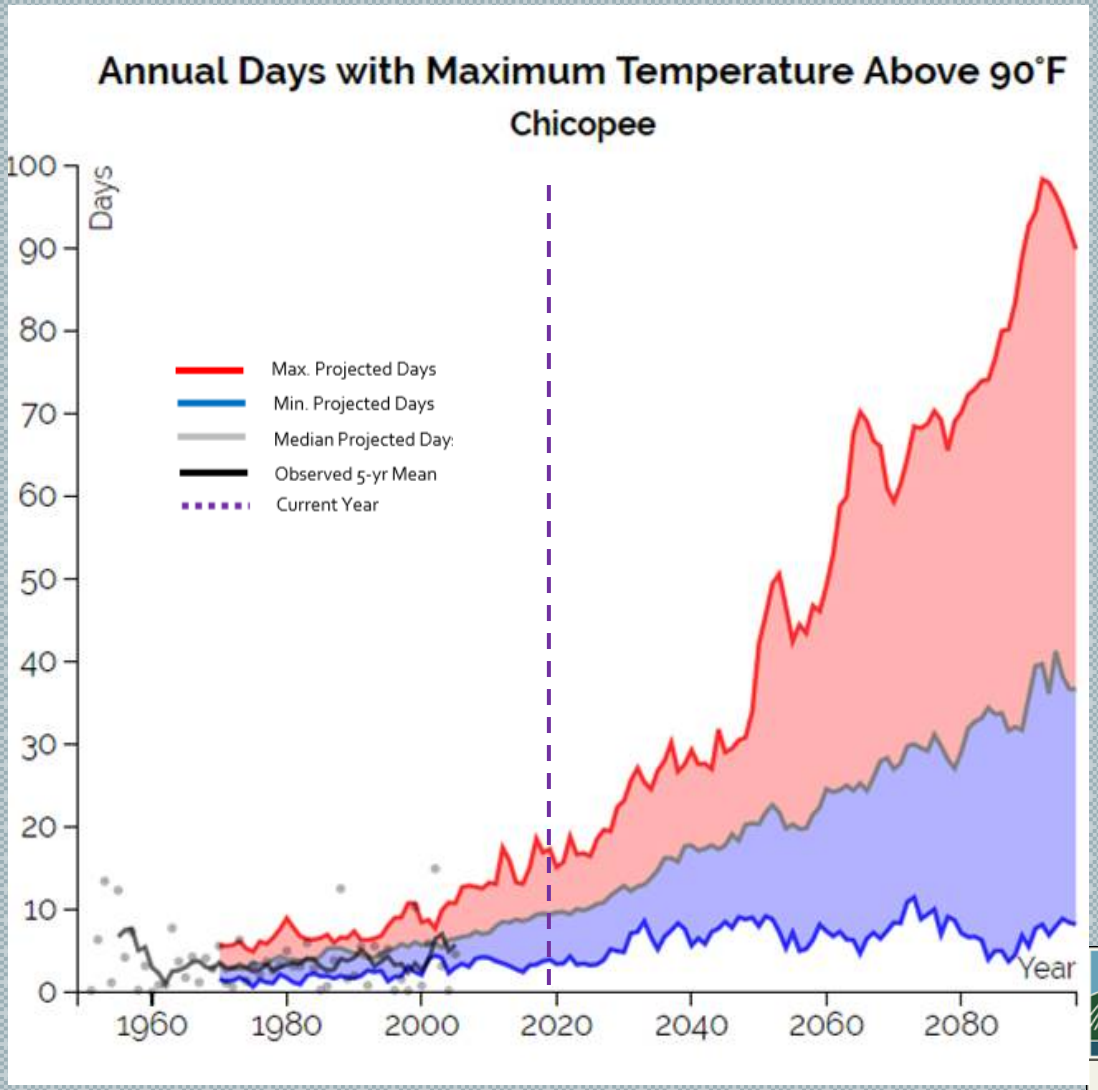
HEAT PROJECTIONS

- Projected increase of 8 to 29 days annually over 90°F by mid century
- Projected increase of 11 to 69 days annually over 90°F by end of century



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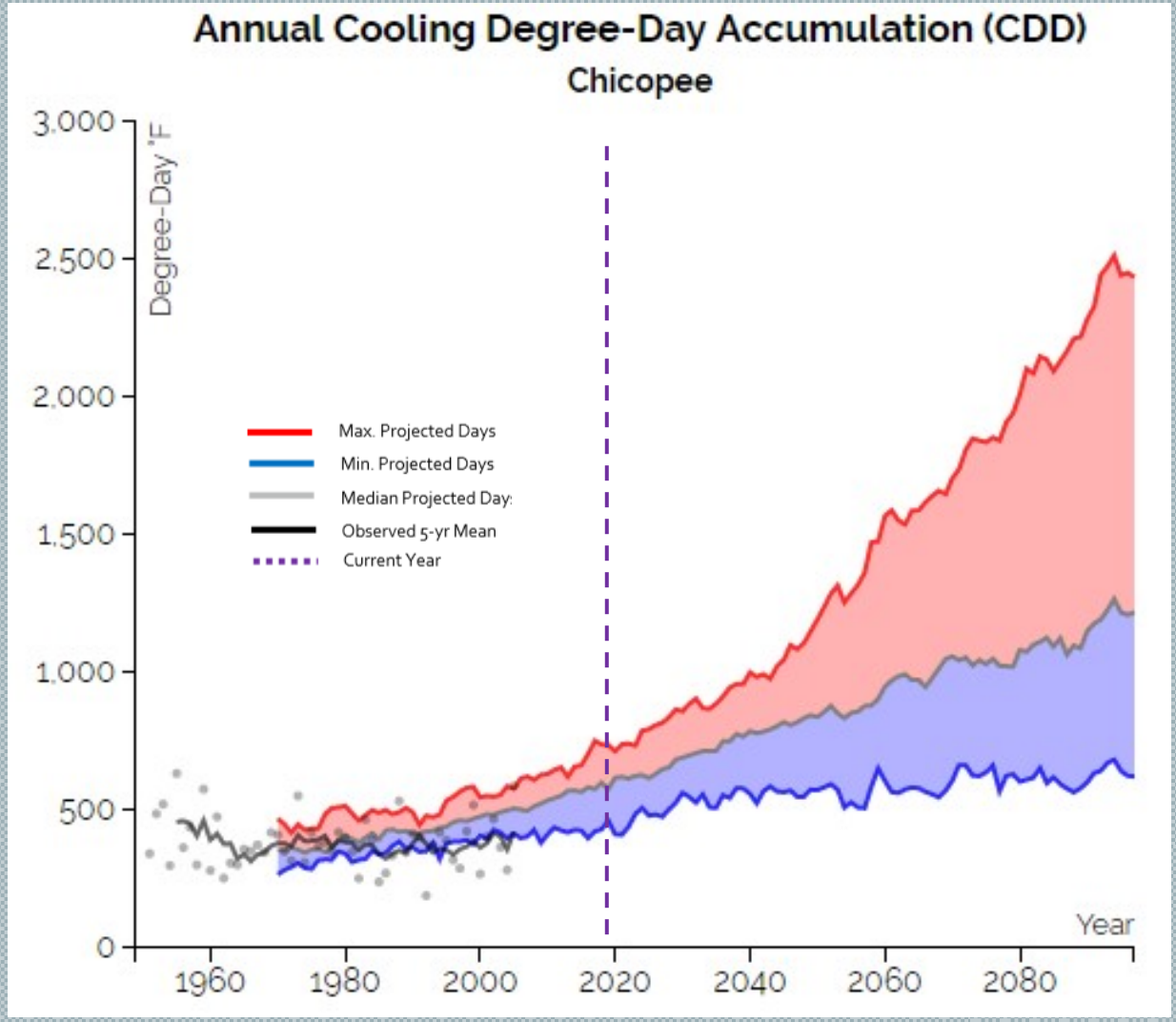
HEAT PROJECTIONS

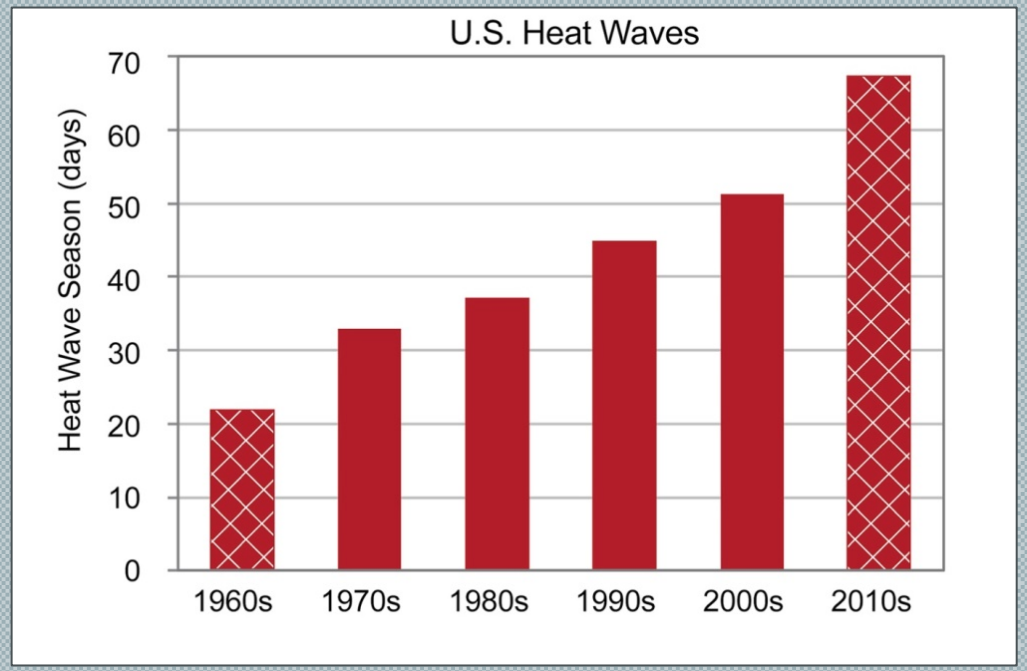
- Projected decrease in heating degree-days and increase in cooling-degree days
- More days above 65˚F means fewer days needed to heat buildings and more days needed to cool buildings.
- Winter
  - 7-19% decrease in HDD by mid century
- Spring
  - 10-24% decrease in HDD by mid century
- Fall
  - 20-33% decrease in HDD by mid century

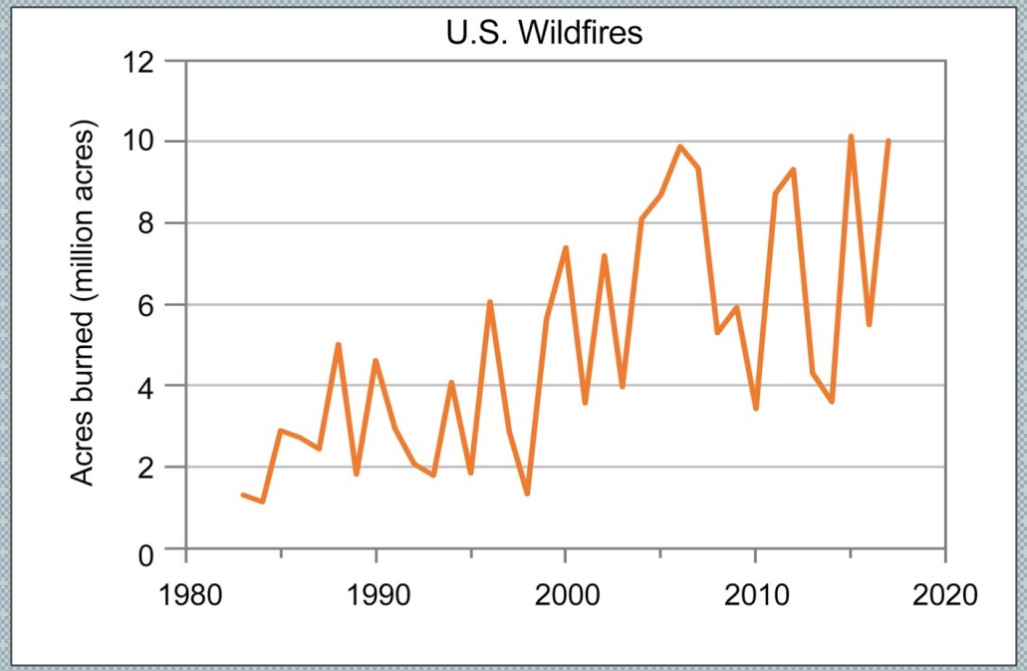


HEAT AND WILDFIRE

Nation-Wide Data

As the number and length of heat waves increase, so will the incidence of wildfires.





