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:

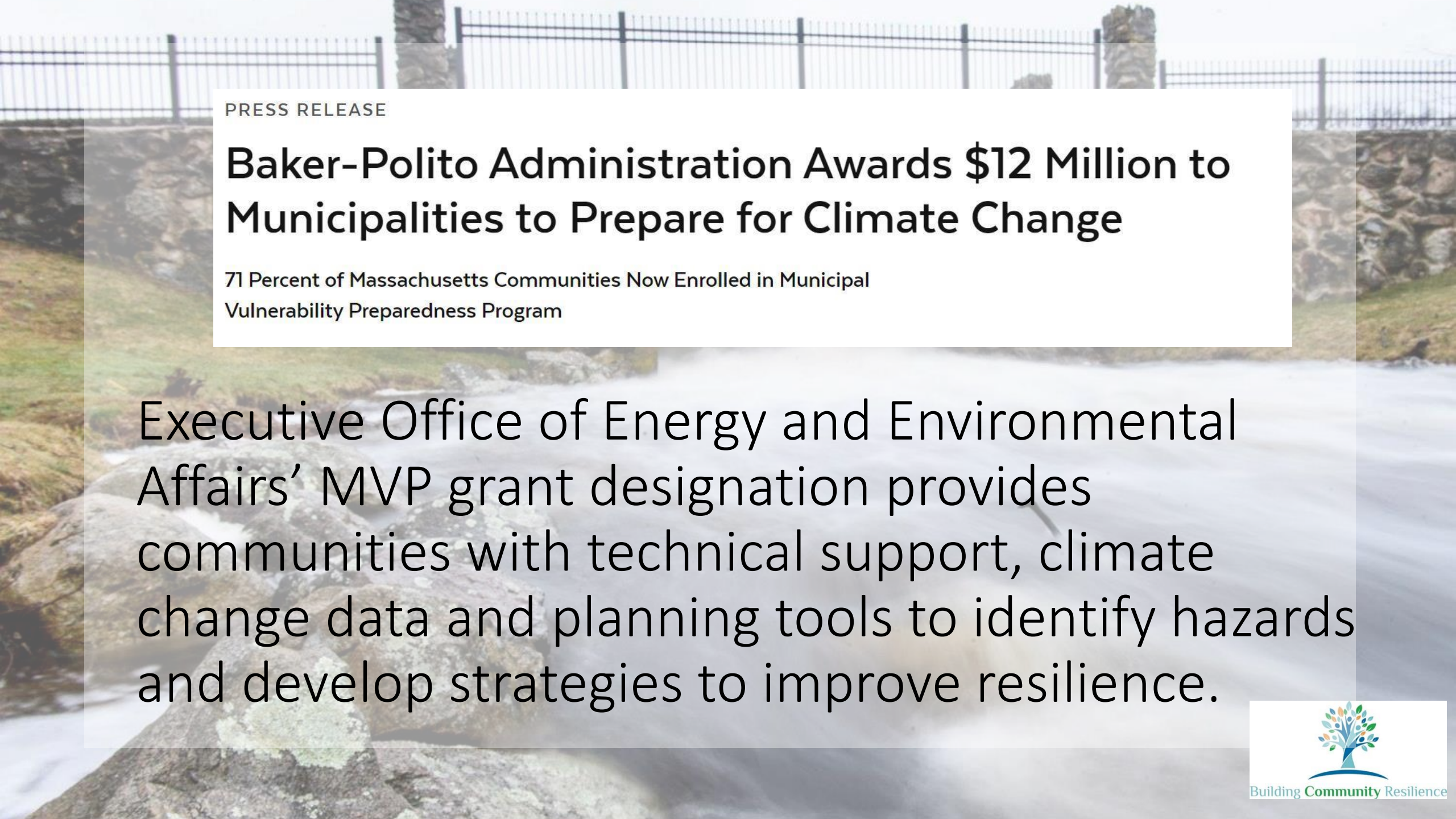
- A State Adaptation Plan
- Agency Climate Coordinators & Vulnerability Assessments
- Municipal Support

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

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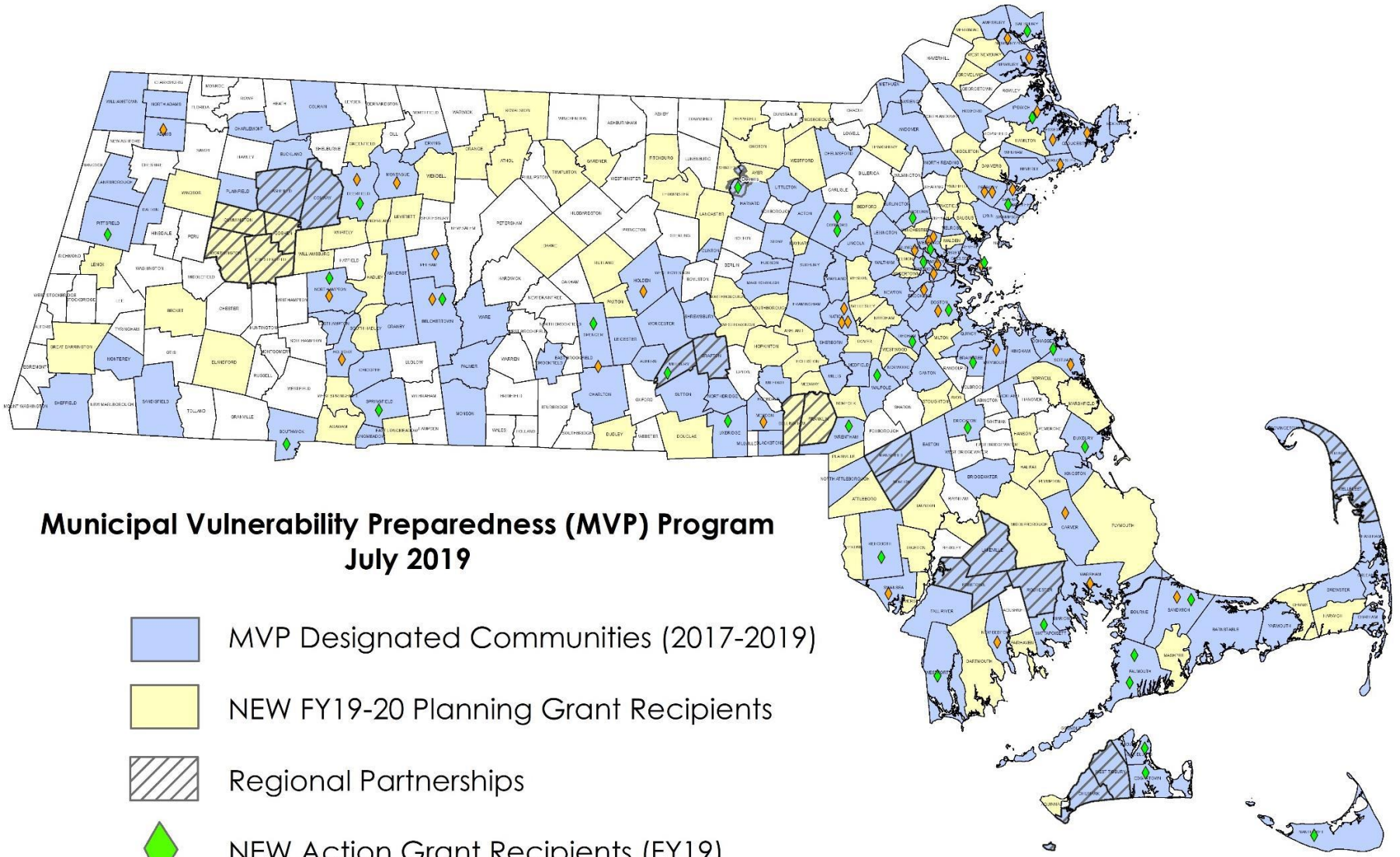


Municipal Vulnerability Preparedness (MVP) Program
July 2019

- 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?

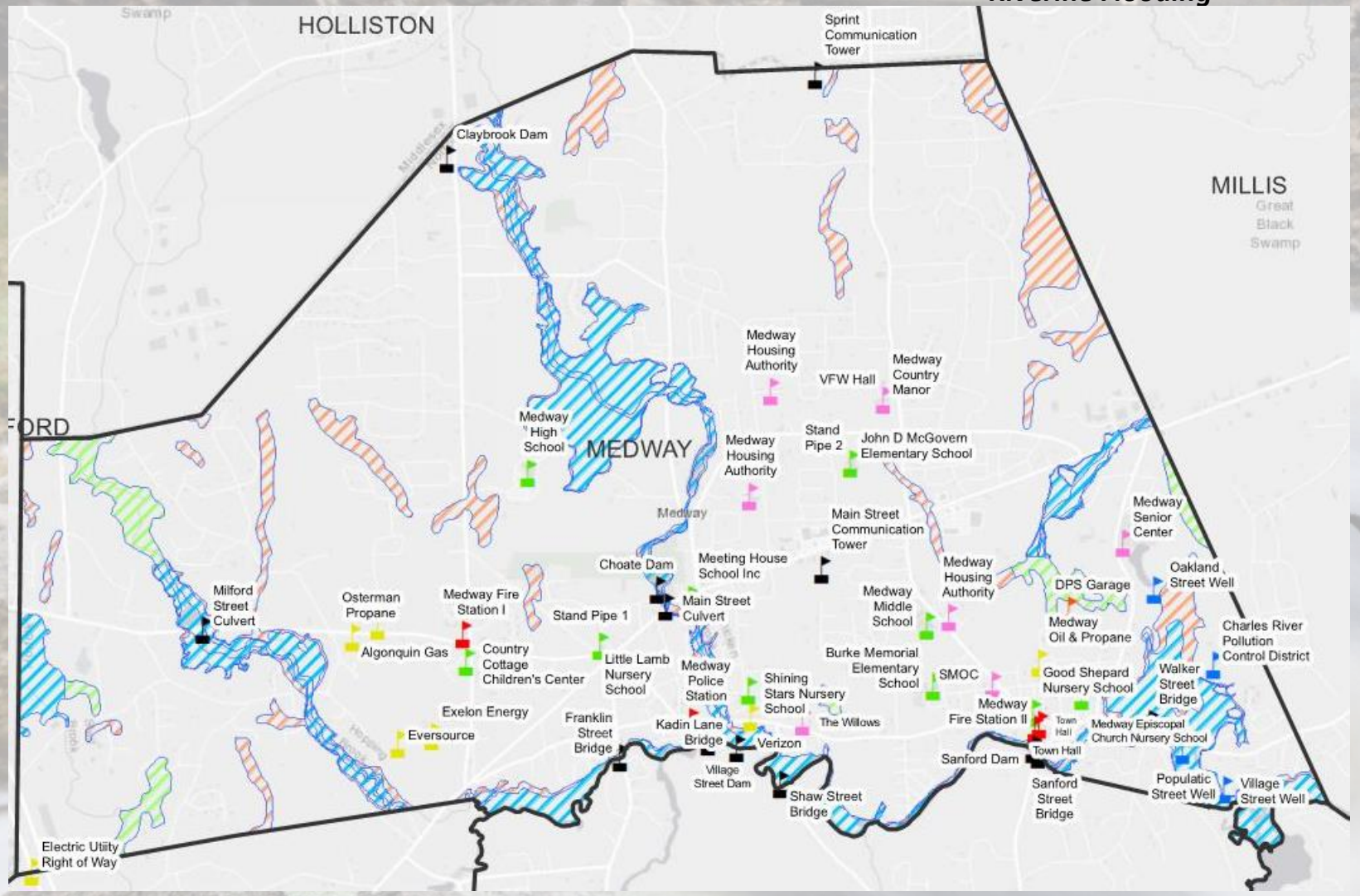
Source: Federal Emergency Management Agency/Community Impact Newspaper

