Stoughton, Massachusetts

MVP Community Resilience Program

Resilience Building Workshop

February 2020

SUMMARY OF FINDINGS

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MVP Community Resilience Program

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SUMMARY OF FINDINGS

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Prepared for: Town of Stoughton, MA

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1.0 OVERVIEW

The Town of Stoughton, located on the southeast edge of Norfolk County, is in both the Neponset River Watershed Basin and Taunton River Watershed Basin. Stoughton is a suburban town whose growing population was under 27,000 at the time of the 2010 census, but has grown to almost 29,000 according to 2018 estimates. The town has many scattered areas of wetlands, several streams and ponds, and a large amount of forested area in town, including 675 acres in the south of town.

Over the past several years there have been an increasing number of impacts due to climate change that have affected the Town of Stoughton. With more frequent storms, the high winds often associated with those storms has caused increasing downed trees and powerlines, with multiple storms having this effect during extreme weather in 2012. Stoughton even experienced a small tornado or "microburst" several years ago crossing Route 138, near influential businesses in the Town. In more recent years, the town has experienced a variety of environmental hazards from invasive species, such as vector borne disease from mosquitos; this year marking one of the highest outbreaks in recent history. Stoughton was in a high risk area. Not only have weather patterns become more severe, but the demographic of local wildlife is shifting as well, bringing in larger numbers of animals like turkeys and coyotes, which are more frequently leaving the forested areas.

In response to the effects of climate change, the Town of Stoughton sought out the Municipal Vulnerability Preparedness (MVP) Program, and conducted a Community Resilience Building (CRB) workshop to identify and address the growing vulnerabilities in Town.

The Workshop's central objectives were to:

- Define top local natural and climate-related hazards of concern;
- Identify existing and future strengthen and vulnerabilities; and
- Develop prioritized actions for the Community.

Stoughton partnered with BETA as its state-certified MVP Planning grant provider to assist with the process and facilitate the CRB workshop. The core team set goals for the workshop and identified and engaged community members to participate. Inviting members of the municipality to directly address intensifying natural hazards due to climate change creates more targeted solutions to these problems and encourages the community to take ownership of the ongoing efforts involved in these solutions. This program is designed to foster discussion in order to help municipalities identify the vulnerabilities, strengths, and opportunities to take action to reduce risk and build resilience in their communities.

1.1 COMMUNITY RESILIENCE BUILDING WORKSHOP

As part of the MVP Program, the Town of Stoughton received a grant to host a CRB Workshop. This report documents the results from the CRB Workshop which BETA facilitated following the CRB framework. The CRB framework is a system of discussions and note taking developed by The Nature Conservancy and prescribed by the MVP Program. The goal of this workshop was to further investigate the Town's prior planning efforts and resiliency measures and to develop a list of strengths, and priority actions to focus on in the immediate future.

1.1.1 PARTICIPANTS AND PLANNING

Planning began with discussions between BETA and the Town Engineer and the Assistant Town Engineer to identify the core team and participant invite list which was selected with guidance from the CRB Workshop Participant Worksheet. An effort was made to invite participants from several different departments in order to have a broad range of perspectives on how climate change would affect the

Town. There were 23 participants from the community who attended the CRB workshop, and they represented many different departments or boards. Diverse representation was crucial to the success of the program, as the Police noticed different hazards than the Highway Department, and the Open Space Committee representative. Additionally, workshop participants who had never attended a CRB workshop had a more town-focused approach, where regional representatives who had previously participated in a CRB Workshop had a broader approach to discussion. This diversity of thought and perspective allowed the workshop to be highly informative and an overall success. The workshop invite list and list of invitees and participants is attached in **Appendix A**. The core team consisted of Assistant Town Engineer Craig Horsfall, Town Engineer Marc Tisdelle, and Town Planner John Charbonneau.

The participants were divided into four groups, distinguished by the colors red, blue, yellow and green, as noted on the maps and matrices. These teams were split up using the "mixed sector" approach, described in the CRB Workshop Guide as grouping "participants from diverse sectors together to foster an exchange of different perspectives and actions for community resilience building. This approach helps participants see the connections comprehensively and develop common actions with co-benefits across sectors." These effects were evident, and the diversity in thought led to a difference in priorities, creating a dynamic discussion throughout the workshop, where participants were introduced to assets and perspectives which they had not previously considered. In the end the groups were able to identify resiliency opportunities that solved multiple vulnerabilities across departments.

Melissa Recos of BETA Presents Power-Point to Workshop Participants

1.1.2 WORKSHOP PROCESS

It was decided that the workshop would be held in one, six-hour session, held on Wednesday, January 15, 2020. Workshop sessions were held from 9:00 am to 3:00 pm at the Stoughton Police Station. BETA led this workshop with multiple CRB-trained individuals. They provided an overview of climate change in the area as well as climate observations and projections from the Northeast Climate Science Center research, and implications that these changes will have on Stoughton's infrastructure, society, and environment so participants could have a more informed discussion throughout the rest of the workshop. The presentation is attached in **Appendix B**.

Throughout the Workshop process, BETA facilitators led the participants in discussion, often using some of the "Triggering Questions" identified in the Community Resilience Building Workshop Guide. Some questions which proved to be most useful were: What hazards have impacted your community in the past? What hazards are impacting your community currently? Where and how often do these impacts occur? What natural resources are important to your community? What makes this infrastructure vulnerable? Location, age, building codes, type of housing?

The session began with an overview of the CRB Workshop, the goals of this session and climate change predictions for the Taunton River Basin by BETA MVP-Certified facilitators Melissa Recos, P.E. and Andrew Dennehy, P.E. Some of the research and projects presented were that precipitation is projected to increase almost 7%, there will be 28% fewer days below freezing, and up to 4 times as many days over 90°F by 2050. A summary of this information, which was given to participants as a handout, is attached in **Appendix C**. A map of the town overlaid with FEMA flood zones was provided to each small group and a map depicting critical facilities in town was also displayed for reference. These maps can be found in **Appendix D**.

The participants then broke out into their designated small groups for further discussion. Small group discussions began by discussing hazards affecting Stoughton and developing a list of the top four hazards of concern each group felt Stoughton was most impacted by. Groups annotated maps to highlight vulnerable areas, infrastructure, flood zones, and community resources in order to better assess which hazards to prioritize in the Risk Matrix. Groups were made up of a facilitator (a member of the BETA team), a scribe/spokesperson, and three other workshop participants.

Small Group Discussion of Priority Hazards Using Town Map

The participants then returned to the larger group to discuss and come to a consensus on the top four hazards moving forward. After a discussion of the hazards brought up by both groups, the top 4 agreed upon hazards were identified as Flooding, High Wind/Winter Storms, Drought/Extreme Temperatures and Invasive Species. After this discussion, the participants returned to their groups in order to discuss features and add them to the matrix. Looking at the map in conjunction with the four identified hazards allowed the participants to more clearly see the flood risk areas as well as identify the locations most impacted by the other three hazards identified as a priority. This was very helpful in discussion of which features were most important. Participants also identified who owned each feature and categorized it as vulnerability or strength. These matrices can be found in **Appendix D**. The participants discussed their features in a large group informally, followed by a break for lunch.

The participants then returned to their small groups to fill in the Risk Matrix by discussing action items that address the hazard and the feature by either posing a solution to a hazard/feature or enhancing the strengths of a feature against a specific hazard identified in the previous session. Some common action items included public outreach and education, tree trimming, installation of Low Impact Development measures and other BMPs; participants were also concerned about shelters in the event of emergencies and that was a theme that came up in almost every group, addressed in either the feature or the action section of the Risk matrix. Throughout the small group discussions, the BETA facilitators stayed with

groups to ask questions to prompt discussion (triggering questions) and provide guidance.

After actions had been identified, the small groups decided whether each action was a high, medium, or low priority and if the time frame was short term, long term, or ongoing action. This prioritization naturally separated the many actions into categories, making it easier to distinguish the *most* important. Using this information each small group determined their top five or six priority actions to present to the large group.

After all groups had completed the above tasks individually, participants reconvened to discuss, rank and prioritize together in order to come to a consensus on the highest priority actions to be taken across Stoughton. Each group explained their thought process and stated their top five actions. A discussion ensued in which the group at large deliberated why some items should or shouldn't be included in the priority actions. The results and any other notable information throughout the process of the workshop are described in the following sections of this report. The sheets where each group contributed their ideas during large group discussion can be found in **Appendix E**.

2.0 Summary of Findings

2.1 Current Concerns & Challenges

2.1.1 Top Hazards Of Concern

During the individual group discussion, the following hazards were identified as being most prevalent and/or impactful in the Town of Stoughton and were brought up for discussion in the larger group.

- Flooding
- Extreme Temperature
- Drought
- Extreme Weather
- Intense/Severe Storms
- High Winds
- Ice/Snow
- Invasive Species

Participants Discuss Priority Hazards in Large Group

The small groups had many of the same concerns in mind while choosing top natural hazards. Every group identified flooding as a top priority affecting Stoughton, as the consequences are severe. Additionally, as rains and impermeable surfaces increase, so does the risk of serious storms, flashfloods, and other rain events which cause flooding, and have serious consequences to Town functioning. Conversation continued in greater depth during the discussion of features and actions and is discussed in later sections.

One of the most common concerns was the recent outbreak of EEE in the area, with Stoughton being in the "High" risk category and several surrounding towns being in the "Critical" risk category. These concerns were universal among participants and recognized as important, especially considering the Town currently does not have a solution or mitigation effort in place for these species.

Many groups wanted to address the consequences of winter storms, or high wind events, as these are extremely common in Stoughton and can seriously affect many aspects of the town, including: schools, jobs, the elderly, those who walk or drive to work, etc. The language was able to be shifted in order to accommodate all the concerns identified in the group.

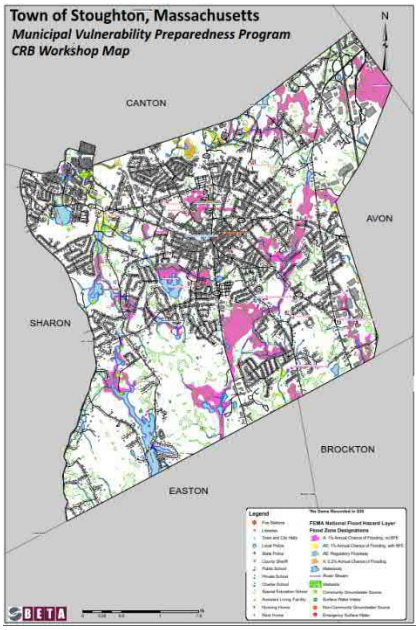
Ultimately, some of these hazards could be grouped together into one category and through the discussion there was largely group consensus on what the top four hazards should be with some discussion of the wording. The group decided on the following hazards as the top four.

Top Hazards

- **Flooding**
- **Extreme Temperatures**
- **Severe Storms**
- **Invasive Species**

2.1.2 Areas of Concern

In discussing the top hazards, participants naturally began pointing out areas where these hazards often occur. The hazards which triggered the most discussion were flooding and drinking water sources. Participants circled various locations marking out both natural resources for drinking water and areas of concern for flooding. The map shows great area in the 100 year flood zone as well as many areas of wetlands and other water bodies. These are the most likely areas to flood and much of Stoughton's residential area is in that high flooding zone. The Red Wing Brook area, is something that was called out on the Maps as well as in the Risk Matrix.



Map of Stoughton used in the CRB Workshop Process

Stoughton has experienced a number of weather-related events in recent years, and these events are expected to increase due to climate change. Flooding in the low-lying areas, especially those along the rivers and ponds or near dams are a concern for Stoughton. Severe winter storms posed another major concern for many of the workshop participants, because this weather leads to fallen trees and downed power lines, as well as isolating the elderly and others in vulnerable groups; with slippery roads people who walk to work or use public transportation are especially vulnerable, and often times those are people in environmental justice populations.

2.1.3 Important Features Related to Identified Hazards

Based on the frequency and severity of the four identified hazards, the groups discussed which areas, communities and systems would be most affected by the occurrence of these hazards. Three categories of town features were discussed: infrastructural, societal, and environmental. Below is a list of all the community features the groups identified:

- Infrastructural
    - Dams

Participants Discuss Features in Small Groups

  - Communication Systems
  - Culvert Crossings
  - Drainage System
  - Electrical Systems
  - Emergency Operations Center
  - Emergency Services
  - Power Grid
  - Public Transportation
  - Road Infrastructure
  - Sewer Pump Stations
  - Septic Systems
  - Sewer System
  - Sheltering/Cooling Facilities
  - Stormwater Management System
  - Sewer Treatment Facility
  - Wells
  - Water System Treatment & Distribution
  - Woods Pond Dam
- Societal
  - Religious Communities
  - Effective Communication
  - Energy & Sustainability Committee
  - Health Care Facilities
  - Non-English-Speaking Population
  - Parks/Fields/Playgrounds
  - Public Safety
  - Recreation
  - Schools
  - Senior Center
  - Shelters
  - Strong Community Business Partners (YMCA, Target, Ikea, Temple, Shelters)
  - Strong Community Ties (People and Resources)
  - Vulnerable Population (Seniors, Kids, Low Income)
- Environmental
  - Water Quality of Local Lakes, Ponds, Streams
  - Agriculture
  - Ames/Long Pond Area
  - Conservation Lands
  - Drinking Water Sources
  - Encourage More Green Space
  - Eutrophication & Pond Management
  - Flood Zones
  - High Ground Water
  - Impaired Water Bodies
  - Lake Management
  - Lakes & Ponds
  - LID /Green Infrastructure Measures

- Open Space
- Playground Near Woods
- Red Wing Brook Area
- Streams/Ponds/Wetland Resource Areas
- Tree Management
- Vector Borne Disease
- Wildlife Habitat

It is important to note that not all these features were considered vulnerabilities. Some of these features are already strong and as the small groups began to think about ranking, the largest vulnerabilities were identified and prioritized.

2.2 Strengths and Assets

Workshop participants noted that the town has strengths in each of the three feature categories: societal, environmental, and infrastructural. Some of the features were noted as both a strength and a vulnerability, like the water system and the power and communication systems. The participants agreed that having a trees and open space in town is a great asset. They provide options for increasing flood storage or restoring floodplains, in the event the Town chooses to investigate that. They also provide habitat for wildlife.

Community ties were considered a strength because they help the Town reach people, and members of groups which could otherwise miss out on important information from the Town. For example, Stoughton has a large population for whom English is not their first language; these community members could be missing out on emergency services information or resources like emergency sheltering etc. Participants noted that Stoughton has a large community of religious organizations which have a large overlap with the non-English speaking population, and in this way the Town can begin reaching out more intentionally to religious communities with emergency services information etc. in order to reach that vulnerable population. Similarly, Stoughton has a strong business community and the Town plans to continue to utilize this group to spread the word about conservation efforts and other Town measures

Sheltering facilities were considered a strength because the Town has sheltering facilities currently, and although some need improvement, the library and other resources have been recently renovated and provide great sheltering options. **Appendix D** has more detailed information for reference.

2.3 Future Actions and Resolutions to Improve Community Resilience

Some of the common action items that related to the biggest concerns came up repeatedly in small groups and are described below.

- *Sewer System:* Stoughton is mostly sewer, but some areas still have septic systems; some participants expressed interest in extending the sewer systems to those areas, especially those near high ground water or drinking water sources. Whereas Stoughton has several areas of drinking water it is also important to continue I/I programs to keep groundwater out of the system and sewage within the system.
- *Tree Trimming:* During high wind or heavy snowstorm events, downed trees and branches cause major maintenance problems in Town. Tree trimming is extremely important preventative maintenance which the Town would like to encourage power companies to continue to keep up with, as many of these trees are not maintained by the Town. The tree program would also

address related concerns regarding tree-affecting diseases which cause more downed trees and limbs.

