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Town of Lynnfield  
Municipal Vulnerability Preparedness (MVP) Project  
Public Listening Session

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# Agenda

- MVP Program Overview
- Climate Projections
- Workshop Results
  - Goals
  - Top Hazards, Challenges, Strengths
  - Prioritized Recommendations
- Next Steps



# MVP Program Overview

## ENVIRONMENTAL BOND 2018



- **\$2.4 billion bond bill with focus on climate change resiliency**
- **Over \$200 million for climate change adaptation**
- **Provides funding for the MVP Program**

# MVP Program Overview

## Obtain Planning Grant



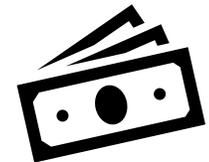
## Complete Workshop

- Identify Actions to Address Vulnerabilities
- Write Report



## Become Certified MVP Community

- Eligible for Grant Funding to Implement Actions

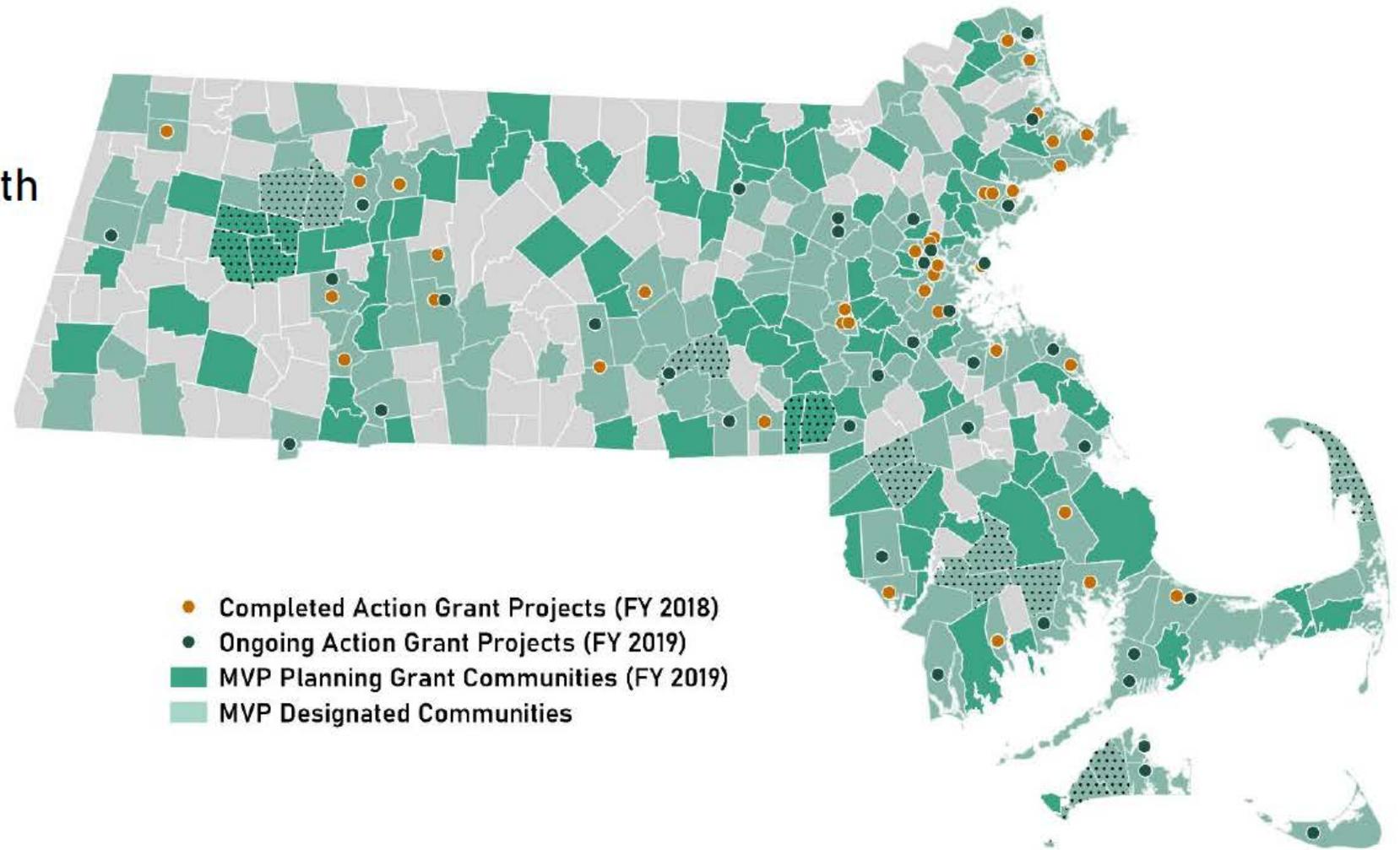


# Three Years of MVP

MVP Designations  