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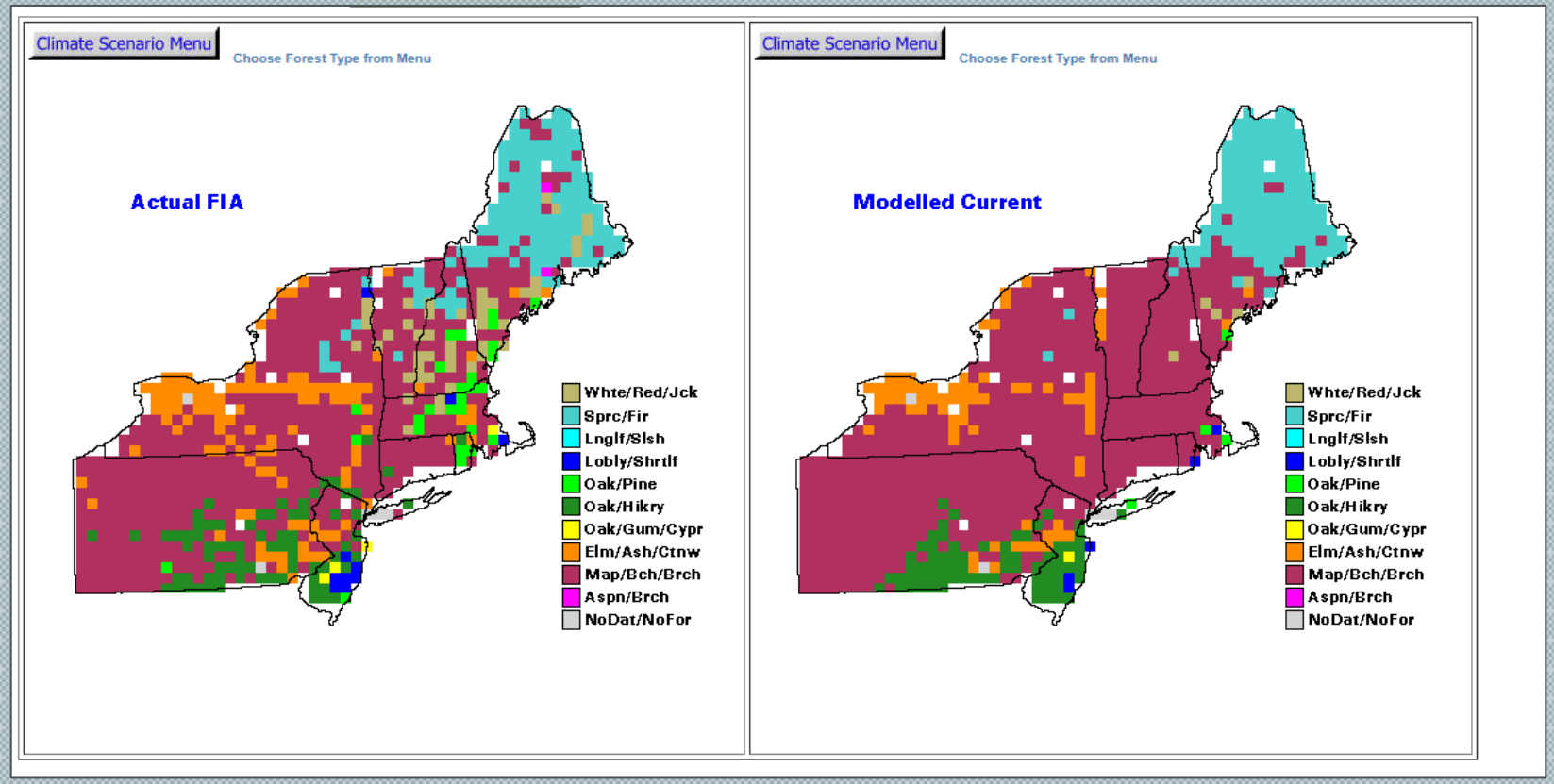
HEAT IMPACTS ON THE ENVIRONMENT

- The ranges of some tree species are expected to move north, and the diversity of species will likely decrease

- Likely increase in invasive species



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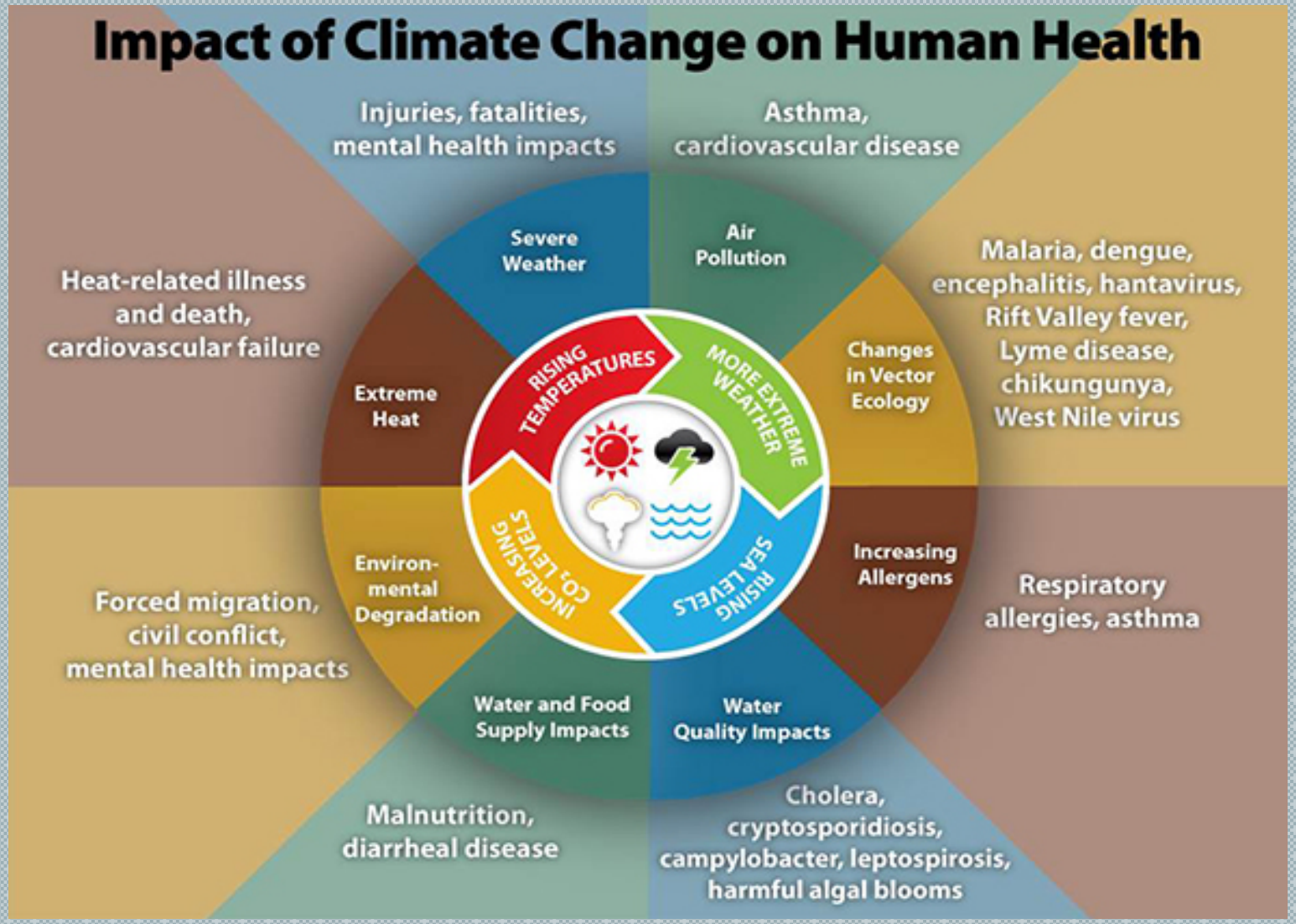
HEAT IMPACTS ON SOCIETY



https://www.cdc.gov/climateandhealth/effects/default.htm

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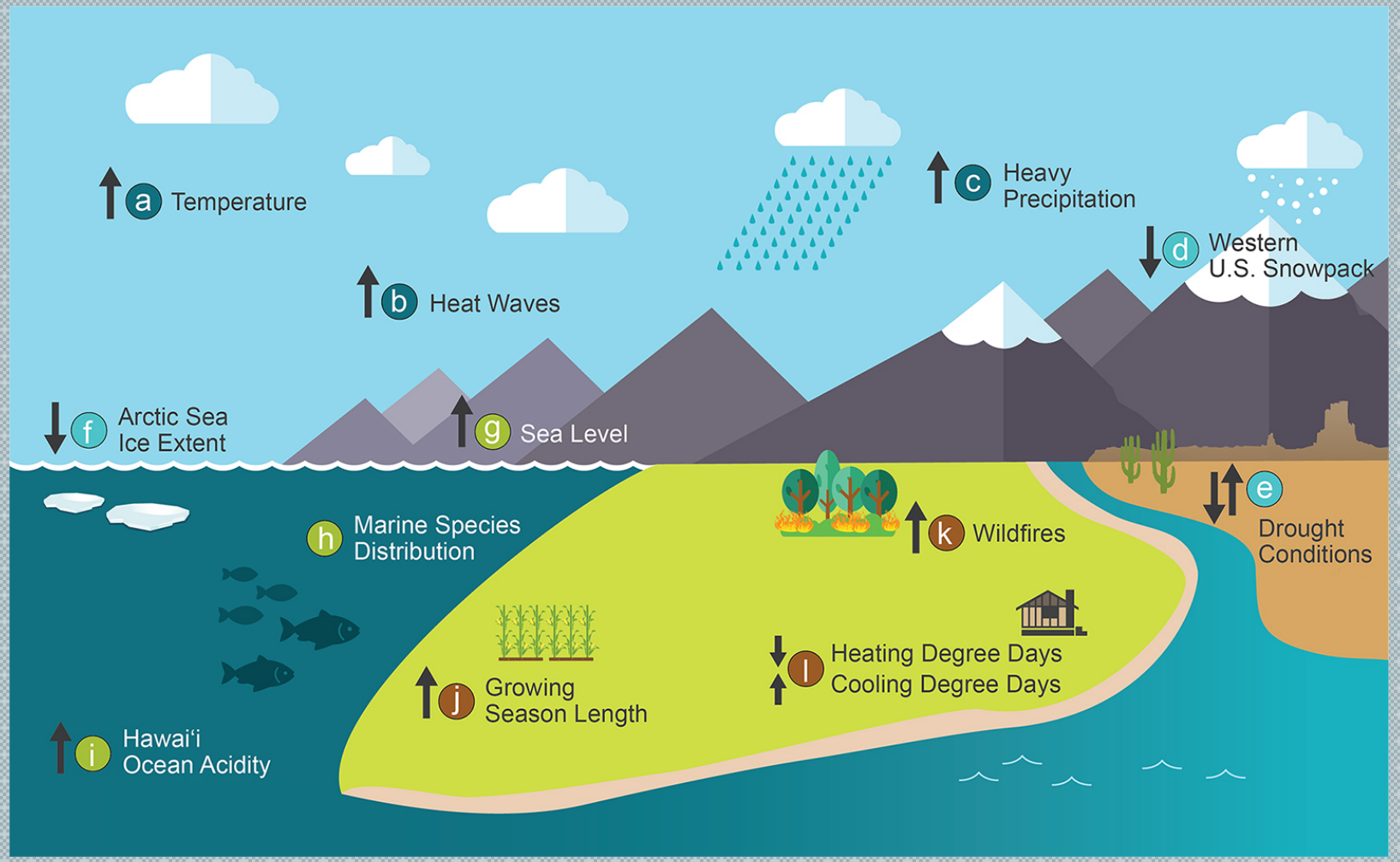
NORTHEAST CLIMATE SCIENCE CENTER UMASS AMHERST

NECASC
Northeast Climate Adaptation Science Center

- NECASC downscaled climate projections for major drainage basins
- Climate Models from the IPCC Fifth Assessment Report
- Historical Data 1971-2000
- Medium and High Emission Scenarios were Chosen (RCP 4.5 and 8.5)
  - Medium Scenario Assumes Emissions Peak at Mid-Century
  - High Scenario Assumes a Continuing Emission Trajectory

QUESTIONS?



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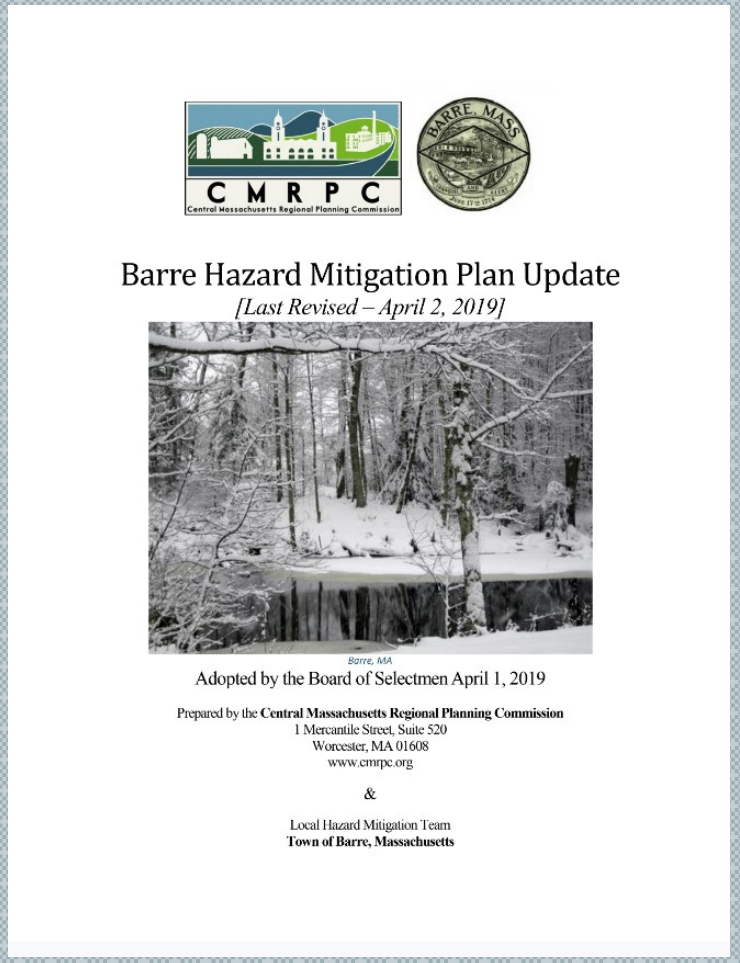
HAZARD MITIGATION PLANNING

- Overlaps somewhat with Hazard Mitigation Planning, but MVP is more focused on climate change in the long term
- Barre's Hazard Mitigation received Final Approval FEMA in April 2019.
- 5-year plans



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Barre Hazard Mitigation Plan Update

[Last Revised – April 2, 2019]

Barre, MA

Adopted by the Board of Selectmen April 1, 2019

Prepared by the **Central Massachusetts Regional Planning Commission**
1 Mercantile Street, Suite 520
Worcester, MA 01608
www.cmrpc.org

&

Local Hazard Mitigation Team
Town of Barre, Massachusetts

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BE PREPARED, MITIGATE THE COSTS

US Natural Disasters in 2017 cost $306 Billion, the most expensive year since NOAA started keeping track in 1980

National Benefit-Cost Ratio Per Peril *BCR numbers in this study have been rounded	Exceed common code requirements	Meet common code requirements	Utilities and transportation	Federally funded
Overall Hazard Benefit-Cost Ratio	4:1	11:1	4:1	6:1
Savings ($billion)	$16/year	$13/year	$2.5	$160
Riverine Flood	5:1	6:1	8:1	7:1
Hurricane Surge	7:1	Not applicable	Not applicable	Too few grants
Wind	5:1	10:1	7:1	5:1
Earthquake	4:1	12:1	3:1	3:1
Wildland-Urban Interface Fire	4:1	Not applicable	Not applicable	3:1

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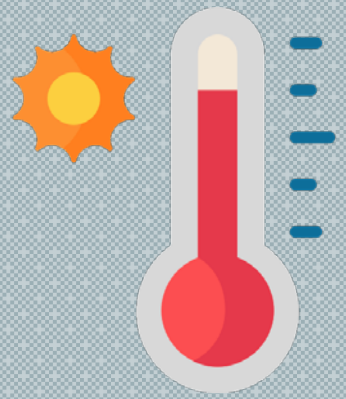
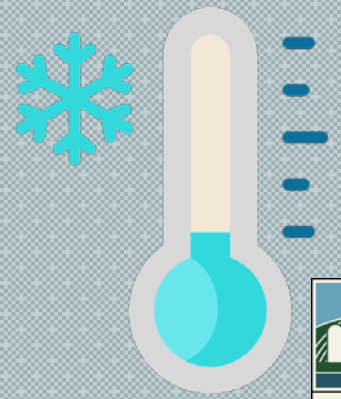
NATURAL HAZARDS

