



# TOWN OF TOWNSEND



## Municipal Vulnerability Preparedness (MVP) Listening Session

May 13, 2020





# WELCOME FROM **W&S**



ADRIA  
BOYNTON



STEVE  
ROY



AMANDA  
KOHN



RUPSA  
ROY





# WELCOME PARTICIPANTS



# WEBINAR LOGISTICS

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- This webinar is being **recorded**
- Overview of Skype
  - Tell us what your favorite thing is about Townsend  
**in the chat!**
- The webinar is paired with an **online survey**
  - A link is included at the end of the presentation



# WEBINAR OUTLINE

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- Overview of MVP and HMP
- Overview of Climate Change
- Strengths and Vulnerabilities
- Priority Action Items
- Next Steps
  - Tell us about your climate adaptation priorities by taking our **online survey!**





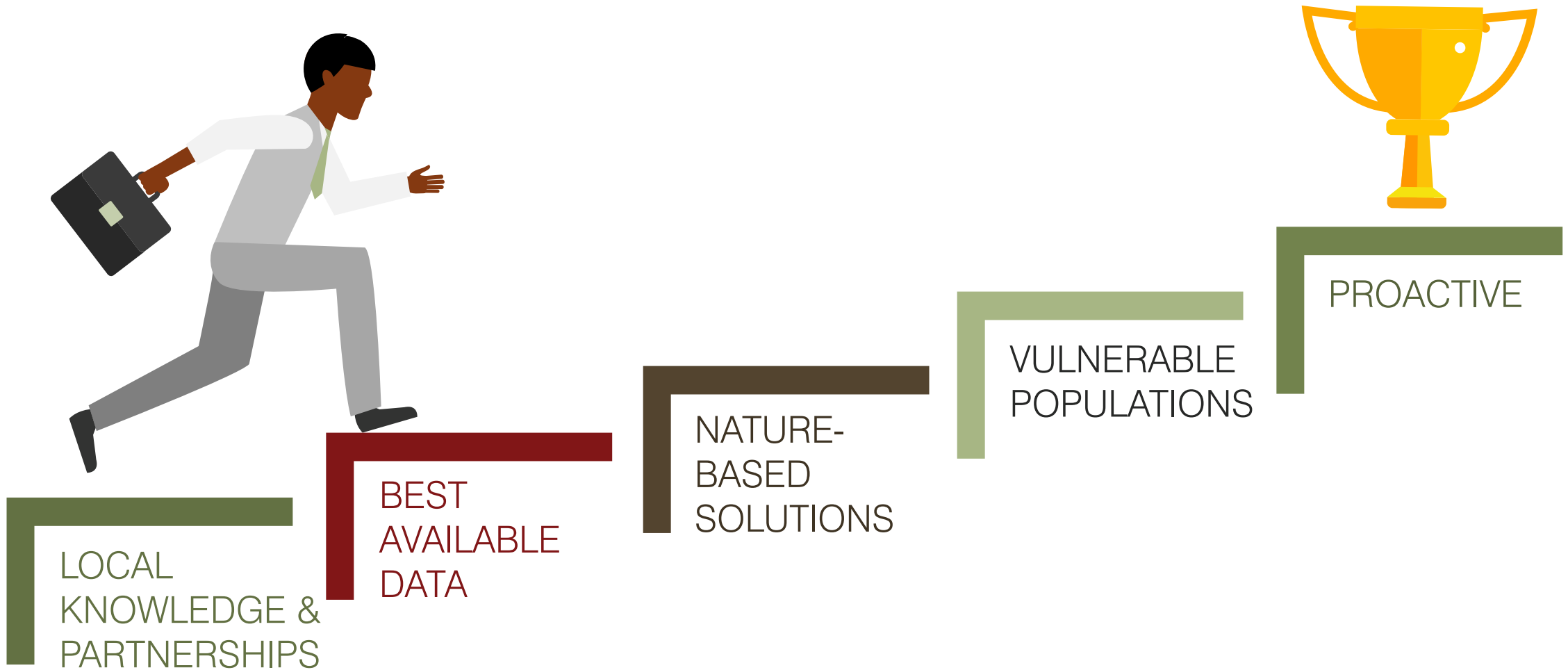
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# MVP & HMP OVERVIEW





# ... MVP Program Goals



# ● ● ● MVP Process

## 1. MVP Planning Grant

- Define climate hazards
- Identify community vulnerabilities and strengths
- Develop and prioritize adaptation actions
- Receive MVP designation

*\* We're also updating Townsend's Hazard Mitigation Plan!*

## 2. MVP Action Grant

1. Implement priority adaptation actions identified during the planning process







# What Can the MVP Action Grant Fund?



Assessments



Outreach & Education



Management  
Measures



Redesign & Retrofit



Nature-Based  
Solutions



Ecological  
Restoration



Water Quality &  
Infiltration



Flood Protection



Extreme Heat  
Mitigation



Drought Mitigation



Energy Resilience



Chemical Safety



Land Acquisition



Housing



Mosquito Control

Massachusetts Executive Office of  
Energy & Environmental Affairs (EOEEA)

**Municipal Vulnerability  
Preparedness (MVP)**



**Overlap**



municipal leadership



regional collaboration



community engagement



review existing information



hazard impacts and vulnerability



existing policies/programs



identify strengths, vulnerabilities,  
and potential actions



report



grant funding

United States Federal Emergency  
Management Agency (FEMA)