71% of the Commonwealth  
249 communities

Action Grant Projects  
FY 18: 37  
FY 19: 36

Total Awards  
\$17M+ in planning and  
action grants to date



# MVP Action Grants: Project Types

- Detailed Vulnerability and Risk Assessment\*
- Community Outreach and Education
- Local Bylaws, Ordinances, Plans, and Other Management Measures
- Redesigns and Retrofits\*\*\*
- Nature-Based Flood Protection, Drought Mitigation, Water Quality, and Water Infiltration Techniques\*\*
- Nature-Based, Infrastructure and Technology Solutions to Reduce Vulnerability to Extreme Heat and Poor Air Quality



\* Most common project type

\*\* Second-most common project type

\*\*\*Third-most common project type

# MVP Action Grants: Project Types (cont.)

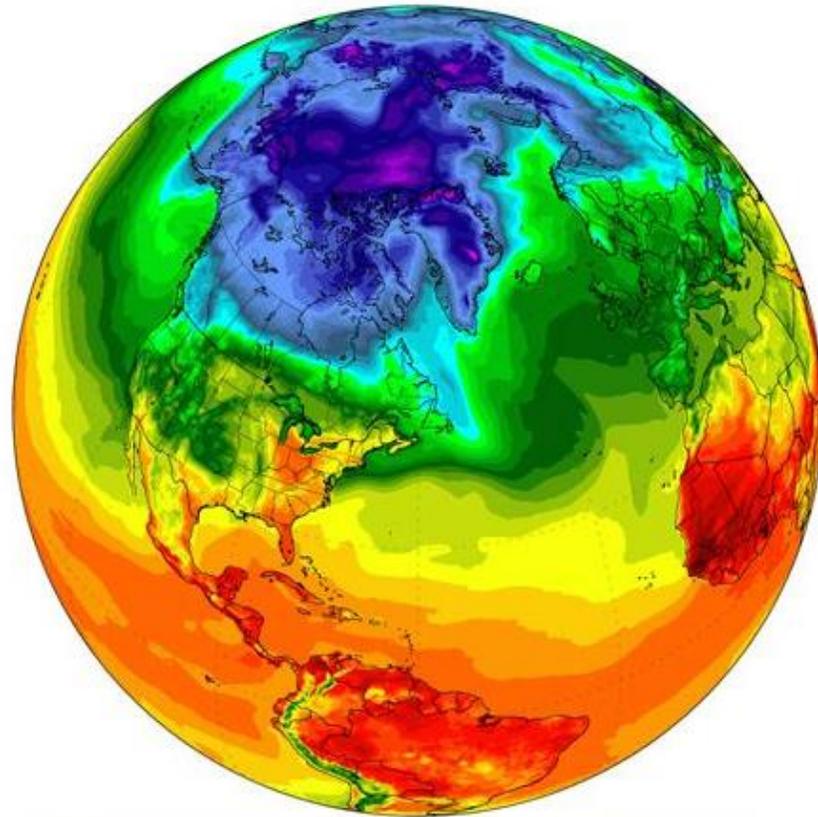


- Nature-Based Solutions to Reduce Vulnerability to other Climate Change Impacts
- Ecological Restoration and Habitat Management to Increase Resiliency

