Municipal Vulnerability Preparedness (MVP)

Community Resilience Building Workshop:

Summary of Findings

KLEINFELDER
Bright People. Right Solutions.

April 2020

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OVERVIEW

The Town of Medway is experiencing more frequent and destructive extreme weather events as a result of climate change. Examples of recent extreme weather events in Medway include precipitation driven flooding in 2010 and near-record breaking heat waves in 2017, 2018, and 2019. Climate change is expected to increase the intensity and frequency of extreme weather events in the region, highlighting the need for the Town to prepare for future weather-related hazards.

To address this concern, the Town participated in the **Municipal Vulnerability Preparedness (MVP)** program administered by the Massachusetts Executive Office of Energy and Environmental Affairs. The MVP program provided the Town a $15,000 grant to conduct a **Community Resilience Building Workshop (CRB)** developed and tested by The Nature Conservancy to inform planning process.

The CRB process was conducted over a period of several months and culminated in an interactive one-day workshop with community stakeholders on October 29, 2019 at the Thayer Homestead. The CRB workshop raised awareness, encouraged interdisciplinary communication, and generated ideas and momentum for building a more resilient Medway.

The workshop's central objectives were to:

- Define local, natural, climate-related **hazards** of concern
- Identify **strengths and vulnerabilities**
- Develop **prioritized actions** for the community
- Determine **immediate opportunities** to collaboratively advance actions to increase resilience

A **Core Group** of Town staff members, including the Assistant Town Administrator, DPW Deputy Director, Compliance Coordinator, Conservation Agent, and Planning & Economic Development Coordinator organized and planned for the workshop. The Core Group selected Kleinfelder as the Town's state-certified MVP consultant and together they worked towards setting goals, gathering relevant background material, and organizing logistics for the workshop.

Medway's MVP Core Team

Multi-stakeholder collaboration was critical to developing a holistic assessment of the community's climate risks and resiliency opportunities. Approximately 30 people participated in the workshop, including members of the Core Group, Town department staff, representatives of various town committees, residents, utility providers, public safety, and non-profit organizations. Workshop participants were assigned to small diversified teams to complete various exercises throughout the day.

This report provides a summary of the concerns, ideas, and priorities shared during Medway's CRB workshop.

I. CLIMATE HAZARDS

To begin the workshop, the Kleinfelder Team presented on the climate hazards facing Medway today and in the future. The presentation included reliable historic climate data for each hazard as well as best-available climate change projections provided by the Massachusetts Climate Change Clearing House at (www.resilientma.org). Historical data was sourced from the Massachusetts State Hazard Mitigation and Climate Adaptation Plan, FEMA National Flood Hazard Layer, as well as local knowledge from Town Staff.

For analysis during the workshop, Kleinfelder created a map of Medway displaying FEMA flood zones overlaid with the Town's critical infrastructure assets, as identified in two sources: the Town's 2018 Hazard Mitigation Plan and the Massachusetts Planning Council (MAPC) critical assets GIS layer. The map is included in Appendix A at the end of this report for reference.

Presentations on climate hazards were followed by small group discussions.

The Core Team chose heavy rainfall and drought as priority hazards for discussion. Other hazards presented as informed by the Hazard Mitigation Plan were:

- **Extreme Heat**
- **Brush Fires**
- **Ice/Snowstorms**
- **Wind**

Following the presentation, stakeholders participated in a full-group discussion about each hazard's impact to Medway in the past and considered the implications of climate change in the future.

TOP CLIMATE HAZARDS

The goal of the discussion was to identify the four most impactful climate hazards to Medway. As previously stated, the Core Group preselected Heavy Rainfall and Drought as the first two hazards. Through discussion and a group wide vote, workshop participants selected two additional climate hazards for further discussion.

The top four climate hazards (not ranked) selected were:

- **Heavy rainfall**
- **Drought**
- **Extreme Heat**
- **Wind**

Heavy rainfall and drought were identified as the hazards having the greatest direct impact on Medway. They impact many private properties, public services and infrastructure, and have diverse population impacts in the community. Responding to these hazards is a strain on public resources.

Extreme heat has increasingly become an issue, causing the Town to designate cooling shelters for residents and bring in misting machines for outdoor community events during the summer. This trend is likely to have increasing impacts in the future. Impacts of extreme heat on human health, particularly for vulnerable populations, as well as natural resources and energy infrastructure were of high concern to participants.

Wind was also brought up as a greater concern for the community. Recent wind events had caused costly damage across the region and has had a significant impact on energy infrastructure and trees.

CURRENT CHALLENGES PRESENTED BY HAZARDS

During the group discussion, workshop participants shared their observations about the four main climate hazards, both in events that occurred in the past and future risk caused by climate change. The major takeaways are described in detail below.

Heavy Rainfall

Medway has experienced heavy rainfall and flooding events (both short and long term) in recent years. Workshop participants commented on areas of inadequate drainage infrastructure as a root cause of flooding issues. Many older roads have undersized drainage infrastructure and some areas lack any drainage at all. As such, many areas are not able to capture and convey rainwater during intense rain events (i.e. the 10-year or greater storm). Roadways often flood during these events and can cause main throughways to become dangerous or impassible.

Route 109 flooding during the March 2010 extreme rain event.

As an example, participants referenced Route 109 flooding during the March 2010 rain event.

In addition, the FEMA 100-year and 500-year flood zones extend into many parts of the Town as seen in the FEMA flood map in Appendix A. The map illustrates the vulnerability of many of the Town's major roadways and critical facilities to riverine flooding. Workshop participants noted that during large rain events, rivers and streams are known to overflow and cause flooding. For instance, the Milford Street Culvert is within the FEMA 100-year flood zone and is prone to frequent flooding.

Drought

In addition to flooding, Medway is susceptible to drought conditions. Workshop participants noted that the Town has conserved resources by instituting water restrictions, especially as it pertains to lawn irrigation during dry/hot conditions. Addressing both flooding and drought hazards requires the primary infrastructure related to those hazards be sized for future climate conditions.

Extreme Heat

During Summer 2019, extreme heat and humidity conditions allowed for intensified and extended suitable conditions for vector-borne diseases and invasive species. With the recent outbreak of Eastern Equine Encephalitis (EEE) in the area, workshop participants were particularly sensitive to the dangers associated with vector-borne diseases. For instance, sports teams struggled to practice later in the season due to restrictions on outdoor time. In the future, the number of days per year over 90 degrees Fahrenheit is projected to increase from 11 days today to 68 days in 2070. Workshop attendees commented that extreme heat is particularly dangerous for vulnerable populations such as people with medical problems, the elderly, and young children.

Wind

Strong winds or microbursts often coincide with large storms such as thunderstorms, nor'easters or hurricanes. These events often knock down trees or power lines, which can block roadways and cause power outages. Workshop participants expressed concern about extreme wind, especially as it pertains to the resilience of above ground utilities and power lines.

Route 109 trees and powerlines down following a high wind event.

II. STRENGTHS AND VULNERABILIES

With the selected climate hazards in mind, participants worked in small groups to identify **infrastructural, societal,** and **environmental** assets in the Town that may be strengths or vulnerabilities related to these hazards. Small groups worked independently to develop lists of these assets through discussion and knowledge sharing. At the end of the exercise, each group shared their compiled list with the rest of the workshop participants. For a full list of vulnerable assets reference the tables in Appendix B and C.

Infrastructural Strengths & Vulnerabilities

Workshop participants identified the Town's drainage infrastructure as an area of high concern. During heavy rainfall events, culverts and piped infrastructure become overwhelmed with the amount of water, causing flooding. Much of the existing infrastructure is outdated and undersized, unable to accommodate rainfall intensification. Current challenges facing the Town's drainage infrastructure include:

- Accessibility
- Private property ownership
- Lack of easements for maintenance
- Undersized
- Beavers blocking culverts

Additionally, the four dams in Medway are in various states of operation. Shown in Table 1 are the dams identified in the Hazard Mitigation Plan. It should be noted that participants identified four dams in town and used familiar names for the dams during the workshop and noted private owners as responsible for maintaining some of the dams. Dams provide flood protection, recreation, aesthetic, and cultural benefits. For each dam maintained by DCR, the agency includes a "Hazard Potential Classification" to indicate the potential damage associated with a dam failure. A failure may cause loss of life, damage to homes, industrial or commercial facilities, roads or railroads. As of February 2017, Massachusetts Dam Safety Regulations were modified to require owners of Significant Hazard Dams to prepare and submit to MassDEP Emergency Action Plans (EAP) including a dam failure inundation map. Workshop participants noted the importance of these dams and their potential vulnerability to failure during severe rain events.

Table 1: Inventory of Dams in Medway (Medway Hazard Mitigation Plan 2018 Update)

Dam Name	River	Owner	Owner Type	Hazard Potential Class
Sanford Mill Pond Dam	Charles River	Private	Private	Significant Hazard
Medway Choate Park Dam	Chicken Brook	Town of Medway	Town of Medway	Significant Hazard
West Medway Dam	Charles River	Private	Private	Low Hazard

The energy and utility infrastructure (electricity, gas, telephone, etc) are essential components of the Town's infrastructure. Additionally, Medway is home to the Exelon Energy power plant, a major energy resource for New England as well as an important Eversource gas pipe and several cell/ communication towers. Workshop participants emphasized the importance of protecting these resources against the discussed climate hazards as they not only affect the Town but the entire region.

Various roads throughout Medway are vulnerable to riverine or drainage infrastructure flooding. Workshop attendees noted that Village Street and Milford Street are areas of concern, especially since they are major routes within the Town. As severe rainfall events increase in the future due to climate change, flooding of roadways will become a more frequent issue. As such, there will be greater danger for drivers and complications for emergency response activities and evacuation routes. Participants discussed the potential

Thayer Homestead Community Event

of raising roadways or upgrading drainage infrastructure in specific areas of concern, as well as an important Eversource gas pipe and several cell/communication towers. Workshop participants emphasized the importance of protecting these resources against the discussed climate hazards as they not only affect the Town but the entire region.

The Medway school system was consistently cited as a strength by participants throughout the CRB workshop. The public schools are in good condition and the High School is equipped to serve as an emergency shelter or cooling facility if needed with back-up generators and air conditioning. In addition, the schools are a societal strength in that they provide a strong education to children and serve as a gathering place for families and community members. Many participants mentioned that they believe Medway is a great place to raise a family and the schools are an important part of that appeal.

Societal Strengths & Vulnerabilities

According to the last census, the Town has an increasing population of elderly residents. Workshop participants noted that during climate-related emergencies, elderly residents are often isolated in their homes and rely heavily on others for transportation, food, water, and medical needs. In addition, vulnerable populations, particularly elderly residents and young children, are highly susceptible to health risks from sustained exposure to extreme heat.

The communication of climate hazards and climate-related risks from Town government and emergency response staff to residents is an ongoing issue in Medway. Workshop attendees emphasized the need for increased communication as well as limiting dissemination of false information across all social media platforms. The “Friends of Medway” account was specifically cited as a source of inaccurate information related to this subject. Overall, communication is important, especially during climate-related emergencies, so the Town is committed to increasing its presence on social media.

Medway has many different forms of land use, including parks/open space, forest, agriculture, commercial, and residential. Workshop participants emphasized the importance of considering all of the different land-use forms within the Town when evaluating climate preparedness. For example, new businesses and property development may increase the impervious area, exacerbating both flooding and extreme heat issues. Climate factors must be accounted for whenever a new development is

proposed to ensure that they do not contribute negatively to the Town's hazard preparedness.

In addition to the advantage of a quality school system, Medway is a close-knit community and the Town hosts many free public events throughout the year. The workshop participants emphasized that the community events are a real strength and bring townspeople together all throughout the year. The bonds between community members not only make Medway an enjoyable place to live but lend themselves to more effective emergency management. The strong community is integral to the Town's effort to improve its resiliency to climate change going forward.

Environmental Strengths & Vulnerabilities

There are various waterways throughout Medway that are valuable resources to the community. Participants noted the Charles River and Choate Pond as especially important waterways. With the projected increase in climate-related hazards, these waterways are at risk of various damaging factors such as pollution and erosion. Protecting the health of these waterways is essential to the wellbeing of the Town and its residents.

While the waterways within Medway are vulnerable to climate hazards, they are also overwhelmingly considered a strength and an asset to the Town. Waterways provide recreational and cooling opportunities as well as aesthetic benefits. Medway is full of accessible public space, including parks, trails, and waterways. Workshop participants cited these public resources as a strength for the Town. Choate Park/Pond was specifically highlighted as an asset to the Town. Participants noted that the rivers, streams and ponds are among their favorite parts of living in Medway. One workshop participant said that the well-maintained trail network was their favorite part of living in Medway.

Trees located on both public and private property in Medway were noted as a strength

Choate Pond

and vulnerability during the workshop. During severe wind events, trees have the potential to block roadways, damage power lines, and fall on homes and businesses. Additionally, participants acknowledged that invasive species and decreased biodiversity are issues to consider, especially as extreme heat and drought become more frequent due to climate change. However, trees were highlighted for their shading and cooling attributes, ability to sequester carbon, and mitigate the impacts of flooding.

AREAS OF CONCERN

The lists in the subsections below summarize the vulnerabilities and challenges identified by participants with respect to the top hazards. Note that flooding is an outcome of extreme rainfall.

Water Infrastructure: Drinking, Sewerage, and Stormwater

Flooding

Vulnerable Locations – Town-wide wells, culverts, and catch basins; the Charles River Pollution Control District wastewater treatment plant; dams at Choate, Village Street, Claybrook, and Sanford.

Management Challenges - Culverts on private property; undersized culverts; dam maintenance on private and public properties; beavers; leaves from trees.

Drought

Vulnerable Locations – Town-wide wells; agricultural irrigation.

Management Challenges - Supply and demand; private water usage.

Energy Infrastructure

Flooding

Vulnerable Locations – Town-wide wells; agricultural irrigation.

Management Challenges - Supply and demand; private water usage.

Heat

Vulnerable Locations – Town-wide electrical power demand and transmission.

Management Challenges -Size of power supply system for future use; distribution during extreme temperatures.

Wind

Vulnerable Locations –Town-wide electric transformers, power-lines, and communications.

Management Challenges -Trees near above ground power lines.

Facilities

Flooding

Vulnerable Locations –Schools; emergency operations center; senior center; Town Hall.

Management Challenges -Serves vulnerable populations; important for business continuity of Town; may serve as shelters; maintaining power.

Heat

Vulnerable Locations – Schools; senior center.

Management Challenges -Serves vulnerable populations; may serve as shelters; maintaining power.

Medway Middle School

Vulnerable Populations

Flood, Drought, Heat, Wind

Vulnerable Populations – Seniors; dependent care populations; isolated individuals.

Management Challenges – Social media misinformation; new residents.

Ecosystems

Flood

Vulnerable Populations – Town-wide tributary waterways; agricultural land.

Management Challenges – Beavers; contamination.

Heat

Vulnerable Populations – Town-wide waterways.

Management Challenges – Invasive species.

Wind

Vulnerable Populations – Town-wide trees.

Management Challenges – Species maintenance.

III. RECOMMENDATIONS FOR IMPROVED RESILIENCE

During the afternoon session of the workshop, Kleinfelder presented case studies of mitigative and adaptive actions that other communities have used to address climate change. Workshop attendees emphasized that Medway should improve infrastructural, societal, and environmental vulnerabilities through the implementations of programs, policies, and projects.

Small groups then worked to identify the best solutions through the following steps:

1. Develop action items to reduce the infrastructural, societal, and environmental vulnerabilities and reinforce its strengths.
2. Prioritize actions that address multiple hazards, are intermediate steps, and/or strengthen existing initiatives and capital improvement projects;
3. Characterize actions as short-term, long-term, or ongoing;
4. Identify the top three recommendations to improve resiliency to the hazards affecting Medway.

TOP RECOMMENDATIONS

The following list of top priority actions was selected by workshop participants from the master list of all recommendations. Each group was tasked with choosing one action from each of the three categories (infrastructure, society and environment). With future funding availability in mind, the groups were encouraged to select projects that were determined to be both **high priority** and **short term .** Later, the Core Team expanded on the list of action items that were not mentioned during the workshop.

The list, which is intended to provide guidance to the Town on next steps, was presented to attendees at the Listening Session on March 2, 2020.

Infrastructural Priority Actions

Action A: Implement adaptive and mitigative strategies for critical buildings. Critical buildings include municipal, assisted care facilities, and gas stations. Primarily aimed at reducing dependency on non-renewable energy sources and retrofitting buildings so they can adapt to changes in cooling needs, power disruptions and protect from flooding.

- Add emergency generators or other evolving technologies to improve resiliency during power outages and allow for business continuity.
- Work with energy provide to study possibilities for microgrid to reduce power disruption.
- Add solar canopies to school parking lots and anticipate furture battery storage techology for energy redundancy.
- As roof replacement is needed, explore the benefits of adding solar panels for energy redundancy, reduce heat impacts to buildings by retrofitting with cool roofs, and/or add insulation to promote energy efficiency.
- Retrofit existing buildings with stormwater management best management practices.

Action B: Protect roadways from flooding. Primarily aimed at protecting essential routes in the Town that are prone to flooding or lie within the FEMA 100-year or 500-year flood zones.

- Improve accessibility during flooding emergencies, by ensuring that evacuation routes are open and residents are not stranded.
- Assess and maintain vegetation along evacuation routes.
- Assess and replace undersized culverts where needed.
- Use beaver deceivers or other methods to discourage beavers from blocking waterways.

- Identify private properties with culverts and dams and secure easements in order to maintain the infrastructure.

Societal Priority Actions

Action A: Educate the public on climate related hazards using diverse community outreach methods. The primary aim is to use education to empower residents to prepare for climate related hazards, especially those who are more vulnerable.

- Use quarterly bills to add info on upcoming seasonal climate threats.
- Continue using different methods of messaging to reach the various demographic groups in town.
- Use the Council on Aging monthly newsletter to disseminate information to older Medway residents.
- Use email to reach vulnerable populations that may not use social media.

Action B: Enhance branding of Town social media accounts to ensure dissemination of accurate information. Primarily aimed at limiting the spread of misinformation on community forums or private accounts.

- Spread awareness of Town social media accounts on all platforms so that residents turn there first to find out about climate-related emergencies.
- More Town social media presence (more frequent posts, more information).
- Create monthly or quarterly newsletters updating residents on the work being done in Town.

Action C: Better facilitate resident involvement in community, meetings, events, and initiatives. Aimed at soliciting more community involvement during the preliminary phases of a project to build community support, thus increasing the project's sustained success. More community involvement will also help ease the strain on current volunteers and diversify the voices representing the Town.

- More frequent mailings and social media posts to increase awareness of community events to improve attendance. The action should help bring residents together and encourage neighbor to neighbor interactions.

Action D: Notify residents of public health or environmental hazards. Aimed at increasing awareness of immediate public health or environmental hazards.

- Notifications would be sent out by mail monthly, quarterly or yearly in existing water bills or other regular public notifications. Regular mail is better than social media because it ensures that everyone (especially elderly) are reached.
- Spread awareness of potential environmental or public health hazards (i.e. EEE) and how best to protect oneself.
- Use the Town's webpage to highlight immediate hazards or threats.
- Develop/sponsor a series of community education events about climate related topics including but not limited to documentary showings and guest speakers.