**Hazard Mitigation Planning  
(HMP)**

planning committee



provide updates  
on development  
changes



document NFIP  
participation and  
compliance



define the future  
update process



address repetitively  
damaged  
structures



document formal  
plan adoption

core team

listening session

climate change  
hazards and  
projections

opportunities to  
improve

risk matrix

prioritize climate  
adaptation actions

summary of findings

state action grants

public input events

natural hazards  
and in-depth  
hazard profile

document  
existing

background research

implementation  
plan for hazard  
mitigation

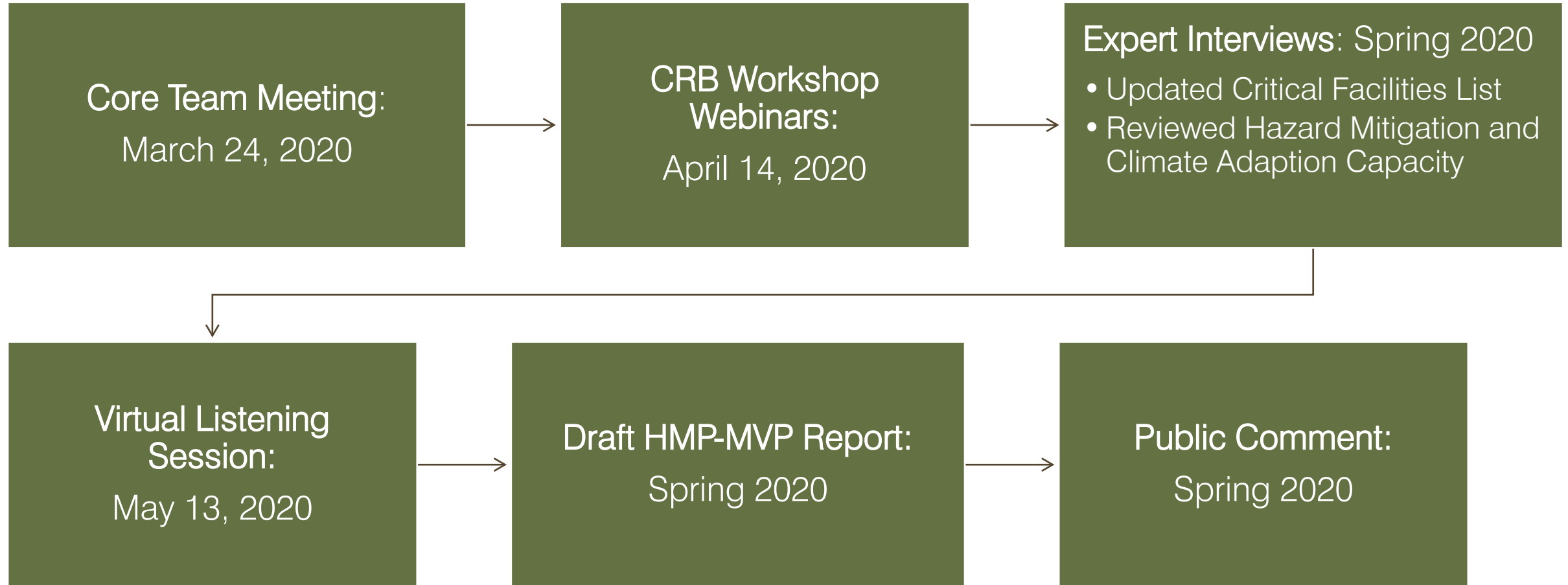
hazard mitigation plan

federal grants





# PROJECT TIMELINE





# COMMUNITY RESILIENCE BUILDING WORKSHOP



Focused on Four Hazards



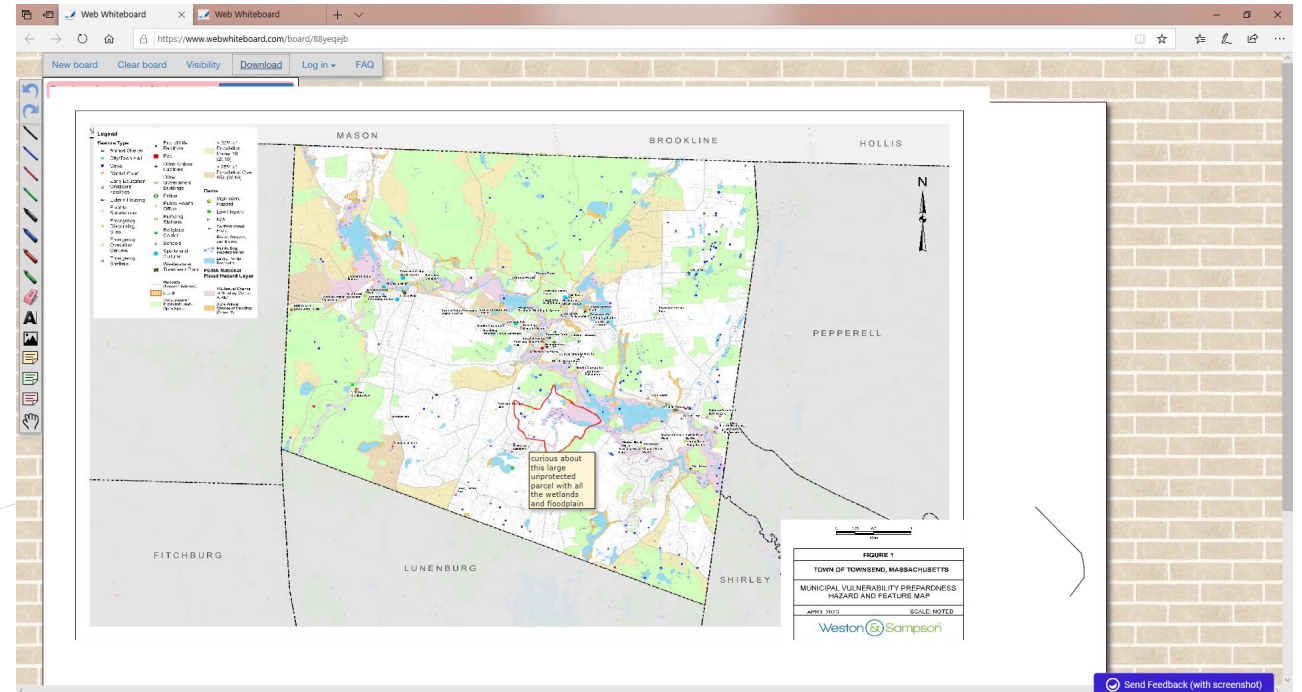
Identified:

- Vulnerabilities
- Strengths
- Priority Action Items



Across Three Categories:

- Infrastructure
- Societal
- Environmental







**Any questions?**



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# CLIMATE HAZARDS

Photo by W&S, 2020







# TOP HAZARDS IN TOWNSEND

**Flooding**



**Drought and  
brush fire**

**Severe Weather**  
(snowstorms,  
thunderstorms,  
tornadoes)



**Extreme  
Temperatures**



# EXTREME TEMPERATURES

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WARMER ANNUAL AIR TEMPERATURES  
**UP 0.5°F PER DECADE SINCE 1970, ON AVERAGE**



WARMER WINTERS  
**UP 1.3°F PER DECADE SINCE 1970, ON AVERAGE**





# EXTREME TEMPERATURES IN MASSACHUSETTS

6

2005  
OBSERVED  
ANNUAL AVERAGE

24

MID-CENTURY  
PROJECTED  
ANNUAL AVERAGE

35

END-OF-CENTURY  
PROJECTED  
ANNUAL AVERAGE

**DAYS WITH TEMPERATURES ABOVE 90°F**

145

2005  
OBSERVED  
ANNUAL AVERAGE

114

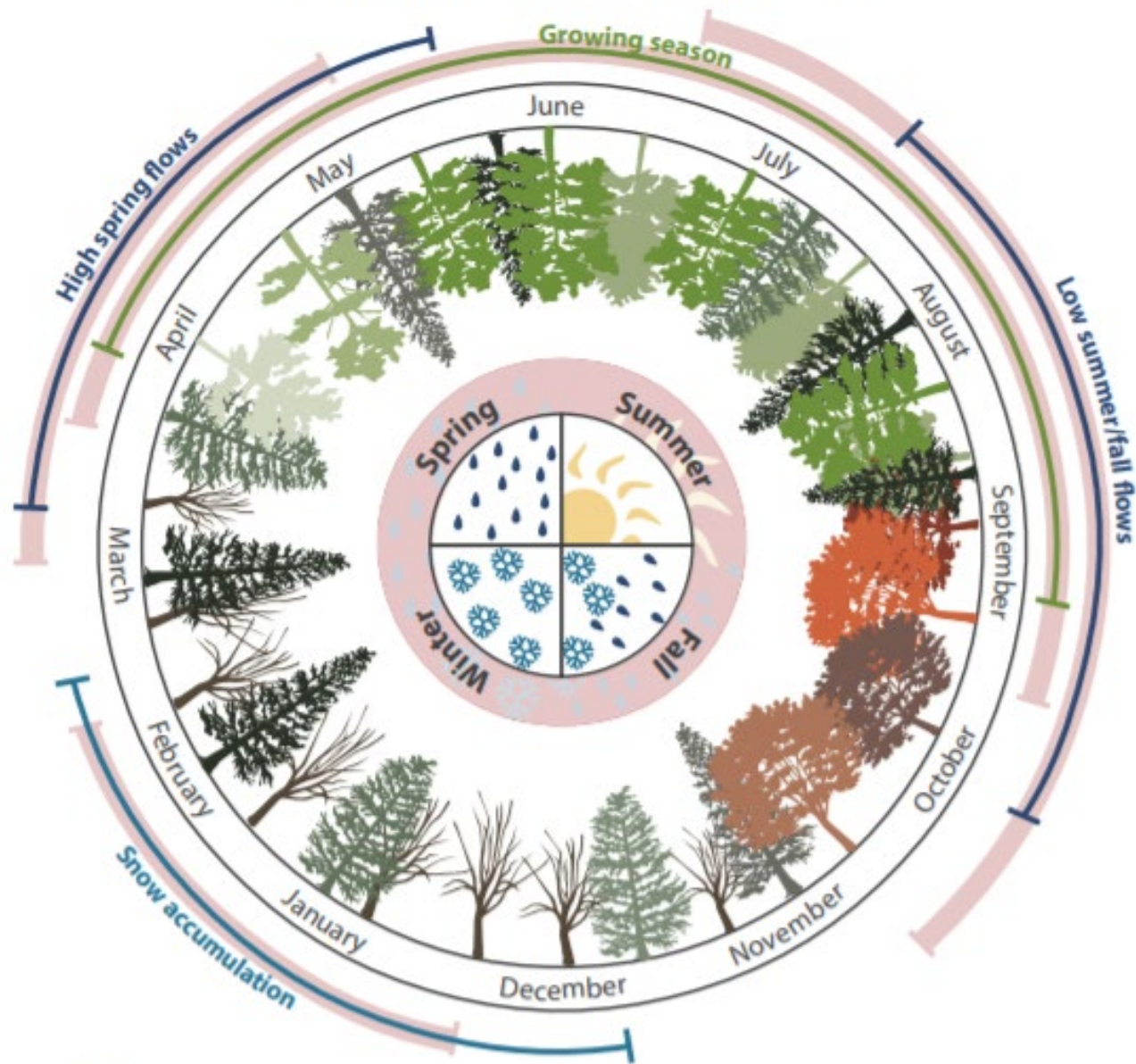
MID-CENTURY  
PROJECTED  
ANNUAL AVERAGE

101

END-OF-CENTURY  
PROJECTED  
ANNUAL AVERAGE

**DAYS WITH TEMPERATURES BELOW 32°F**

## Northeast and Midwest seasonal patterns



Shifted season projected from increasing temperatures and precipitation changes

Image credit: Northeast Climate Science Center, University of Maryland  
Center for Environmental Science