- *Dams:* Every group mentioned dams as a feature that was a concern. As projected rains increase, participants discussed the worry that Stoughton will not be able to manage the increase in flow through the drainage system, and other mitigation efforts. One of the biggest discussions revolved around the necessity or effectiveness of dams and, whether to release, repair or deconstruct them. Participants understood the need for more flood mitigation in the coming years but were hesitant to rely on dams for this process.
- *Vector Borne Disease*: With an outbreak of EEE this past summer and fall, vector borne diseases were a large point of discussion, from prevention measures to education programs. Many participants felt that engaging the student population would be helpful to spread information to parents and other town members. The county also has a program to spray for mosquitos, which the Town will continue to encourage residents to utilize. Other ways to mitigate mosquito breeding were discussed, such as education about bird baths, gutter cleaning, and other standing water.

Some of these items became incorporated into the top five priority action items, while the rest of that list came from more general concerns addressed in the top four hazard categories facing Stoughton.

2.3.1 PRIORITIZING ACTIONS

Participants at the workshop identified a number of recommended actions to address vulnerabilities and increase resiliency. The following is a complete list of these recommendations listed by priority but not ranked within the priority category. See **Appendix D** for the actions as they relate to hazards and features and whether they pertain to a strength or vulnerability. In addition, see **Appendix E** For list of all priority hazards and priority actions.

The high priority actions are as follows:

- Culverts: Condition Assessment, identify/survey culverts that need to be upgraded, evaluate need for maintenance, replacement & upgrades of system, investigate culvert widening/stream crossing, develop Maintenance Plan and monitor
- Road Infrastructure: Route 139 improvements, catch basin cleaning
- Communication Systems: Run frequent tests, civil preparedness
- Power Grid: Increase community solar and other alternative energy sources (Town solar grid on top of building), increase redundancy, expand relationship and communication with utility companies, back-up power, harden electric system, tree management (utility companies), debris management (town), burying utilities & strengthening systems Evaluation
- Health Care Facilities: Generator safety education, encourage changes in-state mandates and meetings with Town to establish emergency action plans, generator safety education
- Stormwater Management System: Retrofit properties and infrastructure with LIDs and BMPs, Stormwater Bylaw & Regulation review and update to reflect future rainfall, maintain BMPs to prevent pooling for mosquito breeding, rain conveyance study, study current ground water conditions, study to identify septic needs in flood prone areas, drainage studies on O&M of current assets: CB cleaning, outfall monitoring, maintaining, replacing, upgrade undersized pipes, etc.
- Vulnerable Age Populations: Identify (list) vulnerable people to contact during extreme events, institute neighbor check in, option for transport to shelter, work with Council on Aging for Emergency Preparedness Training, create inventory of available resources, continue outreach, Reverse 911, coordinate communication with emergency response team, establish public

education plan for notification of shelter facilities and resources, note dangers of heat related injuries, generator safety education, continue to utilize OASIS services and expand to other demographics, Emergency Preparation Training, utilize free lunch program for outreach opportunities, education camps for students, pest control, MBTA evacuation.

- Effective Communication: Cell phone donation programs.
- Public Safety: Education/Communication Public Outreach/Equipment.
- High Ground Water/Drinking Water Sources: General maintenance, pest control, drainage BMPs installed, expand sewer system into high ground water & well areas, continue I/I efforts and O&M program, public outreach.
- Tree management: Continue outreach on tree-affecting invasive species, spray for beetle and gypsy moths, maintain trimming and clearing around utilities, continue easement clearing program, plant more street trees, encourage tree health.
- Vector Borne Disease: Public education - Take advantage of state resources, better networking and communication with State/County for mosquito and tick control, Public Education (i.e. bird baths, standing water, etc.).
- LID/Green Infrastructure Measures: Maintain proper drainage to avoid standing water, maintain stormwater detention at Elementary Schools & other town facilities, review regulations to incorporate advocacy of LID measures, minimize impervious surfaces, continue and expand streetscape project, continue smart water management.

Map of Stoughton used in the CRB Workshop Process

The medium priority actions are as follows:

- Dams (esp. Woods Pond Dam): Condition Assessment, examine, evaluate, and repair, replace, or remove dams, maintenance program, including Pratt Pond, Ames Pond, Woods Pond, etc.
- Septic & Sewer Systems: Continue to implement I/I plan, educate residents about not putting floodwater in sewer, Capital Improvement Plan, extending sewer system, I/I overflow system, O&M of current assets, upgrade undersized pipes, etc., incorporate LIDs into Town Facilities and private properties, Drain Conveyance Study, study current groundwater conditions, study to identify septic needs in flood prone areas.
- Road Infrastructure: Oversizing drainage in Transportation Projects.
- Treatment Facility/Pump Stations: Evaluate/upgrade flood barriers, incorporate LIDs, maintain connection w/ MWRA in case of drought, increase cooling/heating, maintain generators and plant access, private plants to update O&M Plans, complete pump stations upgrades, educate residents about not putting flood water in sewer, general maintenance.
- Water Distribution Systems/Wells and Treatment: Condition Assessment, water dispensing site, explore alternative locations, general maintenance, investigate vulnerability of wells located in Flood Zone, implement/establish a consistent water management plan and restrictions, Implement BMPs and plan during drought, update current plan, look at resting wells during summer/drought and use MWRA instead.
- Culverts: Condition Assessment, develop Maintenance Plan and monitor, identify/survey culverts that need to be upgraded, evaluate need for maintenance, replacement, and upgrades of system, investigate culvert widening/stream crossing.

- Emergency Services & Operations Center: Maintain Emergency Generators, maintain drainage near current facilities, construct new Public Safety Bldg. (Fire/Police), Maintain Emergency Generators, increase communication, upgrade Emergency Operations Center.
- Low Income Population: Institute neighbor check in, option for transport to shelter, create inventory of available resources, continue to utilize OASIS services and expand to other demographics, Public Outreach/Education Communication, Emergency Preparation Training, utilize free lunch program for outreach opportunities, generator safety education, Reverse 911, coordinate with Emergency Response Team, pre-planning, emergency planning, Heating/Cooling stations or cost assistance, work with Housing Authority, MBTA evacuation.
- Non-English Speaking Population: Translate important communication: All emergency calls, website posts, Facebook posts, texts, etc. Train/educate Town staff on resources available for communication with various populations, generator safety education.
- Schools/Emergency Center, Health Centers: Update older health center, add emergency charging, review how to prevent missed school days, access schools to be emergency centers - all have power, large space, school nurse, etc., ensure schools can communicate, generators, upgrade Heating/Cooling, education camps, pest control, general maintenance.
- Shelters: Increase Equipment, add locations, Public Outreach, officially dedicate facilities to be shelters, annually update and enhance shelter Emergency Operation Plan, Update Emergency Operations Center, High School, Library, Senior Center.
- Senior Center: Heating/Cooling, Backup Power, Emergency Supplies and Transportation.
- Energy and Sustainability Committee: Work to minimize Town emissions/cost, continue working towards energy consultant, Community outreach (Mass Save) resources for Town Government and Residents.
- Agriculture: Public Education (Birdbaths and standing water are mosquito breeding grounds), Identify Farms, reach out to help farmers keep agricultural land.
- Green Space/ Wildlife Habitat: Encourage more green space and wildlife habitats, land upkeep, Soccer Field upgrade, maintaining existing land, study to identify habitat that should be preserved, land donation, reclaiming vacant land.
- Red Wing Brook Area: Drainage BMPs installed, pest control, Culvert upgrade, Drainage Study, Bank Stabilization
- Impaired Water bodies, Water Quality of Local Lakes, Ponds, Streams: Testing of Ponds, MS4 Regulations, Green infrastructure Improvements, Maintaining CBs, Drainage BMPs Installed, Public Education (i.e. bird baths, standing water etc.), General Maintenance, Pest Control, Nitrogen/Phosphorus.
- Streams/Tributaries, Ponds, Wetland Reservoir Areas & Flood Zones: Identify and eliminate stormwater pollution sources, Public Education, preserve and restore flood plain, Engineering study to determine and update Zone AES in town, Red Wing Brook Study and restoration to withstand storm flows, protect Buffer Zones with plantings, limit soil bank erosion, green infrastructure.
- Ames/Long Pond Area: Drainage BMPs installed, pest control, Drainage Study, hydrant locations, Distribution Improvements.
- Eutrophication & Pond/Lake Management: Stormwater sampling and notification of impairments, continue outreach, Drainage BMPs installed, Identify and eliminate stormwater pollution sources, Maintain proper drainage to avoid standing water, Continue removal of invasive plants, general maintenance, pest control, continue to implement management plan.

The low priority actions are as follows:

- Road Infrastructure: Pothole maintenance.
- Open Space & Conservation Lands: Adopt a park, regular maintenance, maintain proper drainage to avoid standing water, General Maintenance, pest control, maintain protection of Open Space, obtain more and ensure maintenance of flood storage, Maintain access to community trails, Land Acquisition-Acquire property secure funds to acquire/expand open space, fire prevention equipment.
- Sheltering/Cooling Facilities: Assess shelter capacity, maintain/assess inventory of resources, Assess Transportation-Plan
- Public Transportation: A/C on busses & bus stop shelters, BAT/MBTA to maintain access, increase services during large events.
- Religious Communities: Maintain & Improve communication, increase Town information at large festivals and events, partnership with Faith-based organizations, establish with Memo of Agreement, MRC volunteer group, getting word out.
- Business Communities: Continue outreach/distributing stormwater info. during permitting, encourage water conservation, reuse and energy conservation, incentive program/sponsorship opportunities, partnership with contractors, establish with Memo of Agreement, MRC volunteer group, getting word out.
- Recreation (Parks/Fields/Playgrounds): Snow Removal, increase shade/cooling, Advisory warnings, education through health department, Town-wide coordination and consistency, General Maintenance, pest control, education programs, signs and notices posted.
- Playground near woods: Install bug spray dispensers, proactive insect treatment, coordinate with County, outreach during outbreaks of EEE and other Vector borne disease, Install signs w/ info., Ensure proper grading and drainage, playground improvements, consider installation of water features for cooling.

2.3.2 Highest Priority Actions

The top actions, presented to by the small groups, to all the participants are listed below. As in other categories there was overlap in the findings and opinions of the groups.

- Address culverts and storm water systems
- Establish & Improve community communication, education, and Outreach Plan
- Encourage green space by buying/restoring land
- Improve power system, diversify power and transmission of power
- Improve Emergency Preparedness Plan and Increase public knowledge
- Recreational Facility improvements and improve drainage and health and safety of sites
- Culvert and Drainage Study/Evaluation Program
- Upgrade Emergency Operations Center
- Construct Stormwater Improvements and BMPs
- Drinking-water source protection and Land acquisition
- Expand open space and protect wildlife habitats
- Public Outreach
- Pest Control
- Construct Public Safety Building
- Improve translated communication with non-English speakers
- Expand sewer to eliminate septic systems in high groundwater area
- Create Resource Network to reach vulnerable population
- Implement Tree Management Program to mitigate invasive species and encourage trimming

- Tree and debris management for power grid resiliency
- Red Wing Brook Restoration Study, design and Implementation

After each group presented their proposed top action items there was a large group discussion about the merits of each. Participants discussed how feasible and pertinent each action was to the priority hazards listed earlier. In general, the participants recognized each action as important to the town and the discussion proceeded to come up with consensus on the top priority actions to be taken as a result of the Municipal Vulnerability Preparedness Workshop. The results are as follows:

Participants Discuss Top Priority Actions

Highest Priority Actions

- **Emergency Communication/Action Plan – Community Education/Outreach Program**
- **Drain Capacity, BMP and Culvert Study**
- **Land Acquisition to protect open space & drinking water sources**
- **Public Safety Building**
- **Management and Improvements of recreational facilities & open space**
- **Tree and debris management**

The emergency operations and communications were prioritized because they are crucial to the functioning of the Town, and while many participants wanted to focus on preventative or restoration measures, everyone recognized the importance of maintaining and developing the emergency response systems. Additionally, the group thought that certain aspects of the emergency preparedness were so important that this category shows up in two separate priority actions. The public safety building was also ranked in the highest priority actions. The current emergency facilities are not sufficient for the growing Town. The Town hopes to build one central location to house Police and Fire Departments so that in the event of an emergency, all the necessary tools and resources would be readily available.

Participants saw a wide range of stormwater issues and they agreed that conducting a study of the entire drainage system including drains, BMPs, and culverts would be most beneficial in deciding how to improve these resources in the future. This also allows the Town to have a holistic view of any stormwater problems. Rather than upsizing a culvert to avoid flooding, a study allows research to determine the best method, whether it is increasing flood storage, installing L.I.D. measures or upsizing a culvert.

Land acquisition was recognized as a high priority because of the many diverse benefits. Purchasing land to preserve from development would help maintain and encourage wildlife habitats, as well as to protect areas that flood from being developed. Stoughton also has several wells and areas of high ground water, purchasing land in those areas would further protect drinking water from those sources and encourage more groundwater recharge by maintaining a pervious surface. Recreational facilities and open space were prioritized for similar reasons. Maintaining the facilities is important as the Town already owns is a great start to preserving more land.

Tree and debris management was prioritized because of recent outbreaks of tree-affecting invasive species such as certain beetles and gypsy moths. These are extremely harmful to the trees and cause

rotting and the eventual death of the tree. Not only will this affect the trees, but anything around the trees in danger if the tree or a limb should fall, including homes, cars, powerlines, etc. Another part of a tree and debris management program would be to encourage the power companies to vigilantly trim trees, especially ahead of storms so that power loss would be less frequent.

While this document describes much of the discussion that ensued during the CRB Workshop there is additional detail in the Appendices. See **Appendix D** for a list of all the actions and assets whether it was considered a strength or vulnerability, and **Appendix E** for list of all priority hazards and priority actions.

2.4 Public Listening Session

Stoughton presented the CRB process and summary of findings at a public listening session at Stoughton Town Hall on March 12, 2020. This provided an opportunity for any member of the interested public to learn, ask questions, and provide feedback about the workshop and the results that emerged. The following topics were discussed during the Listening Session:

- Overview of the Municipal Vulnerability Preparedness Program
- Nature Based Solutions and their role in the Program
- Climate data and projections
- Impacts from Climate Change
- Workshop overview
- Hazards, features and actions identified during the workshop
- Priority Actions developed during the workshop
- The next steps for the Town in the program

Input from the attendees of the Listening Session was focused on public outreach and education programs. In particular, attendees felt increased involvement of the Town's public schools would be beneficial.

All of their concerns had previously been captured in the Workshop and are included in the Summary of Findings.

3.0 Next Steps

3.1 Continuing with the MVP Program

Conversations held through the MVP CRB Workshop and listening session highlighted climate related challenges facing Stoughton and enlightened participants and the public to the importance of preparing for and addressing them. Participants identified many short- and long-term strategies for adapting to the changing climate.

The findings will serve as a basis for Stoughton's MVP Action Grant application, providing an opportunity to take the community's ideas and turn them into actions. Priority actions identified during the workshop will also be integrated into local planning efforts to improve the town's resiliency to the effects of climate change.

4.0 Citation

BETA Group (2020, February). MVP Community Resilience Building Workshop Summary of Findings, Stoughton, MA.

5.0 ACKNOWLEDGEMENTS

Many thanks to the MVP Core Team members and CRB workshop participants. Thank you to the Town of Stoughton for providing and coordinating a space to host the workshop and listening session and for making the workshop a priority for town staff to take part in.

Funding for the CRB workshop was provided through a Massachusetts MVP Planning Grant.