- Flooding (all types)
- Droughts and wildfires
- Winter storms
- Severe thunderstorms
- Hurricanes
- Wind and tornadoes
- Extreme temperatures
- Landslides
- Earthquakes





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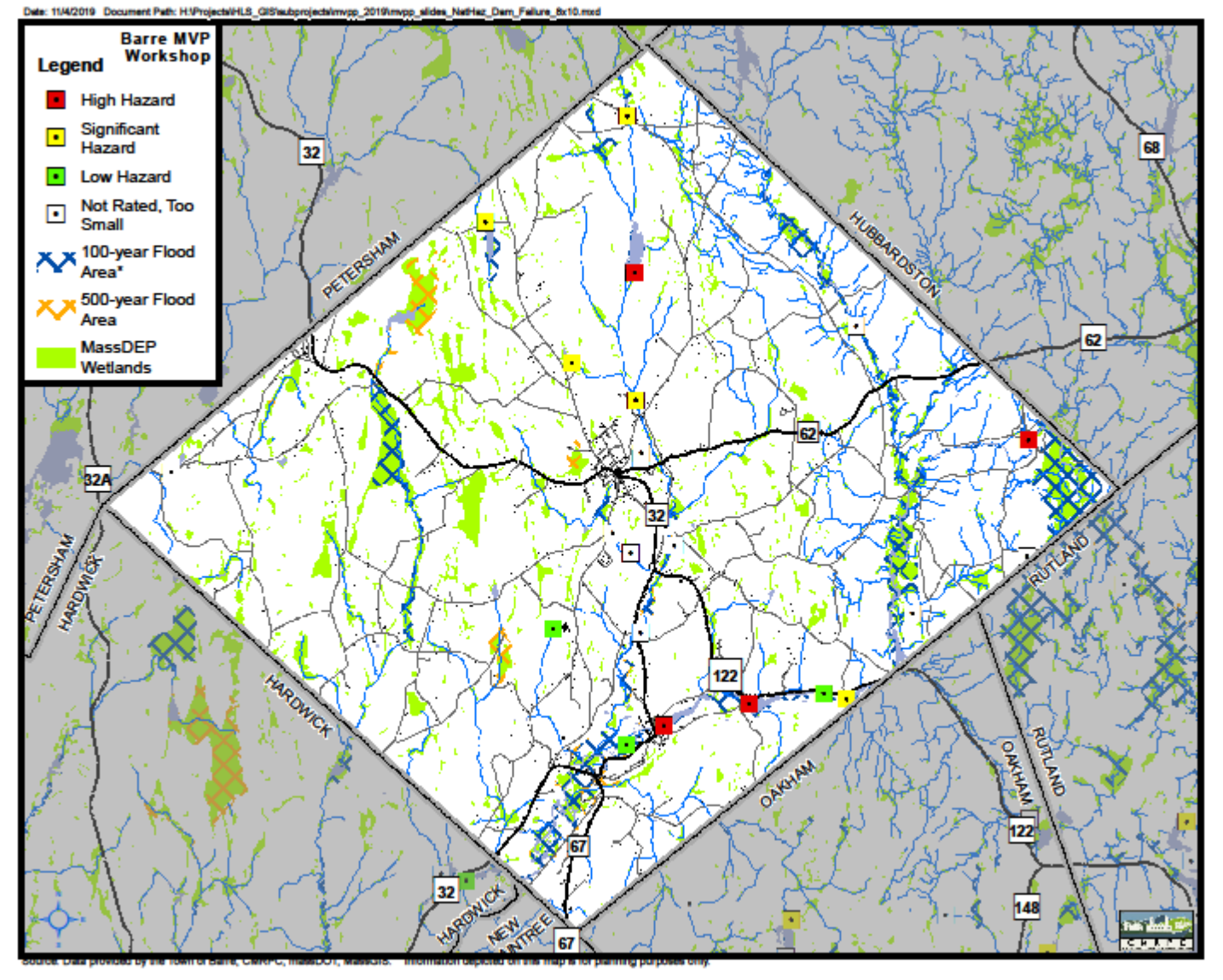
FLOOD RISKS

South Barre along Ware River, 1938

Flooding in Barre, 2011

Images courtesy Worcester Telegram

DAM FAILURE RISK



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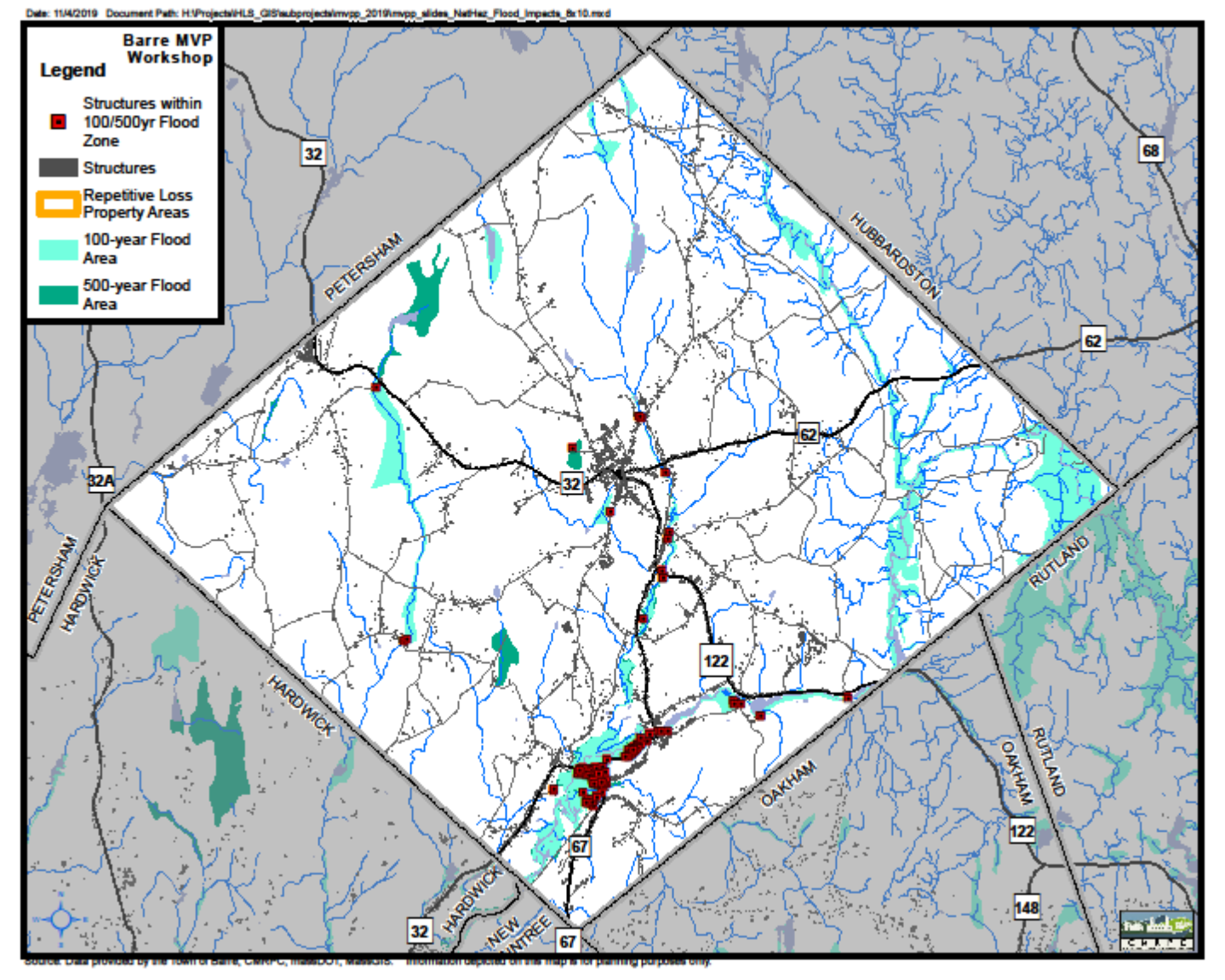
FLOODING IMPACTS



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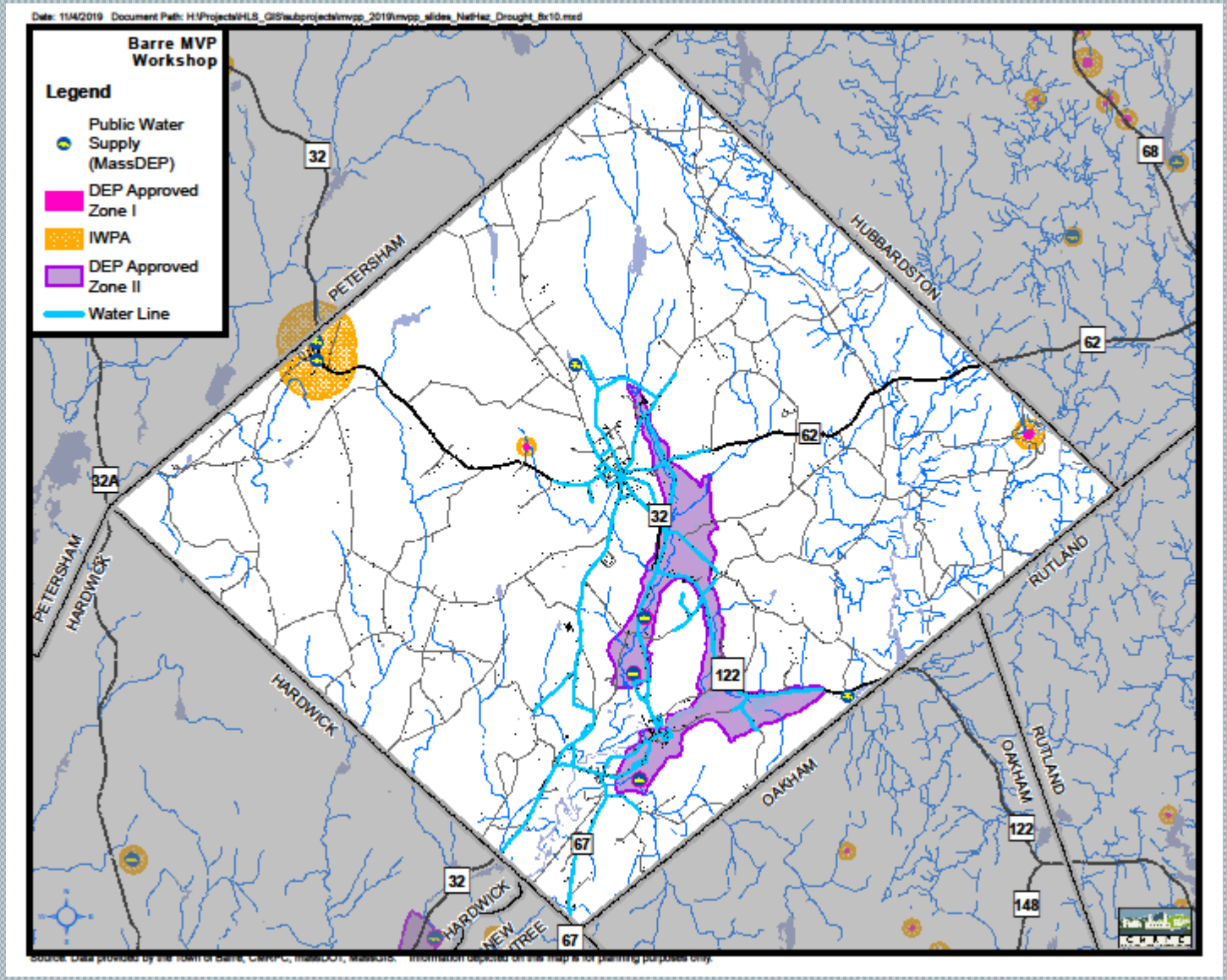
DROUGHT IMPACTS



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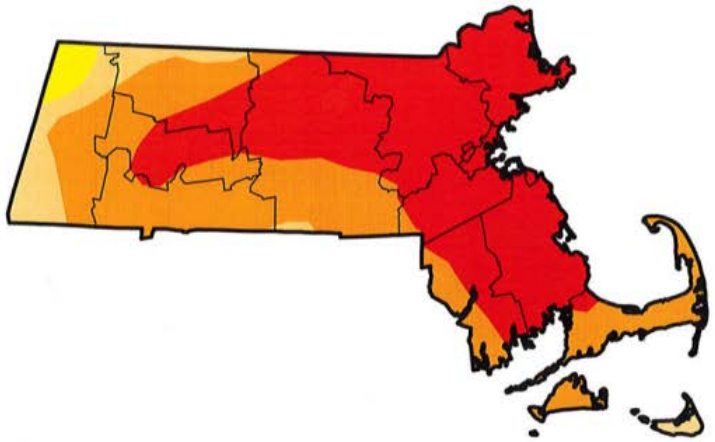
DROUGHT IMPACTS

U.S. Drought Monitor

Massachusetts



September 13, 2016

(Released Thursday, Sep. 15, 2016)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	98.15	89.95	52.13	0.00
Last Week 9/6/2016	0.00	100.00	94.38	77.38	22.67	0.00
3 Months Ago 6/14/2016	20.09	79.91	13.56	0.00	0.00	0.00
Start of Calendar Year 12/29/2015	22.85	77.15	26.34	0.00	0.00	0.00
Start of Water Year 9/29/2015	12.90	87.10	30.43	0.00	0.00	0.00
One Year Ago 9/15/2015	34.81	65.19	0.23	0.00	0.00	0.00