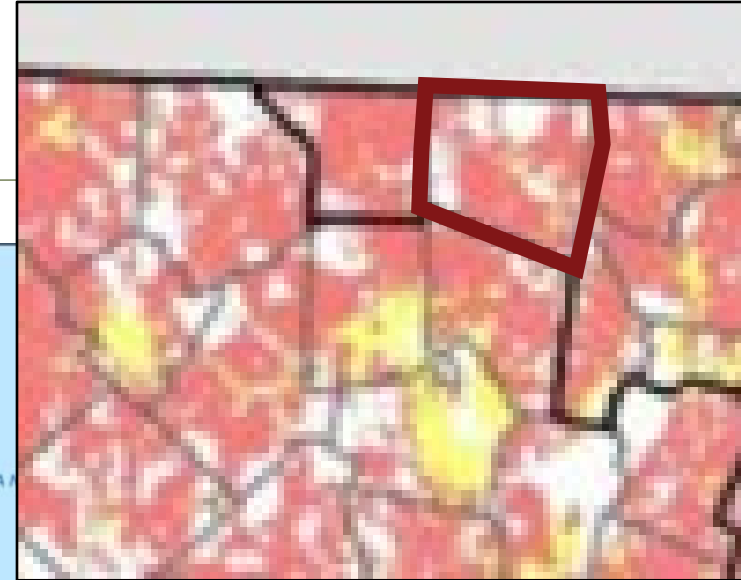
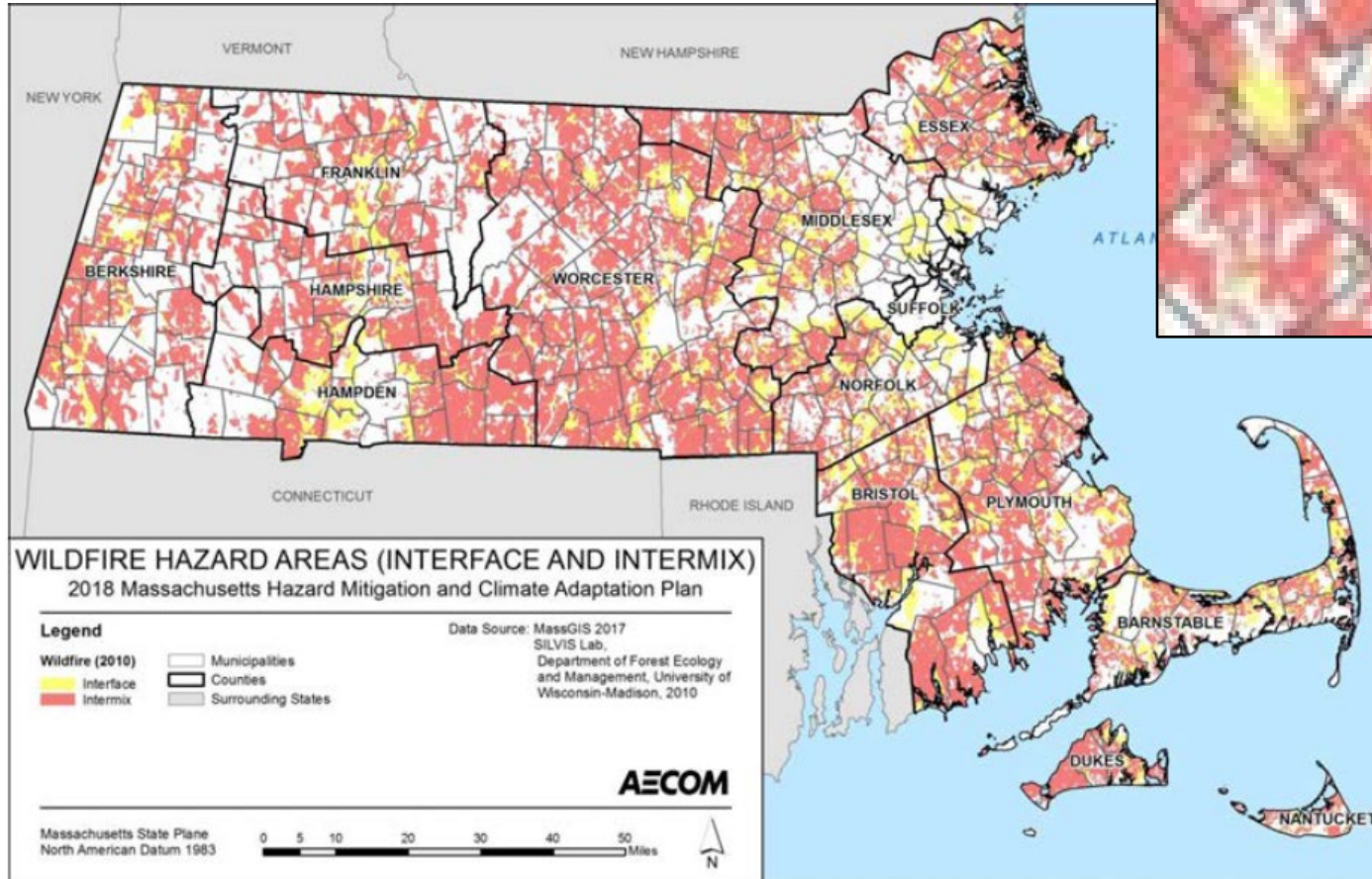
The most notable recent  
drought event was in  
**2016<sup>1</sup>**

The occurrence of droughts  
**lasting 1 to 3 months**  
could go up by as much as  
**75% over existing conditions**  
by the end of the century,  
under the high emissions scenario<sup>1</sup>

1. Source: Executive Office of Energy and Environmental Affairs, Adaptation Advisory Committee. 2011. "Massachusetts Climate Change Adaptation Report," 17.



# WILDFIRE



13

wildfires were reported  
in Townsend over a 6-  
year period.