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

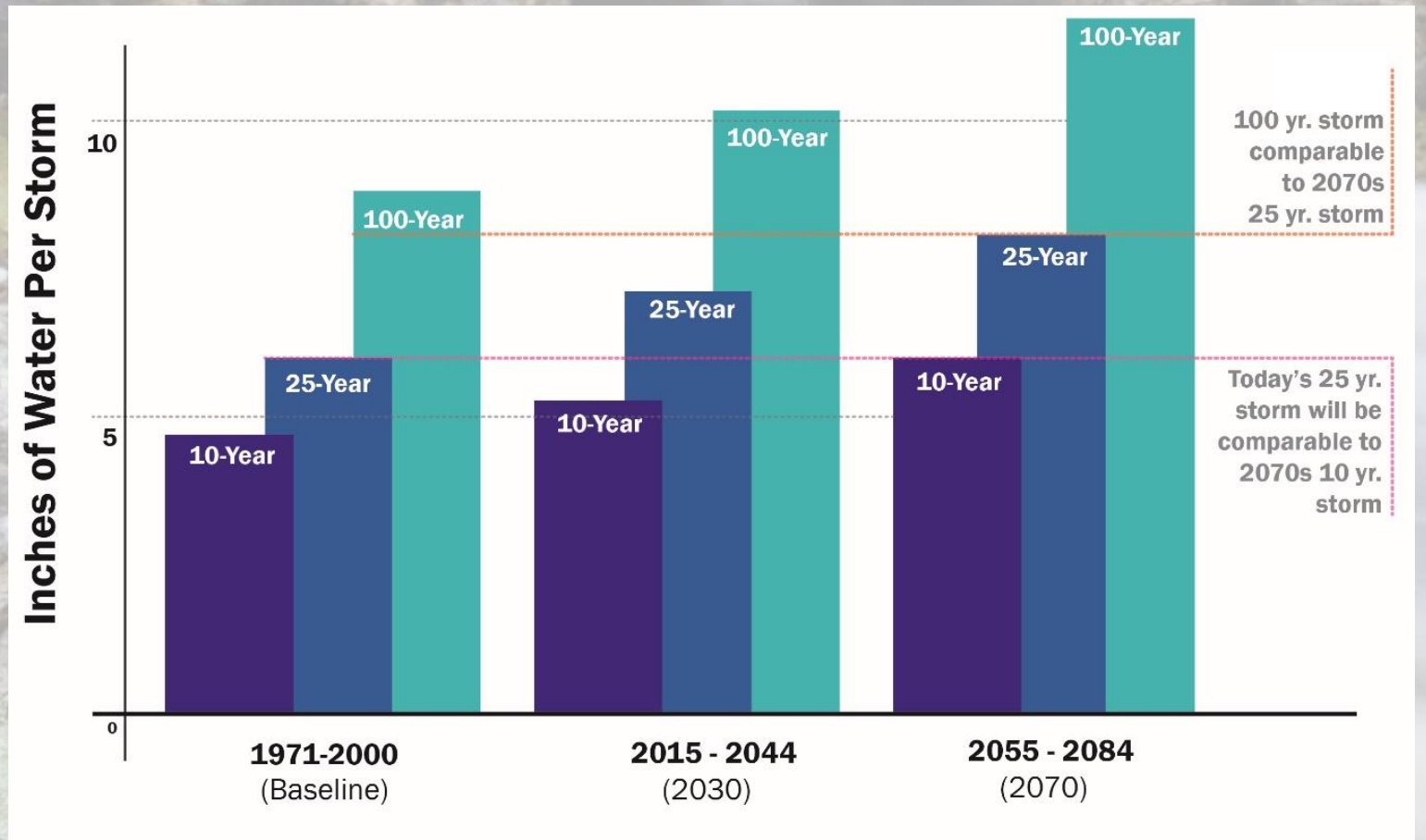
Type

- 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

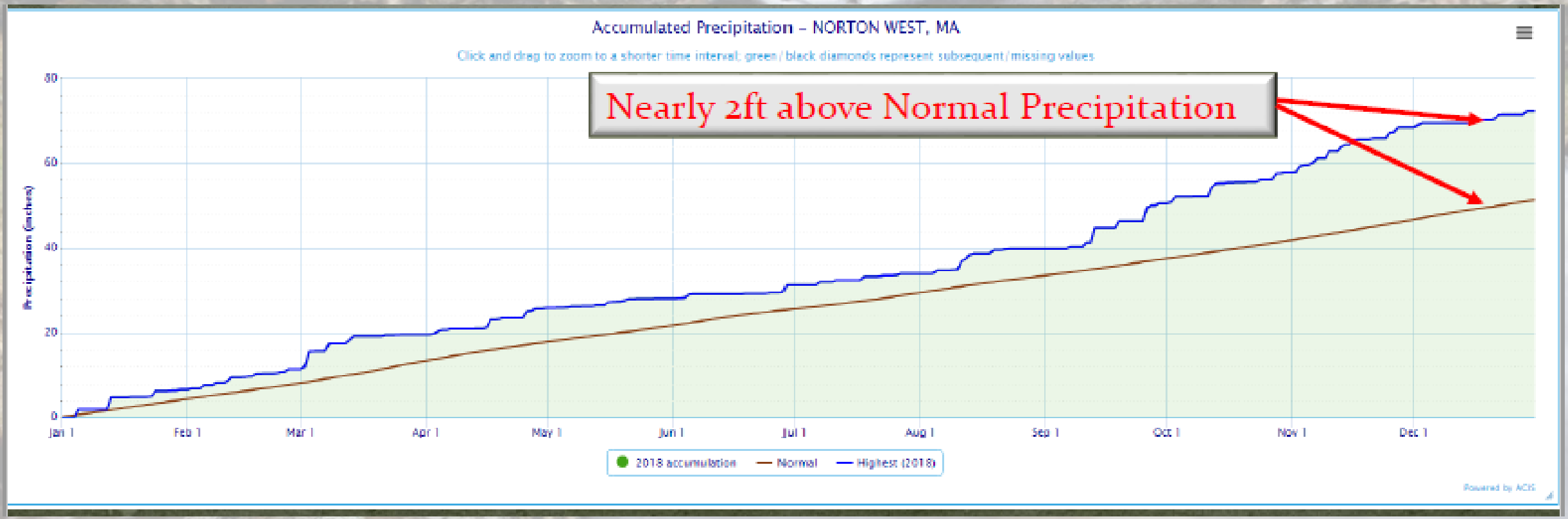
Heavy Rainfall

Applegate Subdivision 9-18-19

Applegate Road Infiltration basin

Credit: Medway Conservation Agent

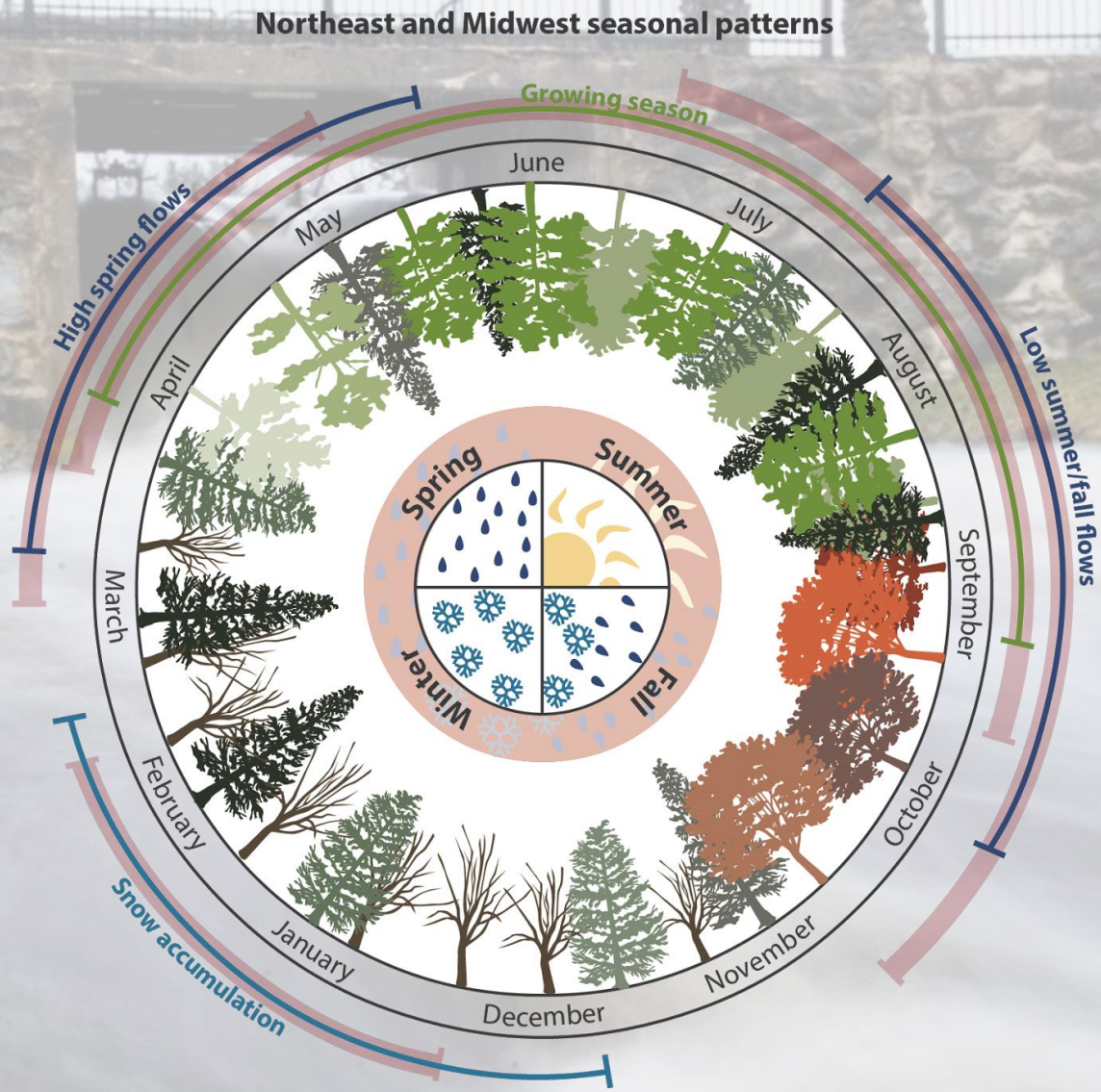
HEAVY RAINFALL



Drought

Drought

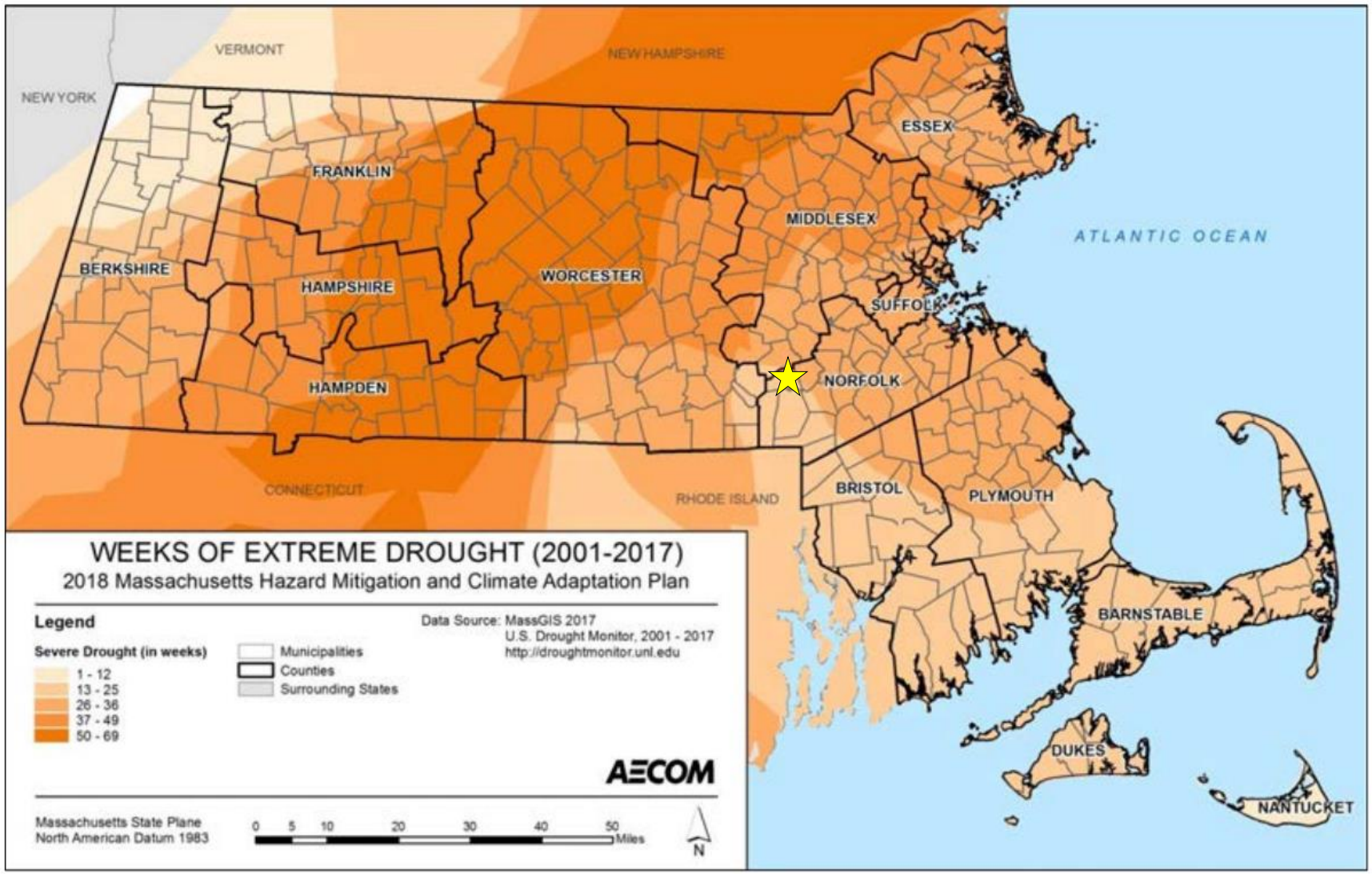