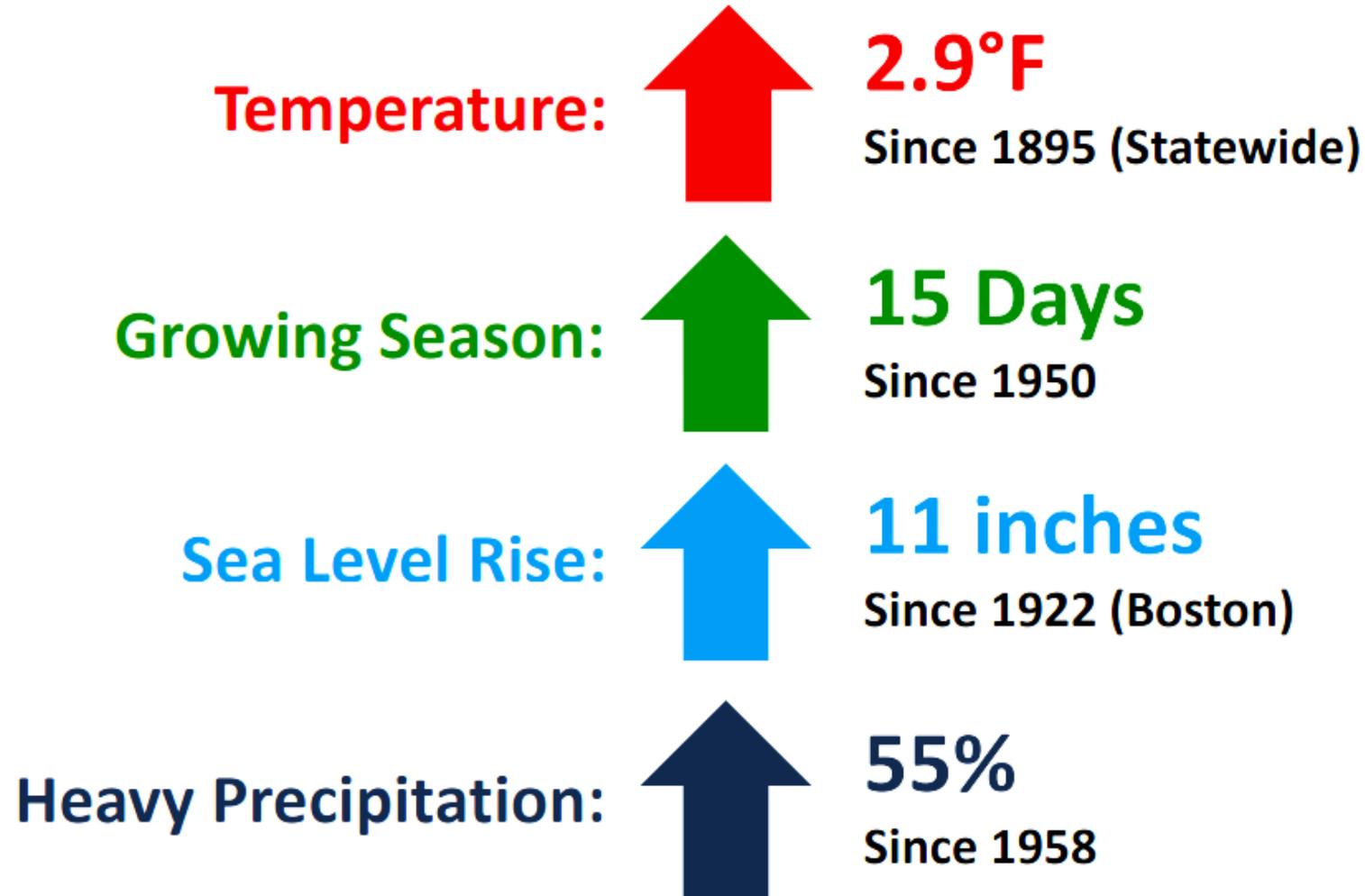
## NEW IN 2019

- Energy Resilience
- Chemical Safety
- Land Acquisition for Resilience
- Subsidized Low-Income Housing Resilience Strategies
- Mosquito Control Districts
- + Expanded eligibility of project location