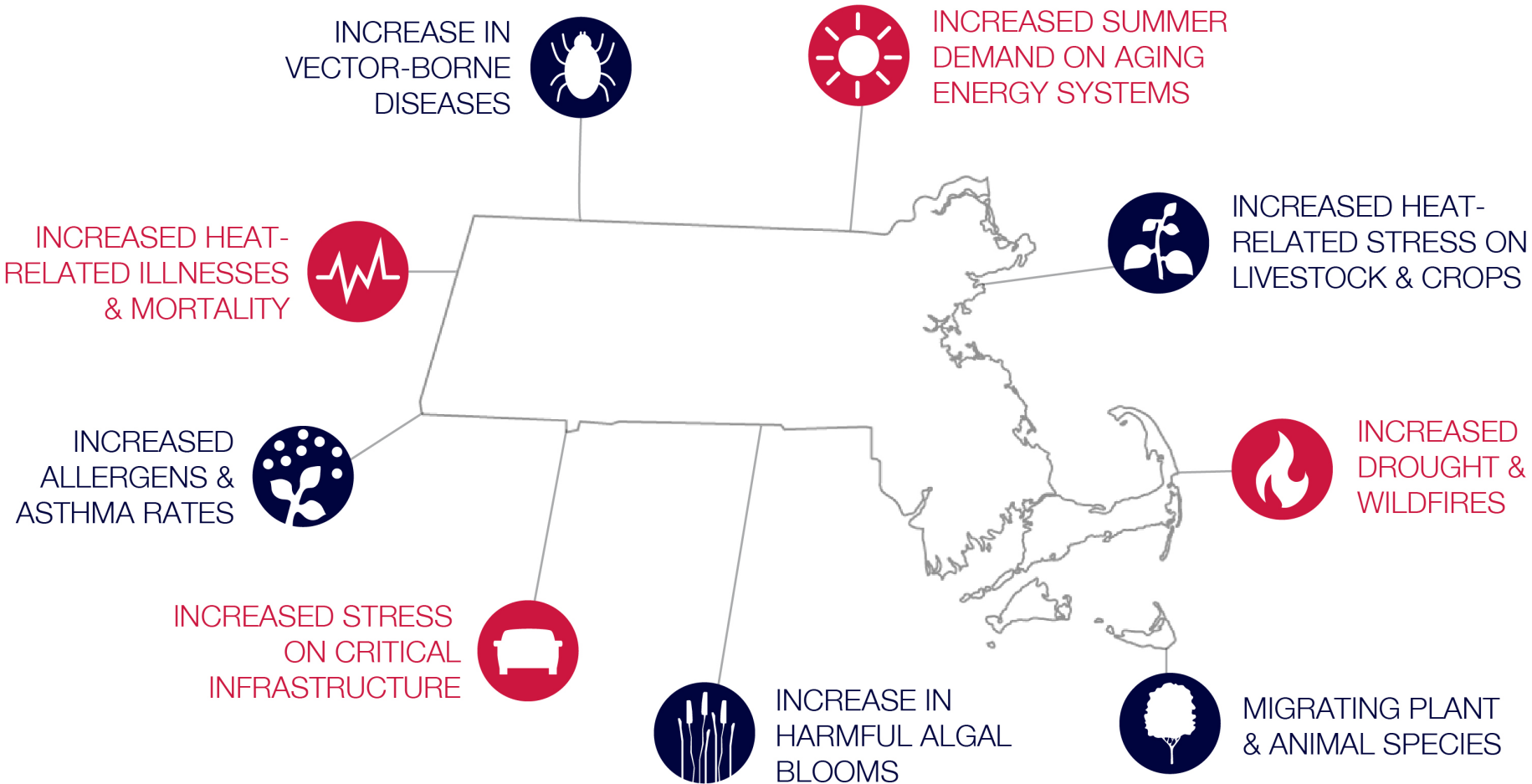
# IMPACTS OF **RIISING TEMPERATURES**



WARMER ANNUAL AIR TEMPERATURES  
UP 0.5°F PER DECADE SINCE 1970, ON AVERAGE



WARMER WINTERS  
UP 1.3°F PER DECADE SINCE 1970, ON AVERAGE







## CHANGES IN PRECIPITATION

MORE **INTENSE & FREQUENT** EXTREME RAIN EVENTS

PRECIPITATION DURING  
**HEAVY EVENTS** IN THE  
N O R T H E A S T

**INCREASED**  
**BY MORE THAN**

**70%**

BETWEEN 1958-2010

Heavy events are defined as the heaviest 1% of all daily events



# EXTREME PRECIPITATION

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8%

**Increase in extreme  
precipitation events  
by midcentury**

13%

**Increase in extreme  
precipitation events  
by 2100**

Extreme precipitation events are defined as events with greater than 2" of rain per day