- More rainfall in large events could mean longer gaps with no rainfall locally.
- Hot days combined with a reduction in soil moisture will exacerbate drought conditions in spring, summer, and fall.
- Could impact natural resources:
  - Farms
  - Trees
  - Water quality
  - Aquatic organisms
  - Aquifers



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

DROUGHT - HISTORIC

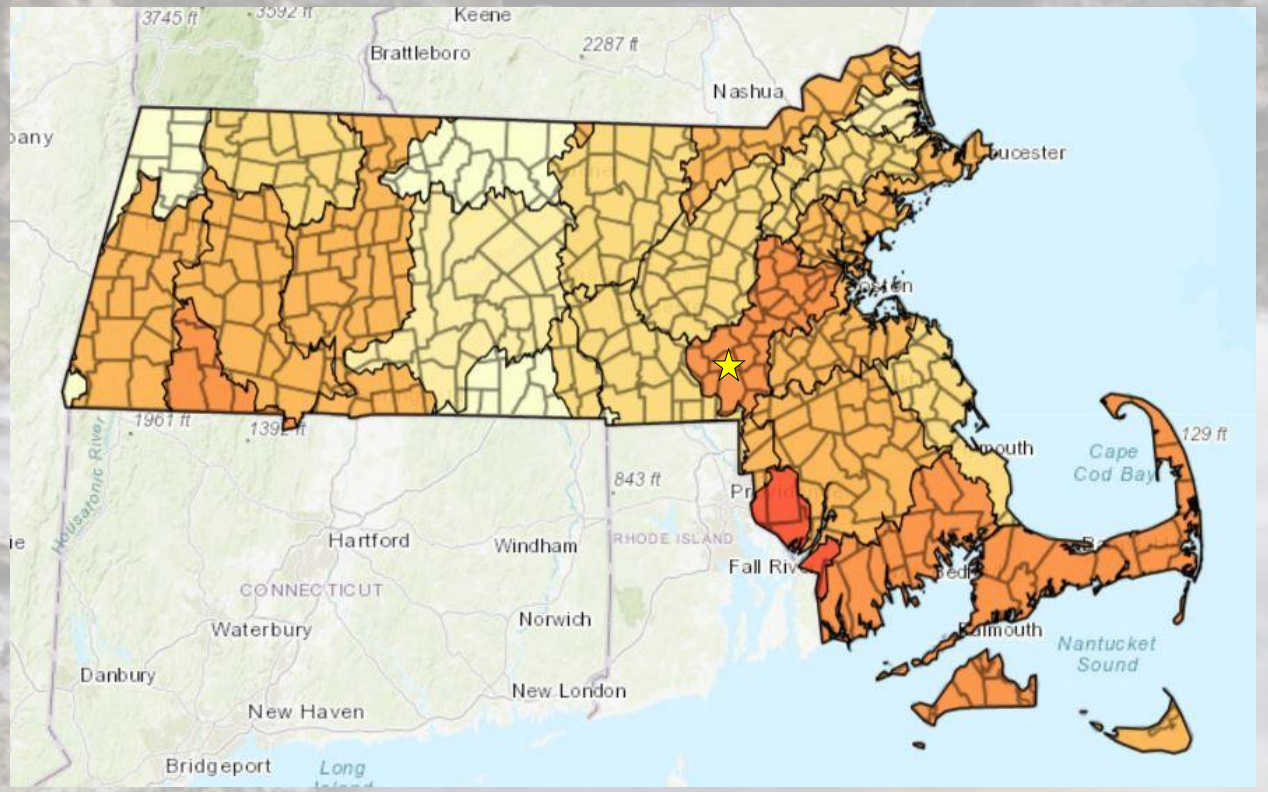
Figure 4-8: Weeks of Severe Drought (2001-2017)