APPENDIX A

- Participant List

Appendix A: List of Invitees

1/15/2020	First	Last	Department / Role
X	David	Billo	Energy & Sustainability Committee
X	Janiece	Bruce	Public Health Director
	Fran	Bruttaniti	Procurement Officer
	Matthew	Cauchon	Recreation Department
X	John	Charbonneau	Town Planner
	Nathan	Cleveland	Energy & Sustainability Committee Chair
X	James	Conlon	Environmental Affairs
X	Ian	Cooke	Neponset River Watershed Assoc.
X	Pat	Cotton	Weston and Sampson
	Robert	Desmond	Finance Committee
X	John	Diaz	Greenman-Pederson Inc.
X	Jack	Erickson	Building Inspector
X	Tom	Fitzgerald	DPW Superintendent
	William	Galvin	State Representative
X	Paul	Giffune	Facilities Manager
X	Robin	Grimm	Town Manager
X	Susan	Herman	Internal Auditor
	Brian	Holmes	Police Sargent
X	Craig	Horsfall	Assistant Town Engineer
X	Bruce	Hughes	Old Colony Planning Council
	Joyce	Husseini	Director of Maint. and Ops - Schools
	Luis	Kafka	State Representative
	Dan	Kelly	Downtown Redevelopment Committee
	Charles	Kilmer	Old Colony Planning Council
X	Larry	Langlois	GIS Coordinator
X	Michael	Laracy	Fire Chief
X	Sean	Leahy	Board of Health
	Forrest	Lindwall	Redevelopment Authority
	Dr. John	Marcus	Superintendent of Schools
	Pamela	McCarthy	Economic Development Department
	Donna	McNamara	Police Chief
	Phil	McNulty	Water/Sewer Superintendent
	Laurie	Muncy	Old Colony Planning Council
X	James	O'Connor	Police Safety Officer
	Robert	O'Regan	Energy & Sustainability Committee
X	Lawrence	Perry	Town Sanitarian

Appendix A: List of Invitees

1/15/2020	First	Last	Department / Role
	Tony	Phillips	Energy & Sustainability Committee Secretary
	Jose	Risa	Lawyer
	Richard	Scardina	Energy & Sustainability Committee
	Kerry	Snyder	Neponset River Watershed Assoc.
	Michael	Sullivan	Board of Selectmen
X	Joan	Tierney	Office of Sate Representative
	Walter	Timilty	State Senator
X	Marc	Tisdelle	Exec. Director of Dev. Services/ Town Engineer
	Ryan	Trahan	Environmental Partners
	Edward	Trunfio	Finance Committee
X	Scott	Turner	Environmental Partners
X	Mary	Waldron	Old Colony Planning Council

1/15/2020	Name	BETA Group Title
X	Caroline Armstrong	Engineering Designer
X	Andrew Dennehy, PE	Project Manager
X	Dan Hammerberg	Engineering Designer
X	Mary Beth Irwin	Staff Engineer
X	Melissa Recos, PE	Project Manager
X	Paul Smith, PE	Senior Project Manager

APPENDIX B

- CRB Workshop Presentation

Municipal Vulnerability **Program (MVP)**

Stoughton, MA

January 15th, 2020

BETA

Welcome and Introductions

- Andrew Dennehy, Associate, BETA Group, Inc.
- Melissa Recos, Project Manager, BETA Group, Inc.
- Mary Beth Irwin, Staff Engineer, BETA Group, Inc.
- Dan Hammerberg, Engineer, BETA Group, Inc.

Municipal Vulnerability Program Agenda

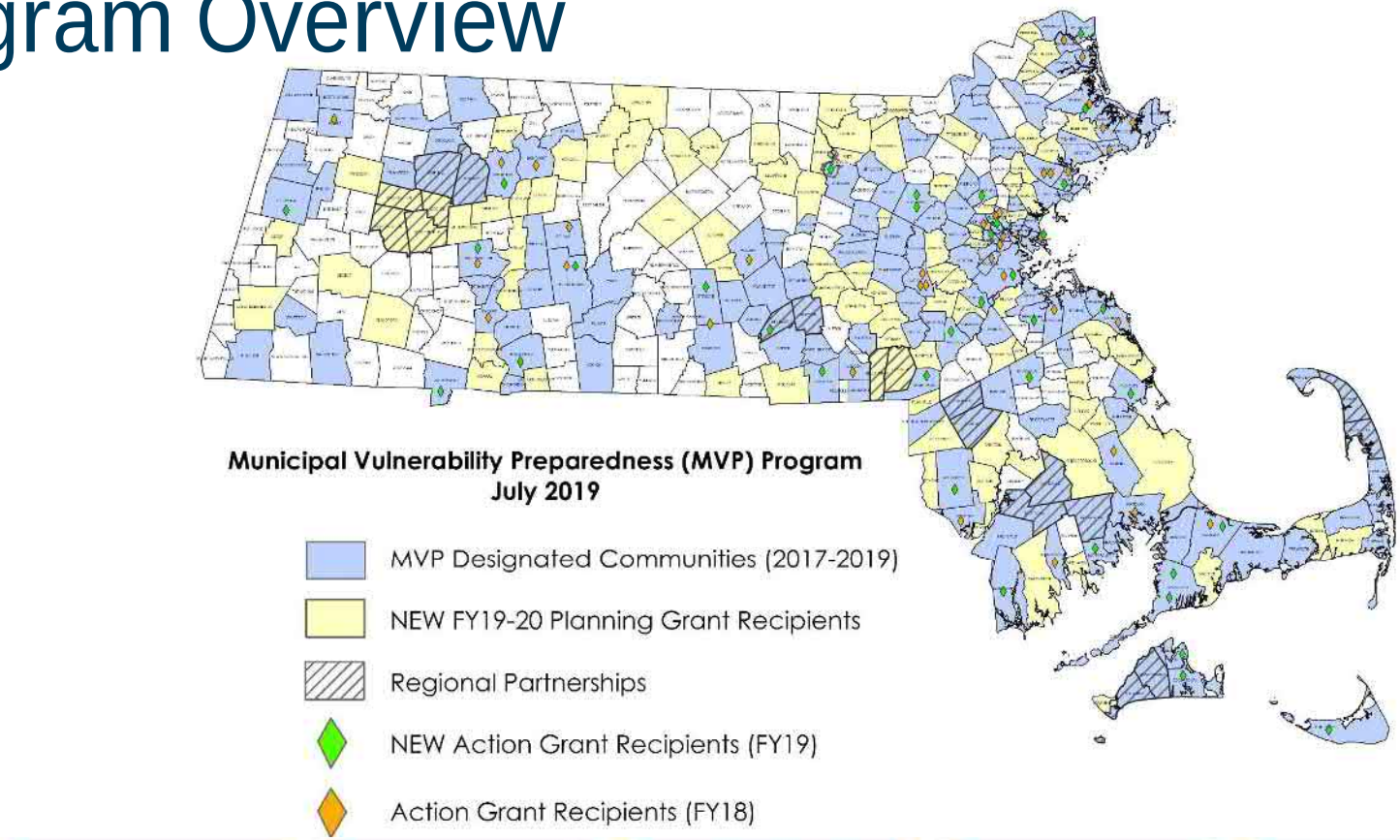
- Program Overview
- Workshop Overview
- Science and Resources Information
- Introduction to Small Team Exercise #1
- Reporting Small Team Findings #1
- Small Team Exercise #2
- Reporting Small Team Findings #2
- Summary Discussion

Program Overview

EXECUTIVE ORDER 569: AN INTEGRATED CLIMATE CHANGE STRATEGY FOR THE COMMONWEALTH 9.16.16

- Reducing greenhouse gas emissions to combat climate change
- Preparing for the impacts of climate change
  - State Adaptation Plan
  - Agency Vulnerability Assessments
  - Municipal Support
  - Climate Coordinators

Program Overview



1. Engage Community
2. Identify CC impacts and hazards
3. Complete assessment of vulnerabilities & strengths
4. Develop and prioritize actions
5. Take Action

BETA

Program Overview

Two MVP Grant Opportunities

RFR 1: MVP Planning Grant

RFR 2: MVP Action Grant

Nature Based Solutions

Nature-Based

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

Green Infrastructure

Low Impact Development (LID

Nature Based Solutions

Floodwater Detention and Retention Basins

Daylighting Rivers and Streams

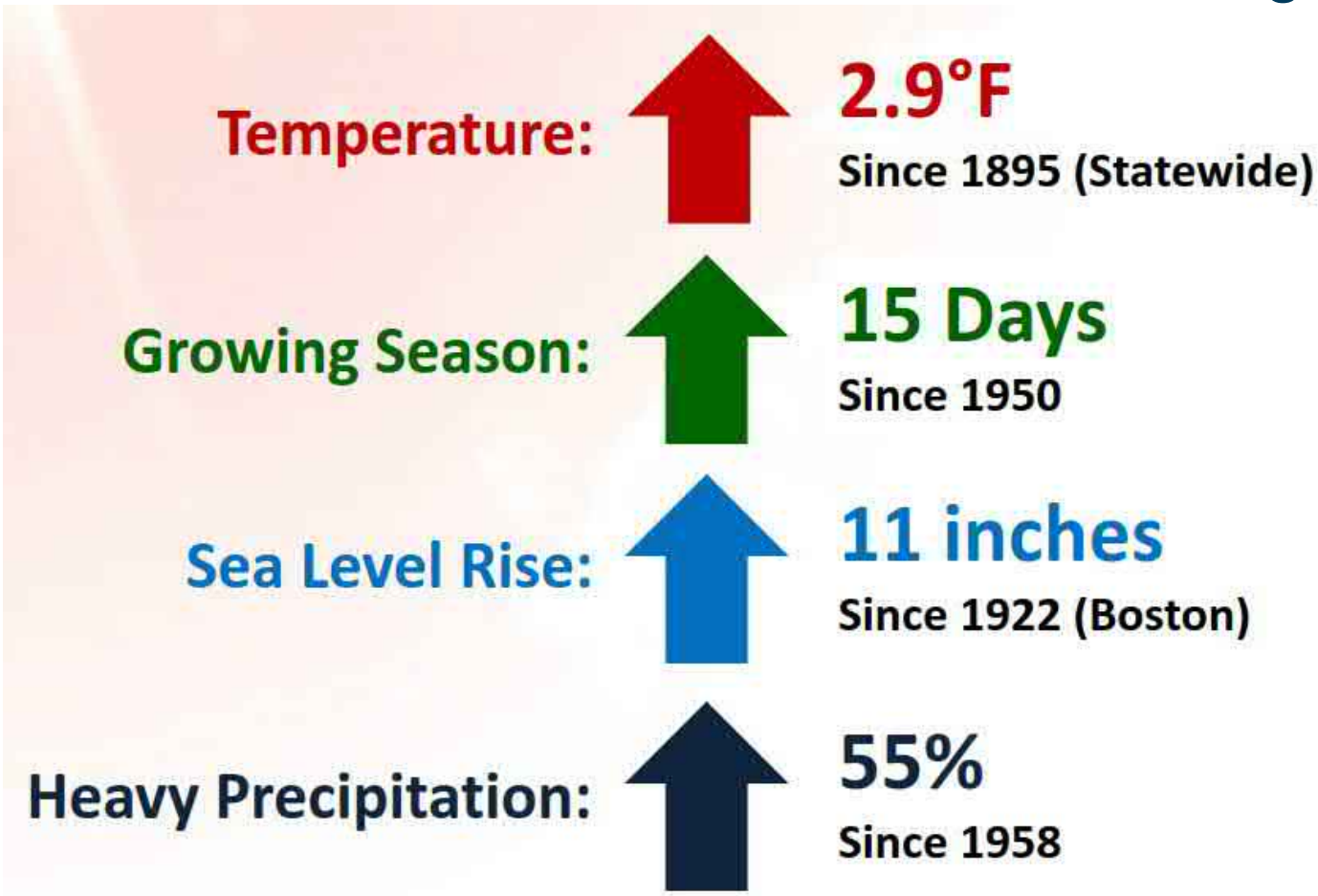
Open Space Preservation through Land Acquisition

Green Streets

Flood Friendly Culverts

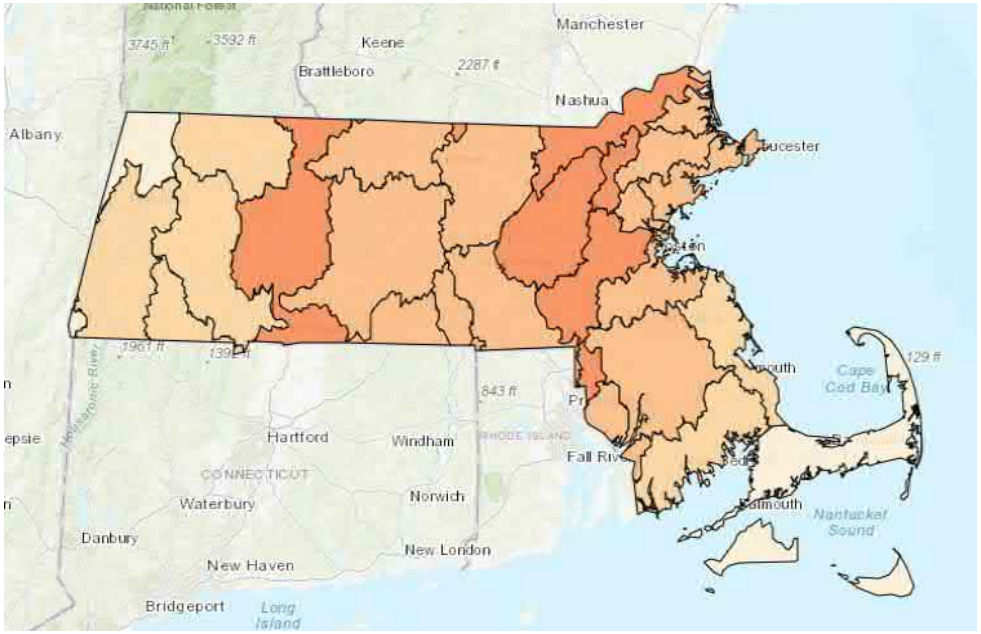
Regulatory and Policy Approaches to Address Hazards