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Eric Luebehusen
U.S. Department of Agriculture

http://droughtmonitor.unl.edu/

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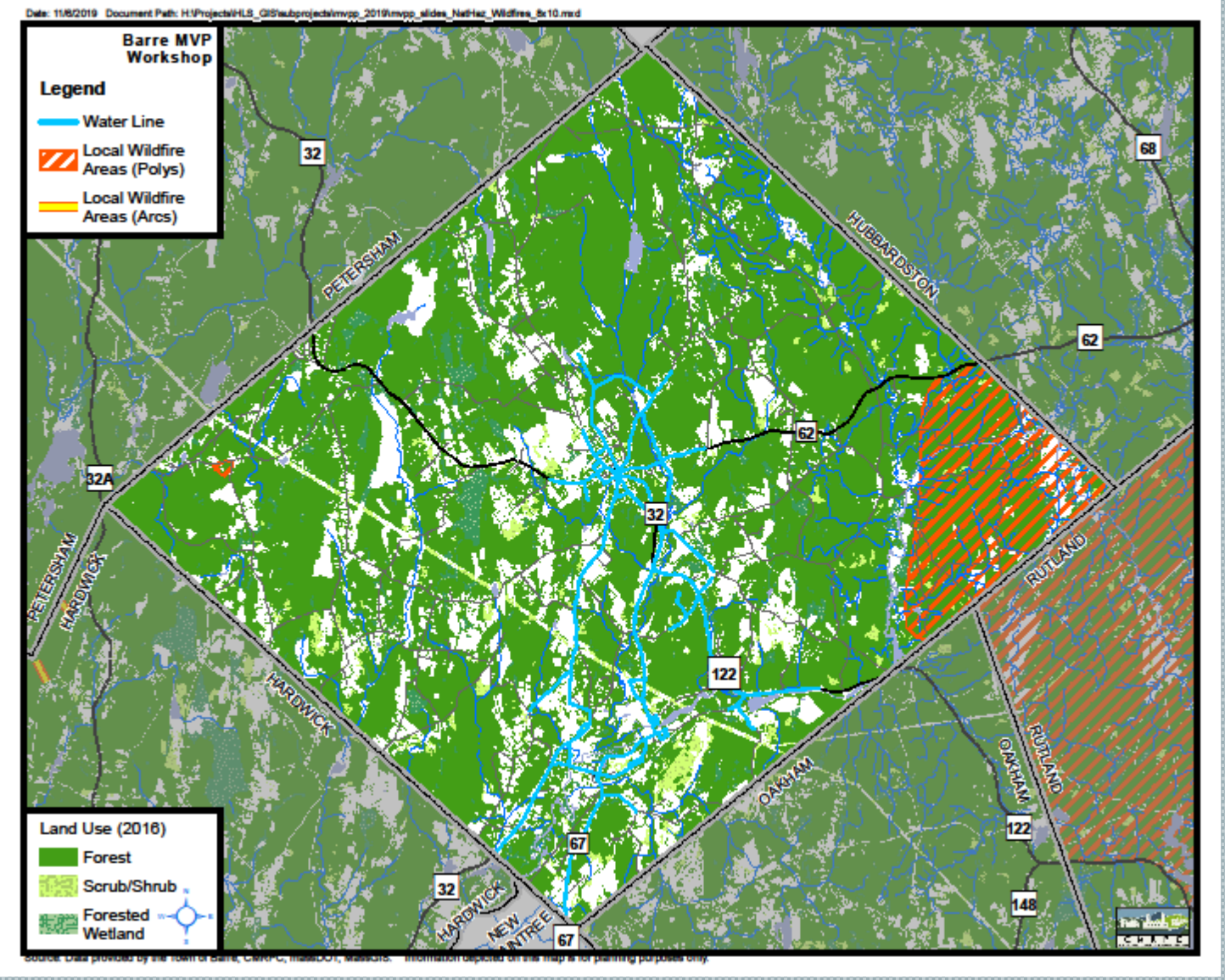
WILDFIRE



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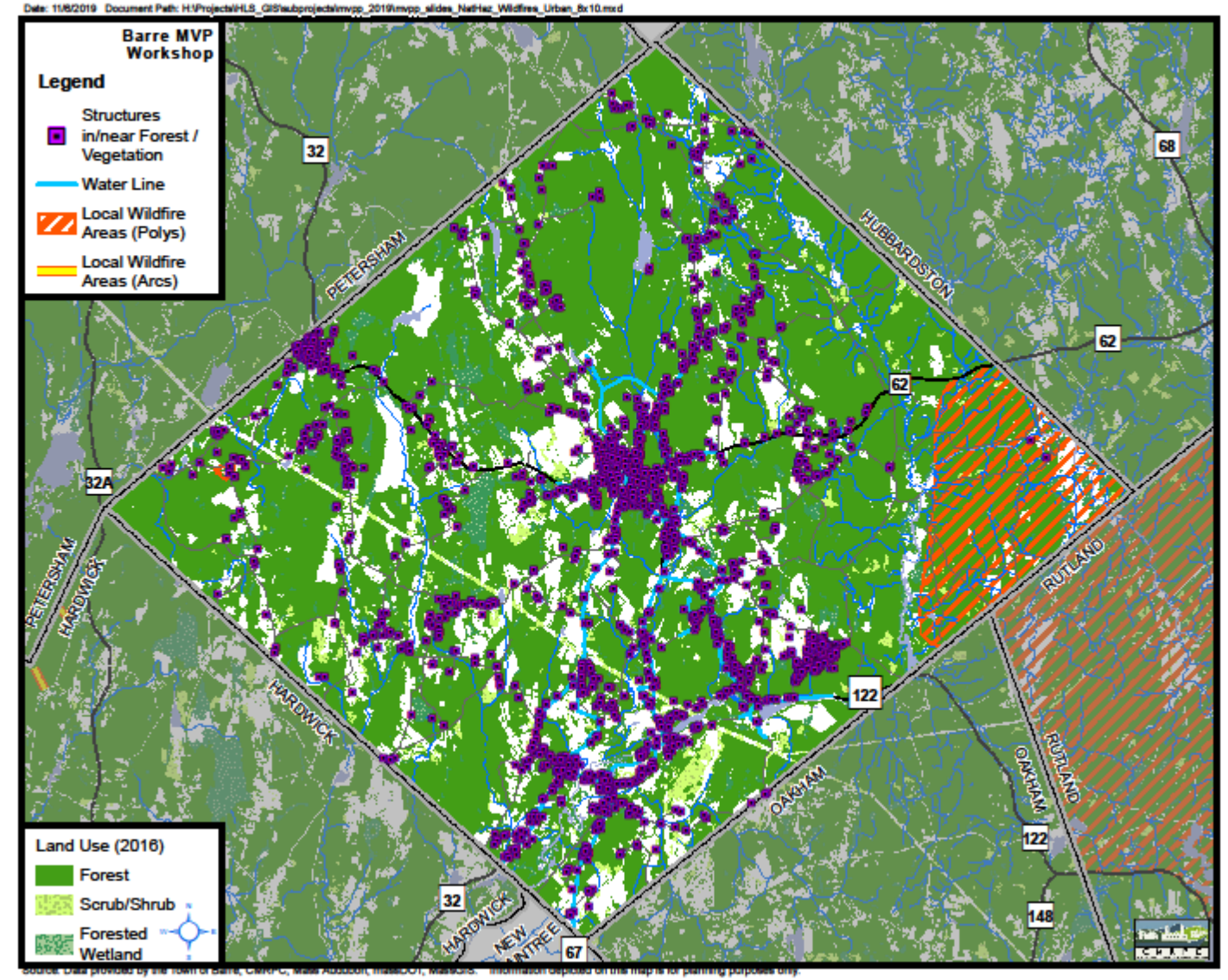
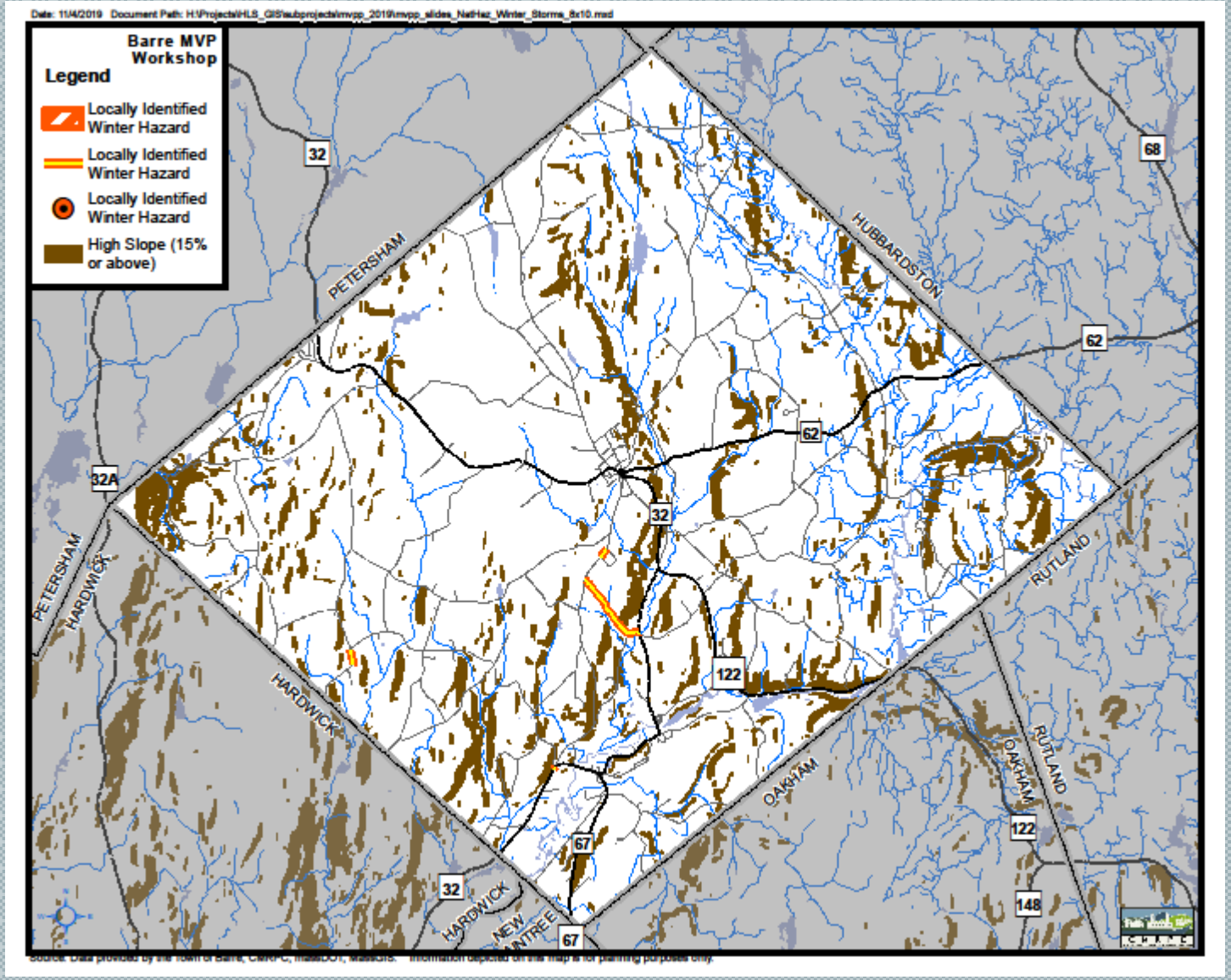
WILDFIRE/URBAN INTERFACE



WINTER STORMS



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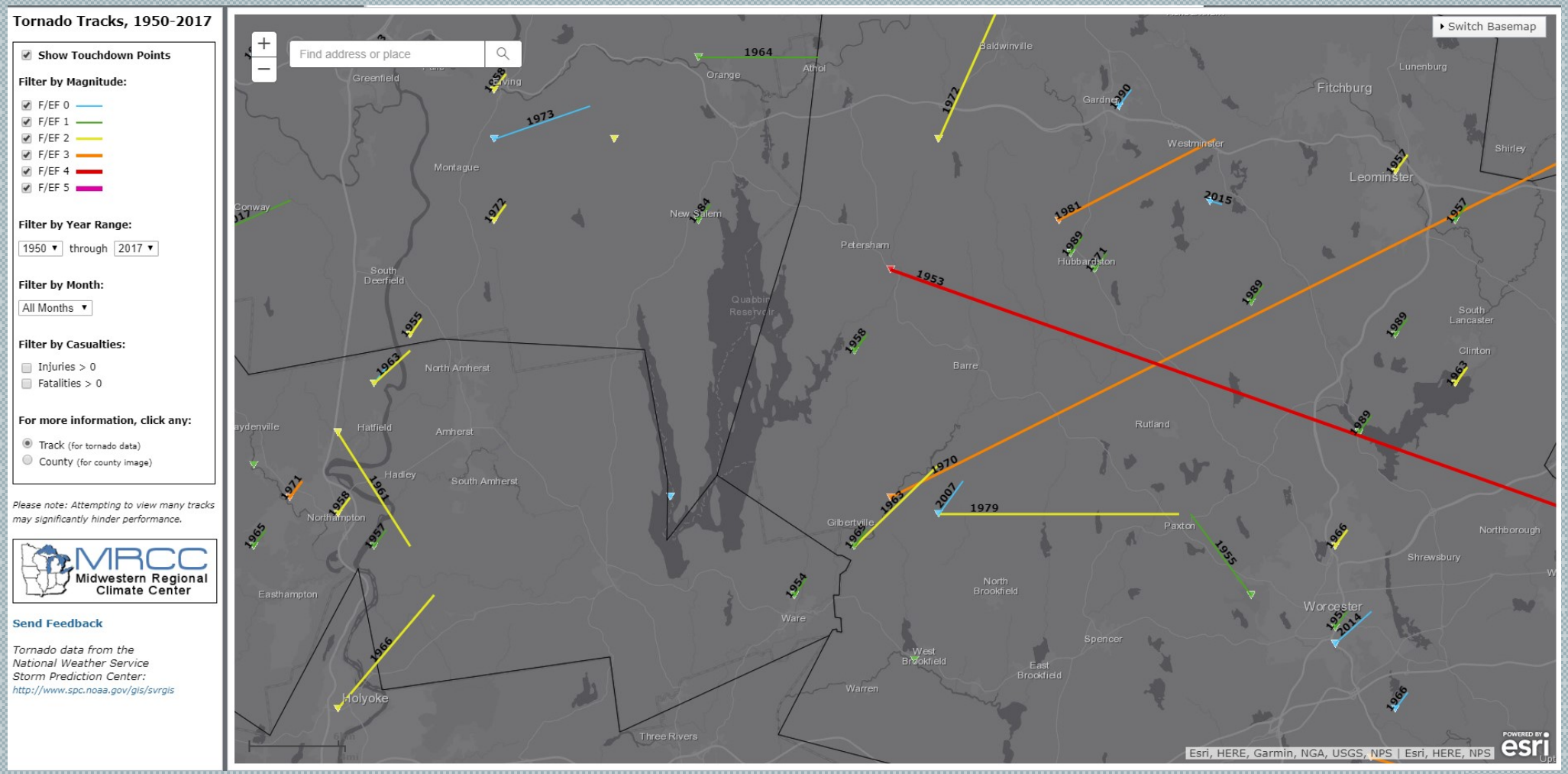
EXTREME STORMS