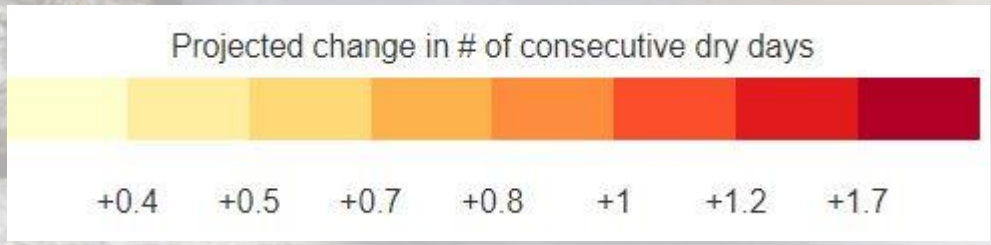


Source: U.S. Drought Monitor, 2017

Source: 2018 SHMCAP report

DROUGHT – 2030 CONSECUTIVE DRY DAYS



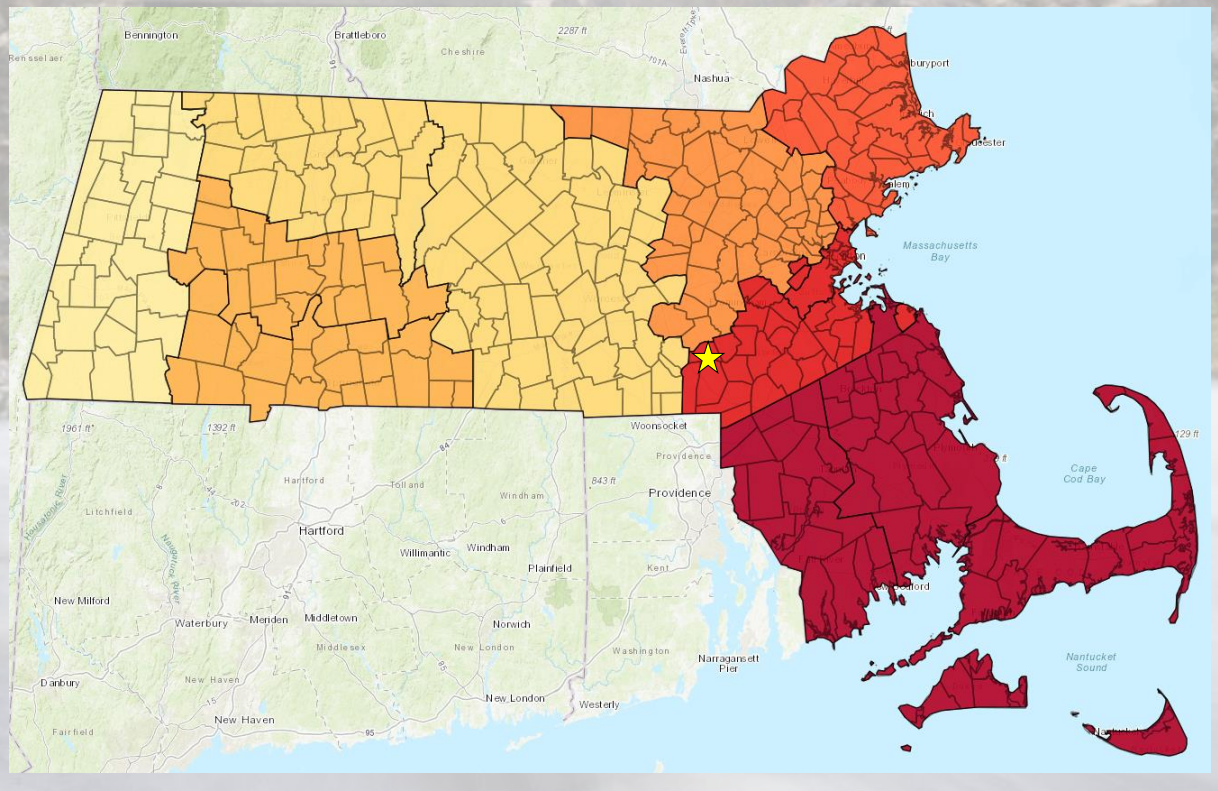


Source: resilientma.org, 2019

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.



