

Town of Hardwick

Municipal Vulnerability Preparedness

SUMMARY OF FINDINGS

JUNE 2022



ABOUT THE AUTHORS

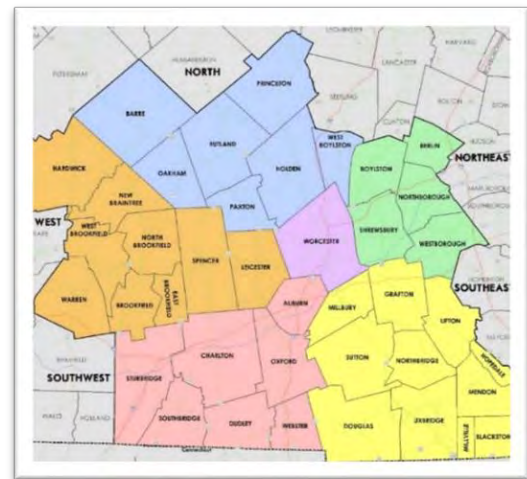
CMRPC Mission

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 and 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. CMRPC's programs include Transportation, Regional Services, Geographic Information Systems (GIS), and Community Planning.



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.

CONTENTS

About the Authors	1
CMRPC Mission	1
Our History and Progress	1
Contents	2
Executive Order 569 and the Massachusetts Municipal Vulnerability Preparedness program.....	3
Hardwick: A Profile.....	4
Community Resilience Building Workshop	5
Workshop Overview	5
Summary of Findings.....	7
Top Hazards	8
Current Concerns and Challenges Presented by Hazards and Climate Change	10
Specific Categories of Concerns and Challenges	12
Infrastructure Concerns	12
Societal Concerns	13
Environmental Concerns.....	14
Infrastructure Strengths.....	17
Environmental Strengths	19
Infrastructure Actions	21
Societal Actions	21
Environmental Actions	22
Top Recommendations	23
Next Steps	27
CRB Workshop Participants	28
CRB Workshop Project Team	29
Citation.....	29
Acknowledgements.....	30
Appendix	31

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 Framework. Towns and cities are free to choose the consultant of their choice from a list of certified MVP providers. The Town of Hardwick 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>

HARDWICK: A PROFILE

The Town of Hardwick, Massachusetts was incorporated on January 10, 1739. As a central Massachusetts Town, Hardwick is located in Worcester County, just 24 miles west of Worcester City. Off of MA-32, the Town of Hardwick includes the villages of Hardwick, Gilbertville, Wheelwright, and Old Furnace. Hardwick is primarily a bedroom community, located a mere 30 miles from Springfield, 73 miles from Boston, and 160 miles from New York City.

Hardwick is bordered by the Town of Ware in the south, New Braintree in the east, Barre in the northeast, Petersham in the north, and Quabbin Reservoir in the west. The Town is 38.40 square miles and lies about 880 feet above sea level. The Ware River, at the southeast border of Hardwick, has an elevation of about 600 feet above sea level. Moving north from there, Hardwick increases in elevation, reaching rugged land in the northwest.

Hardwick is home to a total population of 3,039 residents. From an estimate of 2,926 residents in the 2010 US Census, the population of Hardwick has increased 3.86% to its current number. The median age of Hardwick residents is 36.7 years old. 25.1% of residents are under 18 years of age, and 17.3% are over 65 years. 96.2% of Hardwick residents are White, 3.4% are Hispanic or Latino (of any race), 0.8% are Black or African American, 0.1% are Asian, 0.5% are some other race, and 2.4% are two or more races. The median household income resides at \$60,703, with 15.9% of the population living below the poverty level.

According to the Long-Range Transportation Plan Mobility 2040 provided by the Central Massachusetts Regional Planning Commission (CMRPC), Hardwick is not expected to struggle with overpopulation in the coming decades, with population predictions remaining close to those of 2010. The CMRPC also has categorized Hardwick into a low growth community in terms of employment, with employment numbers also expected to remain similar in the coming decades.

The Town of Hardwick prides itself on a modern-day small-town sense of community within an environment rich in American colonial history. The Gilbertville Public Library, Paige Memorial Library, Barre/Hardwick Senior Center, Hardwick Little League, and Hardwick Fair provide community engagement for all residents of the town. The Hardwick Farmers Co-op, Chestnut Farms, and Hardwick Farmers' Markets provide fresh healthy food to the community, by the community. Quabbin Country, the East Quabbin Land Trust, and Massachusetts Division of Fisheries and Wildlife also provide a nature outlet for its residents.

COMMUNITY RESILIENCE BUILDING WORKSHOP

The Town of Hardwick contracted with the Central Massachusetts Regional Planning Commission (CMRPC) on October 8, 2020, 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 Hardwick. The project coordinators and CMRPC met in Winter 2021 to begin the initial planning process. The project coordinators planned an initial kickoff in February 2021 for this planning effort. However, due to ongoing conditions with the COVID-19 pandemic, and with staff turnover in the Town, it was decided to postpone the project to the following year. In May 2021, an extension to the Town of Hardwick's MVP Planning Grant was requested and granted. Planning activities began again in Winter 2022. On January 12, 2022, a small group of Town Officials, Board Members, and community leaders convened to form the "Core Team" which, together with CMRPC staff, organized and planned the CRB Workshop over the course of five meetings.

The Town of Hardwick's CRB workshop was scheduled to be held during the month of March 2021. The workshop would take place over the course of two separate in-person meetings. The first meeting would be held for three hours. The first hour would be dedicated to welcoming and introducing participants to the workshop, reviewing important information about the MVP program as well as natural and climate hazards of the Town, and discussing a brief overview the day's objectives. The remaining two hours would be dedicated to identifying features, location, and ownership of vulnerabilities and strengths in Town. The second meeting was reserved for completion of the prior meetings work and to develop actionable items to improve resiliency throughout the Town of Hardwick.

Workshop Overview

The CRB workshop was held in-person at the Municipal Office Building on **Thursday, March 24th from 5:00 – 8:00 PM**, and on **Thursday, March 31st from 5:00 – 8:00 PM**. To prepare participants for the workshop all presentations were pre-recorded by the Core Team and the staff at CMRPC. Upon completion of the MVP program overview presentation, Climate Projections presentation, Hazards presentation, and Matrix/ Nature Based solutions presentation, the invitation and workshop materials document were put together. The invitation included information about the meeting, and the workshop materials document was complete with links to each presentation, table maps, two-page MVP program overview, CRB Workbook, and an agenda for each of the two meetings. Participants were instructed to watch all presentations at their leisure prior to the workshop. On the day of the workshop, CMRPC staff gave an overview presentation on the MVP program, climate and natural hazards found in Hardwick, and tasks for each respective day of the workshop.



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

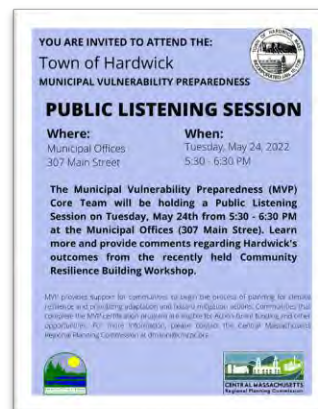
- Overview of the CRB process
- Overview of the MVP program
- A summary of climate change projections, impacts and mitigation strategies
- A detailed profile of natural hazards in the Town of Hardwick, including the top four hazards perceived by the core team.

During the first workshop meeting date, the group discussed the top four hazards that affect Hardwick. There was agreement between the Core Team and all participants that--in no particular order-- ***flooding, severe storms (wind), winter storms/extreme cold (ice) and drought/extreme heat (wildfire/invasives)*** have the greatest effects and potential impacts on the Town. Having identified these hazards, workshop attendees were then asked to work through the CRB program's matrix and mapping exercise. Table facilitators, along with CMRPC staff guided stakeholders in three small group 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.

The group then reconvened one week later to build upon the first day's work. The goal of the second session was to continue to identify features and begin to identify actionable items to reduce or mitigate the projected impacts of climate change. Once the group had completed the matrix, the groups gave a summary of findings by the table reporters. At that point, the group were given five stickers to vote on their top priority actions. Each participant was instructed to vote for their top societal, infrastructure, and environmental action idea. Once they voted on those top three actions, they were allowed to place two additional votes on any other actions that they were in favor of the Town pursuing. The results of this voting exercise were used to prioritize and organize the matrix and report.

Thirty (30) stakeholders attended the CRB Workshop, including representatives from Town government, emergency services, the MVP Core team, Municipal Department Heads, Conservation Commission, Planning Board, Board of Selectmen, local farmers, local contractors, and concerned citizens of Hardwick.

A public listening session to discuss MVP results and recommendations for future actions was held in-person on Tuesday, May 24, 2022 from 5:30 – 6:30 pm. The listening session was properly promoted across several avenues, with ten (10) people in attendance. Between the two meetings, a total of forty (40) people participated in the MVP process.



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, severe storms, drought and extreme temperatures, and winter storms and extreme cold as the primary hazards facing Hardwick. All the participants agreed that these four hazards were the most relevant for Hardwick.



The Town's emergency personnel, Town buildings, and rural character were described as strengths, along with the water resources and recreation opportunities. The Town's rural character and agricultural roots were considered to be major strengths, limiting development pressures and providing access to healthy, locally grown food. Communication systems and access were considered a vulnerability and a barrier to information distribution. Dams, culverts, and bridges were also considered vulnerable safety hazards leading to additional flooding concerns.

Another area that was widely seen as a hazard to the Town and a burden on Town resources is the Department of Environmental Protection Order on the sewer lines in Hardwick. The failed sewer lines polluted the Ware River, resulting in significant fines from the Environmental Protection Agency. Though the Town is working to rectify this matter, it has occupied already limited Town resources and staff time. Invasive species were also noted in the parks and forested areas across Town, threatening the native plant species in these areas and increasing wildfire risks. Other vulnerable areas mentioned were roadway flooding, runoff contamination, and beaver activity.

The water supply was considered a major vulnerability by all. The Town does not have a public water supply, though it does have two private water districts. There was concern that these water systems have aging infrastructure and are vulnerable to contamination. As the frequency and duration of drought increases, and as development pressures increase, the demand for clean water will also increase. Therefore, it was discussed that it will be integral to the conserve the land surrounding the aquifers to protect the water supply.

It was also discussed that there is a need to establish a series of public education campaigns regarding stormwater management, wetlands, tick and mosquito best practices, invasive species identification and management, and the benefits of the Community Preservation Act.

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 forested areas, emergency preparedness, limited resources and influence, and flooding.

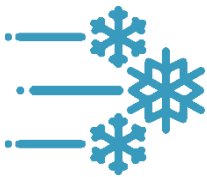
TOP HAZARDS

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: **drought and extreme heat (wildfire and invasive species), severe storms (wind), flooding, and winter storms and extreme cold (snow and ice).**

In 2016, Hardwick experienced extreme droughts along with most 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. It is expected that as climate change worsens, all of these natural events will increase in severity and frequency.



Flooding.



DROUGHT/EXTREME HEAT

Projecting an increase of consecutive dry days, 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/EXTREME COLD

Annual days below freezing will decrease, 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.



SEVERE STORMS

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 climate continues to change. Local dams, undersized culverts, and beaver activity have all contributed to flooding throughout Town.

Winter Storms and Extreme Cold. 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.

Drought and Extreme Heat. 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 are on town water or have wells.

Severe Storms. 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 Hardwick 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 and sleet in the winter. Higher wind in the summer and storm severity increases with warmer temperatures.

CURRENT CONCERNS AND CHALLENGES PRESENTED BY HAZARDS AND CLIMATE CHANGE

Meetings with the MVP Core Team prior to the workshop as well as the workshop 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). Hardwick does not have a public water supply in place, but does have two private water districts. It will be important for the town to secure a backup drinking water supply as the current supply is already limited, vulnerable to drought, and vulnerable to contamination.

At the workshop, CMRPC staff presented downscaled climate change data provided by Massachusetts's Executive Office of Energy and Environment Affairs (EEA) and the Northeast Climate Science Center at the University of Massachusetts, Amherst. Hardwick lies within the Chicopee River Watershed 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 to a range of 9 to 30 hot days annually, days below freezing will fall to a range of 19 to 38 cold days annually, and annual precipitation will increase 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 Hardwick area.

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

- Issues associated climate change will exacerbate problems that are already apparent, and the town lacks the resources to address 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 greater need for cooling and less need for heating, especially among vulnerable groups such as children and seniors.
- 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.
- 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. Tree damage will occur from intense windstorms 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 there will be a greater 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.

SPECIFIC CATEGORIES OF CONCERNS AND CHALLENGES

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

Infrastructure Concerns

Culverts & Dams

At the workshop, all three tables noted that culverts and dams were a major vulnerability for the Town. According to the Massachusetts Office of Dam Safety, there are ten dams in the Town of Hardwick. There was a concern by participants that many of these dams are old and in need of repairs. Additionally, half of these dams are privately owned, making it difficult to track the management of these dams. One dam of particular concern was the Wheelwright Dam. This dam was in poor condition and is in the process of being removed.

Many culverts in Town are undersized and are failing. When a culvert fails, this can cause the water to overflow the road embankment and cause significant erosion. This can lead to failure or obstruction to structures further downstream, and can cause significant flooding hazards. Though a Town-wide issue, participants noted increased flooding caused by these failed culverts along Barre Road, Main Street, and within the local wetlands. As the intensity and frequency of precipitation increases, the likelihood of dam failure and culvert failure will also increase if this infrastructure is not properly monitored and updated.

Utility Systems

Another vulnerability identified at the workshop was the Town's utility systems. There is no public water supply in the Town of Hardwick. Instead, there are two private water districts and other residents rely on private wells. The two private water districts in Hardwick are the Gilbertville Water District and Wheelwright Water District. Workshop participants noted that these water systems are functioning okay for now, but there was concern about the aging condition of this infrastructure. There was also concern that the water wells and aquifers are at risk of flooding and contamination. Private water wells are also at risk of drying during periods of drought.

There was also concern with the septic systems in Town. The sewer lines and wastewater treatment plants in Town are very vulnerable and are under a DEP order due to violations. Overflow from this system has been overflowing into and polluting the Ware River. The Town has received significant fines from EPA for this issue, and has been working to mitigate this vulnerability. Many other Town projects have been put on hold as the majority of staff time and resources have been dedicated in order to rectify this DEP order.



INFRASTRUCTURE

- Culverts & Dams
- Utility Systems
- Facilities & Historic Structures

The power grid was also viewed as being vulnerable to tree damage. Many street trees in Town have been impacted by invasive pests, such as the Asian longhorned beetle, Emerald ash borer, Gypsy moth, and Hemlock woolly adelgid. Damage from these insects causes these trees to decline or die. And in high wind events or lightning storms, these trees are at more risk of falling into the street or on powerlines, leading to power outages. Prolonged power outages could have impacts to the water and septic systems in Town, limiting access to clean drinking water. There is no Town-sponsored tree removal and replacement program, and though National Grid periodically trims street trees that are along power lines, more management is required to reduce this vulnerability.

Facilities & Historic Structures

The third major infrastructure vulnerability discussed at the workshop is facilities and historic structures in Town. Many facilities in Town require upgrades to restore functionality. The old foundry is a historic facility that all three tables discussed during the workshop. The former Pioneer Foundry is a hazardous waste site with contamination from oil, grease, lead, asbestos, polycyclic aromatic hydrocarbons, and phosphoric acid. Without proper cleanup, this site will continue to be a hazard in Town, preventing redevelopment and risking contamination nearby. Other mills in Town have similar concerns and are currently being underutilized. If cleaned up and upgraded, those historic mills could be redeveloped. Hardwick's Municipal Offices located at 307 Main Street is another at-risk building. The Municipal Offices building has a flat and spongy roof, putting it at risk for snow loads. It also lacks a sufficient generator, making it vulnerable to power outages. Poor drainage infrastructure leads to flooding in and around this building, and large trees in the back threaten to fall onto and damage the building. In order to remain functional during times of crisis, significant upgrades should be made to the building. The Town's historic records are stored in this building, in an area vulnerable to flooding. These records should be stored in a fire and flood resistant location, and should be digitized to better preserve this information.

Societal Concerns



Emergency Services

Emergency services were noted as a major vulnerability in the societal category. To begin, participants noted that the Town of Hardwick is very spread out, splitting off into three different areas of Town. As such, it is difficult to travel to and from these areas very quickly, creating an obstacle to receiving and giving services. Additionally, the Police Station is located in New Braintree, extending the already far commute. Located at 20 Memorial Drive, the Police Station is shared between the Town of New Braintree and the Town of Hardwick. There is a desire to construct a police station in Town to cut down on travel time during periods of crisis. Just as the police station is not located in Town, hospitals are also not in Town or in adjoining towns. The

SOCIETAL

- Emergency Services
- Communication Systems
- Lack of Industry & Access

Town of Hardwick is in a hospital dead zone with the most recent closing of Mary Lane Hospital in Ware. Now that Mary Lane has closed, the closest hospital to Hardwick is Athol Hospital. There are also no ambulance bays in Town. Without easy access to a hospital, residents will be at more risk in times of crisis when medical attention is needed. Generally, residents of Hardwick will find access to healthcare more difficult to achieve.

Communication Systems

The communication systems in Town were also viewed as a societal vulnerability. As stated above, the Town of Hardwick is very spread out. Just considering the physical location of people, it can be rationalized that communication between people in different parts of Town is difficult and limited. The Town does have a CodeRED alert system that allows the Town to send out emergency notifications. Despite having this alert system, there were concerns about how functional the system could be during power outages. The Town has become so reliant on electricity that there was concern with how to communicate without technology. Also, the Town's website was suggested to be improved to provide more information and easier access to that information. With the likelihood of increased storm events and other severe weather, it will be necessary to communicate disaster preparedness information with the residents of Hardwick.

Lack of Local Industry & Access

Though its rural character was noted as a strength, Hardwick's lack of local industry and access created other issues. There is no public transportation system in Hardwick, so residents must rely on personal vehicles for transportation. This leaves those who are unable to drive or unable to afford their own personal vehicle with a limited ability to travel. In times of emergency, these vulnerable persons will be unable to evacuate on their own. The Town of Hardwick is also lacking in local industry and businesses. While Hardwick's rural character was viewed as a strength by workshop participants, attendees also recognized that the lack of residential growth has also impacted the possibility of economic growth. Without new residents coming into Town, the residential tax base cannot grow. And without more people coming into the Town, there is a perceived lack of desire to establish new businesses within Hardwick, further limiting the Town's revenue. The Town's budgeting has to rely on residential taxes, grant programs which are often difficult to utilize due to required matches, and private fundraising. Additionally, because of the Town's small size and distance away from Boston and the larger metropolitan area, participants noted that Hardwick has very little political power or influence in the State. With a small, rural voice, the needs of Hardwick and its residents are often missed or overlooked at the State level.

Environmental Concerns



Invasive Species

The growing presence of invasive species was noted by participants as a major vulnerability to the Town's environmental resources. Invasive species are animals, plants, or other organisms from another region of the country or world, that are in a new

ENVIRONMENTAL

- Invasive Species
- Nuisance Species
- Forestry Management

environment, and don't belong in that environment. These species can either be introduced to the area on purpose to help mitigate the population size of a native species, or by accidental release. Invasive species are detrimental as they can cause extinction of native plants and animals, destroy biodiversity, or permanently alter habitats since there is no natural predator to keep these invasive species in check. As the climate continues to warm, it is expected that invasive species will continue to overrun the Town's ecosystem, out-competing native species. Participants noted that invasive species have already impacted Hardwick's aquatic and forest resources. Aquatic invasive plants have been found in Hardwick Pond, impacting use of this resource. Invasive plants and pests have also been negatively impacting the health of trees in Hardwick, particularly the street trees. Common invasive species that have been observed around Town include Japanese knotweed, Common barberry, Common buckthorn, Glossy buckthorn, Japanese barberry, Multiflora rose, Norway maple, Oriental bittersweet, and Purple loosestrife.

Nuisance Species

Similar to invasive species, participants also noted that nuisance species have been a vulnerability to the Town as well. Nuisance species are plants, animals, or other organisms that are native to an area, but have overpopulated a region due to a lack of a predator, removal regulations, or the changing climate. The first nuisance species that workshop participants identified was beavers. All three tables at the workshop noted that beavers have been causing flooding and property damage concerns Town-wide. Beavers will instinctively build a dam when they hear the noise of running water. As such, culverts are often targeted by beavers, adding to increases in flooding along roads in Town. Because beavers are a keystone species, or a species that helps maintain a functioning ecosystem, the State's regulations limit how towns can trap and remove beavers. Even if beavers were removed from an area, their instinct would likely draw them back to the same location again. Though a Town-wide issue, participants noted increased beaver activity along Barre Road.

Deer populations were also discussed as increasing as well. Gray wolves became extinct in Massachusetts, eliminating a natural predator to deer. Predation of deer is limited to recreational hunting and coyotes, but these strategies have been unable to keep up with the growing deer population. Aside from increased human-wildlife interactions, deer also create concerns from damage they cause to trees, shrubs, and gardens, and from carrying deer ticks. In Massachusetts, deer ticks can carry Lyme disease. Typically, deer ticks will die out during the cold winter months, controlling the deer tick population and managing the spread of Lyme disease. However, climate change will result in milder and warmer winters, causing fewer disease-carrying ticks to die out during those winter months. With fewer ticks dying, the overall tick population will increase, creating a greater chance of contracting Lyme disease.

In addition, as the climate continues to warm, and as periods of flood and drought increase, risk of other insect-borne diseases, especially EEE and West Nile Virus, will worsen. Mosquitos carry EEE and West Nile Virus (WMV). They tend to lay their eggs in and around standing water, so populations of mosquitoes will likely increase in times of flooding. Mosquitos are also more aggressive on hot, dry days, and will feed more frequently during those periods, causing greater

instances of contracting those diseases. Children and senior citizens are more susceptible to the effects of insect-borne diseases.

Forestry Management

Forestry management is a third environmental vulnerability noted by participants at the workshop. Drought, wind events and invasive species can lead to increased fire load and risk of wildfires. With an increase in temperatures and numbers of consecutive hot days, drought, and consequently more wildfires, will be an ongoing hazard. Along with drought, climate change will bring about a shift in flora and fauna for the region. Plants and animals that have adapted to warmer and drier climates will increase in Massachusetts, and native species that are better adapted to cooler weather will decrease. As noted above, when a non-native species invades an area, it can often outcompete the native species. Without a predator to manage population numbers, invasive species can dominate an ecosystem quickly. This is especially detrimental to forest ecosystems. Invasive plants and vines can grow around trees, choking them out and causing them to decline. There are also concerns regarding invasive insects. Participants noted that the Asian longhorned beetle, Emerald ash borer, Gypsy moth, and Hemlock woolly adelgid are a concern to the area. While these insects typically do not have direct harmful effects to humans, they do have disastrous effects on native tree species in Massachusetts. The gypsy moth prefers to feed on oak and birch trees, amongst other species, while the Asian Longhorn Beetle prefers hardwoods such as Ash, Birch, and Elm. Trees that are impacted by invasive insects are much more vulnerable to damage during intense storm events as well as drought. Ice storms, drought, and heat have added to this pest damage, and the town has been unable to keep up with the maintenance of its street trees. There was also considerable concern regarding the impact of solar farms on forested areas. While the Town is not threatened by development pressures, there have been growing concerns over the development of commercial solar developments. Solar companies have been utilizing historic farmland to construct commercial solar panel installations. In addition, they have also been clear cutting forested areas to erect commercial solar installations. This has resulted in habitat destruction, forest fragmentation, and erosion.

CURRENT STRENGTHS AND ASSETS

Hardwick has taken some steps to address natural hazards and climate change over recent years. Public opinion holds that emergency personnel are a “societal strength” that will protect and strengthen the Hardwick community. Perceived environmental strengths focused mainly on the large and diverse number of natural resources and recreation opportunities that Hardwick residents can take advantage of.

Infrastructure Strengths



INFRASTRUCTURE

- Town Buildings
- Stormwater Management
- Rural Character

Town Buildings

Despite needing upgrades to improve usability, workshop participants viewed Town Buildings as a strength to Hardwick. The Highway and Fire Departments are both located nearby one another at 165 Petersham Road. Being located so close together allows for better collaboration and communication. These facilities are also located within Town, allowing for quicker access.

As mentioned before, there are numerous historic mills in Town that are not being utilized. Workshop participants noted that these buildings are beautiful and should be restored. If restored and upgraded, these mills could provide an opportunity for redevelopment and growth of local industry. It was also noted that Salem’s Mill could be restored to produce water power. Another notable mill is located on 94 Main Street. This mill was built in 1910 and was purchased this past winter to be redeveloped into a cannabis cultivation facility. If successful, this mill could bring in more revenue to the Town.

Stormwater Management

Again, even though culverts and dams in Hardwick were considered vulnerable, stormwater management, as a whole, was considered a strength to the Town. Though some culverts are undersized, those that are in good condition and are functioning properly provide a great benefit to the Town. Culverts are intended to convey water from one side of a road or obstacle to another. In doing this, culverts allow water to continue to flow without running onto or flooding a roadway. The Town should inventory and monitor its culverts in order to maintain these culverts in good condition.

In addition to successful culverts in Town, there are also benefits of some dams. Barre Falls Dam can store up to 7.82 billion gallons of water for flood control purposes. And Wheelwright Dam, despite being a Significant Hazard, is in motion for removal. Over the next few years, the East Quabbin Land Trust will be facilitating the removal of Wheelwright Dam with the help of New Braintree and Hardwick. Once removed, the Ware River’s natural flow will be restored in that area, providing better water and habitat quality conditions.

Rural Character

The final infrastructure strength that participants identified is the rural character of the Town. Workshop attendees boasted about the history and culture of the Town. Valued as a rural, farming community, participants shared that there is less development pressure in the Town. Not many people are moving into Hardwick, so there is not an increased burden on the Town's resources. Without the pressure to build, the Town is not significantly increasing its impervious surface footprint and is not encroaching on valuable resources such as waterways, wetlands, vernal pools, or other important wildlife habitat. Without a large or increasing population, there is not as much pressure to provide important services, such as schooling.

Societal Strengths



Emergency Personnel

While emergency services were viewed as a vulnerability by participants, the Town's emergency personnel were seen as major strengths by all workshop participants. The Highway Department provides a critical role in preparing for and cleaning up from storm damage. Despite the small size of the department, they keep the roads cleared of snow, and they salt the roads to prevent icing during winter storms. After severe storms, they clean up debris and fallen trees from the roads. There is a desire to expand the department size and budget to help with these efforts. The Fire Department was also viewed as a major strength to the Town due to their role in fire protection and prevention. The Highway and Fire Departments are located near one another, so communication and coordination between the two departments is streamlined. Additionally, participants noted that the fire station has a temporary water supply that can be used as needed as well as a generator to provide backup power in the event of outages. In the past, residents have utilized the fire station for water and showers when there have been prolonged power outages. The Town also shares a Community Emergency Response Team (CERT) with New Braintree. The Town's CERT has approximately 30 members involved in the organization and a Deputy Emergency Management Director was recently hired.

SOCIETAL

- Emergency Personnel
- Sense of Community
- Local & Regional Organizations

Sense of Community

A second societal strength identified by the workshop attendees is the Town's sense of community. As a small town with limited staff and budget, the Town depends more on the initiative of its residents. Residents volunteer to serve on the numerous boards and committees, and many residents hold positions on multiple boards. In addition to residents stepping up to help on the Town's boards, they also step up to help one another. Participants at the workshop noted the strong community mindedness of Hardwick. Neighbors build strong relationships and are able to rely on each other in times of need. As many people in Town are lifelong residents,

there is a deep knowledge about the history and culture of Hardwick. And, because of limited resources, residents in Hardwick are more self-sufficient than other communities.

Local & Regional Organizations

Though the industry in Hardwick is not large, participants identified local and regional organizations as a third societal strength to the Town. Some notable organizations that attendees listed include the East Quabbin Land Trust, Eagle Hill School, the food pantry, Stone Church, the Hardwick Farmers Co-op, and Rose32. The East Quabbin Land Trust (EQLT) is a regional organization that formed in 1994 in an effort to protect farmland and wildlife habitat. The mission of EQLT is to foster the sustainable use of natural and historic resources for the benefit of all through the conservation and stewardship of the farmlands, woodlands, and waters. EQLT has helped Hardwick address environmental issues, such as beaver activity and invasive species management, as well as helped the Town preserve valuable agricultural and conservation lands. Eagle Hill School, located at 242 Old Petersham Road, is a coeducational college preparatory boarding school that provides individualized education for students with diverse learning profiles. Participants noted that the school could be more utilized as a resource to help with Town projects and volunteer opportunities, as well as a potential additional sheltering facility. The Tri-Parish Community Church manages a food pantry in the basement of the Municipal Building. The pantry provides food and coupons to the Hardwick farmer's market to those in need. The Stone Church, located next to the Municipal Offices at 283 Main Street, is a historical landmark with a large congregation. The Friends of the Stone Church host events and facilitate community service for the Town. The Hardwick Farmers Co-op Exchange, located at 444 Lower Road, is a member-owned co-operative with over 2,700 farmers and other agricultural stakeholders. The Co-op was founded in 1914, and the 7-acre facility includes warehouses and a large retail store to meet the feed, supplies, and other needs of the Town's local farmers. Rose32, located at 412 Main Street is a small, family-owned bakery specializing in small-batch gourmet breads, European-style pastries, and light cafe fare. All of these organizations help to support the Town's projects, residents, and local economy.

Environmental Strengths



Agriculture

Participants of the workshop noted agriculture in Town as an important strength to the community. Farmland in Hardwick is more prevalent than in other communities in the Central Massachusetts region.

Active farms help to preserve agricultural lands and habitat, instead of developing that space into housing, industries, or solar developments. Farms also benefit the Town and surrounding communities by providing access to local, healthy foods. An important agricultural resource in Town is the Hardwick Farmers Co-op Exchange. As noted above, this organization is a member-owned co-operative with over 2,700 farmers and other agricultural stakeholders. The Co-op

ENVIRONMENTAL

- Agriculture
- Water Resources
- Recreational Opportunities

provides equipment and supplies in the following categories: livestock, forage crop, farming, fencing, pet supplies, clothing, nursery stock, garden supplies, and wild birds. Membership with the Hardwick Farmers Co-op gives farmers a 3% discount, shares that earn interest, access to special member only sales, invitation to the annual Member's meeting, and periodic newsletter. The Co-op also sponsors workshops and clinics for members and other farming stakeholders. Another agricultural resource that participants discussed was the Hardwick Community Fair. This annual fair offers numerous agricultural and creative exhibits, demonstrations, food, live music, dancing, children's games, wagon rides, and an antique tractor parade. The Fair has been held in Hardwick over the past 260 years, and has helped to celebrate the agricultural and rural character of the Town.

Water Resources

The Town of Hardwick has numerous water resources that are both recreational and environmental assets. The Quabbin Reservoir is located across the towns of Hardwick, Ware, Belchertown, Pelham, Shutesbury, New Salem, and Petersham, and contains 412 billion gallons of water. Though this area is managed by the State, it provides preservation and protection of this valuable resource. In addition, there are numerous wetlands distributed across the Town. These wetlands contain a large diversity of flora and fauna, and play an important role in the water supply, water purification through filtration, and flood storage control. Major surface waters in Hardwick include the Ware River, Muddy Brook, Moose Brook, Danforth Brook, Elwell Brook, Canterbury Brook, and Newton Brook, Hardwick Pond, Fish Brook, Broadmeadow Brook, and Pine Hill Brook. Participants specifically noted Ware River and Hardwick Pond as strengths. The Ware River is one of the largest rivers in Worcester County. Common fish species found here include bass, pickerel, perch, and sunfish. And typically, birds found along the Ware River include kingfisher, green and great blue herons, osprey, and bald eagle. It was recommended that the Town construct a floating turbine on the Ware River and use its flow to generate power for the Town. Hardwick Pond is 99 acres large, has an average depth of ten feet, and a maximum depth of 28 feet. Common fish species found here include largemouth bass, chain pickerel, yellow perch, black crappie, brown and yellow bullhead, red-breasted sunfish, bluegill, pumpkinseed suckers, and golden shiner.

Recreational Opportunities

As discussed above, the Town of Hardwick is full of forested, agricultural, and water resources. Each of these areas provide the Town with a number of different recreational opportunities. The numerous water resources provide areas in Town to fish, swim, or boat. Hardwick Pond is the largest pond on Muddy Brook and has a concrete boat ramp, providing access for boating and fishing. MassWildlife stocks the pond with brook and rainbow trout. The Ware River is also stocked by MassWildlife with brook, brown, and rainbow trout. Ware River Access Park is a conservation property owned by the Massachusetts Department of Fish and Game. It is 53 acres large, contains trails, and is open to the public for hiking, water access, and wildlife viewing. Participants also noted that Danforth Brook is also stocked with brook trout annually.

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 Hardwick MVP Workshop. The completed Matrix for each table can be found in the Appendix at the end of this document.

Infrastructure Actions



The first group of actions developed by participants involves **improving the emergency preparedness** of the Town. To do this, it was suggested that the Town upgrade the senior center. Installing a community kitchen and a sufficient generator could help to convert the senior center into a secondary shelter.

Additionally, as participants noted that the Highway Department is small. Limited staff, space, and budget make it more difficult for the Town to function properly. As such, it was suggested to expand the Highway Department facility.

Expanding access was also suggested by workshop participants. It was recommended to establish a safe sidewalk connection at the Lower Road and Rail Trail area. This connection would give Gilbertville residents a safe path to emergency shelter at school. In addition, it was suggested to develop a sidewalk master plan to increase the availability of sidewalks across the Town.

Upgrading stormwater management and resource protection was a third suggestion to improve infrastructure in Town. It was recommended that the Town perform a Town-wide culvert inventory and assessment. With this assessment, the Town could more easily keep track of culverts and their status, prioritizing upgrades when most needed. And, as mentioned before, the Wheelwright Dam is in the process of being removed. However, it was suggested that the Town help facilitate this removal and investigate potential recreation opportunities. In terms of upgrading the energy grid, it was suggested that the Town establish a Municipal Light Plant and to construct a floating turbine on the Ware River to generate a hydraulic form of alternative energy.

INFRASTRUCTURE

- Emergency Preparedness
- Expanding Access
- Stormwater Management & Resource Protection

Societal Actions



In order to improve preparedness and knowledge, participants suggested **expanding education and outreach opportunities** in the Town. It was recommended that the Town establish educational programs providing guidance on ticks, mosquitos, and insect-borne diseases. It was also suggested that the

SOCIETAL

- Education & Outreach
- Partnerships & Relationships
- Resource Development

Town create a “Welcome to Hardwick” handbook detailing important information to new residents of Hardwick. And, the Town should utilize The Reminder news outlet for regional marketing opportunities.

In addition, it was also suggested that the Town **continue to foster partnerships and relationships** with surrounding Towns and organizations. It was recommended by participants that the Town partner with the Eagle Hill School to be able to utilize the facility as an additional shelter in times of emergency or to host Town events and services when applicable. Attendees also suggested that the Town of Hardwick partner with surrounding communities, particularly communities that are smaller in size or are rural, in order to represent a stronger rural voice to the State.

To help accomplish the actions listed in this plan and other Town planning documents, workshop attendees recommended **increasing resource development**. To accomplish this, it was suggested that the Town establish a Town Planner or Grant Writer staff position to help coordinate planning efforts and locate outside funding. It was also recommended that the Town enact the Community Preservation Act (CPA) in Town to preserve funding opportunities for recreation, historic preservation, conservation, and housing efforts. An education campaign should be utilized to help gain support for enacting the CPA. Participants also suggested identifying sources and applying for funding to construct a Police Station within the Town and to update the Paige Memorial Library, transforming it into a heating and cooling center.

Environmental Actions



In order to preserve the Town’s environmental assets, it was recommended that the Town **invest in resource protection**. Participants suggested establishing an invasive species management program, and partnering with the East Quabbin Land Trust to remove invasive species on Town land. In addition, the Town should establish a tree inventory and assessment program, prioritizing trees for removal. When established, the Town should partner with surrounding communities to create a regional tree management program with shared equipment and funding. A drone study of stone walls and construction of beaver deceivers were recommended to help locate and preserve stone walls and to limit beaver activity respectively.

To improve quality and opportunity, participants suggested **expanding water protection and access**. It was recommended that the Town conserve the open space surrounding the Gilbertville Water District and the Muddy Brook Aquifer in order to protect that water supply land. In addition, it was suggested that the Town renovate the boat ramp at Hardwick Pond to improve boat access.

ENVIRONMENTAL

- Resource Protection
- Water Protection & Access
- Agricultural Economy

As farming and agriculture are an important component of the Town's character, many participants suggested **fortifying the agricultural economy** in Hardwick. To do this, it was suggested that the Town prioritize agricultural land for preservation and utilize a regional marketing program for local farms. In addition, it was recommended that the Town identify and acquire land for a leased and shared farm space for farmers who cannot afford to buy their own land. And finally, it was recommended that the Town establish a regional agricultural climate action plan, identifying areas of vulnerability in the region as it relates to agriculture, and creating an action plan to build resilience.

Top Recommendations

On the last day of the workshop, participants were given stickers to vote on their top priority actions.

The majority of participants indicated that they were most concerned with both the possibility of increased flooding events and the possibility of increased winter and severe storms as the climate continues to change. The top four priority recommendations include:

1. Fortify the agricultural economy in Hardwick by:
 - a. prioritizing agricultural land for preservation,
 - b. utilizing regional marketing program for local farms,
 - c. identifying and acquiring land for a shared/leased farm space, and
 - d. establishing a regional agricultural climate action plan.
2. Establish a tree inventory and assessment program, prioritizing trees for removal. Partner with surrounding communities to establish a regional tree management program with shared equipment and funding.
3. Establish a senior center with amenities such as a generator, community kitchen, and heating and cooling capabilities. Utilize the center for educational opportunities.
4. Establish a Town Planner and/or Grant Writer staff position.