# Climate Projections



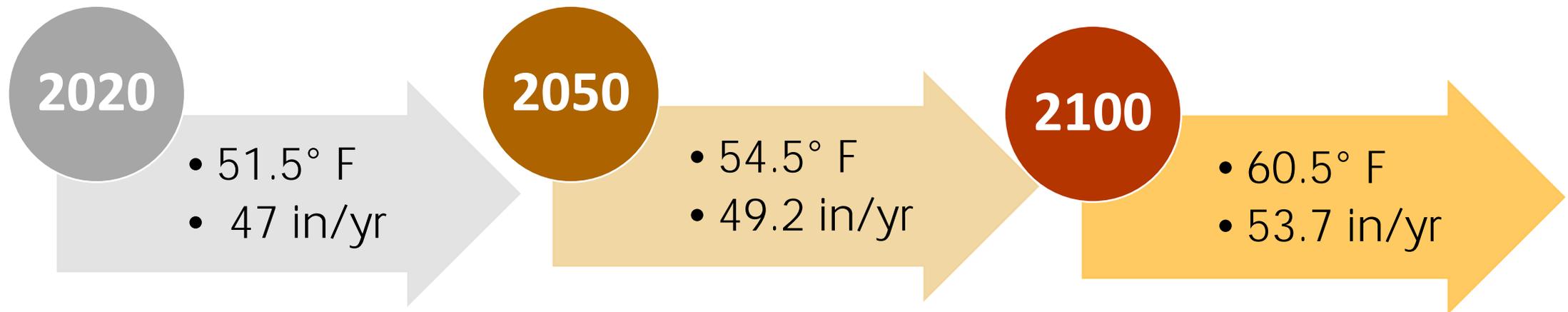
# Massachusetts Observed Climate



Source: Climate Science Special Report, 2017; NOAA NCEI nClimDiv; NOAA Ocean Service