Environmental Priority Actions

Action A: Eradicate invasive species on "The Boardwalk" trail off Adams Street. The goal of this action item is to help curb the spread of invasive species in the Adams Street area and the town overall, which is exacerbated by the changing climate.

- Develop and implement a 3-year plan to remove invasive plant species and replant with native vegetation. The model is relatively short-term and could serve as a template for other areas in Medway suffering from invasive

species.

- Improve public awareness of invasive species.

Action B: Inspect and enhance flood resilience of Charles River. The purpose of this action item is to protect the Charles River, surrounding infrastructure, and environmental assets from climate hazards, particularly flooding.

- Inspect dams to measure structural integrity and capacity.
- Review FEMA flood zones and flood insurance maps alongside the Charles River.

Action C: Improve Town-wide tree planting strategy and maintenance. This action item is intended to address the health of the trees on municipal properties. Trees that are not properly maintained can be a hazard during high wind events. Conversely, trees are also an asset as they provide shade and cooling during warmer months, provide stormwater management through water absorption through the root and evapotranspiration, and sequester carbon.

- Create a tree master plan with a "right tree, right place" initiative. Examples include:
- Trees with roots that grow vertically rather than horizontally
- Not planting trees under above-ground power lines or near large below-ground utilities.
- Planting trees with wide leaves to block sunlight to promote cooling.
- Educate the public on how to maintain privately owned trees.
- Improve maintenance efforts (regular pruning, cutting down dead trees, etc.) to limit the probability of trees damaging power lines or blocking roadways.

Other Potential Actions

This section lists the other action items identified during the workshop. The items were categorized as "High", "Medium" or "Low" priority items. Items within each group are in no particular order.

HIGH PRIORITY

The following are considered high priority:

Implement green infrastructure requirements/regulations –promote green infrastructure for groundwater recharge; continue DPW rain barrel program; follow MS4 permit plan for compliance; sump pump monitoring and management; community education about harmful impacts of sump pumps.

- Understand rainfall infiltration – look to the towns that have strong I/ I program.
- More aggressive tree maintenance– responsibility is shared by Town and Power Company.
- Ask utility companies to have a climate assessment vulnerability discussion with Town.
- Add solar canopies for generating power from the sizable open space of parking lots and improving energy resiliency of the school system by providing a renewable source.
- Remove barriers to maintenance such as the standing order from Conservation Commission for Minor Repair.
- Add flooding to emergency planning.
- Design solar for future battery storage capacity to provide power redundancy during outages.

Develop list of special needs population, especially those that require oxygen and CPAP machines; update annually; check senior centers and schools; ensure communication to residents.

MEDIUM PRIORITY

The following are considered medium priority:

Identify second location for emergency operations command center. This is to provide for redundancy and growth of

operations.

- Wastewater repurposing - study on greywater.
- Develop a town-wide hydraulic model to better understand drainage.
- Implement a stormwater utility to fund drainage infrastructure improvements.
- Develop a town-wide hydraulic model to better understand drainage.
- Implement a stormwater utility to fund drainage infrastructure improvements.

- Identify vulnerable populations for targeted outreach during extreme weather events and training prior to emergency weather events.
- Create an "adopt a catch basin" program.
- Mix public education on climate change issues and prevention strategies with other community events.
- Education for coaches and players on extreme heat and dehydration symptoms.

- Study to identify open space potential throughout town.

LOW PRIORITY

The following are considered low priority:

- Require new cell tower operators to build in emergency back-up systems to be able to operate.

- Create a mini-grant or loan program for vulnerable populations for furnaces and air conditioners.

- Work with local agriculture to study potential contamination from farms and livestock and future risk to farming industry from climate change.
- Work with local farms to provide alternative methods to controlling overgrowth with programs such as "goat-scaping."
- Implement sustainable solutions such as a plastic bag ban, and composting.
- Establish a maintenance program for intermix zones to prevent wildfire during drought and extreme heat.
- Establish a maintenance program for intermix zones to prevent wildfire during drought and extreme heat.

IV. MVP LISTENING SESSION

The MVP Listening Session was held on March 2, 2020 from 5:30pm to 6:30pm, preceeding the Board of Selectmen's meeting. The Core Team presented a general background of the MVP Program and its objectives, the climate data and hazards identified during the Workshop, the strengths, vulnerabilities and areas of concern identified during the Workshop, and the Top Action Items identified during the Workshop. Then, the Core Team asked the Listening Session participants to vote on which Top Action Items were of most importance to them. The intent was to help the Core Team further clarify which Action Items should be pursued first once the Town is awarded MVP designation.

Each participant was given three dots and were asked to vote on their top action from the infrastructural, societal, and environmental categories. The results were as follows:

Category	Action
Infrastructure	Add solar canopies to school parking lots with capacity for battery storage for energy redundancy.
Societal	Educate the public on climate related hazards using diverse community outreach methods to empower residents to prepare for climate related hazards, especially for those who are more vulnerable.
Environmental	Create a Tree Master Plan with a "Right Tree – Right Place" policy.

Residents voting on priority actions during the Listening Session

After voting, the Core Team held an open discussion for participants to raise their own ideas. Some of the main points from that discussion included the need to explore backup power generation at local fueling stations and at cell towers to ensure residents and municipal staff can access fuel and have minimal disruption to communications during an emergency. One participant emphasized the need to translate how the climate data and hazards can affect Medway residents directly. The importance of preserving existing trees and planting new trees as a mitigative and adaptive measure to climate change was also discussed at length.

V. CONCLUSION

NEXT STEPS

The MVP Core Group will continue to meet regularly to pursue actionable recommendations stated in this report and to develop additional pursuits as a result of the data collected in the Community Resilience Building Workshops. The Core Group will focus on high priority and policy recommendations as a first step. Acknowledging available funding through the MVP Action Grant, the Core group will use the priority action list and feedback heard at the listening session to inform future projects and submissions for funding.

WORKSHOP STAKEHOLDERS

The Town of Medway wishes to thank the participants and project team for a successul workshop. The Town looks forward to collaborating on immediate and future efforts to make Medway more resilient.

Affiliation of Workshop Participants and Invitees

- Affordable Housing Committee (Chair) – Bob Ferrari
- Agricultural Commission – Paul Atwood
- Assistant Town Administrator – Allison Potter
- Board of Health – Beth Hallal
- Building Commissioner – Jack Mee
- Charles River Pollution Control District – Elizabeth Taglieri
- Charles River Watershed Association – Delilah Bethel
- Columbia Gas – Karen Newell
- Columbia Gas – Lauren Cantrell
- Columbia Gas – Ben Phillips
- Communication Director – Sandy Johnston
- Compliance Coordinator – Stephanie Carlisle
- Conservation Agent – Bridget Graziano
- Council on Aging Director – Courtney Riley
- DPW Director – Dave D'Amico
- DPW Deputy Director – Peter Pelletier
- Eversource – Brian Mello
- Fire Department – Chief Jeff Lynch
- Human Resources – Katherine Bird
- Library Director – Margaret Perkins
- Medway High School Project Green – Joan Hallett
- MVP Central Regional Coordinator – Hillary

King

- Open Space Committee (Chairman) – Tina Wright
- Planning and Economic Development Board (Chairman) – Andy Rodenhiser
- Planning & Economic Development Coordinator – Susan Affleck-Childs
- Police Department – Chief Allen Tingley
- Redevelopment Authority (Treasurer) – Doug Downing
- Schools Facility Director – Jim Kane
- Town Administrator – Michael Boynton

Invited, Not in Attendance:

- Board of Selectmen members

WORKSHOP PROJECT TEAM

Core Group:

- Stephanie Carlisle (Compliance Coordinator)
- Allison Potter (Assistant Town Administrator)
- Bridget Graziano (Conservation Agent)
- Susan Affleck-Childs (Planning & Economic Development Coordinator)
- Peter Pelletier (DPW Deputy Director)

Kleinfelder:

- Robin Seidel (MVP Certified Provider)
- Laura Nolan (Facilitator, Project Manager)
- John Rahill (Facilitator)
- Jill Rossini (Facilitator)

CITATION

Town of Medway (2020), Community Resilience Building Workshop: Summary of Findings. Planning Department and Kleinfelder. Medway, Massachusetts.

REFERENCES

Town of Medway (2018), Town of Medway Hazard Mitigation Plan 2018 Update, Prepared by MAPC.

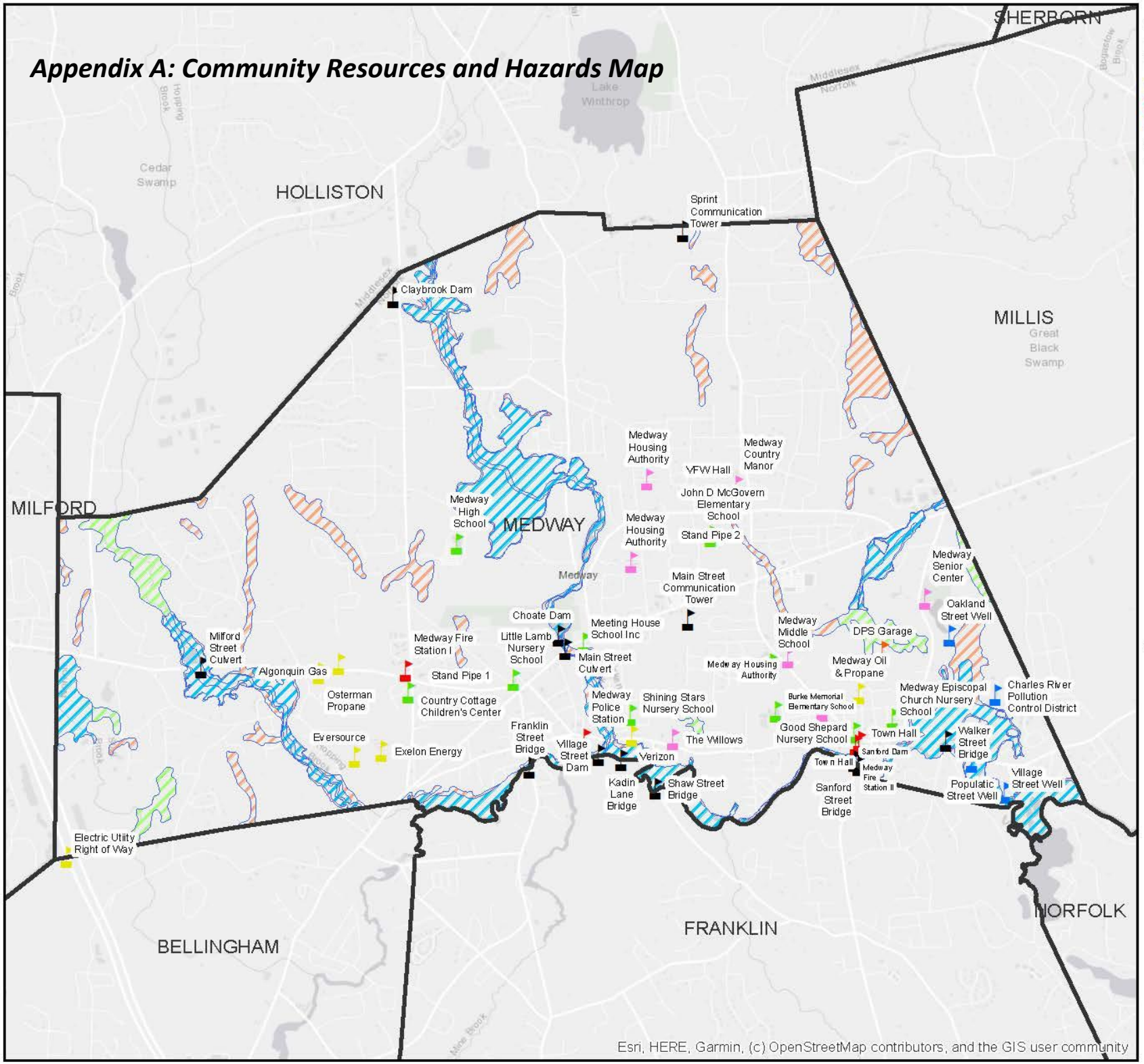
MAPC (2018) GIS layers: Hot Spots and Critical Assets.

ACKNOWLEDGEMENTS

Special thanks to:

- **Massachusetts Executive Office of Energy and Environmental Affairs** for providing the Town with grant funding to implement the CRB process.
- **Core group** members and **workshop participants** for contributing their time, passion, and ideas.

Appendix A: Community Resources and Hazards Map



Legend

FEMA National Flood Hazard

Flood Zone

- A
- AE
- X

CriticalFacilities

Type

- Senior/Assisted Living
- Bridge
- Communications
- DPW Garage
- Dam
- Daycare
- Emergency Ops Center
- Electric
- Fire Station
- Gas
- Police station
- School
- Sewer treatment plant
- Townhall
- Well
- Town Boundary

APPENDIX B: Medway Critical Assets		
Name	**Address**	**Asset Type**
Sanford Street Bridge	Sandford Street at Town line	Bridge
Walker Street Bridge	Walker Street at Town line	Bridge
Franklin Street Bridge	Franklin Street at Town line	Bridge
Milford Street Culvert	Milford Street	Bridge
Main Street Culvert	Main Street	Bridge
Shaw Street Bridge	Shaw Street at Elm Street, Franklin	Bridge
Kadin Lane Bridge	Kadin Lane Charles River	Bridge
Sprint Communication Tower	40 Hill Street R.	Communication Tower
Main Street Communication Tower	113 Main Street	Communication Tower/ Town Repeater
Choate Dam	Choate Park	Dam
Sanford Dam	Sanford Street	Dam
Village Street Dam	311 Village Street Rear	Dam
Claybrook Dam	161 Summer Street	Dam
Meeting House School Inc	157 Main St	Daycare
Little Lamb Nursery School	199 Main Street	Daycare
Good Shepard Nursery School	170 Village Street	Daycare
Medway Episcopal Church Nursery School	16 School Street	Daycare
Shining Stars Nursery School	37 Cottage Street	Daycare
Country Cottage Children's Center	35 Summer Street	Daycare
DPS Garage	Broad Street Extension	DPW Garage
The Willows	276 Village Street	Elderly Housing
Medway Housing Authority	Kenney Drive	Elderly Housing
Medway Housing Authority	Mahan Circle	Elderly Housing
Medway Housing Authority	Lovering Heights	Elderly Housing
Electric Utiity Right of Way	ROW	Electricity Lines
Town Hall	155 Village Street	EOC
SMOC	17 Holliston Street	Family Shelter
Medway Fire Station I	44 Milford Street	Fire station

APPENDIX B: Medway Critical Assets		
Name	**Address**	**Asset Type**
Medway Fire Station II	161 R Village Street	Fire Station
Medway Oil & Propane	37 Broad Street	Fuel Storage
Osterman Propane	Milford Street	Gas and Propane distribution
Algonquin Gas	Milford Street	Gas transmission
Medway Country Manor	115 Holliston Street	Nursing home
Medway Police Station	315 Village Street	Police station
Exelon Energy	7 Summer Street	Power generating plant
Eversource	West Street	Power substation
VFW Hall	123 Holliston Street	Proposed Municipal Property
Medway High School	88 Summer Street	School
Burke Memorial Elementary School	16 Cassidy Lane	School
Medway Middle School	45 Holliston Street	School
John D McGovern Elementary School	9 Lovering Street	School
Medway Senior Center	76 Oakland Street	Senior center
Charles River Pollution Control District	68 Village Street	Sewer treatment plant
Town Hall	155 Village Street	Townhall
Verizon	292 Village Street	Utility
Stand Pipe 2	35 Lovering Street	Water stand pipe/ Communication Repeater
Stand Pipe 1	14 Highland Street	Water stand pipe/ Communication Repeater
Village Street Well	31 Village Street	Well
Populatic Street Well	Water Street	Well
Oakland Street Well	48 Oakland Street	Well

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.com

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

Flooding/ Heavy Rainfall (1)	Drought (2)	Extreme Heat (3)	Wind (4)

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

V = Vulnerability **S** = Strength

B=Both

Group	Features	Location	Ownership	V or S	Hazard	Actions	Priority H - M - L	Time Short Long Ongoing
	Infrastructural							
Group 1	Drainage Infrastructure	Town-Wide	Public/Private	V/S	Rainfall/Flooding	Green Infrastructure, Low-Impact Development, Actively Promote Re-Charge (H), Continue Rain Barrel Program, Ensure MS4 Compliance, Maintenance (Especially Private Property), and support pump	1-H, 3-M	L-3, O-2
	Wastewater Treatment Plant	Medway	Public/Shared Ownership	V/S	Rainfall/Wind	I/I Program (H), Illicit Connections in 4 Communities (M)	2-H	L-2, O-2
	Medway Schools	Multiple Locations	Town	S	All	Ensure back-up generators are functioning and have sufficient capacity (H); air conditioning infrastructure - at least in certain areas (M); central air (M); white roofs, roofs at Memorial and McGovern (M); and solar parking canopies.	1-H, 2-L, 1M	L-3, S-1
	Town Water Wells	Multiple Locations	Town	V/S	Drought/Wind	Installing satellite wells (H), grey water (M), wastewater repurposing - study on greywater	1-H, 1-M	O-1, L-1
	Emergency Operations Center	Police Station	Town	S	All	Find back-up location - town hall or 2nd floor of fire station (H).	M	S
	Utilities - Electric, Gas, Communications	Town-Wide	Private/Town	V/S	All	Ongoing tree maintenance (H); working with private companies (M); cold-weather incidents for gas	1-H, 2-L	S-O, 2-L
	Excelon Power Plant - Cell Towers	Town-Wide	Private	V/S		Built-in emergency system to any new cell towers.	L	S
Group 2	Utilities - Aging Infrastructure - Stormwater, Trash, Gas, Electric,Solar, Water, and Sewer	Town-Wide	Town, Eversource and Verizon	B	Flooding/Heavy Rainfall, Wind	Underground utilities - solar and generators, grey water, sump connections, reusable bags, compostable materials/bbiodegradable, dam removal feasibility study.	L	O
	Roads** → Pervious vs.Impervious - (Medway "Δ") /Tanks Dams Wells/Trails Sidewalks	Village Milford	Town/Private	B	Flooding/Heavy Rainfall, Heat	Roads - pervious pavement, raise roads → Village drainage.	H	S/O
	Schools/Senior Center	Oakland	Town/Private	B	Extreme Heat	Continue emergency management procedure.	M	O
	Turf Fields /Playgrounds → Balancing Infrastructure	High School	Town	B	Extreme Heat	Public Outreach - "Flag" days.	L	O
	Waste Management	Town-Wide	Town/Private	V	Wind, Flooding/Heavy Rainfall	Sustainable recycling, town-wide compost.	L	O
	Local vs. Global Food System	Town-Wide	Town/Private	B	Flooding/Heavy	Re-use bags, compost, sustainable gardening.	L	O
Group 3	Charles River - Sanford Dam (Poor Condition, Old, Out of Design?)	River	State	V	Rainfall/Wind	Understand and prioritize needed improvements and costs. Document risks and consider removal.	H	L/O
	Charles River Pollution - Flood Plain - Pollution Control District WWTP - Back-Up Power?	Village/Street	CRPCD - Town	V/S	Rainfall/Wind/Heat	Assess wind impacts → trees. Process? Understand upgrade potential - address infiltration/inflow charging. Re-use → agriculture, industrial (Excelon), town land,, groundwater discharge.	M	L
	Drainage - Design Size, Municipal Separate Storm Sewer System	Town-Wide	Town/DPW	V/S	Rainfall	Understand what new design storms would do to system → maintenance → $ → Staff Needs. Planning/Cons are updating to reflect NOAA Atlas/Standards. Rainbarrel program → Educate public → Assess infiltration basin retrofit.	M	O
	Town Structures* - Schools,Town Hall May be Out of Compliance	Town-Wide	Town	V/S	Rainfall/Drought/ Wind/Heat	Stormwater re-charge @ town sites, rain garden retrofit, drought-tolerant planting, roof-top solar (high school & middle school), AC in schools (solar), rain barrels/cisterns, compostable toilets, set example.	H	S
	Gas Systems - Underground, Meters at Homes. Vulnerable during Construction, Rainfall/Cold	Town-Wide	Columbia	V/S	Rainfall/Heat/Wind	Education, avoid construction in the rain, alternative public notification systems, → capture all generations → emergency response.	M	S/O
	Groundwater Wells - Private Wells	Zone 1	Town	V/S	Rainfall/Drought/ Heat/Wind	Public education for drought → on-going. CRPKD groundwater recharge → Excelon replenishment.	H	All - S/L/O