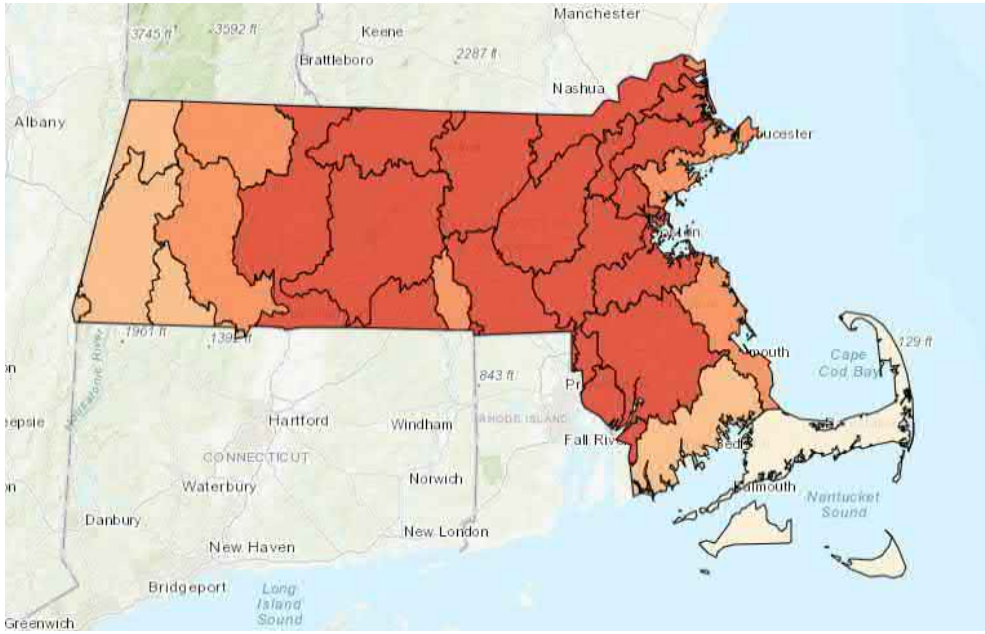
Massachusetts Observed Climate Changes



Massachusetts Projected Climate Changes

Change in # of Days above 90°F – 2050 Scenarios





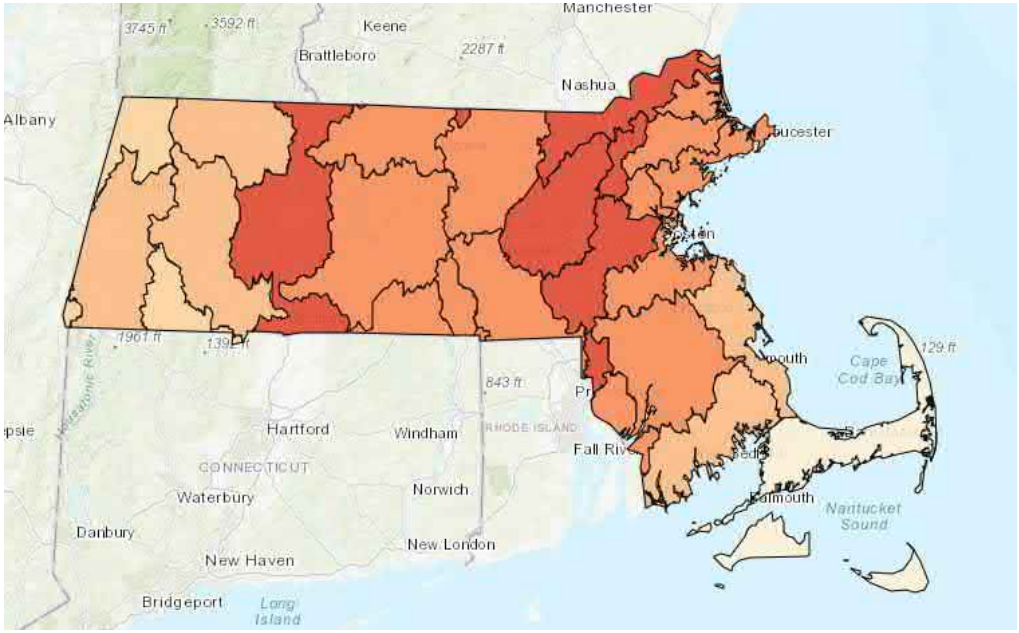
Projected change in # days above 90°F

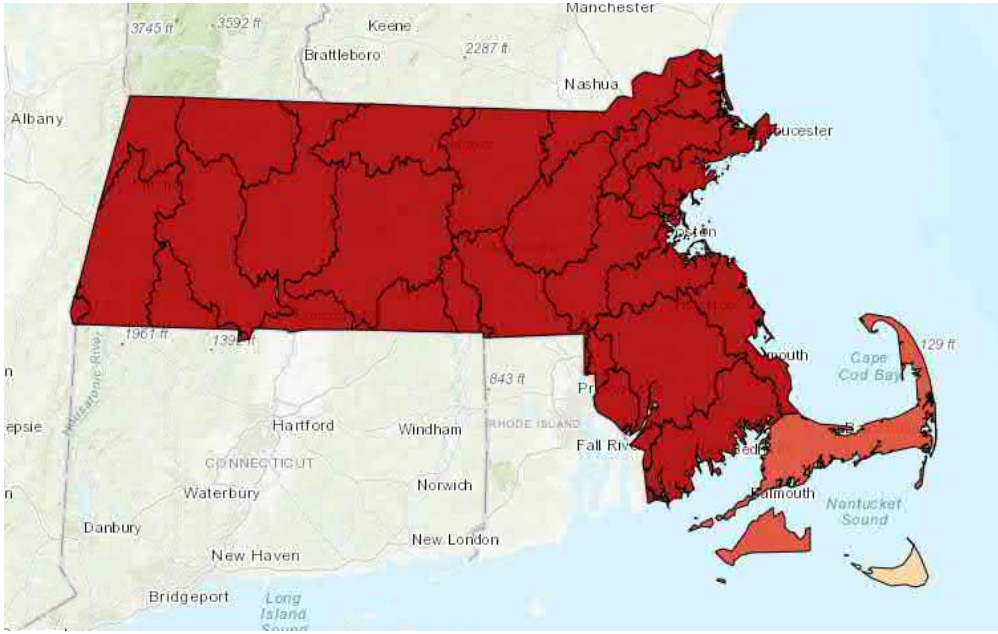
+7.6 +12.4 +16.5 +21.8 +39.4

BETA

Massachusetts Projected Climate Changes

Change in # of Days above 90°F – 2090 Scenarios





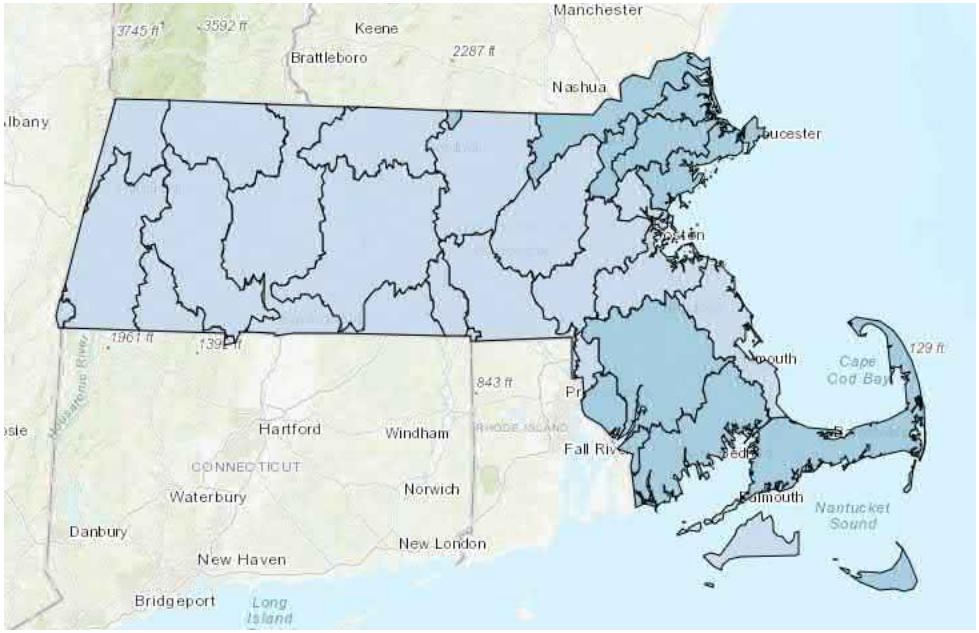
Projected change in # days above 90°F

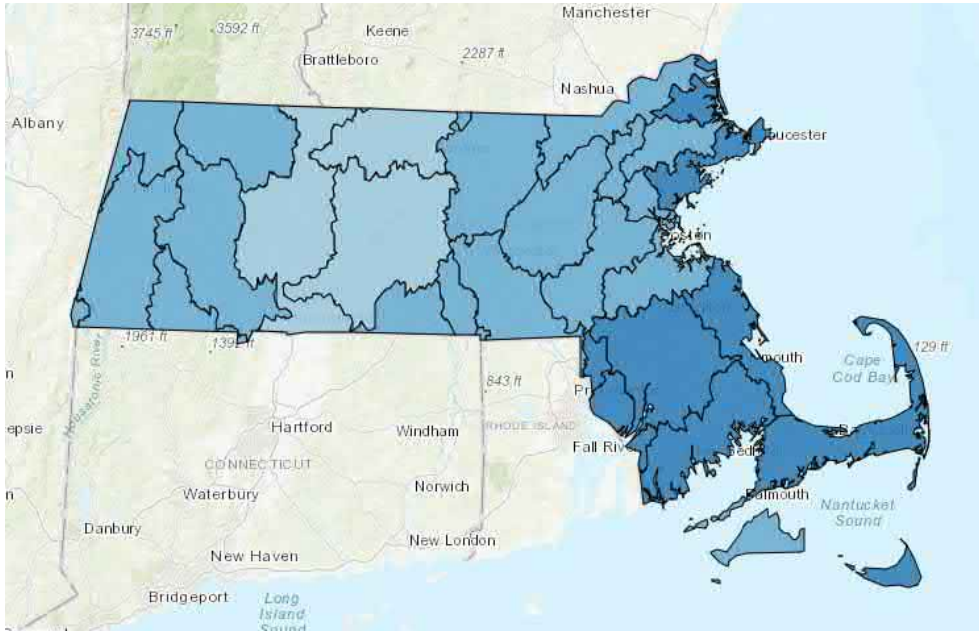
+7.6 +12.4 +16.5 +21.8 +39.4

BETA

Massachusetts Projected Climate Changes

Change in # of Days below 32°F – 2050 Scenarios





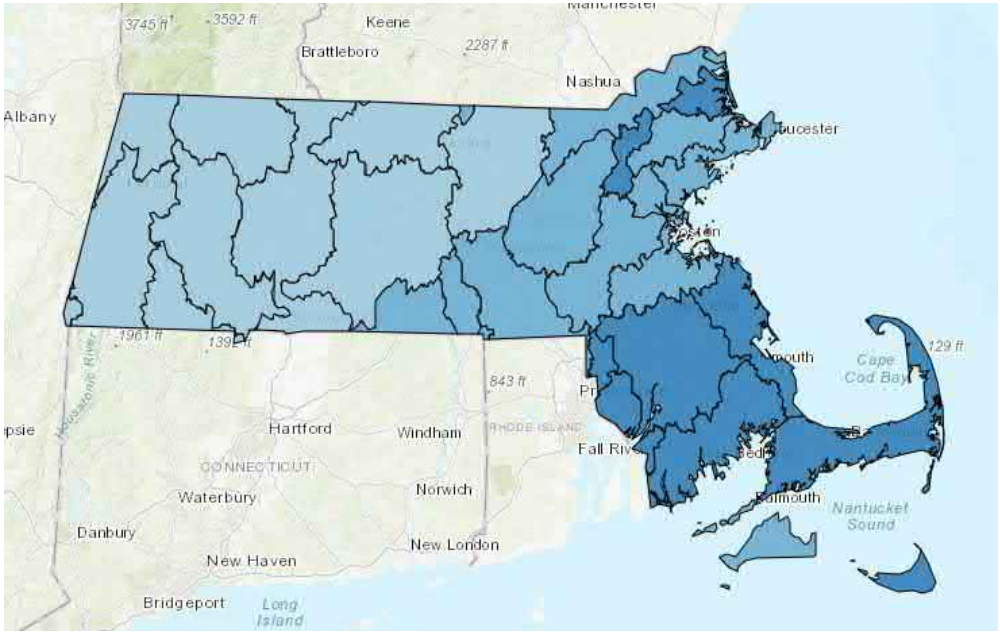
Projected change in # days below 32 °F

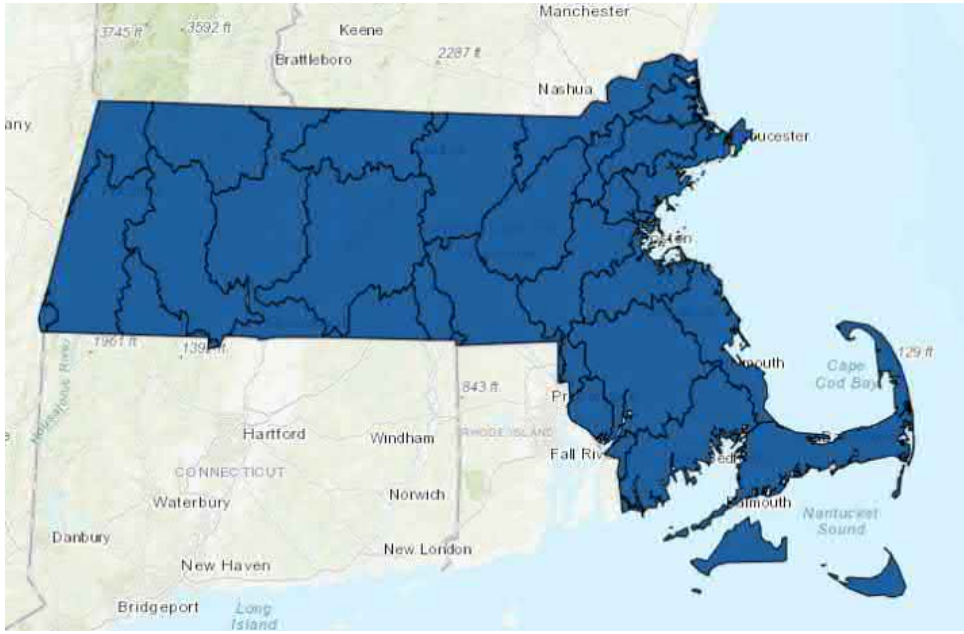
-20.6 -25.6 -30.8 -33.9 -47.3

BETA

Massachusetts Projected Climate Changes

Change in # of Days below 32°F – 2090 Scenarios





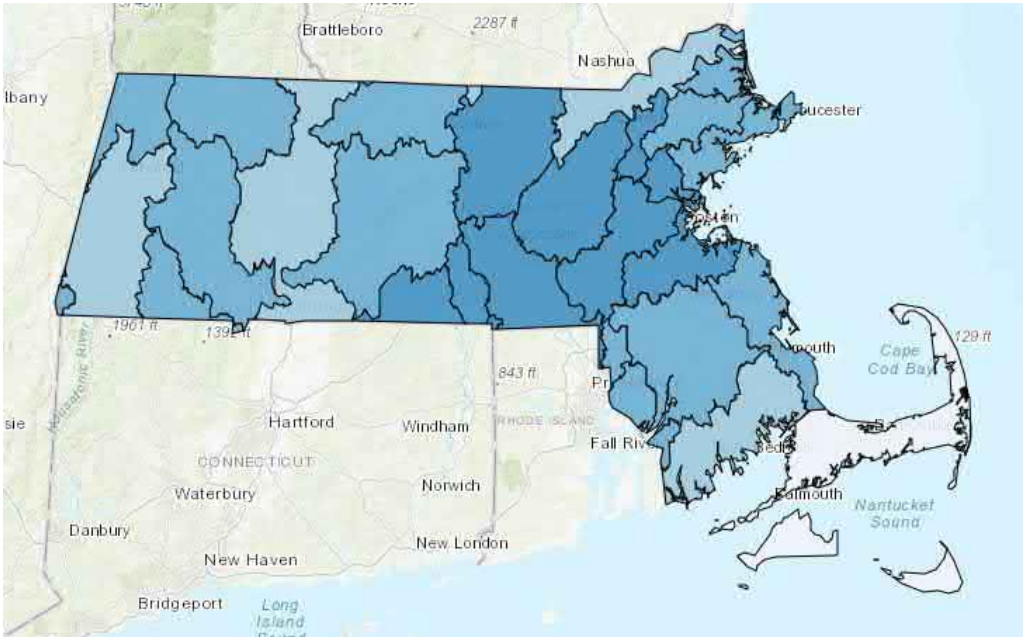
Projected change in # days below 32 °F

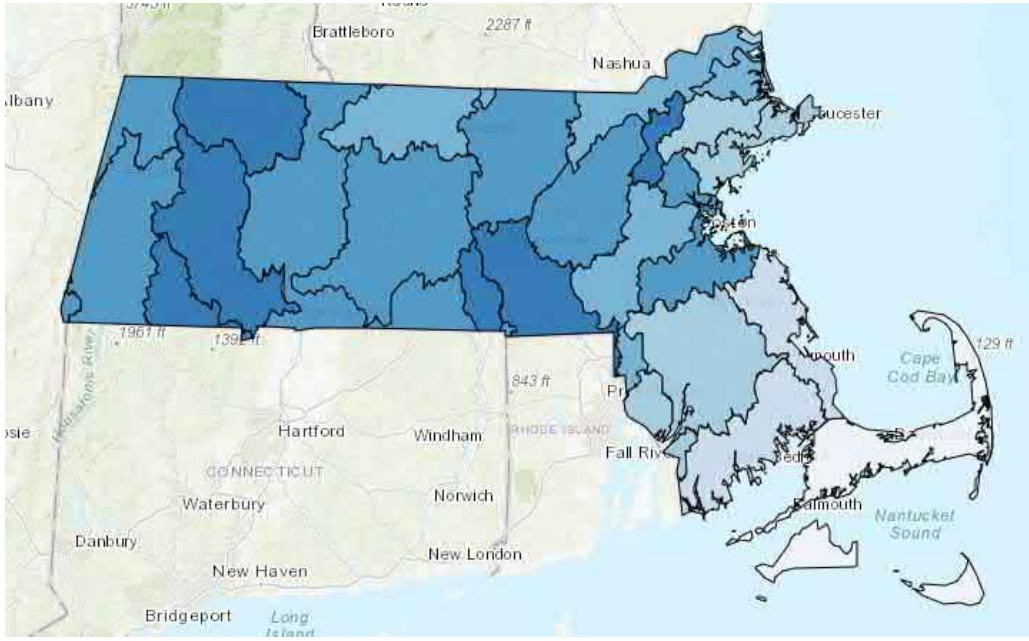
-20.6 -25.6 -30.8 -33.9 -47.3

BETA

Massachusetts Projected Climate Changes

Change in Inches of Precipitation– 2050 Scenarios



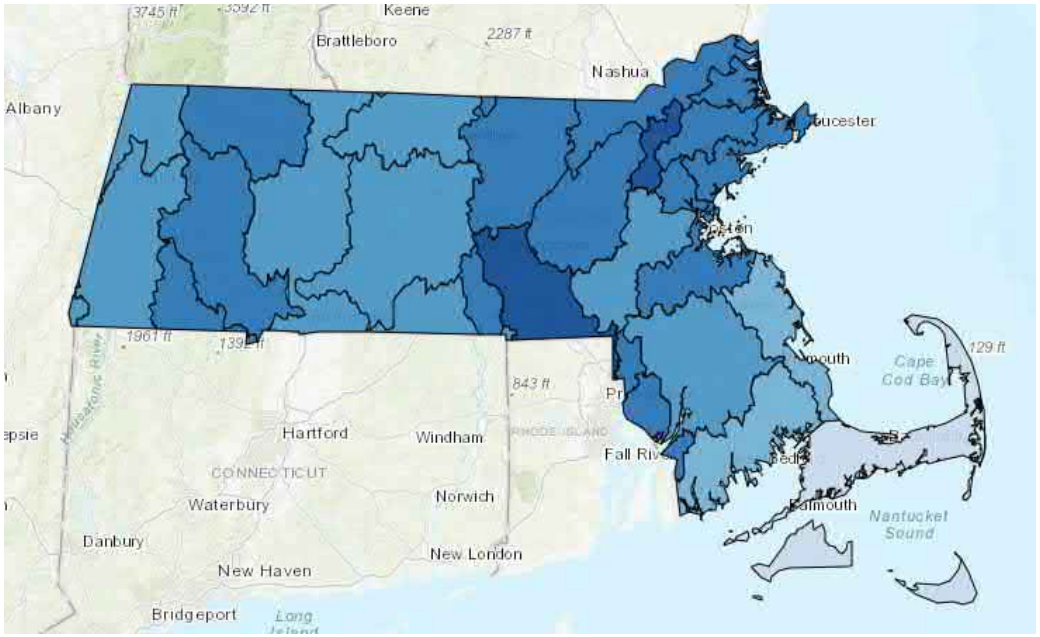


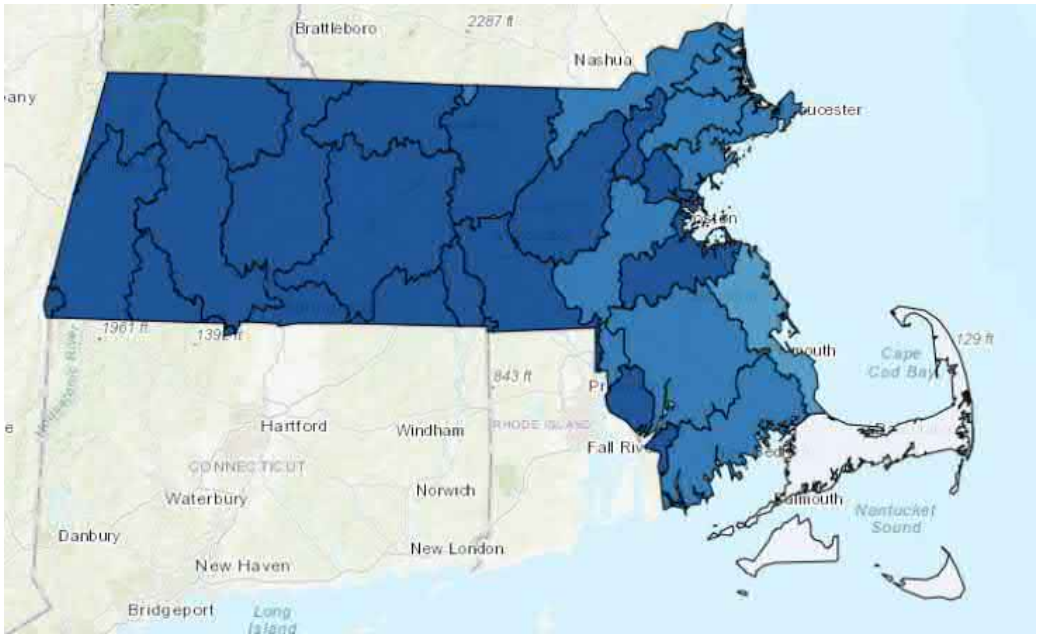
Projected change in inches of total precipitation

+1.9 +2.5 +3 +3.4 +3.9 +4.5

Massachusetts Projected Climate Changes

Change in Inches of Precipitation– 2090 Scenarios





Projected change in inches of total precipitation

+1.9 +2.5 +3 +3.4 +3.9 +4.5

BETA

Massachusetts Projected Climate Changes

Variable	Observed Value (1971-2000 average)	Change by 2050s	Change by 2090s
Annual average temperature	47.5 °F	Increase by 2.8-6.2 °F	Increase by 3.8-10.8 °F
Days per year with Temp > 90°F	5 days	Increase by 7-26 days	Increase by 10-63 days
Days per year with Temp < 32°F	146 days	Decrease by 19-40 days	Decrease by 24-64 days
Total Precipitation per year	47 inches	Increase by 0.9-6 inches	Increase by 1.2-7.3 inches
Number of days with precip > 1 in	7 days	Increase by 0-3 days	Increase by 1-4 days

Impacts from Climate Change

Increasing Temperatures

- Increase in heat-related illnesses
- Higher ozone levels and poorer air quality
- Changes to growing seasons
  - Algal blooms become larger and more frequent
  - Native species may decline and invasive species move in
  - Warmer winters contribute to increase in vector-borne diseases (Lyme, EEE West Nile)
- Larger demands on energy systems
  - Peaks in power demand during hot summer days can cause outages

Impacts from Climate Change

Increased Precipitation and Downpour Intensity

- Increased risk of flooding
  - Roadway ponding hazards and closures
  - Damage to roadways and infrastructure
  - Basement flooding
  - Increase potential for toxic mold build-up
- Water quality impacts
  - More frequent large rain events degrade habitat and carry soils and nutrients to lakes and waterways (elevated risk for swimming, fishing, drinking)
- Impact on agriculture and natural ecosystems

Impacts from Climate Change

Changes to Rain and Snow Patterns

- Reduced snow cover
- Impacts to habitats and species
- Potential increase in drought events
  - Local water supply shortages
- Extreme weather
  - Safety risks
  - Public service disruptions
  - Power outages
  - Infrastructure sustains more wear and tear

Workshop Overview

- Characterize Hazards
- Identify Community Vulnerabilities and Strengths
- Identify and Prioritize Community Actions
- Determine the Overall Priority Actions
- Develop Comprehensive Summary Products

Workshop Overview

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

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

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

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

Characterize Hazards

Identify past, current, and future hazards (large team).

Direct participants to make a list of hazards (causes of impacts) that the community has dealt with, currently faces, and anticipates experiencing in the future (i.e., tornados, ice/wind storms, drought, wildfire, tsunamis, sea level rise, landslides, earthquakes, etc.). Utilize the following triggering questions to accelerate dialogue and surface initial agreement on top four hazards.

- What hazards have impacted your community in the past? Where, how often, and in what ways?
- What hazards are impacting your community currently? Where, how often, and in what ways?
- What effects will these hazards/changes have on your community in the future (5, 10, 25 years)?
- What is exposed to hazards and climate threats within your community?
- What have been the impacts to operations and budgets, planning and mitigation efforts?
- Others concerns or considerations related to impacts?