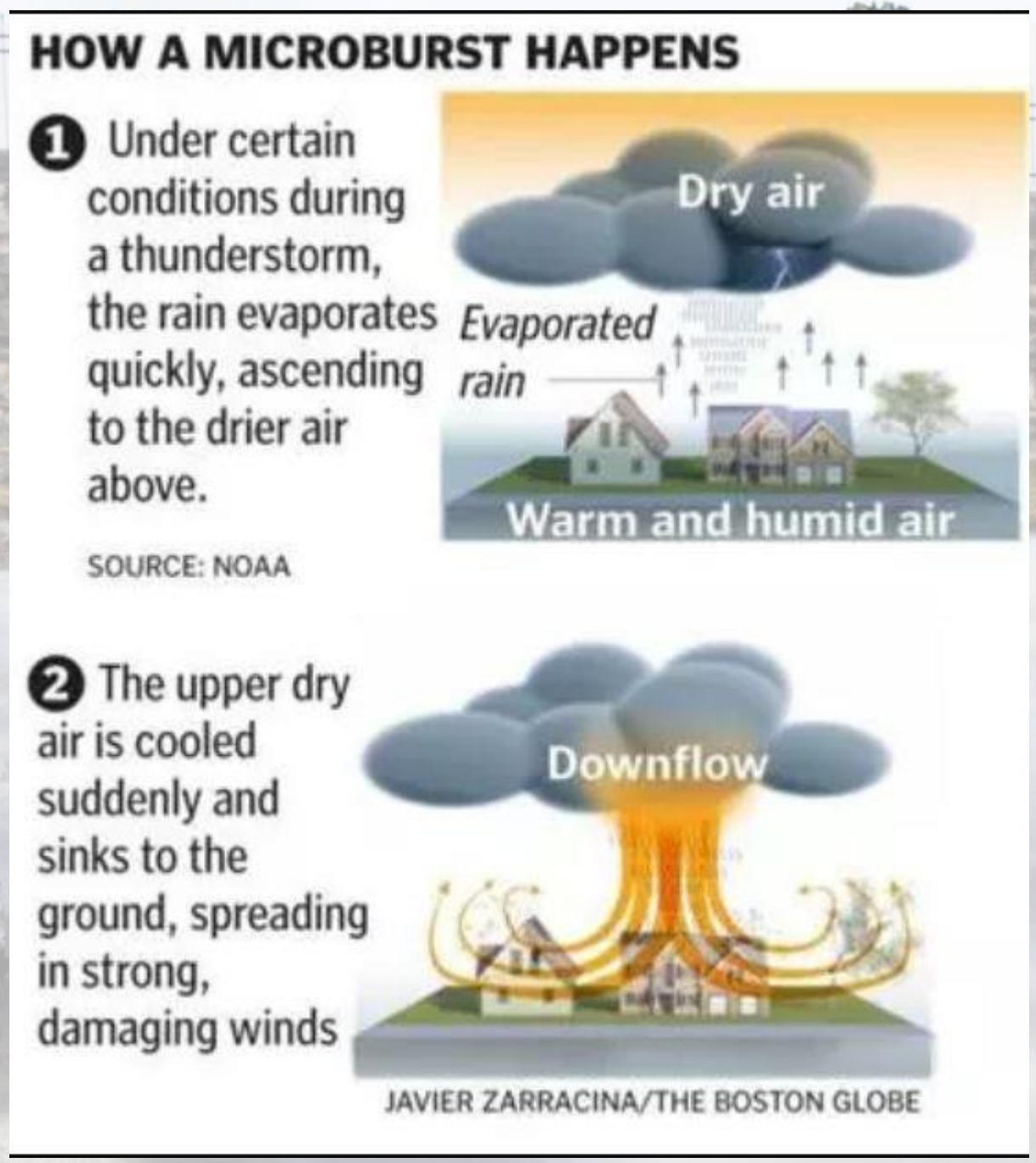
Source: resilientma.org, 2019

WIND

Source: Route 109, Town of Medway

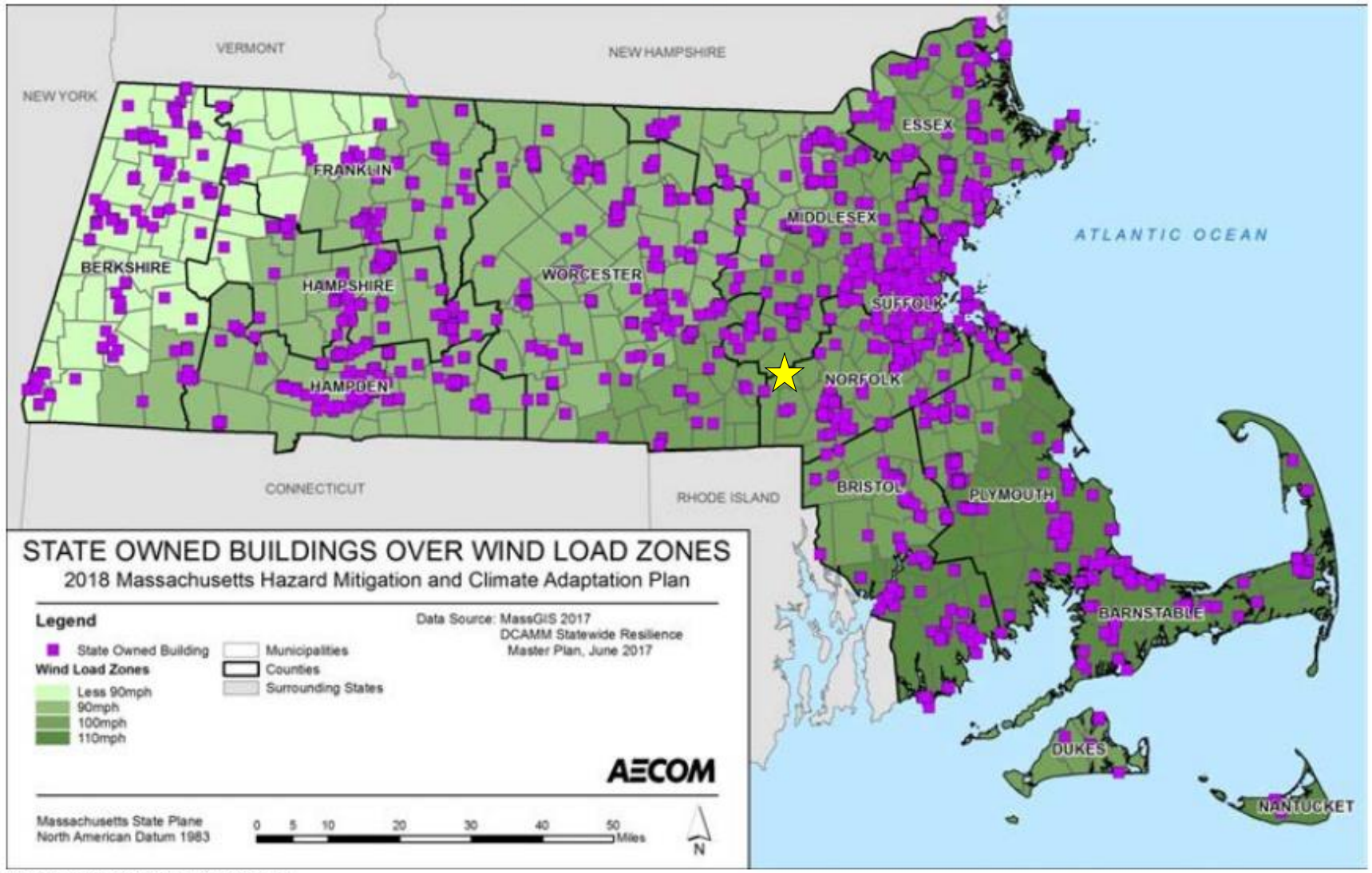
Wind

- 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



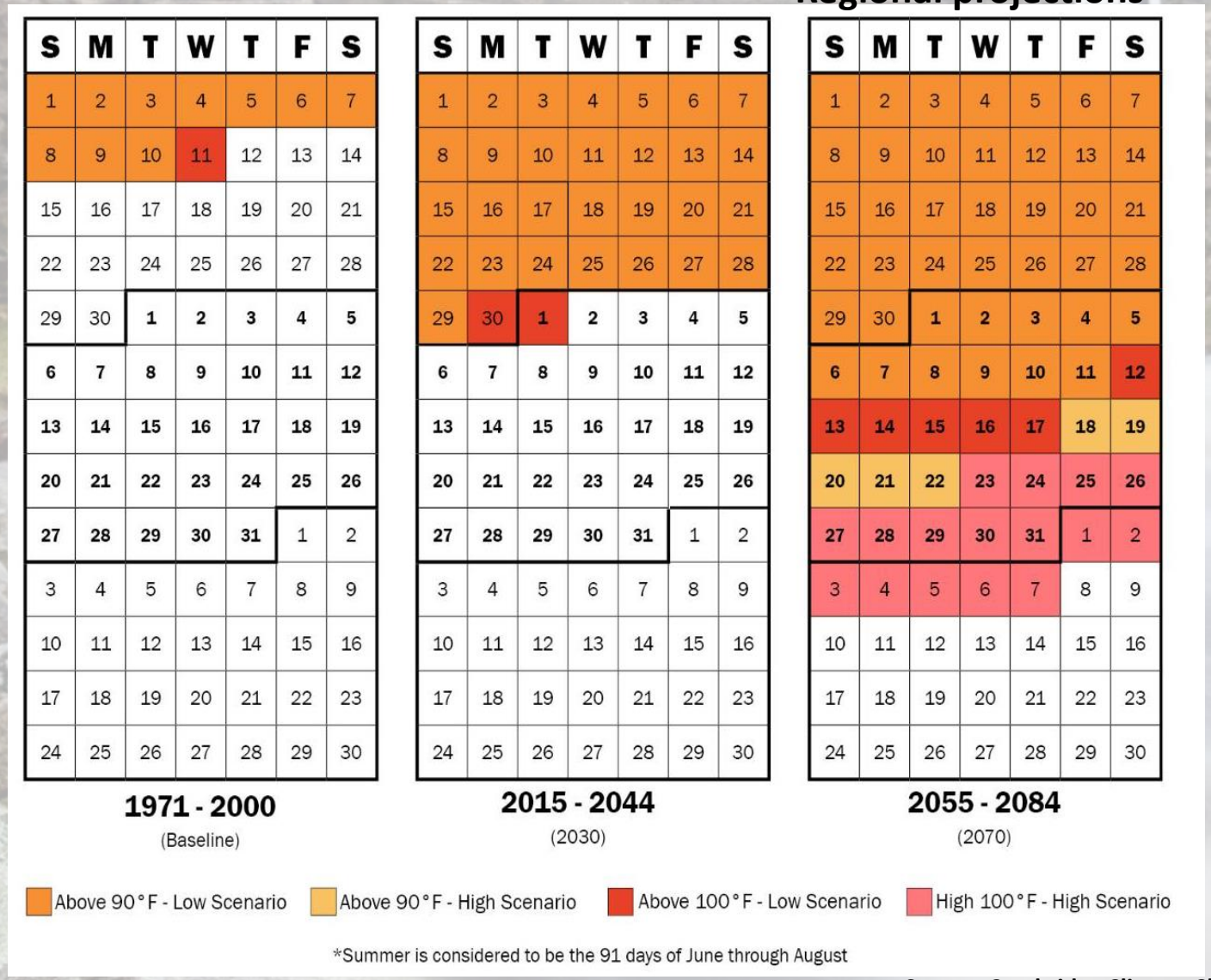
Source: DCAMM, 2017 (facility inventory)