Community Resilience Building Risk Matrix

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Group	Features	Location	Ownership	V or S	Hazard	Actions	Priority H - M - L	Time Short Long Ongoing
Group 4	Power system - Transformers and Power Lines	Town-Wide. Triangle	Eversource	V	Wind (Ice & Snow)	Burying power lines in the right places (1). Raising equipment from flooding (2). Battery and solar incentives*(3). Generators for critical facilities (4). Microgrid study (5).	1-L, 2-M, 3-M, 4-H, 5-L	1-L, 2-O, 3-O, 4-S. 5-S
	Culverts on Private Property in Remote Locations	Town-Wide, Milford & Clark Sts.	Town easement on private property.	V	Flooding/Wind	Public Outreach - education (1). Identify with Post and DPW at culvert (2). Obtain easements for maintenance and reporting culvert maintenance (3). Funding mechanisms for maintenance. (4). Town hydraulic m?(5)	1-H, 2-L, 3-M, 4-M, 5-H	1-S, 2-O, 3-O, 4-O, 5-L
	Piped Infrastructure, Age, Size	Town-Wide/Brentwood ?	Town	V	Flooding/Wind	Homeowner Rain Garden Program (1). Stormwater utility (2). Adopt a catch basin program (3). Continue replacing pipes for future climate (4). Remove barriers to maintenance → standing order from Conservation Commission for minor repairs (5).	1-M, 2-L, 3-M, 4-H, 5-H	1-S, 2-L, 3-S, 4-O, 5-O
	Dams - Choate → Town; Village Street → Private; Claybrook → Private; Sanford → Owner	Regional/Town	2 Town & 2 Private	V	Flooding	Study impact of climate to Choate Dam (1). Advocate to conservation commission for changes (2). Town to partner (or easement) with private dam owners on education and standards for maintenance and repair (3).	1-M, 2-H, 3-H	1-S, 2-O, 3-S
	Evacuation Routes, Major Roads - Main Street, Village Street, Holliston, and Summer	Town	Town/State	V	Flooding	Clark Street - enlarge culvert and raise road (1). Signage (2). Public outreach (3). Add flooding to emergency plan (4)	1-H, 2-L, 3-L 4-H	1-O, 2-S, 3-S, 4-S
	Municipal Buildings - Town Hall, High School, School Shelters, Middle School, and VFW	Town	Town	V/S	All	RVA of town-owned buildings with cost-benefit analysis with design options (1). New emergency complex out of flooding (2).	1-M, 2-M	1-S, 2-L
	Societal							
Group 1	Seniors/Special Needs Poulations	Senior Housing/ Spread Out	State/Private	V	Extreme Heat/Wind	Develop list of special needs population, especially those that require oxygen (H); make sure this list is updated annually*; check senior centers and schools; ensure communication to residents(L); and CPAC machines.	H, L	S-O, 1-L
	Social Media	Instagram/Facebook/ Twitter	Town/Public	S/V	All - Misinformation	Brand the town's social media accounts so that residents go there first over other misinformation accounts(H); enlarge font of electronic messaging sign(H); more of Michael's videos (H).	H, H, H	O-S-O
	Impatience/Instant Gratification		Public	V	All	Recogning and adapting to new forms of human behavior (M), social media helps with this; help residents understand the challenges of response time (M)	M	O
	Community Events	Town-Wide	Town	S	All	Increase resident participation and volunteerism (H); mix public education on climate change issues and prevention strategies with other community events (M).	H, M	L, S-O
	Affordability/Affordable Housing	Town-Wide	Town/Private	V	All	Mini-grants of low-interest loans to low-income residents for implementing climate resiliency projects (H); developing more industry/commercial businesses in town to lower taxes (L).	M, L	L, L
	Youth Sports	Town-Wide	Town	V/S	All	Make sports more affordable to ensure participation across income levels (M); coach and player education for extreme heat and dehydration symptoms (M); make sure there is sufficient water at	M, M, M	L, L, S
Group 2	O & M - Catch Basins/Meters/Vents	Town	State	B	Heavy Rainfall	Educate → Adopt a catch basin!	H	O
	Educational/Public Outreach	Town	State	S	Heavy Rainfall/Extreme Heat	School presentations; flyers; green curriculum.	M	O
	Community Responsibility/Open Spaces	Town	Town/Private	S	Heavy Rainfall/Drought	Water consumption; reuse and reduce and recycle.	H	O
	Water Bans/Ordinances (1)	Town	State	B	Drought/Extreme Heat	Impervious tax; plastic bag bans.	M	S
	Media*	Town	State	B	Heavy Rainfall/Drought/Extreme Heat/Wind	Positive outreach; encourage feedback/involvement → planning phase.	H	S
	Diverse Ages/Aging Population	Town	State	B	Extreme Heat	O & M → cooling areas, cleaning → tripping prevention.	H	O
	Canoe Launch*/Network of Recreation	Village Street	Conservation	V/S	Rainfall	Plantings/vegetation.	M	S

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Group	Features	Location	Ownership	V or S	Hazard	Actions	Priority H - M - L	Time Short Long Ongoing
Group 3	Agricultural Community/Dwindling Workforce	Town-Wide	Private	V/S	Heat/Rainfall/Wind/Drought	Preservation/protect land; water education; farm pond use; coordination with conservation; education → options → development rights.	M	L
	School Community - Families, Teachers, Teachers from Out-of-Town*	Town-Wide	N/A	S	Rainfall/Drought/Wind/Heat	Changing event times (heat); school calendar/start time; parent-teacher organizations → education on hazards; microgrids; Charles River; education → rain gardens, signs, and hazards.	M	S
	Senior Community	Town-Wide	N/A	V	Heat/Rainfall	Microgrids/generators; locating cooling centers; solar?; watershed → education; education - hazards, who to call; building networks.	M/H	S
	Route 109 - Commercial Center - Emergency Route	Route 109	Town/State	V/S	Rainfall/Wind	Stormwater maintenance; retrofit → green infrastructure; state coordination	H	L/O
	N/A	N/A	N/A	N/A	N/A	N/A		
Group 4	Personal Irrigation of Lawns	Town-Wide	Private	V	Drought	Tertiary water re-use for irrigation (1); ? Education /communication (2); study to determine downstream and water quality and flow; native species education (3).	L-1, H-2, H-3	L-1. S-2. 0-3
	Public Communication of Future Needs	Town-Wide	Town	V	All	*See other strategies.	H	S
	Elderly During Power Outages and Evacuations	Town-Wide	Town	V	Heat/Cold, Flooding, Wind	Neighborhood shelters (1); more comfortable, consider pets as part of shelter with generators.	M	O
	Economic Impacts	Town-Wide	Town	V	All	Small business toolkit (1); resilience hub at the library (2).	H-1, H-2	S-1&2
	Neighbor to Neighbor - Isolation - Not Knowing Neighbors	Town-Wide	Town	V/S	All	Microgrants for neighborhoods for parties to meet your neighbors (1); use NextDoor for engagement → engage on all platforms (2).	M-1. H-2	S-1, O-2
	Communication - Cross-Generational	Town-Wide	Town	V/S	All			
	Environmental							
Group 1	Waterways	Town-Wide	Public	V/S	Rainfall/Drought	Green infrastructure to limit pollutant loading during extreme rainfall events (rain gardens) (M); install at schools to teach kids about green infrastructure (M)	M	L
	Diseases/Illnesses ("EEE")	Town-Wide	Public	V/S	Drought/Heat	Public eduation adapting to EEE (M); limiting standing water (M); put public notifications in monthly or yearly letters to residents (could be expanded to many other categories (H).*	M, M, H	O, O, O
	Wildfires/Brush Fires	Town-Wide (More Northern)	Public	V	Drought/Extreme Heat	Maintenance of intermix areas (L); public education (L).	L, L	L, L
	Issues with Development/Loss of Resources	Town-Wide	Private	V	All	Tree preservation or planting by-laws (M); forest master plan (M); drainage infrastructure/green infrastructure requirements (H)	M, H	S, S-O
	Farming and Agricultural Lands	Town-Wide	Private	S/V	Drought	Study of potential contamination to farms and livestock from flooding (L); ensure animals have sufficient food and water for drought conditions L); involve agricultural committees (M).	L, L, M	L, L, S
	Open Space/Trails	Town-Wide	Public	S	All	More open space and trails (M); maintenance (M); study to explore open space for flood storage (M).	M, M, M	O, O, L
Group 2	Trees (Street)	Town/Private	Town/Private	B	All	Strategic planting; buy a tree; trail maintenance.	M	S/O
	Invasive Species*	Town/Private	Town/Private	V	Heavy Rainfall/Drought	Adams Street "Boardwalk" trail -> implement 3-year plan to remove invasive species and plant with native species	H	S
	Farmlands	Town/Private	Town/Private	B	Heavy Rainfall/Drought	Community integration; outreach/inform.	M	O

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Group	Features	Location	Ownership	V or S	Hazard	Actions	Priority H - M - L	Time S Long O ngoing
	Charles River Watershed	Town	Town	B	Heavy Rainfall/Drought	Regional; Charles River Climate Compact; flood storage; protect ? to Chicken Brook; lake population clean-up; dam removal.	H	L
	Groundwater Resources	Private	Private	B	Heavy Rainfall/Drought	Protective zones.	M	L
	Conservation/Land Use*	State/Federal	State/Federal	B	All	Eco-burials; monitor construction/redevelopment → infiltration.	H	S
Group 3	Charles River - National Resource - Regional Benefit*	River	State	V/S	Rain/Drought/Wind	See dam decision - potential flood storage (may want to keep); educate →flood insurance →mitigation; ask FEMA to study future flood hazard.	H	L
	Agricultural Land - Threat of Redevelopment	Town-Wide	Agricultural Commission/Private /Comm Farm/Town	V/S	Drought/Heat/Rainfall	Water re-use; agricultural practices →crops, irrigation needs; preserve land.	M	L
	Town Lands/Trails - Conservation Space	Town-Wide	Town	V/S	All	Goatscaping; breakaway boardwalk → new design and construction methods.	L	S
	Waterways - Hopping Brook and Chicken Brook - Tributaries to the Charles River	Town-Wide	Town	V/S	Drought/Rain/Wind	Water re-use and storage; water quality testing; beavers?	L	S
	"Town Dump" - Inform - Rodents Bring Yard-Waste - Less to Runoff and Clog Drainage	Broad Street	Town	V/S	Rainfall/Heat	Educating the public; stormwater runoff handling.	M	S/O
	Choate Park/Pond/Dam	Choate Park	Town	V/S	All	Trees/planting; rain garden/bio-retention.	M	S/O

Municipal Vulnerability Preparedness (MVP) Workshop

Timeline

1. **SUMMER 2019:** Applied for the MVP planning grant, formed a Core Group, and selected state-certified MVP consultant (Kleinfelder)
2. **LATE SUMMER 2019:** Core Group meeting to identify initial target hazards
3. **EARLY FALL 2019:** Gathered available background information
4. **OCTOBER 29, 2019:** Hold 8-hour workshop
5. **LATE FALL 2019:** Finalize workshop outcomes into a report
6. **DECEMBER 2019:** Hold public listening session
7. **EARLY 2020:** Be designated a "Climate Change Municipal Vulnerability Preparedness Community" by EOEAA
8. **FUTURE:** Increased funding opportunities through MVP Action grant program

Terminology

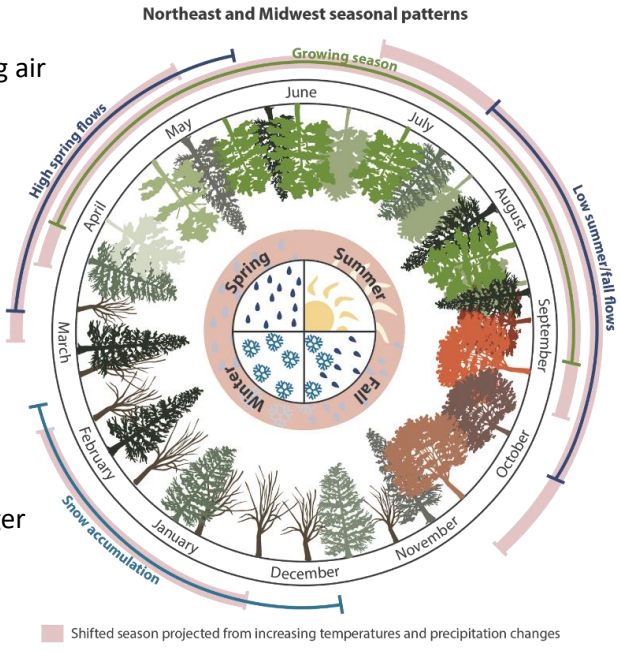
100-year storm: a storm that has a 1% chance of occurring during any given year.

Storm Recurrence Interval	Annual chance of occurring	Inches of Rain in 24 hours
500-year	1/500 = 0.2%	11.3
100-year	1/100 = 1%	8.27
25-year	1/25 = 4%	6.45
10-year	1/10 = 10%	5.26

Microburst: an intense small-scale column of sinking air (downdraft) produced by a thunderstorm or rain shower and is usually less than or equal to 2.5 miles in diameter.

Drought: Widespread drought has occurred across the region as recently as 2016, and before that in the early 2000s, 1980s, and mid-1960s. More frequent and severe droughts are expected as climate change continues to increase temperatures, raise evaporation rates, and dry out soils - even in spite of more precipitation and heavier rainfall events. More rainfall in large events could mean longer gaps with no rainfall locally.

Heat wave: Three consecutive days over 90 degrees.



Municipal Vulnerability Preparedness (MVP) Workshop

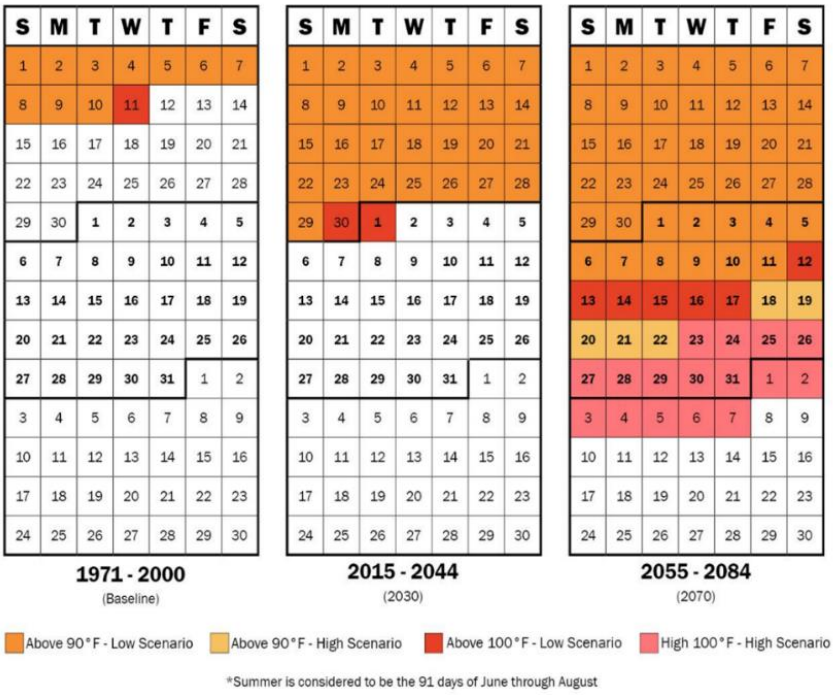
Brush Fires

Interface: has less than 50% vegetative cover

Intermix: has more than 50% vegetative cover

Heat Degree Days (HDD): is a measurement designed to quantify the demand for energy needed to heat a building, derived from measurements of outside air temperature.

Cooling Degree Days (CDD): a measurement designed to quantify the demand for energy needed to cool buildings.