TOP RECOMMENDATIONS



















































- Dam & Bridge Evaluation
- Climate Vulnerability Assessment
- Culvert Inventory
- Emergency Shelter Outreach Campaign






































At the end of the two-day workshop, Dani Marini thanked attendees for giving their time and attention, and commended the town for their willingness and flexibility in being a part of this timely planning process. The top recommendations on the following pages were compiled based on those actions reported out voted on by participants. Actions are organized by priority and project type. The key below describes the Category and Hazard types found in the top priority action table.

Category	Key
Infrastructural	
Societal	
Environmental	

Hazard	Key
Severe Storms/Flooding	
Winter Storms	
Wind	
Drought	
Wildfires	

Category	Actions	Vote	Hazard
HIGH PRIORITY			
	Fortify the agricultural economy in Hardwick by: 1) prioritizing agricultural land for preservation, 2) utilizing regional marketing program for local farms, 3) identifying and acquiring land for a shared/leased farm space, and 4) establishing a regional agricultural climate action plan.	11	 
	Establish a tree inventory and assessment program, prioritizing trees for removal. Partner with surrounding communities to establish a regional tree management program with shared equipment and funding.	10	 
	Upgrade the senior center to function as a secondary shelter in times of need by installing a community kitchen, improving generator, and establishing it as a heating and cooling center. Utilize the center for educational opportunities.	6	 
	Establish a Town Planner and/or Grant Writer staff position.	5	 
	Investigate the ownership of Wheelwright Dam and prioritize removal. Once the dam is removed, restore the area for recreation and swimming opportunities.	4	 
	Perform a Town-wide culvert inventory and assessment.	4	
	Identify and apply for funding to construct a Police Station in Hardwick.	4	 
MEDIUM PRIORITY			
	Continue to support and work with the East Quabbin Land Trust on local projects including beaver management, invasive species removal, and land protection.	3	
	Expand the DPW facility	3	 
	Enact the Community Preservation Act. Establish an education campaign to help gain support for the CPA.	3	 
	Invasive species management program	2	 
	Protect open surrounding Gilbertville Water District, ad Muddy Brook Aquifer	2	 
	Lower road/Rail Trail to establish a safe sidewalk connection. Connect rail trail to give Gilbertville residents safe path to emergency shelter at school	2	 
	Establish a Municipal Light Plant	2	  
	Partner with the Eagle Hill School to use the facility for shelter or for other Town services/events	2	  
	Educational program - ticks, insect-borne diseases	2	
LOW PRIORITY			
	Improve public access/boat access to Hardwick Pond	1	 

	Beaver management/beaver deceivers	1	
	Ware River Park restoration - project underway	1	 
	Perform a drone study to identify stonewall for preservation	1	
	Identify land for shared/leased farm space	1	  
	Sidewalk master plan	1	
	FEasibility study to redevelop Salem's Mill	1	
	Floating turbine on Ware River	1	
	Identify and apply for funding to improve Town library, transform into a heating/cooling center	1	 
	Utilize The Reminder news outlet for regional marketing	1	  
	Create a Welcome to Hardwick handbook	1	 
	Improve communications Town-wide	1	  
	Partner with surrounding communities for stronger representation to state	1	  

Next Steps

This planning process and list of prioritized recommendations is only the first step in building a more resilient community. The intent of the Summary of Findings Report is to identify the strengths and vulnerabilities of a Town, and to brainstorm potential actions that could help the Town build climate resilience. Once the State accepts the Summary of Findings report and deems the Town of Hardwick an MVP Designated Community, the Town should begin identifying projects that they would like to complete from the list of Recommended Actions. Based on Town interests and capabilities, should begin developing action plans to pursue these projects, and should utilize MVP Action Grants, Town resources, or other grant programs and funding opportunities to explore these ideas further.

CRB WORKSHOP PARTICIPANTS

Name	Affiliation	Attended	Table #
Abbie White	Recycling Chair	Y	1
Andrew Smith	EEA MVP Regional Coordinator	Y	1
Bill Zinni	Conservation Commission	Y	2
Chris Buelow	MA Fish & Wildlife	Y	3
Cynthia Henshaw	East Quabbin Land Trust	Y	1
David Annunziata	Eagle Hill School	Y	1
Dawn Campelo	Hardwick Farmers Co-Op	Y	3
Deb Morrison	New Braintree MVP Core Team	Y	2
Dorrinda O'Keefe-Shea	Local Realtor	Y	2
Emily Bancroft	Historical Commission	Y	1
Eric Vollheim	Emergency Management Director	Y	1
Erik Fleming	Planning Board	Y	3
Jenna Garvey	Library Trustee	Y	2
Joseph Raskett	Hardwick Sugar Shack	Y	2
Judy Kohn	Board of Health	Y	3
Kate Morreale	Golden Egg Farm	Y	1
Kevin Landine	Police Department	Y	1
Lucinda Childs	Open Space Committee	Y	3
Mark Korzec	Local Farmer	Y	3
Marlo Stein	Round Table Farm	Y	2
Nicole Parker	Town Administrator	Y	2
Pamela Hill	National Grid	Y	2
Patricia Tinker	Rosy Goat Farm	Y	1
Paul Benoit	Hardwick MVP Core Team	Y	3
Randy Noble	Historical Society	Y	2
Raymond Walker	Fire Chief	Y	3
Rebecca Bottomley	Conservation Commission	Y	1
Rick Romano	East Quabbin Land Trust	Y	3
Steve Gould	Hardwick Farmers Co-Op	Y	
Stan White	Whitesfields Farm	Y	2

CRB WORKSHOP PROJECT TEAM

Name	Affiliation	Role
Nicole Parker	Town of Hardwick	Town Administrator
Eric Vollheim	Town of Hardwick	Emergency Management Director
Paul Benoit	Town of Hardwick	Local Resident
Cynthia Henshaw	Town of Hardwick	East Quabbin Land Trust
Meg Haight	Town of Hardwick	Local Resident
Maryann Stolgitis	Town of Hardwick	Local Resident
Dani Marini	CMRPC	Associate Planner, Lead Coordinator

CITATION

Town of Hardwick (2022) Community Resilience Building Workshop Summary of Findings. Central Massachusetts Regional Planning Commission. Hardwick, Massachusetts.

ACKNOWLEDGEMENTS

The Municipal Vulnerability Preparedness (MVP) program and Community Resiliency Workshop were funded by the Executive Office of Energy and Environmental Affairs. This Summary of Findings and CRB Workshop were prepared for the community of Hardwick by the Central Massachusetts Regional Planning Commission (CMRPC). Support from the Hardwick Board of Selectmen and Town Officials was much appreciated.

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

Nicole Parker, Town Administrator
Eric Vollheim, Emergency Management Director
Paul Benoit, Local Resident
Cynthia Henshaw, East Quabbin Land Trust
Meg Haight, Local Resident
Maryann Stolgitis, Local Resident

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

Dani Marini, Associate Planner, CMRPC
Mary Hannah Smith, Associate Planner, CMRPC
Ian McElwee, Associate Planner, CMRPC
Chris Dunphy, Principal Planner, CMRPC
Faye Rhault, Assistant Planner, CMRPC
Eric Gemperline, Assistant Planner, CMRPC
Matt Franz, Project Manager, CMRPC
Andrew Smith, Regional Coordinator, EEA

APPENDIX

- I. Agendas
- II. Workshop Meeting Materials
 - a. Invitation
 - b. Agendas
 - c. Presentations
 - d. Sign In Sheet
 - e. Table Matrix
- III. Listening Session Materials
 - a. Flyer
 - b. Presentation
 - c. Sign In Sheet
- IV. Maps



1 Mercantile Street – Suite 520
Worcester, MA 01608
508.756.7717 P
508.792.6818 F
www.cmrpc.org

Hardwick Municipal Vulnerability Preparedness (MVP)
Meeting #1 Pre-Kickoff

Date/Time: October 18, 2021 10:30 AM

Location : <https://us02web.zoom.us/j/86958594535?pwd=L01Sc0YrYkROdi9jZWZlZ3bThhQkhaUT09>

Meeting ID: 869 5859 4535 **Passcode:** 518484 **Dial in number:** 1-646-558-8656

AGENDA

- Introductions
- MVP Program Background
- Roles & Responsibilities
 - Town
 - Assemble Core Team (participates in prep meetings, workshop and listening session)
 - Identify stakeholders 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
 - 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
- Core Team Timeline
 - Core Team Meetings (3-5 total)
 - Pre-Workshop meeting/Call
 - CRB Workshop
 - Listening Session (Must be held before May 31st)
- 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)
 - Invitations and RSVP
- In-Kind Match/Other/next meeting



1 Mercantile Street – Suite 520
Worcester, MA 01608
508.756.7717 P
508.792.6818 F
www.cmrpc.org

Hardwick Municipal Vulnerability Preparedness (MVP)
Meeting #1 Kickoff

Date/Time: January 27, 2022 5:00 PM

Location : <https://us02web.zoom.us/j/87170730148?pwd=TnFqQSttUDkzM3RqeklwNFItT1NNZz09>

Meeting ID: 871 7073 0148 **Passcode:** 130406

AGENDA

- Introductions
- MVP Program Background
- Roles & Responsibilities
 - Town
 - Assemble Core Team (participates in prep meetings, workshop and listening session)
 - Identify stakeholders 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
 - 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
- Core Team Timeline
 - Core Team Meetings (3-5 total)
 - Pre-Workshop meeting/Call
 - CRB Workshop
 - Listening Session (Must be held before May 31st)
- 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)
 - Invitations and RSVP
- In-Kind Match/Other/next meeting



1 Mercantile Street – Suite 520
Worcester, MA 01608
508.756.7717 P
508.792.6818 F
www.cmrpc.org

Hardwick Municipal Vulnerability Preparedness (MVP)

Meeting #2

Date/Time: February 9, 2022 5:00 – 6:30 PM

ZOOM: <https://us02web.zoom.us/j/89153677853?pwd=V04zVGhjR3c1ZFY4d3cwOE4yUVM0UT09>

Meeting ID: 891 5367 7853 **Passcode:** 978988

AGENDA

- I. Welcome/Recap
- II. Brainstorm Stakeholders
- III. Workshop Structure
 - a. Format
 - b. Date(s)
 - c. Time(s)
- IV. Natural Hazards Review
- V. Next Meeting

Tasks to Complete

- ☐ Create Stakeholder List
- ☐ Decide Workshop Format
- ☐ Decide Workshop Date(s) and Time(s)
- ☐ Determine Workshop Roles
- ☐ Send Invitations



1 Mercantile Street – Suite 520
Worcester, MA 01608
508.756.7717 P
508.792.6818 F
www.cmrpc.org

Hardwick Municipal Vulnerability Preparedness (MVP)

Meeting #3

Date/Time: February 23, 2022 5:00 – 6:00 pm

ZOOM: <https://us02web.zoom.us/j/86769147522?pwd=VzBrNHd2Vy9OdKhac0o5cGRGVlllZz09>

Meeting ID: 867 6914 7522 **Passcode:** 232039

AGENDA

- I. Welcome/Recap
- II. Stakeholders Review
- III. Natural Hazards Discussion
- IV. Workshop Structure
 - a. Thursday, March 24
In-person
5:00 – 8:00 or 6:00 – 9:00?
 - b. Thursday, March 31
In-person
5:00 – 8:00 or 6:00 – 9:00?
- V. Next Steps/Roles
 - a. Invitations
 - b. Pre-Workshop Materials
 - c. Scribes
 - d. Food?
- VI. Next Meeting

Tasks to Complete

- ☒ Create Stakeholder List
- ☒ Decide Workshop Format
- ☒ Decide Workshop Date(s) and Time(s)
- ☐ Determine Workshop Roles
- ☐ Send Invitations



Participate in **Hardwick's** Municipal Vulnerability Preparedness (MVP) Program

Given events like the Springfield tornado in 2011, the snowstorms of 2015, the extreme drought of 2016 and recent Hurricanes Harvey and Irma, we find ourselves in a new era of more unpredictable and severe weather that can potentially cause damage to our community.

To be as proactive as possible, I would like to personally invite you to participate in a, two-part, Community Resilience Building Workshops focused on preparing and protecting the Town of Hardwick.

The MA Executive Office of Energy and Environmental Affairs' (EEA) Municipal Vulnerability Preparedness (MVP) Program Workshops

Thursday, March 24th, 5:00 – 8:00 pm
Municipal Offices, 307 Main Street, Gilbertville, MA 01031

Refreshments provided

&

Thursday, March 31st, 5:00 – 8:00 pm
Municipal Offices, 307 Main Street, Gilbertville, MA 01031

Refreshments provided

The Town of Hardwick is collaborating with EEA and CMRPC to offer this timely workshop which will bring together community members to comprehensively identify and prioritize steps to reduce risk and improve resilience across Hardwick. This workshop will help develop and advance comprehensive community resilience planning, hazard mitigation, and adaptation efforts.

The workshops objectives are to:

- 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

To learn more about the general program information, please visit the following websites:

- Community Resilience Building: <https://www.communityresiliencebuilding.com/crbworkshopguide>
- Municipal Vulnerability Program: <https://www.mass.gov/municipal-vulnerability-preparedness-mvp-program>
- Resilient MA, Climate Change Clearinghouse for the Commonwealth: <https://www.resilientma.org/>

Meeting materials for **Hardwick's** MVP workshop will be sent out on March 21st to those who RSVP. We would appreciate your participation in this timely workshop. To RSVP to **Hardwick's** MVP workshop, please complete this survey:

<https://forms.gle/LU4y7aFzwetuf6fO9>

Please RSVP by March 18, 2022

If you have any questions about the program, please contact Eric Vollheim, Emergency Management Director, at stonedance@comcast.net, or Dani Marini, CMRPC Environmental Planner, at dmarini@cmrpc.org.

We look forward to seeing you or a designee at our workshop. Thank you for your assistance with this important project!

Sincerely,
Nicole Parker, Town Administrator



Thank You for Your Participation in Hardwick's Municipal Vulnerability Preparedness (MVP) Program!



The Town of Hardwick is collaborating with EEA and CMRPC to offer a two-day workshop on ***March 24th and March 31st*** which will bring together community members to comprehensively identify and prioritize steps to reduce risk and improve resilience across Hardwick. Follow the instructions below in order to help make your community more climate resilient! If you have any questions about the program, please contact Eric Vollheim, Hardwick Emergency Management Director, at stonedance@comcast.net. We look forward to seeing you at our workshop!

Step 1. Discover Hardwick's MVP Dropbox

The resources included in this guide will help you learn more about the MVP program and prepare you for the upcoming workshop. All of these resources and more can be found in the following Dropbox link.

Workshop Dropbox:

<https://www.dropbox.com/sh/8u298oqrlphz9bl/AAB7f6MsQ872P2G230eX0oBna?dl=0>

Step 2. Review the Program Overview and Workshop Guide

The following two documents will give you an overview of the MVP program and will describe a typical Community Resiliency Building (CRB) workshop.

MVP Program Overview:

https://www.dropbox.com/s/uaw51vccnf0s74o/MVP%20Program%20Info_Updated%202019.pdf?dl=0

CRB Workbook:

<https://www.dropbox.com/s/7c5xla75n73syh/CRB%20Workshop%20Guide.pdf?dl=0>

Step 3. Watch the MVP Presentations Prior to Workshop

The following link contains pre-recorded presentations that will help you be better prepared for the MVP workshop. The presentations include an overview of the program and the MVP process, climate projections, and hazards that Hardwick may face in the future.

Presentations:

<https://www.dropbox.com/sh/fxnyypun4bm4bq1/AABItRcd17VoqWVWoYaFOdj9a?dl=0>

Step 4. Familiarize Yourself with the Matrix and Mapping Tools

During the workshop, we will divide up into breakout groups to discuss strengths, vulnerabilities, and possible actions that the town can take. During this process, we will be filling out a matrix and marking up a map with our ideas. The following two documents will show you an example of a completed matrix and will give you a set of pre-made maps that already display various features, hazards, and resources in Hardwick.

Complete Matrix Example:

<https://www.dropbox.com/s/9viuf0mj5yidwnm/Completed%20Matrix%20Example.pdf?dl=0>

Maps:

<https://www.dropbox.com/sh/jv31leig5ykqwhv/AABE0KNMjkoGleTk8ja2L1Q-a?dl=0>

Step 5. Attend the Workshop!

The two-day workshop will be held on ***March 24th and March 31st from 5:00 – 8:00 pm in-person at the Municipal Offices (307 Main Street)***. The agendas for each day are listed below. Please review the agenda for each day.

Agenda Day 1:

<https://www.dropbox.com/s/7985j3cygp7vemr/Hardwick%20MVP%20Agenda%20Day%201.pdf?dl=0>

Agenda Day 2:

<https://www.dropbox.com/s/z0xphgtncvae39/Hardwick%20MVP%20Agenda%20Day%202.pdf?dl=0>



Community Resiliency Building Workshop

Town of Hardwick

Municipal Vulnerability Preparedness

Day 1- Thursday, March 24, 2022

5:00 – 8:00 pm; Check-in at 4:40 pm

Meeting Location: Municipal Offices, 307 Main Street, Gilbertville, Hardwick, MA 01082

Workshop Materials: <https://www.dropbox.com/sh/8u298oqrlphz9bl/AAB7f6MsQ872P2G230eX0oBna?dl=0>

Refreshments will be provided

Workshop Agenda

4:40 – 5:00 pm

- Check-in, grab food

5:00 – 5:45 pm

- Welcome
- Overview Presentation
- Questions & Answers

5:45 pm – 6:45 pm

- Breakout Groups
 - Identify Hazards & Local Features
 - Discuss Strengths & Vulnerabilities

6:45 – 6:55 pm

- 10-Minute Break

6:55 – 7:50 pm

- Breakout Groups
 - Identify Hazards & Local Features
 - Discuss Strengths & Vulnerabilities
 - Identify Actions to Build Resilience
(as time allows)

7:50 pm – 8:00 pm

- Reconvene as Large Group
 - Quick Table Summary
 - Closing Remarks & Wrap Up

Day 1: Workshop Objectives

- Define extreme weather and climate related hazards
- Identify current and future vulnerabilities and strengths

Homework

- Review hazards, vulnerabilities, and strengths
- Brainstorm actions to address vulnerabilities



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





Community Resiliency Building Workshop

Town of Hardwick

Municipal Vulnerability Preparedness

Day 2- Thursday, March 31, 2022

5:00 – 8:00 pm; Check-in at 4:40 pm

Meeting Location: Municipal Offices, 307 Main Street, Gilbertville, Hardwick, MA 01082

Workshop Materials: <https://www.dropbox.com/sh/8u298oqrlphz9bl/AAB7f6MsQ872P2G230eX0oBna?dl=0>

Refreshments will be provided

Workshop Agenda

4:50 – 5:00 pm

- Check-in, Grab Food

5:00 – 5:20 pm

- Welcome & Recap from Day 1
- Questions & Answers

5:20 – 6:20 pm

- Breakout Groups
 - Identify Actions to Reduce Risks and Build Resilience

6:20 – 6:30 pm

- 10-Minute Break

6:30 – 7:30 pm

- Breakout Groups
 - Identify Actions to Reduce Risks and Build Resilience
 - Prioritize Actions by Urgency and Timing

7:30 – 8:00 pm

- Reconvene as Large Group
- Table Reports
- Closing Remarks & Wrap Up

Day 2: Workshop Objectives

- Review vulnerabilities and strengths identified on Day 1
- Develop and prioritize actions;
- Identify opportunities for the Town to advance actions and reduce risks to build resilience

Homework

- Review actions to reduce risks and build resilience
- Vote for top priority actions via survey (link to be emailed)
- Attend Listening Session



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



TOWN OF HARDWICK

Municipal Vulnerability Preparedness (MVP)

Community Resilience Building

Workshop

March 24 and 31, 2022

Day One, March 24th

5:00 – 8:00 pm



Thank You for Your Participation in Hardwick's Municipal Vulnerability Preparedness (MVP) Program!



The Town of Hardwick is collaborating with EEA and CMRPC to offer a two-day workshop on **March 24th and March 31st** which will bring together community members to comprehensively identify and prioritize steps to reduce risk and improve resilience across Hardwick. Follow the instructions below in order to help make your community more climate resilient! If you have any questions about the program, please contact Eric Vollheim, Hardwick Emergency Management Director, at stonedance@comcast.net. We look forward to seeing you at our workshop!

Step 1. Discover Hardwick's MVP Dropbox

The resources included in this guide will help you learn more about the MVP program and prepare you for the upcoming workshop. All of these resources and more can be found in the following Dropbox link.

Workshop Dropbox:

<https://www.dropbox.com/sh/8u298oqrphz9bl/AAB7f6MsQ872P2G230eX0oBna?dl=0>

Step 2. Review the Program Overview and Workshop Guide

The following two documents will give you an overview of the MVP program and will describe a typical Community Resiliency Building (CRB) workshop.

MVP Program Overview:

<https://www.dropbox.com/s/uaw51vccnf0s74o/MVP%20Program%20Info%20Updated%202019.pdf?dl=0>

CRB Workbook:

<https://www.dropbox.com/s/7c5xla75n73syrh/CRB%20Workshop%20Guide.pdf?dl=0>

Step 3. Watch the MVP Presentations Prior to Workshop

The following link contains pre-recorded presentations that will help you be better prepared for the MVP workshop. The presentations include an overview of the program and the MVP process, climate projections, and hazards that Hardwick may face in the future.

Presentations:

<https://www.dropbox.com/sh/fxnyvpun4bm4bq1/AABltRcd17VoqWVWoYaFOdj9a?dl=0>

Step 4. Familiarize Yourself with the Matrix and Mapping Tools

During the workshop, we will divide up into breakout groups to discuss strengths, vulnerabilities, and possible actions that the town can take. During this process, we will be filling out a matrix and marking up a map with our ideas. The following two documents will show you an example of a completed matrix and will give you a set of pre-made maps that already display various features, hazards, and resources in Hardwick.

Complete Matrix Example:

<https://www.dropbox.com/s/9viuf0mj5yidwnm/Completed%20Matrix%20Example.pdf?dl=0>

Maps:

<https://www.dropbox.com/sh/jv31lejg5yqwhv/AABE0KNMjikoGleTk8ja2L1Q-a?dl=0>

Step 5. Attend the Workshop!

The two-day workshop will be held on **March 24th and March 31st from 5:00 – 8:00 pm in-person at the Municipal Offices (307 Main Street)**. The agendas for each day are listed below. Please review the agenda for each day.

Agenda Day 1:

<https://www.dropbox.com/s/7985j3cygp7vemr/Hardwick%20MVP%20Agenda%20Day%201.pdf?dl=0>

Agenda Day 2:

<https://www.dropbox.com/s/z0xphgtncvae39/Hardwick%20MVP%20Agenda%20Day%202.pdf?dl=0>





Community Resiliency Building Workshop

Town of Hardwick

Municipal Vulnerability Preparedness

Day 1- Thursday, March 24, 2022

5:00 – 8:00 pm; Check-in at 4:40 pm

Meeting Location: Municipal Offices, 307 Main Street, Gilbertville, Hardwick, MA 01082

Workshop Materials: <https://www.dropbox.com/sh/8u298oqr1phz9bl/AAB7f6MsQ872P2G230eX0oBna?dl=0>

Refreshments will be provided

Workshop Agenda

4:40 – 5:00 pm

- Check-in, grab food

5:00 – 5:45 pm

- Welcome
- Overview Presentation
- Questions & Answers

5:45 pm – 6:45 pm

- Breakout Groups
 - Identify Hazards & Local Features
 - Discuss Strengths & Vulnerabilities

6:45 – 6:55 pm

- 10-Minute Break

6:55 – 7:50 pm

- Breakout Groups
 - Identify Hazards & Local Features
 - Discuss Strengths & Vulnerabilities
 - Identify Actions to Build Resilience
- (as time allows)*

7:50 pm – 8:00 pm

- Reconvene as Large Group
 - Quick Table Summary
 - Closing Remarks & Wrap Up

Day 1: Workshop Objectives

- Define extreme weather and climate related hazards
- Identify current and future vulnerabilities and strengths

Homework

- Review hazards, vulnerabilities, and strengths
- Brainstorm actions to address vulnerabilities



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



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

**1. Engage
Community**

**2. Identify CC
Impacts &
Hazards**

**3. Complete
Assessment of
Vulnerabilities
& Strengths**

**4. Develop &
Prioritize
Actions**

5. Take Action

CLIMATE RESILIENCE

is defined as the ability of a community to address the needs of its built, social, and natural environment in order to anticipate, cope with, and rebound stronger from events and trends related to climate change hazards, including temperature changes, extreme weather, sea level rise, coastal and inland flooding, changes in precipitation, and other impacts.

THE MATRIX


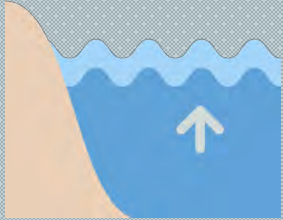
Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.org				
				Top Priority Hazards (tornado, floods, wildfire, hurricanes, drought, heat wave, etc.)				
H-M-L priority for action over the Short or Long term (and Ongoing) V = Vulnerability S = Strength				Floods	Winter Storms	Droughts & Wildfires	Priority H - M - L	Time Short Long Ongoing
Features	Location	Ownership	V or S					
Infrastructural								
Societal								
Environmental								

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

STEP ONE: HAZARD IDENTIFICATION



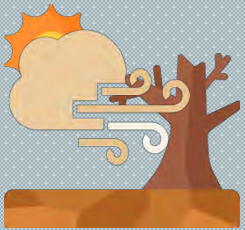
- **Flooding**
 - Riverine
 - Street



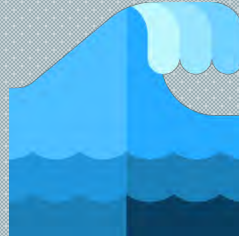
- **Landslides**
- **Mudslides**



- **Tornadoes**



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



- **Tsunami**



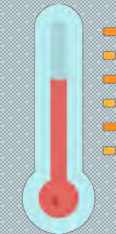
- **Hurricanes/
Nor'easters**



- **Wild Fires**



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



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

STEP ONE: HAZARD IDENTIFICATION

1. Flooding Inland Flooding Coastal Flooding

- Dust Storms

2. Extreme Heat/Drought Wildfires Invasive Species

3. Severe Storms Wind Lightning


- Tsunami

Nor'easters

4. Extreme Cold/Winter Storms Snow Ice

ires

STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

Community Resilience Building Risk Matrix  www.CommunityResilienceBuilding.com

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, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Top 4 Hazards	H-M-L	Time	
						Short	Long
Infrastructural							
Societal							
Environmental							

PRIMARY TOPIC AREAS



- Infrastructure




- Society



- Environment

STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

Community Resilience Building Risk Matrix  www.CommunityResilienceBuilding.com

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, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Top 4 Hazards				Priority	Time
								H-M-L	Short Long Ongoing
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									
Wetlands									


STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES



Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.com					
H-M-L priority for action over the Short or Long term (e.g.)				Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)					
V = Vulnerability S = Strength				Top 4 Hazards				Priority	Time
Features	Location	Ownership	V or S					H-M-L	Short Long Duration
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									
Wetlands									

Estimated Location

STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

Community Resilience Building Risk Matrix  www.CommunityResilienceBuilding.com

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, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Top 4 Hazards				Priority	Time
				H	M	L		H-M-L	Short Long Ongoing
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									
Wetlands									

Public? Private? State?

Estimated Location

STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

Community Resilience Building Risk Matrix  www.CommunityResilienceBuilding.com

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, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Top 4 Hazards				Priority	Time
				H	M	L		H-M-L	Short Long Ongoing
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									
Wetlands									



Vulnerability or Strength

Public? Private? State?

Estimated Location

BREAK OUT GROUP: FIRST MEETING

- Step 1- Fill in top 4 Natural Hazards

Flooding, Drought/Extreme Heat, Severe Storms, Winter Storms/Extreme Cold

- Step 2- Identify key features
 - Infrastructure- Dams
 - Societal- Senior Housing
 - Environmental- Wetlands
- Where is the Feature Located
- Identify ownership (Public, Private...)
- Identify vulnerability, strength or both

QUESTIONS

TIME TO GET TO WORK

NEXT STEPS



Community Resiliency Building Workshop

Town of Hardwick

Municipal Vulnerability Preparedness

Day 2- Thursday, March 31, 2022

5:00 – 8:00 pm; Check-in at 4:40 pm

Meeting Location: Municipal Offices, 307 Main Street, Gilbertville, Hardwick, MA 01082

Workshop Materials: <https://www.dropbox.com/sh/8u298oqr1phz9bl/AAB7f6MsQ872P2G230eX0oBna?dl=0>

Refreshments will be provided

Workshop Agenda

4:50 – 5:00 pm

- Check-in, Grab Food

5:00 – 5:20 pm

- Welcome & Recap from Day 1
- Questions & Answers

5:20 – 6:20 pm

- Breakout Groups
 - Identify Actions to Reduce Risks and Build Resilience

6:20 – 6:30 pm

- 10-Minute Break

6:30 – 7:30 pm

- Breakout Groups
 - Identify Actions to Reduce Risks and Build Resilience
 - Prioritize Actions by Urgency and Timing

7:30 – 8:00 pm

- Reconvene as Large Group
- Table Reports
- Closing Remarks & Wrap Up

Day 2: Workshop Objectives

- Review vulnerabilities and strengths identified on Day 1
- Develop and prioritize actions;
- Identify opportunities for the Town to advance actions and reduce risks to build resilience

Homework

- Review actions to reduce risks and build resilience
- Vote for top priority actions via survey (link to be emailed)
- Attend Listening Session



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



QUESTIONS

dmardini@cmrpc.org

TOWN OF HARDWICK

Municipal Vulnerability Preparedness (MVP)

Community Resilience Building Workshop

March 24th and March 31st, 2022

Day Two, Thursday March 31st

5:00 – 8:00 pm



Community Resiliency Building Workshop

Town of Hardwick

Municipal Vulnerability Preparedness

Day 2- Thursday, March 31, 2022

5:00 – 8:00 pm; Check-in at 4:40 pm

Meeting Location: Municipal Offices, 307 Main Street, Gilbertville, Hardwick, MA 01082

Workshop Materials: <https://www.dropbox.com/sh/8u298oqr1phz9bl/AAB7f6MsQ872P2G230eX0oBna?dl=0>

Refreshments will be provided

Workshop Agenda

4:50 – 5:00 pm

- Check-in, Grab Food

5:00 – 5:20 pm

- Welcome & Recap from Day 1
- Questions & Answers

5:20 – 6:20 pm

- Breakout Groups
 - Identify Actions to Reduce Risks and Build Resilience

6:20 – 6:30 pm

- 10-Minute Break

6:30 – 7:30 pm

- Breakout Groups
 - Identify Actions to Reduce Risks and Build Resilience
 - Prioritize Actions by Urgency and Timing

7:30 – 8:00 pm

- Reconvene as Large Group
- Table Reports
- Closing Remarks & Wrap Up

Day 2: Workshop Objectives

- Review vulnerabilities and strengths identified on Day 1
- Develop and prioritize actions;
- Identify opportunities for the Town to advance actions and reduce risks to build resilience

Homework

- Review actions to reduce risks and build resilience
- Vote for top priority actions via survey (link to be emailed)
- Attend Listening Session



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



THE MATRIX

Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.com					
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, drought, sea level rise, heat wave, etc.)					
Features	Location	Ownership	V or S					Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Societal									
Environmental									

STEP THREE: ACTIONS, PRIORITY AND TIMELINE

[illegible]

MVP CORE PRINCIPLES

- I. Furthering a community identified priority action to address climate change impacts
- II. Utilizing climate change data for a proactive solution
- III. Employing Nature-Based Solutions (NBS)
- IV. Increasing equitable outcomes for and supporting strong partnerships with Environmental Justice (EJ) Populations and Climate Vulnerable Populations
- V. Conducting robust community engagement
- VI. Achieving broad and multiple community benefits
- VII. Committing to monitoring project success and maintaining the project into the future
- VIII. Utilizing regional solutions toward regional benefit
- IX. Pursuing innovative, transferable approaches

NATURE BASED SOLUTIONS

- Make use of natural systems
- Mimic the natural processes
- Actions to protect, sustainably manage, and restore ecosystems
- Simultaneously providing well-being and biodiversity

International Union for Conservation of Nature (IUCN)

NATURE BASED SOLUTIONS (LID)

Use natural systems or mimic natural processes to absorb and slow runoff and stormwater, and 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

MORE EXAMPLES OF LOW IMPACT DEVELOPMENT AND GREEN INFRASTRUCTURE



Green Parking Lots



Permeable Paving

INFRASTRUCTURE PROJECTS

Traditional Culvert



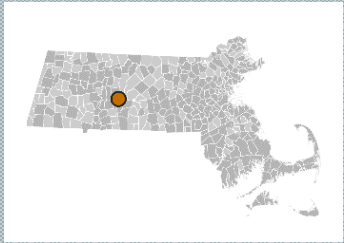
Nature Based Culvert



Example Action Grant Projects

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

Belchertown



Designing and permitting for a replacement water storage tank that would increase storage capacity and resiliency to drought, and completing a feasibility/ concept design of a rainwater harvesting system at Belchertown High School to irrigate the athletic fields.



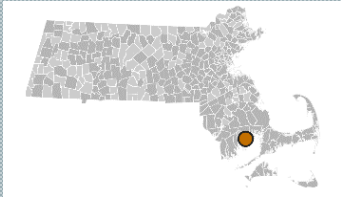
Nature-based solutions

Pilot potential

Example Action Grant Projects

Land Acquisition for Resilience

Mattapoisett



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



Data Utilization

Proactive

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

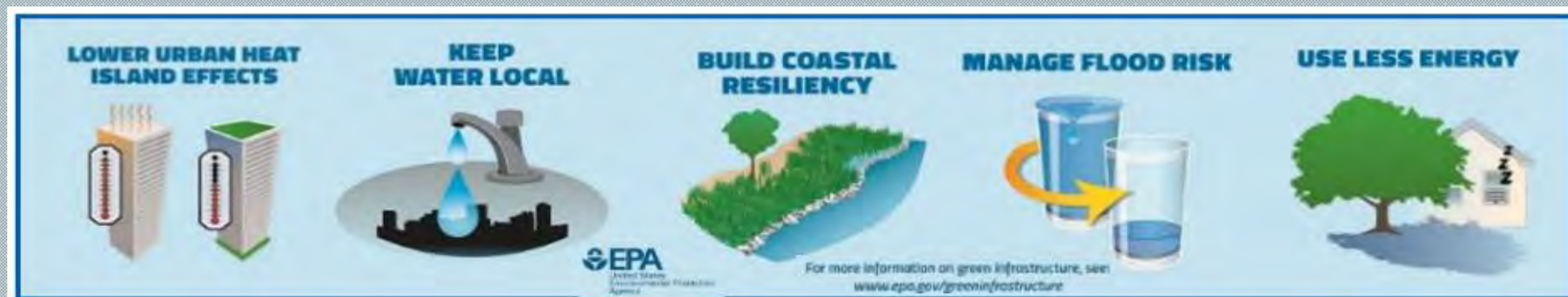
- Protect and restore natural features for improved aesthetics

Value


- Increased property values

Regulatory

- Assistance in meeting regulatory requirements



STEP THREE: ACTIONS

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

Features	Location	Ownership	V or S	Top Priority Hazards (tornado, floods, wildfire, hurricane, drought, heat wave, etc.)			Priority	
				Floods	Winter Storms	Droughts & Wildfires	H-M-L	Short Long Ongoing
Infrastructural								
Societal								
Environmental								

Completed

1. Engage Community


2. Identify CC Impacts & Hazards

3. Complete Assessment of Vulnerabilities & Strengths

4. Develop & Prioritize Actions

5. Take Action

STEP THREE: PRIORITIES

Community Resilience Building Risk Matrix  www.communityresiliencebuilding.com


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

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

Features	Location	Ownership	V or S	Top 4 Hazards	Time
Infrastructure					Short Long Ongoing
Societal					
Environmental					

Completed

STEP THREE: TIMELINE

Community Resilience Building Risk Matrix  www.communityresiliencebuilding.com

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

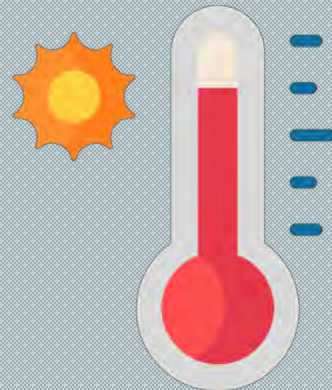
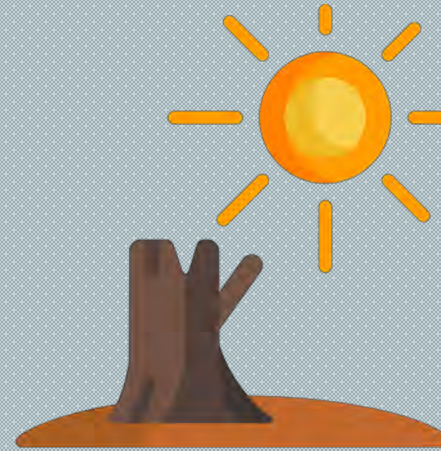
Top Priority Hazards (tsunami, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave)

Top 4 Hazards

Features	Location	Ownership	V or S	H · M · L	Priority
Infrastructure					
Societal					
Environmental					

Completed

QUESTIONS



**WHAT DID YOUR
TABLE FIND?**

TABLE REPORTS

Top Infrastructure, Societal, and Environmental Concerns

Top project ideas or actions that your group was excited about

Unique perspectives or observations

TIME TO VOTE

Add one dot to each category:

- Infrastructure
- Environment
- Society

Place remaining two dots any where you would like

Return to your seat when completed

NEXT STEPS

- Complete the survey
- Public listening session
- Report development
- Public listening sessions and presentation to Board of Selectmen in Spring 2022
- Develop resources and implement action

**1. Engage
Community**

**2. Identify CC
Impacts &
Hazards**

**3. Complete
Assessment of
Vulnerabilities
& Strengths**

**4. Develop &
Prioritize
Actions**

5. Take Action

MVP ACTION GRANT

Next round is open and accepting applications until May 5, 2022

up to \$2 million for an individual community

up to \$5 million for regional projects

one year grant cycle (typically) July 1st- June 30th

25% Match - Cash or In-kind (Non-State Funds)

Discuss grant ideas with MVP coordinator to develop competitive application

<https://resilientma.org/mvp/>

**THANK
YOU**

TOWN OF HARDWICK

Municipal Vulnerability Preparedness (MVP) Community Resilience Building Workshop

March 24th, 5:00 – 8:00 pm

&

March 31st, 5:00 – 8:00 pm

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

**I. Engage
Community**

**2. Identify CC
Impacts &
Hazards**

**3. Complete
Assessment of
Vulnerabilities
& Strengths**

**4. Develop &
Prioritize
Actions**

5. Take Action

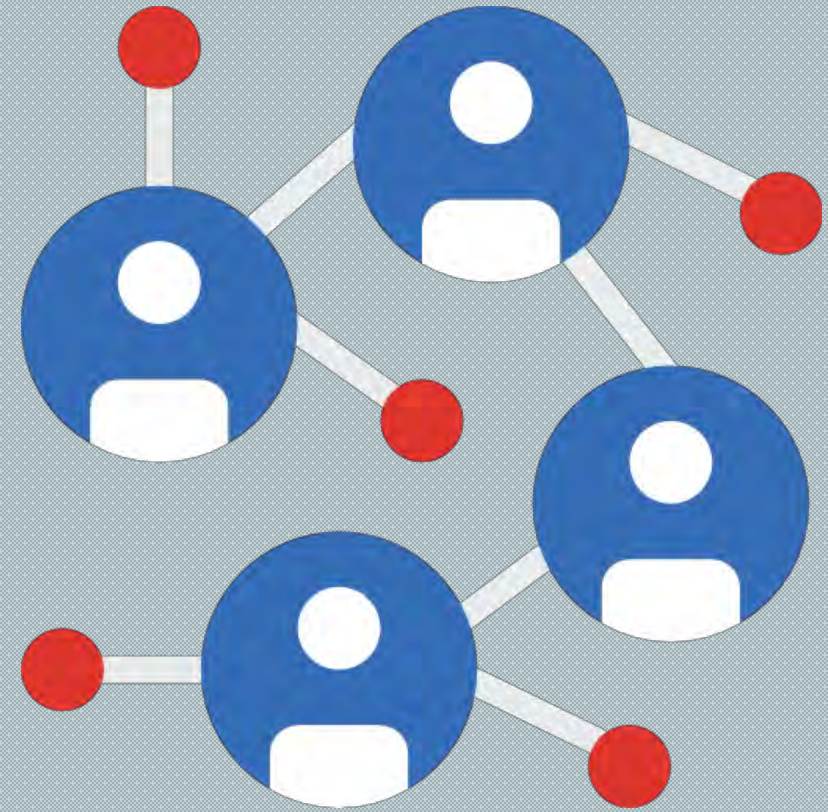


COMMUNITY RESILIENCE BUILDING WORKSHOP OBJECTIVES

- 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

BREAKOUT GROUPS

- 3-4 tables of 6 to 8 individuals
- Each table will discuss
 - Societal,
 - Infrastructure, and
 - Environmental
- Tools and Resources
 - Matrix, Maps, & Each Other



THE MATRIX

Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.com					
H-M-L priority for action over the <u>Short</u> or <u>Long</u> term (and <u>Ongoing</u>) V = Vulnerability S = Strength				Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)				Priority	Time
								H - M - L	Short Long Ongoing
Features	Location	Ownership	V or S						
Infrastructural									
Societal									
Environmental									

STEP ONE: HAZARD IDENTIFICATION

What are the Top Four Natural Hazards in Hardwick?