## Flood Prone Areas<sup>3</sup>

Route 13

North End Road, west of Ball Road

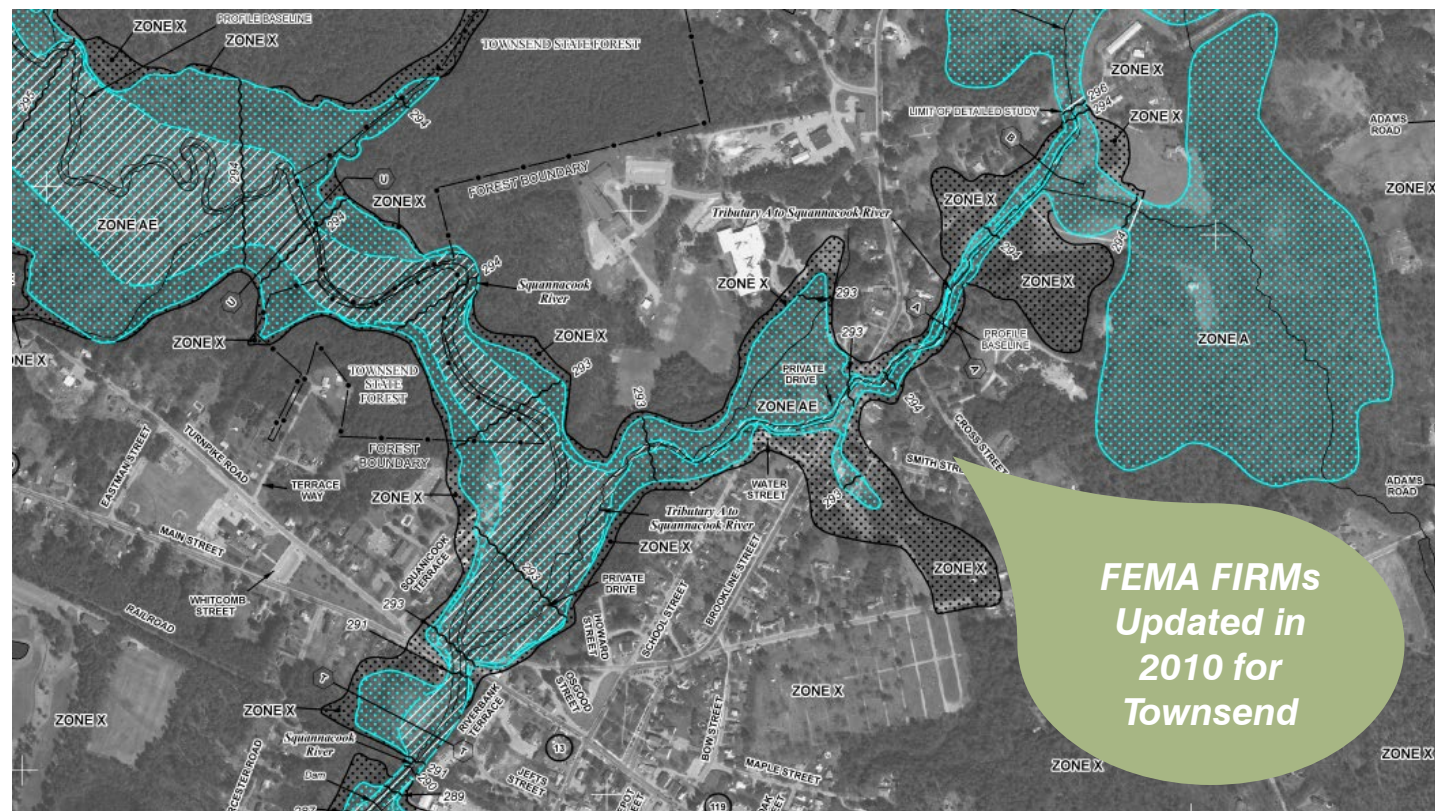
Pearl Hill Brook, south of Old City Road

Intersection of South Row, South Harbor, and Old Meeting House Road

Highland Street by Adams Road

24 Meadow Road

17 Meadow Road



Above: a portion of the FEMA Flood Insurance Rate Map (FIRM) for Townsend

## REPETITIVE FLOOD LOSS STRUCTURES

- Defined as an NFIP-insured structure that has had at least 2 paid flood losses of more than \$1,000 each in any 10-year period since 1978<sup>1</sup>
- Townsend has **3** repetitive loss structures<sup>2</sup>

1. Federal Emergency Management Agency (FEMA). 2019. "Definitions." Accessed August 29, 2019. [Fema.gov/national-flood-insurance-program/definitions#R](https://www.fema.gov/national-flood-insurance-program/definitions#R)