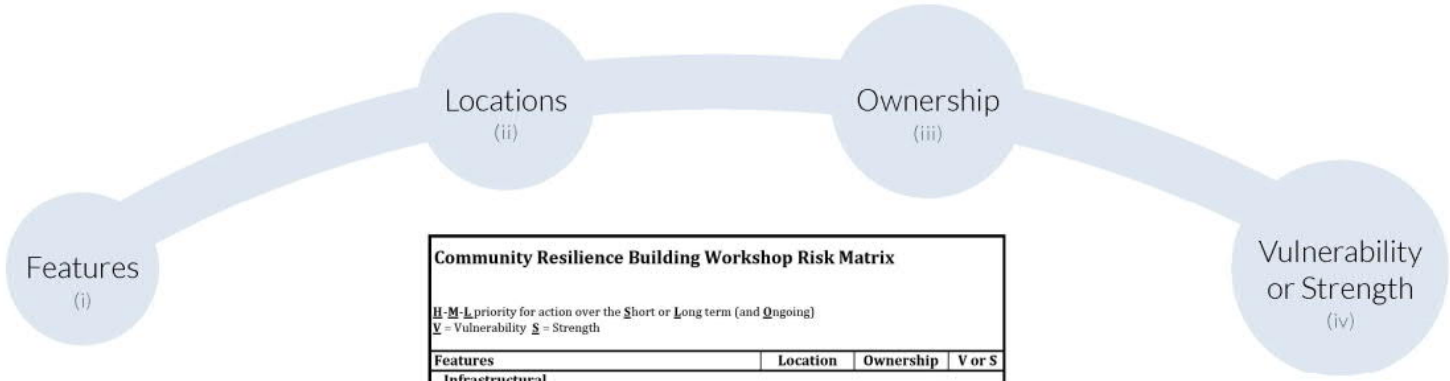
A **Hazard** is like the sun. The **Risk** from that hazard is sunburn. The **Vulnerability** includes the length of **Exposure** of skin to the sun. The **Action** to reduce risk from the hazard is to apply sunscreen or seek shade.

Top to bottom: © Rich Reid/TNC, © Devan King/TNC, © Jay Harrod/TNC

Hazard Characterization

- Inland Flooding
- Tsunami
- Severe Winter Storm
- Drought
- Extreme Temperatures
- Tornadoes
- Landslide
- Wildfires
- Coastal Flooding
- Invasive Species
- Earthquakes
- Coastal Erosion
- Hurricanes/Tropical Storms
- Other Severe Weather (strong wind, extreme precipitation)

Identify Community Vulnerabilities and Strengths



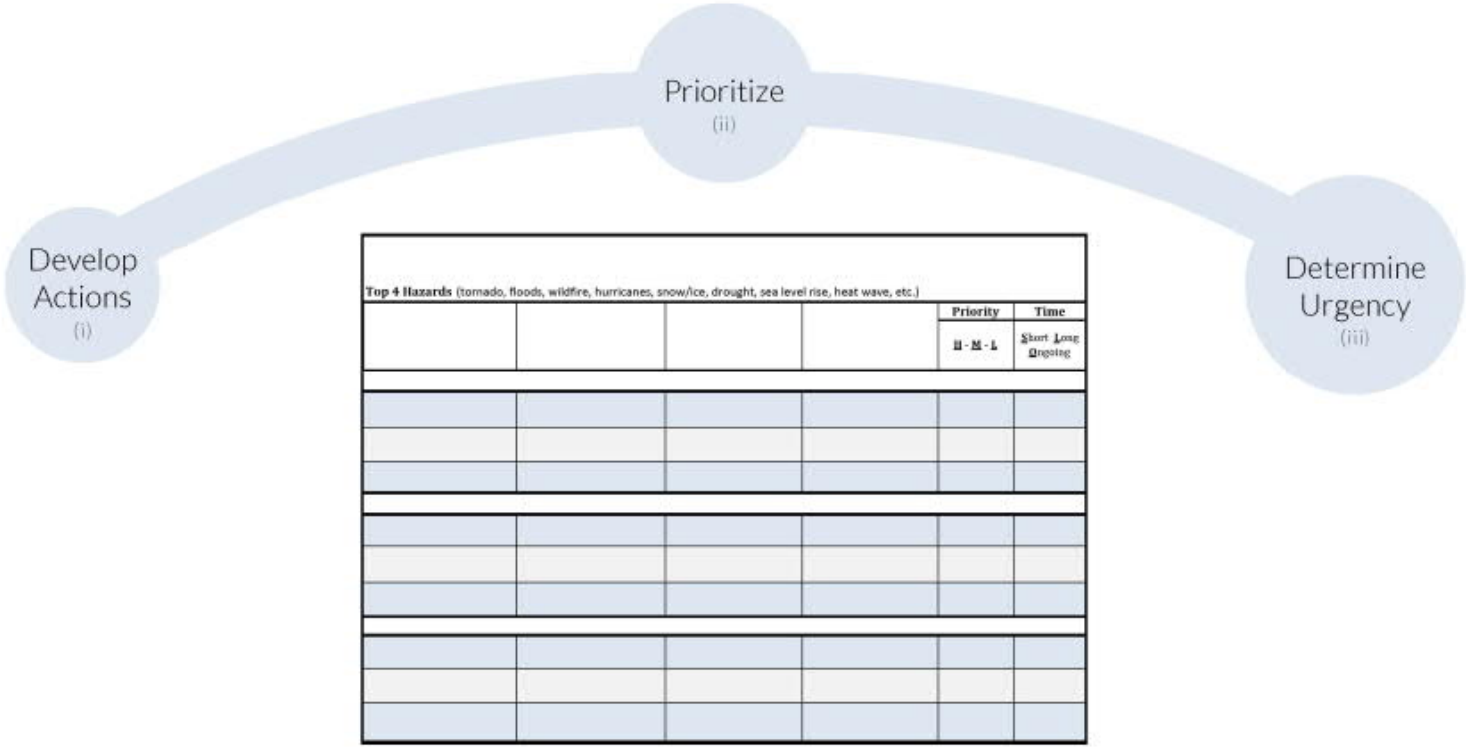
Community Resilience Building Workshop Risk Matrix

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

Features	Location	Ownership	V or S
Infrastructural			
Societal			
Environmental			

Steps C1, C2 and C3 below focus on identifying intrastructural, societal and environmental vulnerabilities and strengths. Each step requires three tasks to complete the Risk Matrix: **(i)** identify features, **(ii)** describe feature locations, **(iii)** identify feature ownership, and **(iv)** identify each feature as a vulnerability or strength, or both.

Develop and Prioritize Actions



Steps D1, D2 and D3 below focus on identifying and prioritizing intrastructural, societal and environmental actions. Each step requires three tasks to complete the Risk Matrix: **(i)** develop actions, **(ii)** prioritize actions (**H**igh, **M**edium, **L**ow), and **(iii)** determine urgency (**O**ngoing, **S**hort-term, **L**ong-term).

Example Actions

Community Resilience Building Workshop Risk Matrix

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

Top 4 Hazards (tornado, floods, wildfire, hurricanes, snow/ice, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Coastal Flooding SLR/Storm Surge	Inland Flooding and Rain Events	Ice and Snow	Wind	Priority H-M-L	Time S Long O ngoing
Infrastructural									
Town Campus	Specific	Town	V	Verify risk from flooding events; Identify alternative locations during peak flooding; Verify maintenance plan annually				H	S
Evacuation Routes - Roads	Town-wide	Town/State	V	Install highly visible signage for evacuation routes; Develop and implement communication program				H	S
Electrical Distribution System	Multiple	CL&P/Town	V	Within floodplain area, establish plan to address protection and long-term relocation of equipment		Upgrade transformers; Maintain power line protection zone (tree trimming)		H	O-L
Dams (inland and coastal)	Multiple	Private	V	Prevent possibility of catastrophic dam failure; Identify and remove dams to minimize downstream flooding due to failure				H	L
Railway and State Bridges	Multiple	Amtrak/State	V	Improve communications between parties; Expand green/grav infrastructure and improve bridge structures; Assess vulnerability and prioritize infrastructure improvement list				M	S
State Roads/Intersections	Town-wide	State/Town	V	Coordinate with DOT, volunteers, public works to improve response; Need signage to warn of flooding risk in critical intersections				M	L
Wharves and Shore Infrastructure	Shore	Town-State-Private	V	Pursue comprehensive shoreline management plan; Establish community dialogue on retaining/relocating infrastructure				L	S
Waste Water Treatment Facility	Specific	Town	V	Conduct alternative siting feasibility study; Relocate to low risk area within next 25 years.				L	L
New Ambulance Center	Specific	Town	S	Continue to support services in budget; Add additional staff and vehicle at next annual cycle					Ongoing
Zoning Regulations (maintain large lot size)	Multiple	Town	S	Current building codes control development in risky areas; Consider additional zoning incentives (TDRs) to reduce risk to residential units					Ongoing

More examples of actions:

- Improved access in high-risk locations
- Reduce housing stock in vulnerable areas
- Prioritize development in low-risk areas
- Integrate future risks in capital improvement plans
- Flood-proof manhole covers
- Secure new generators for critical facilities

When prioritizing, consider factors such as:

- Funding availability and terms
- Agreement on outstanding impacts from recent hazard events
- Necessity for advancing longer term outcomes
- Contribution towards meeting existing local and regional planning objectives

Examples of urgency:

- Current project to install hurricane-proof roof on school is an ongoing **(O)** action.
- Ensuring evacuation procedures are updated annually is considered a short-term **(S)** action.
- Reducing housing stock in high-risk areas, elevating a road, or replacing a bridge are long-term **(L)** actions.