# Lynnfield Projected Climate

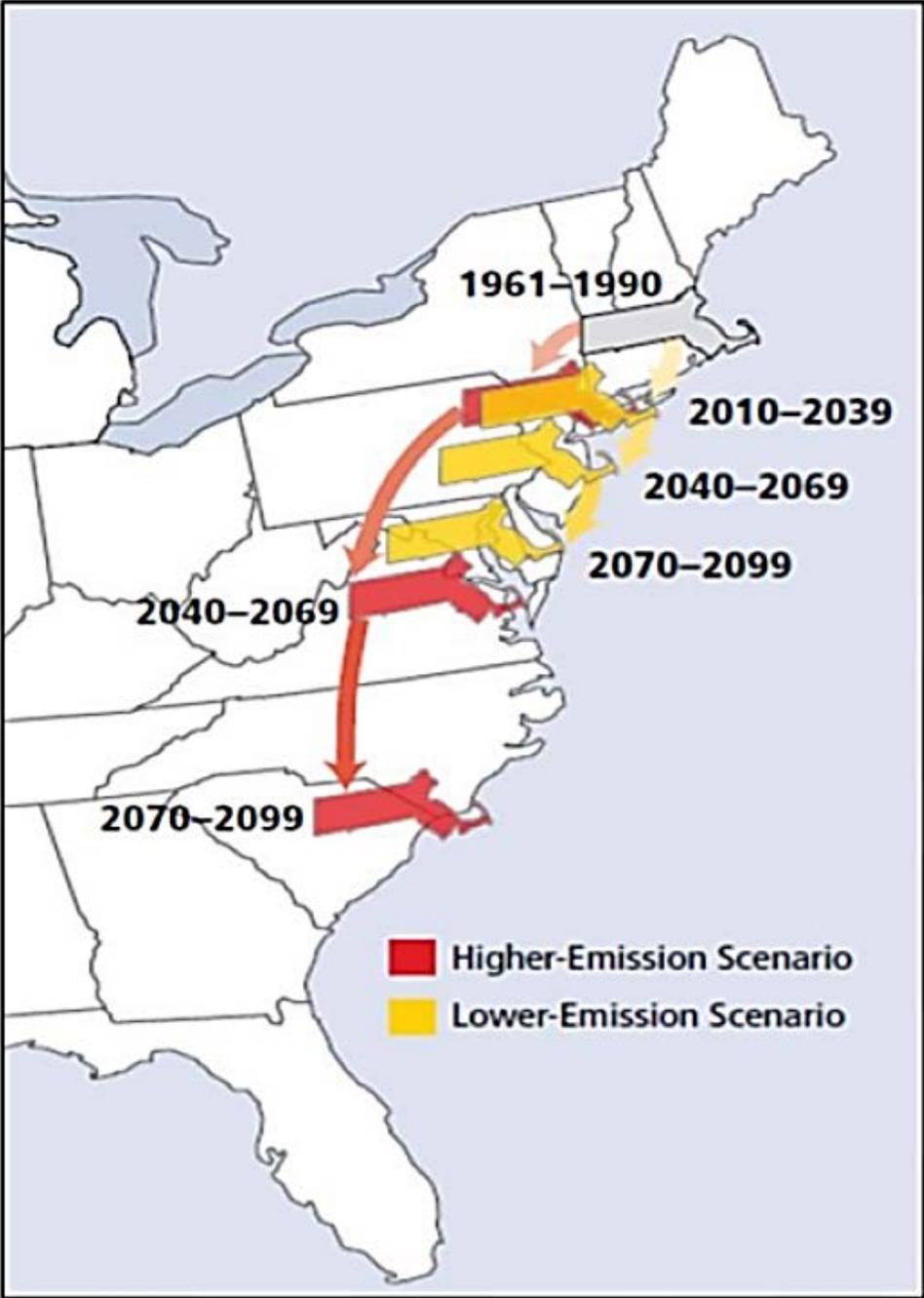
Average annual temperature and precipitation projections for Essex County