CRITICAL INFRASTRUCTURE & FACILITIES

- What infrastructure and facilities are critical to the region and its residents? Which do we most need or desire to protect from hazards?
  - Those needed to respond to hazard events or which would exacerbate hazard scenarios, if affected
  - Those needed to perform day-to-day municipal operations and to support basic services and economic activity
  - Major employers and institutions, natural and cultural resources, recreational and historic sites, etc…

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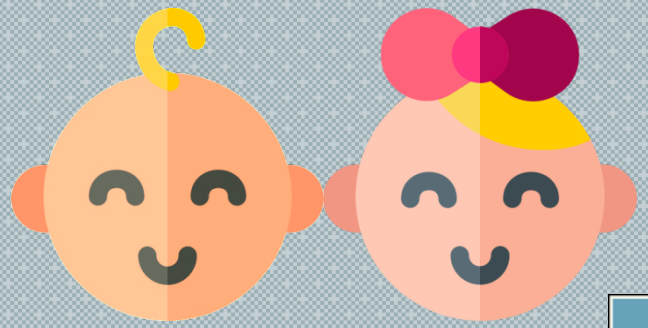
VULNERABLE POPULATIONS

- Vulnerability is not just about utilities, facilities, or businesses
  - Disproportionate populations of potentially vulnerable demographic groups (elderly, children, etc.) or socioeconomic groups (low income households, etc.) living/working in high-risk areas
  - Can be on neighborhood scale, or at specific locations
  - Cultural vulnerability (cultural or language isolation)
  - These will evolve over time, as climate and populations change



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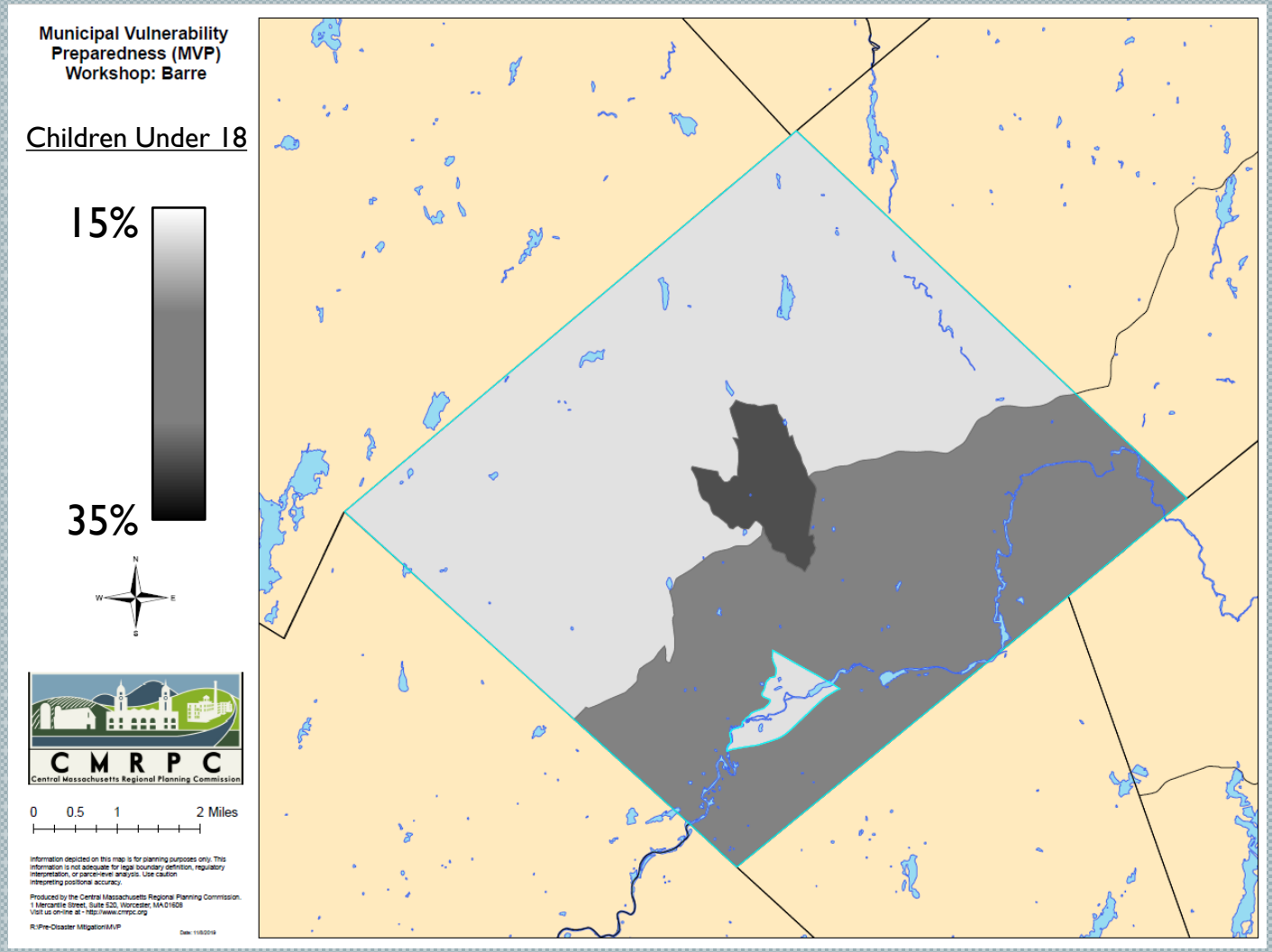
VULNERABLE POPULATIONS: CHILDREN



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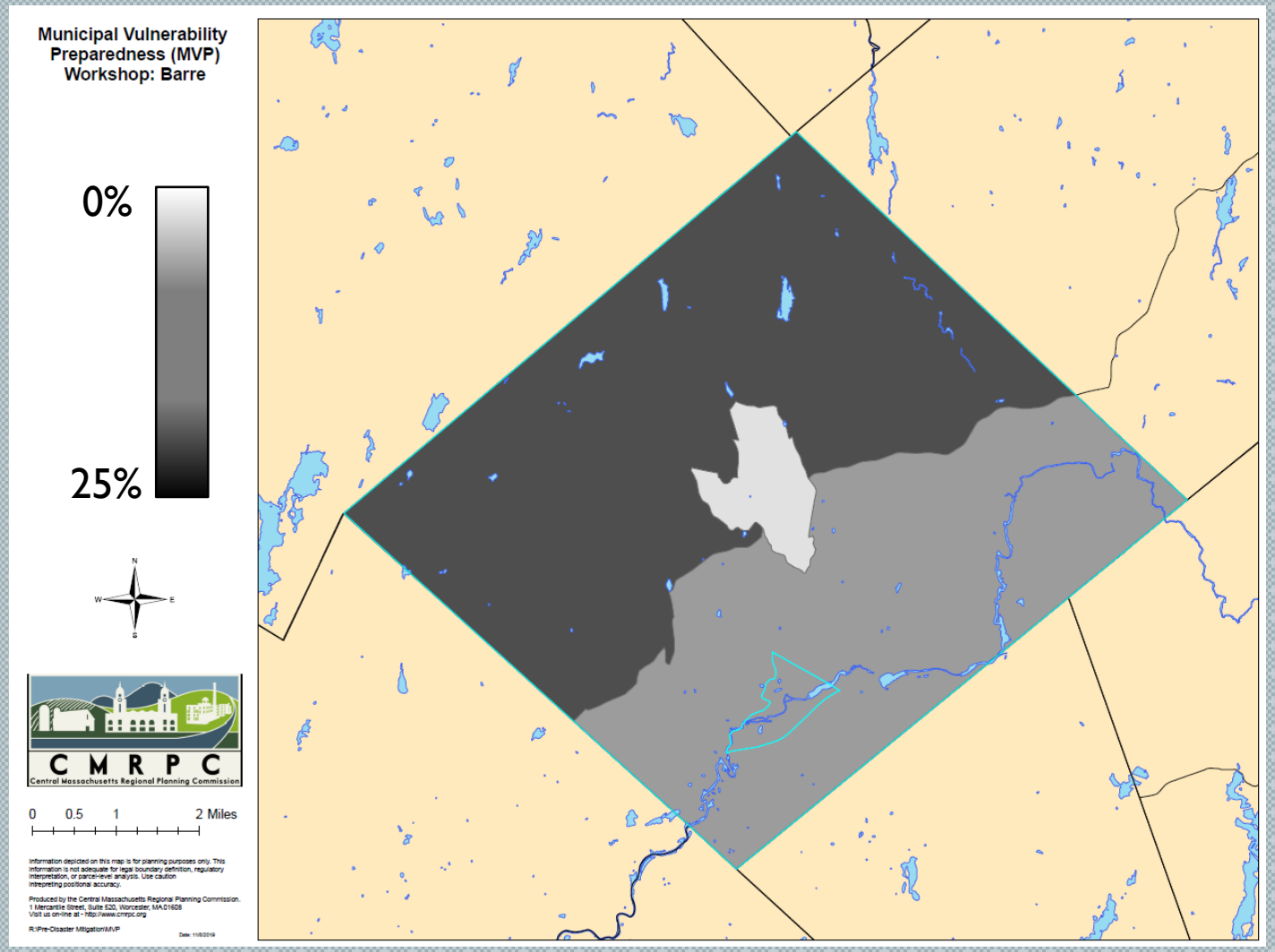
VULNERABLE POPULATIONS: SENIORS (65+)



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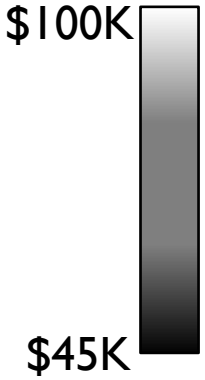
VULNERABLE POPULATIONS: HOUSEHOLD INCOME



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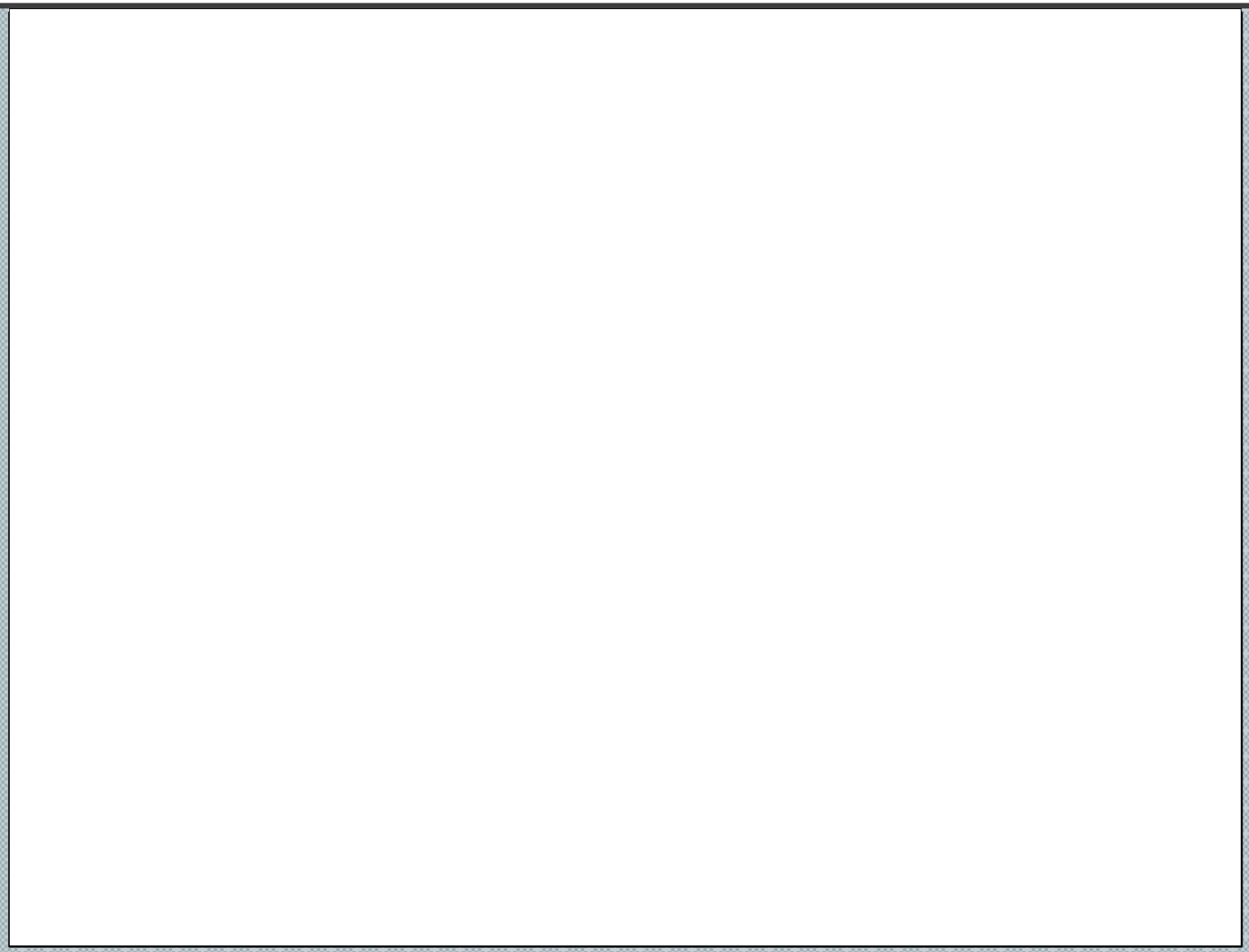
VULNERABLE POPULATIONS: RENTER OCCUPIED



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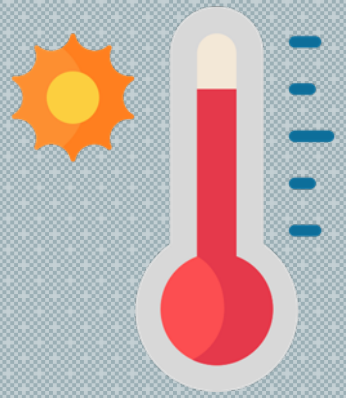
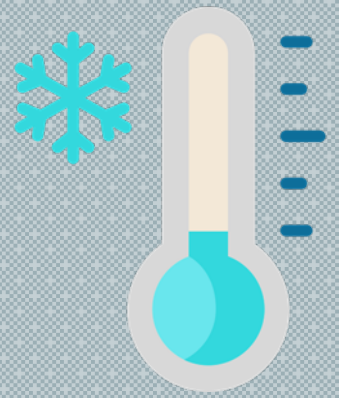
QUESTIONS





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THE MATRIX

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, drought, heat wave, etc.)

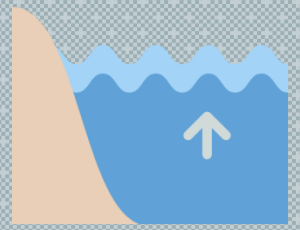
Features	Location	Ownership	V or S	Floods	Winter Storms	Droughts & Wildfires	Priority H - M - L	Time Short Long Ongoing
Infrastructural								
Societal								
Environmental								

STEP ONE: HAZARD IDENTIFICATION

What are the Top Four Natural Hazards in Barre?