Wrap-up

- Discuss actions and priorities
- Consensus on top five priority actions
- Questions?
- Next Steps
- Wrap-up

APPENDIX C

- Workshop Handouts

IMPROVING COMMUNITIES TOGETHER

Stoughton Municipal Vulnerability Preparedness (MVP) Program Workshop

TAUNTON RIVER BASIN CLIMATE CHANGE PROJECTIONS (PRECIPITATION)[1]

SUMMARY OF MODELING RESULTS

- Average annual precipitation could increase almost 7% by 2050s and 9% by 2090s.
- Greatest increase in precipitation will occur during winter months.
- Greatest increase in consecutive dry days will occur during fall months.

PRECIPITATION PROJECTIONS

Climate Parameter	Baseline (1971-2000)	Mid-Century (2050s)	End of Century (2090s)
Annual Precipitation (inches)	47.48	50.04 – 50.69	51.29 – 51.66
Winter Precipitation (inches)	12.13	13.01 – 13.18	13.58 – 14.63
Spring Precipitation (inches)	11.94	12.64 – 13.60	13.06 – 13.82
Summer Precipitation (inches)	10.99	11.02 – 11.86	10.90 – 11.56
Fall Precipitation (inches)	12.42	12.93 – 13.02	12.65 – 12.77
Annual Days with Precipitation over 1 inch	8.23	9.75 – 10.28	10.14 – 11.03
Annual Days with Precipitation over 2 inches	0.90	1.24 – 1.29	1.23 – 1.57
Annual Days with Precipitation over 4 inches	0.03	0.06	0.01 – 0.10
Annual Consecutive Dry Days	17.33	18.02 – 18.58	17.83 – 19.17

[1] Source: Northeast Climate Science Center, 2018. Massachusetts Climate Change Projections. University of MA Amherst. Published by MA Executive Office of Energy and Environmental Affairs. Available at: http://resilientma.org/data/datamajor-river-basins.

IMPROVING COMMUNITIES TOGETHER

Stoughton Municipal Vulnerability Preparedness (MVP) Program Workshop

TAUNTON RIVER BASIN CLIMATE CHANGE PROJECTIONS (TEMPERATURE)[1]

SUMMARY OF MODELING RESULTS

- By 2050, average temperatures could increase by 10%. By 2090, average temperatures could increase by 18%.
- Number of days with temperatures +90 °F could increase by 4 times as today by 2050. By 2090, there could be 8 times as many +90 °F than today.
- Number of days with temperatures below freezing could drop by almost 28% by 2050 and almost 49% by 2090.
- Less energy is expected to be spent on heating in the winter, but more energy is expected to be spent on cooling in the summer.

TEMPERATURE PROJECTIONS

Variable	Baseline (1971-2000)	Mid-Century (2050s)	End of Century (2090s)
Average Annual Temperature (°F)	49.85	53.61 – 55.02	54.74 – 58.80
Maximum Annual Temperature (°F)	60.27	63.91 – 65.28	65.06 – 69.09
Minimum Annual Temperature (°F)	39.44	43.33 – 44.77	44.46 – 48.62
Annual Days with Max Temp over 90°F	7.44	23.19 – 30.57	28.31 – 60.77
Annual Days with Min Temp below 32°F	129.76	103.09 – 93.51	93.69 – 66.26
Annual Heating Degree-Days (Base 65°F)	6,130	5,129 – 4,867	4,841 – 4,016
Annual Cooling Degree-Days (Base 65°F)	580	967 – 1,148	1,121 – 1,708
Annual Growing Degree-Days	2,622	3,327 – 3,623	3,564 – 4,484

[1] Source: Northeast Climate Science Center, 2018. Massachusetts Climate Change Projections. University of MA Amherst. Published by MA Executive Office of Energy and Environmental Affairs. Available at: http://resilientma.org/data/datamajor-river-basins.

IMPROVING COMMUNITIES TOGETHER

Stoughton Municipal Vulnerability Preparedness (MVP) Program Workshop

DEMOGRAPHIC DATA[1]

Parameter	Breakdown
Total Area	15.2 square miles
% of Land Use	Agriculture = 12.8% Forest = 62.7% Open Space = 7.7% Recreation = 0.1% Urban = 14.2% Water = 2.5%
Population	2,829
Age	0-19 = 20% 20-34 = 17% 35-64 = 48% 65+ = 16%
Household Income	<$40,000 = 17% $40,000 - $60,000 = 11% $60,000+ = 72%
% Below Poverty Line	4%
Race	Asian = 1% Black = 0% White = 97% Other = 2%
Ethnicity	Hispanic = 3% Not Hispanic = 97%
Environmental Justice	0%
% Population Over 65 Living Alone	1.9%
Asthma Emergency Visits	46.8 (age-adjusted rate per 10,000 people)
Pediatric Asthma Prevalence	8.9% of all children enrolled in grades K-8

[1] Source: MA Dept of Public Health, 2018. MA Environmental Public Health Tracking Community Profile for Plympton. Report Created on October 10, 2019.

IMPROVING COMMUNITIES TOGETHER

Stoughton Municipal Vulnerability Preparedness (MVP) Program Workshop

EXAMPLES OF STRENGTH AND VULNERABILITIES[1]

INFRASTRUCTURE

Examples of Vulnerabilities:

- Main road floods during storms, blocking emergency response.
- Power outages during heat waves lead to health concerns.
- Wildfire and high winds resulting in supply chain interruptions.
- Sewer pump stations become submerged and inoperable.
- Compromised rail system due to heat-related warping of tracks.

Examples of Strengths:

- Critical road elevated and passable by emergency management
- Hurricane roof installed at school with improved sheltering capacity.
- Hardened utility lines reduce outages due to ice storms.
- Undersized culvert replaced to reduce flooding in key intersection.
- Improvement to communication systems during extreme weather.

SOCIETAL

Examples of Vulnerabilities:

- Senior housing without backup generators during heat waves.
- Residents without access to transportation during hurricane evacuation.
- Household contamination and sewage mobilization during flooding.
- Limited areas of refuge in elementary schools during tornados.

Examples of Strengths:

- Reliable communications protocols across departments for all employees.
- "Neighbor-helping-neighbor" program aligned with emergency operations.
- Well-supported volunteer organizations (fire, ambulance, CERTs).
- Faith-based and civic groups with hazard preparedness plans.

ENVIRONMENTAL

Examples of Vulnerabilities:

- Proliferation of subdivisions in wildfire and flood prone areas.
- Lack of urban tree canopy increasing heat island effect.

Examples of Strengths:

- Forested watersheds maintain drinking water supply during droughts.
- Native, vegetated slopes remain stable after intense 24hr rain events.
- Floodplains provide stormwater storage and downstream flood reduction.

[1] Source: Community Resilience Building Workshop Guide, communityresiliencebuilding.com

APPENDIX D

- Workshop Matrices and Maps

Town of Stoughton, Massachusetts

Municipal Vulnerability Preparedness Program

CRB Workshop Map

I

- MWRA HOOKUP
- DAM REPAIR, CULVERT INV.
- WATER STORAGE, WELL UPGRADE
  - BACKUP POWER : BATTERY
- YMCA
- HIGH SCHOOL
- HELI-PAD
- TRAFFIC ISSUES
- COMMUNICATION

HWY TIPP ~~STEWART~~ SINKING ROAD sewer line & water line

SINAI HOSPITAL

School

School

CANTON

SHARON

AVON

BROCKTON

EASTON

5

- ELDERLY HOUSING EVAC PLAN
- EMERGENCY DISPENSE SITE
- LOCAL EVAC. ROUTE
- GREEN

E

- WETLANDS

MED CENTER

DAM

RESERVOIR POND

GLEN ECHO POND

BEAR SWAMP

BRITTONS POND

WOODS POND

MUDDY POND

FARRINGTONS POND

DRY POND

PUDS POND

MONTE POND

Whitman Brook

AMES LONG POND

Legend

Fire Stations	
Libraries	
Town and City Halls	
Local Police	
State Police	
County Sheriff	
Public School	
Private School	
Charter School	
Special Education School	
Assisted Living Facility	
Nursing Home	
Rest Home	

*No Dams Recorded in GIS

FEMA National Flood Hazard Layer Flood Zone Designations

- A: 1% Annual Chance of Flooding, no BFE
- AE: 1% Annual Chance of Flooding, with BFE
- AE: Regulatory Floodway
- X: 0.2% Annual Chance of Flooding
- Waterbody
- River/ Stream
- Wetlands
- Community Groundwater Source
- Surface Water Intake
- Non-Community Groundwater Source
- Emergency Surface Water

BETA

0 0.25 0.5 1 1.5 Mi

Town of Stoughton, Massachusetts

Municipal Vulnerability Preparedness Program

CRB Workshop Map

N

CANTON

AVON

SHARON

BROCKTON

EASTON

PUDS POND

MONTE POND

Redwing Brook Area

Woods Pond Area

Ames Long Pond Area

DW Sources

DW Source

RESERVOIR POND

Whitmarsh Brook

GLEN ECHO POND

BEAR SWAMP

BRITTONS POND

WOODS POND

MUDDY POND

FARRINGTONS POND

DRY POND

AMES LONG POND

Legend

- Fire Stations
- Libraries
- Town and City Halls
- Local Police
- State Police
- County Sheriff
- Public School
- Private School
- Charter School
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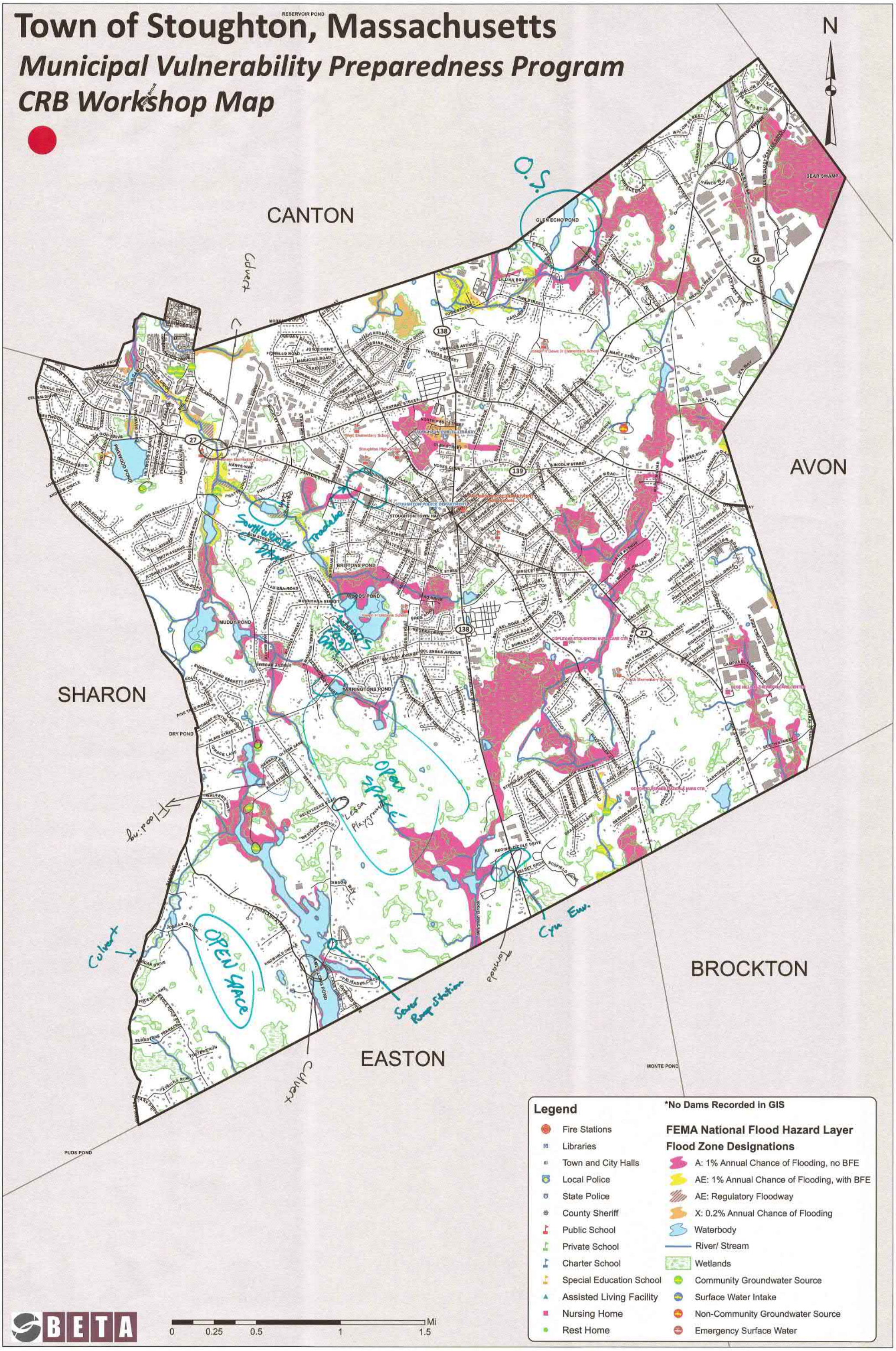
Town of Stoughton, Massachusetts