Source: <http://resilientma.org/>

# What do these Projections mean?

*(relative to temperature)*



# Potential Consequences of Climate Change



## Changes in precipitation

- Inland flooding
- Drought



## Rising Temperatures

- Wildfires
- Invasive species/pests



## Extreme Weather

- Hurricanes/tornadoes
- Severe winter storms



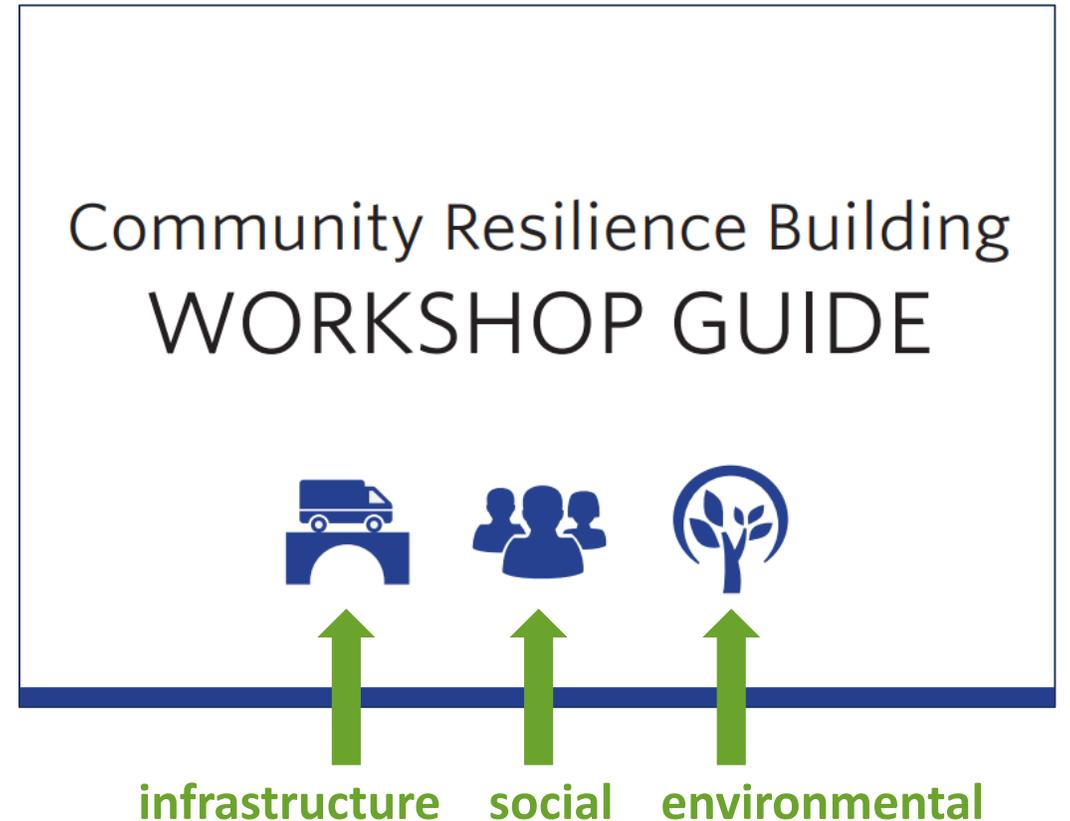
## Human-induced hazards

- Loss of habitat/floodplains
- Overuse of fertilizers/pesticides

# CRB Workshop Purpose

## Use Community Resilience Building Workshop Guide to:

- Complete **baseline assessment** of climate change and natural hazard vulnerability
- Develop **specific actions** to address priority hazards/vulnerabilities



# CRB Workshop Goals



# Workshop Results

*(Workshop Held on February 5, 2020)*

<b>Town of Lynnfield – MVP Core Team</b>
Charles Richter, PE, Town Engineer
Kristin McRae, RS, Health Director (Board of Health)
Emilie Cademartori, Director of Planning and Conservation
Glenn Davis, Fire Chief / Emergency Management Director
John Tomasz, DPW Director
Jennifer Welter, Planning and Conservation
John Scenna, Superintendent, Lynnfield Center Water District
Robert Dolan, Town Administrator
Steven deBettencourt, Assistant Director of Facilities

# Workshop Attendees

Name	Department/Committee	Team
Kate Flaws	Planning Board	Red
Emilie Cademartori	Director of Planning and Conservation	
Jennifer Welter	Conservation Commission Staff	
Jim Finegan	Superintendent, Lynnfield Water District	
Michelle Pacillo	Office of State Representative Brad Jones	
Steve Rogers	Kinder-Morgan	
John McDonagh	Reading Municipal Light District	
Glenn Davis	Fire Chief/Emergency Management Director	Blue
Brian Shaffer	Zoning Board of Appeals	
John Tomasz	Director, Department of Public Works	
John Scenna	Lynnfield Center Water District	
Susan Lambe	Planning Board Staff	
Kirk Mansfield	Conservation Commission	
Patrick McDonald	GIS Coordinator and Field Inspector	Green
Charlie Richter	Town Engineer	
Kristin McRae	Health Director (Board of Health)	
Brian Abcunas	Peabody Municipal Light Plant	
Cory Diehl	Kinder-Morgan	
Steve deBettencourt	Assistant Director of Facilities (DPW)	
Bob Hartzel	CEI	Facilitators
Elisha Musgraves	CEI	
David Roman	CEI	



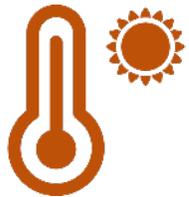
# Top Hazards



**Flooding:** There are several areas in town that have experienced historical flooding.



**Strong Storms:** Heavy rainfall, high winds, winter storms with potential to damage infrastructure and other physical, social, and environmental consequences.