1. Engage Community
2. Identify CC Impacts & Hazards
3. Complete Assessment of Vulnerabilities & Strengths
4. Develop & Prioritize Actions
5. Take Action

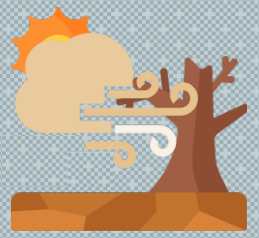
STEP ONE: HAZARD IDENTIFICATION



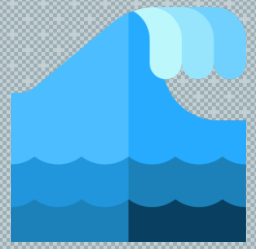
- **Flooding**
  - Riverine
  - Street

- **Landslides**
- **Mudslides**

- **Tornadoes**



- **Drought**
- **Dust Storms**



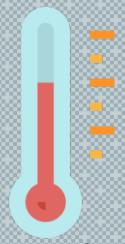
- **Tsunami**

- **Hurricanes/ Nor'easters**

- **Wild Fires**

- **Winter Storms**
  - **Snow**
  - **Ice**

- **Earthquakes**



- **Extreme Temperatures**
  - **Heat**
  - **Cold**

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STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

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Infrastructural								
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Features	Location	Ownership	V or S	Floods	Winter Storms	Droughts & Wildfires	Priority H - M - L	Time Short Long Ongoing
Infrastructural								
Societal								
Environmental								

Dam

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STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

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Features	Location	Ownership	V or S	Floods	Winter Storms	Droughts & Wildfires	Priority H - M - L	Time Short Long Ongoing
Infrastructural								
Dam								
Societal								
Senior Center								
Environmental								

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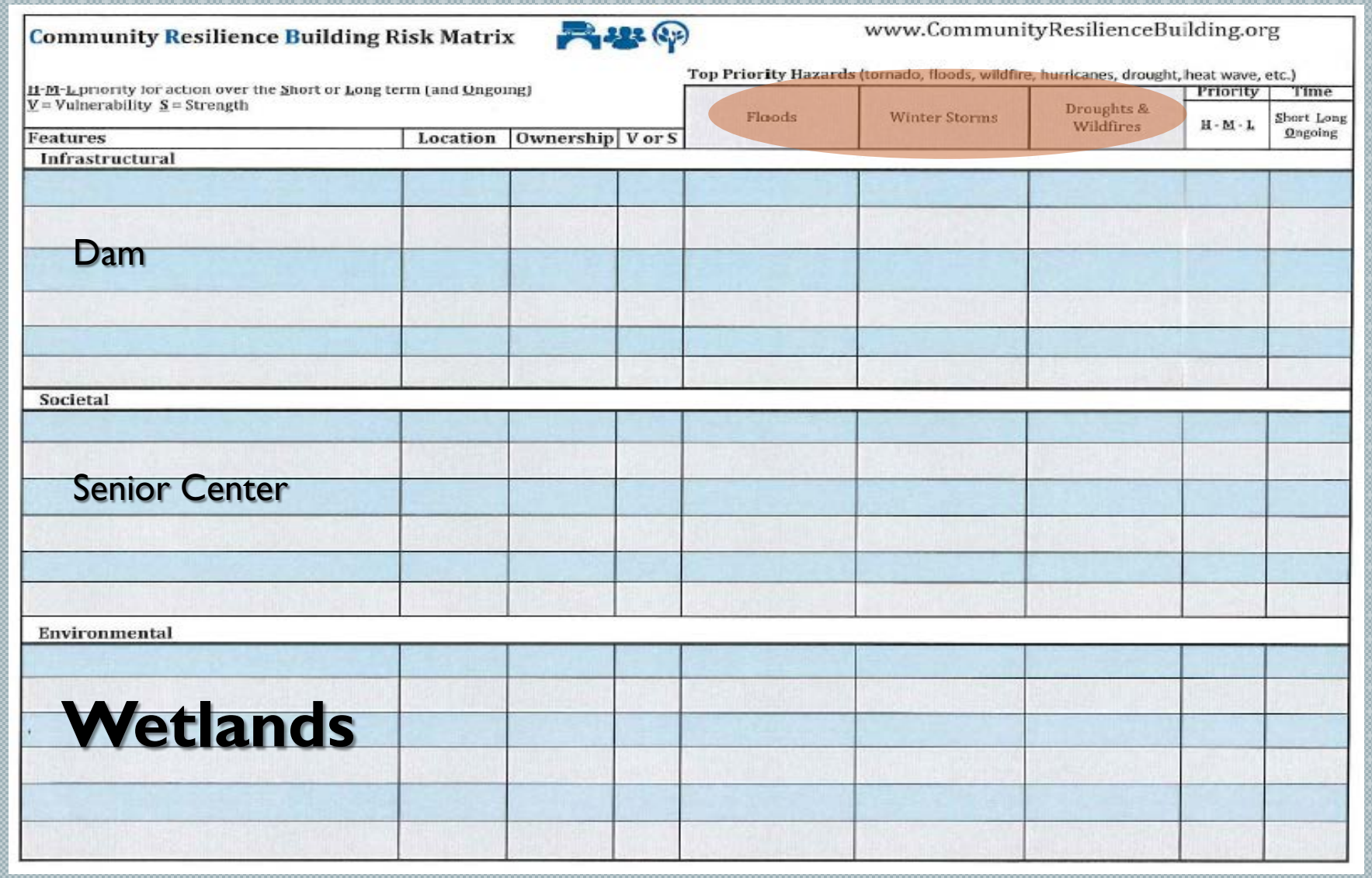
STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES



Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

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Infrastructural								
Societal								
Environmental								

Dam

Senior Center

Wetlands

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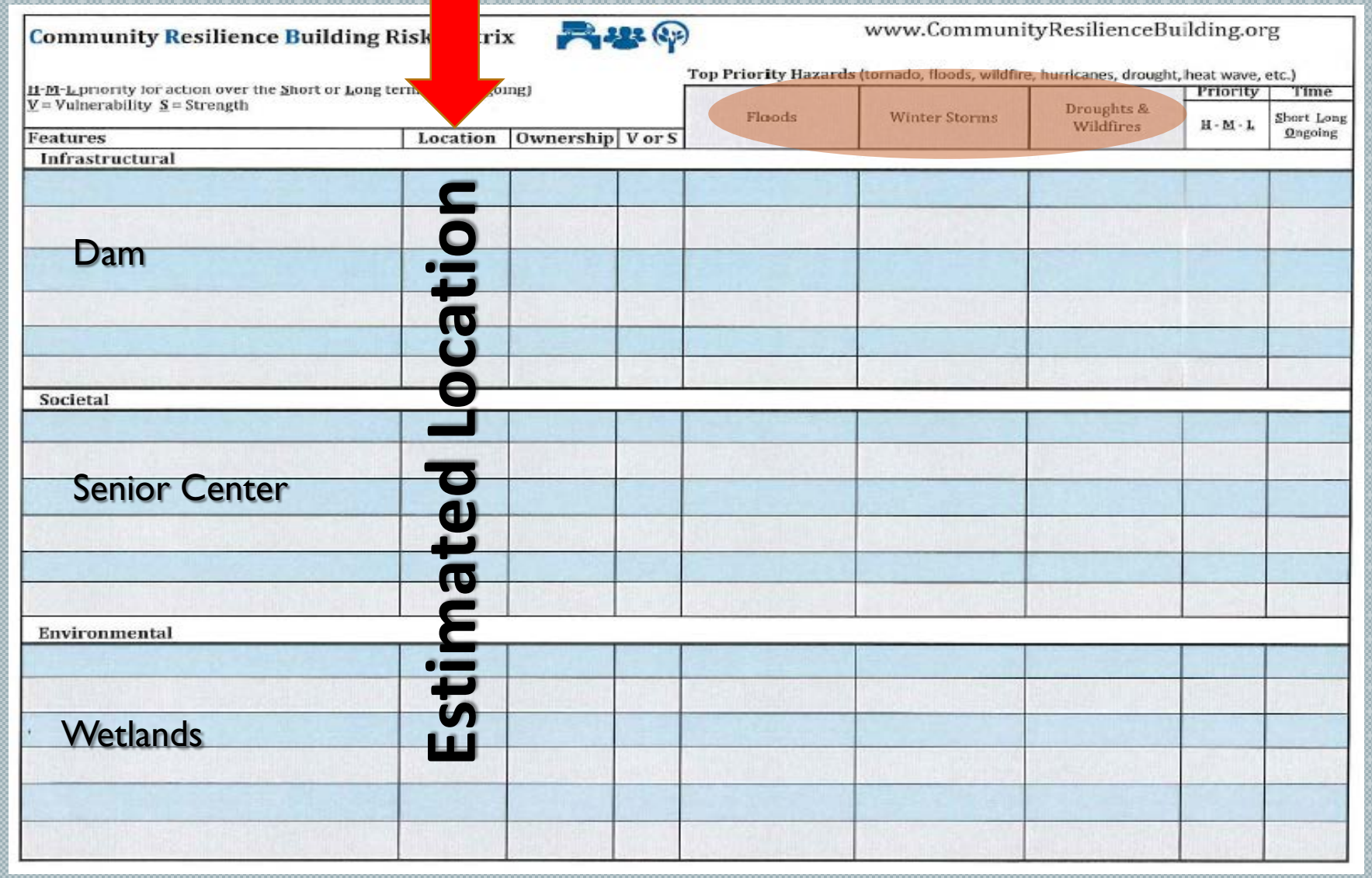
STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES



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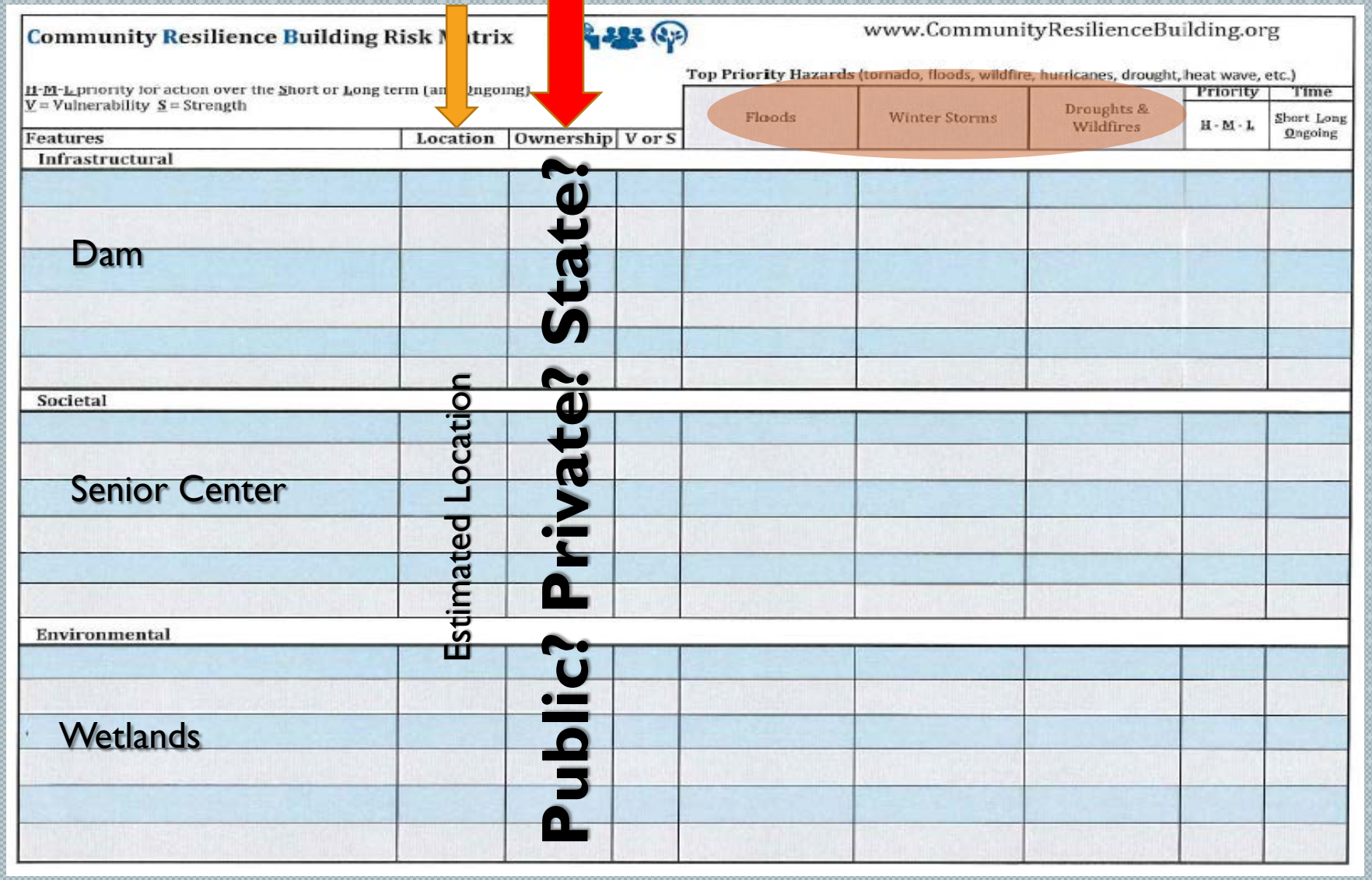
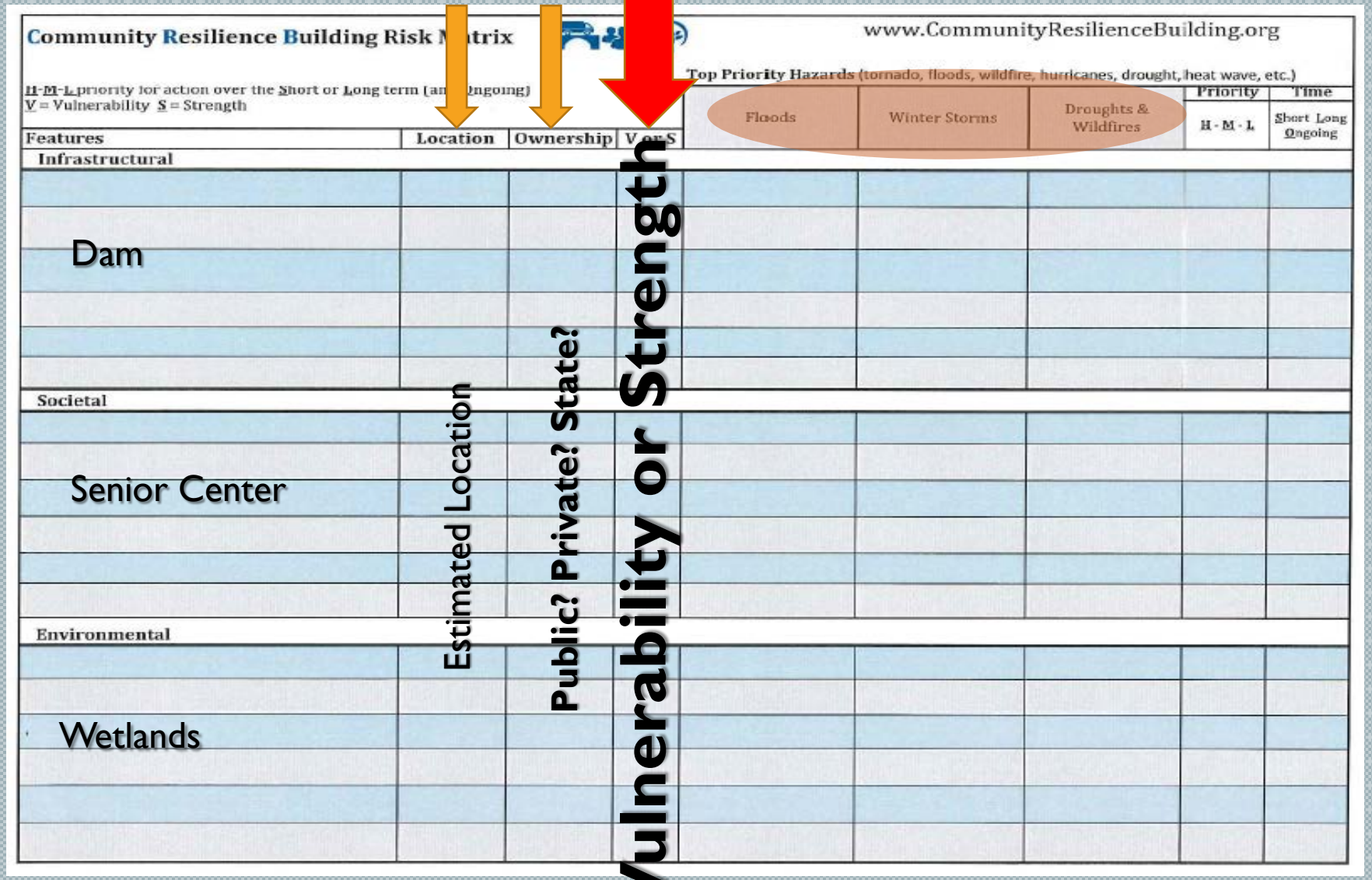
STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES



STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES



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BREAK OUT GROUP: STEP 1 AND 2

At your table:

- Step 1- Fill in top 4 Natural Hazards
- Step 2- Identify key features
    - Infrastructure- Dams
    - Societal- Senior- Center
    - Environmental- Wetlands
  - Where is the Feature Located
  - Identify ownership (Public, Private)
  - Identify vulnerability, strength or both

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TIME TO GET TO WORK

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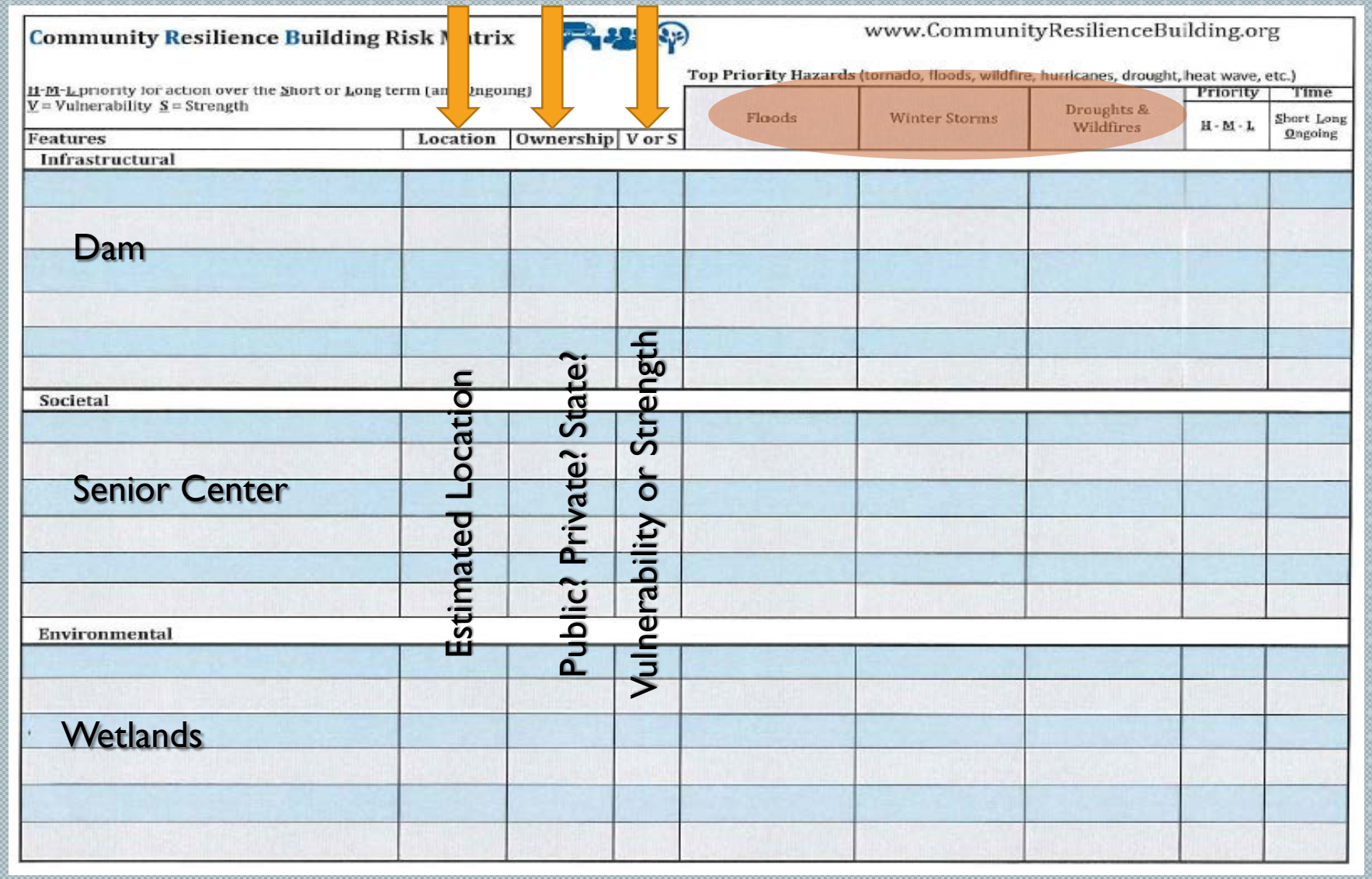
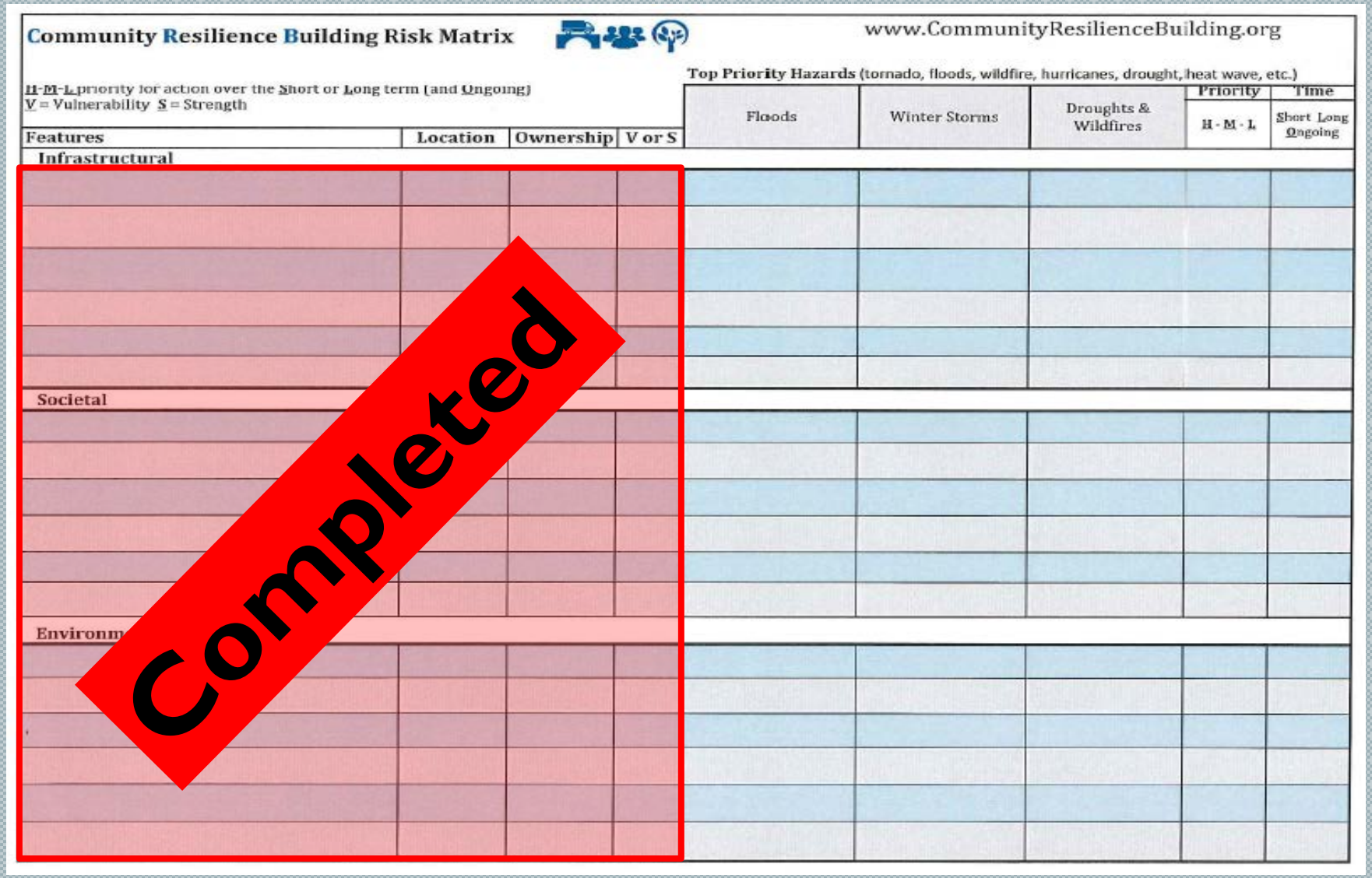
STEP TWO: COMPLETED



STEP THREE: ACTIONS, PRIORITY AND TIMELINE



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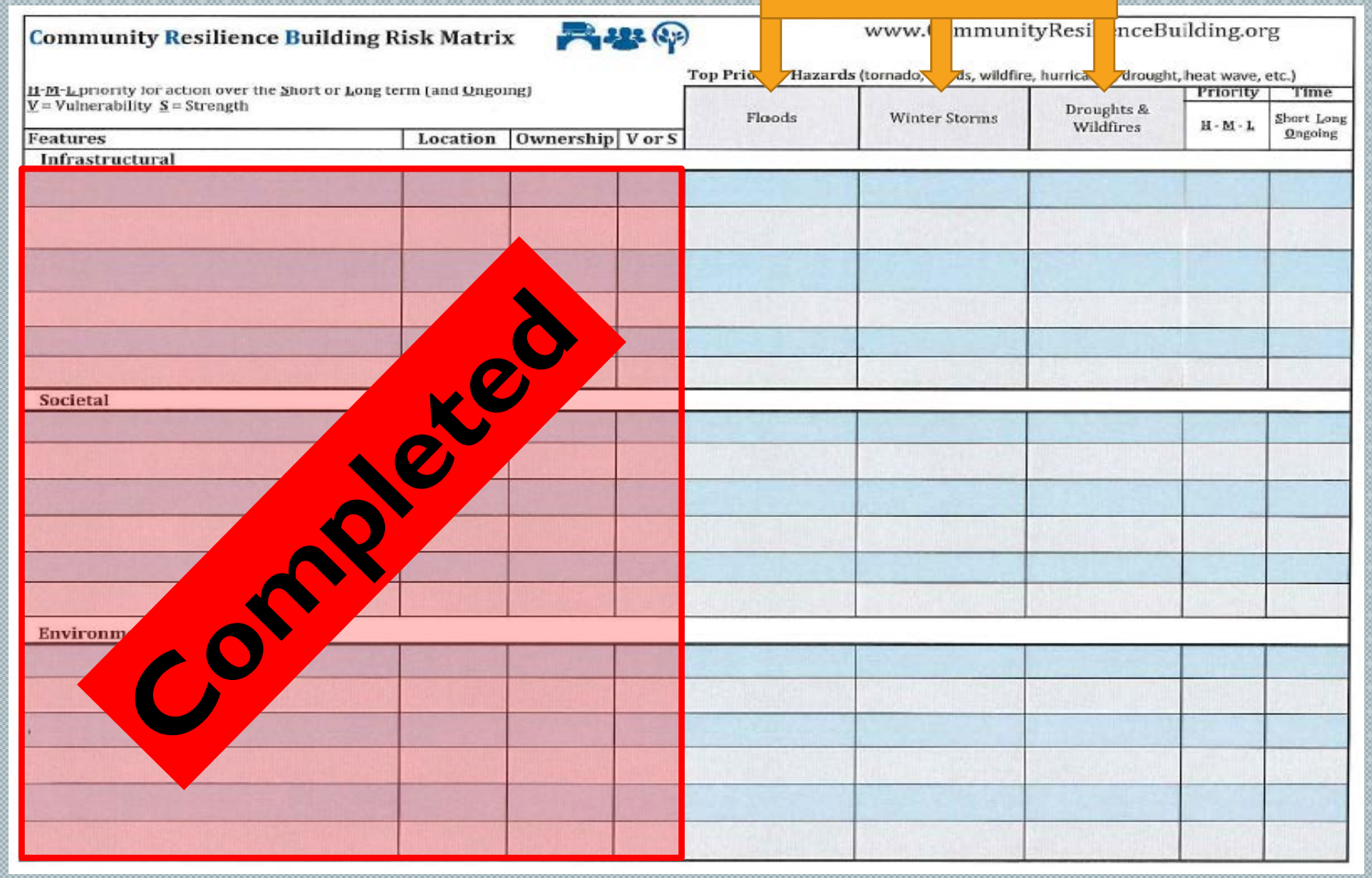
STEP THREE: ACTIONS, PRIORITY AND TIMELINE



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NATURE BASED SOLUTIONS (LID)

- Natural systems mimic natural processes to absorb and slow runoff and stormwater, and also reduce heat islands.