1. Engage
Community

2. Identify CC
Impacts &
Hazards

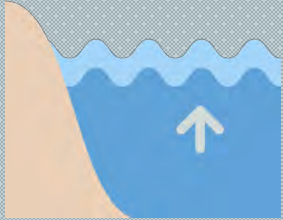
3. Complete
Assessment of
Vulnerabilities
& Strengths

4. Develop &
Prioritize
Actions

5. Take Action



STEP ONE: HAZARD IDENTIFICATION



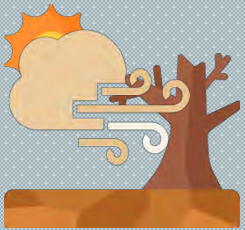
- **Flooding**
 - Riverine
 - Street



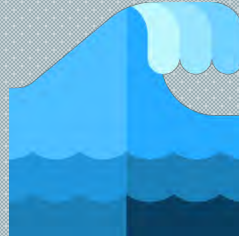
- **Landslides**
- **Mudslides**



- **Tornadoes**



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



- **Tsunami**



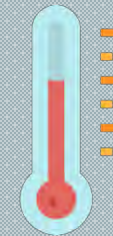
- **Hurricanes/
Nor'easters**



- **Wild Fires**




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



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

STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

Community Resilience Building Risk Matrix  www.CommunityResilienceBuilding.com

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, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Top 4 Hazards	H-M-L	Time	
						Short	Long
Infrastructural							
Societal							
Environmental							

PRIMARY TOPIC AREAS



- Infrastructure




- Society



- Environment

STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES



Community Resilience Building Risk Matrix


www.CommunityResilienceBuilding.com

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, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Top 4 Hazards				Priority	Time
								H-M-L	Short Long Ongoing
Infrastructural									
Dam									
Societal									
Environmental									

STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

Community Resilience Building Risk Matrix  www.CommunityResilienceBuilding.com


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

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

Features	Location	Ownership	V or S	Top 4 Hazards				Priority	Time
				H	M	L		H-M-L	Short Long Ongoing
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									



STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

Community Resilience Building Risk Matrix  www.CommunityResilienceBuilding.com

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

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

Features	Location	Ownership	V or S	Top 4 Hazards				Priority	Time
				H	M	L		H-M-L	Short Long Ongoing
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									
Wetlands									




STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES



Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.com					
H-M-L priority for action over the Short or Long term (e.g.)				Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)					
V = Vulnerability S = Strength				Top 4 Hazards				Priority	Time
Features	Location	Ownership	V or S					H-M-L	Short Long Duration
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									
Wetlands									

Estimated Location

STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

Community Resilience Building Risk Matrix  www.CommunityResilienceBuilding.com

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, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Top 4 Hazards				Priority	Time
				H	M	L		H-M-L	Short Long Ongoing
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									
Wetlands									

Public? Private? State?

Estimated Location

STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.com

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, drought, sea level rise, heat wave, etc.)


Features	Location	Ownership	V or S	Top 4 Hazards				Priority	Time
				H	M	L		H-M-L	Short Long Ongoing
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									
Wetlands									

Vulnerability or Strength

**Estimated Location
Public? Private? State?**

DAY 1 COMPLETE

STEP TWO: COMPLETED


Community Resilience Building Risk Matrix  www.CommunityResilienceBuilding.com

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

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

Features	Location	Ownership	V or S	Top 4 Hazards				Priority	Time
				H	M	L		H-M-L	Short Long Ongoing
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									
Wetlands									

STEP THREE: ACTIONS, PRIORITY AND TIMELINE

Community Resilience Building Risk Matrix  www.CommunityResilienceBuilding.com

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

Top Prior Hazards (tornado, flood, wildfire, hurricane, earthquake, drought, sea level rise, heat wave, etc.)

Top 4 Hazards

Priority Time

Features Location Ownership V or S

Infrastructure

Societal

Env

Completed

Nature Based Solutions

NATURE BASED SOLUTIONS

- Make use of natural systems
- Mimic the natural processes
- Actions to protect, sustainably manage and restore ecosystems
- Simultaneously providing well-being and biodiversity

International Union for Conservation of Nature (IUCN)

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

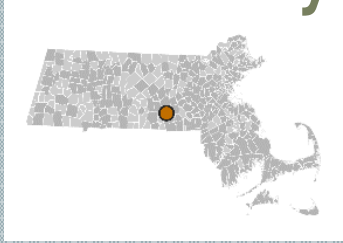


Contained bioswale or planter box

Example Action Grant Projects

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

Millbury



Designing green infrastructure like stormwater planters, bioretention bump outs, rain gardens, and other measures like porous pavers and pervious pavement to reduce heat island effects and stormwater runoff into the Blackstone River.

Nature-based solutions



MORE EXAMPLES OF LOW IMPACT DEVELOPMENT AND GREEN INFRASTRUCTURE



Green Parking Lots

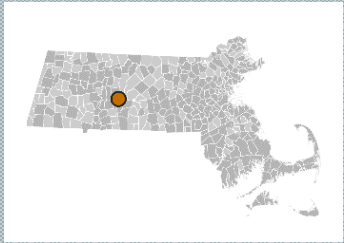


Permeable Paving

Example Action Grant Projects

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

Belchertown



Designing and permitting for a replacement water storage tank that would increase storage capacity and resiliency to drought, and completing a feasibility/ concept design of a rainwater harvesting system at Belchertown High School to irrigate the athletic fields.



Nature-based solutions

Pilot potential

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



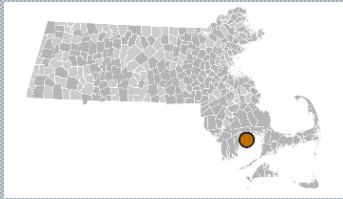
Nature Based Culvert



Example Action Grant Projects

Land Acquisition for Resilience

Mattapoisett



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



Data
Utilization
Proactive

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: PRIORITIES

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.com

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

Priority

Time

Top 4 Hazards

High/ Med. Low

Completed

Nature Based Solutions

Societal

Environmental

Features

Location


Ownership

V or S

Priority

Time

STEP THREE: TIMELINE

Community Resilience Building Risk Matrix  www.CommunityResilienceBuilding.com

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, drought, sea level rise, heat waves)

				Top 4 Hazards				Priority	
Features	Location	Ownership	V or S					H-M-L	Short Long Ongoing
Infrastructure									
Societal									
Env									

Completed

Nature Based Solutions

High/ Med. Low

Short/Long/Ongoing

REPORT OUTS

**What did your table
find?**

SUMMARY DISCUSSION

- Areas of agreement
- Areas of unique perspectives

NEXT STEPS

- Complete the survey
- Report development
- Public “Listening” session with Members of the Public and Board of Selectmen Spring 2021
- Develop resources and Implement actions.

**1. Engage
Community**

**2. Identify CC
Impacts &
Hazards**

**3. Complete
Assessment of
Vulnerabilities
& Strengths**

**4. Develop &
Prioritize
Actions**

5. Take Action



CONTACT US

Hardwick Core Team Leader

Eric Vollheim stonedance@comcast.net

CMRPC Project Leader

Dani Marini, dmarini@cmrpc.org

Executive Office of Energy and Environmental Affairs

Andrew Smith, andrew.b.smith@state.ma.us

**THANK
YOU**

CLIMATE PROJECTIONS AND IMPACTS FOR THE TOWN OF HARDWICK

**1. Engage
Community**

**2. Identify CC
Impacts &
Hazards**

**3. Complete
Assessment of
Vulnerabilities
& Strengths**

**4. Develop &
Prioritize
Actions**

5. Take Action

**Municipal Vulnerability Preparedness
Community Resilience Building Workshop – March 24 and 31**



CLIMATE CHANGE PROJECTIONS

Climate projections

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



Natural Hazards

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



EXAMPLES OF IMPACTS OF CLIMATE CHANGE

Infrastructure

- **Transportation** - Increased precipitation and flooding can disrupt traffic, delay construction, and 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.

Societal

- **Agriculture** - Impact on crops from more extreme temperature and precipitation
- **Human Health** - More frequent, extreme and longer heat waves will impact vulnerable populations.

Environment

- **Ecosystems** - Impacts such as range shifts, habitat loss, more pests and more invasive species

OUR CLIMATE IS ALREADY CHANGING

Temperature:



**3° F
Since 1895**

Growing Season:



**11 Days
Since 1895**

Sea Level Rise:



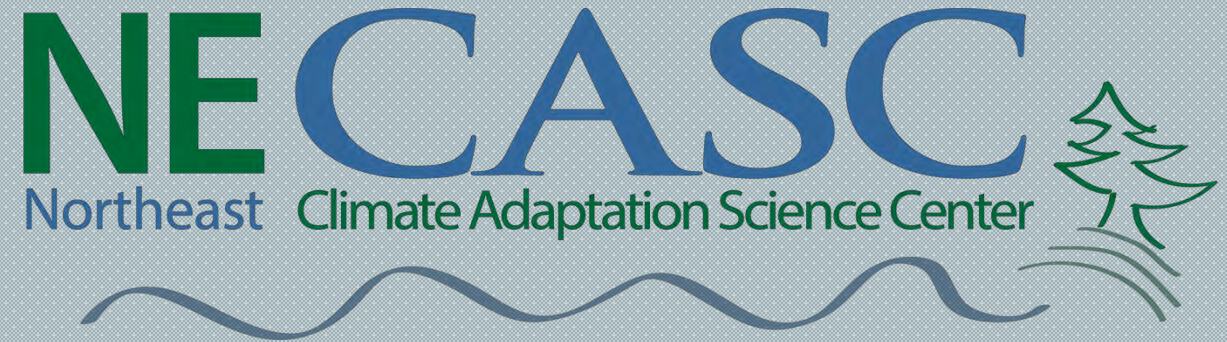
**8 inches
Since 1900**

Strong Storms:



**55%
Since 1958**

NORTHEAST CLIMATE SCIENCE CENTER UMASS AMHERST



- 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

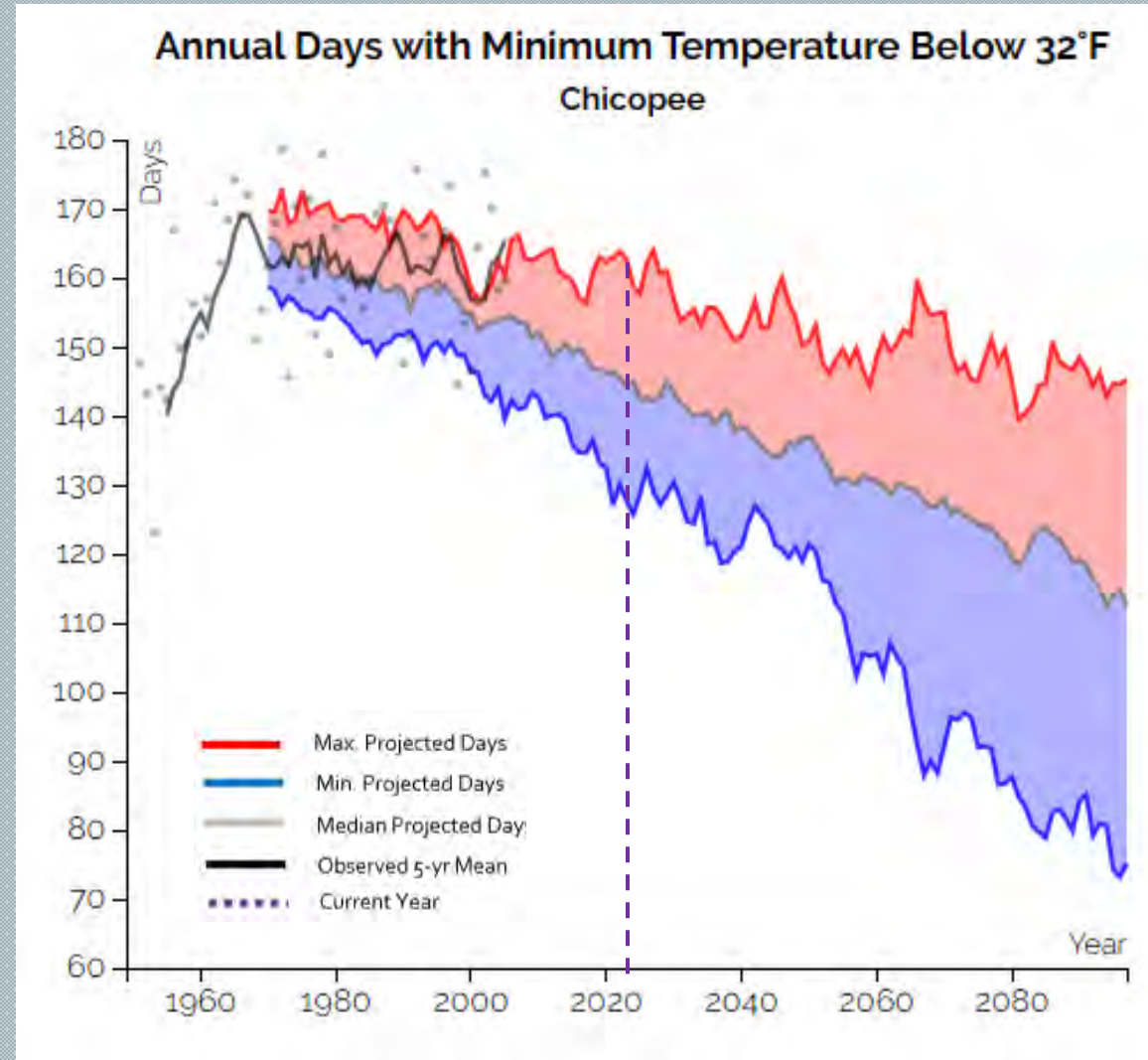


CHICOPEE RIVER BASIN



WINTER STORMS

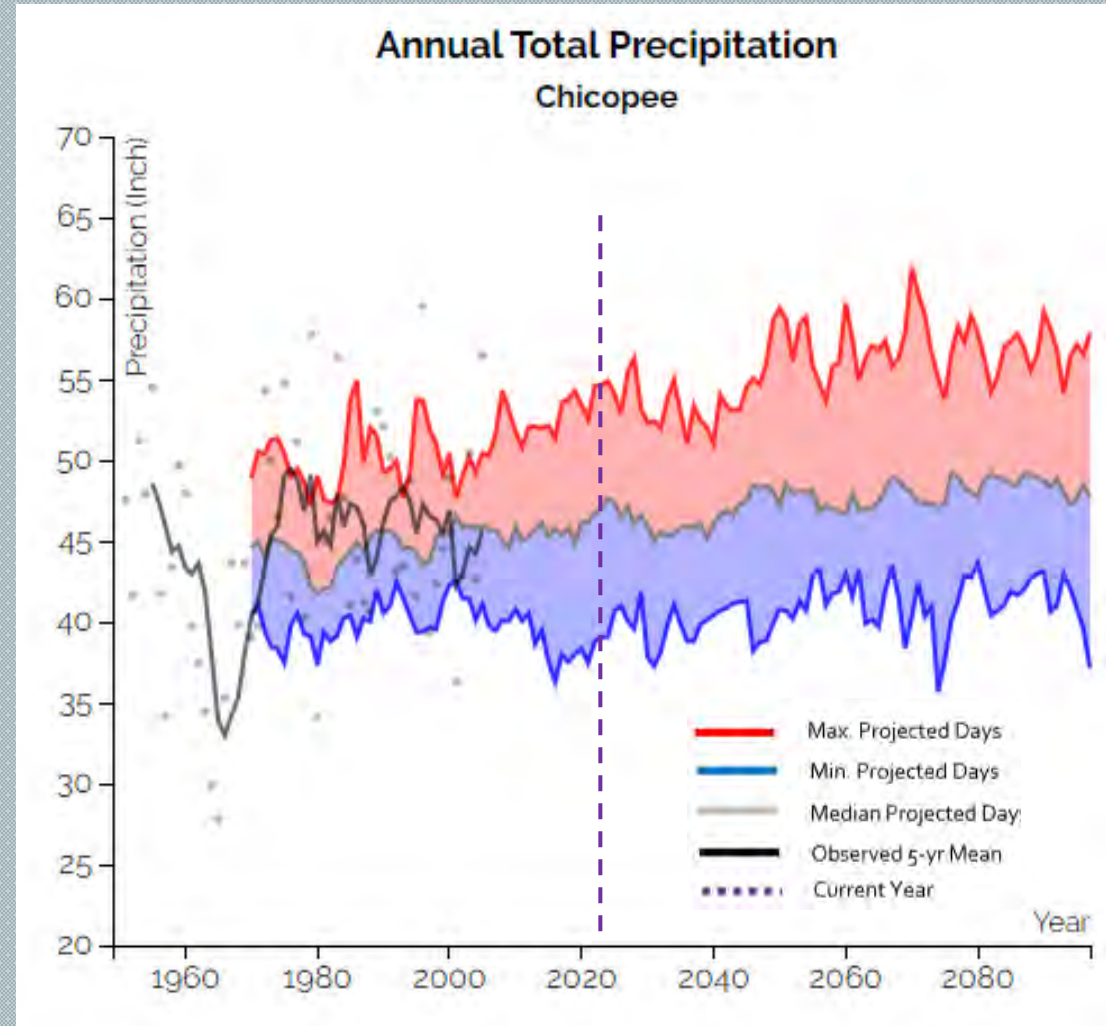
- Annual days below freezing will decrease
- Rising temps → more winter precipitation to fall as rain or freezing rain
- Lower snowfall accumulation
- Winter - Highest projected increase in precipitation
- Storms that do occur may be worse
 - proximity to Atlantic Ocean increases risk of large storm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



HEAVY RAINFALL AND FLOODING

Seasonal

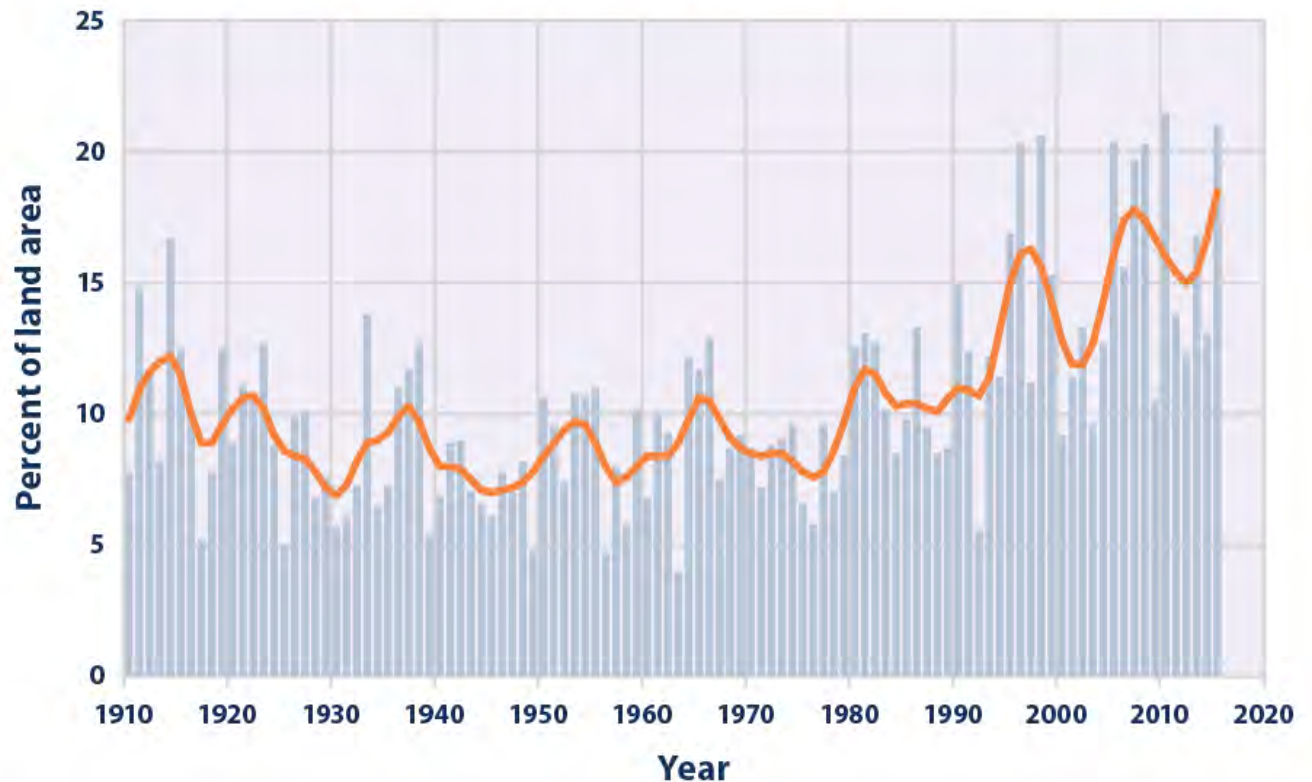
- **Winter** – Largest increase expected, up to .6 to 3.9 inches by end of century
- **Spring** – Expected increase of .2 to 2.8 inches by end of century
- **Summer** – Possible decrease of 1.2 inches to increase of 2.0 inches by end of century
- **Fall** – Possible decrease of 1.7 inches to increase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



HEAVY RAINFALL AND FLOODING

- 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

Extreme One-Day Precipitation Events in the Contiguous 48 States, 1910–2015



Data source: NOAA (National Oceanic and Atmospheric Administration). 2016. U.S. Climate Extremes Index. Accessed January 2016. www.ncdc.noaa.gov/extremes/cei.

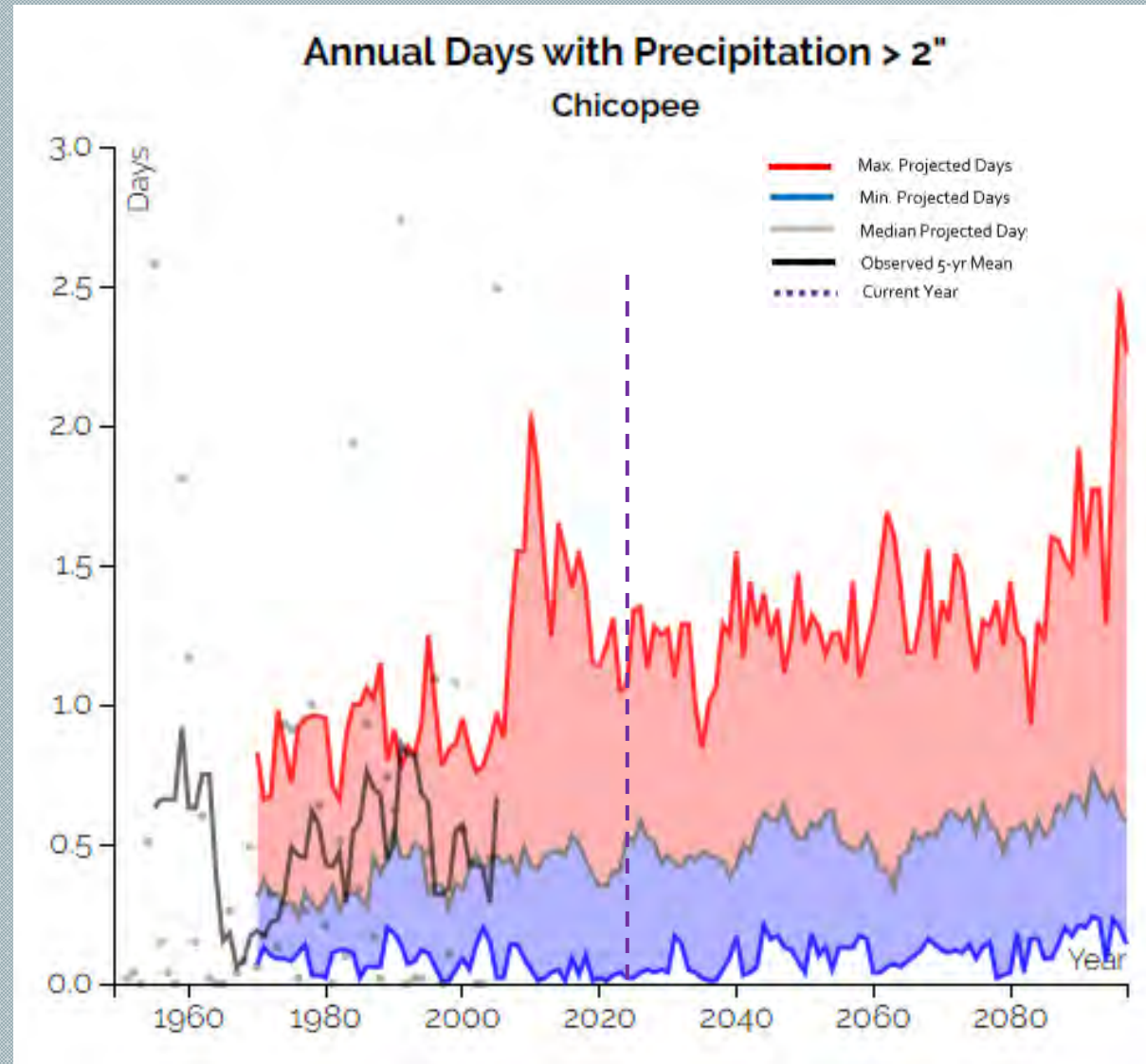
For more information, visit U.S. EPA's "Climate Change Indicators in the United States" at www.epa.gov/climate-indicators.



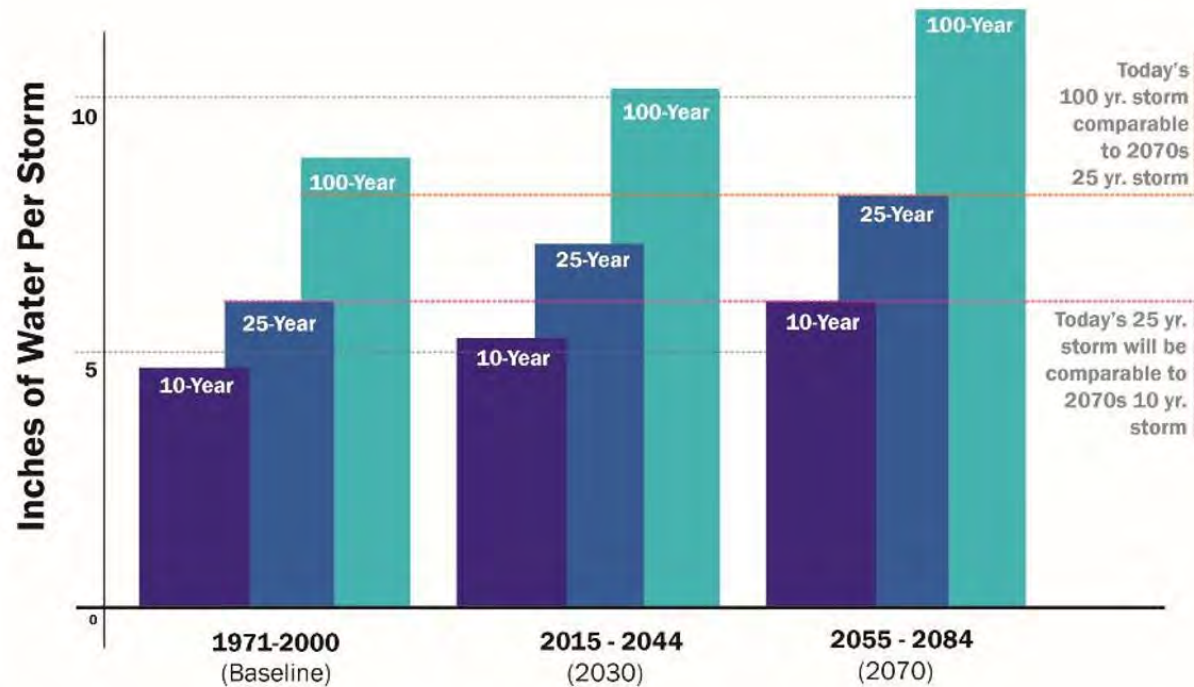
HEAVY RAINFALL AND FLOODING

Extreme Precipitation

- The number of days each year with more than 2 inches of precipitation will increase.



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.



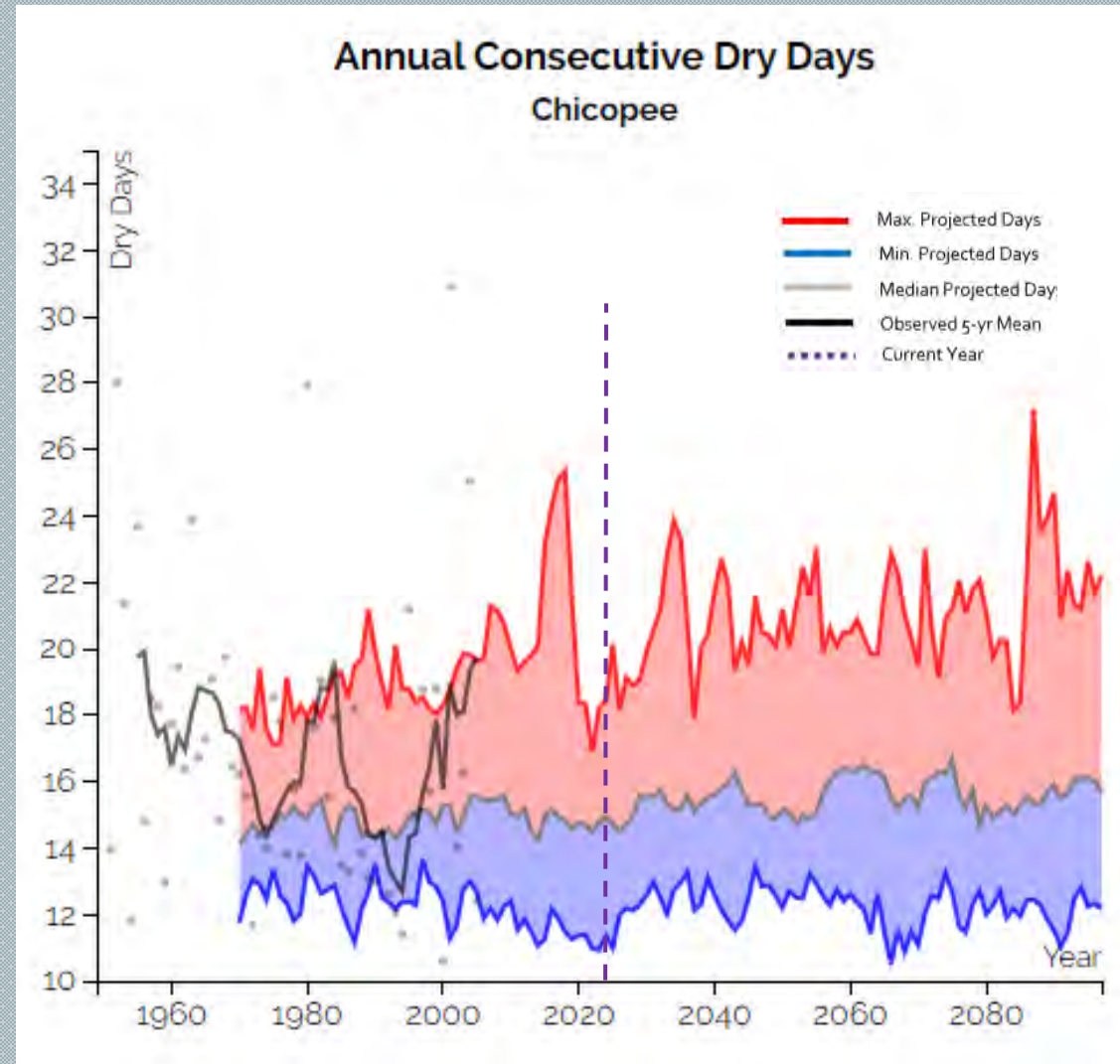
IMPACTS OF INCREASED PRECIPITATION

- 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



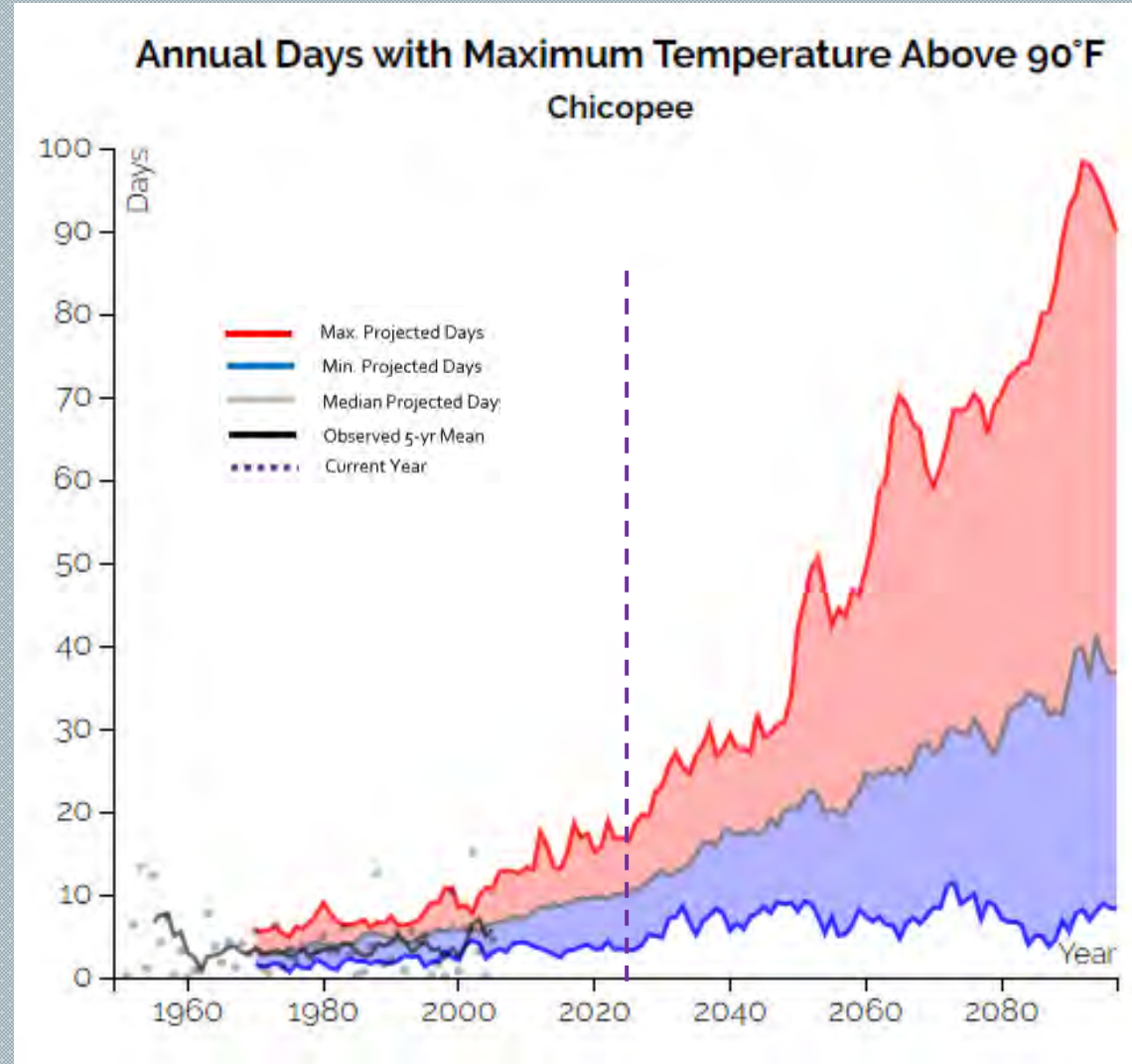
DROUGHT IMPACTS

- 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



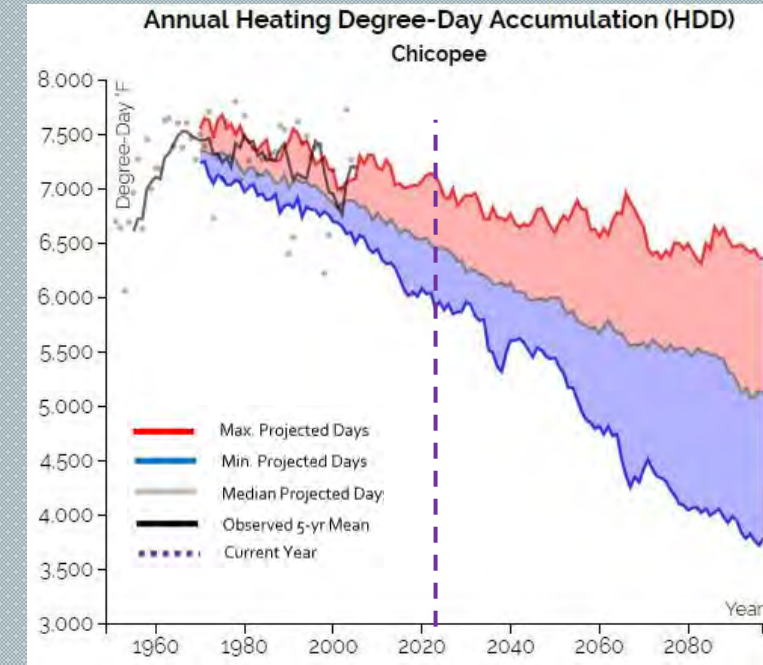
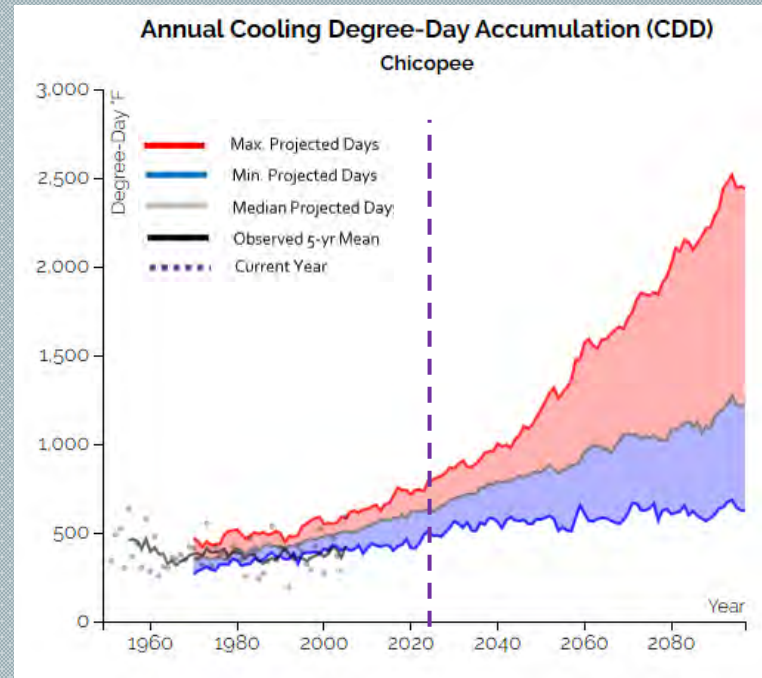
HEAT PROJECTIONS