Core Teams

Medway's Team	Kleinfelder Team
Stephanie Carlisle	Robin Seidel
Allison Potter	Laura Nolan
Bridget Graziano	John Rahill
Susan Affleck-Childs	Jill Rossini
Peter Pelletier	

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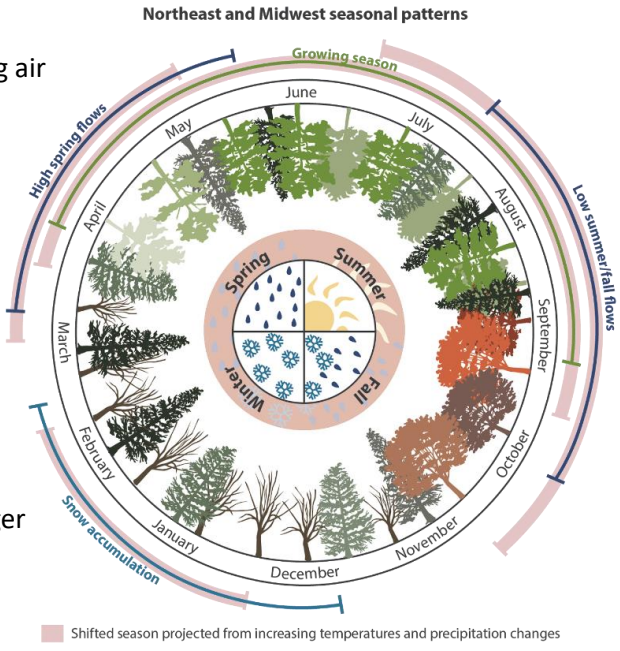

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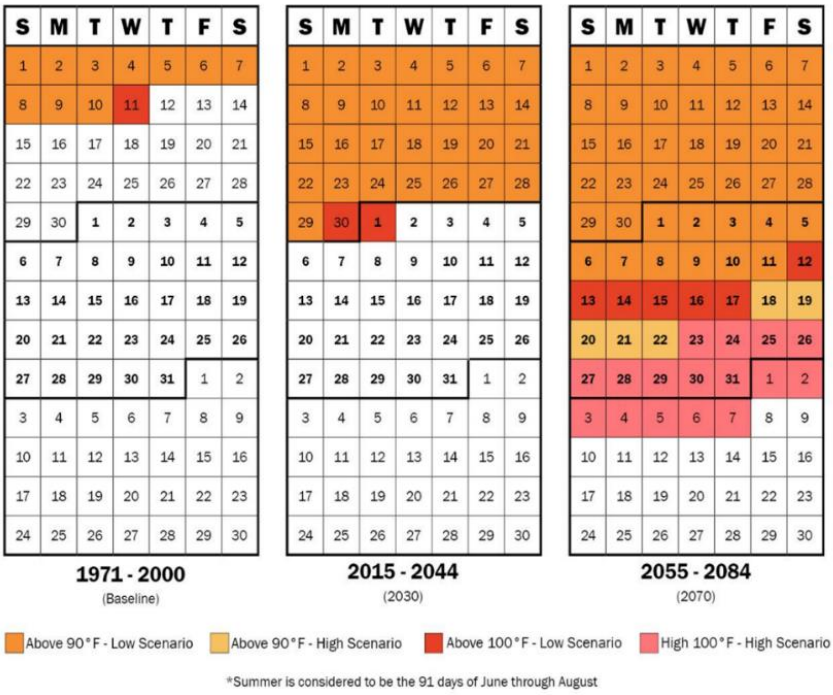

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Municipal Vulnerability Preparedness

Listening Session

March 2, 2020

MVP Core Team

- Susan Affleck-Childs, Planning & Economic Development Coordinator
- Stephanie Carlisle, Compliance Coordinator, DPW (Project Lead)
- Bridget Graziano, Conservation Agent
- Peter Pelletier, DPW Deputy Director
- Allison Potter, Asst. Town Administrator

Building Community Resilience

Background

2016 Executive Order 569

A comprehensive approach to reduce greenhouse gas emissions to combat climate change and prepared for the impacts of climate change with:

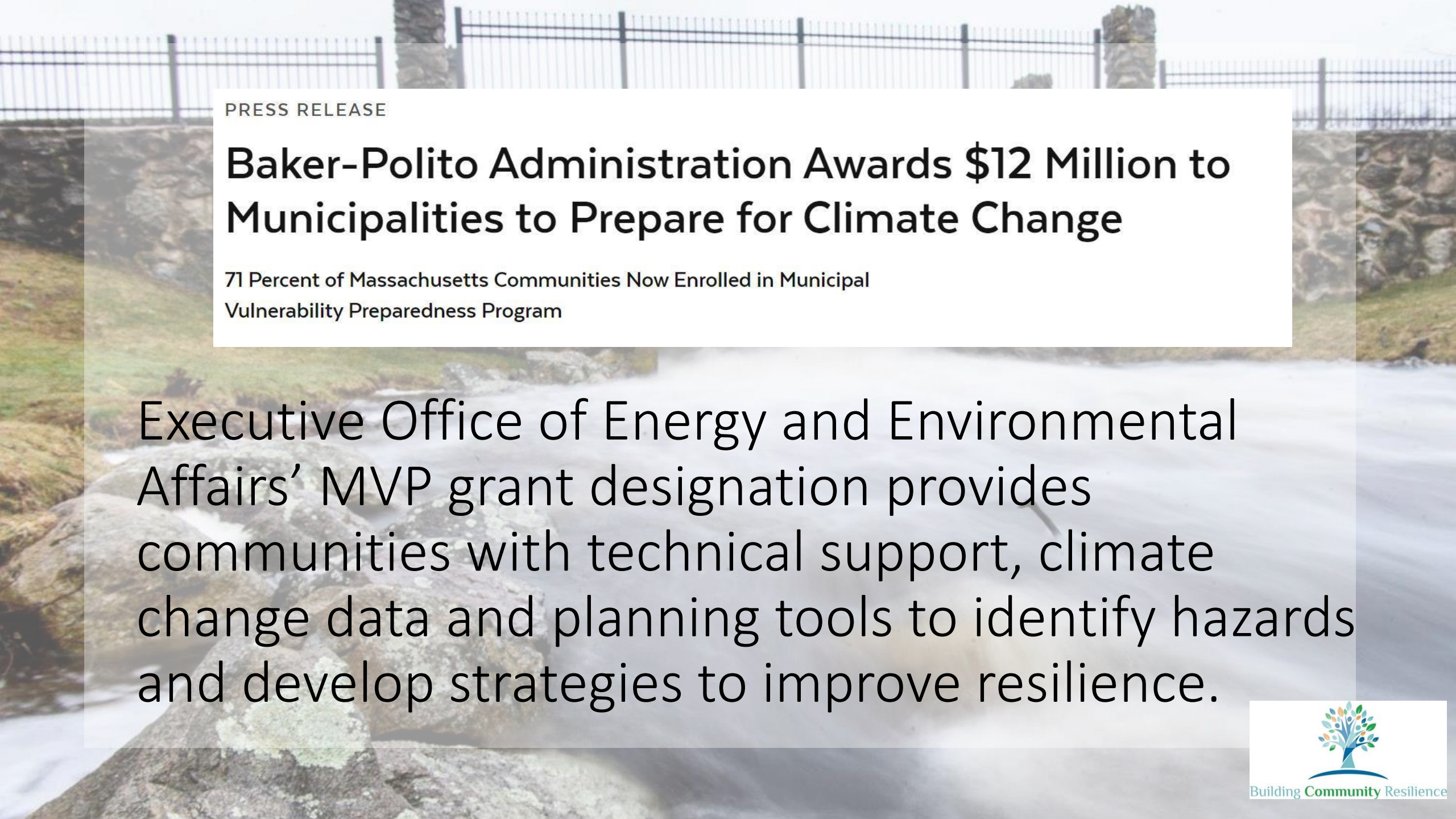
- A State Adaptation Plan
- Agency Climate Coordinators & Vulnerability Assessments
- Municipal Support

2018 Environmental Bond Bill

$2.4 billion bond bill with focus on climate change resiliency

- Over $200 million authorized for climate change adaptation
- Codifies EO 569, including the Municipal Vulnerability Preparedness (MVP) Program

Building Community Resilience



PRESS RELEASE

Baker-Polito Administration Awards $12 Million to Municipalities to Prepare for Climate Change

71 Percent of Massachusetts Communities Now Enrolled in Municipal Vulnerability Preparedness Program

Executive Office of Energy and Environmental Affairs' MVP grant designation provides communities with technical support, climate change data and planning tools to identify hazards and develop strategies to improve resilience.

Building Community Resilience

MVP Planning Grant

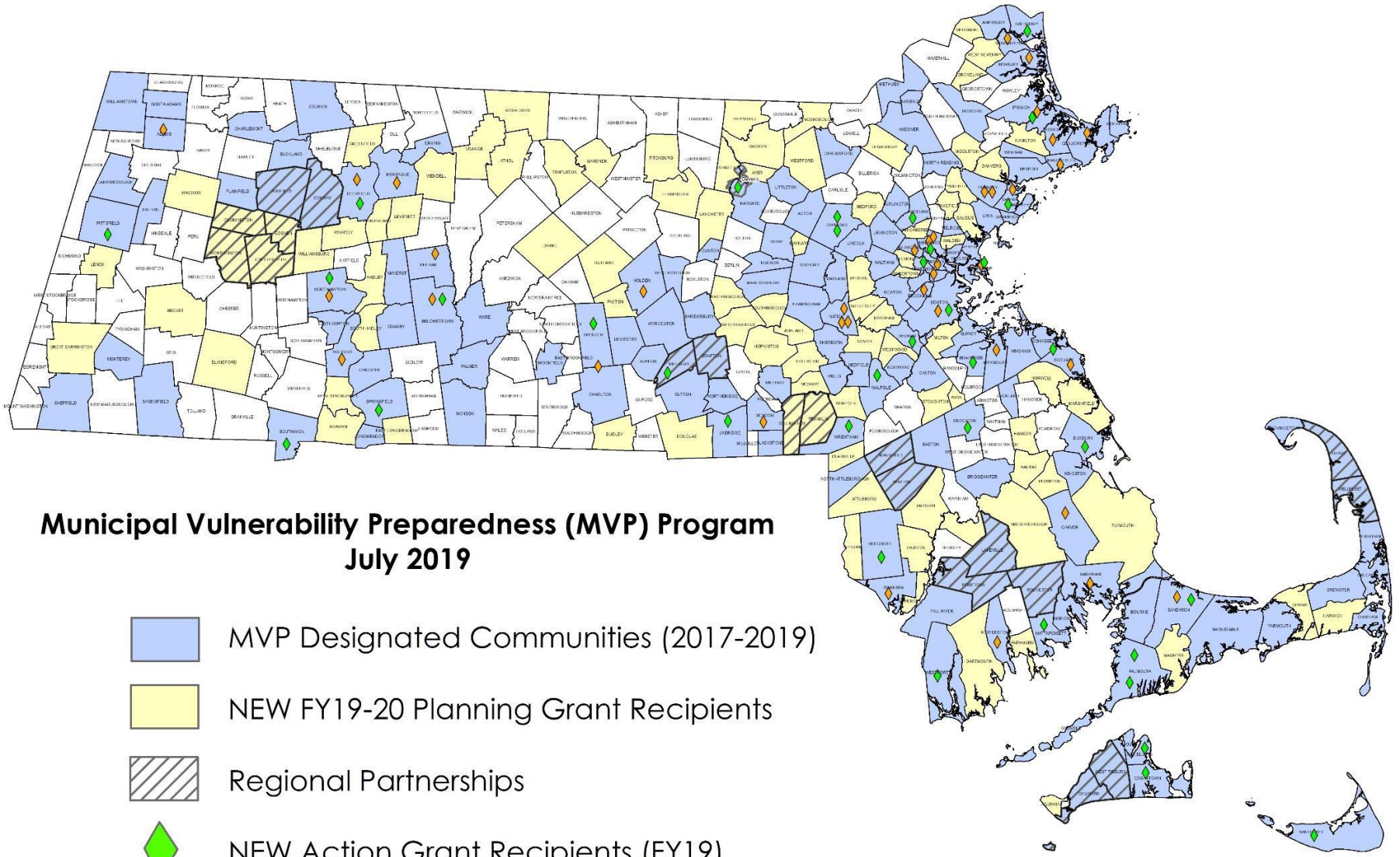
- Define and characterize hazards using latest science and data
- Building Community Resilience WORKSHOP (October 2019)
  - Identify existing and future community vulnerabilities and strengths
  - Develop and prioritize community adaptation actions
  - Identify opportunities to take action
- Conduct community engagement LISTENING SESSION (March 2020)
- Receive MVP designation

Building Community Resilience

MVP Action Grant

- After MVP designation, Medway will be eligible to apply for action grants
- Implement priority adaptation actions identified through planning process

Building Community Resilience



Municipal Vulnerability Preparedness (MVP) Program
July 2019

- MVP Designated Communities (2017-2019)
- NEW FY19-20 Planning Grant Recipients
- Regional Partnerships
- NEW Action Grant Recipients (FY19)
- Action Grant Recipients (FY18)

Building Community Resilience

Hazards of Concern in Medway

What are Medway's past, current, and future hazards?

Heavy Rainfall

Drought

Extreme Heat

Wind

HEAVY RAINFALL

Village Street Flooding – 2010
Credit: David Belcher/Daily News Staff

What is a 100-year Storm?

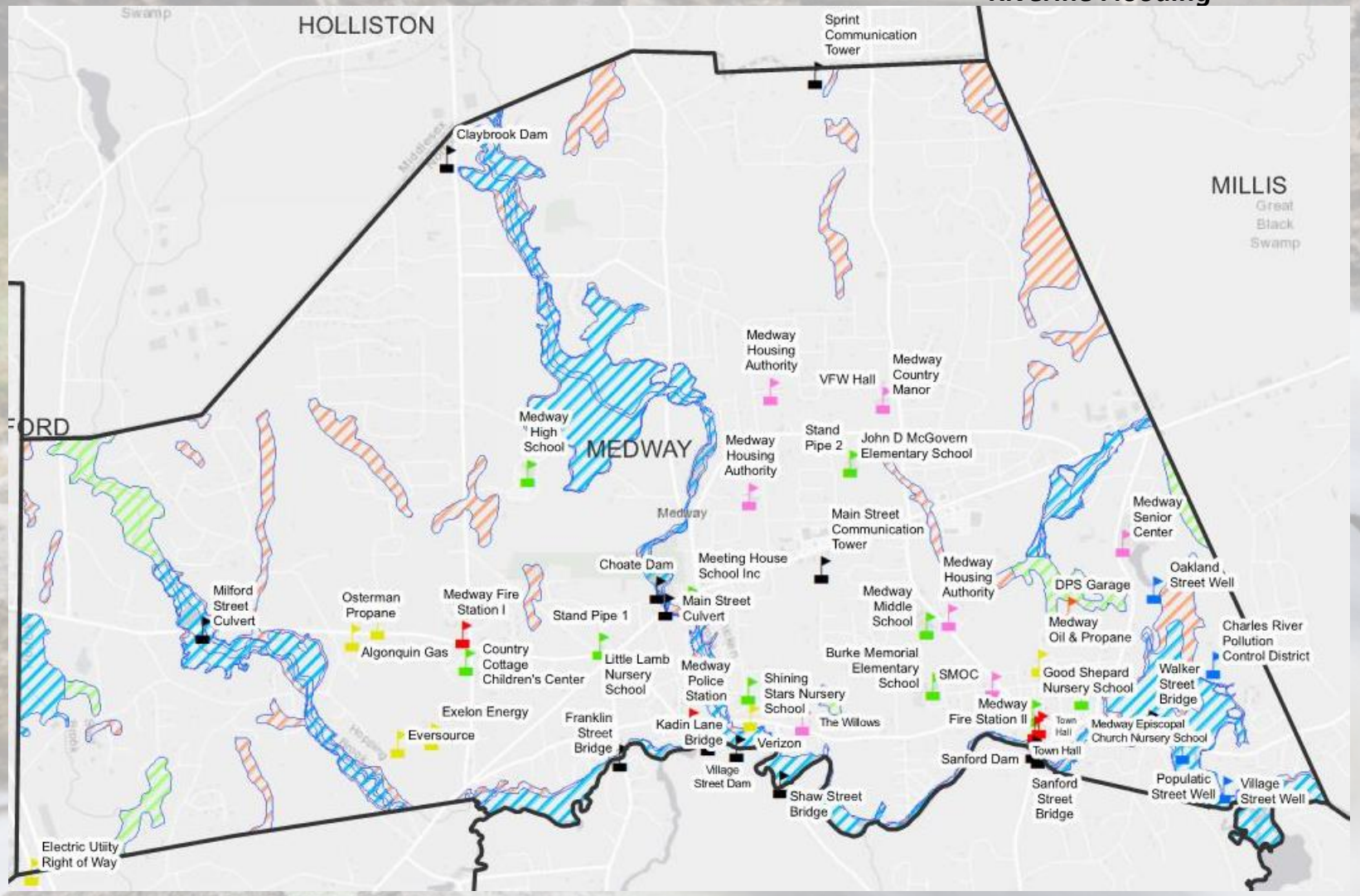
Source: Federal Emergency Management Agency/Community Impact Newspaper

100 year flood is an estimate of the long-term recurrence interval which does not mean that we have a 100 Years in between each flood of greater or equal magnitude. Floods can happen irregularly.

- 500-year Storm = 0.2% annual chance of occurring
- 100-year Storm = 1% annual chance of occurring
- 25-year Storm = 4% annual chance of occurring
- 10-year Storm = 10% annual chance of occurring

HEAVY RAINFALL – FEMA 100-YEAR

Riverine Flooding



FEMA National Flood Hazard Layer

Flood Zone

- A
- AE
- X
- Town Boundary

CriticalFacilities

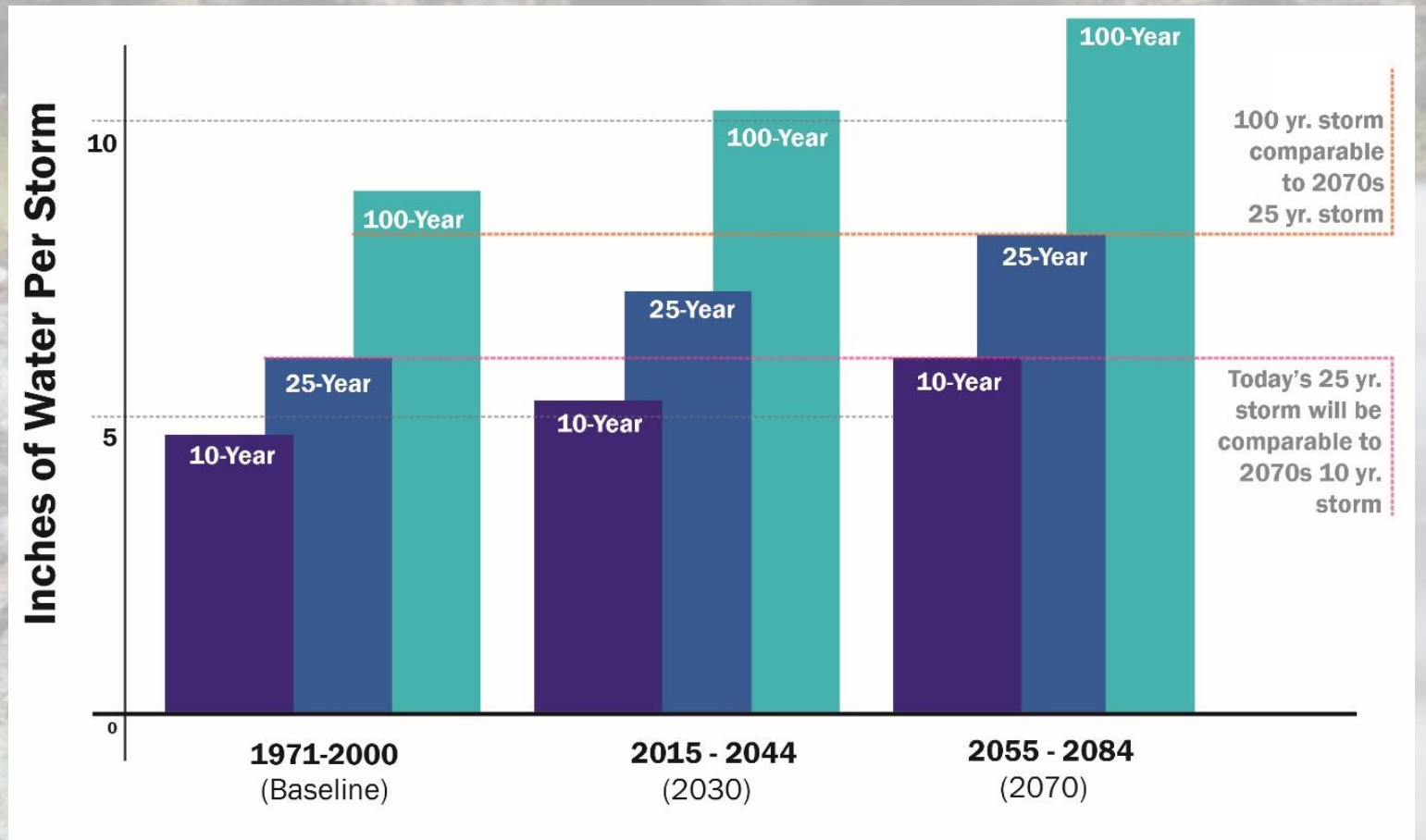
Type

- Senior/Assisted Living
- Bridge
- Communications
- DPW Garage
- Dam
- Daycare
- Emergency Ops Center
- Electric
- Fire Station
- Gas
- Police station
- School
- Sewer treatment plant
- Townhall
- Well