- Low impact development (LID) designs can be integrated into new development at neighborhood scales and work with traditional approaches

Bioswale between sidewalk and street

Contained bioswale or planter box

Mass Audubon

Shaping the Future of Your Community

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MORE EXAMPLES OF LOW IMPACT DEVELOPMENT AND GREEN INFRASTRUCTURE

Green Parking Lots

Permeable Paving

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ECONOMIC BENEFITS OF LID AND GREEN INFRASTRUCTURE PROJECTS

Aquatic restoration projects in MA, like these natural culverts, are contributing to a growing "restoration economy" by providing jobs and economic output.

Traditional Culvert

Nature Based Culvert

Mass Audubon

Shaping the Future of Your Community

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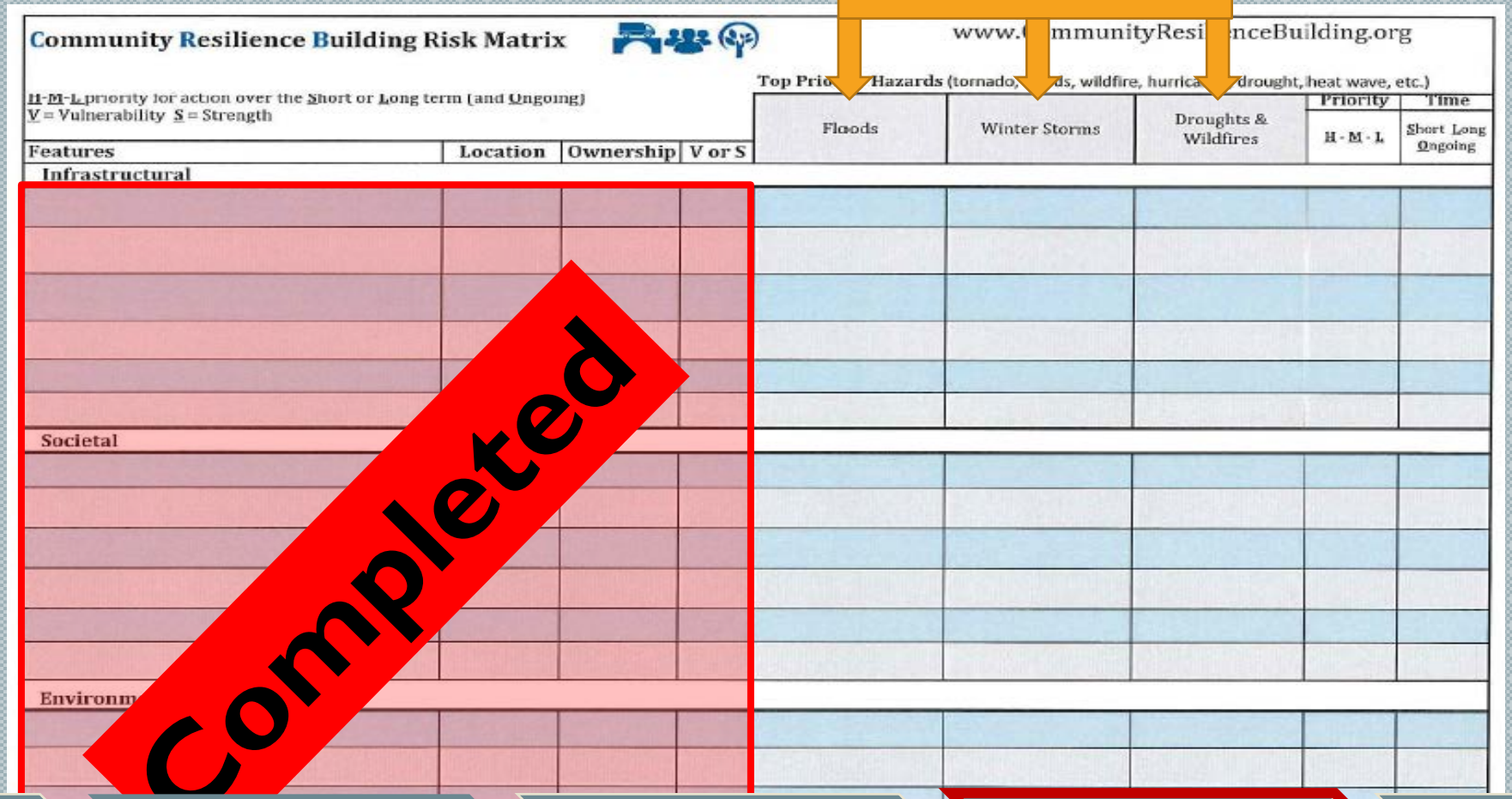
BENEFITS OF GREEN INFRASTRUCTURE AND LID

- Cost Savings
  - Reduced development costs for infrastructure and maintenance
  - Reduced energy costs for residents
- Public Safety
  - Reduced flooding
  - Improved water quality
  - Increased climate change resiliency
  - Reduced urban heat island effect
- Quality of Life
  - Protect and restore natural features for improved aesthetics
- Value
  - Increased property values
- Regulatory
  - Assistance in meeting regulatory requirements

STEP THREE: ACTIONS



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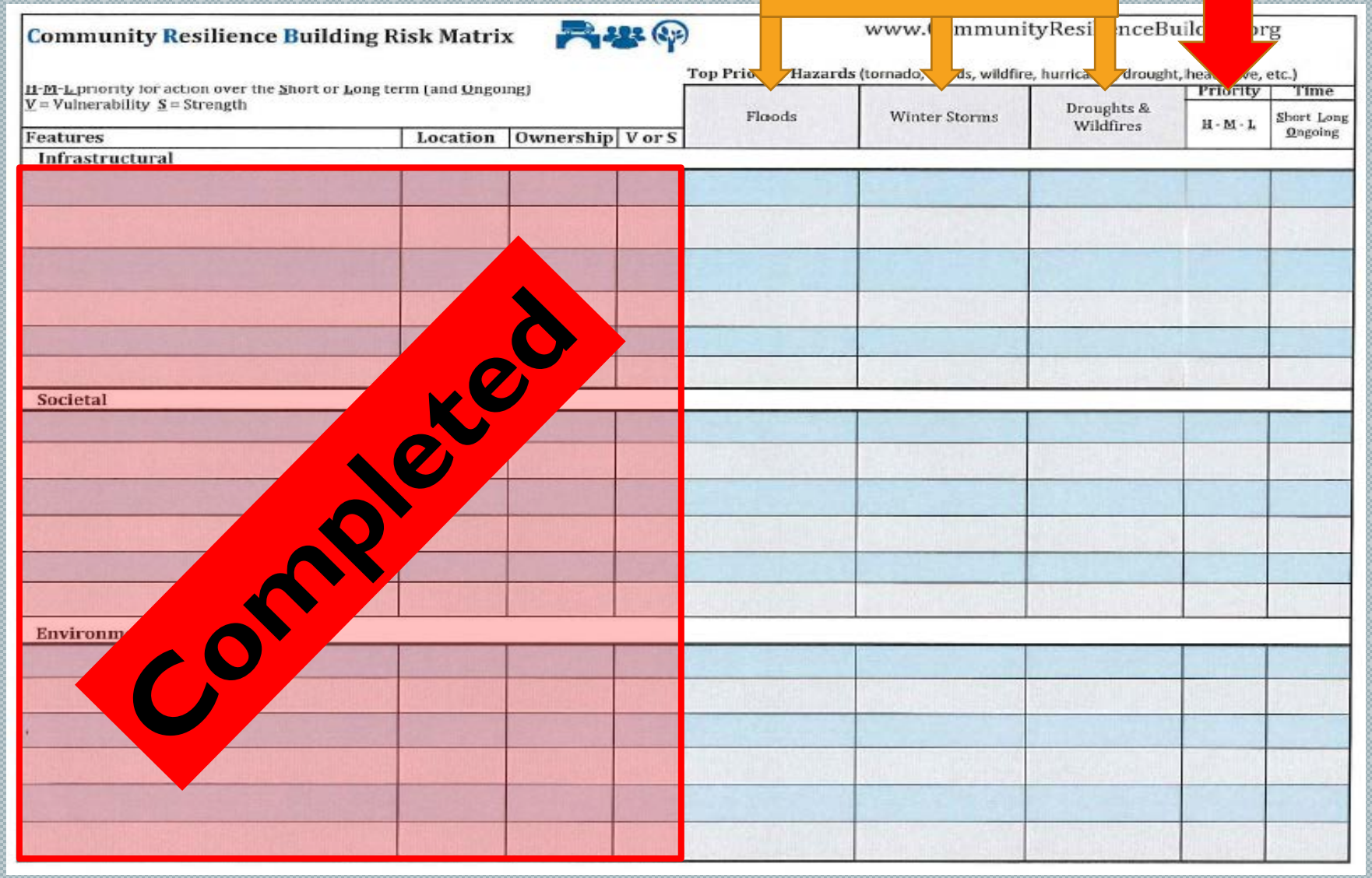
5. Take Action

STEP THREE: PRIORITIES



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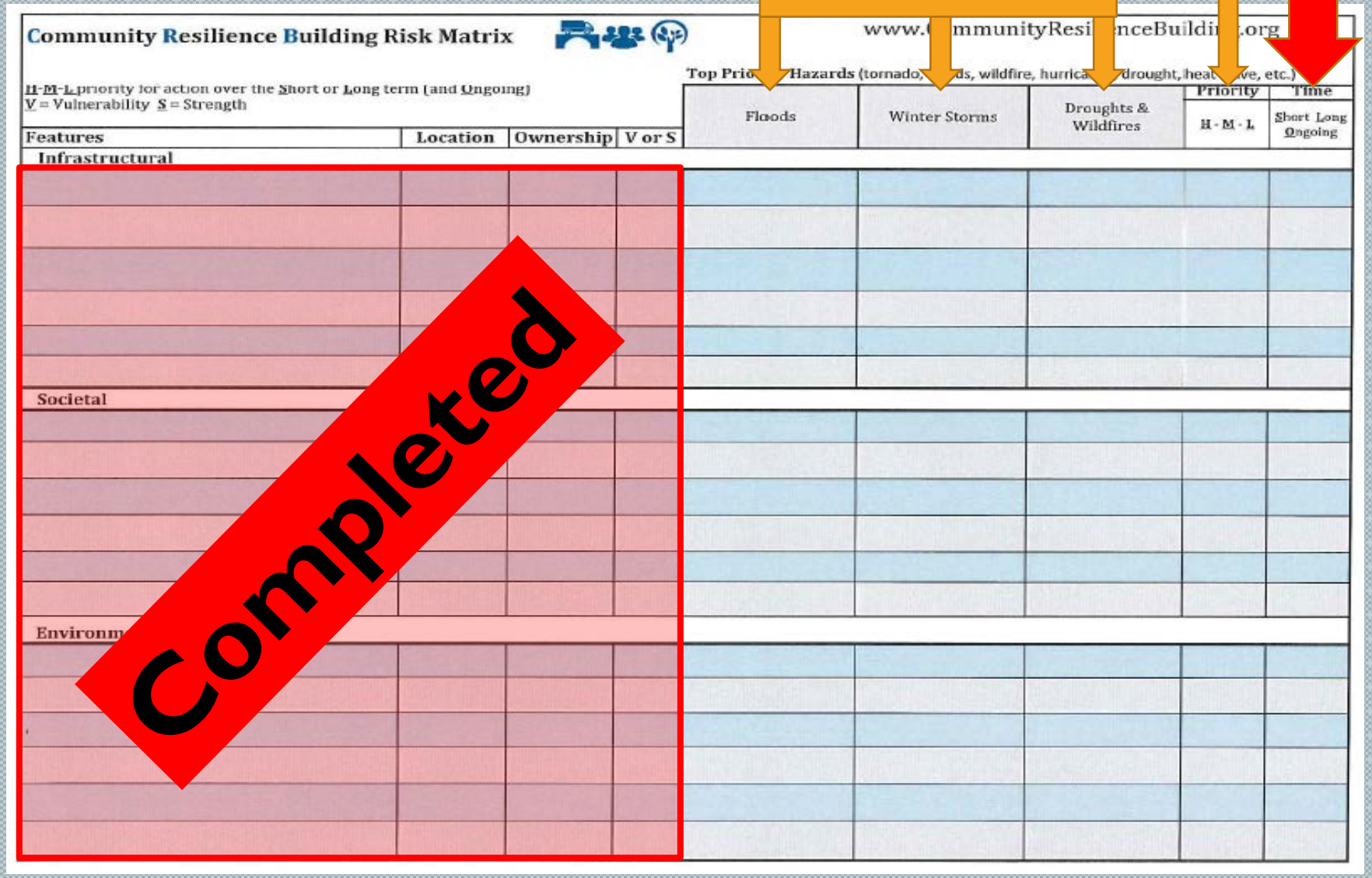
STEP THREE: TIMELINE



TIME TO GET TO WORK

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REPORT OUTS

What did your table find?

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TIME TO VOTE

- Add one dot to each category
- Place remaining two dots any where you would like
- Return to your seat when completed

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SUMMARY DISCUSSION

- Areas of agreement
- Unique perspectives

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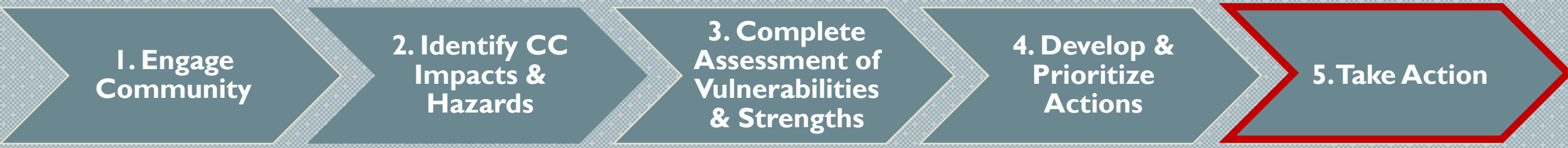
NEXT STEPS

- Report development
- Public "Listening" session with Members of the Public and Board of Selectmen
- Develop resources and Implement actions.



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- CMRPC Project Leader,
  - Peter Peloquin, ppeloquin@cmrpc.org
- Executive Office of Energy and Environmental Affairs –
  - Andrew Smith, andrew.b.smith@state.ma.us

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QUESTIONS OR COMMENTS

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THANK YOU

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