- 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



HEAT PROJECTIONS

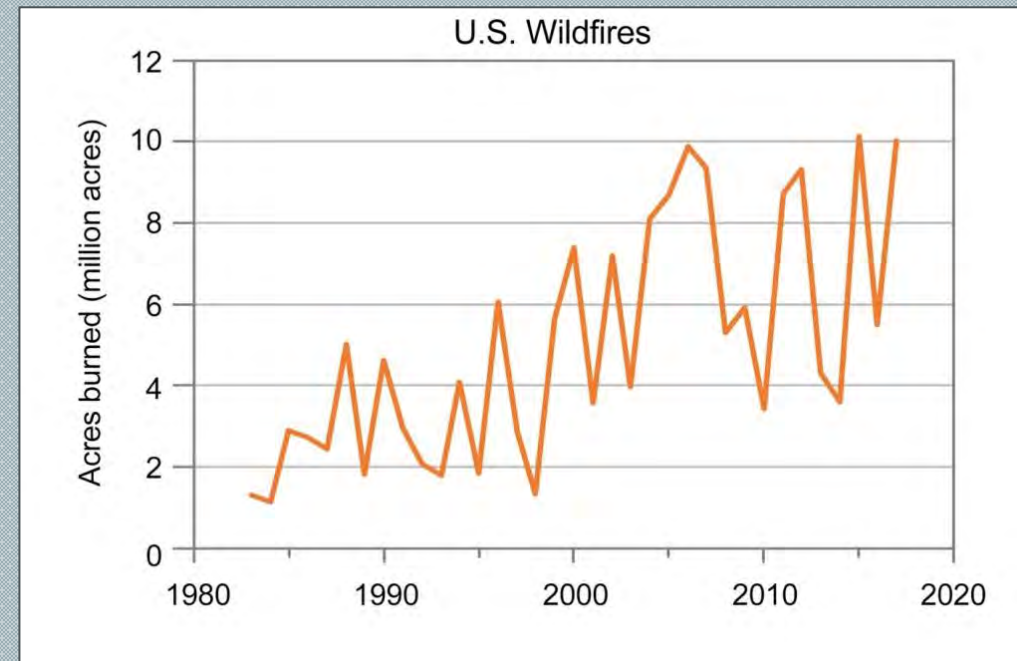
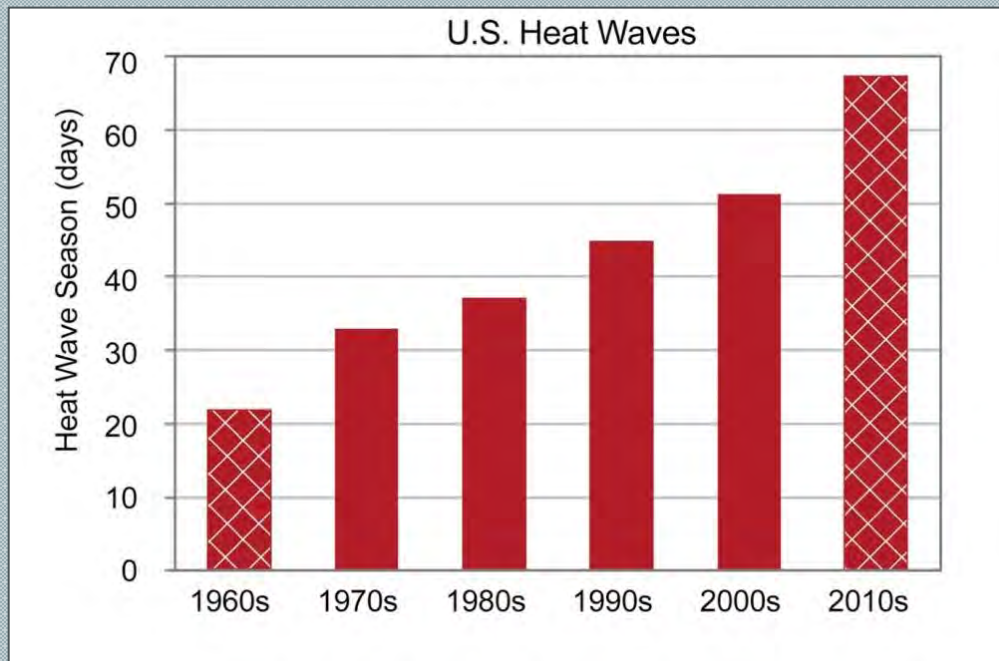
- Projected decrease in heating degree-days and increase in cooling-degree days
- More days above 65°F means fewer days needed to heat buildings and more days needed to cool buildings.
- Winter
 - 7-19% decrease in HDD by mid century
- Spring
 - 10-24% decrease in HDD by mid century
- Fall
 - 20-33%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



HEAT AND WILDFIRE

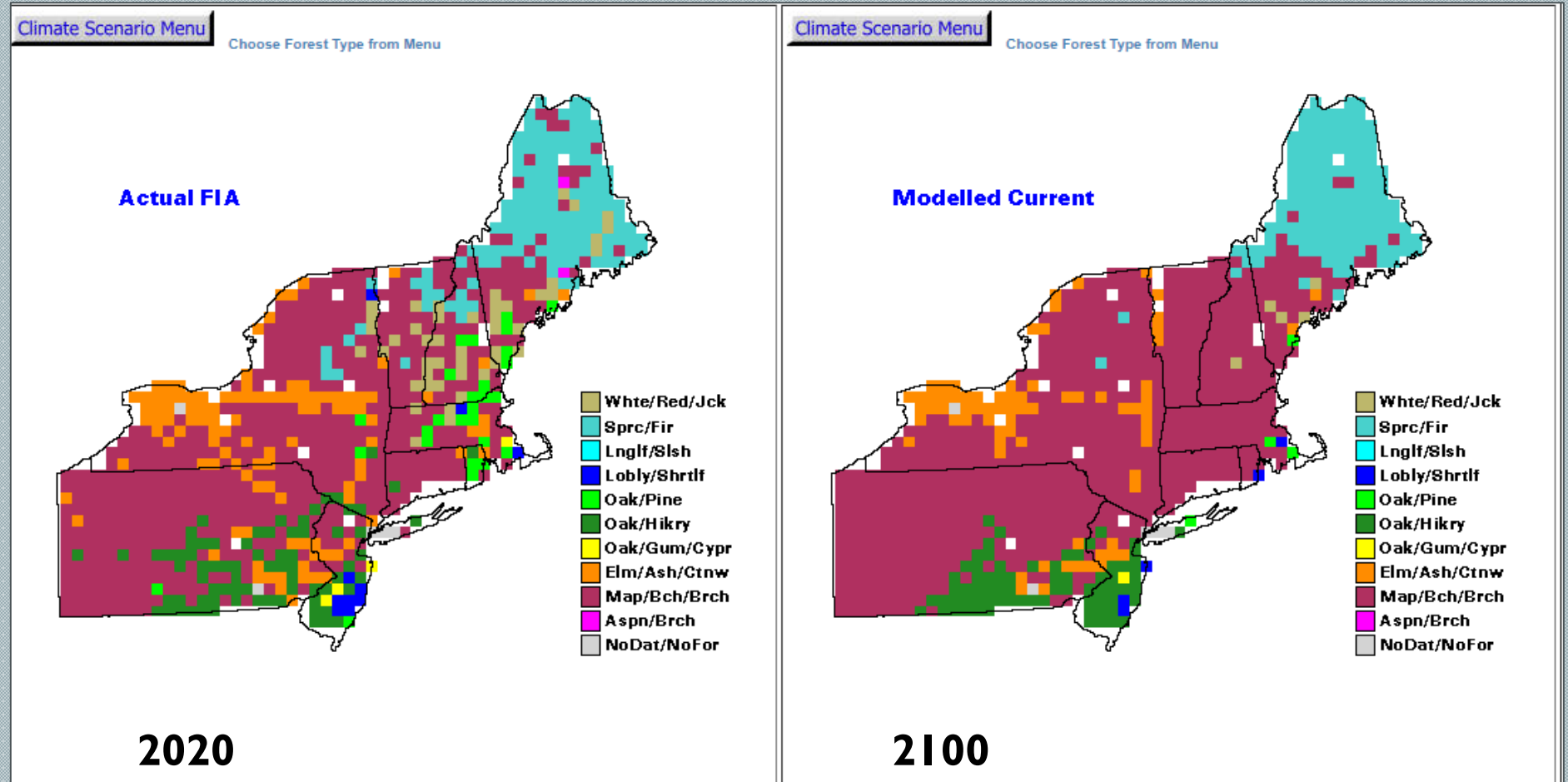
Nation-Wide Data

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

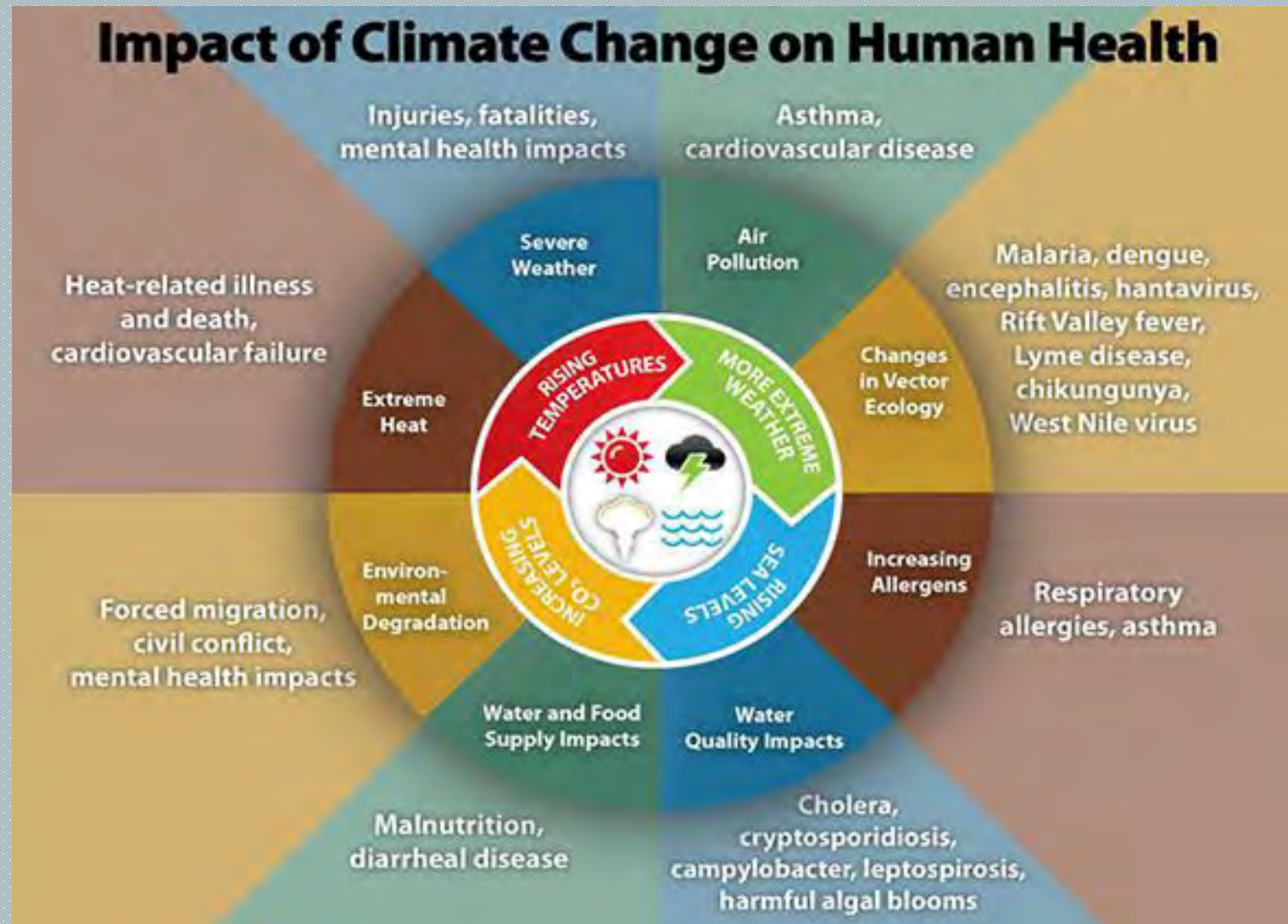


HEAT IMPACTS ON THE ENVIRONMENT

- Ranges of tree species are expected to move north
- Diversity of species will decrease
- Increases of invasive species are likely

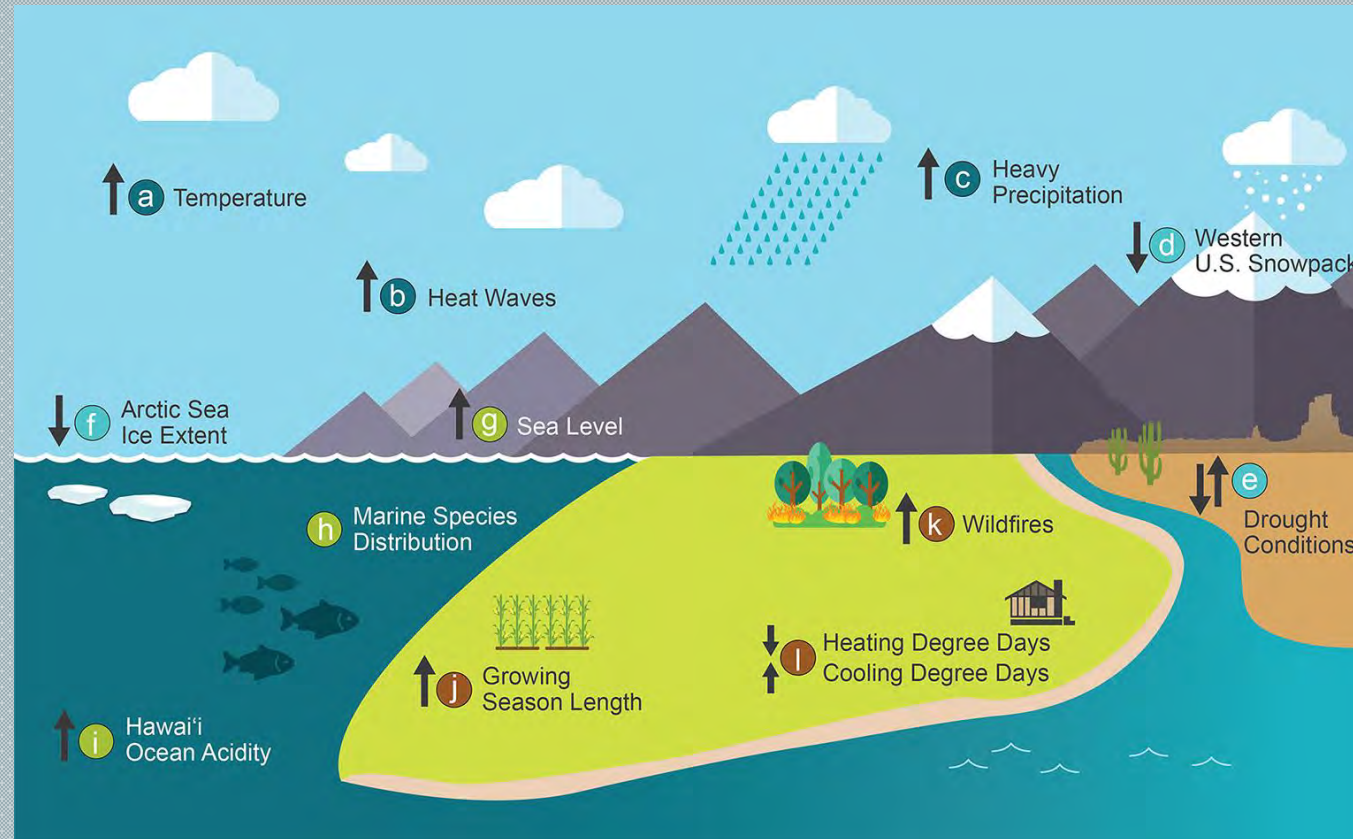


HEAT IMPACTS ON SOCIETY



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

THANK YOU!



NATURAL HAZARDS TOWN OF HARDWICK

Municipal Vulnerability Preparedness (MVP) Community Resilience Building Workshop

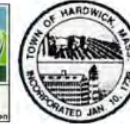
March 24th, 5:00 – 8:00 pm

&

March 31st, 5:00 – 8:00 pm

HAZARD MITIGATION PLANNING

- Overlaps somewhat with Hazard Mitigation Planning, but MVP is more focused on climate change in the long term
- Hardwick's Hazard Mitigation was adopted in August 2019.
- 5-year plans



Hardwick Hazard Mitigation Plan Update

[Last Revised – August 6, 2019]



Hardwick, MA, February 2009

Adopted by the Board of Selectmen August 5, 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 Hardwick, Massachusetts



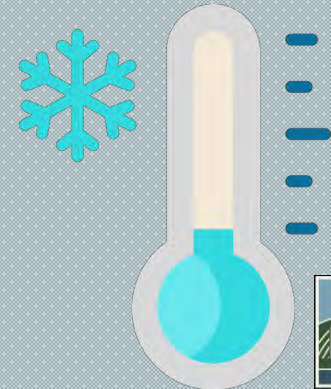
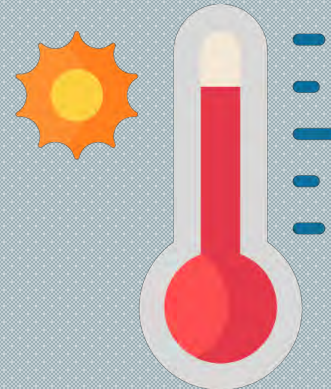
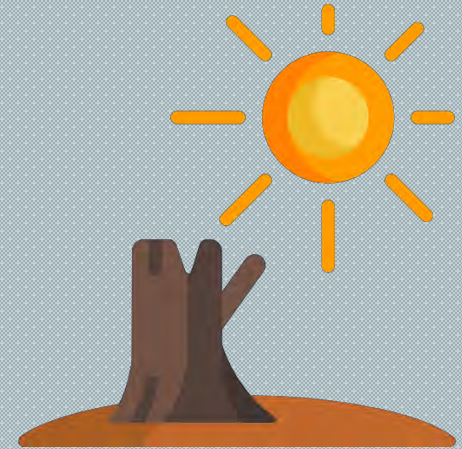
BE PREPARED, MITIGATE THE COSTS

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 <small>*BCR numbers in this study have been rounded</small>		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

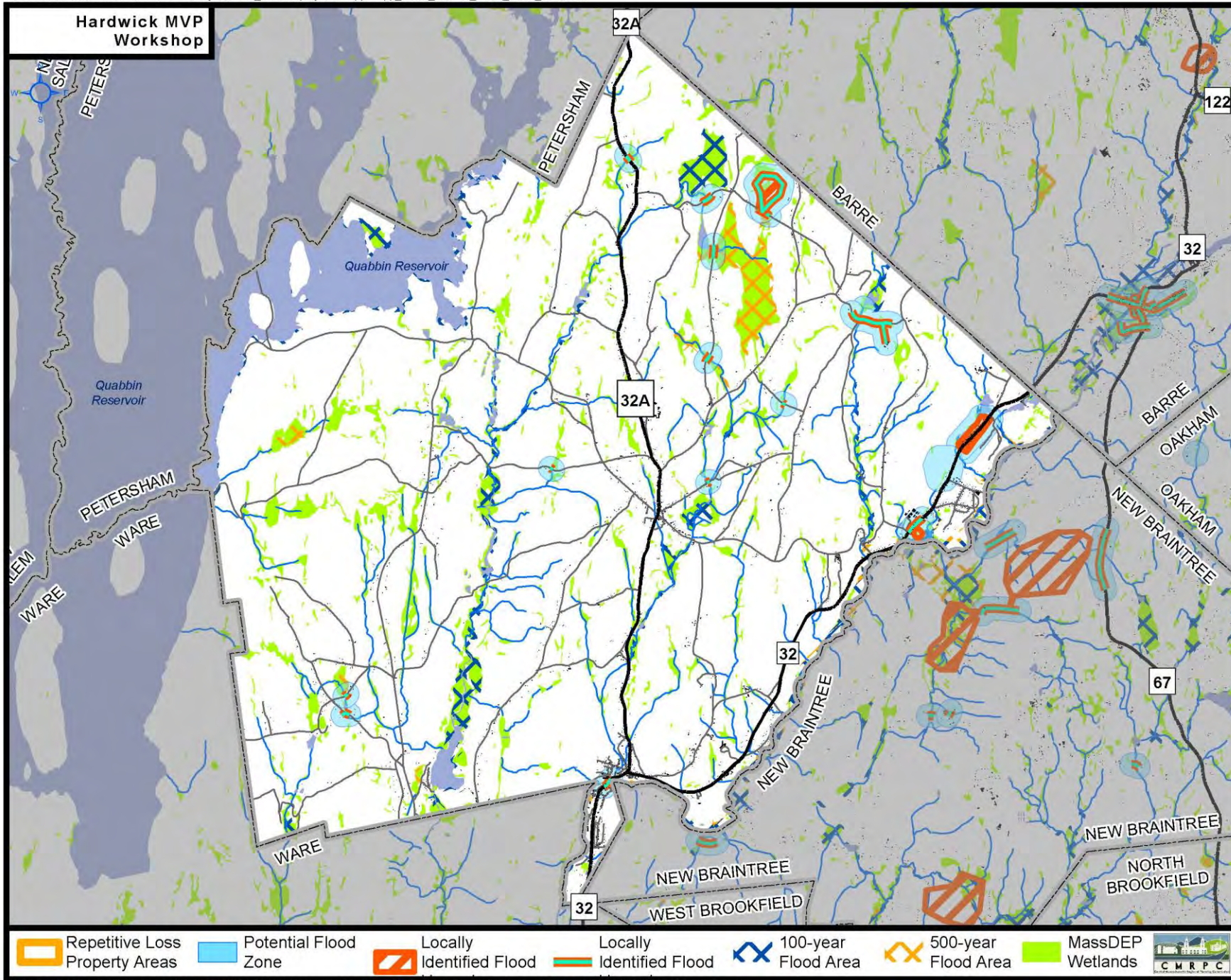
NATURAL HAZARDS

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



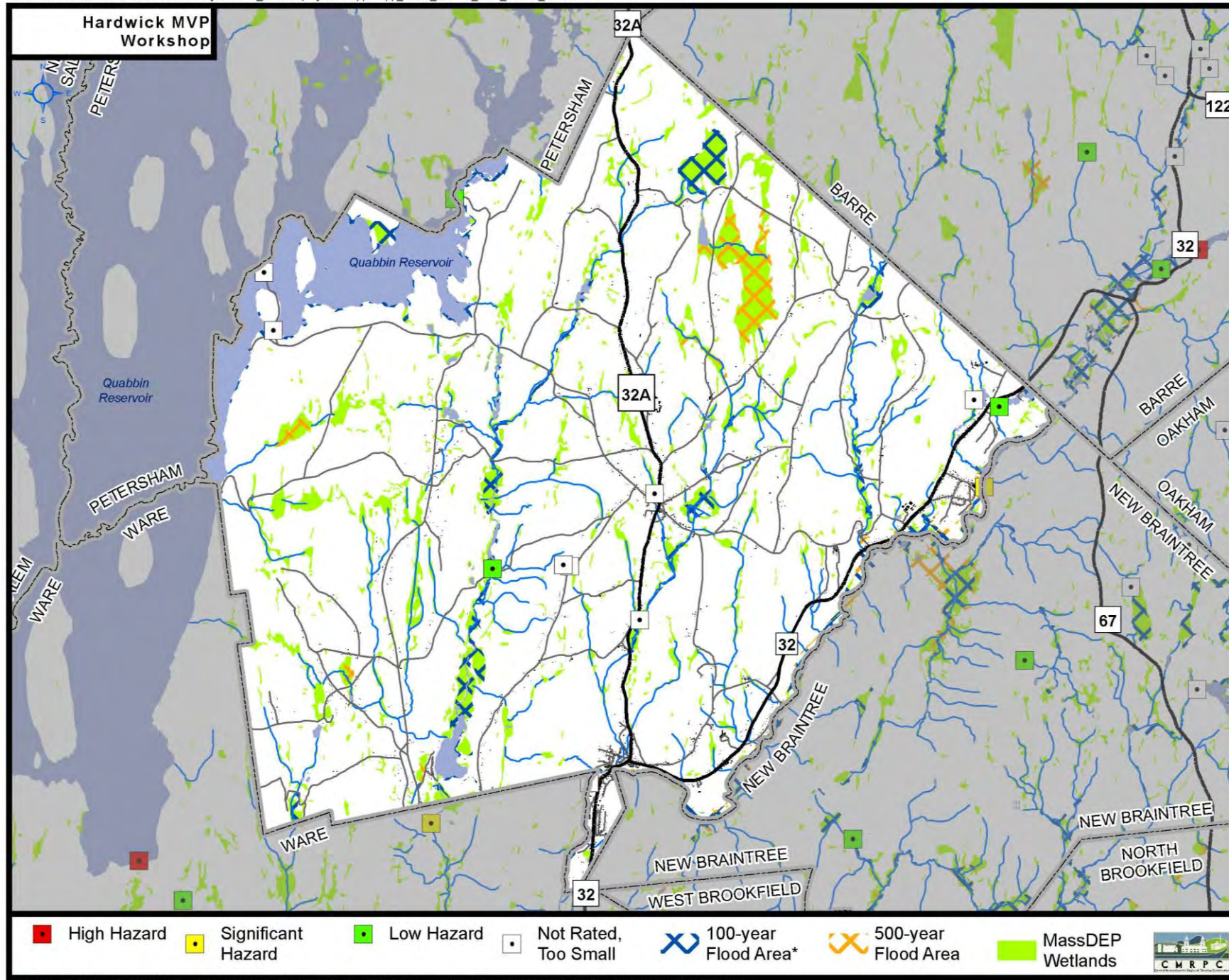
FLOOD RISKS

Date: 12/15/2020 Document Path: H:\Projects\HLS_GIS\subprojects\rmvpp\rmvpp_slides_NatHaz_Flood_Risks_8x10.mxd

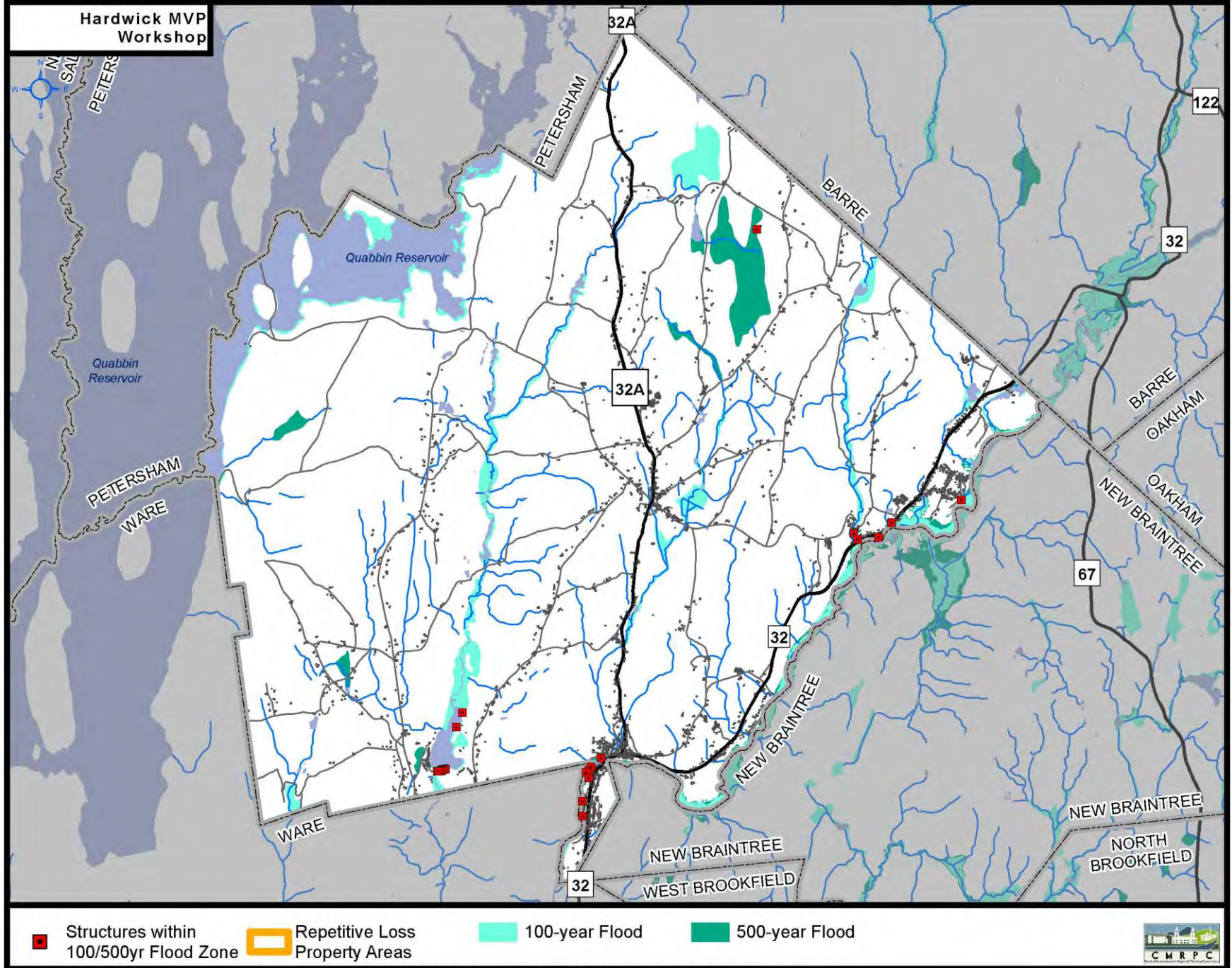


DAM FAILURE RISK

Date: 12/15/2020 Document Path: H:\Projects\HLS_GIS\subprojects\mvp\mvp_slides_NatHaz_Dam_Failure_8x10.mxd



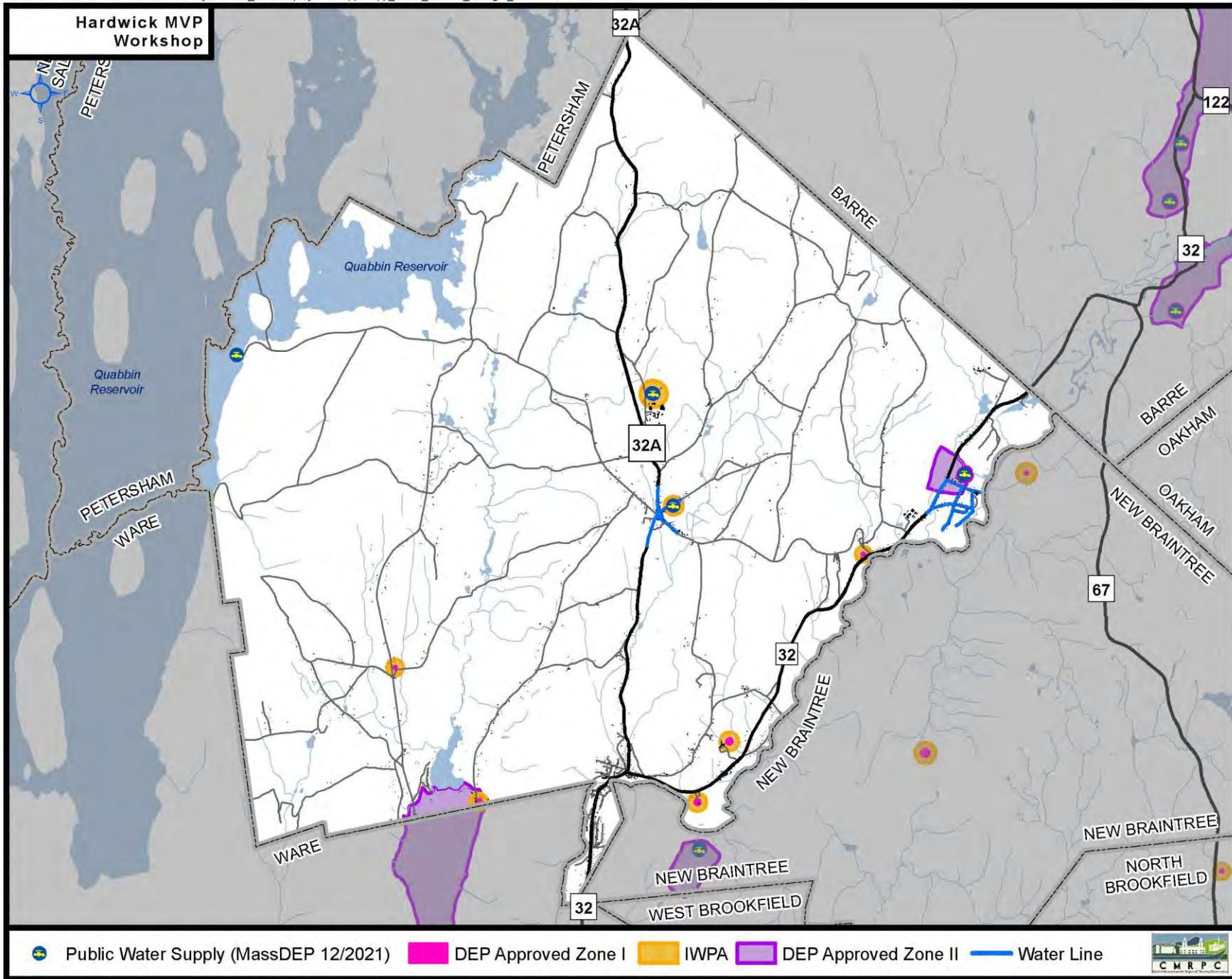
FLOODING IMPACTS



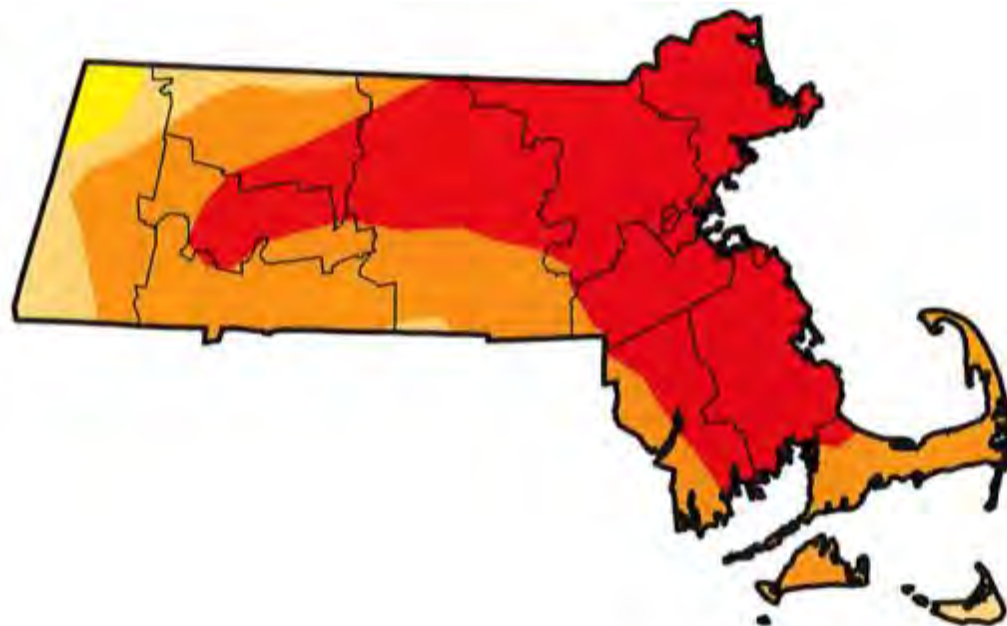
Source: Data provided by the Town of Hardwick, CMRPC, massDOT, MassGIS. Information depicted on this map is for planning purposes only.