Credit: Hazard Mitigation Plan 2018, Town of Medway

Heavy Rainfall – Future Projections

- Total annual rainfall will increase
- Heavy rainfall events will become more frequent



Most piped infrastructure is built for the 25-year baseline storm

Source: Cambridge Climate Change Vulnerability Assessment - 2015

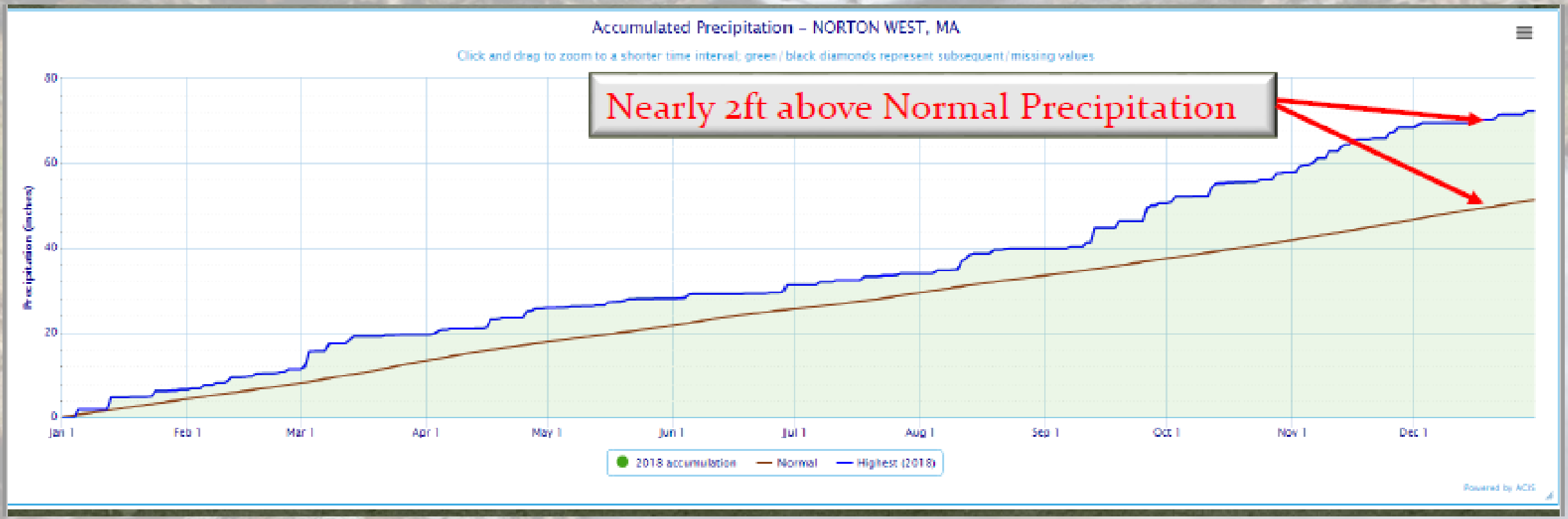
Heavy Rainfall

Applegate Subdivision 9-18-19

Applegate Road Infiltration basin

Credit: Medway Conservation Agent

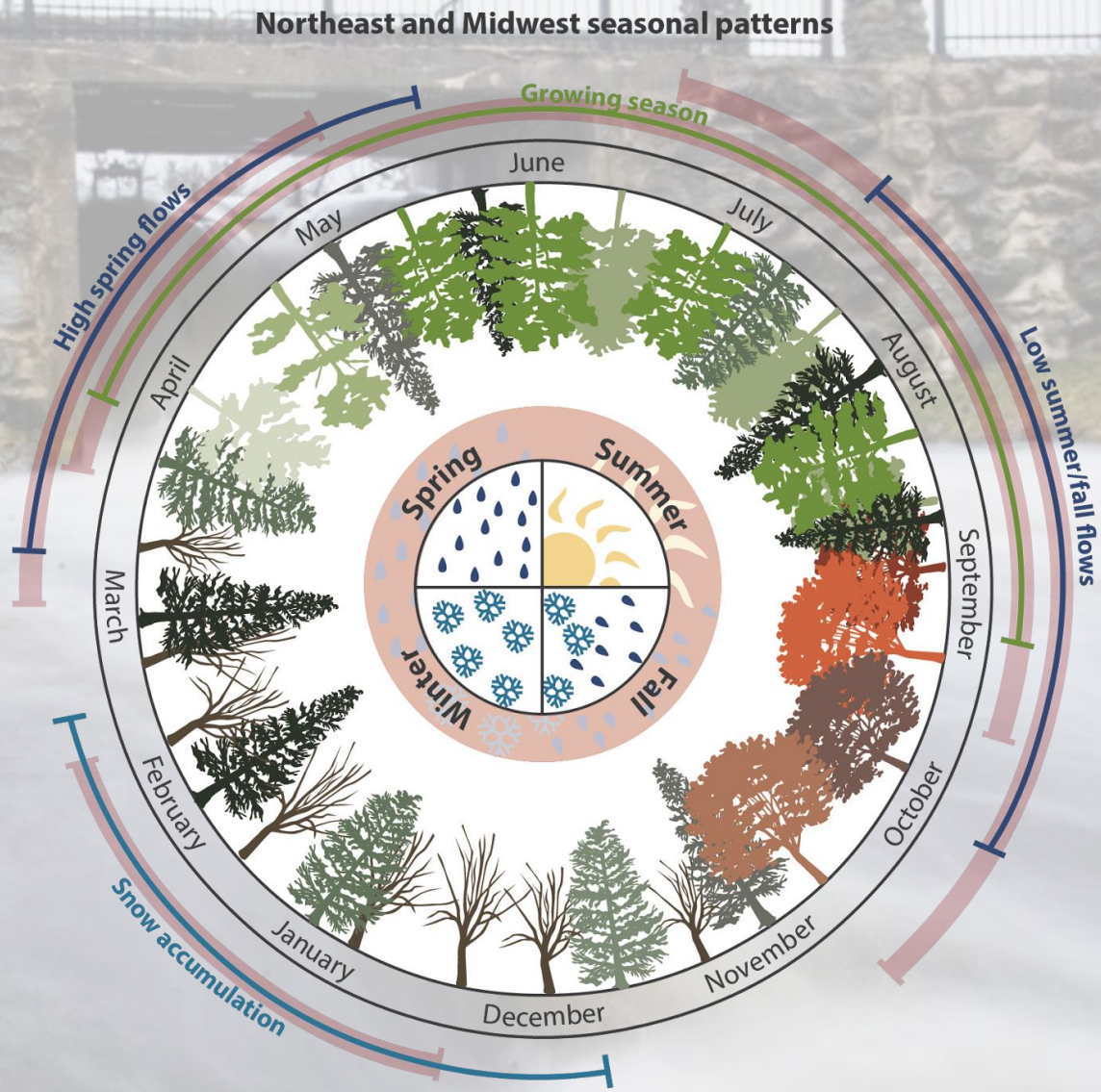
HEAVY RAINFALL



Drought

Drought

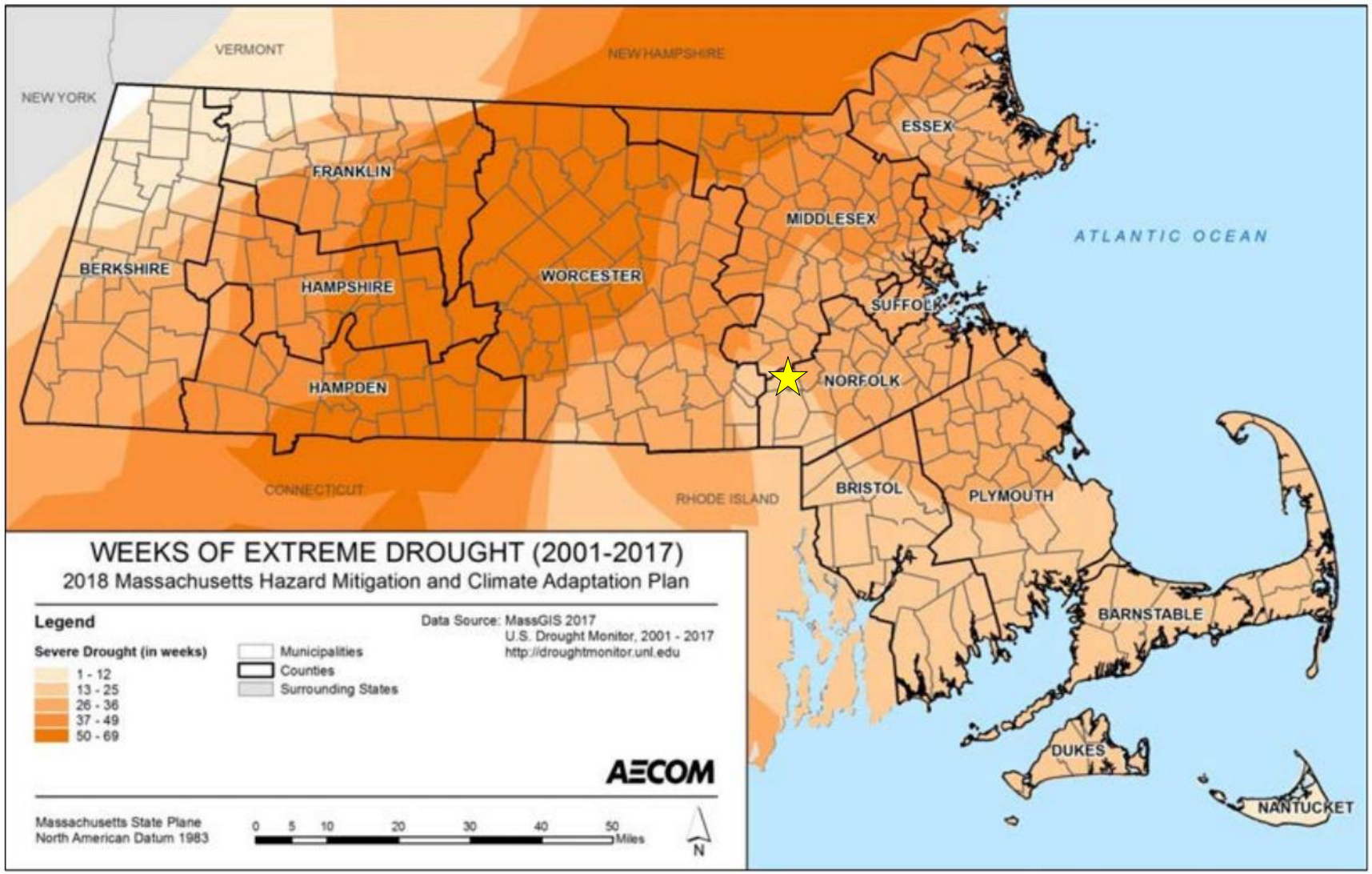
- More rainfall in large events could mean longer gaps with no rainfall locally.
- Hot days combined with a reduction in soil moisture will exacerbate drought conditions in spring, summer, and fall.
- Could impact natural resources:
  - Farms
  - Trees
  - Water quality
  - Aquatic organisms
  - Aquifers



Source: Integration and Application Network, University of Maryland Center for Environmental Science

DROUGHT - HISTORIC

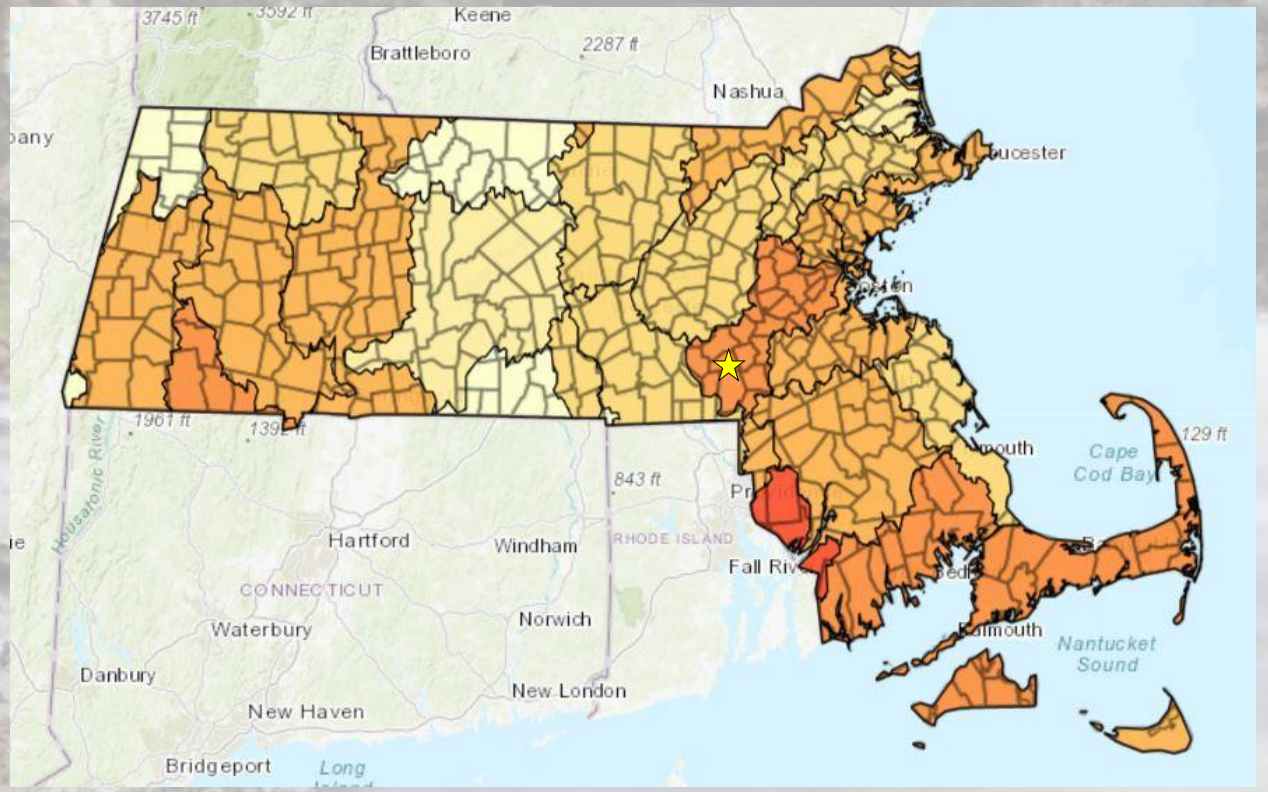
Figure 4-8: Weeks of Severe Drought (2001-2017)

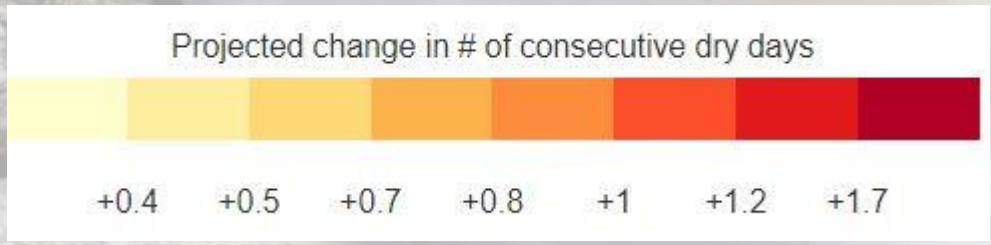


Source: U.S. Drought Monitor, 2017

Source: 2018 SHMCAP report

DROUGHT – 2030 CONSECUTIVE DRY DAYS



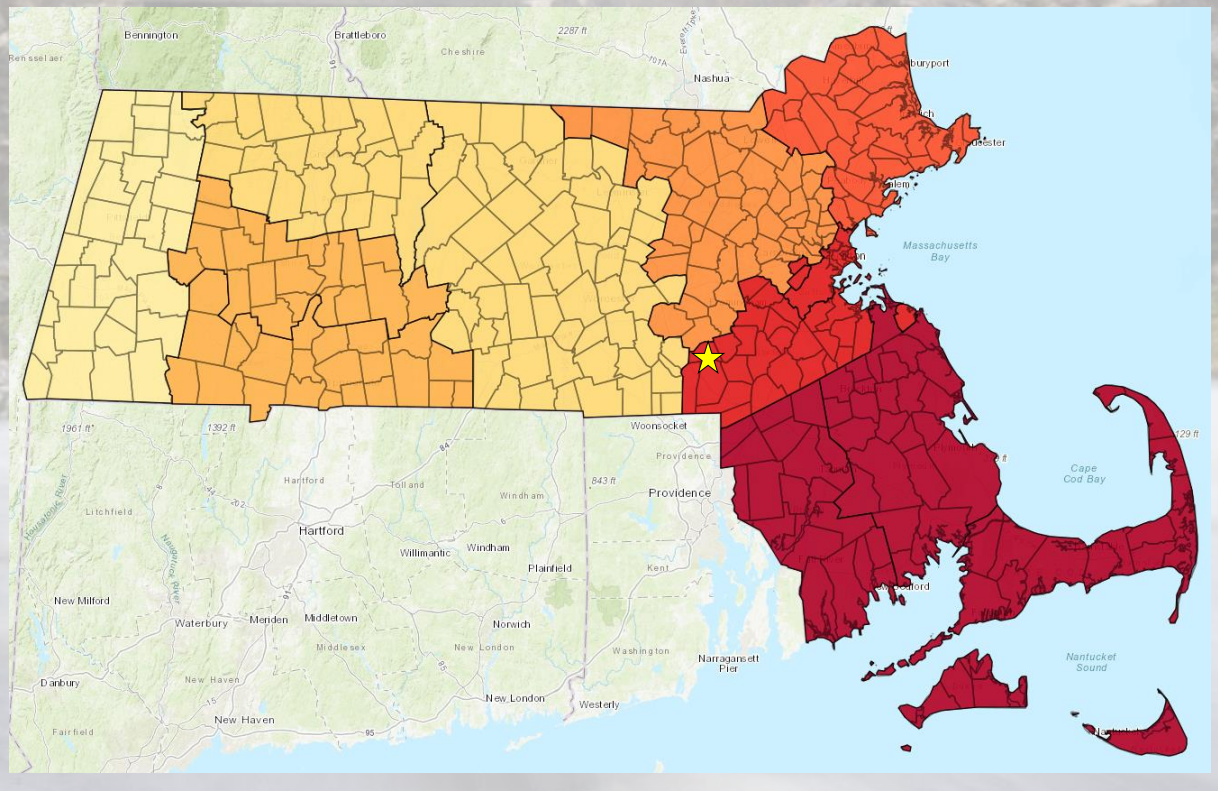


Source: resilientma.org, 2019

Drought – 2070 Consecutive Dry Days

Less frequent precipitation events are also expected, meaning:

- More consecutive dry days or extreme dry spells
- Heavy rainfall events occur less often increasing the risk for both flooding and drought.