2. MA Department of Conservation and Recreation (DCR). 2020. "Community Repetitive Loss: Town of Townsend"

3. Montachusett Region Hazard Mitigation Plan, 2015

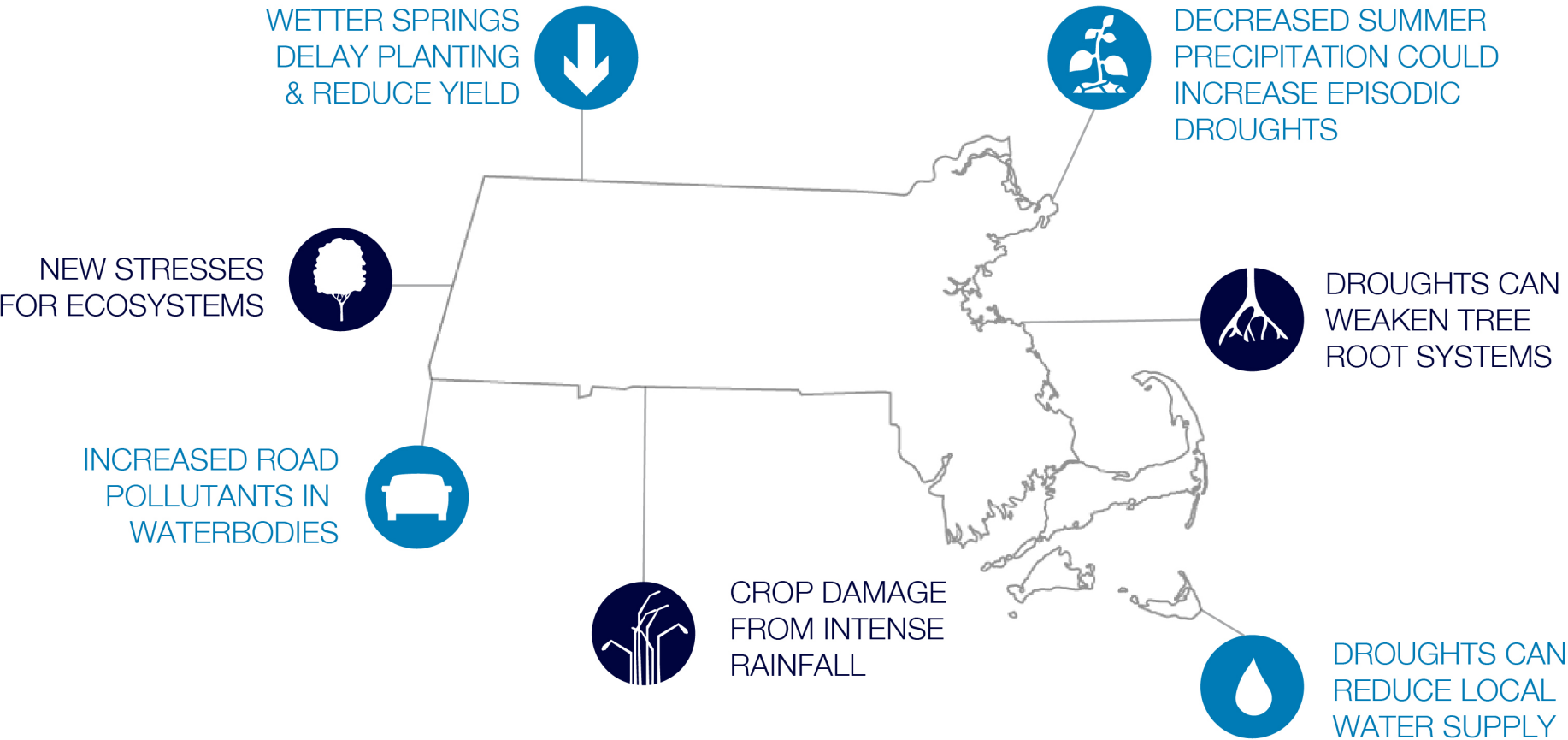




# IMPACTS OF CHANGING PRECIPITATION



HIGHER AVERAGE ANNUAL PRECIPITATION  
INCREASED BY ABOUT 10% IN THE NORTHEAST IN THE LAST 50 YEARS





# SEVERE WINTER WEATHER

The blizzard of 2013 left nearly  
**400,000 Massachusetts  
residents without power**

Heavy blizzards are among  
the **most costly and  
disruptive** weather events  
for Massachusetts  
communities



Nor'easters along the Atlantic  
coast are increasing in  
frequency and intensity

**Jan 3-4, 2018: Winter Storm Grayson**

**March 2, 2018: Winter Storm Riley**

**March 8, 2018: Winter Storm Quinn**

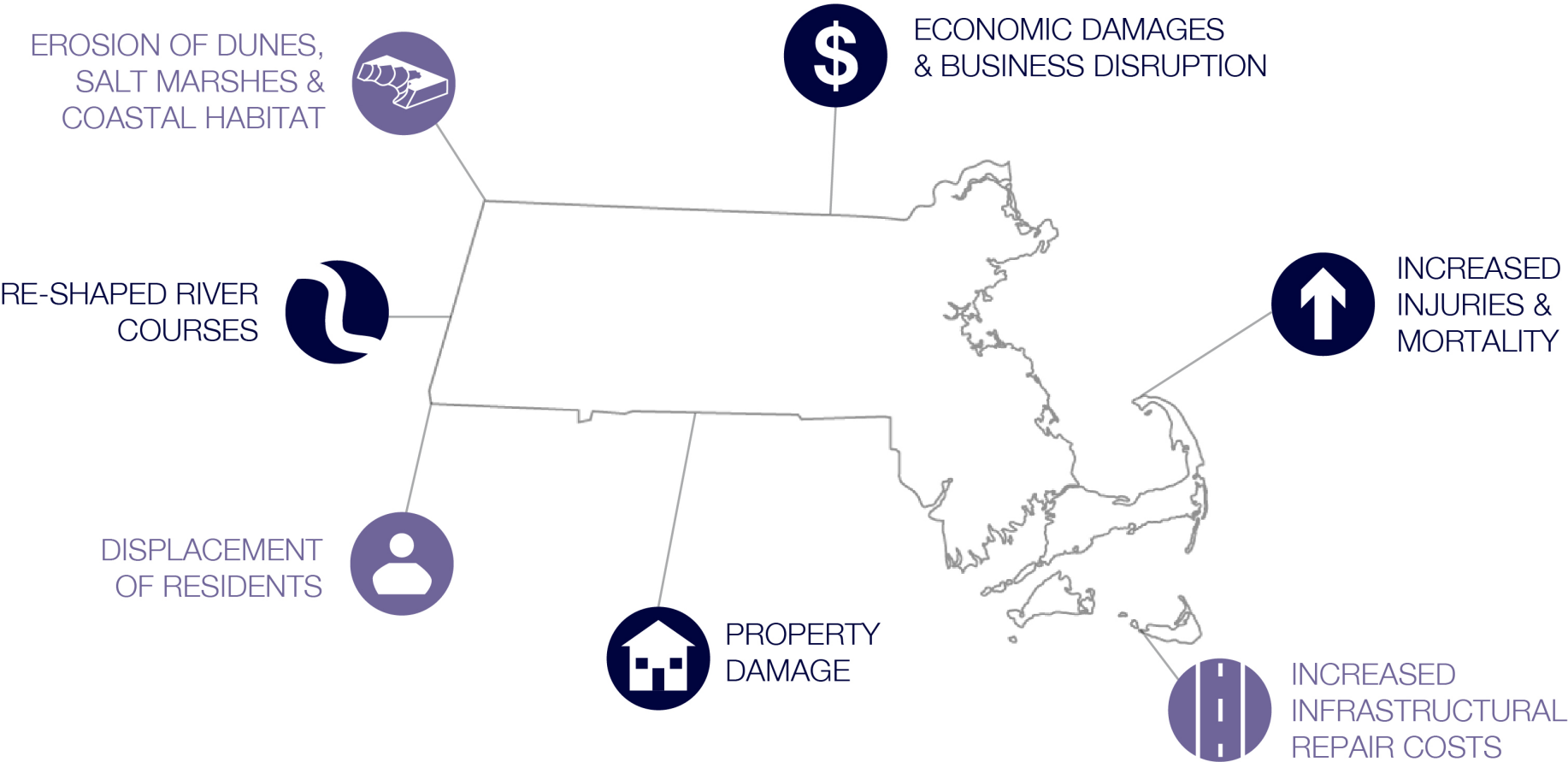
**March 13, 2018: Winter Storm Skylar**



# IMPACTS OF **EXTREME WEATHER**



STORMS ARE BECOMING MORE INTENSE AND DAMAGING







**What hazard most  
concerns you?**

**What memories do you  
have of climate impacts?**

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# STRENGTHS & VULNERABILITIES

Private sector solar array. Photo by the Town of Townsend.