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	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought
D2 Severe Drought	

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

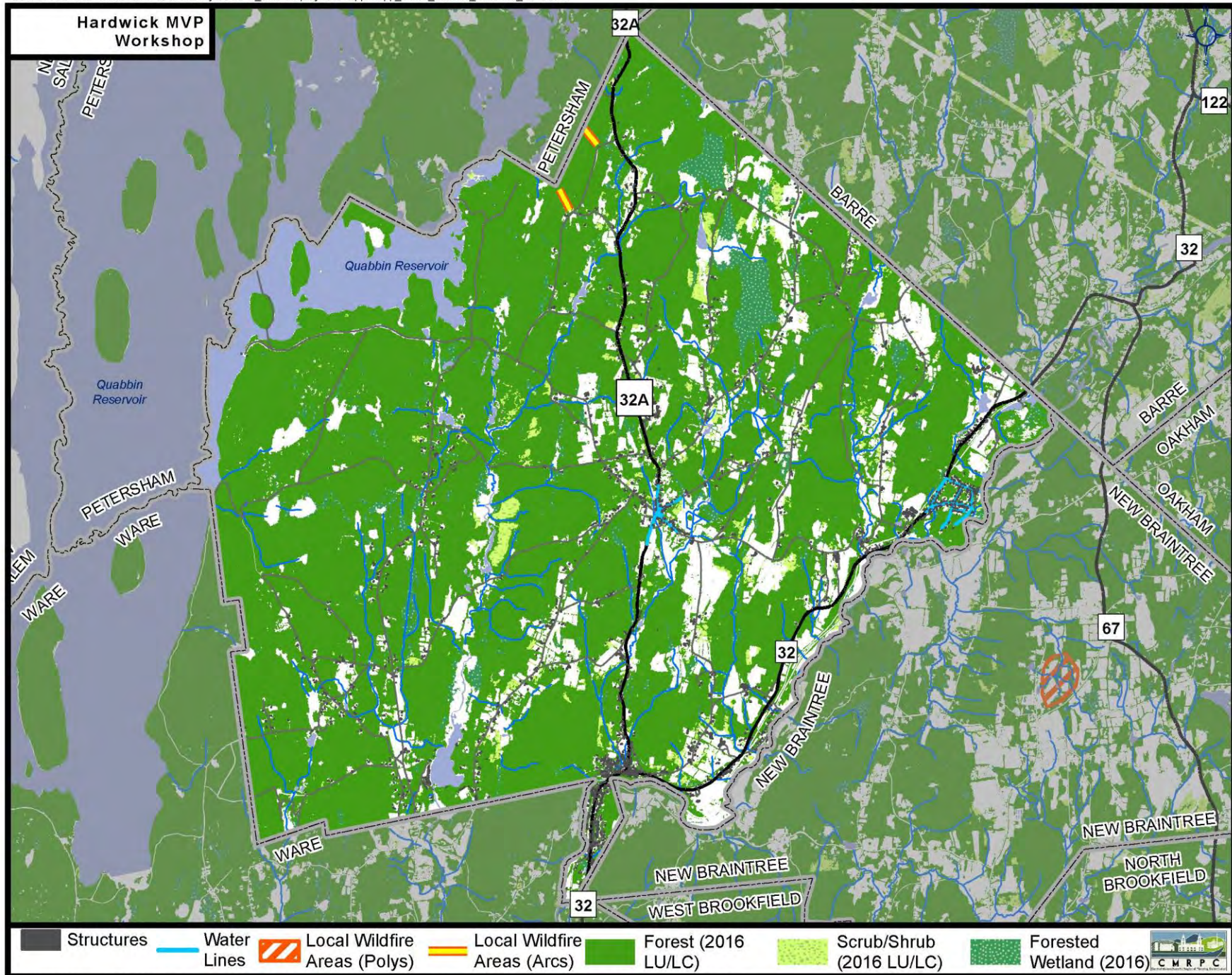
Author:
Eric Luebehusen
U.S. Department of Agriculture



<http://droughtmonitor.unl.edu/>

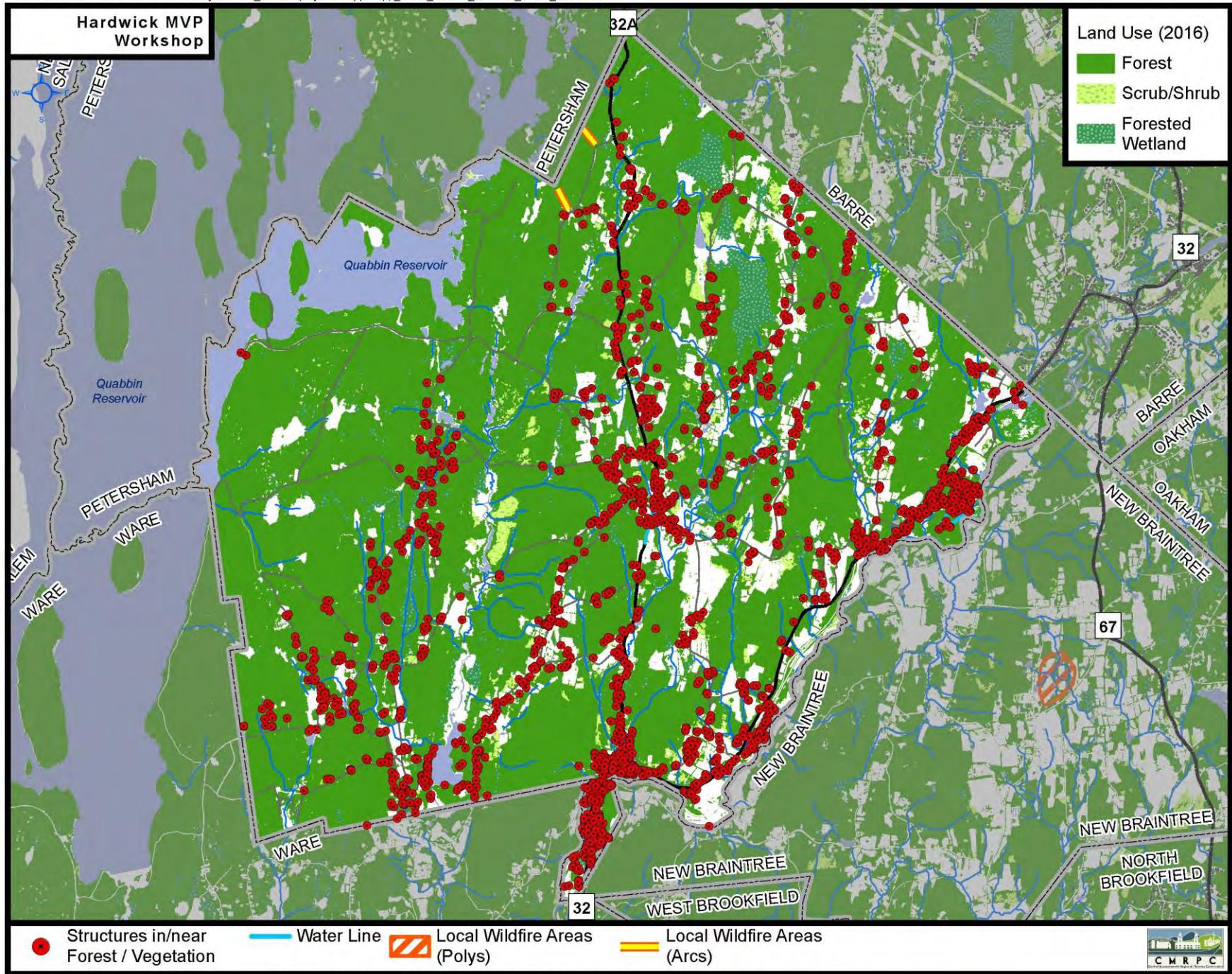


WILDFIRE



WILDLAND/URBAN INTERFACE

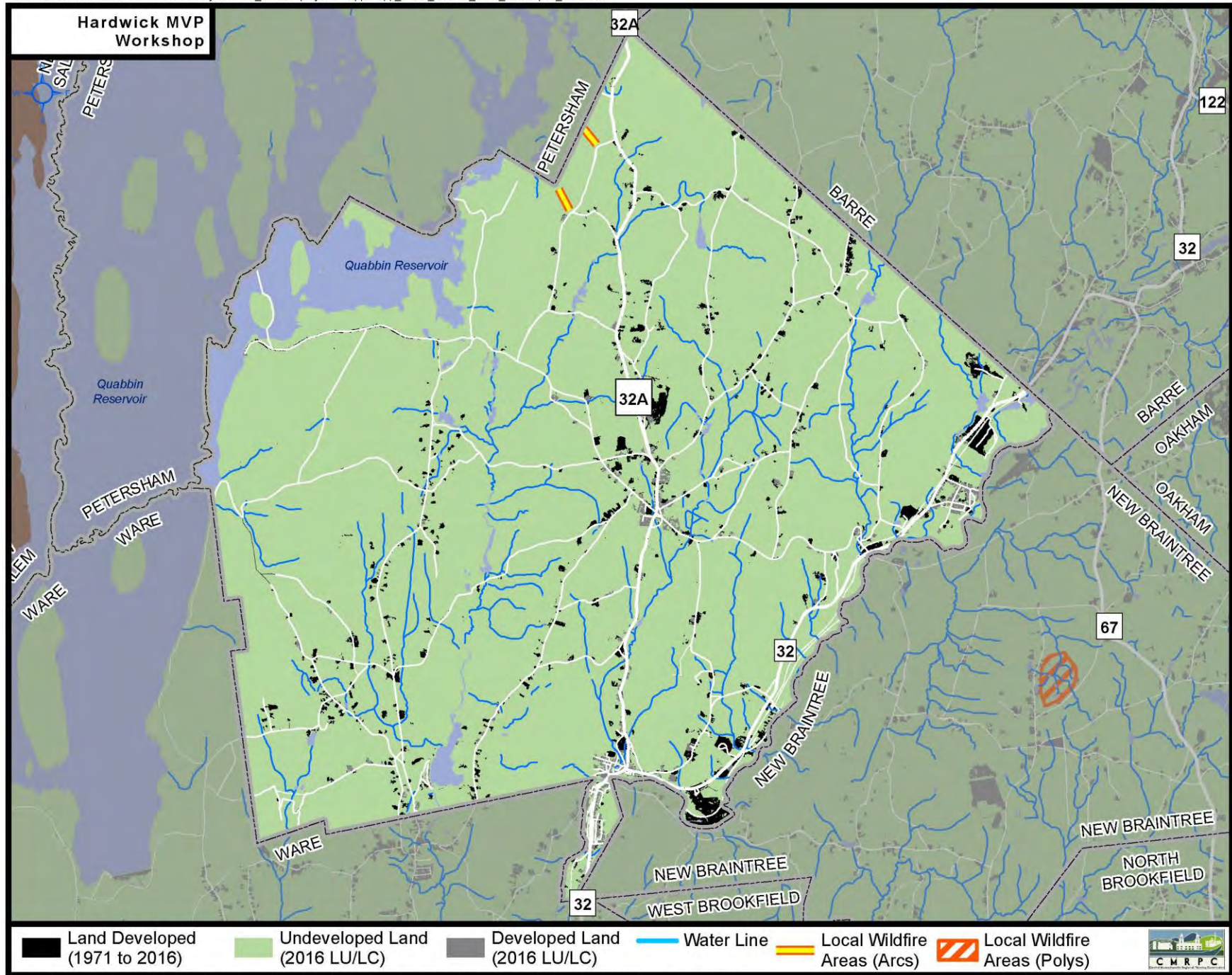
Date: 12/18/2020 Document Path: H:\Projects\HLS_GIS\subprojects\mvp\mvp_slides_NatHaz_Wildfires_Urban_8x10.mxd



Source: Data provided by the Town of Hardwick, CMRPC, Mass Audubon, massDOT, MassGIS. Information depicted on this map is for planning purposes only.

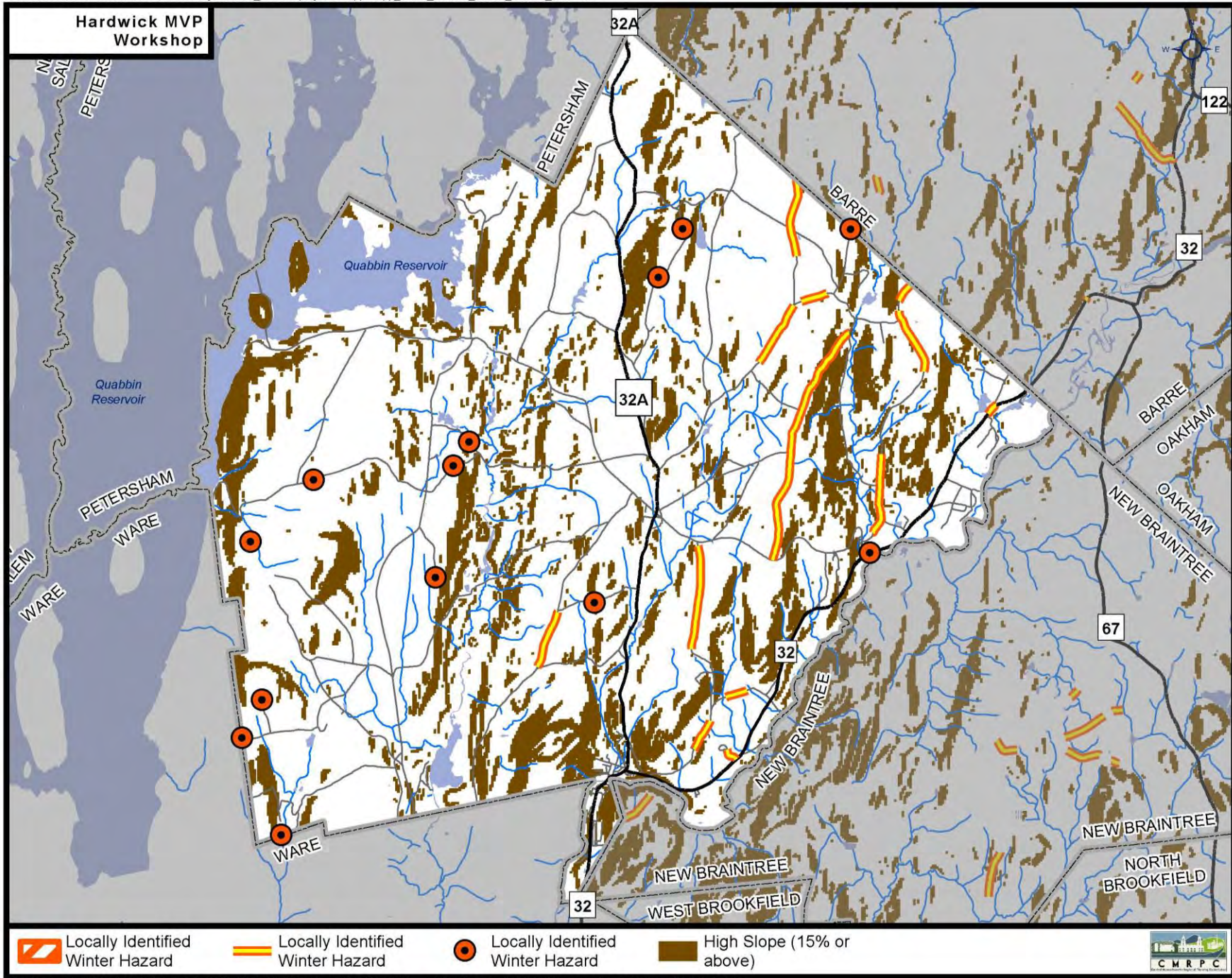
FIRE & NEW DEVELOPMENT

Date: 12/15/2020 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp\mvpp_slides_NatHaz_Land_Developed_8x10.mxd



WINTER STORMS

Date: 12/10/2020 Document Path: H:\Projects\HLS_GIS\subprojects\mvp\mvp_slides_NatHaz_Winter_Storms_8x10.mxd



EXTREME STORMS

Tornado Tracks, 1950-2017

☒ Show Touchdown Points

Filter by Magnitude:

- ☒ F/EF 0
- ☒ F/EF 1
- ☒ F/EF 2
- ☒ F/EF 3
- ☒ F/EF 4
- ☒ F/EF 5

Filter by Year Range:

1950 through 2017

Filter by Month:

All Months

Filter by Casualties:

- ☐ Injuries > 0
- ☐ Fatalities > 0

For more information, click any:

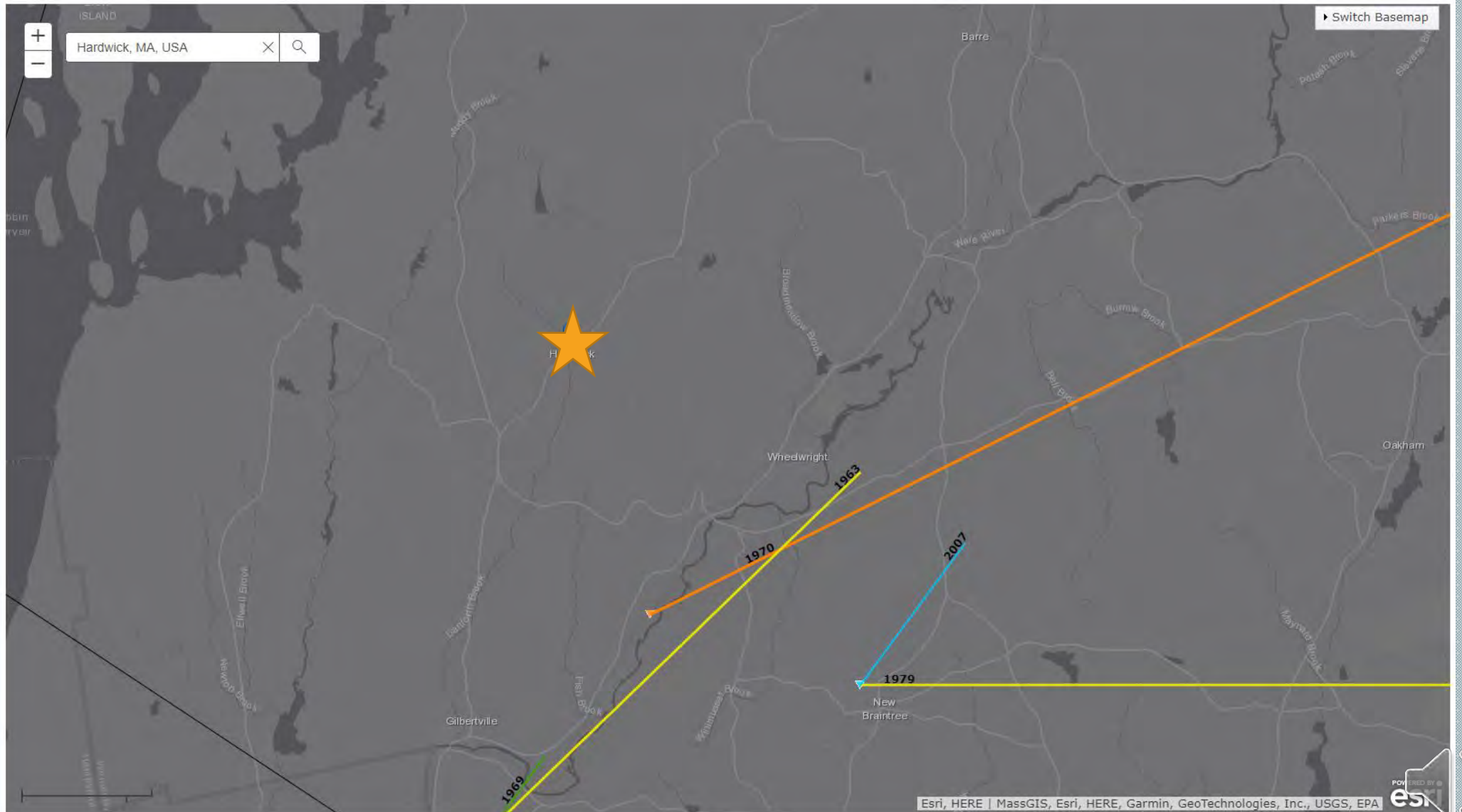
- ☒ Track (for tornado data)
- ☐ County (for county image)

Please note: Attempting to view many tracks may significantly hinder performance.



Send Feedback

Tornado data from the
National Weather Service
Storm Prediction Center:
<http://www.spc.noaa.gov/gis/svrgis>

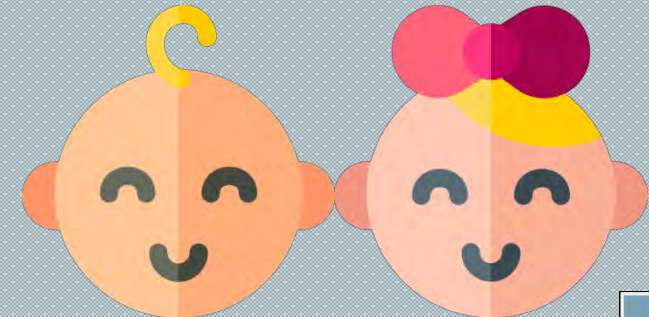


CRITICAL INFRASTRUCTURE & FACILITIES

- 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...

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



VULNERABLE POPULATIONS (CONT.)

Seniors (65+) - 17.3% of the population is 65 years or older

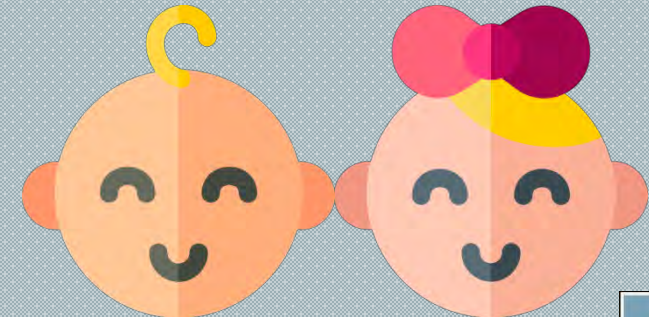
Youth (Under 18) - 25.1% of the population is under the age of 18

Renter Occupied – 32% of the population rents their home

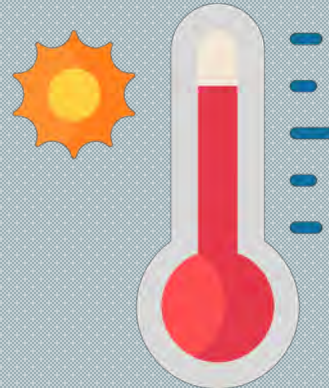
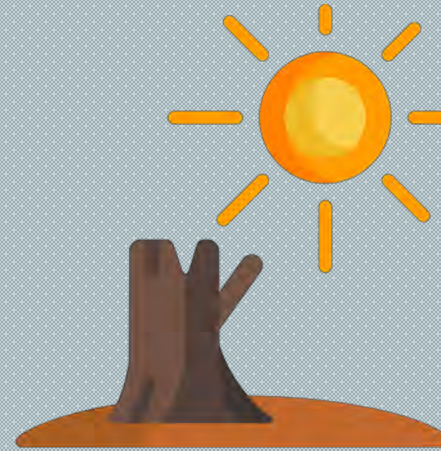
Language - 5.5% of the population speaks a language other than English at home

Low-Income - 15.9% of the population is in poverty

Disability – 13.1% of the population is disabled



QUESTIONS



**THANK
YOU**

Date: March 31, 2022

Hardwick Municipal Vulnerability Preparedness Workshop - Day 2

Location: Municipal Offices

Time: 9:00 - 4:00 pm

Name	Table #	Email Address	Title	Organization
Abbie White				
Andrew Smith	1			
Bill Zinni	1		Recycling Chair	
Chris Buelow	2	billzinni@comcast.net	Conservation Commission	
Christopher L Lajoie	3			
Cynthia Henshaw	1			
Dawn Campelo	✓ 1			
Deb Morrison	3	Storemanager.hcx@comcast.net	St. Mary	Hardwick Towne Co
Dorrinda O'Keefe-Shea	2			
Emily Bancroft	2			
Eric Vollheim	1			
Erik Fleming	3	stuedane.	PMD	Town of Hardwick
Jenna Garvey	3	MORNINGFIELD @ COMCAST.NET		
John O'Leary	2	jennaga@yahoocool		
Joseph Raskett	1			
Kate Morreale	2			
Kevin Landine	1			
Lucinda Childs	3	KLANDINE@townofhardwick.ca	LT	HTPA
Mark Korzec	3			
Marlo Stein	2	marlostein@gmail.com		Round Table Farm
Nicole Parker	2	here		
Pamela Hill	2			
Patricia Tinker	1			
Paul Benoit	3			
PJ McDonald	1			
Randy Noble	2			
Raymond Walker	3			
Rebecca Bottomley	1	b2b3bottomley@gmail.com	CONS. Comm	
Richard Wine	3			
Rick romano	3			
Robert Rogowski	2			
Stan White	2	stan white		

Date: March 31, 2022

Hardwick Municipal Vulnerability Preparedness Workshop - Day 2

Name	Table #	Location: Municipal Offices	Email Address	Title	Organization
Faye Rhawlt					
Jan McElwae					CMRPC
Paul Benoit					CMRPC
BARBARA LARSON					
Cynthia Henshaw					
Mary Hannah Smith					
Chris Dunphy					CMRPC
Dani Marinil					CMRPC
Daryl Anawzick					CMRPC
Deb Morrison					CMRPC
Rick Rana					
ERIK FLEMING					
RANDALL NOBLE					PLANNING BO.
Steve Souff					HHS
Johanna Cloud					Hardwick Foremen's Co-op
Andrew Smith			judith.kahn		BOH
			andrew.b.smith@mass.gov		EEA

Community Resilience Building Risk Matrix

Town: **Hardwick**

H-M-L priority for action over the Short or Long term (and Ongoing)

V = Vulnerability S = Strength



TABLE # 1

www.CommunityResilienceBuilding.org

Features	Location	Ownership	V or S	Description	Flooding	Drought/ Extreme Heat	Severe Storms	Winter Storms Extreme Cold	Priority	Time
Infrastructure										
Gilbertville Municipal Bldg.	Main St.	Town	V-S	No Generator. Limited access. Drainage/Flood issues						
Culverts / Flooding	Town-wide / Barre Rd	Public	V	Failing/Collapsing. Wetlands backing up						
Wastewater Treatment / Sewer 1972	Plant in Gilb.	Public	V	Failing. Under DEP order. Fires. Capacity?						
Wheelwright	Wheelwright	Public	V	Package Plant. Serves Wheelwright						
Old Town Hall	Hardwick Center	Public	V-S	Historic. Meeting Place. Water Intrusion						
2 Private Water Districts	Gilb. / Wheelwright	Quasi	V	OK. But wells. Concern.						
Railroad	Gilbertville	Private	V	Old. Passed derailments. Run-off. Washouts						
Rail Trail	Gilb. - Wheelwright	E. Quabbin L.T.	S	Tourism. Recreation						
Whistle Stop	Gilbertville	Private	S	Historic. Tourism						
Fire Protection / Two in Gilb.	Gilb. / Wheelwright	Public	S	OK. Some concern. Holding tank. Storm water						
Hardwick Elementary	Lower Rd.	Public	V	No Heating/Cooling. Has Generator (w/ fuel tank)						
Road Network	Public / Town	Public	V	Condition? Few Main Rds. Limited connections						
Quabbin Estates	Wheelwright	Private	V	Assisted Living						
SMOC Housing	4 in town	Private	V	Low-income. Substance abuse. Low fuel. Challenge						
Fire Station	Hardwick	Public	S	Temp Water Supply as needed - Farm Livestock						
Libraries	Gilb. / Hardwick	Private	S	Historic.						
Gilbertville Park	Gilb.	Public	V-S	OK. Needs more looking at getting in place and some usability						
Dams	Gilb.	Private	V	Old. Condition? Wheelwright Pond Dam (agric and water) electric delivery of land mass, connectivity						
Nanforth Brook	Gilb.	Public	V-S	Old swimming hole						
Hardwick Center	Hardwick	Public	S	Historic. Hardwick Fair						
Ware River Park	Gilb.	Public	S	Access to W.R. Restoration under way						
Mills	Gilb.	Private	V-S	Marijuana Facility? Jobs						
Societal										
Police - No Perm. Place			V	Facility. Stretched services. Isolation						
Gilbertville	Village		V	LMI Pop. Affordable Housing attracts from all over. Drug use. Police challenged						
Volunteerism			V/S	Cultural - Societal changes. Longer commutes						
Housing			V-S	No jobs. Tougher for younger people						
Agriculture		Private	S	Affordable, but cause challenges						
Hardwick Fair	Hardwick		S	Balance Growth - Services						
Vulnerable Pop.				Help Retain. Land Protection tools						
No Senior Center			V	Attracts thousands.						
Food Bank			V	Elderly, LMI, Transient						
Eagle Hill			V	Some go to N. Brantree. Used to have space in Municipal Bldg.						
Growth Pressures	Gilb. Building		S							
Golf Course			V-S	Solar, Cheap housing, Agriculture - Property Stress.						
Environmental										
Drought / Dry wells			V	Agriculture concern & Livestock						
Fires			V	Shallow wells						
Trees			V	Drought Humidity, Brush, Wild Fires						
Trees	Ridge Rd. Greenwich, etc.		V	Million of Tree Work						
Invasive Pests. Bugs			V	Dead/Fallen. Maintenance, Safety						
Invasives			V	Power lines. Lost Power.						
			V	Zoonotic Disease. Lyme. Mosquitoes						
			V	Ticks. - Tarping wires. Lost/warped						
			V	Chop. Treatment. Japanese Knotweed						
			V	Bittersweet. Hailail. - Grows well when natives don't. Brown Mistle?						
			V	Beaver Despoilers?						
East Quabbin Land Trust			V							
Beavers			V							
Run-off, washouts, wetlands			V							
Land Use / Chapter 61			V							
Watered by Quabbin			V							

Top Priority: Flooding, Drought, Severe Storms, Winter Storms, Extreme Cold

① Acquisition of flood plains. Attempts in process. But holding back other projects

② Culverts: 8 needed to fix. 3 distribution/drainage planning as related to flooding & public life. Volunteers @ Eagle Hill Students

③ Protect open land surrounding Gilb. border. Protect Property. Both Fire & Livestock

④ Community Building - Hard work connecting people. Broadband

⑤ Revamp CERT Team. 24 hr. Training?

⑥ Spray Park.

⑦ Wheelwright Pond Dam. Get listed as priority removal. When removed, what is plan that addresses vulnerability. Cooling Stations Recreation. Both W. R. Park & Dam area.

⑧ Gilbertville Municipal Parking Lot: Solar canopy for shade, lighting, power source for things like farmers market.

⑨ Church St. - No Place Bar Bldg. Removal to create open space. Bio Swales Etc.

⑩ CPA.

⑪ Plan how to make Gilbertville Climate Resilient; Plan with residents.

⑫ Independent Power Source (Solar & Battery) for at risk. Pilot Project.

⑬ Lower Rd./Rail Trail - Sidewalk/safe path connections. So, this connect piece of Rail Trail while providing safe path for Gilb. residents to Emergency shelter at School

POWER -

⑭ Regionalization of Tree Services, w shared Equip. Protect Loss of Power. Municipal Power. MLP. Look into establishing MLP.

⑮ Rolling Power. Big Battery on wheels

⑯ CPA. Conservation Restrictions

⑰ CPA approval.

⑱ And for Local Revenue, but ? OPEN DEBATE!

Town:

Y = Vulnerability S = Strength



TABLE # 2

www.CommunityResilienceBuilding.org

[illegible]

Community Resilience Building Risk Matrix

Town: **HARDWICK**

H-M-L priority for action over the Short or Long term (and Ongoing)

V = Vulnerability S = Strength



TABLE # 3

www.CommunityResilienceBuilding.org

H-M-L priority for action over the Short or Long term (and Ongoing)					Top Priority Hazards (floods, fires, hurricanes, earthquakes, drought, sea level rise, etc.)				Priority	Time
Features	Location	Ownership	V or S	Description	Flooding	Extreme Heat	Extreme Cold / Winter Storms	SEVERE STORMS		
Infrastructural										
Wheelwright Dam		Private	V/S	old, needs repair or removal, power						
Street Trees / no tree program		Town	V	Dead, all, large, fall in road						
Municipal Offices			V/S	flat roof, drains flood, roof spurgey						
Aquifer in Gilbertville			V/S	brown site						
Muddy Brook aquifer			S	Flood control for Ware River						
Barre Falls Dam			S	lose power → no water						
Drinking Water			V	don't have secure power						
Power / Electricity			V	Town so spread out						
Emergency Services			V	people came for water / showers						
Fire Station			V	rely on electricity too much						
Electric Balance			V	None						
Police Station			V	None						
Ambulance Bays			V	None						
Community Kitchen (survival kitchen)			V	None, where do ppl go for food when power out						
Bridges / Culverts			V	None						
Flooding (Main Street)			V	underutilized						
Mills			V	hazards, did ZIE hazard mitigation						
The Foundry		Private	V	Highway 1 Fire (S) nearby, Police in NB (V)						
Highway Department / Fire / Police		Town	V/S	department should be closer						
Page Building			V	No parking						
Butlers Garage			V	limited access						
Lost Airfields			V							
Societal										
Old Buildings			V/S	history, to preserve, sitting on aquifer						
Town divided in three sections			V/S	Not priority of state, small voice						
Small Town - limited political power			V	closest hospital, far away, in dead zone						
Athol Hospital			V	physical, communication						
Connectivity			V	None						
Public Transportation			V	determines where you go for services						
Border of political boundaries			V	cracks that people fall through						
No Bylaws to deal w/ development			V							
Rural Community			S							
Traffic Laws / Trapping Laws			V							
Rail Trail			S							
The Foundry			S/V	could restore, historic						
Salem's Mill			S	could use water power if restored						
Gilbertville			S	Restore to historic						
Abandoned Calvinist Church (CCC)	Next to Mimi's		S							
Town Commons			S/V	historic register						
code reg system			V	building is vulnerable & documents not protected						
presentation of town records			V	need to be an effective local gov.						
local government			V							
Environmental										
Lots of tree loss			V/S	older trees sequester more carbon						
Ash Borer			S	bitter sweet						
Invasives			S	balance - need to be prepared						
Wildfires			S	grow then burn						
loss of open land / agriculture			S	Harness for power						
Less Development			V/S	don't have ground solar, put on roof						
Solar / Wind projects			S	impacts environment, strong center						
Ware River			V/S	Quabbin, AP, open space						
Whitcomb Dam			S	Quabbin connecting out						
Solar / Hydrogen			V/S							
Barnyard (Thane Bridge)			S							
open land to AP			S							
limited growth			S							
Restricted Land			S							
Railroad			S							
Wildlife corridors			S							
paths in Hardwick center			S							
pred loss			S							
EEE			S							
Town Hall			S							

Top Priority Hazards (floods, fires, hurricanes, earthquakes, drought, sea level rise, etc.)

Flooding Extreme Heat Extreme Cold/Winter Storms SEVERE STORMS

Priority Time

In process of being reviewed / habitat restoration

regional/central curra E EMT card + student program

utilize river for power, have power center

centrally located EMS

Build sufficient shelters instead of more homes (Eagle Hill)

subdivision central land for green adverts + assessments

No storm drains.