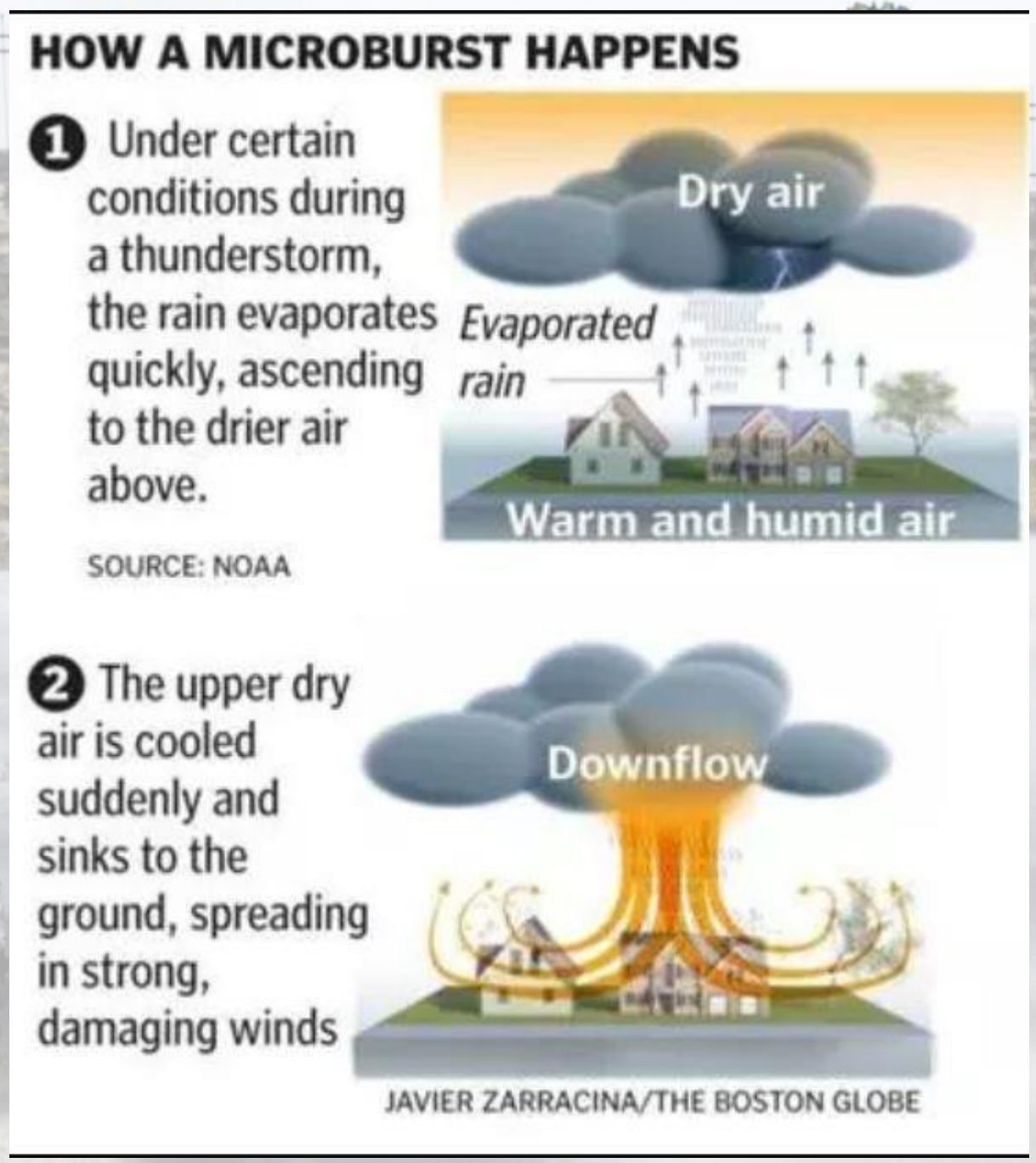
Source: resilientma.org, 2019

WIND

Source: Route 109, Town of Medway

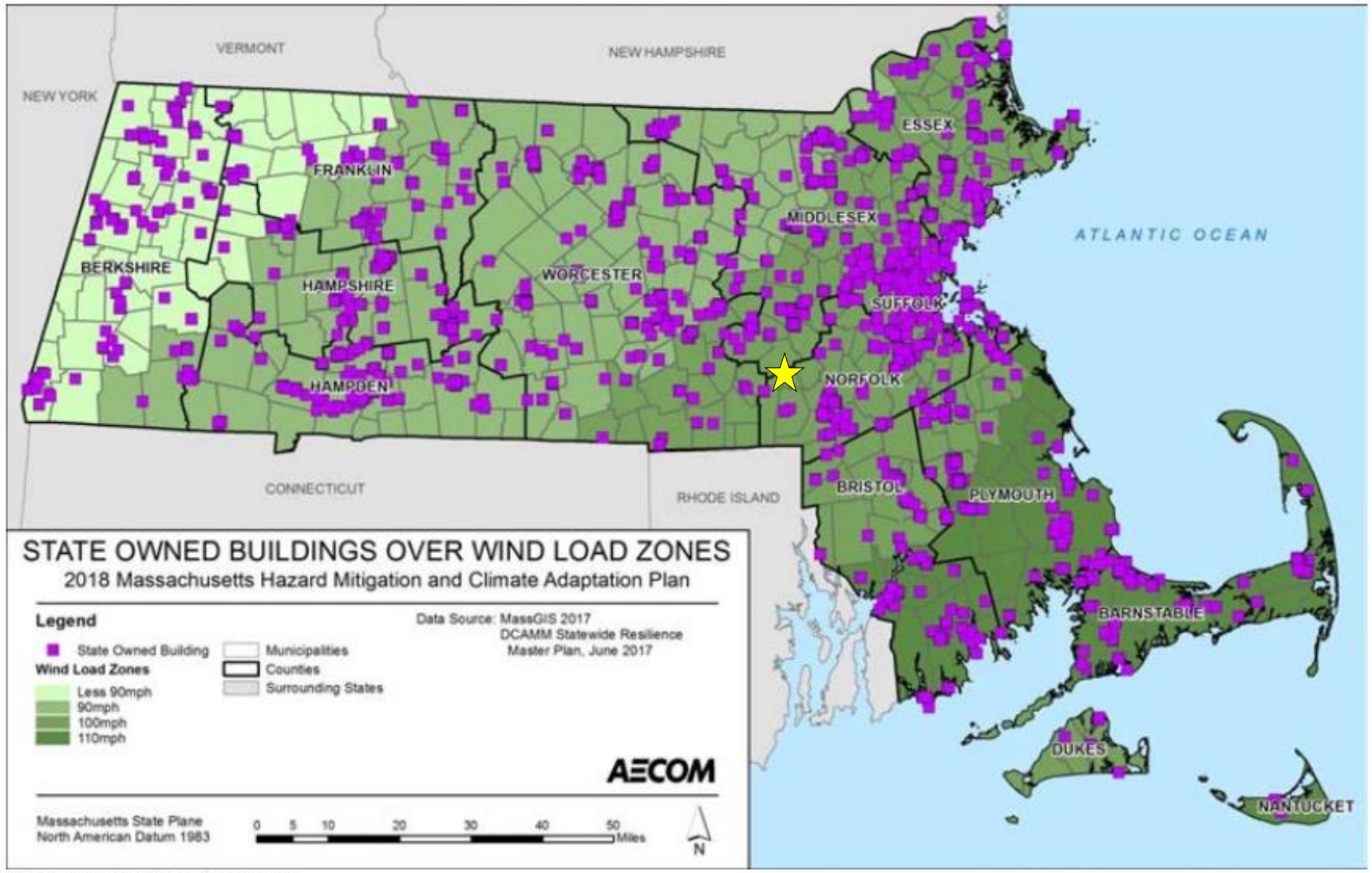
Wind

- Typically, damaging winds are classified as those exceeding 50-60 mph.
- Damaging winds can occur from microbursts, blizzards, tropical storms, tornados, etc.
- Impacts: town resources, infrastructure, private and public property.
- Microburst history in Medway: Aug 2005, August 2015



WIND

Figure 4-76: Wind Load Zones in the Commonwealth of Massachusetts



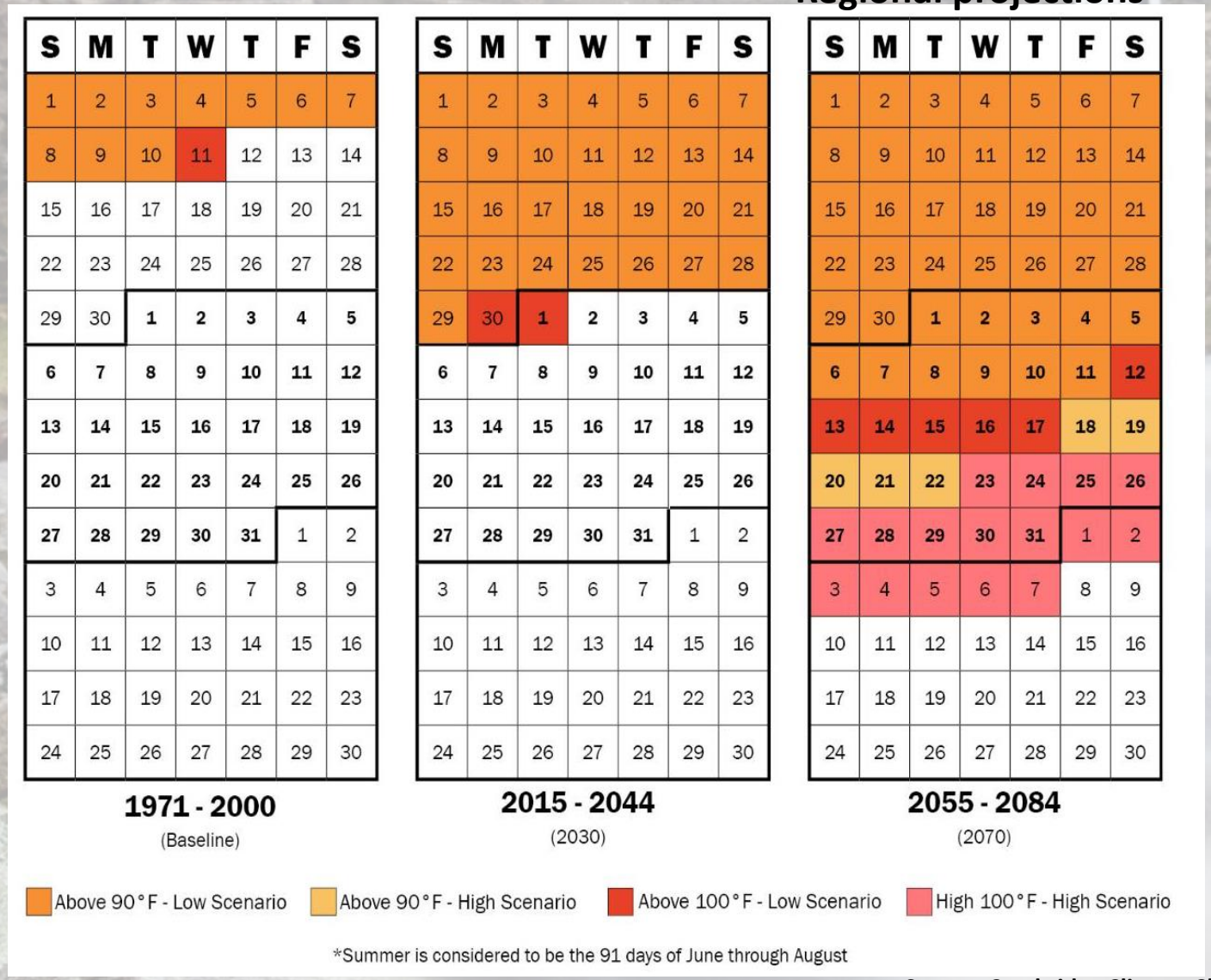
Source: DCAMM, 2017 (facility inventory)

Heat

Celebrate Medway Day, July 20, 2019.
Source: Town of Medway

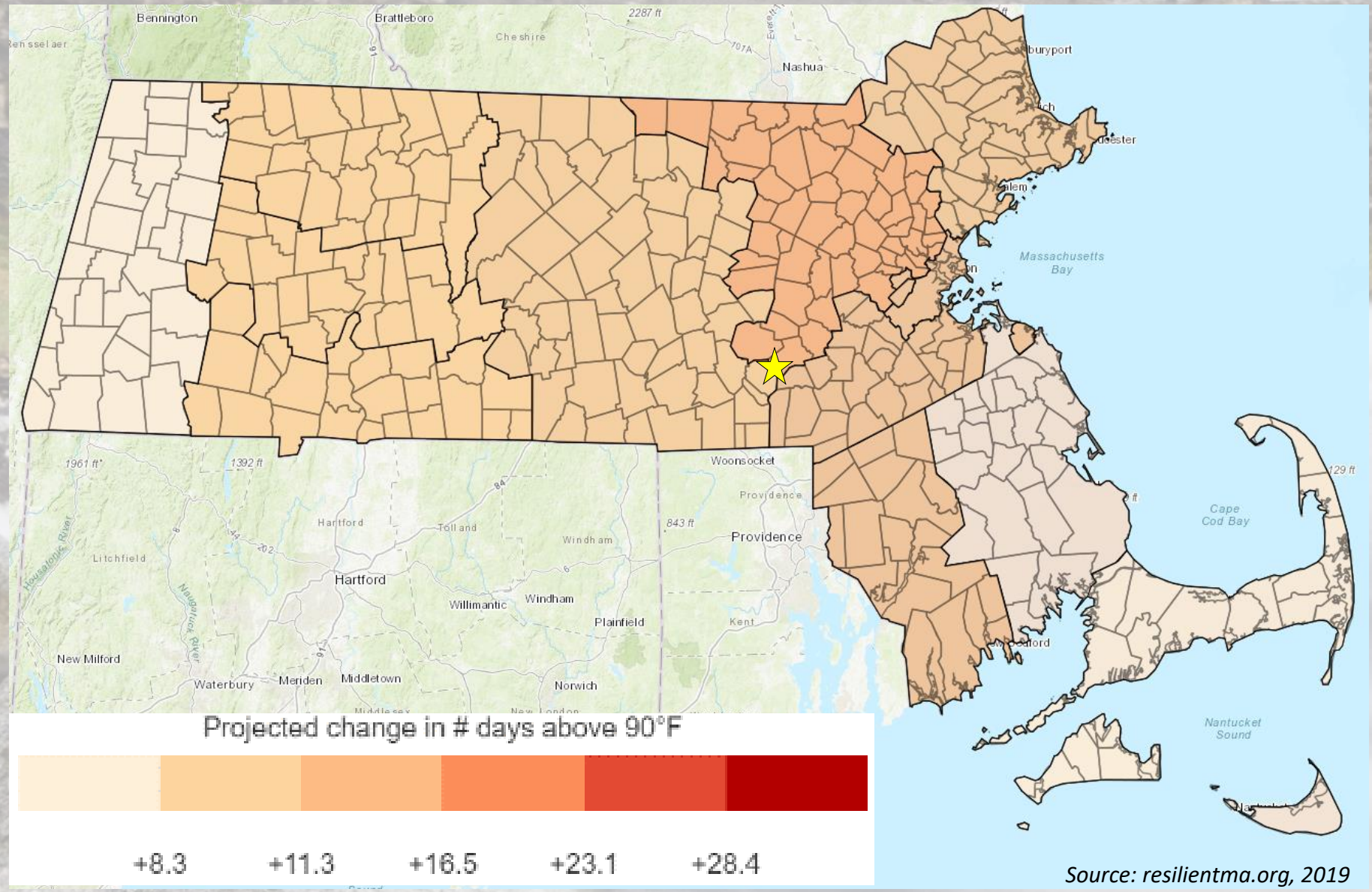
Extreme Heat

Regional projections



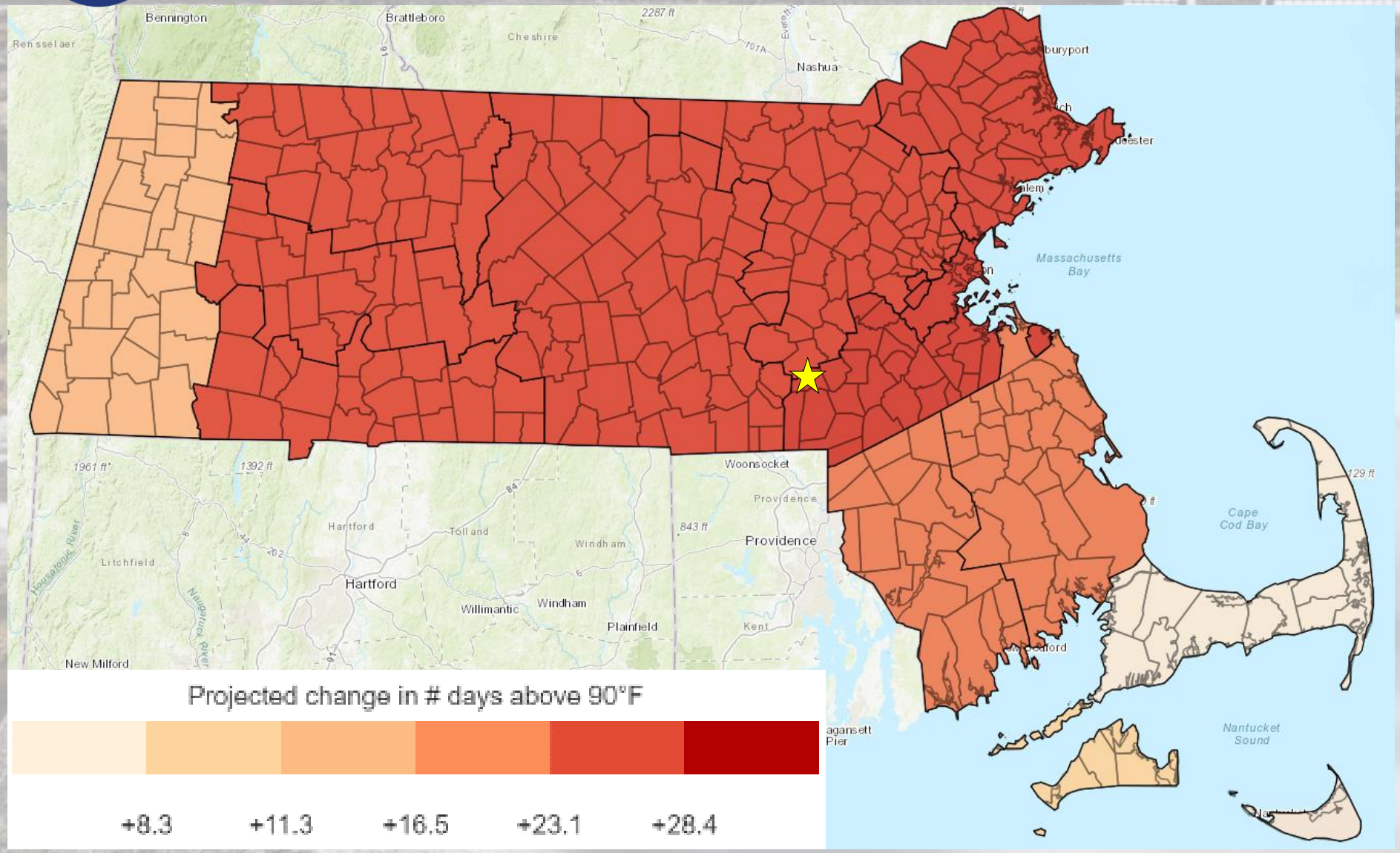
Source: Cambridge Climate Change Vulnerability Assessment - 2015