Heat

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

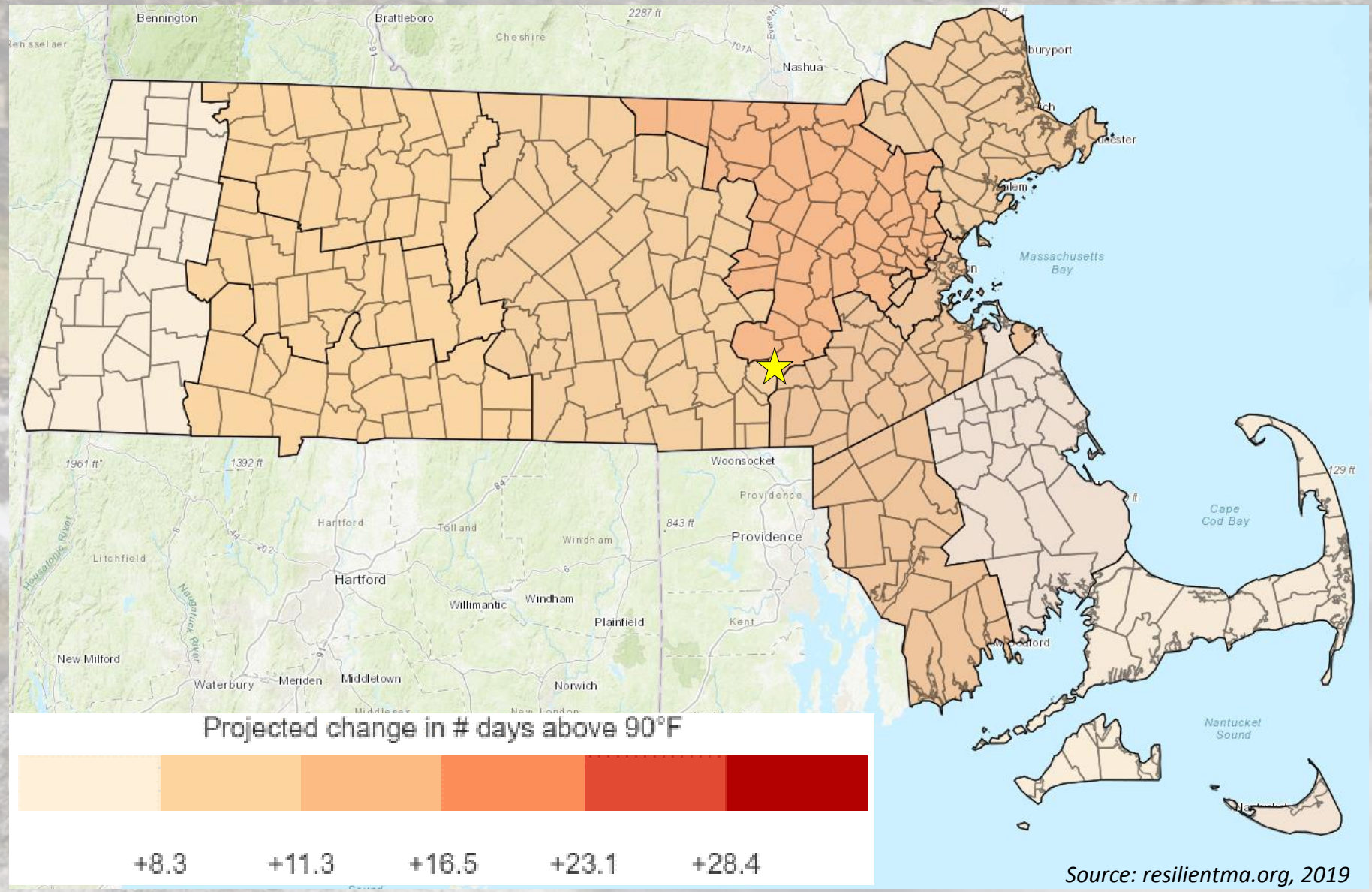
Extreme Heat

Regional projections



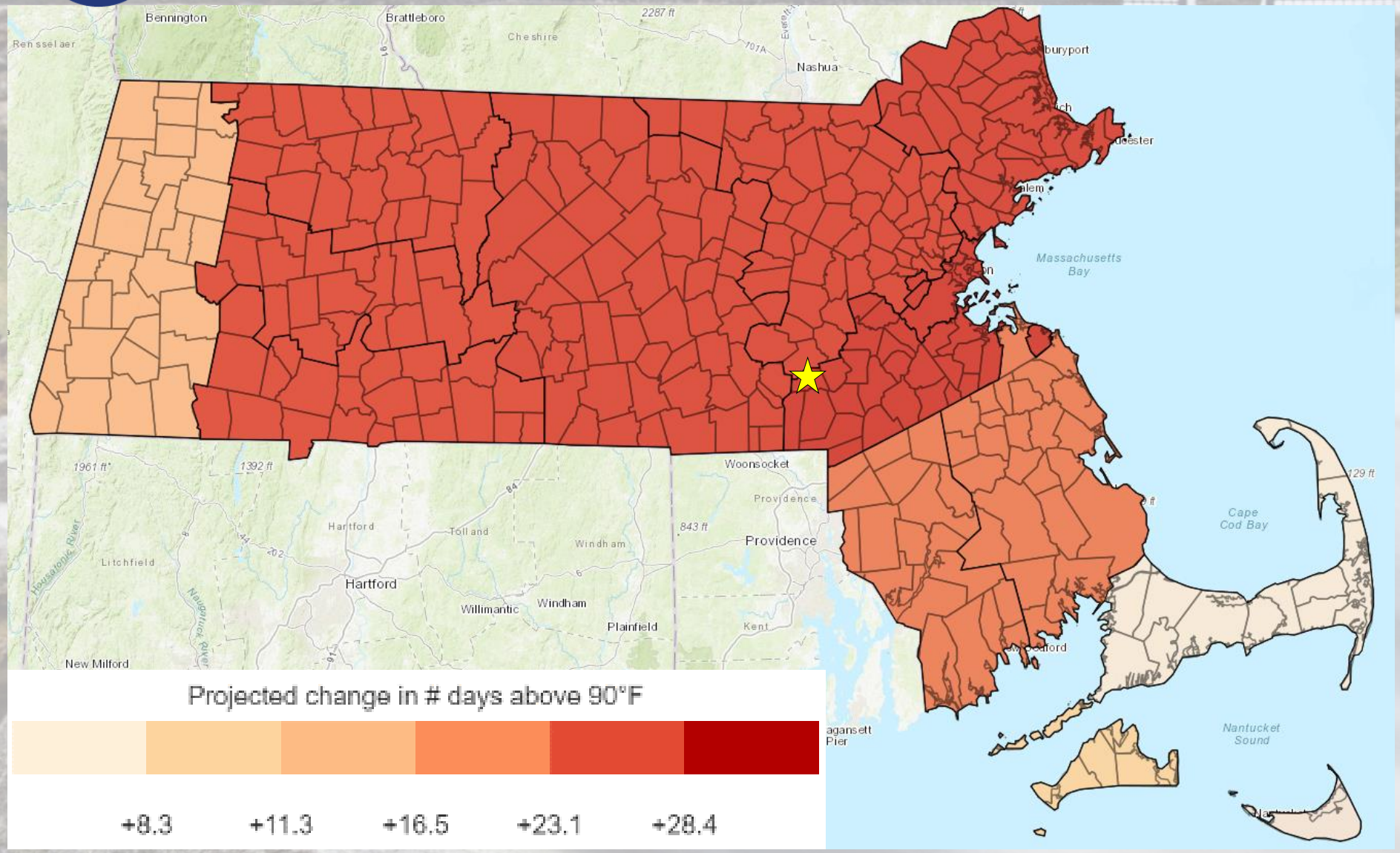
Source: Cambridge Climate Change Vulnerability Assessment - 2015

Extreme Heat - 2030



Source: resilientma.org, 2019

Extreme Heat - 2070

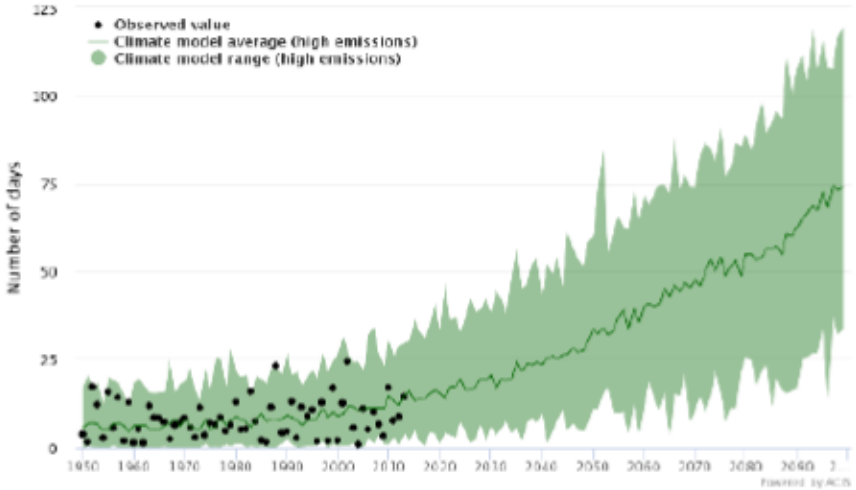


Source: resilientma.org, 2019

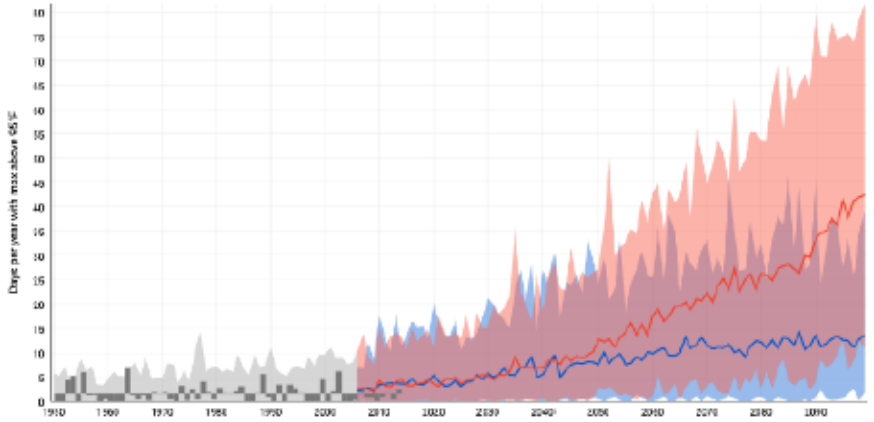
Extreme Heat

Climate Trends: Projections

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



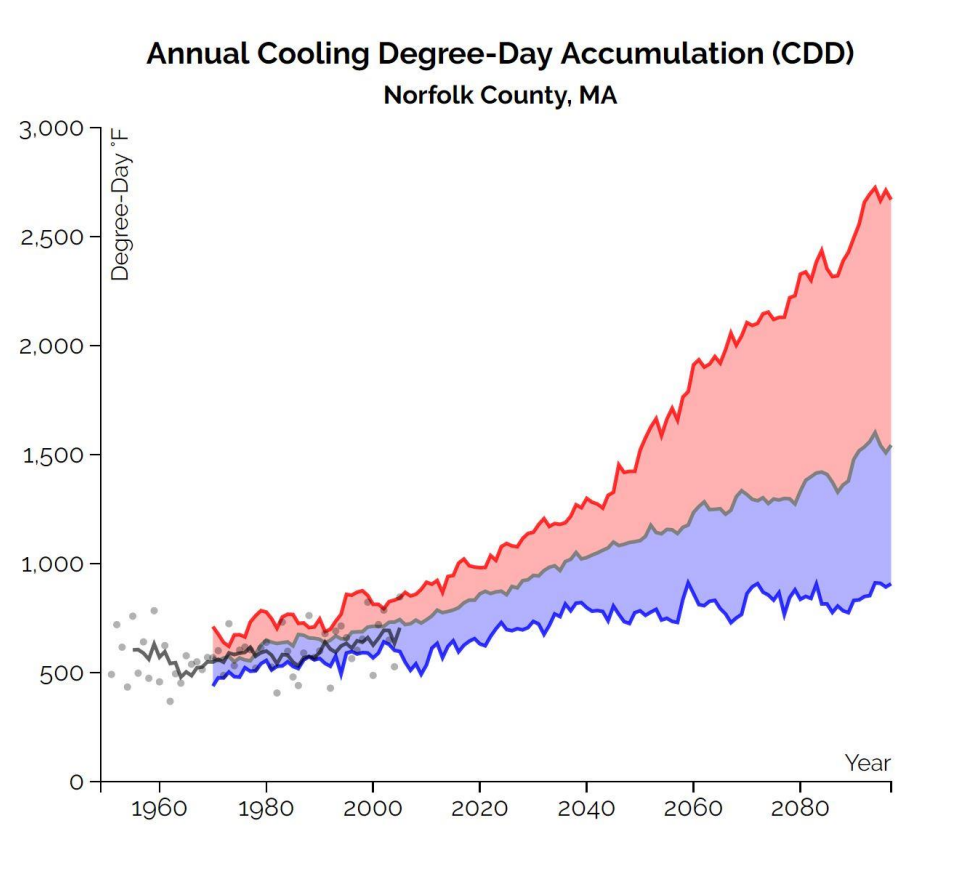
Number of days with high temp > 95°F
@ Suffolk County, MA