Needs removal

Ruggles Rd. Building, Public Safety complex

Where to put compost? → food security, etc. during winter storms

town info sessions or social media

community transit grant

Redevelop the Mill, Reuse, Shops

need backup when no power

Better storage not in town building / digitize

drone study Stone wall preservation

EGLT gets grant funding, planning & prevention

landscape management / controlled burns

land protection + shared farm space

Floating turbine

update updating bylaw, integrating solar panels

Walking / biking tours (ecotourism)

Public education

incentives, attract farmers, protect ag land

TABLE 3: HARDWICK MVP

- ~~abundant~~ reservoirs on Dugle(?) Range → Gilbertville ^{*covers all aspects in MVP} supply potential
- Land has no protection → privately owned (Dougal Range) Spring St.
- Gilbertville get water from New Braintree ~~PA~~ (up to Rydal Hill)
- DPW → need a DPW, services under one roof
- Private Water Districts → Vulnerability
- Sewer → polluting Ware River
dumping human waste, failed sewage plants
overflows and dumps in River
millions in fines
Town owned, waiting on USDA funding in the works
- Access to Hardwick → no access from West → water
- National Grid → need for fiber optics/high speed internet
- Evacuation Routes → Route 32
Route 2
Route 9
- Highway Department → Should have fuel tank
- Cumberland Farms → only one gas station in Town (for prob closing soon)
- Access to Food → Vulnerability
- Shelter → no formal shelter in Town
(either in Barre or the elementary school)
(Turn elementary school into formal shelter)
- Lack of local manufacturing/
Bedroom community
- Planning → development not fully formed
→ want to be smarter about landscape development
- Not a lot of people coming into town V/S
→ no + many subdivisions
- Tourism potential → historic, recreation, farming
Eco Tourism (walking/biking trails)
to go to visit

Cumberland
needs to
have a
generator

- Rail Trails, bird watching, hiking
- Want to keep as recreational, environmental areas
- Don't have local industry
- Want a rural community - don't want development
- Have hubs of population
- Equidistant between the Pike and Rt. 2
- Lack of access to healthcare
 - ↳ Save Mary Lane
- Tick-borne / Mosquito-borne disease
 - Lyme, EEE
 - ↳ has not sprayed in past
 - ↳ impacts to human health, soil, agriculture
- Fiber optics
Cell Service → vulnerability, everyone wants fast internet
- Bat population → white nose syndrome, pop. decline
- Cemeteries → Full of Fermeldshelz
- Redefine region - border of CMRPC / PVPC
- Not CPA Town (try again-edu. campaign)
- ~~Web~~ Website → not great
- Public Education / Preparedness
 - ↳ add education resources to website
- The Grange → resources
- Lack of activism → no activists
 - ↳ Funding for welcome booklet
- Community Health Survey → project idea

YOU ARE INVITED TO ATTEND THE:

Town of Hardwick

MUNICIPAL VULNERABILITY PREPAREDNESS



PUBLIC LISTENING SESSION

Where:

Municipal Offices
307 Main Street

When:

Tuesday, May 24, 2022
5:30 - 6:30 PM

The Municipal Vulnerability Preparedness (MVP) Core Team will be holding a Public Listening Session on Tuesday, May 24th from 5:30 - 6:30 PM at the Municipal Offices (307 Main Street). Learn more and provide comments regarding Hardwick's outcomes from the recently held Community Resilience Building Workshop.

MVP provides support for communities to begin the process of planning for climate resilience and prioritizing adaptation and hazard mitigation actions. Communities that complete the MVP certification program are eligible for Action Grant funding and other opportunities. For more information, please contact the Central Massachusetts Regional Planning Commission at dmarini@cmrpc.org.



MUNICIPAL VULNERABILITY PREPAREDNESS (MVP) PROGRAM

Public Listening Session

Hardwick, MA

May 24, 2022

5:30 - 6:30 PM



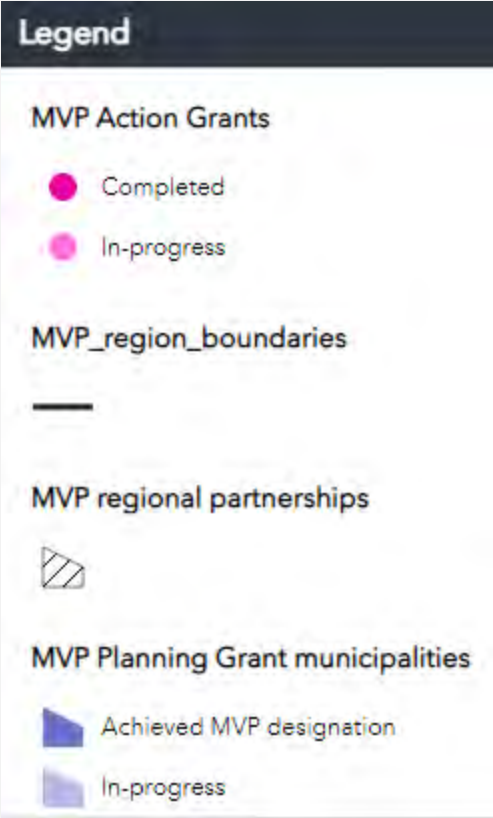
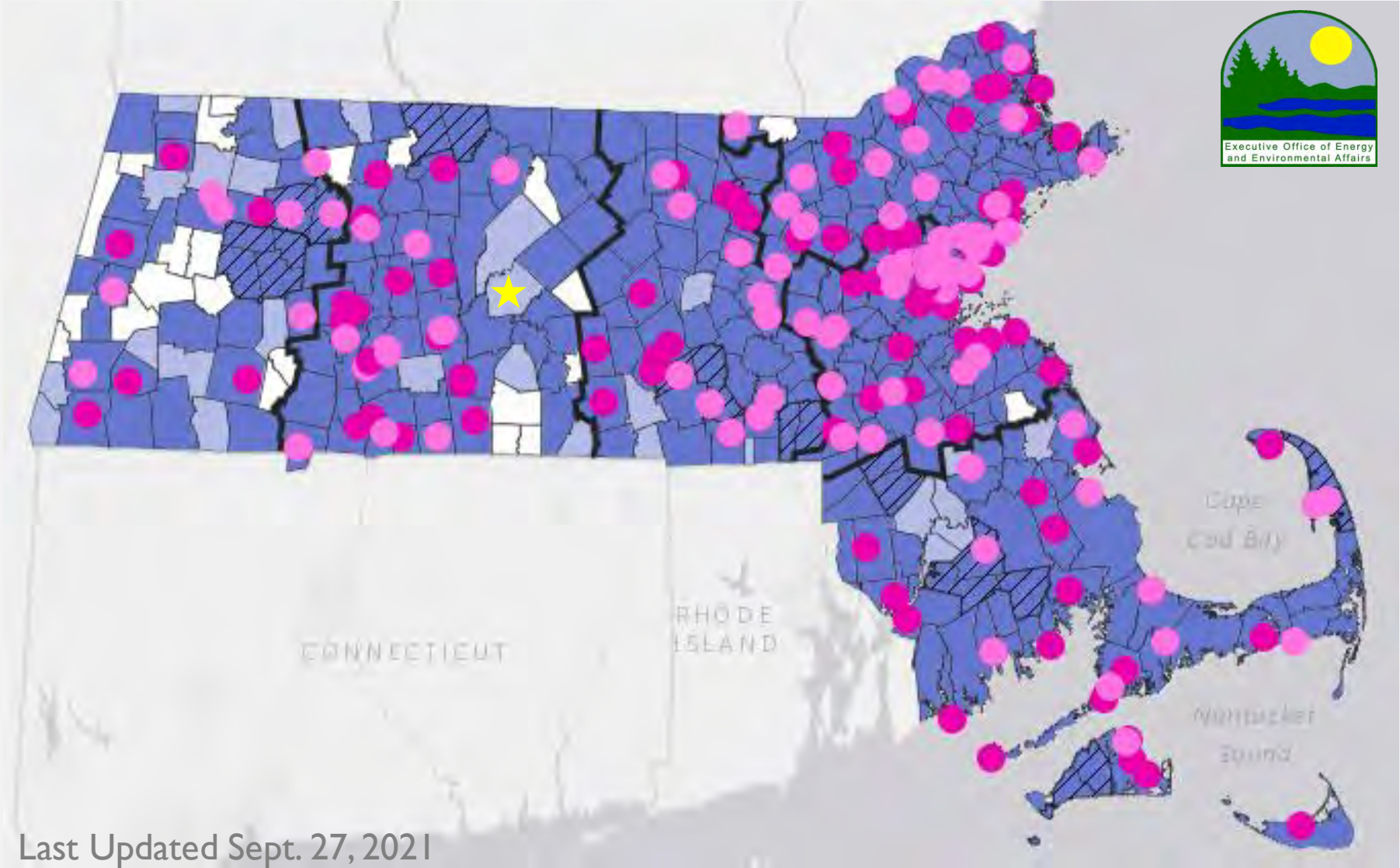
MUNICIPAL VULNERABILITY PREPAREDNESS (MVP)

- 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) Grant Programs

Planning Grants and Action Grants

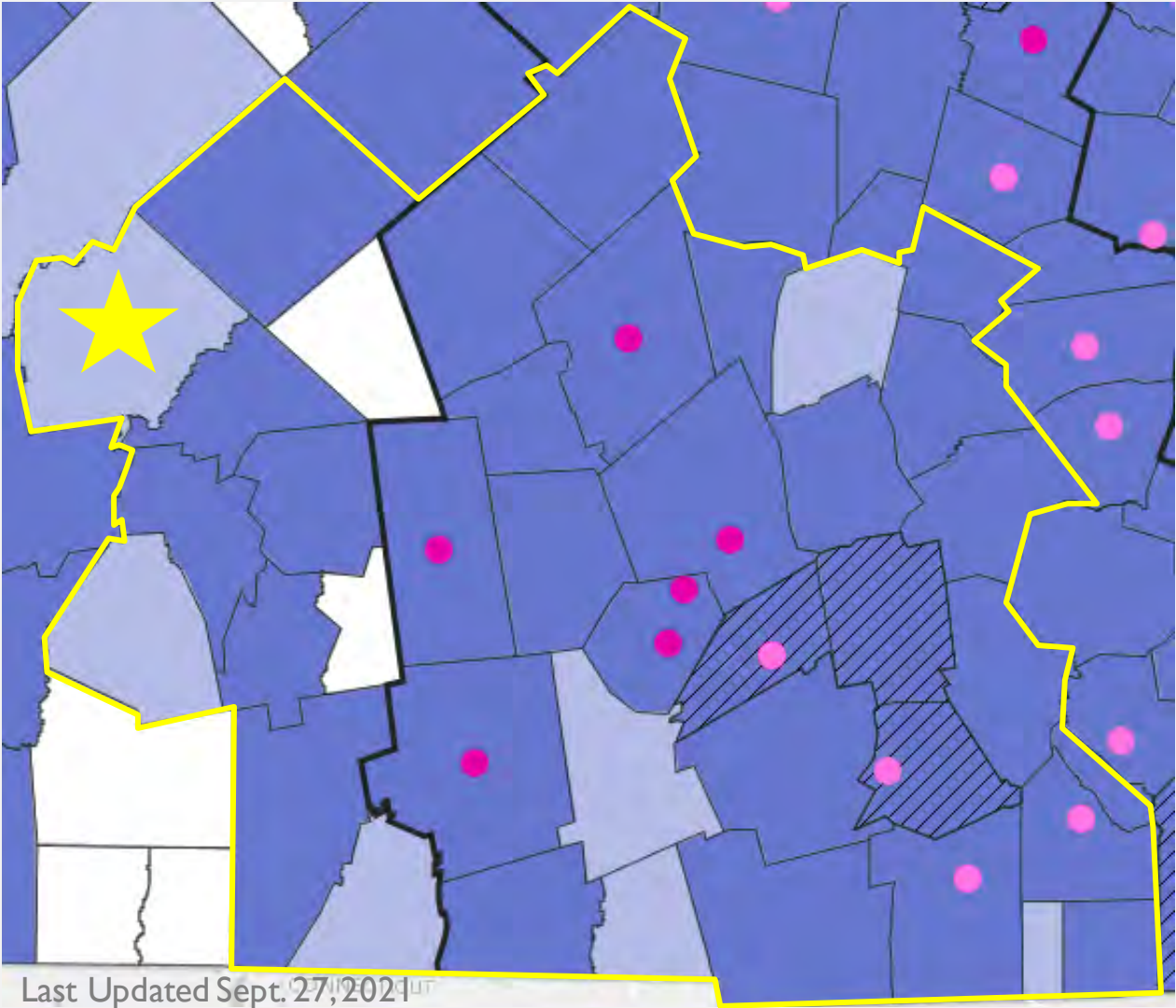


Last Updated Sept. 27, 2021

Source: Massachusetts Executive Office of Energy and Environmental Affairs beta Climate Grant Viewer

Municipal Vulnerability Preparedness (MVP) Grant Programs

Central Massachusetts Planning Grants and Action Grants



MVP Program Manager for Greater Connecticut River Valley:

Andrew Smith
(617) 655-3874
andrew.b.smith@mass.gov



COMMUNITY RESILIENCE BUILDING (CRB) PROCESS

- Community-driven process led by the project coordinators (Nicole Parker and Eric Vollheim) and Core Team members
- Hardwick's 7-member Core Team met 5 times in January, February, and March
- Invitation-only workshop was held in-person on March 24th and March 31st
- 30 attendees, including local officials, board and committee members, business, schools and non-profit groups
- Listening session (today) is open to the public



CRB 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

STEP ONE: IDENTIFY TOP 4 HAZARDS

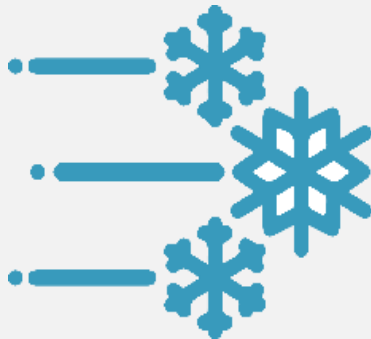
DROUGHT/EXTREME HEAT
(WILDFIRES & INVASIVES)



FLOODING
(INLAND & COASTAL)



WINTER STORMS/EXTREME COLD
(SNOW & ICE)

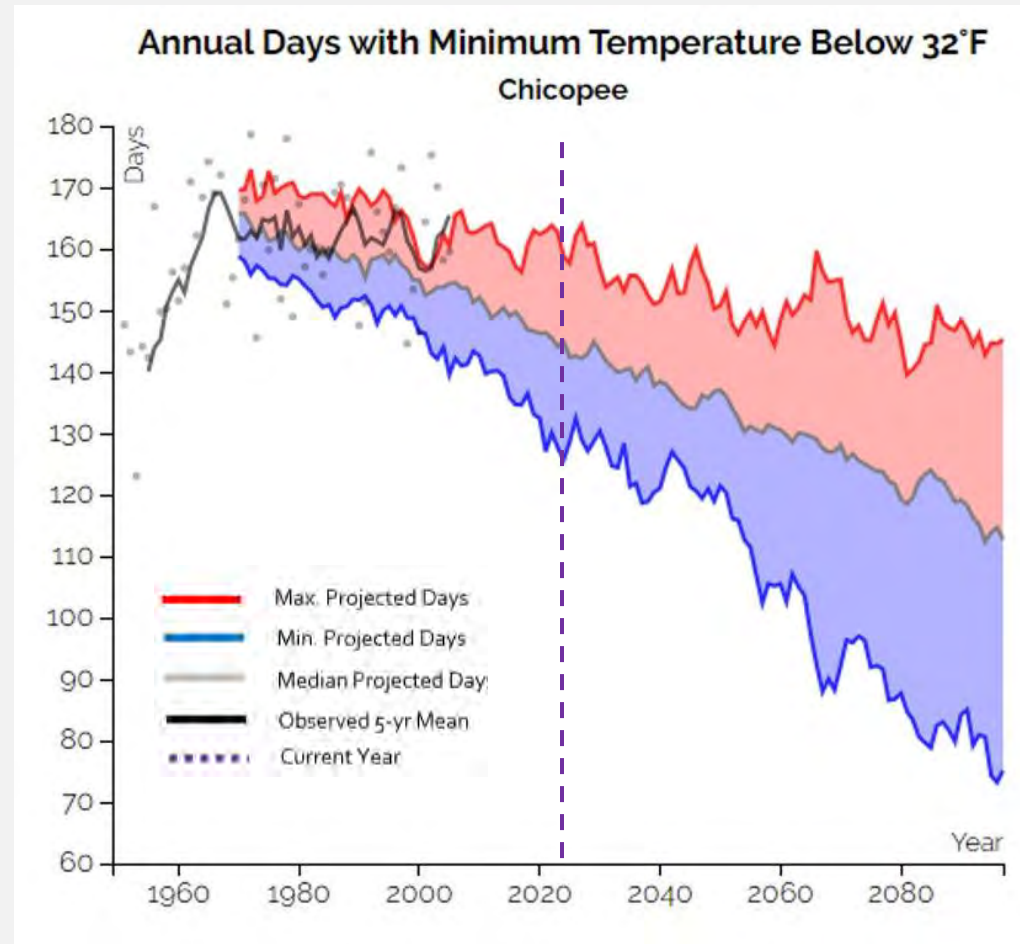


SEVERE STORMS
(WIND & TORNADO)



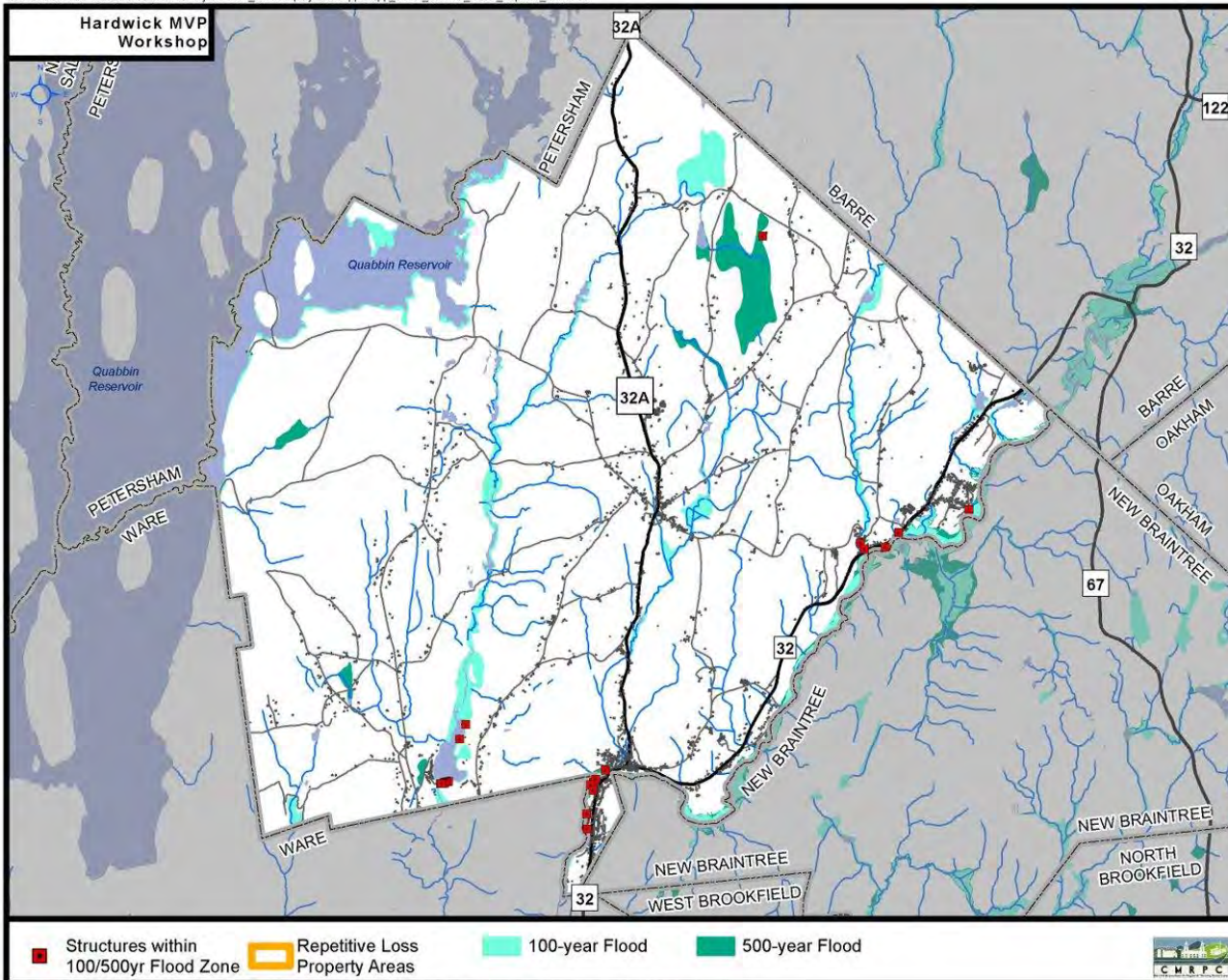
WINTER STORMS

- 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

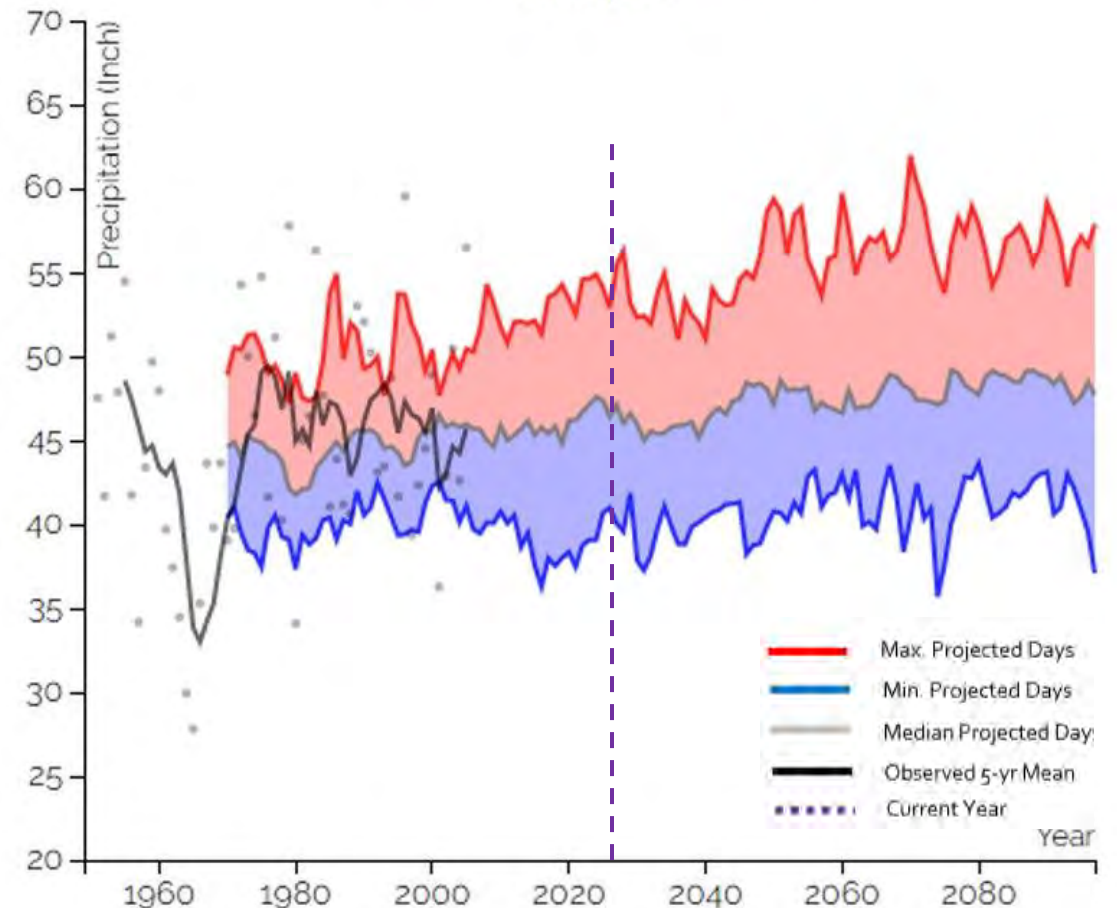


HEAVY RAINFALL AND FLOODING IMPACTS

Date: 2/18/2022 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp\mvpp_slides_NatHaz_Flood_Impacts_8x10.mxd

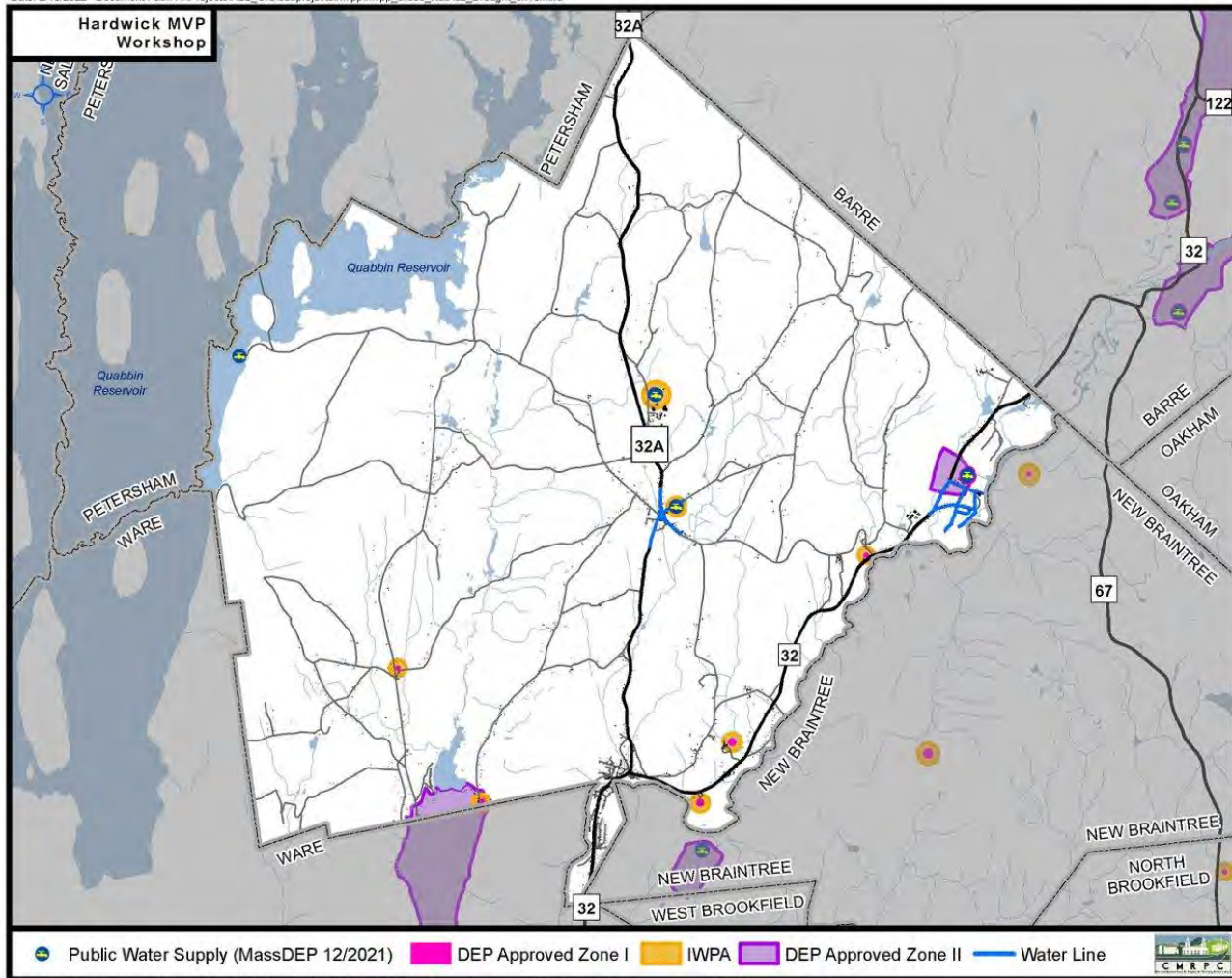


Annual Total Precipitation Chicopee



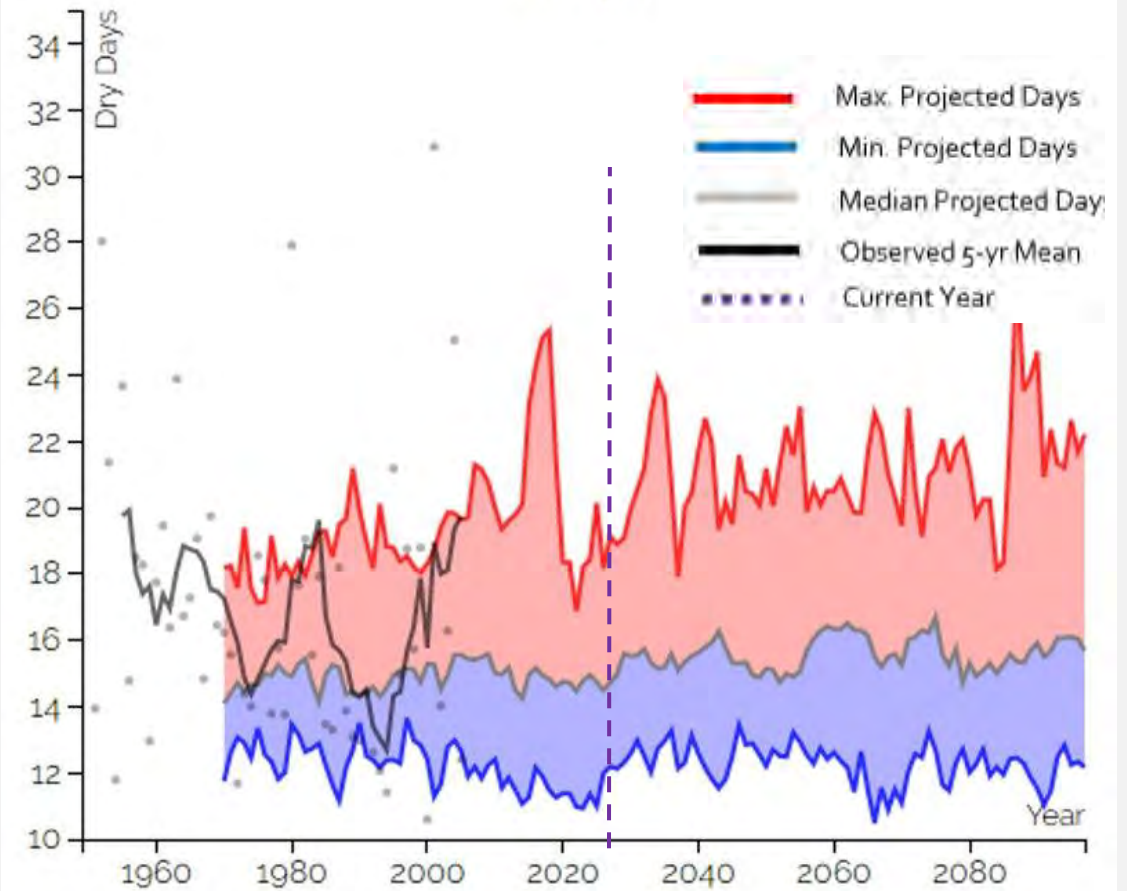
DROUGHT IMPACTS

Date: 2/18/2022 Document Path: H:\Projects\HLS_GIS\subprojects\mvp\mvp_slides_NatHaz_Drought_6x10.mxd



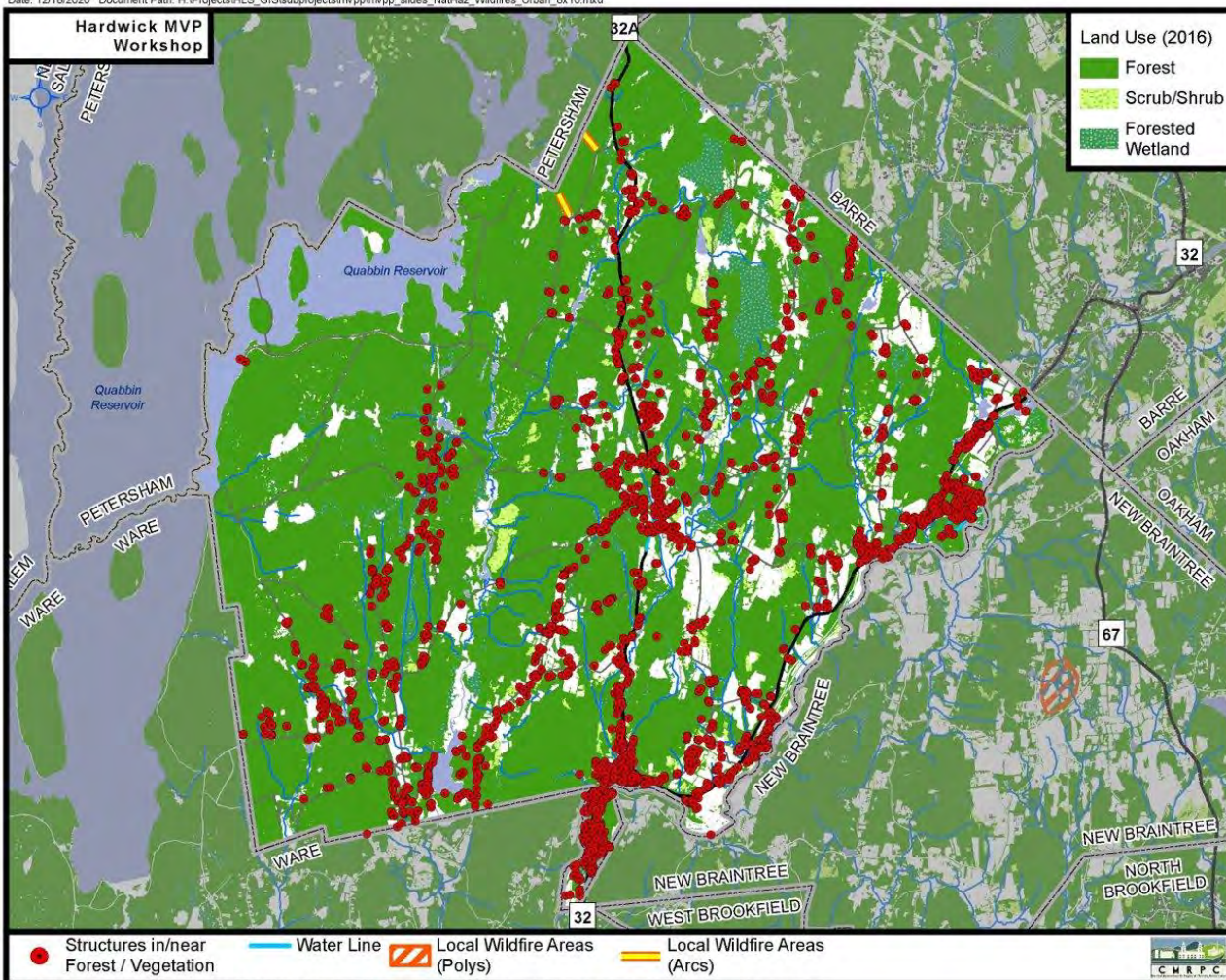
Annual Consecutive Dry Days

Chicopee



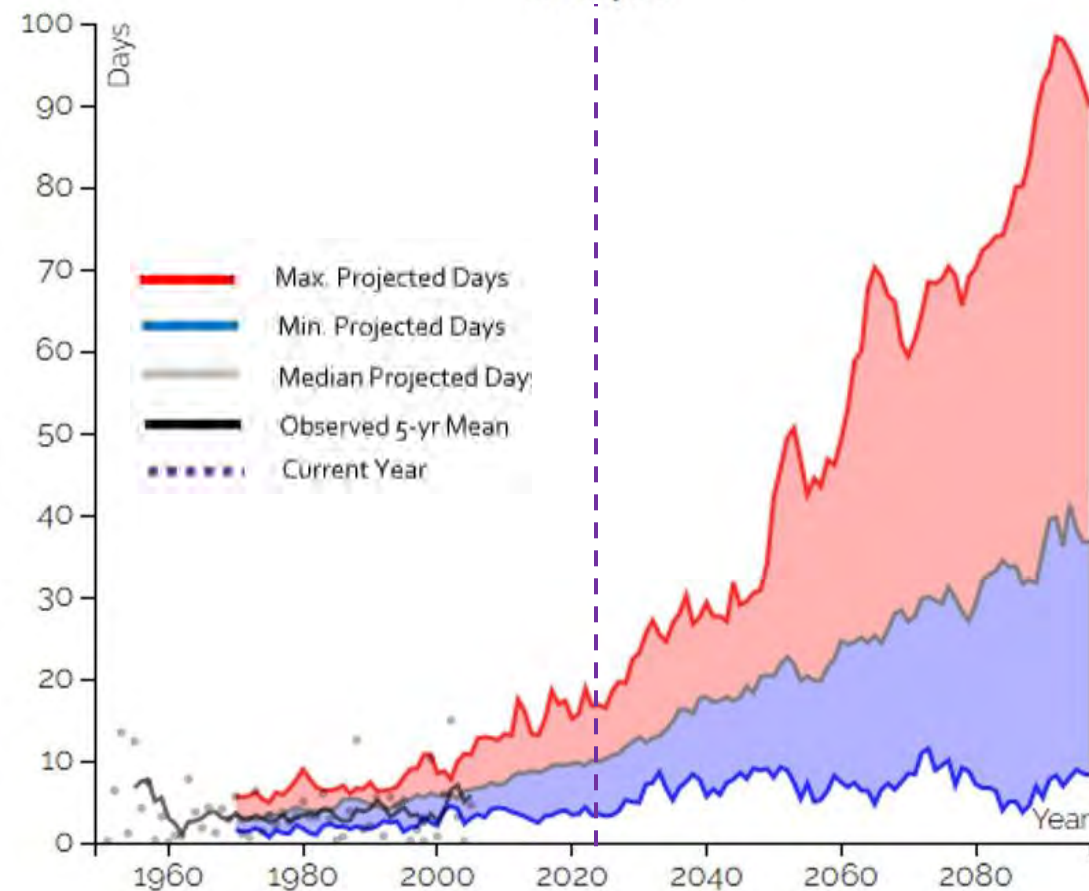
HEAT IMPACTS

Date: 12/18/2020 Document Path: H:\Projects\HLS_GIS\Subprojects\mvp\mvp_slides_Nat-Haz_Wildfires_Urban_8x10.mxd