# INFRASTRUCTURE

## Strengths

- Culverts and stormwater drainage
- Subdivision regulations require maintenance of private stormwater systems
- Roads and bridges
- Private wells and septic systems
- Public water supply
- Opportunities for solar
- Complete Streets Program





# INFRASTRUCTURE

## Vulnerabilities

- Culverts and stormwater drainage is undersized
- Stormwater pollution from roadways
- Unknown effectiveness of stormwater best management practices and regulations
- Meadow Road bridge floods
- Roadways in West Townsend often flood
- Downed powerlines from tree damage during storms
- Communication infrastructure lacks redundancy
- Unknown conditions of dams
- Private septic systems are not always properly maintained
- Possible surface water or ground water pollution in drinking water wells
- Three out of five of the water supply wells don't have a generator
- Public wells are at risk of flooding
- Wells are at risk of drying up during droughts



# ENVIRONMENTAL

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## Strengths

- Forests
- Regular tree maintenance
- Street trees
- Parks and open space
- Waterbodies
- Wetlands' ability to provide water storage
- Future development



# ENVIRONMENTAL

## Vulnerabilities

- Encroachment of development on natural resources
- Ability of native species to thrive in a hotter environment
- Lack of street trees to provide shade in parts of town
- Invasive species
- Vector-borne diseases
- Beavers causing flooding





# SOCIETY

## Strengths

- Local businesses, including local farms
- Municipal buildings and services
  - Elected and appointed municipal boards and committees
  - Townsend Energy Committee
- Food pantry and delivery service for seniors
- Municipal and emergency services
- Community support and volunteers
- New business support
- Seniors are well connected through the Council of Aging and Friends of Seniors
- Complete Streets
- Montachusett Regional Planning Commission



# SOCIETY

## Vulnerabilities

- Residents at risk of isolation
- Residents with limited English proficiency when communications are primarily in English
- Vulnerable housing units in the floodplain
- Residents with challenges to prepare or adapt
- Some residents do not have internet
- No cooling centers
- Lack of transit to shelters and essential services
- Critical services need back up power
- Food access and reduction of local food production
- Food bank does not have a generator
- Emergency Management Plan
- Affordable housing shortages
- Increase municipal capacity through additional staff and work with volunteers and non-profits
- Need for more economic development



**What do you think about  
these vulnerabilities and  
strengths?**





# EXISTING HAZARD PROTECTION

- 
- Senior Center activities
  - Community outreach and education
  - Shelters
  - Emergency generators
  - Volunteer programs
  - Green infrastructure projects
  - Fire safety
  - Snow removal
  - Green Community Designation
  - Regional Emergency Planning Committee
  - Massachusetts Municipal Association Best Practice Series
  - Massachusetts State Building Code
  - Complete Streets Funding Program
    - Committee
    - Current Greenville Road Bridge project
  - Townsend Energy Committee
  - Project funding support
    - Montachusett Regional Planning Commission
    - District Local Technical Assistance and Unified Planning Work Program
    - Community Development Building Grant Community



# HIGH PRIORITIES: INFRASTRUCTURE

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- Assess dams, gather data on hazardous dams, consider benefits of keeping or removing dams, and consider land acquisition
- Investigate options for solar panels and include battery storage
- Consider options for EV charging stations
- Tree maintenance
- Add repeaters to communication system to increase reliability
- Assess what resident's homes are not serviced by internet
- Assess risk to cell tower
- Study well floor levels compared to floodplain information and get additional generators.
- Ensure water supply during drought through aquifer studies and assessing drought impacts on ground and surface water supply. Study options to connect with a larger surface water system and the possibility of land acquisition



# HIGH PRIORITIES: ENVIRONMENT

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- Assess options for protecting wetlands, including studying development upstream and assessing options for zoning, purchasing, and land acquisition
- Protect waterways through bank restoration and stabilization
- Study options for protecting aquifers and the town's water supply, including options for regulations, waivers, zoning, low impact development, transfer of development rights
- Limit or do not allow building in the floodplain. Assess options for encouraging development outside of the floodplain, including by producing design guidelines for developers





# HIGH PRIORITIES: SOCIETY

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- Services for residents at risk of isolation: in-home visitation services and medical visits
- Language support for adults: classes at a local church, library, or the Senior Center
- Translate documents and emergency communications and develop infographic signage
- Create an economic center to help make business plans. Hire a local Planner to focus on supporting economic revitalization
- Assess risk of extreme storms to municipal buildings and services, and options for adaptation
- Provide additional municipal staff and training. Secure memoranda of understanding with similar departments in adjacent Towns. Improve use of communication technology during extreme events. Consider options for interconnectivity and regional collaboration
- Create an agricultural advisory committee and organize farmers markets and public outreach for gardening programs. Turn land into victory garden-style space for apartment residents. Develop programs and incentives for local farms and farm stands
- The Food Bank needs a generator and walk-in refrigerator



**What project idea do you  
think should be a high  
priority?**



We want to understand  
your priorities

Comment on the webinar and tell us more about hazards  
and preparedness in Townsend by taking our survey!

[tinyurl.com/TownsendMVPSurvey2](https://tinyurl.com/TownsendMVPSurvey2)