Municipal Vulnerability Preparedness Program

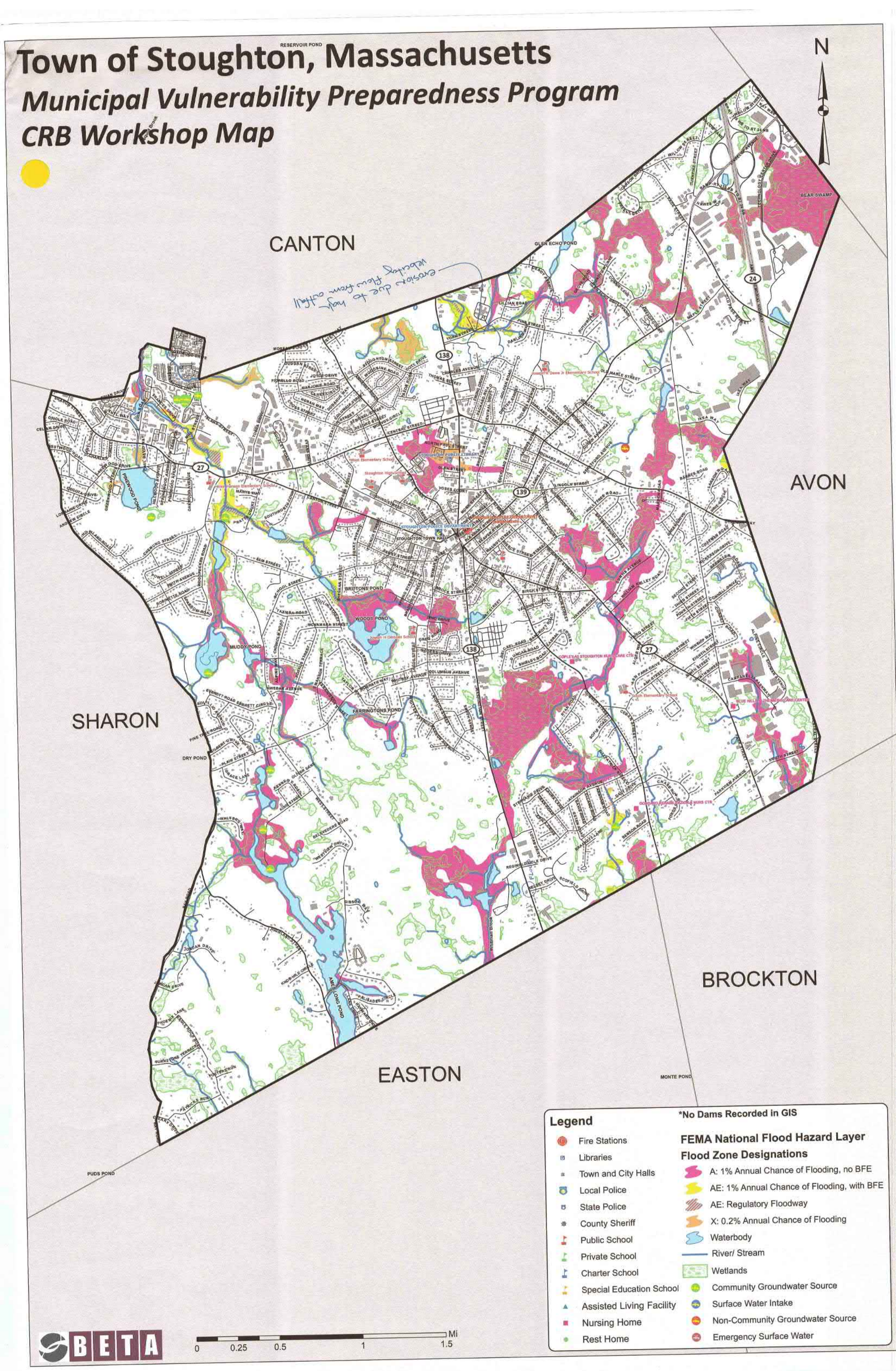
CRB Workshop Map



Town of Stoughton, Massachusetts

Municipal Vulnerability Preparedness Program

CRB Workshop Map



Legend

- Fire Stations
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BETA

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

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

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

Features	Location	Ownership	V or S	FLOODING/ DROUGHT	EXTREME TEMPS.	SEVERE STORMS	INVASIVE SPECIES	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
DAMS	· Pratt · Ames Pond · Other Locations	PRIVATE PUBLIC	V/S	· CONDITION ASSESSMENT		" "		M	L/O
CULVERTS	· All over TOWN	PRIVATE PUBLIC	V/S	· CONDITION ASSESSMENT *		" "		H	S
WATER SYSTEM	ALL OVER	PUBLIC PRIVATE	V/*	· C.A. · WATER DISPOSING SITE	C.A. "	C.A. "		M M	· O · S
COMMUNICATION SYSTEMS	TOWN WIDE	PUBLIC	V	· RUN FREQUENT TESTS, · CIVIL PREPAREDNESS (SCHOOL, ELDERLY,) W/ RFP		" "		H	S
SEWER SYSTEM	TOWNWIDE	PUBLIC	V	· CAPITOL IMPROVEMENT PLAN · EXTENDING SEWER SYSTEM · I/I, OVER FLOW SYSTEM		" "		M	O
ROAD INFRASTRUCTURE	· 139 TOWNWIDE	PUBLIC PRIVATE	V	· RTE 139 · POT HOLES, MAINTENANCE · OVERSIZING DRAINAGE IN TRAS. PROJECTS		" "		M	O
Societal ELECTRICAL SYSTEMS	TOWNWIDE	PRIVATE	V *	· CATCH BASIN CLEANING · TOWN SOLAR GRID ON TOP OF BUILDING		· BURYING UTILITIES · STRENGTHING SYSTEMS		H	
VULNERABLE POPULATION (SENIORS, KIDS, LOW INCOME)	TOWNWIDE	PUBLIC	V/S	· REVERSE 911 · COMMUNICATE COORDINATE W/ EMERGENCY RESPONSE TEAM	· COOLING STATIONS YMCA, WITH NOTIFICATION THROUGH REVERSE 911, FACEBOOK	· PRE PLANNING · EMERGENCY PLANNING · MBTA EVAC.	· EDUCATION CAMP.	H	O
SCHOOLS → EMERGENCY CENTER Health centers		PUBLIC	S	· ~~IMPROVE~~ ~~MIDDLE SOUTH~~ · ~~NEW HIGH~~ SCHOOL, · OLDER HEALTH # CENTER · EMERGENCY CHARGING STATIONS	· ACCESS SCHOOLS TO BE ALL HAVE POWER, LARGE SPACE, SCHOOL NURSE · CAN SCHOOLS COMMUNICATE?	EMERGENCY CENTER	· EDUCATION CAMP.	M	S.
STRONG COMMUNITY PARTNERS Business (YMCA, ~~TARGET~~, IKEA, TEMPLE, SHELTERS		PRIVATE	S	· PARTNERSHIP W/ CONTRACTORS FAITH BASED ORG. · ESTABLISH W/ MEMO OF AGREEMENT				L	O
STRONG COMMUNITY TIES / Resources people		PUBLIC	S	· MRC :. VOLUNTEER GROUP :. GETTING WORD OUT				L	O
EFFECTIVE COMMUNICATION		PUBLIC	V	· CELL PHONE PROGRAMS - DONATION		" "		H	S
RECREATION		PUBLIC	V *	· ADVISORY, WARNINGS · EDUCATION THROUGH HEALTH DEPT · TOWN-WIDE COORDINATION & CONSITENCY			· EDU. PROGRAMS · SIGNS, NOTICE	M	O
Environmental									
WATER QUALITY OF LOCAL LAKES, PONDS, STREAMS			V	· TESTING OF PONDS · MS4 :. REGULATIONS · GREEN INFR. IMPROVEMENTS · ~~MAINTAINING CBs~~		" " *	· PUBLIC EDUCATION I.E BIRD BATHS, ETC.	H	S
CONSERVATION LANDS			S	· ~~ADOPT A~~		· ADOPT A PARK · REGULAR MAINTENANCE	" "	L	O
ENCOURAGE MORE GREEN SPACE			S	· LAND DONATION · LAND UPKEEP · SOCCER FIELD UPGRADE MAINTAINING EXISTING LAND	" :. Reclaiming Vacant Land, public funded;		" "	~~H~~ L	O
~~FARM~~ AGRICULTURE			S	· IDENTIFY FARMS, REACH OUT WITH HELP (KEEP AG LAND)	" "	" "	" "	M	O
STREAM TRIB.			V	· PROTECT BUFFER ZONES WITH PLANTINGS · LIMIT SOIL BANK EROSION · ~~GROW~~ GREEN INFR.		· PUBLIC.. EDUCATION		M	O
VECTOR BORNE ILLNESS			V				· PUBLIC EDUCATION I.E. BIRD BATHS, STANDING WATER	H	O

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

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

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

Features	Location	Ownership	V or S	Flooding / Drought	Extreme Temperatures	Severe Storms	Invasive Species	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Culverts / Drainage System	TW	Town	V/S	Culvert / Drainage Studies Maintenance / Replace	—	Monitoring	—	H	Ongoing / Long Term
Woods Pond Dam	Woods Pond	Town	V/S	Maintenance Program	—	Maintenance Program	—	L	Ongoing
Electrical Grid	TW	National Grid	S	—	Increase Redundancy	Tree trimming Underground Eval.	—	M	Ongoing
Municipal Pump Stations	TW	Town	V/S	—	Increase Cooling/heat	—	Gen. Maintenance	H	Ongoing
Emergency Operations Center	Rose Street	Town	V/S	Upgrade EoC Increase Communications	→	→	—	H	Long Term (3-5?)
Water Distribution Systems / Wells	TW	Town / Private	V/S	Explore alternative locations	→	→	Gen. Maintenance	H	Ongoing / LT
Societal									
Parks / Fields / Playgrounds	TW	Town	S	—	Increase shade/cooling	Snow removal	Gen. Maintenance Pest Control	L	Ongoing
Vulnerable Populations	TW	—	V	Pub. Outreach / Education Communication	Cooling / warming stations →	→	Pest control	H	Ongoing
Schools	TW	Town	V/S	Education Upgrade heating/cooling →	→ Generators →	→	Pest control Gen. Maintenance	H	Ongoing / LT
Public Safety	Rose Street / TW	Town	V/S	Education / Communication Pub. Outreach / Equipment →	→	→	—	H	Ongoing / LT
Shelters	Rockland Street Library	Town	V/S	Increase equipment Add locations Pub. Outreach →	→	→	—	M	Ongoing / ST
Senior Center	Rockland Street	Town	V/S	Heating/cooling Backup Power Emergency Supplies / Transportation →	→	→	—	M	Ongoing / ST
Environmental									
Ames / Long Pond Area	Southwest Area	Town / Private	V/S	Drainage Study	Hydrant locations Distribution Improvements	Drainage BMPs installed ↓	Gen Maintenance Pest Control ↓	M	Long Term
Red Wing Brook Area	Northern Area (Central)	Town / Private	V/S	Culvert upgrade Drainage Study	Bank stabilization	↓	↓	M	Long Term
Impaired Water Bodies	TW	Town / Private	V/S	Water Quality Improve Pub. Outreach	Nitrogen / Phosporous	↓	↓	M	ST / LT / Ongoing
Open Space	TW	Town / Private	V/S	Land acquisition	Fire prevention Equipment	—	↓	L	Long Term
Drinking Water Sources	TW	Town / Private	V/S	Pub. Outreach	Pub. Outreach	↓	↓	H	Ongoing
Lakes + Ponds	TW	Town / Private	V/S	Pub. Outreach	Gen. Maintenance Nitrogen Phosporous	↓	↓	H	Ongoing / LT

Community Resilience Building Risk Matrix

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V = Vulnerability **S** = Strength

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

Features	Location	Ownership	V or S	Flooding / Drought	Extreme Temperatures	Severe Storms	Invasive Species	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Culverts & Dams	Town-Wide	Town & Private	V&S	Maintain, Replace & Upgrade & Evaluate need for ↑ - investigate culvert widening/stream cleaning/	X	Develop Maintenance Plan →	→	H	O
Treatment Facility/Pump Stations				Evaluate/upgrade flood barriers - Maintain connection w/ MWRA in case of drought	X	· Maintain generators & Plant access · Private Plants ↳ update O&M Plans	X	M	O
~~Wastewater~~ & Drainage Innfra. / ~~Residential Flooding~~				- O&M current assets ↳ I/I, CB cleaning, outfall monitoring - Upgrade undersized Pipes	X →	→ to prevent ponding for Mosquito Breeding		M	O
Sheltering/Cooling Facilities			S	Assess Shelter Capacity →	look into Peter call/other Communication	Maintain/Assess inventory of Resources · Assess Transportation - Plan	X	L	S
Emergency Services		Town	V&S	Maintain drainage near current Facilities · Construct new Public Safety Bldg (Fire Relief)	←	Maintain Energy Generator · Update Energy Action Plan	X	H	O/L
Public Transportation				BAT/MBTA to Maintain Access · Increase Services during Emergency	A/C on Buses - Bus Stop Shelters	→	X	L	S
Societal									
Non-English Speaking Pop	Town Wide	\	V	(TRANSLATED) Communication ↳ All Emergency Call Website/FB Posts flyers etc	→	→	→	H	S
Religious Communities		Private	S	Maintain & Improve communication - Increase town info at religious/family Events - Encourage Communities to attend large or important town events	→	→	→	L	O
Vulnerable Age Population		\	V	Create inventory of available resources · Continue to utilize OASIS seniors & expand to other demographics · Continue outreach	- Identify (list) Vulnerable People to contact during extreme events - Neighbor check in? - Transport to Shelter?	Work w/ COA for Emergency Preparedness Training	→	H	O
Low-Income Pop.		\	V	Work w/ for Emergency Prep Training · Utilize free lunch Program for outreach opportunities	Heating/Cooling Cost assistance · Work w/ Housing Authority	→	→	M	O
~~Business~~ Business Community		Private	S	Continue outreach/distributing Stormwater · Encourage water Conservation & Rain Use & Energy Conservation Incentive program/ Sponsorship opportunities?	info during permitting	→	→	L	O
Energy & Sustainability Committee		Public	S	Community outreach ↳ MASS SAVE · Resource for Town gov. & residents	Continue working towards energy consultant · work to minimize town's omissions/cost	→	X	M	O
Environmental									
High Ground Water		\	V&S	- Expand sewer system into High ground water & well areas - Continue I/I efforts (CCTV program)	X	→	X	H	O
Playgrounds Near Woods		Town	V	ensure Proper drainage & playground appearance	Consider installation of water features for cooling	→	- Install flying spray dispensers · Promote insect-transmitted illness awareness · outreach during outbreaks and EEE-weeks · Install signs w/info	L	S
Open Space		Town & Private?	S	Maintain Protections · obtain more · Ensure Maintenance of flood Storage Protection Capacity	→	Maintain access to Community trails	- Maintain proper drainage avoid standing water.	L	O
Lake Management		Town	S	Maintain/evaluate inlet/outlets to lake	Maintain Almas Pond Beach	Storm water Sampling & notification of impairments/ continue outreach	Continue Removal of Invasive Plants	M	O
Tree Management		Town & Private	V&S	Encourage tree health	Plant more street trees	· Maintain trimming & clearing around utilities · Continue easement clearing program	Continue outreach on tree-affecting invasives - Spray for beetle Clapboard Mass	H	O
LID / Green Infra Measures			S	- Review Regs. to incorporate advocacy of LID measures · minimize impervious surfaces · continue & expand Streetscape proj · continue Smart water management	Encourage vegetated areas & reduce impervious areas · Encourage efficient building - green Roofs!	Maintain Stormwater Operation @ Elementary Schools & other town facilities	→	H	O

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

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

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

Features	Location	Ownership	V or S	Extreme Temps.	Severe Storms	Flooding / Drought	Invasive Species	Priority H-M-L	Time S L O
Infrastructural									
POWER GRID	TW	Private	V	Expand relationship and communication with utility companies. Back up Power. Hardean Elect. System.	Tree Management (Util. Comp) Debris Management (Town)	—	—	H	S, L & O
STORMWATER MGT. SYSTEM	TW	Combined	V/S	Retrofit properties & infrastructure with LIDs & BMPs.	Rx Stormwater Bylaw & Regulation Review + update to reflect future rainfall	Incorporate LIDs into Town Facilities and private properties. Drain conveyance study: Study current and conditions	Maintain BMPs to prevent mosquitos.	H	S, L, & O
SEWER PUMP STATIONS AND TOWN SEWER / SEPTIC SYSTEMS	TW	Municipal & Private	V/S	—	Continue to implement I/I plan. Complete PS upgrades. Educate residents about not putting flood water in sewer.	Study to identify septic needs in flood prone areas	—	M	L
WATER SYSTEM TREATMENT & DISTRIBUTION	TW	Municipal	V/S	Implement/Establish a consistent water management plan & restrictions.	Investigate vulnerability of wells located in flood zone	Implement BMPs & Plan during drought. Update current plan. Look at resting wells during Summer/drought yrs. MWRA instead		M	S, L & O
Culvert CROSSINGS	TW	Combined	V	-		Identify/Solve culverts that need to be upgraded?		M	O
DAMS	TW	Combined	V	-		Examine, Evaluate and repair, replace or remove dams.		M	S, L
Societal									
Shelters/COOLING & WARMING	HS & Senior C. & Library	Municipal	S	Officially dedicate facilities to be shelters. Annually update & enhance shelter Em Op plan		Update EOC (emergency operations center)		M	L, O
Schools	TW	Municipal	V/S	Review how to prevent missed school days Install AC in bldgs				M	L, O
SENIOR POPULATION	TW	Town/state/Private	V	Establish Public Education Plan for notification of shelter facilities & resources & dangers of heat related injuries				H	S, L, O
~~NON-NATIVE~~ DIVERSE SPEAKING POPULATION	TW	N/A	V/S	Train/educate town staff on resources available for communication with various populations	*Alternative fuel education			M	S, L, O
HEALTH CARE FACILITIES	Multiple	Private	V/S	Encourage changes in State mandates to meet with Town to establish emergency action plans				H	S
Impoverished cross section of society	TW	Town/Private	V	~~Train/educate town staff on~~				M	S, L, O
Environmental									
VECTOR BORNE DISEASE	TW	Public	V	*Public education. Take advantage of state resources Better network/signage + communication with state/county for mosq. tick control				H	O
FLOOD ZONES	TW	Municipal/Private	V/S			Preserve and restore flood plain. Engineering study to determine and update zone AE's in town.		M	L, O
STREAMS PONDS WETLAND RESOU. AREAS	TW	Municipal/Private	V/S		Identify and eliminate stormwater pollution sources.	Red Wing Brook Study + Restoration to withstand storm flows.		H	S, L
UPLAND OPEN SPACE	TW	Municipal/Private	V/S			Aquire property secure funds to aquire/expand open space.		M	O
WildLife HABITAT	TW	Municipal/Private	V/S			Study to identify habitat that should be preserved.		M	O
~~UPPER REAC~~ Eutrophication & POND MGT.	Multiple/TW	Municipal	V/S				Continue to implement management plan	H	O