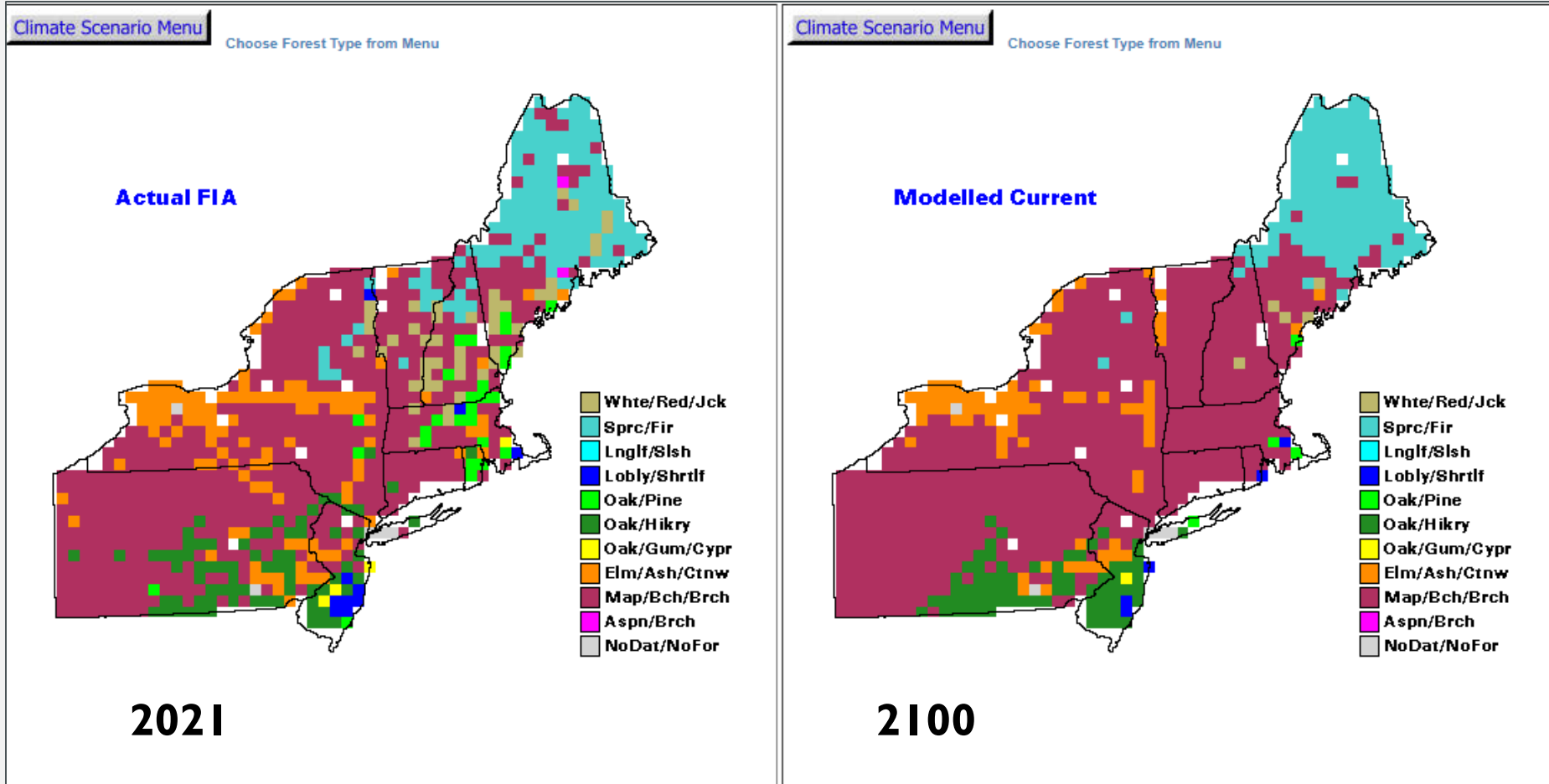


Annual Days with Maximum Temperature Above 90°F

Chicopee



HEAT IMPACTS ON THE ENVIRONMENT



- Species expected to move north
- Diversity of species will likely decrease
- Likely increase in invasive species

PRIMARY TOPIC AREAS



- Infrastructure



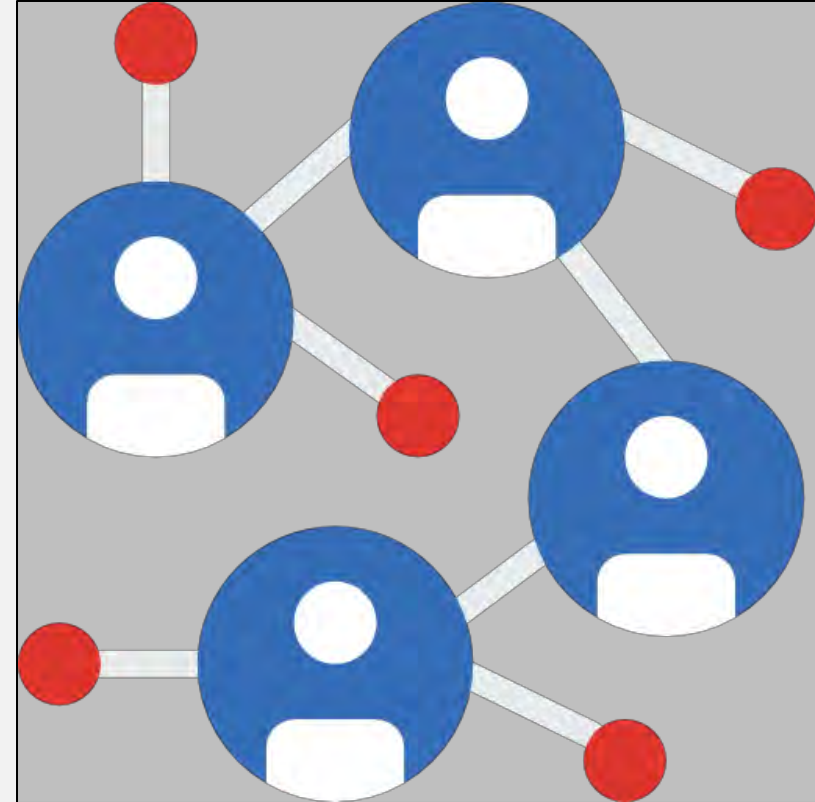
- Society



- Environment

BREAKOUT GROUPS

- 3 Breakout groups of 10 individuals
- 4 Focus Hazards
- 3 Focus Sections
- Tools and Resources
 - Matrix, Maps, HMP & Each Other




Icon made Prettyicons from Flaticon.com

THE MATRIX

Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.com					
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, drought, sea level rise, heat wave, etc.)					
Features	Location	Ownership	V or S					Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Societal									
Environmental									

STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES


Community Resilience Building Risk Matrix  www.CommunityResilienceBuilding.com

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, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Top 4 Hazards	Priority	Time
Infrastructural						
Societal						
Environmental						

STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

Community Resilience Building Risk Matrix  www.CommunityResilienceBuilding.com

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, drought, sea level rise, heat wave, etc.)

Features				Top 4 Hazards				Priority	Time
Location	Ownership	V or S					H-M-L	Short Long Ongoing	
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									
Wetlands									


STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES



Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.com					
H-M-L priority for action over the Short or Long term (e.g.)				Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)					
V = Vulnerability S = Strength				Top 4 Hazards				Priority	Time
Features	Location	Ownership	V or S					H-M-L	Short Long Duration
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									
Wetlands									

Estimated Location

STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

Community Resilience Building Risk Matrix  www.CommunityResilienceBuilding.com

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, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Top 4 Hazards				Priority	Time
								H-M-L	Short Long Ongoing
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									
Wetlands									

Public? Private? State?

Estimated Location

STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

Community Resilience Building Risk Matrix  www.CommunityResilienceBuilding.com

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

Features	Location	Ownership	V or S	Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)				Priority	Time
				Top 4 Hazards				H-M-L	Short Long Ongoing
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									
Wetlands									


Vulnerability or Strength

Public? Private? State?

Estimated Location



STEP THREE: ACTIONS, PRIORITY AND TIMELINE

Community Resilience Building Risk Matrix  www.CommunityResilienceBuilding.com

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

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

Top 4 Hazards

Priority Time

H-M-L Short Long Ongoing

Features Location Ownership V or S

Infrastructure

Societal

Environmental

Completed

Nature Based Solutions

TABLE SUMMARIES

[illegible]

TABLE #3		City of Everett - Community Development Department	
Description	Priority	Timeline	Status
<p>remained, power out, fall in road of, diesel fumes, fuel</p> <p>War River water ware power out water/shower city too much</p> <p>go for fuel when power out</p> <p>leaked mitigation water, pipe in NB (V)</p>	<p>Flooding Extreme Heat</p> <p>Extreme Cold/ WINTER STORMS</p> <p>SEVERE STORMS</p>	<p>Priority</p> <p>High</p>	<p>Not Done</p>
<p>need backup when no power better storage not in normal building/dump</p> <p>water more carbon</p>	<p>need backup when no power better storage not in normal building/dump</p>	<p>Priority</p> <p>High</p>	<p>Not Done</p>
<p>historic power of restored area</p> <p>need backup when no power better storage not in normal building/dump</p>	<p>need backup when no power better storage not in normal building/dump</p>	<p>Priority</p> <p>High</p>	<p>Not Done</p>
<p>water more carbon</p>	<p>water more carbon</p>	<p>Priority</p> <p>High</p>	<p>Not Done</p>

GROUP VOTE



WHAT DID THE GROUP FIND?

INFRASTRUCTURE CONCERNS



Culverts



Water and Sewer



Facilities and
Historic Structures

INFRASTRUCTURE STRENGTHS



Stormwater
Management



Town Facilities



Rural Character

INFRASTRUCTURE ACTIONS

HIGH PRIORITY



Upgrade the senior center to function as a shelter in times of need by installing a community kitchen, improving generator, and establishing it as a heating and cooling center. Utilize the center for educational opportunities.



Investigate the ownership of Wheelwright Dam and prioritize removal. Once the dam is removed, restore the area for recreation and swimming opportunities.



Perform a Town-wide culvert inventory and assessment.

SOCIETAL CONCERNS



Emergency Services



Communication
Systems



Lack of Industry

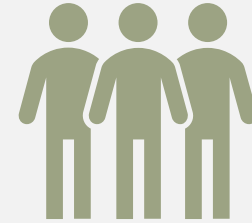
SOCIETAL STRENGTHS



Emergency
Personnel



Local Organizations
& Groups



Sense of
Community

SOCIETAL ACTIONS

HIGH PRIORITY



Identify and apply for funding to construct a Police Station in Hardwick.

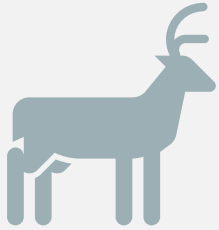


Establish a Town Planner and/or Grant Writer staff position.



Adopt the Community Preservation Act. Develop an education campaign to help with adoption by promoting the benefits of the CPA program.

ENVIRONMENTAL CONCERNS



Nuisance Species

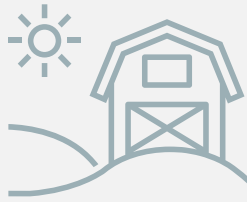


Invasive Species



Forestry

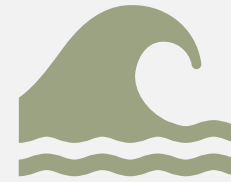
ENVIRONMENTAL STRENGTHS



Agriculture



Recreation
Opportunity



Water Resources

ENVIRONMENTAL ACTIONS

HIGH PRIORITY



Fortify the agricultural economy in Hardwick by: 1) prioritizing agricultural land for preservation, 2) utilizing regional marketing program for local farms, 3) identifying and acquiring land for a shared/leased farm space, and 4) establishing a regional agricultural climate action plan.



Establish a tree inventory and assessment program, prioritizing trees for removal. Partner with surrounding communities to establish a regional tree management program with shared equipment and funding.



Continue to support and work with the East Quabbin Land Trust on local projects including beaver management, invasive species removal, and land protection.

NEXT STEPS FOR HARDWICK



Finalize draft report with assistance from CMRPC



Final report submitted to EEA by June 30, 2022



Hardwick receives “MVP Community” certification



Annual reporting by Core Team



Develop and apply for MVP Action Grants

ACTION GRANTS

Action Grants were launched this Spring

Up to \$3 million for an individual community

Up to \$5 million for regional projects

One year grant cycle (typically) July 1st- June 30th

25% Match - Cash or In-kind (Non-State Funds)

www.mass.gov/municipal-vulnerability-preparedness-mvp-program

<https://resilientma.org/mvp/>



Questions and Comments?

CONTACT

Dani Marini, dmarini@cmrpc.org

Environmental Planner

Central Massachusetts Regional Planning Commission



Thank you!





Meeting Name: MVP Listening Session

Community: Hardwick

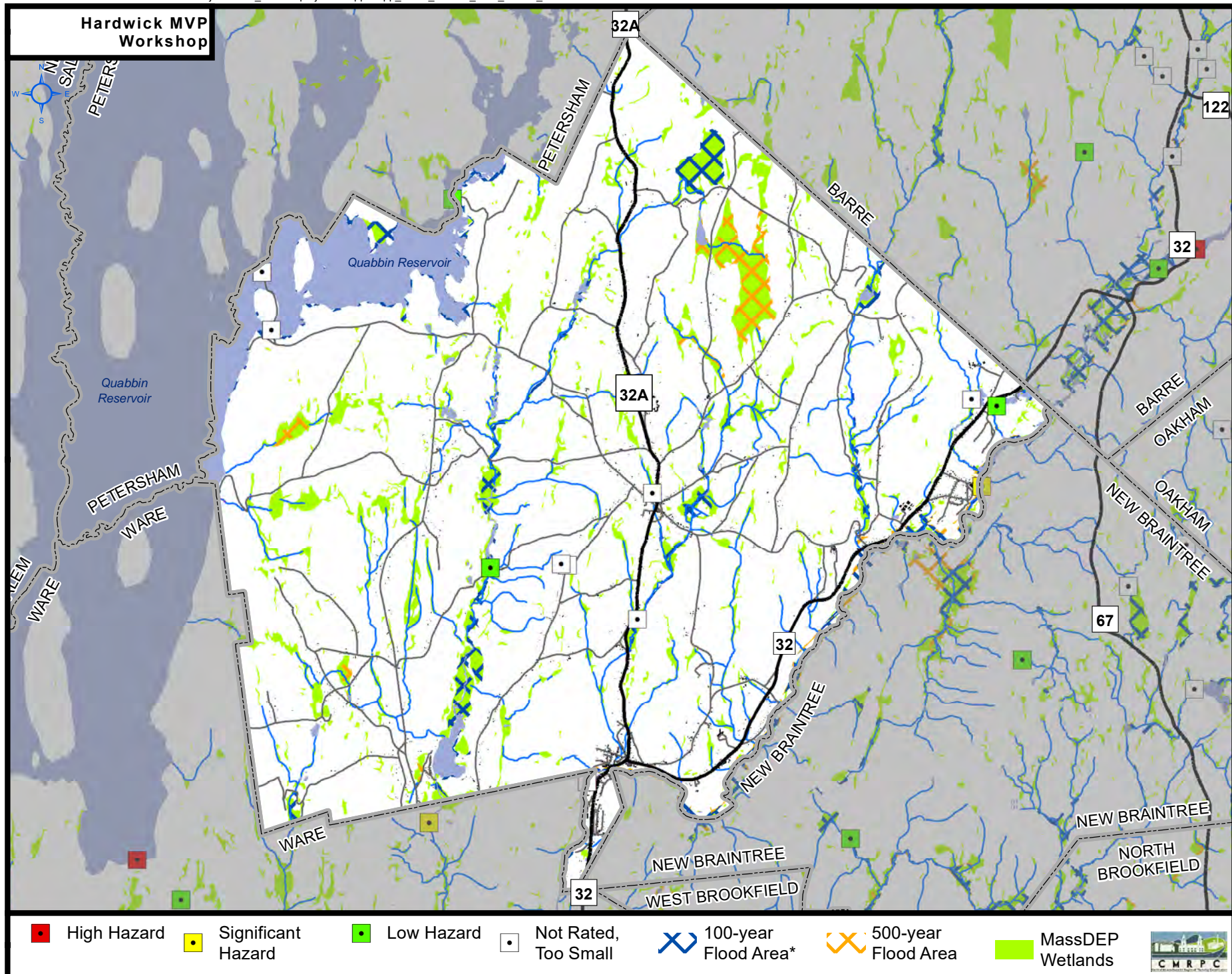
Location: Municipal Offices

Date: May 24, 2022

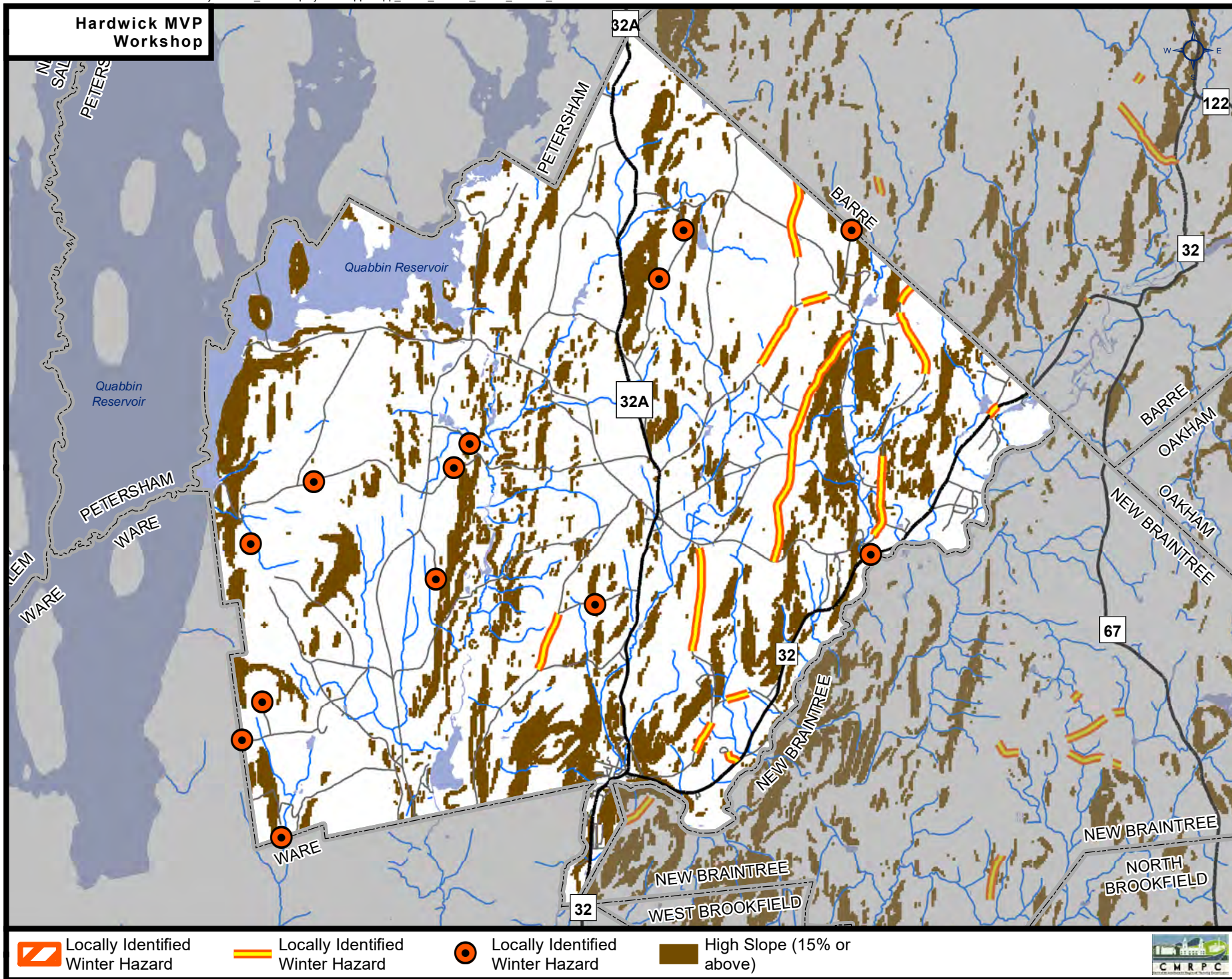
Meeting Time: 5:30

Participant Name	Organization	Title	E-Mail
DANI MARINI	CMRPC	PLANNER	DMARINI@CMRPC.ORG
Nicole Parker	Town of Hardwick	Town Administrator	admin@townofhardwick.com
Marlo Stein	Round Table Farm	Owner	howdy@roundtablefarm
Peter Benoit			
ERIC VOLLHEIM	HDWK EMD/PIS	CHAIRSMAN	STONEDANCE@COMCAST.NET
HARRY T COMERFORD	HDWK / PB		
Lucinda Childs	Planning Board	clerk	L.J. Childs@comcast.net
Jenna Garver	Planning Board		JennaGarver@comcast.net
Anne M. Barnes	Town House Advisory		grammich40@yahoo.com