**Drought / Extreme Temperatures:** Drought could limit water supply availability; extreme temperatures could impact vulnerable populations.



# Community Resilience Building Risk Matrix



www.CommunityResilienceBuilding.org

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

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

Features	Location	Ownership	V or S	Flooding	Strong Storms	Drought	↑ Temps	Priority	
								H-M-L	Short Long Ongoing
<b>Infrastructural</b>									
A Under-sized culverts / stormwater infrastructure	Leige Rd. (former) mostly town		V	*1				H	S-L
B Sangus R. / Beaver Dam Bk (Lyndfield/Windfield) (mult. water waste & sewer) (another cur. not; dam impacting water supply)			V	study to eval. 95% waterworks / imp. projects	balance of float capacity and impact on water supply			H	L
C Hawkes Bk → septic systems during flood events culverts undersized			V	Hawkes Bk / Capote Rd. study → flooding; water supply concerns				M	S
D Townhomes - snow/ice risk increasing	town-wide	Partly Power; Realty Power	V		retrofit brackets (most good = maintenance) micro-spills / battery storage for critical facilities study			M	S
F Areas on private wells / septic	combing of Oak Edge Tornado → waste water / drinks → close proximity		V/S	decision support tool - real time data equipment!	town-wide eval. of water supply resiliency - private wells			M	S
Pilling Pond dam (new!): Decision support: good		town	S					H	S
<b>Societal</b> GIS assessment Layer - *2									
E Shelters capacity for extreme (EOC) events	Middle Sch H.S.	Town	V		Sr. Center / Sunnyside Sch. → need generators for add capacity → Huddell Sch. → currently structural repair practical			M	O
G Code Red sufficient for elderly population?					? (more feedback from Fire Chief) → Fire Chief? ...			S	O
H Evacuation routes - coord. @ State MassDOT	Rt. 28 Rt. 1	State		A.H. ranks (evaluate further)	Flooding impact etc. route not very resiliant → Low-level ev. equip for Sunnyside Sch.			L	L
<b>Environmental</b>									
I Sangus River corridor → competing ecology + water supply intake during droughts			V		LYNN HAS water use study: ID trigger thresholds for operations plan: finally! → drought: needs for outlet structures / spillway (Real-time data; decision support)				
J Reedy Meadow - overall ecology health ... invasive spp risks			V/S	Ecological inventory of existing communities	inv. st. mgt. plan			L	S
K ↑ Cyanobacteria, algae blooms in surface waters	esp. Pilling Pond		V		septics: elevation; floating marshes → ID Other nutrient sources → ID				
L Ipswich River habitat loss, water supply			V						
M Lyndfield Gr. water district (protect)			S	potential land protection → golf course	Sagamore plans for redev. ... town acquisition?				

\*1 → funding to complete this climate resiliant infrastruct.  
 Town GIS → easements layer (town; utilities, etc.)  
 \*2 → investigate all technologies to ↑ resiliency of above-ground power lines  
 EEA to clarify if only diesel gens. are not fundable... gas ok?  
 \*3 → investigate all technologies to ↑ resiliency of above-ground power lines

Patrice M.  
 Charlie R.  
 Kristin M.  
 Brian A.