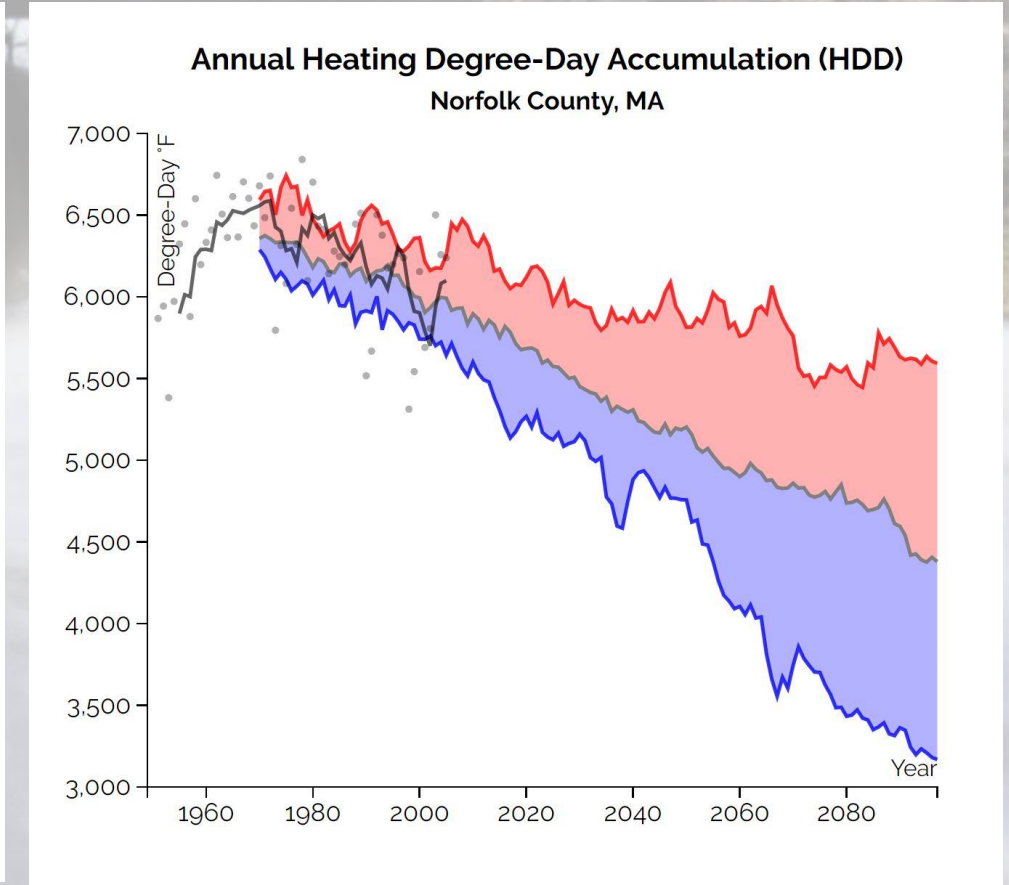


NRCC Cornell University

Northeast Regional Climate Center

Extreme Heat – Energy Demand



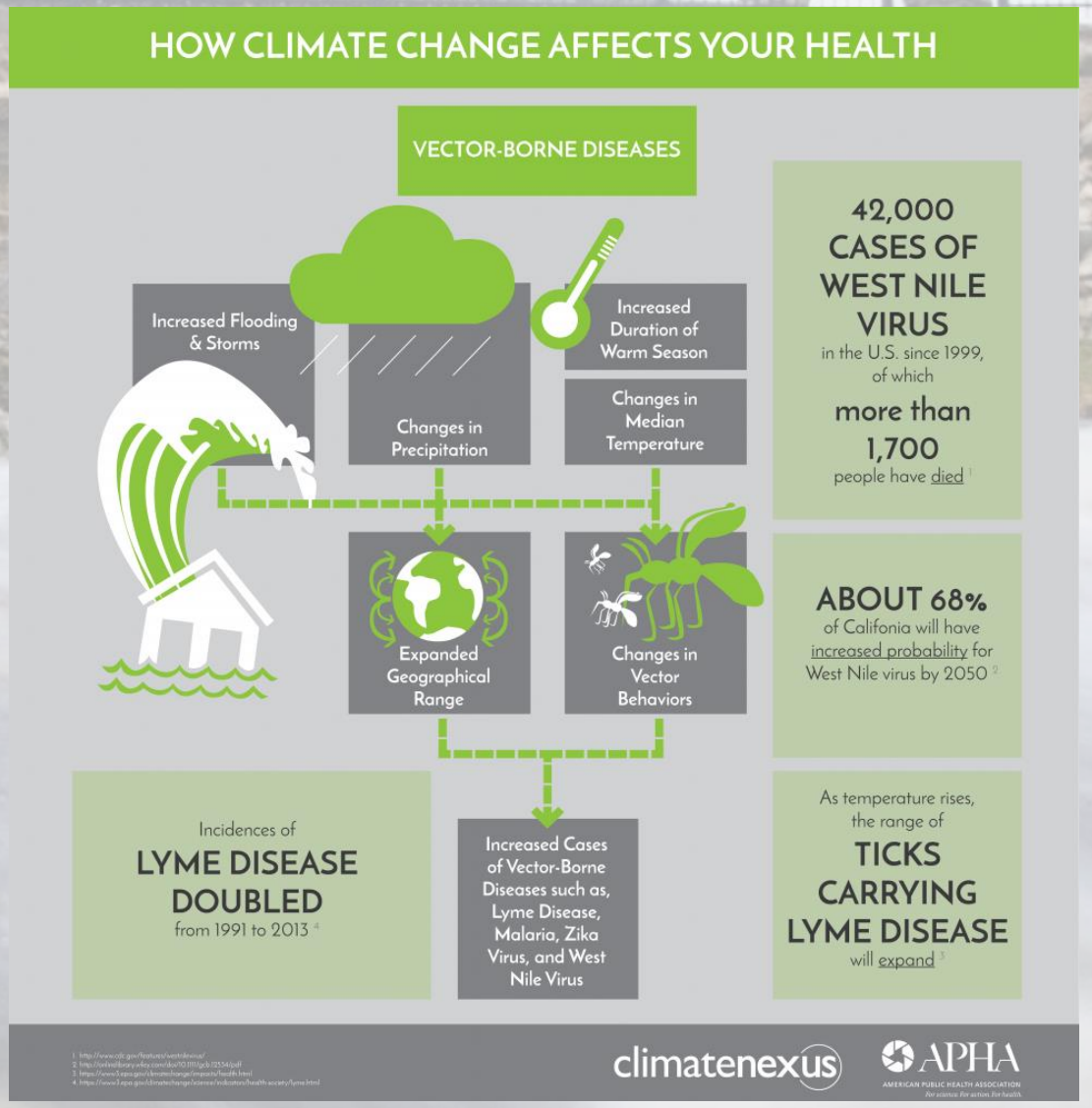


There will be more days required for cooling buildings than for heating by 2070.

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

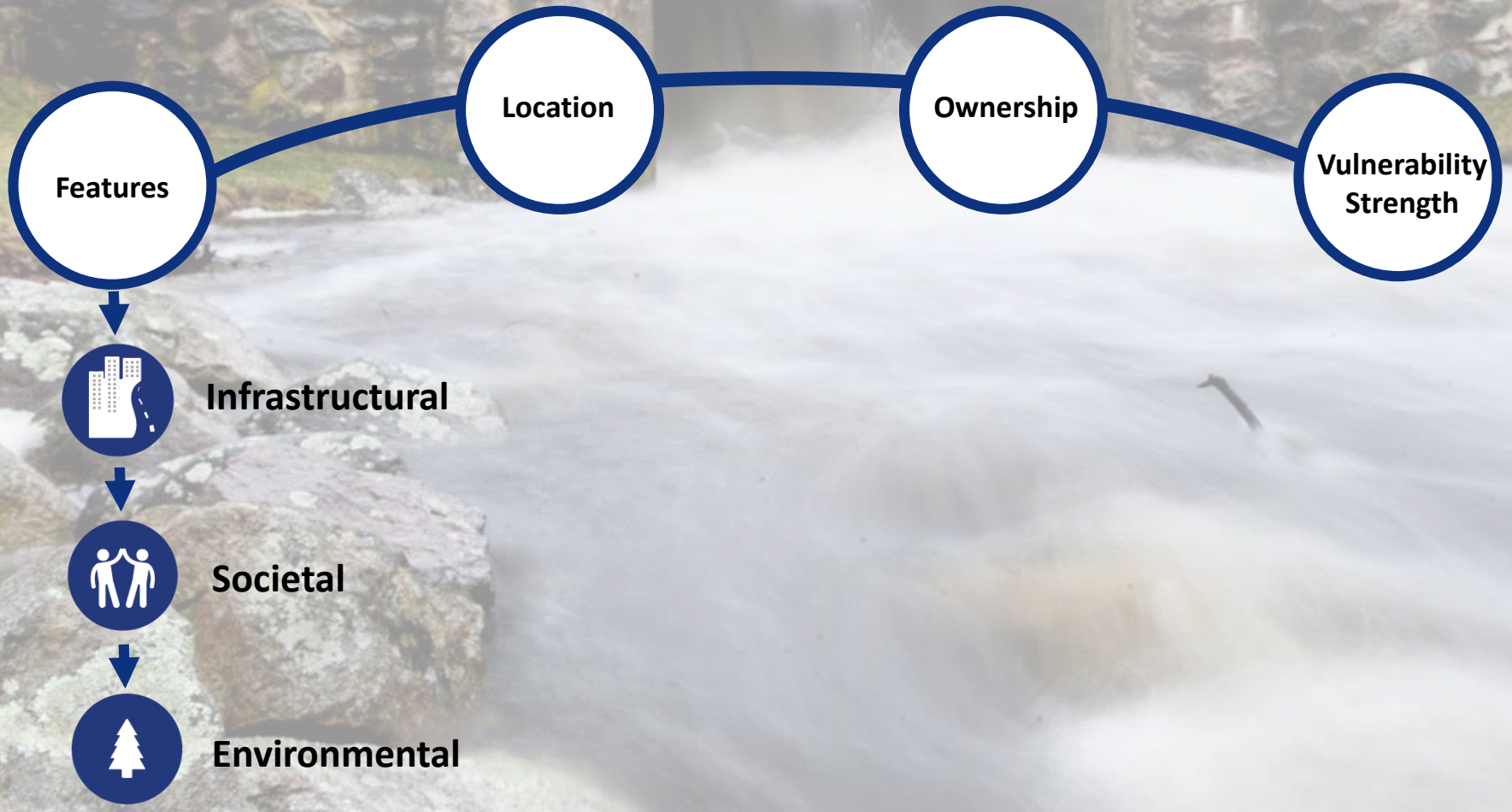
- Common themes across New England
  - Increasing annual precipitation
  - Increasing frequency of heavy rains
  - Warming annual temperatures
  - Shift in precipitation frequency
- Trend toward increased flood magnitude and/or frequency
  - Most pronounced where significant land use change and/or urbanization 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