Extreme Heat - 2030



Source: resilientma.org, 2019

Extreme Heat - 2070

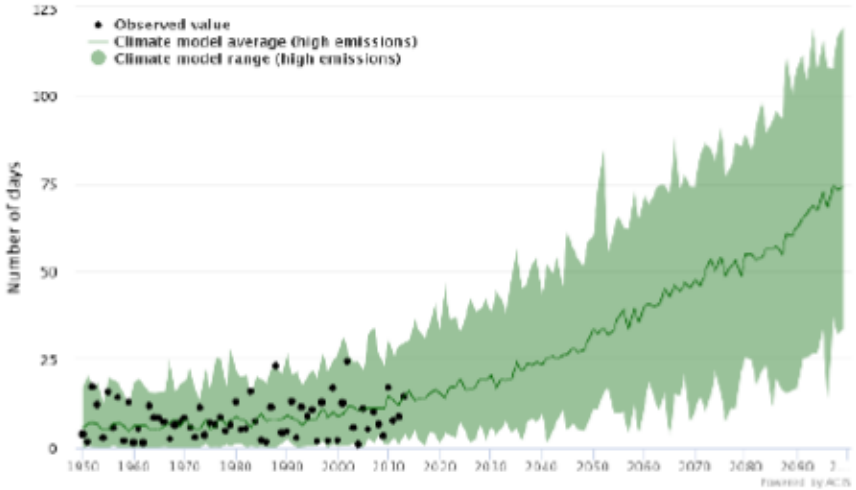


Source: resilientma.org, 2019

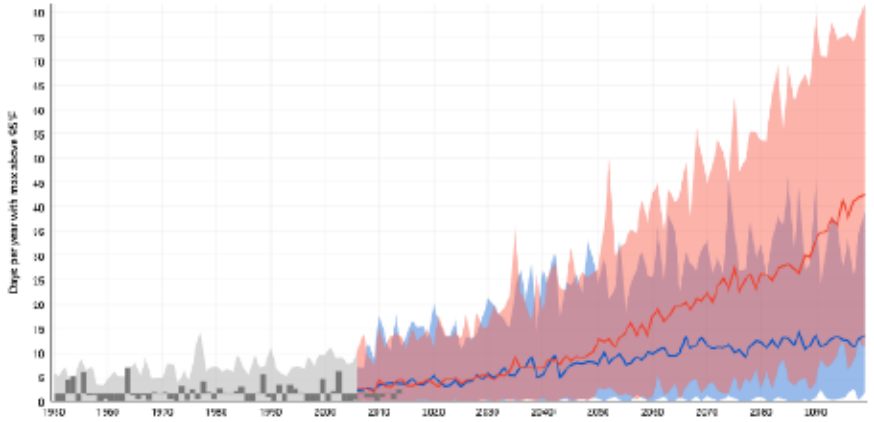
Extreme Heat

Climate Trends: Projections

Number of days with high temp > 90°F
@ Norfolk County, MA



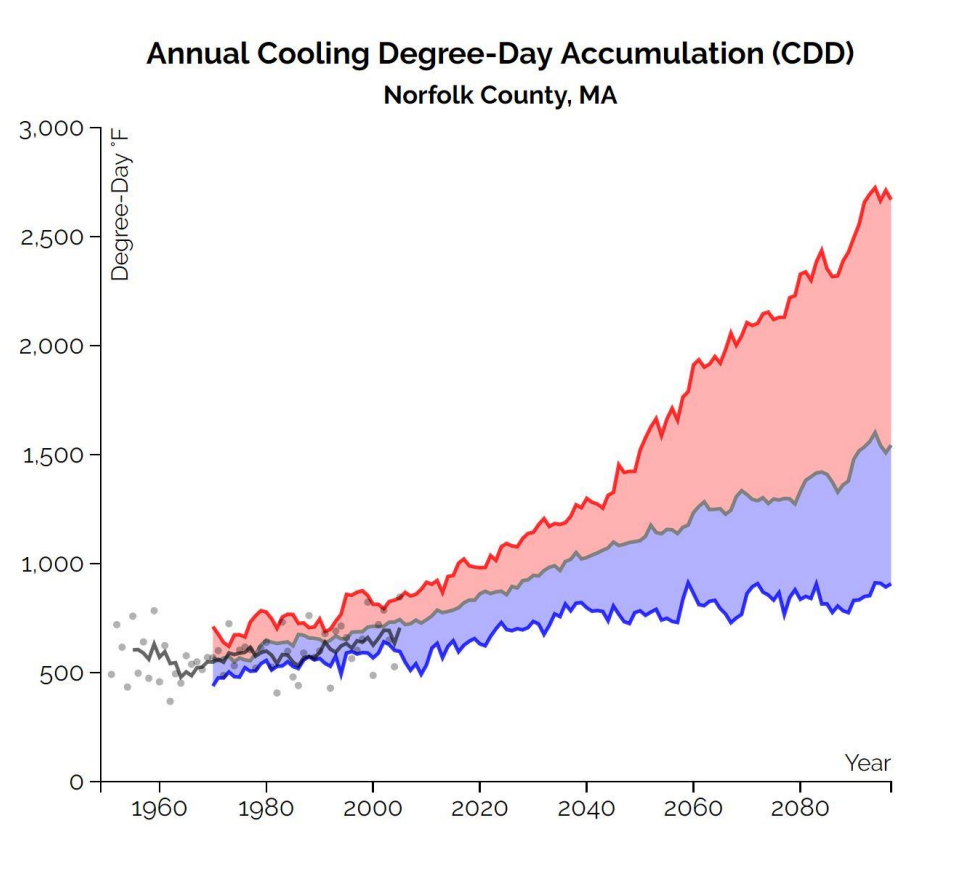
Number of days with high temp > 95°F
@ Suffolk County, MA

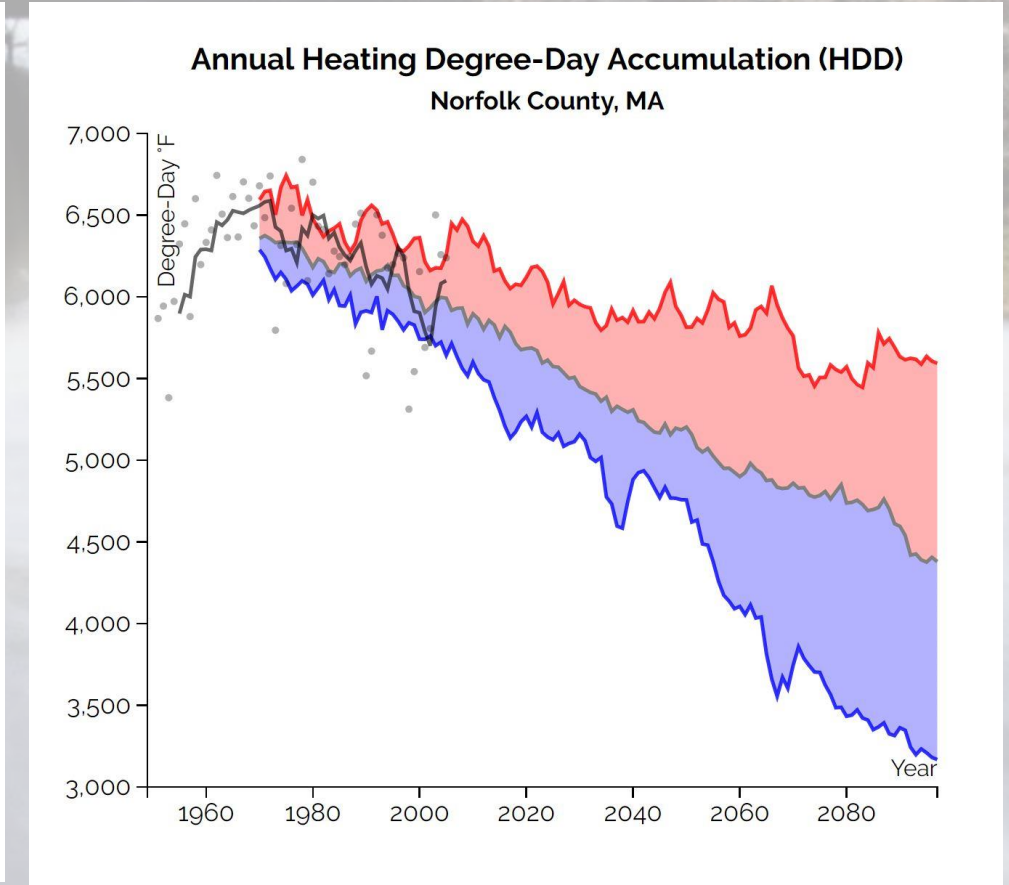


NRCC Cornell University

Northeast Regional Climate Center

Extreme Heat – Energy Demand



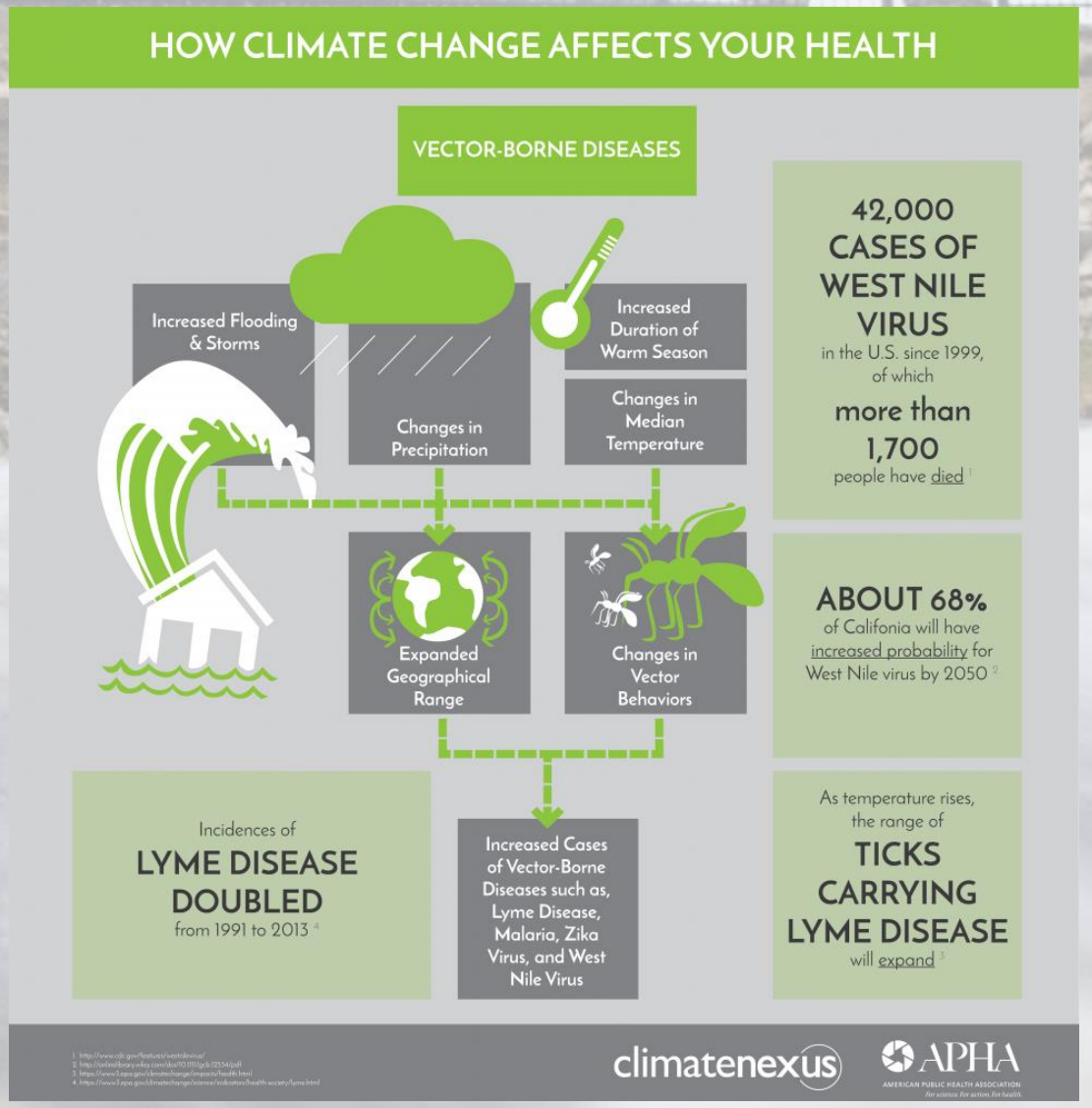


There will be more days required for cooling buildings than for heating by 2070.

Extreme Heat – Public Health

Human health issues:

- Heat-related illness and mortality, e.g. heat stroke
- Air quality, asthma
- Vector-borne diseases



The Changing Climate

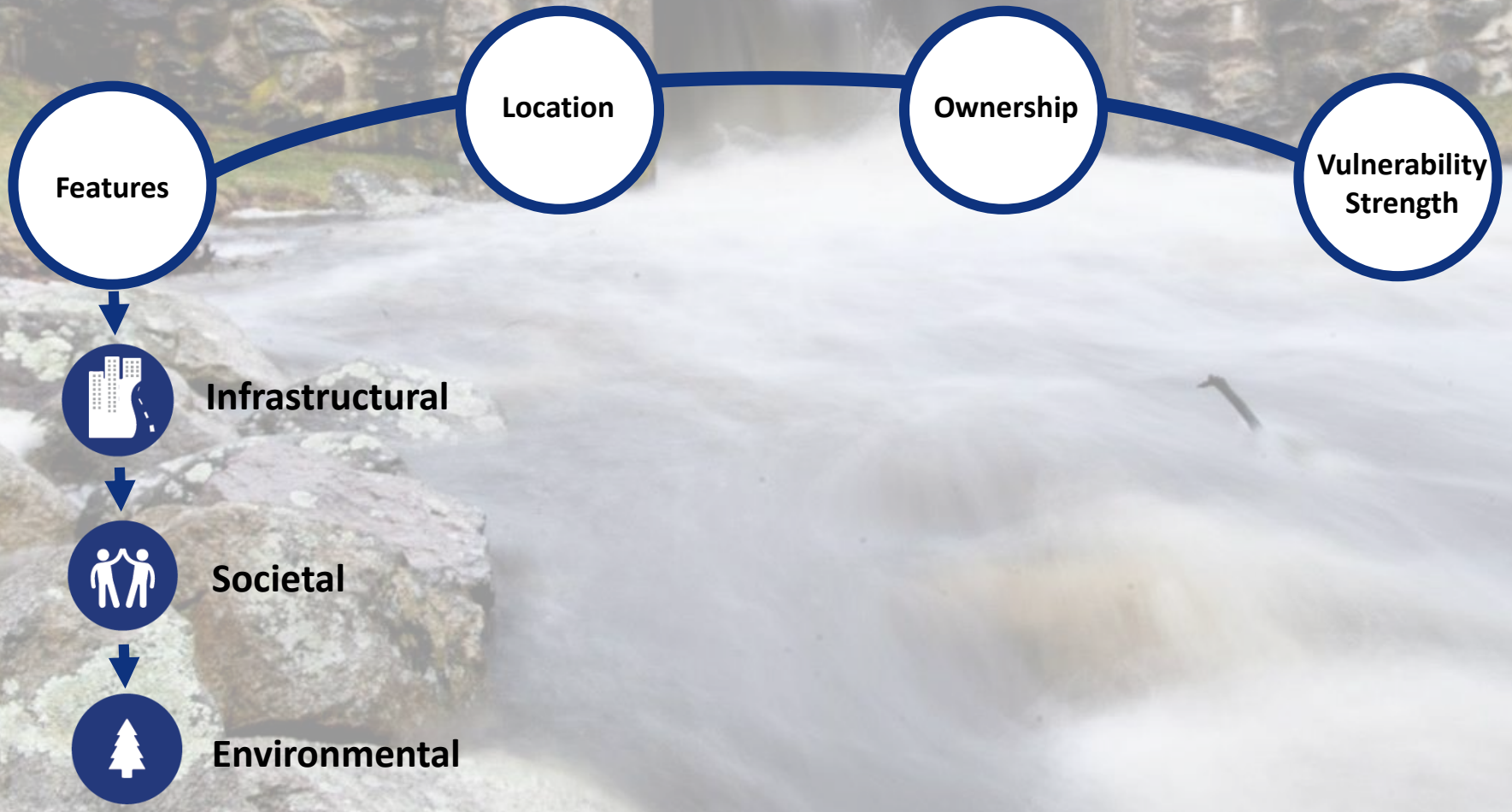
- Common themes across New England
  - Increasing annual precipitation
  - Increasing frequency of heavy rains
  - Warming annual temperatures
  - Shift in precipitation frequency
- Trend toward increased flood magnitude and/or frequency
  - Most pronounced where significant land use change and/or urbanization has occurred
  - More pronounced in smaller river basins and basins without flood control reservoirs

USGS gage floods during the May 2006 event
USGS Gage Lowell, MA.