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

Combined Ranking Matrix

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	Flooding / Drought	Extreme Temperatures	Severe Storms	Invasive Species	Priority H - M - L	Time Short Long Ongoing
Infrastructural									
Dams (esp Woods Pond Dam)	Pratt Pond, Ames Pond, Woods Pond & Other	Public & Private	V & S	Condition Assessment Examine, Evaluate and repair, replace or remove dams, Maintenance Program		Condition Assessment Examine, Evaluate and repair, replace or remove dams, Maintenance Program		M	L & O
Communication Systems	Town-wide	Public	V	Run Frequent tests, civil preparedness				H	S
Road Infrastructure	139 & Town-wide	Public & Private	V	Catchbasin Cleaning, Route 139, Pot hole maintenance, oversizing drainage in Transportation projects				H, L, M	S & O
Power Grid	Town-Wide	Town & Private	V		Increase community Solar & other alternative energy sources (Town solar grid on top of building), Increase Redundancy. Expand relationship and communication with utility companies. Back-up Power. Harden Electric System, Tree management (utility companies) Debris management (town), Burying utilities & strengthening systems Evaluation			H	S, L & O
Stormwater Management System	Town-Wide	Town & Private	V & S	Incorporate LIDs into Town Facilities and private properties. Drain conveyance study. Study current Ground water conditions. Study to identify septic needs in flood prone areas, Drainage Studies on O&M of current assets: CB cleaning, Outfall	Retrofit properties & infrastructure with LIDs & BMPs	Stormwater Bylaw & Regulation review & update to reflect future rainfall O&M of current assets: CB cleaning, Outfall Monitoring, Upgrade Undersized Pipes etc.	Maintain BMPs to prevent pooling mosquitos for mosquito breeding	H	S, L & O
Sewer System/ Septic Systems	Town-wide	Public & Private	V & S	Capital improvement plan, extending sewer system, I/I overflow system, O&M of current assets, Upgrade Undersized Pipes etc. Incorporate LIDs into Town Facilities and private properties. Drain conveyance study. Study current Ground water conditions. Study to identify septic needs in flood prone areas		Continue to implement I/I plan. Educate residents about no putting flood water in sewer		M	L & O
Treatment Facility/ Pump Stations	Town-wide	Town & Private	V & S	Evaluate/upgrade flood barriers, Incorporate LIDs, Maintain connection w/ MWRA in case of drought	Increase Cooling/heating	Maintain generators & plant access, Private Plants to update O&M Plans, Complete pump stations upgrades, . Educate residents about no putting flood water in sewer	General Maintenance	M	O
Water Distribution Systems/ Wells & Treatment	Town-wide	Town & Private	V & S	Condition Assessment, Water Dispensing Site, Explore alternative locations Investigate vulnerability of wells located in Flood Zone, Implement BMPs & Plan during drought. Update current plan. Look at resting wells during summer/ drought and use MWRA instead	Implement/ Establish a consistent water management plan & restrictions	Investigate vulnerability of wells located in Flood Zone	General Maintenance	M	S, L & O
Culverts	Town-Wide	Town & Private	V & S	Condition Assessment, Identify/survey culverts that need to be upgrade, Evaluate need for maintenance, replacement & upgrades of system , Investigate culvert widening/ stream crossing		Condition Assessment, Develop Maintenance Plan & monitor		M	S, L & O
Sheltering/ Cooling Facilities	Town-Wide	Town & Private	S	Assess shelter capacity	Assess shelter capacity, look into Robo-call/other communication	Assess shelter capacity, Maintain/assess inventory of resources, Assess Transportation-Plan		L	S
Emergency Services & Operations Center	Town-Wide	Town	V & S	Maintain drainage near current facilities, Construct new pub. safety Bldg (Fire/ Police), Maintain Emergency Generators, increase Communication	Upgrade Emergency Operation Center Increase Communications Maintain Emergency Generators	Maintain Emergency Generators	Maintain Emergency Generators	H	O & L
Public Transportation	Town-Wide	Town	V & S	BAS/MBTA to Maintain Access, increase services during large events	A/C on Busses - Bus Stop Shelters	BAS/MBTA to Maintain Access, increase services during large events		L	S
Societal									
Vulnerable Age Population	Town-Wide	-	V & S	Identify (list) Vulnerable people to contact during extreme events, Institute neighbor check in, option for transport to shelter, Work with Council on Aging for Emergency Preparedness Training, Create Inventory of available resources, Continue Outreach, Reverse 911, Communicate coordinate with emergency response team, Establish public Education Plan for Notification of shelter facilities & resources & dangers of heat related injuries, generator safety education, Continue to utilize OASIS services & expand to other demographics, Work for emergency Preparation Training, Utilize free lunch program for outreach opportunities		MBTA evacuation	Education camp for Students, Pest Control	H	Various
Low-Income Population	Town-Wide	-	V & S	Institute neighbor check in, option for transport to shelter, Create Inventory of available resources, Continue to utilize OASIS services & expand to other demographics, Public Outreach/ Education Communication, Work for emergency Preparation Training, Utilize free lunch program for outreach opportunities, Generator safety education, Reverse 911, Communicate coordinate with emergency response team, Pre-planning, emergency planning	Heating/Cooling stations or cost assistance, work with Housing Authority	MBTA evacuation		M	Various
Non-English Speaking Population	Town-Wide	-	V & S	Translate Important Communication: All emergency calls, website posts, Facebook posts, texts etc. Train/educate town staff on resources available for communication with various populations, Generator safety education				H/M	Various
Schools - Emergency Center, Health Centers	Town-wide	Town	V & S	Update Older health center, add emergency charging, Review how to prevent missed school days, Install AC in buildings	Access schools to be emergency enters - all have power, large space, school nurse etc., ensure schools can communicate, Generators, Upgrade Heating/ Cooling, Review how to prevent missed school days, Install AC in buildings		Education camp, Pest Control General Maintenance,Review how to prevent missed school days, Install AC in buildings	M	Various
Religious Communities	Town-Wide	Private	V & S	Maintain & Improve communication, Increase town information at large festivals & Events, Encourage communities to attend large or important town events. Partnership with Faith based organizations, Establish with memo of agreement, MRC volunteer group getting word out				L	O
Business Community	Town-Wide	Private	V & S	Continue outreach/ distributing stormwater info during permitting, encourage water conservation& Reuse & Energy conservation, incentive program/Sponsorship opportunities, Partnership with contractors, Establish with memo of agreement, MRC volunteer group getting word out				L	O
Effective Communication		Public	V	Cell phone donation programs				H	S
Recreation (Parks/ Fields/ Playgrounds)	Town-wide	Town	V & S		Increase Shade/ cooling, Advisory warnings, education through health department, Town-wide coordination & consistency	Snow Removal	General Maintenance & Pest Control, Education programs, signs notice	L/M	O
Public Safety	Rose Street/ Town-wide	Town	V & S	Education/ Communication Public Outreach/ Equipment				H	O & L
Shelters	Rockland Street Library	Town	V & S	Increase Equipment, Add locations, Public Outreach,Officially dedicate facilities to be shelters, Annually update & enhance shelter Emergency Operation Plan, Update Emergency Operation Center, High School, Library, Senior Center				M	Various
Senior Center	Rockland Street	Town	V & S	Heating Cooling, Backup Power, Emergency Supplies/Transportation				M	O & S
Health Care Facilities	Town-Wide	Private	V & S	Generator safety education, Encourage changes in-state mandates to meet with Town to establish emergency action plans, generator safety education				H	S
Energy & Sustainability Committee	Town-Wide	Private	V	Community outreach (Mass Save) Resources for Town Government & Residents	Continue working towards energy consultant, Work to minimize town emissions/cost			M	O
Environmental									
High Ground Water/ Drinking Water Sources	Town-Wide	Town/Private	V	Expand sewer system into high ground water & well areas, continue I/I efforts & O&M program, Public Outreach	Public Outreach	Drainage BMPs Installed, Expand sewer system into high ground water & well areas, continue I/I efforts & O&M program	General Maintenance Pest Control	H	O
Encourage More Green Space/Wildlife Habitat	Town-wide	Town/Private	V & S	Study to identify habitat that should be preserved, Land Donation, Land Upkeep, Soccer field upgrade maintaining existing land	Reclaiming Vacant Land, Public funded, Land Donation, Land Upkeep, Soccer field upgrade maintaining existing land		Public Education i.e. Bird baths, standing water etc.	M	O
Agriculture			S	Identify Farms, Reach out with Help (keep agriculture land)			Public Education i.e. Bird baths, standing water etc.	M	O
Playground Near Woods	Town-Wide	Town	V & S	Ensure proper grading and drainage , Playground improvements	Consider installation of water features for cooling	Ensure proper grading and drainage , Playground improvements	Install bug spray dispensers, Proactive insect treatment/ Coordinate with county, Outreach during outbreaks of EEE and other Vector borne disease, Install signs w/ info	L	S
Tree Management	Town-Wide	Town & Private	V & S	Encourage Tree Health	Plant more street trees	Maintain trimming & clearing around utilities, Continue easement clearing program	Continue outreach on tree-affecting invasive, Spray for beetle & gypsy moss	H	O
LID / Green Infrastructure Measures	Town-Wide	Town & Private	V & S	Review regulations to incorporate advocacy of LID measures, Minimize impervious surfaces, continue & expand streetscape project, Continue smart water management	Encourage vegetated areas & reduce impervious areas, Continue & expand streetscape project, Encourage efficient buildings, Green Roofs	Maintain stormwater detention at Elementary Schools & other town facilities	Maintain proper drainage to avoid standing water	H	O
Vector Borne Disease	Town-Wide	Public	V	-	Public education - Take advantage of state resources, Better networking & communication with state/county for mosquito & tick control	-	Public Education i.e. Bird baths, standing water etc.	H	O
Open Space & Conservation Lands	Town-wide	Town/Private	V & S	Land Acquisition-Acquire property secure funds to acquire/ expand open space., Maintain protection of Open Space, obtain more and ensure maintenance of flood storage	Fire prevention, equipment	Adopt a park, Regular maintenance Maintain protection of Open Space, obtain more and ensure maintenance of flood storage, Maintain access to community trails	Maintain proper drainage to avoid standing water, General Maintenance Pest Control	L L	O O & L
Red Wing Brook Area	Northern Area (Central)	Town/Private	V & S	Culvert Upgrade, Drainage Study	Bank Stabilization	Drainage BMPs Installed	General Maintenance Pest Control	M	L
Impaired Water bodies, Water Quality of Local Lakes, Ponds, Streams			V	Testing of Ponds, MS4 Regulations, Green infrastructure Improvements, Maintaining CBs, Water Quality Improvement, Public Outreach	Nitrogen/ Phosphorous	Testing of Ponds, MS4 Regulations, Green infrastructure Improvements, Maintaining CBs, Drainage BMPs Installed	Public Education i.e. Bird baths, standing water etc., General Maintenance Pest Control	H/M	S
Streams/Tributaries, Ponds, Wetland Reservoir Areas & Flood zones	Town-Wide	Municipal/ Private	V & S	Preserve and restore flood plain, Engineering study to determine and update zone AES in town, Red Wing Brook Study & Restoration to withstand storm flows, Protect Buffer zones with plantings, Limit soil bank erosion, Green Infrastructure	-	Identify and eliminate stormwater pollution sources, Public Education	-	M	S, L & O
Ames/ Long Pond Area	Southwest Area	Town/Private	V & S	Drainage Study	Hydrant locations, Distribution Improvements	Drainage BMPs Installed	General Maintenance Pest Control	M	L
Eutrophication & Pond/Lake Management	Town-Wide	Town	V & S	Maintain/ evaluate inlets/ outlets to lakes, Public Outreach	Maintain Ames Pond Beach, General Maintenance, Nitrogen Phosphorous	Stormwater sampling & notification of impairments/ continue outreach, Drainage BMPs Installed, Identify and eliminate stormwater pollution sources.	Maintain proper drainage to avoid standing water, Continue removal of invasive plants, General Maintenance Pest Control, Continue to implement management plan	H	O & L

APPENDIX E

- **Top Priority Voting Results**

Flooding
Ext. Temp
- Drought
Severe Storms

Flooding
High Winds
Ice/Snow
Ext. Temps

Flooding
Intense storms
Ext. Heat
-Invasive Species

Severe Weather
Ext. Temp
Inland Flooding
-Invasive Species/diev. disease

Top 4 Hazards

- Flooding
- Drought
- Ext. Temps
- Severe Storms
- Invasive Species

Discussion of Features

Inf

- Public Trans.
- Emerg Services
- Wastewater infrust
- Shelter/cooling facilities
- Culverts/Drain Syst
- Woods Pond Dam
- Elect. Grid
- Munic. Pump Stations
- Emerg. Ops Center/Commun.
- Water Distsyst/Wells

Soc

Communication + Recreation

- Parks/Fields/Playgrds
- Vuln. Pop./divers
- Schools
- Public Safety
- Shelters
- Senior Center/pop

Non-eng Speakers

- Religous Comm
- Health care fac.
- poverty level
- Buisness Com
- Energy/Sust. Committee

Env

- Ames/Long Pond
- Red Wing Brook
- Imp. Waters
- Open Space
- Drinking Water Sor.
- Lakes & Ponds
- Streams
- Vector-borne dise
- Flood Zones
- Wild life Habitat
- High GW
- Playgrds near woods
- Tree Management
- LID/Green Inf.
- Agriculture

Blue Group Top Actions

- Address Culverts & SW Systems
- Improve Comm Communication Plan
- Encourage Green Space by buying/restoring land
- Imp. Power System, diversify power & transmission of power
- Imp. Emerg Preparedness Plan & Increase Public knowledge
- Recreational Facility improvements and improve drainage and Health & Safety of sites

Green Group Top Actions

- Culvert/Drainage Studies
- Upgrade EOC
- Construct SW Improvements/BMPs
- Drinking Water Source Protection/ Land Acq.
- Public Outreach
- Pest Control

Red Group Top Actions

- Construct Public Safety Bldg
- Culvert Evaluation Program
- Improve translated communication with non-native speakers
- Expand sewer to eliminate septic systems in HGW
- Create resource network to reach vulnerable aid population
- Implimeht tree management program to mitigate invasive species & encourage trimming

Yellow Group Top Ac-

- tree + debris management for power grid resiliency
- Drain Capacity + Study to incorporate offsite LIDs + BMPs
- Est. Community Ed & outreach program
- Expand Open Space + Protect wildlife habitat
- Red Wing Brook Restoration Study, design + Implementation

Yellow Group

Overall Top Actions

Top 6 Actions

- Community Education + Outreach Program
- Drain Capacity, BMP, Culvert Study
- Land Aquis to protect open space & drinking water sources
- Public Safety Building
- Management/ Improvements at recreational facilities/open space
- Emergency Communication/Action Plan
- Tree trimming management + Debris management