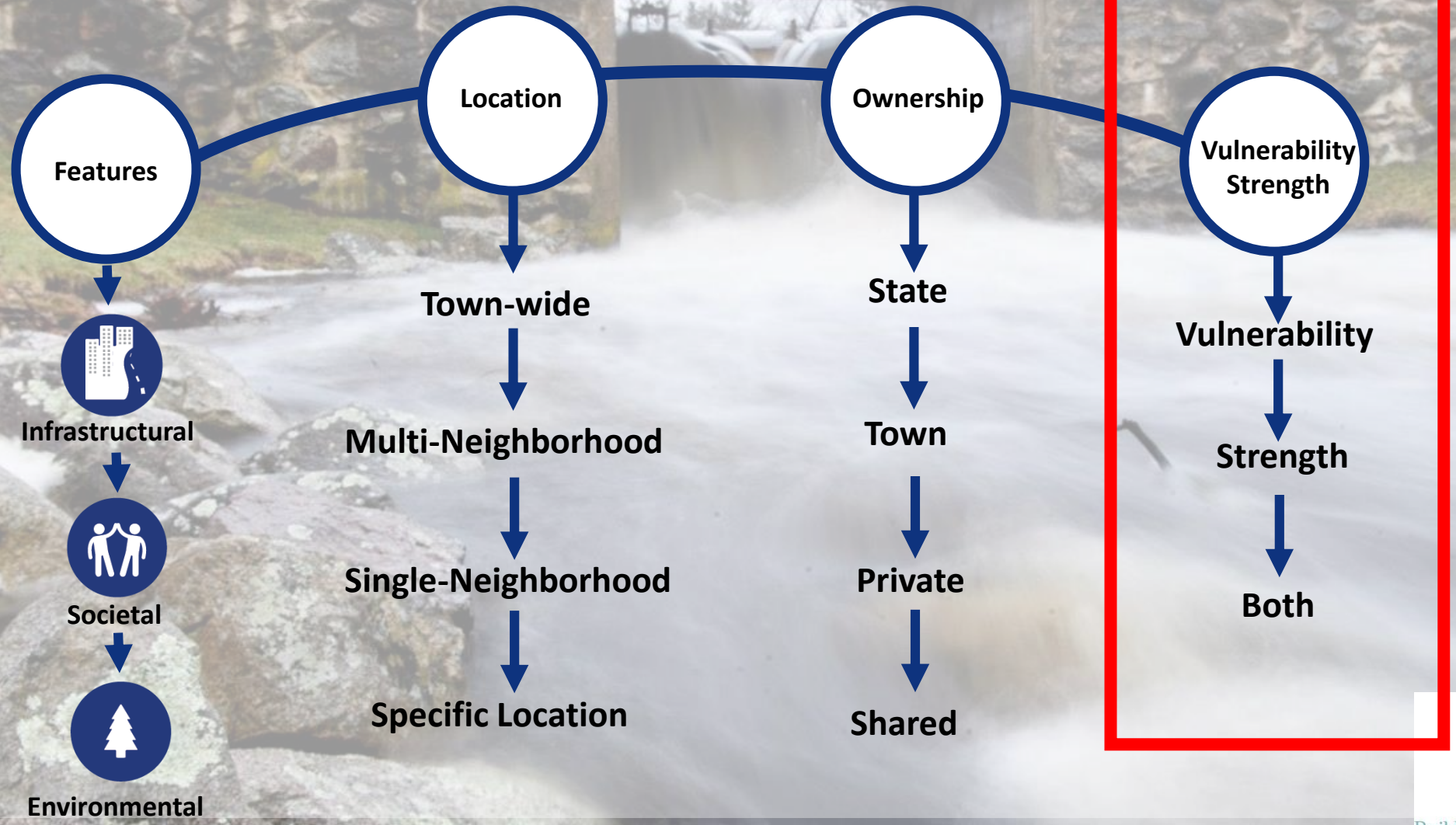
Strengths
Vulnerabilities
&
Areas of Concern

Strengths & Vulnerabilities



Building Community Resilience

Strengths & Vulnerabilities



Building Community Resilience

Infrastructural Features

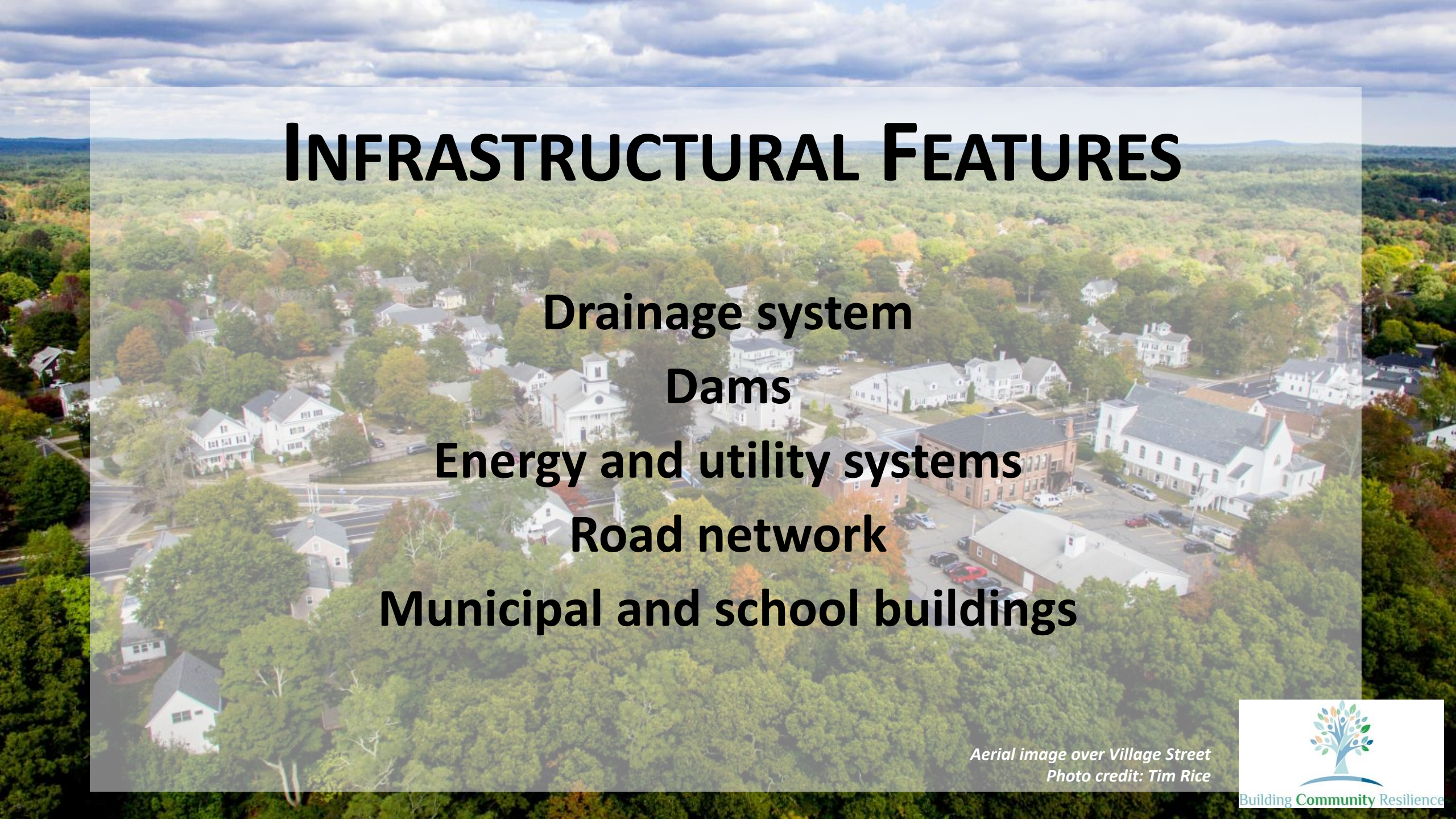
Drainage system

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

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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

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Societal Features

Demographics

Community groups

Communications

Tractor Pull 2018
Photo credit: Tim Rice

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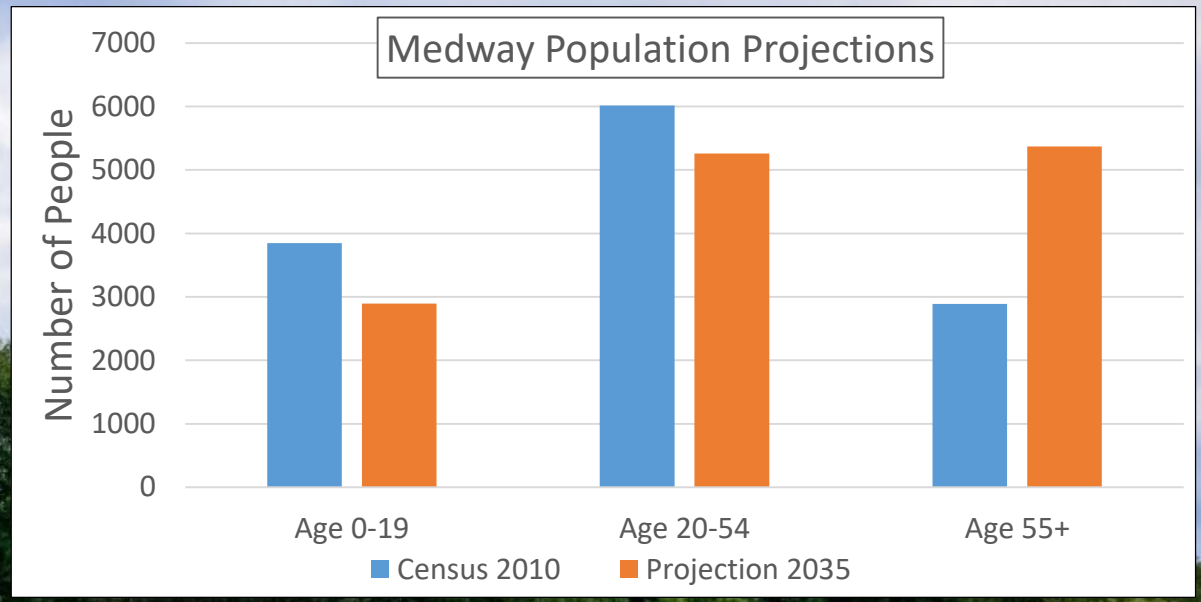
AREAS OF CONCERN

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

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Environmental Features

Waterways

Agricultural lands

Parks and Trails

Ground Water

Adams Street Aerial
Photo credit: Tim Rice

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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

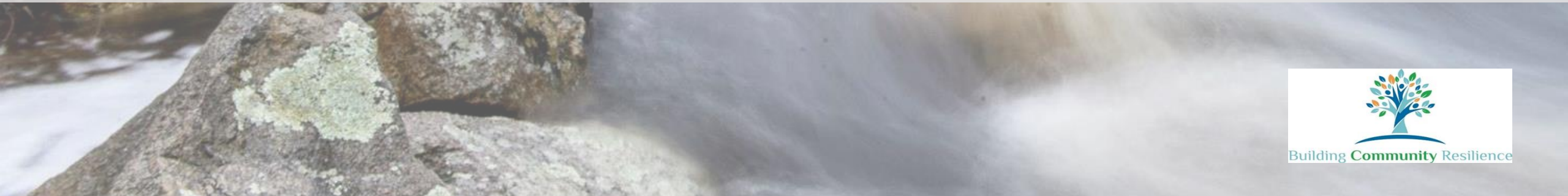
PRIORITY ACTIONS – ENVIRONMENTAL

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?

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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