Flash flooding is about to destroy this home in Warren, NH during the October 2017 floods.
Source: Accuweather.com

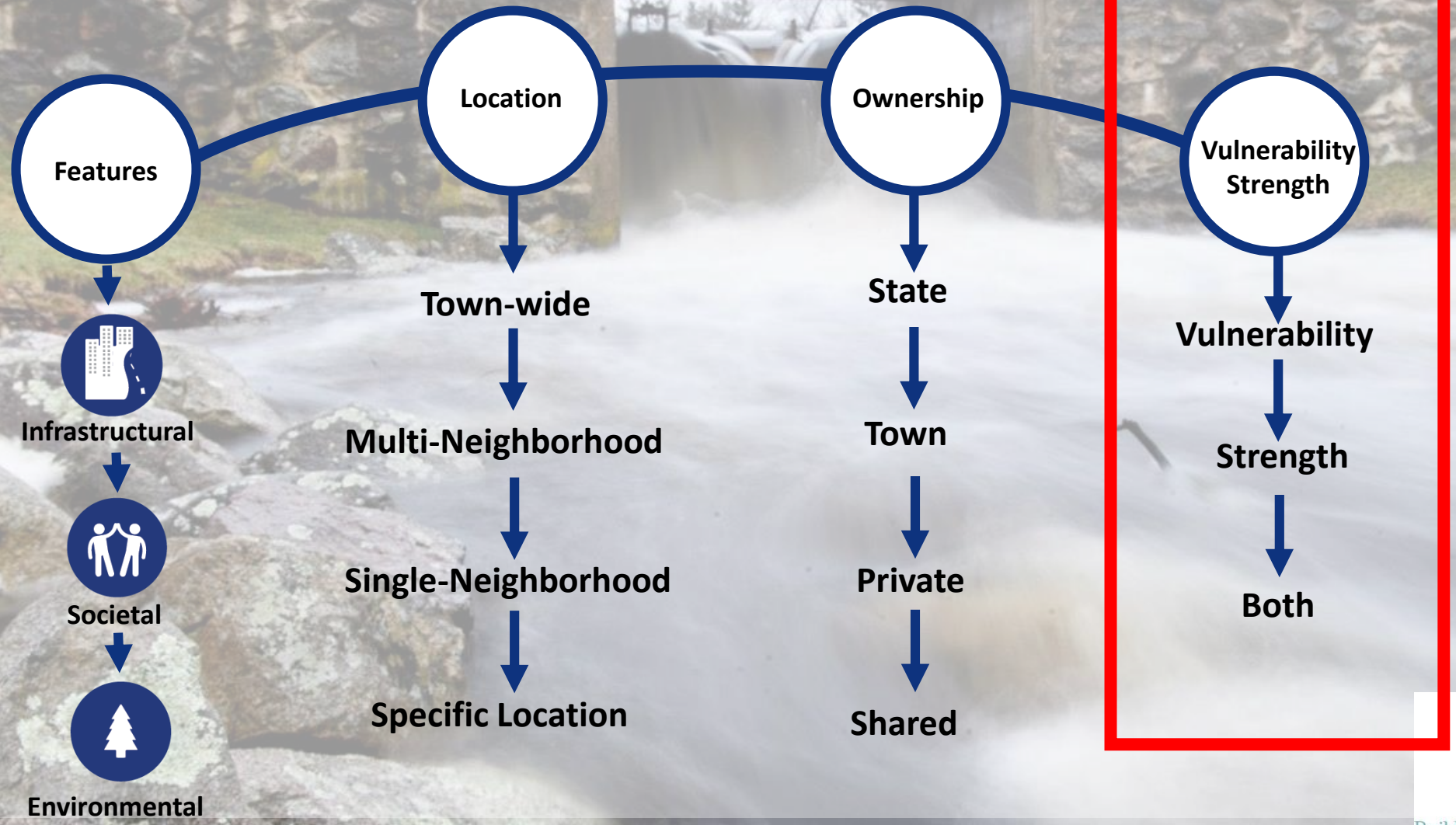
Strengths
Vulnerabilities
&
Areas of Concern

Strengths & Vulnerabilities



Building Community Resilience

Strengths & Vulnerabilities



Building Community Resilience

Infrastructural Features

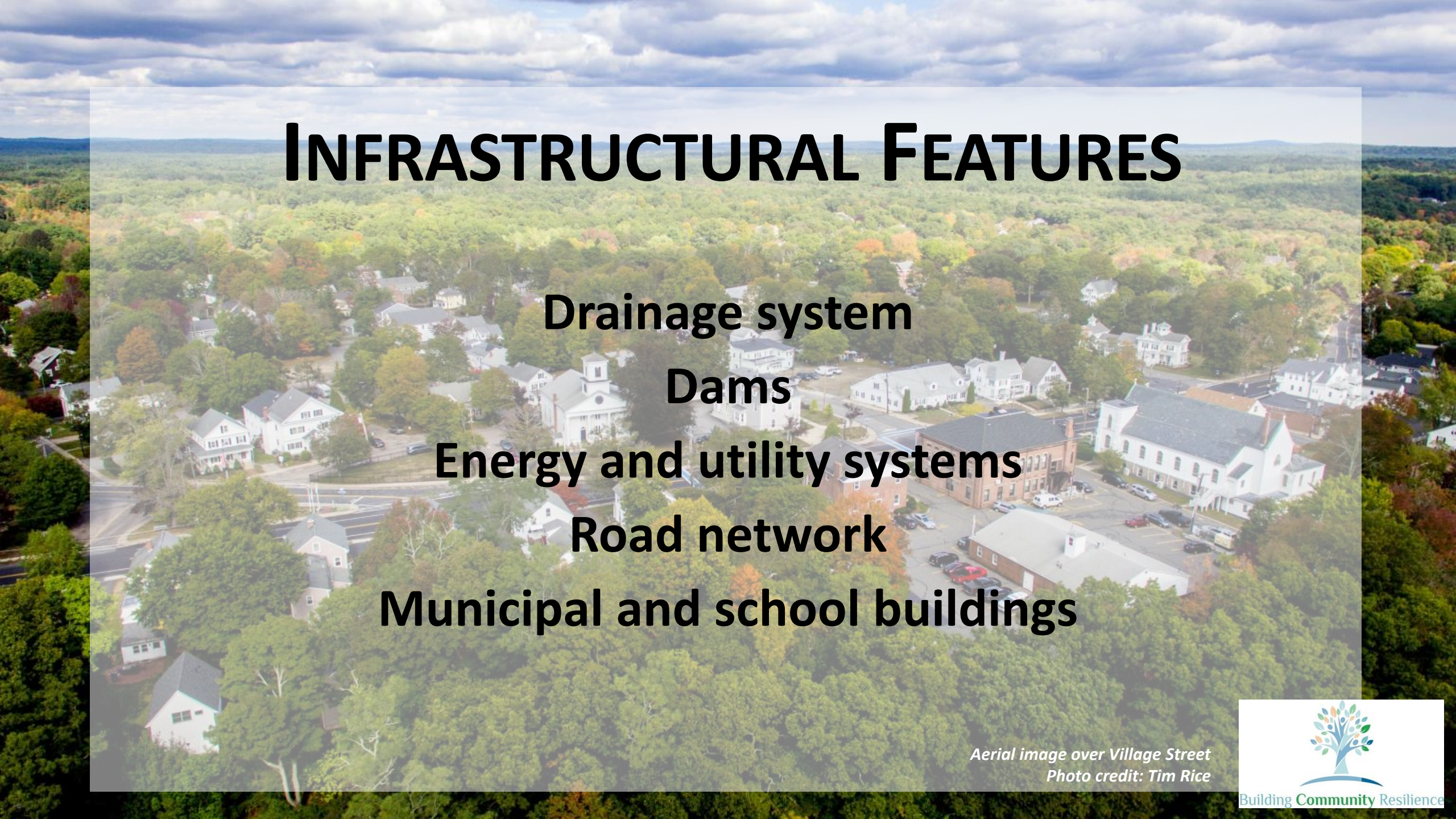
Drainage system

Dams

Energy and utility systems

Road network

Municipal and school buildings



Aerial image over Village Street
Photo credit: Tim Rice

Building Community Resilience

AREAS OF CONCERN

Water Infrastructure

Vulnerable Locations

- Drinking water wells
- CRPCD wastewater treatment plant
- Culverts
- Catch basins
- Dams at Choate, Village Street, Claybrook, and Sanford

Flooding

Vulnerable Locations

- Drinking wells
- Agricultural operations

Drought

October 2005
Sanford Street Dam
Photo credit: Town of Medway

Building Community Resilience

AREAS OF CONCERN

Energy, Utilities, and Roadways

Vulnerable Locations –

- Electric transformers
- Power-lines
- Communications lines
- Evacuation routes/ roadways

- Flooding

- Heat

- Wind

Route 109
Photo Credit: Town of Medway

Building Community Resilience

AREAS OF CONCERN

Facilities

Vulnerable Locations –

- Schools
- Senior Center
- Town Hall
- Emergency operations centers

Flooding

Heat

Senior Center
Photo Credit: Town of Medway

Building Community Resilience

Societal Features

Demographics

Community groups

Communications

Tractor Pull 2018
Photo credit: Tim Rice

Building Community Resilience

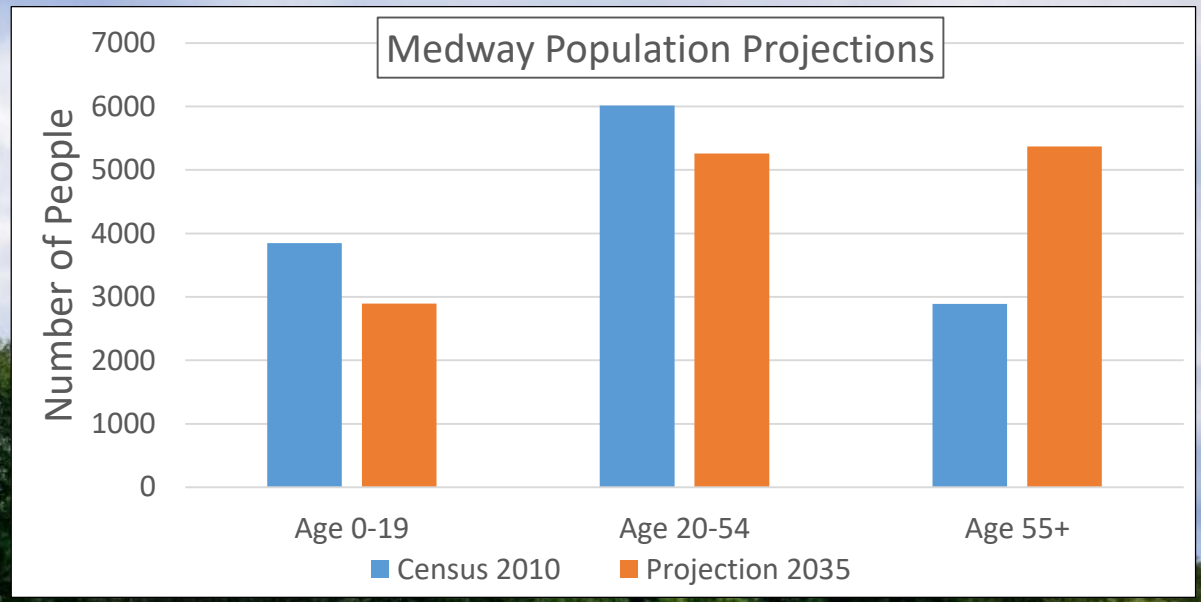
AREAS OF CONCERN

Vulnerable Population

Vulnerable populations–

- Seniors
- Dependent care populations
- Isolated individuals
- Children and youth sports groups
- Outdoor workers and agricultural community

Flooding
Heat
Wind
Drought



Data Credit UMASS Donahue Institute

Thayer Home
Photo Credit: Town of Medway

Building Community Resilience

Environmental Features

Waterways

Agricultural lands

Parks and Trails

Ground Water

Adams Street Aerial
Photo credit: Tim Rice

Building Community Resilience

AREAS OF CONCERN

Environmental Infrastructure

Vulnerable Locations Town-wide

- Waterways
  - Charles River
  - Choate Park Pond
  - Chicken Brook
  - Hopping Brook

Flooding

- Agricultural lands

Heat

- Trees on public and private lands

Wind

Choate Park Pond
Photo Credit: Town of Medway

Building Community Resilience

Recommended Actions

PRIORITIZING

HIGH, MEDIUM, LOW PRIORITY

Factors to consider:

- $$$
- Impacts from recent events

- Advancing longer term outcomes
- Contribution towards existing local and regional planning goals
- Urgency (SHORT TERM, LONG TERM, ONGOING)

Building Community Resilience

Priority Actions - Infrastructural

Implement adaptive and mitigative strategies for critical municipal buildings.

- Add emergency generators or other evolving technologies.
- Add solar canopies to school parking lots with capacity for battery storage for energy redundancy.
- Retrofit existing buildings with stormwater management best management practices.

Protect roadways from flooding.

- Improve accessibility during flooding emergencies, by ensuring that evacuation routes are open.
- Use beaver deceivers or other methods to discourage beavers from blocking waterways.

Building Community Resilience

PRIORITY ACTIONS - SOCIETAL

Educate the public on climate related hazards using diverse community outreach methods.

- Use quarterly bills to add info on upcoming seasonal climate threats.
- Continue using different methods of messaging to reach the various demographic groups in town.
- Use the Council on Aging monthly newsletter to disseminate information to older Medway residents.
- Use email to reach vulnerable populations that may not use social media.
- Develop/sponsor a series of community education events about climate related topics including but not limited to documentary showings and guest speakers.

Building Community Resilience

PRIORITY ACTIONS – ENVIRONMENTAL

Eradicate invasive species on "The Boardwalk" trail off Adams Street.

- Develop and implement a 3-year plan to remove invasive plant species and replant with native vegetation. The model is relatively short-term and could serve as a template for other areas in Medway suffering from invasive species.

- Improve public awareness of invasive species.

Inspect and enhance flood resilience of Charles River.

- Inspect dams to measure structural integrity and capacity.

- Review FEMA flood zones and flood insurance maps alongside the Charles River.

Building Community Resilience

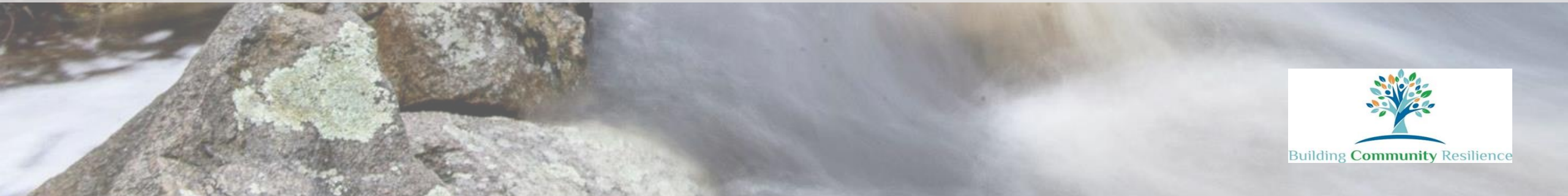
PRIORITY ACTIONS – ENVIRONMENTAL

Improve Town-wide tree planting strategy and maintenance.

- Create a tree master plan with a “right tree, right place” initiative. Examples include:
  - Trees with roots that grow vertically rather than horizontally
  - Not planting trees under above-ground power lines or near large below-ground utilities.
  - Planting trees with wide leaves to block sunlight to promote cooling.

- Educate the public on how to maintain privately owned trees.

- Improve maintenance efforts (regular pruning, cutting down dead trees, etc.) to limit the probability of trees damaging power lines or blocking roadways.



Building Community Resilience

MVP Listening Session - Next Steps?

- Community Preferences for Action Plan
- Questions and Answers
- Other Ideas?

Community Preferences

- The Action Plan Recommendations developed during the workshop held in October 2019 are posted around the room. 3 sheets.
- You will be given 3 red dot stickers. Please use the dots to vote for one item on each of the Feature Sheets that is the highest priority for you.

Building Community Resilience

Questions and Answers

- What questions do you have about the MVP program and what has been presented?
- Are you familiar with any “green” infrastructure projects in the area? Which types would you like to see implemented in Medway? Where?
- How can the Town help you learn about climate change?

Building Community Resilience

Other Ideas

- What ideas do you have for other actions the Town of Medway could undertake to address the impacts of climate change in our community?

Building Community Resilience


Thank you
Building Community Resilience

Societal Priority Actions

Action A: ***Educate the public on climate related hazards using diverse community outreach methods to empower residents to prepare for climate related hazards, especially for those who are more vulnerable.***

- Use quarterly bills to add info on upcoming seasonal climate threats.
- Continue using different methods of messaging to reach the various demographic groups in town.
- Use the Council on Aging monthly newsletter to disseminate information to older Medway residents.
- Use email to reach vulnerable populations that may not use social media.

Action B: ***Enhance branding of Town social media accounts to ensure dissemination of accurate information and limit the spread of misinformation.***

- Spread awareness of Town social media accounts on all platforms so that residents turn there first to find out about climate-related emergencies.
- More Town social media presence (more frequent posts, more information).
- Create monthly or quarterly newsletters updating residents on the work being done in Town.

Action C: ***Better facilitate resident involvement in community, meetings, events, and initiatives to build community support***

- More frequent mailings and social media posts to increase awareness of community events to improve attendance. The action should help bring residents together and encourage neighbor to neighbor interactions.

Action D: ***Notify residents of public health or environmental hazards to increase community awareness***

- Notifications would be sent out by mail monthly, quarterly or yearly in existing water bills or other regular public notifications. Regular mail is better than social media as it ensures that everyone (especially elderly) are reached.
- Spread awareness of potential environmental or public health hazards (i.e. EEE) and how best to protect oneself.
- Use the Town's webpage to highlight immediate hazards or threats.
- Develop/sponsor a series of community education events about climate related topics including but not limited to documentary showings and guest speakers.

Infrastructural Priority Actions

Action A: ***Implement adaptive and mitigative strategies for critical municipal buildings to reduce dependency on non-renewable energy sources and retrofit buildings so they can adapt to changes in cooling needs and flooding frequencies.***

- Add emergency generators or other evolving technologies to improve resiliency during power outages and allow for business continuity. Confirm where we have generators and where the next most critical locations are.
- Add solar canopies to school parking lots with capacity for battery storage for energy redundancy.
- As roof replacement is needed, explore the benefits of adding solar panels for energy redundancy, reduce heat impacts to buildings by retrofitting with cool roofs, and/or add insulation to promote energy efficiency.
- Retrofit existing buildings with stormwater management best management practices.

Action B: ***Protect roadways from flooding to protect essential routes in the Town that are prone to flooding or lie within the FEMA 100 year or 500 year flood zones.***

- Improve accessibility during flooding emergencies, by ensuring that evacuation routes are open and residents are not stranded.
- Assess and maintain vegetation along evacuation routes.
- Assess and replace undersized culverts where needed.
- Use beaver deceivers or other methods to discourage beavers from blocking waterways.
- Identify private properties with culverts and dams and secure easements in order to maintain the infrastructure.

Environmental Priority Actions

Action A: ***Eradicate invasive species on "The Boardwalk" trail off Adams Street to curb spread of invasive species***

- Develop and implement a 3-year plan to remove invasive plant species and replant with native vegetation. The model is relatively short-term and could serve as a template for other areas in Medway suffering from invasive species.
- Improve public awareness of invasive species.

Action B: ***Inspect and enhance flood resilience of Charles River to protect the Charles, surrounding infrastructure and environmental assets from climate hazards, particularly flooding.***

- Inspect dams to measure structural integrity and capacity.
- Review FEMA flood zones and flood insurance maps alongside the Charles River.

Action C: ***Improve Town-wide tree planting strategy and maintenance to address the health of trees on municipal properties.***

- Create a tree master plan with a "right tree, right place" initiative. Examples include.
- Trees with roots that grow vertically rather than horizontally
- Not planting trees under above-ground power lines or near large below-ground utilities.
- Planting trees with wide leaves to block sunlight to promote cooling.
- Educate the public on how to maintain privately owned trees.
- Improve maintenance efforts (regular pruning, cutting down dead trees, etc.) to limit the probability of trees damaging power lines or blocking roadways.