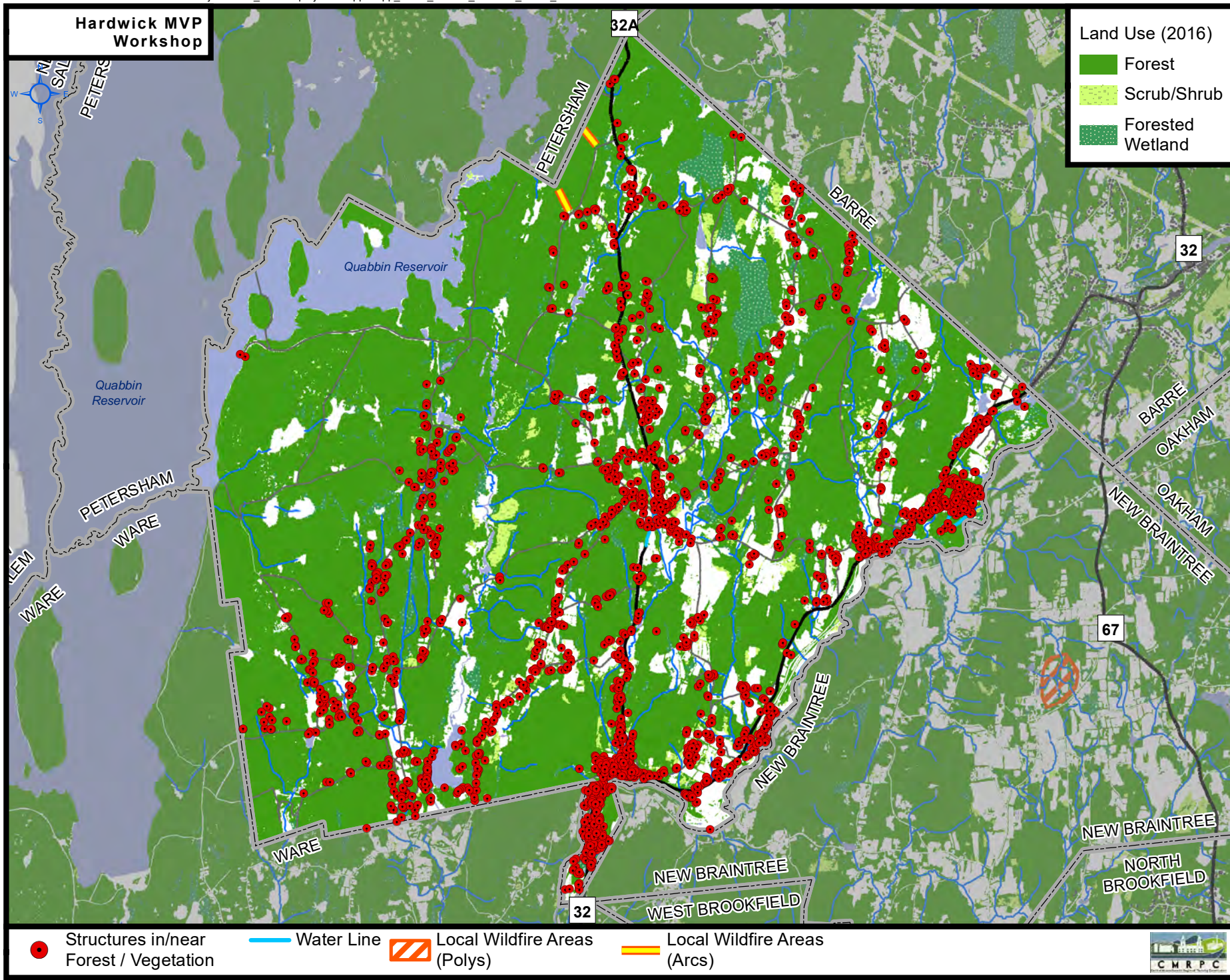
Hardwick MVP Workshop



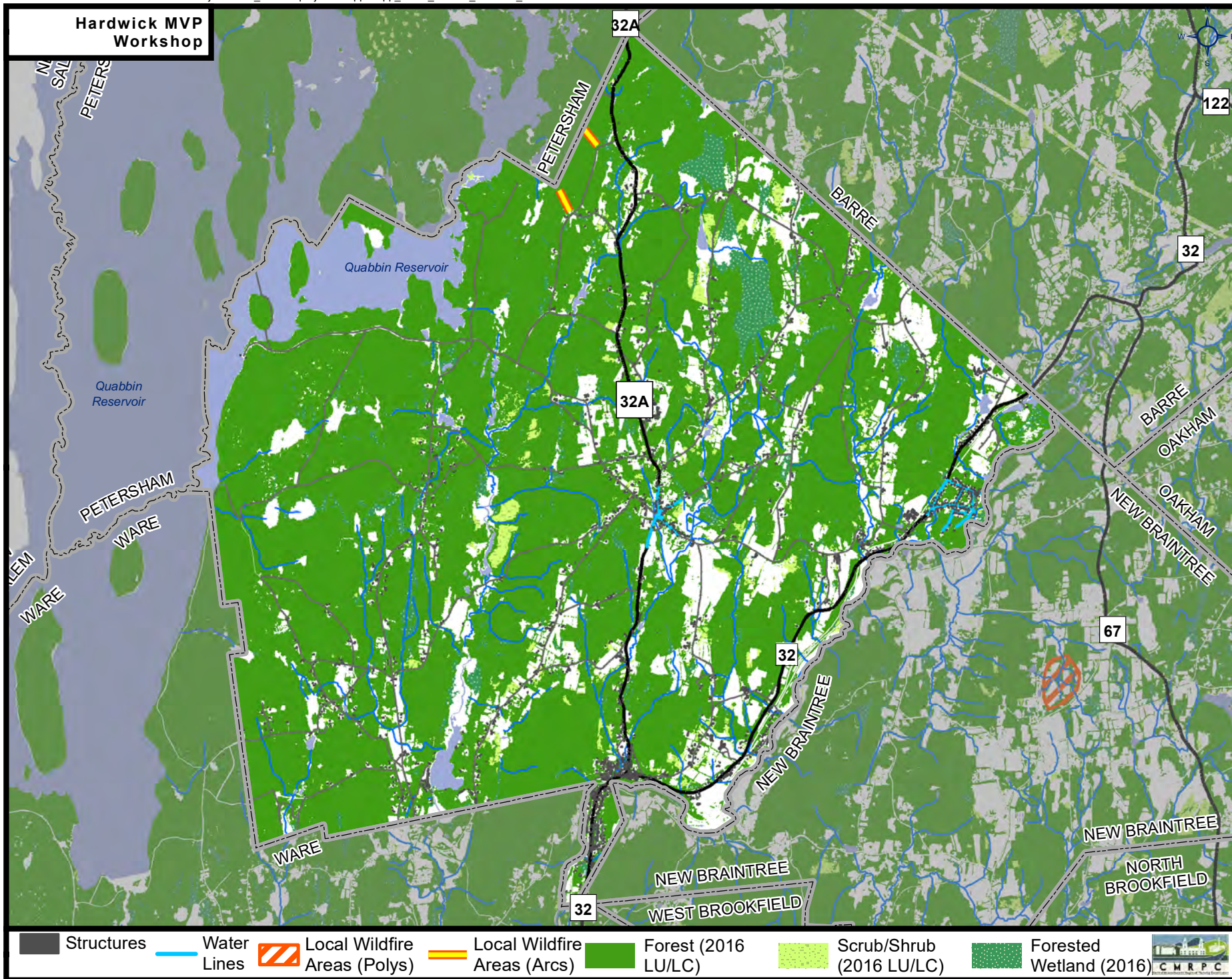
Hardwick MVP Workshop



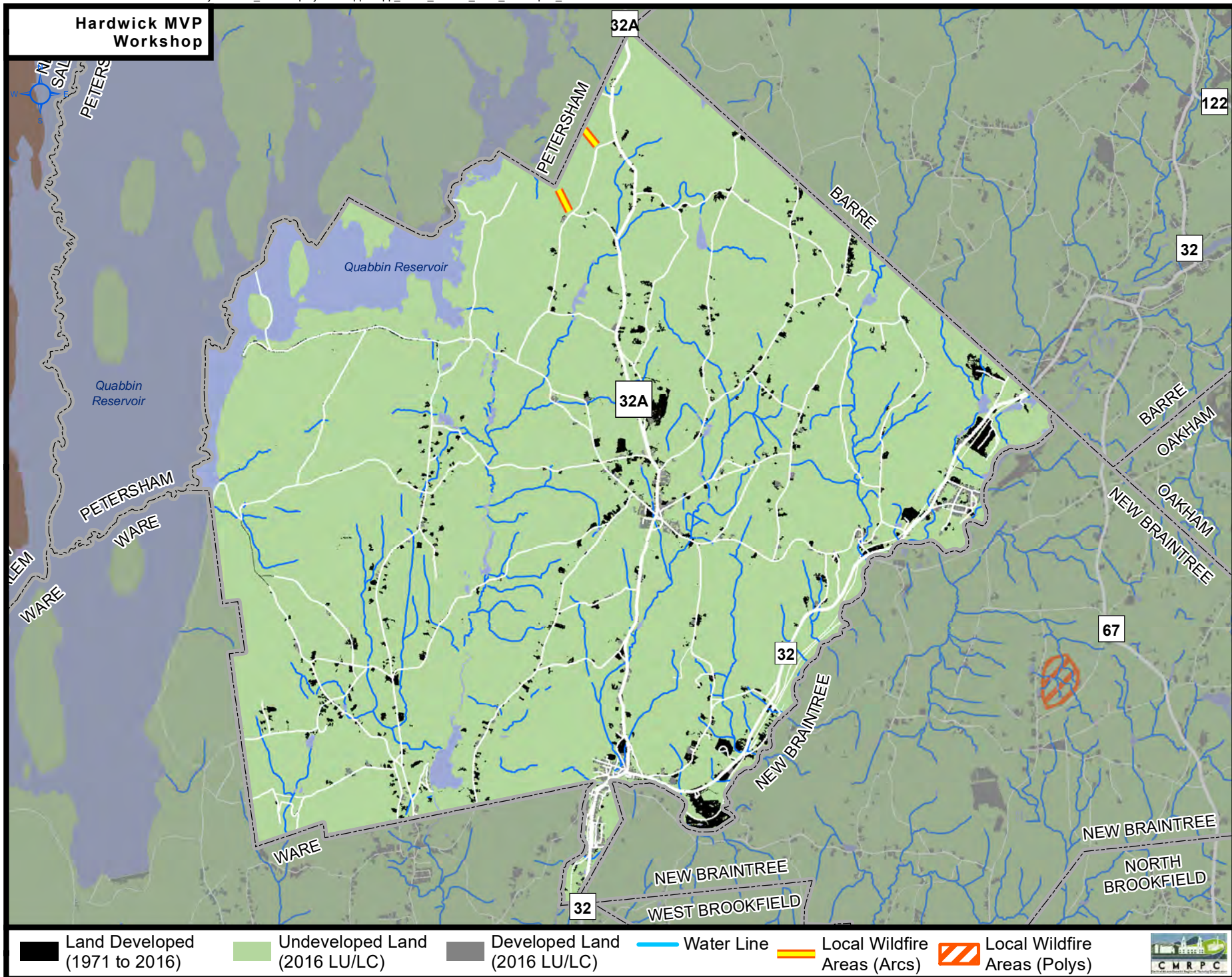
Hardwick MVP Workshop



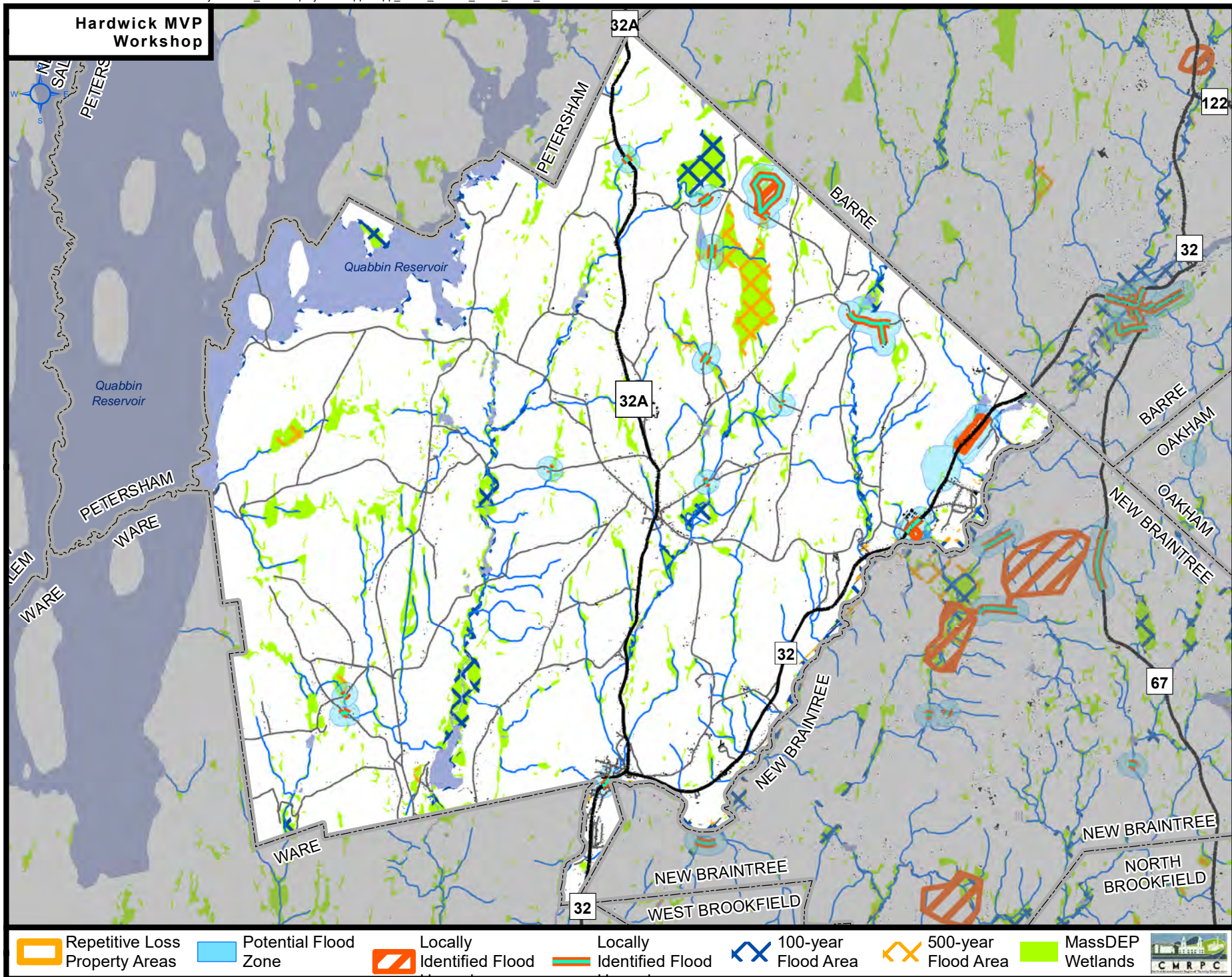
Hardwick MVP Workshop



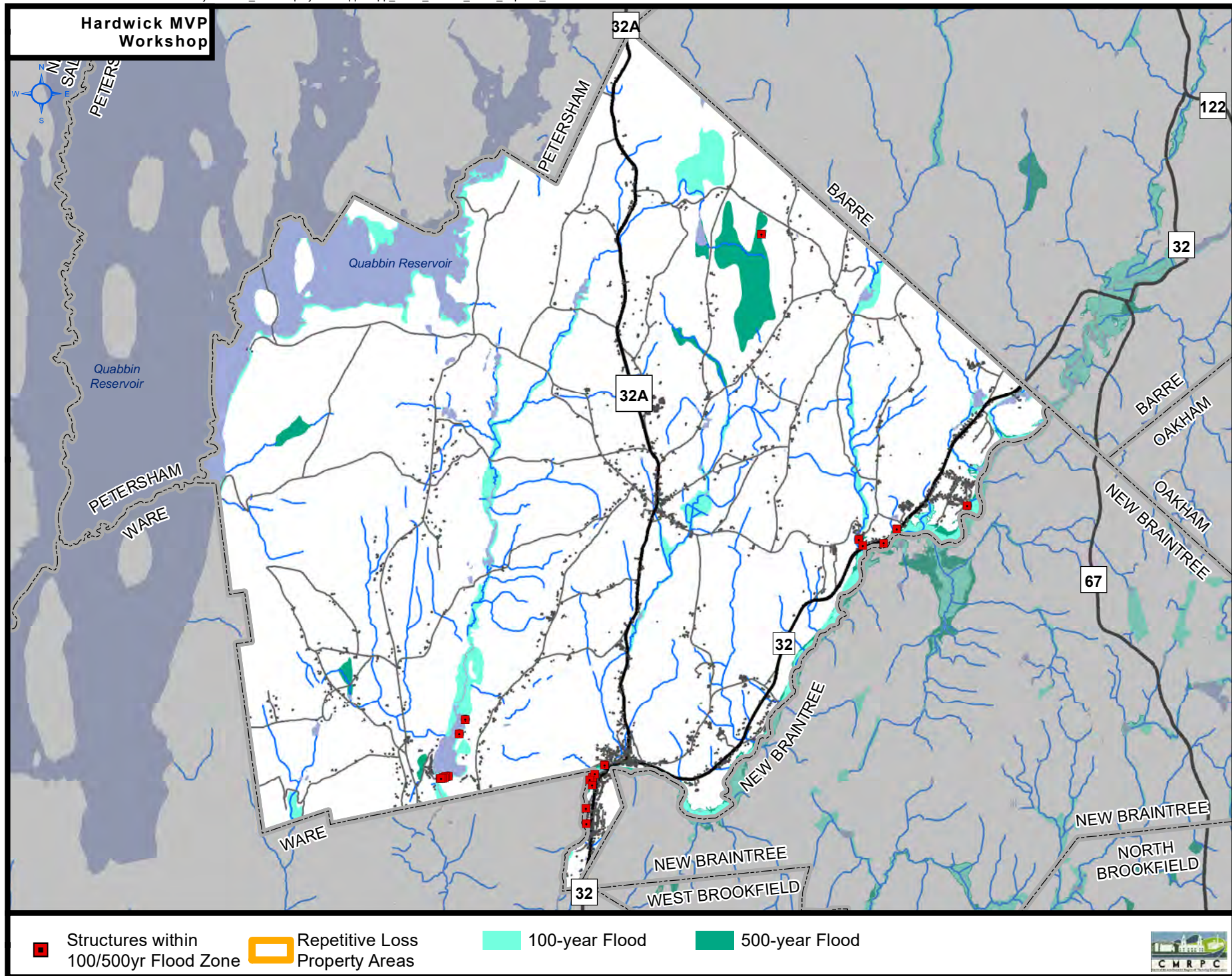
Hardwick MVP Workshop



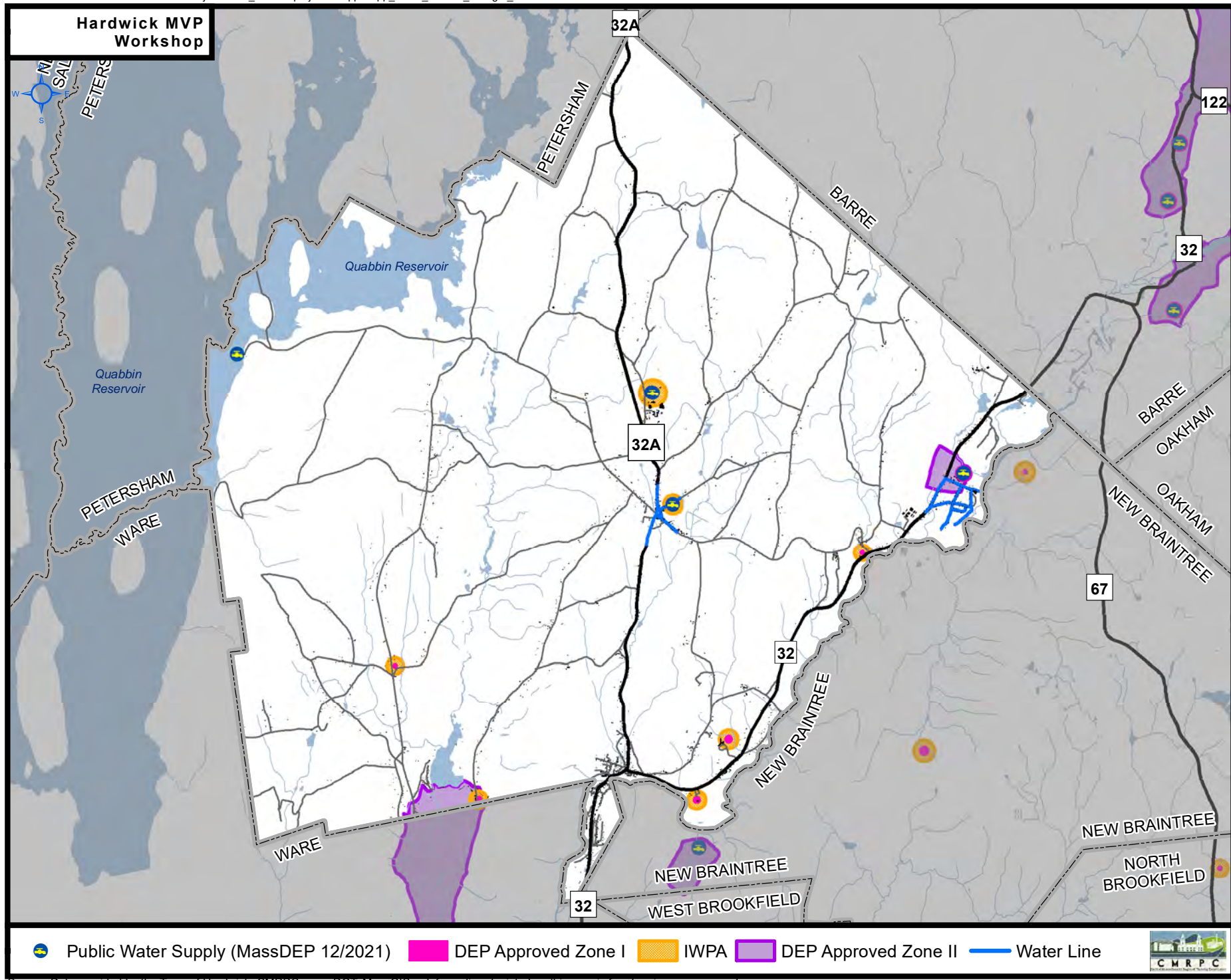
Hardwick MVP Workshop



Hardwick MVP Workshop

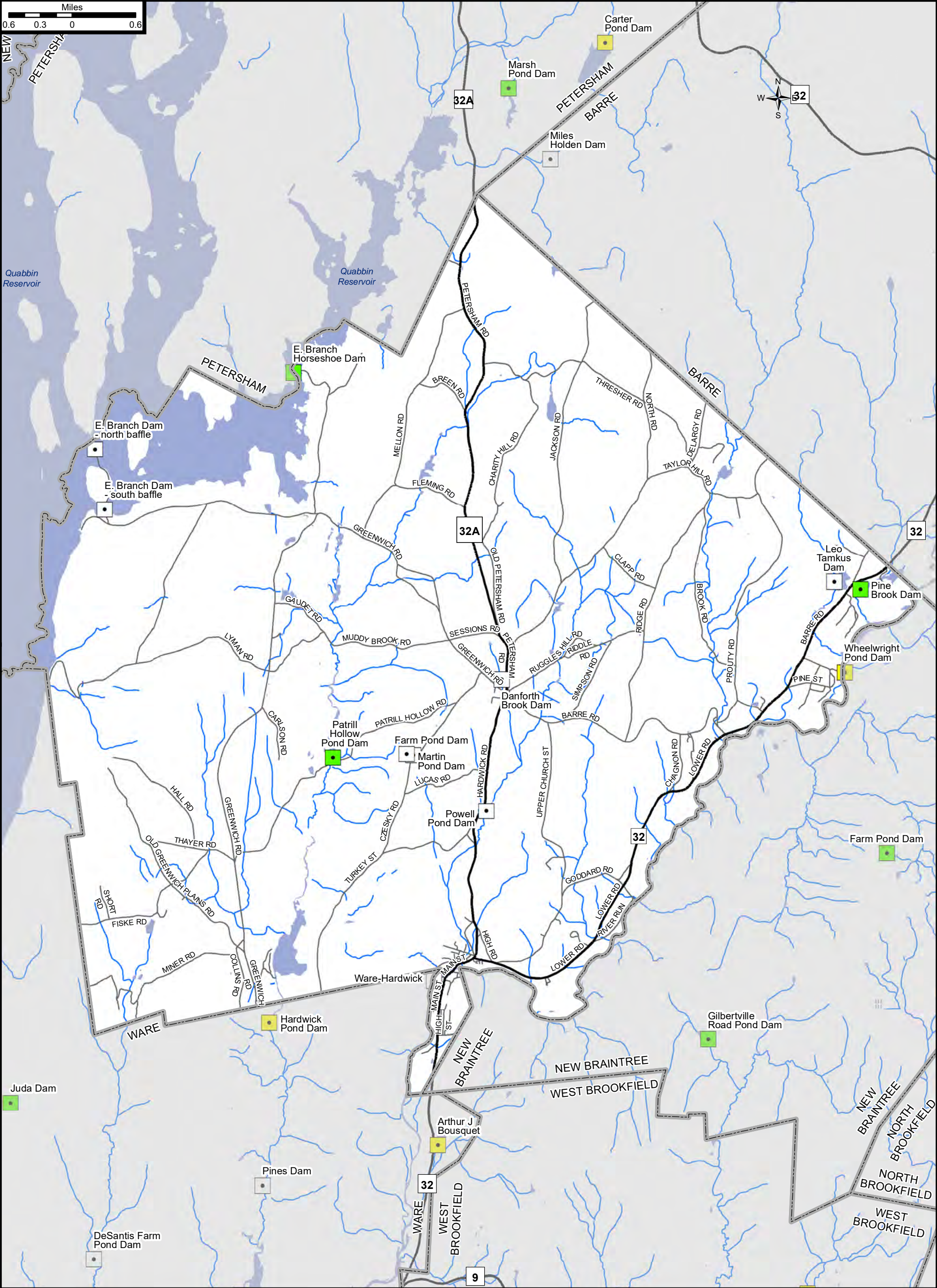
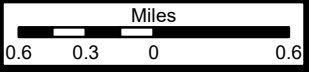


Hardwick MVP Workshop



Reference Map: Dams (2012)

Town of Hardwick, 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 Hardwick, CMRPC, massDOT, MassGIS.

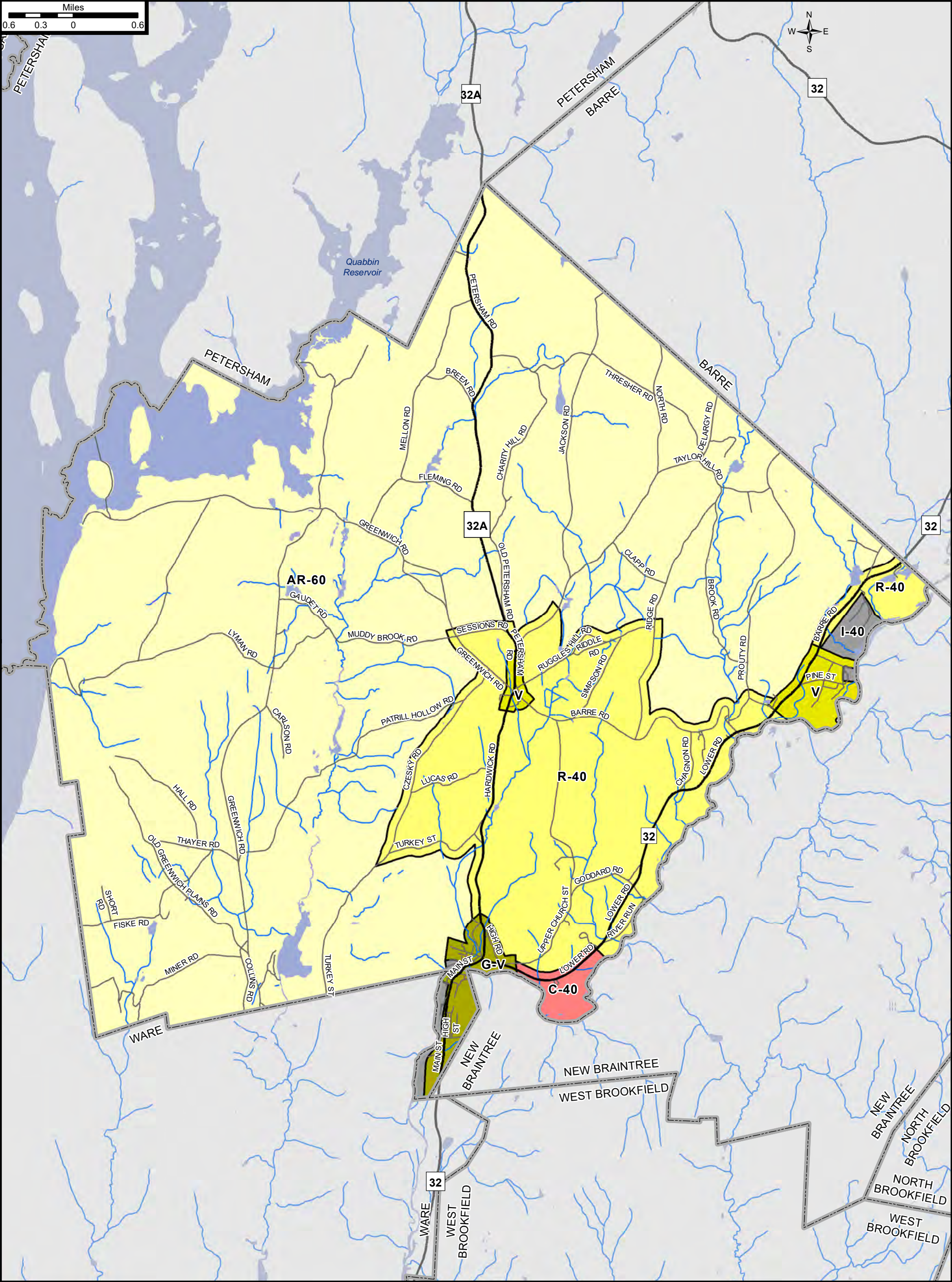
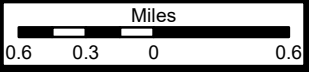
Information depicted on this map is for planning purposes only. This information is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analysis. Use caution interpreting positional accuracy. One Mercantile Street, Suite 520 - Worcester, MA 01608

Central Massachusetts Regional Planning Council

Municipal Vulnerability Preparedness (MVP) Workshop

Reference Map: Zoning

Town of Hardwick, Massachusetts



Zoning Districts

- | | |
|----------------------------------|--------------------------------|
| Agricultural Residential (AR-60) | Gilbertville Village (G-V) |
| Neighborhood Residential (R-40) | Industrial (I-40) |
| Village Residential (V) | Commercial, Residential (C-40) |

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

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.

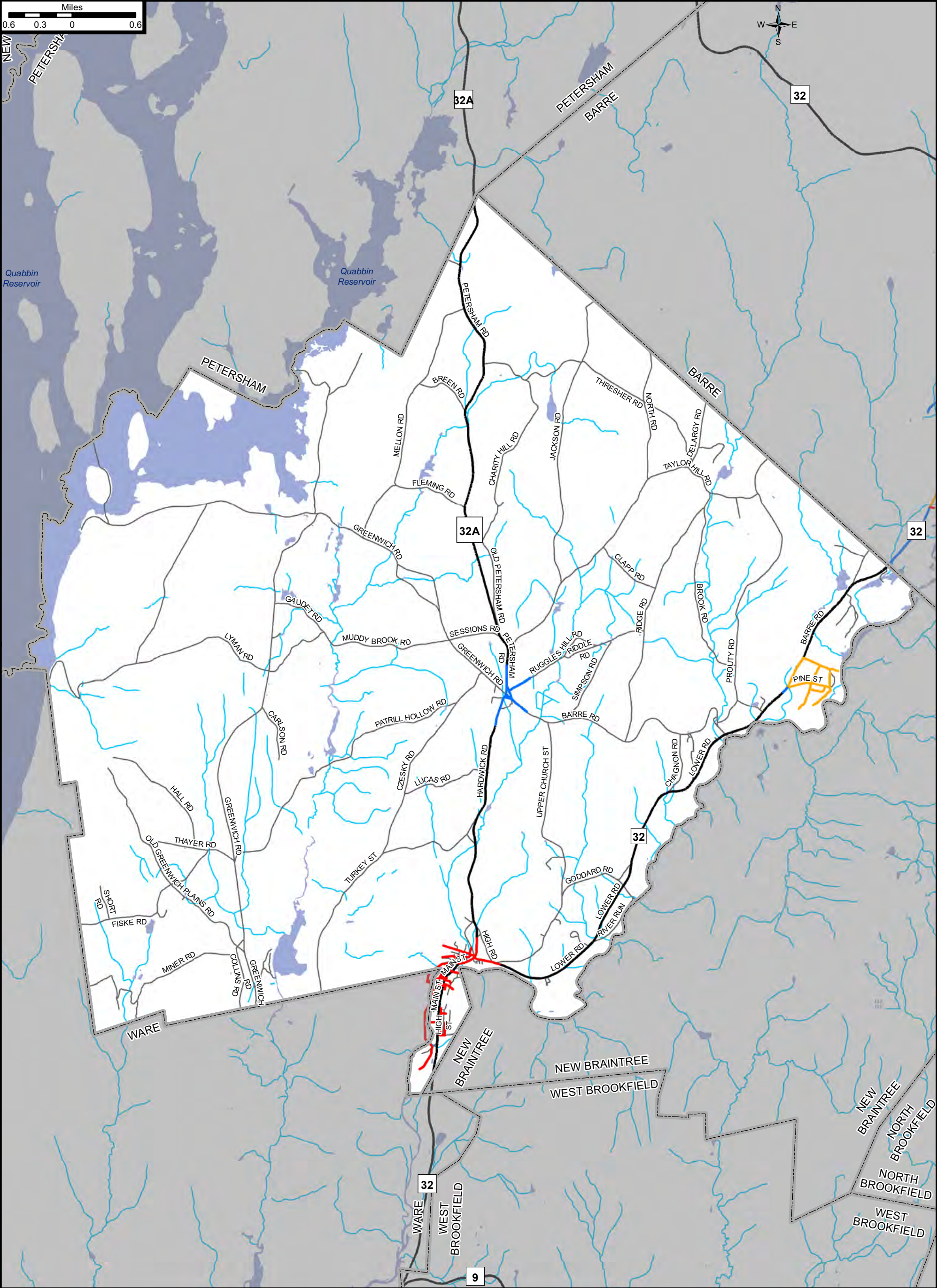
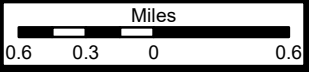


One Mercantile Street, Suite 520 - Worcester, MA 01608

Municipal Vulnerability Preparedness (MVP) Workshop

Reference Map: Utility Infrastructure

Town of Hardwick, Massachusetts



- Town Boundary
- Major Road
- Local Road
- Water Bodies
- Sewer Line
- Water Line
- Water/Sewer

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

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.

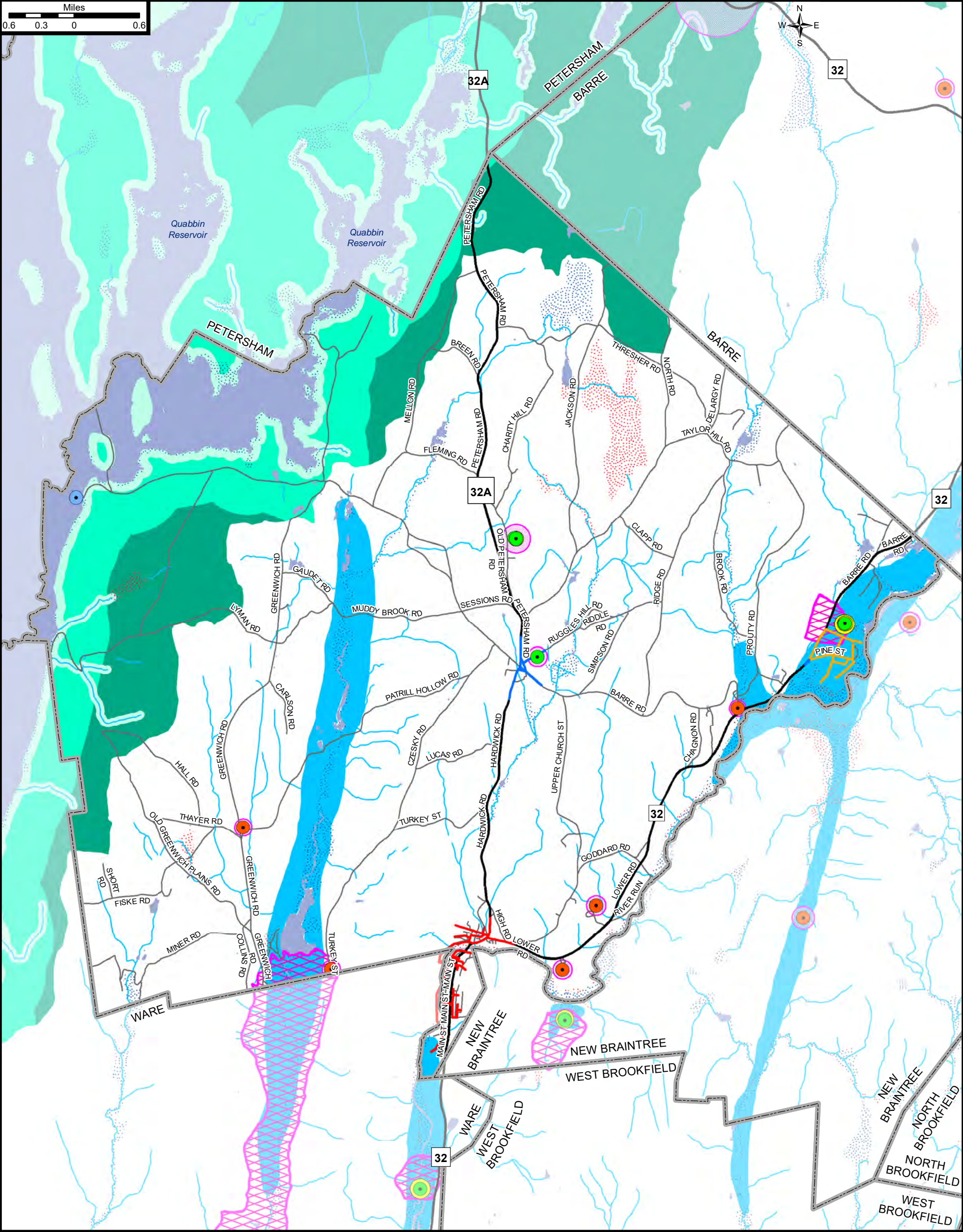
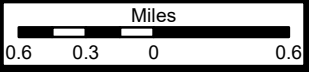
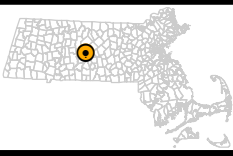
One Mercantile Street, Suite 520 - Worcester, MA 01608



Municipal Vulnerability Preparedness (MVP) Workshop

Reference Map: Water Resources

Town of Hardwick, Massachusetts



— Sewer Line — Water/Sewer
— Water Line

massDEP Public Water Supplies (8/2021)

- Community Groundwater Source
- Non-Community Groundwater Source
- Surface Water Intake
- Emergency Surface Water

DEP Approved Zone I (8/2021)

- Approved Wellhead Protection Areas (Zone II) (8/2021)
- Interim Wellhead Protection Areas (8/2021)

Aquifer (Low, Med, High)

FEMA National Flood Hazard Layer (DFIRM Data) or 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

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

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.

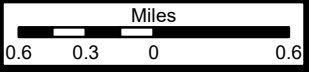


One Mercantile Street, Suite 520 - Worcester, MA 01608

Municipal Vulnerability Preparedness (MVP) Workshop

Reference Map: Orthophoto (2021)

Town of Hardwick, Massachusetts



Source: Data provided by the Town of Hardwick, CMRPC, massDOT, MassGIS, Imagery from MassGIS.

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.

CMRPC
Central Massachusetts Regional Planning Council

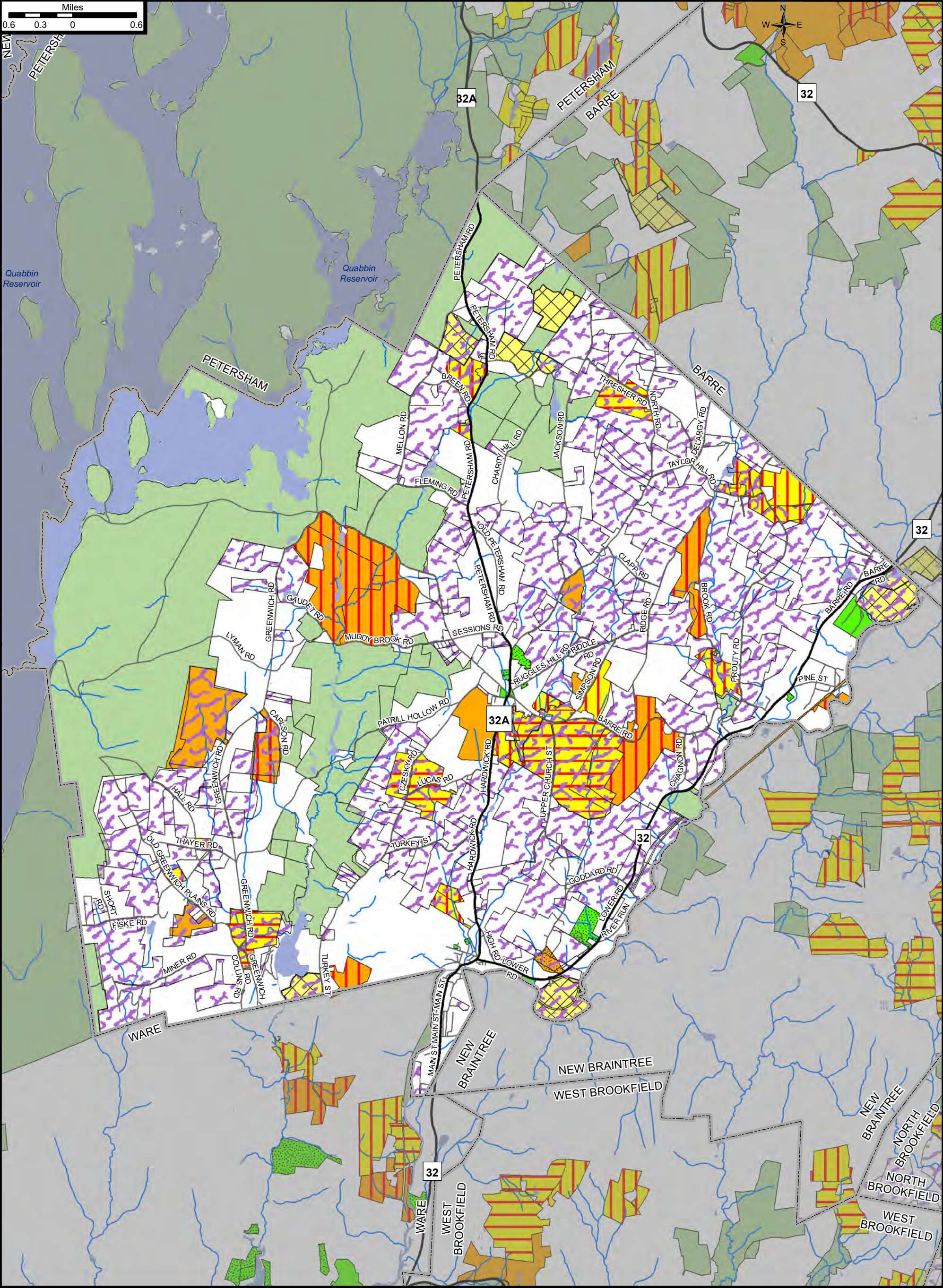
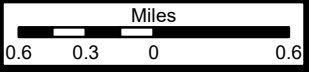
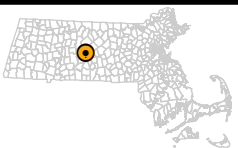
One Mercantile Street, Suite 520 - Worcester, MA 01608

Municipal Vulnerability Preparedness (MVP) Workshop

Reference Map: Open Space

Town of Hardwick, Massachusetts

Open Space data
provided by MassGIS.
Current as of 12/2021.
Chapter Land data
provided by Town.



- | | | | |
|---------------|-----------------------------|-----------------|---------------------------------------|
| Town Boundary | Open Space Ownership | Level of | Chapter Land (61, 61A, 61B) |
| Water Bodies | Federal | Perpetuity* | Conservation Restriction |
| Major Road | State | Limited | Agricultural Preservation Restriction |
| Local Road | Municipal | None | |
| | Private | | |
| | Non-Profit | | |

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

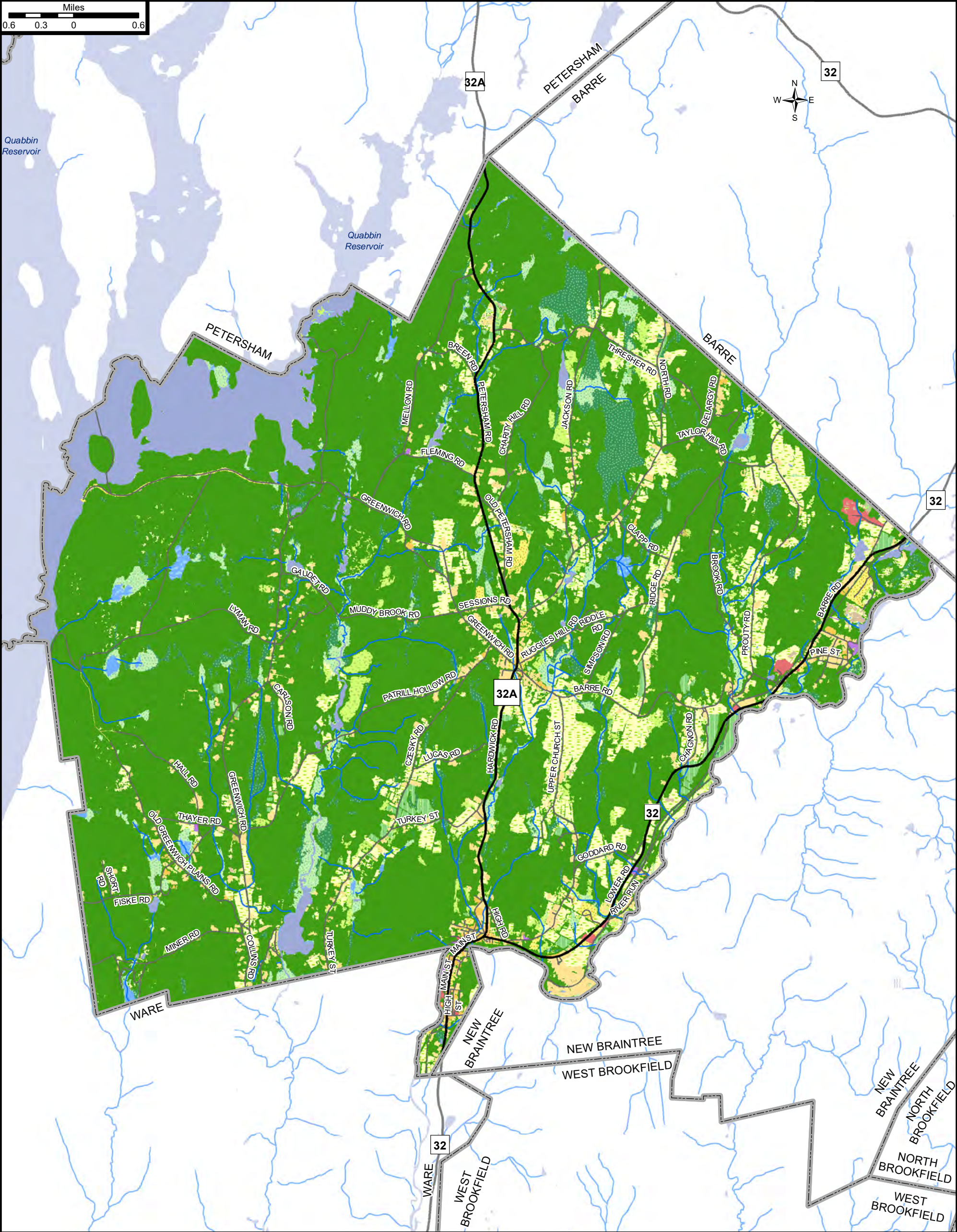
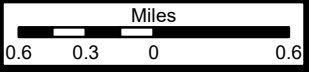


One Mercantile Street, Suite 520 - Worcester, MA 01608

Municipal Vulnerability Preparedness (MVP) Workshop

Reference Map: Land Use (2016)

Town of Hardwick, Massachusetts



Residential

Residential - Multi-Family

Commercial

Industrial

Mixed Use - Other

Urban Public/Insti...

Pasture/Hay

Cultivated

Forest

Scrub/Shrub

Bare Land

Forested Wetland

Non-forested Wetland

Saltwater Wetland

Water

Unconsolidated Shore

Aquatic Bed

Other Impervious

Developed Open Space

Right-of-way

Cranberry bog


Orchard

Nursery

Misc

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

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.

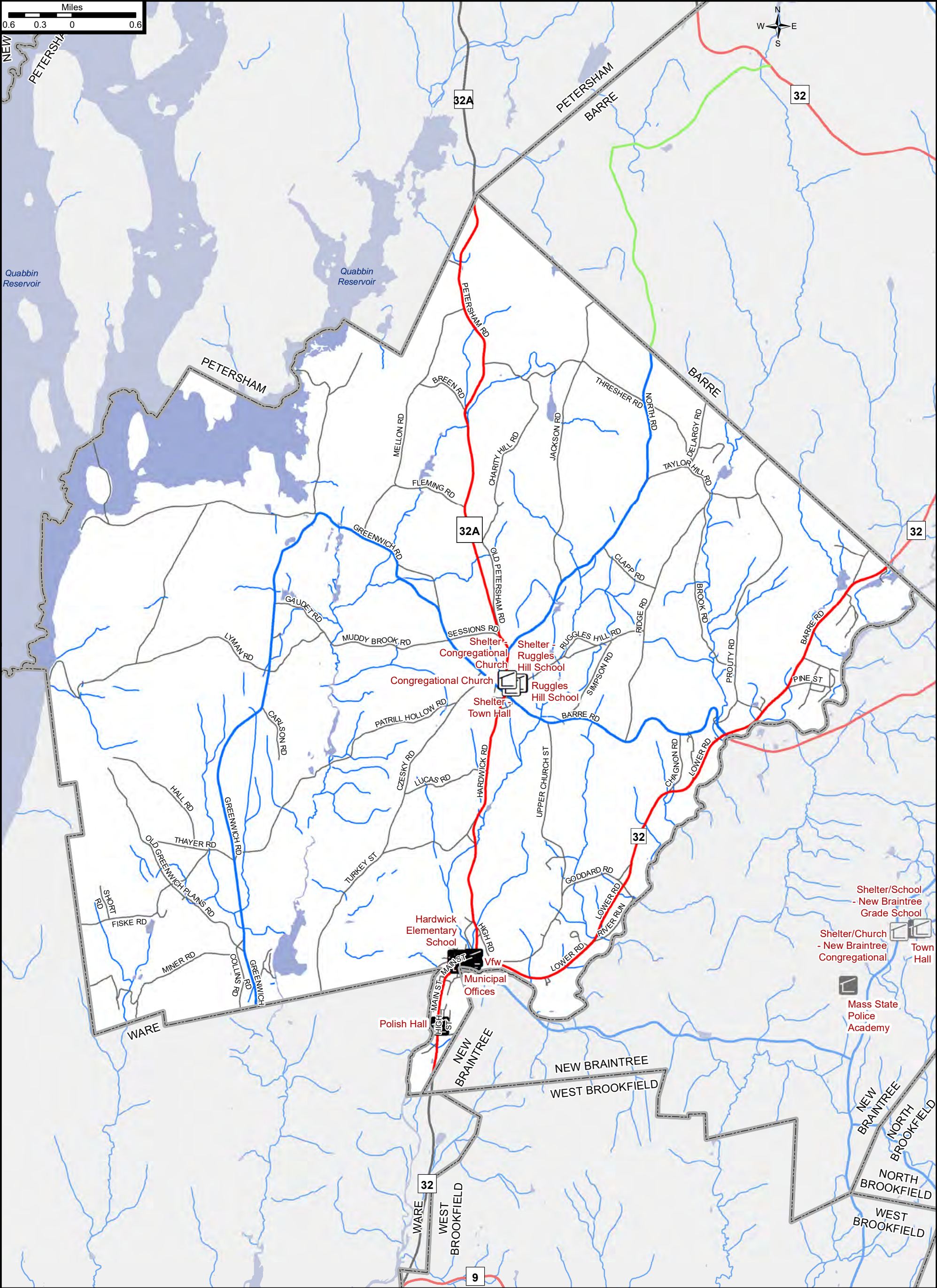
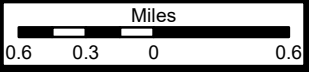
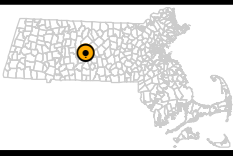


One Mercantile Street, Suite 520 • Worcester, MA 01608

Municipal Vulnerability Preparedness (MVP) Workshop

Reference Map: Evacuation Routes & Shelters

Town of Hardwick, Massachusetts



Legend

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

Evacuation Routes

- Highway
- Primary
- Secondary
- Tertiary

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

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.



One Mercantile Street, Suite 520 - Worcester, MA 01608

Municipal Vulnerability Preparedness (MVP) Workshop