Top Hazards

Concerns / Strengths

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought)

Features	Location	Ownership	V or S	Top Priority Hazards			Priority	Time
				Flooding	Strong Storms	Drought: Extreme/Increasing Temperatures		
<b>Infrastructural</b>				<b>Proposed Actions</b>			<b>Actions</b>	
Undersized culverts and stormwater infrastructure	multiple locations <sup>2</sup>	mostly town-owned	V	a. Multiple culvert/stormwater infrastructure improvement areas have already been studied and are ready for implementation (see Note 2 for list). b. Flooding impact study of Route 1/Salem Street intersection to recommend improvements			H	S - L
Saugus River/Beaverdam Brook corridor	Saugus River/Beaverdam Brook	multiple mgt. entities	V	Conduct study to evaluate system weaknesses and potential improvements. This area has multiple management entities (Lynnfield, Wakefield, Lynn Water & Sewer), requiring a balancing of flood concerns, ecological concerns, and the need to impound water for water supply.			H	L
Hawkes Brook / Carpenter Road area	Hawkes Brook / Carpenter Road	Town and private	V	Culverts undersized and septic systems at risk of failure during flood events. Conduct study of flooding/water supply concerns.			M	S
Power lines	town-wide	Peabody Municipal Light Plant; National Grid	V				M	O
							M	S
Private wells/septic systems	town-wide	private	V (but S for infiltration)	Concern with regard to comingling of water supply and wastewater during floods and loss of water supply during drought - some areas do not have option to tie into municipal water. Conduct town-wide evaluation of water supply resiliency			M	S
Flow management infrastructure	Pillings Pond; Saugus River	Town	S	New Pillings Pond dam could be enhanced with instrumentation to provide real-time data and decision support for flow mgt., lake drawdown, etc. Sam approach could be used to better manage flows in Saugus River.			H	S
<b>Societal</b>								
Sheltering capacity for extreme weather events	Middle School ; High School	Town	V	Conduct study to evaluate needs for expanded sheltering capacity, including assessment of generators (size/type), and other amenities such as beds, etc. Include evaluation of needs associated with treatment for insect-borne illnesses (e.g. Zika virus, etc.) Note: Locations to expand capacity have already identified as the Senior Center (top location), Summer St. School, and Huckleberry School. Assess need for an Emergency Operations Center.			M	O
At-risk populations	town-wide	N/A	V	Coordinate with Fire Chief/Emergency Management Director to determine if any modifications are needed to the Code Red emergency notification network or other tools to provide assistance to at-risk populations during emergencies.			L	L
Evacuation routes	Rt. 128; Rt.1	State	V	Coordinate with Fire Chief/Emergency Management Director to determine potential alternative evacuation routes. Flooding impacts to the primary routes is a low-level concern, except for Summer St./Rt. 128 (see Note 2).			L	L
<b>Environmental</b>								
Saugus River corridor	Saugus River corridor	multiple mgt. entities	V	Conduct watershed study to identify key thresholds for operating dam in response to both flooding and drought conditions. A primary concern is balancing the need to protect ecology (i.e., wetlands, rare species habitat, regionally important bird nesting area) and maintain water supply during drought. Study should identify needs for an upgraded outlet structure/spillway.			M	L
Reedy Meadow - invasive species	Reedy Meadow		V	Conduct ecological inventory and invasive species management plan to establish baseline and actions to respond to new invasive species threats			L	S
Increased occurrence of harmful algal blooms (cyanobacteria)	Pillings Pond	State-listed Great Pond	V	Septic systems: conduct homeowner education/outreach; funding mechanisms for septic upgrades; identify failing septic. Reduce nutrient sources through green infrastructure, LID retrofits			L	L
Ipswich River habitat loss/impact due to water supply withdrawals	Ipswich River	multiple	V	Assess potential additional land protection in Ipswich River watershed, including Sagamore golf course planned for redevelopment. Protected land in Lynnfield Center Water District is a strength.			M	S

# Top Concerns: *Infrastructure*



- **Stormwater Infrastructure**
  - Undersized/aging culverts – road flooding in multiple places
  - Town has initiated studies at multiple locations  
*(e.g., Ledge Road / Hawkes Brook, Summer Street)*

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- **Pillings Pond Dam**
  - Low lying surrounding areas are at flood risk
  - Current management plan does not include collection of real-time data of rapidly changing water levels during storm events

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- **Saugus River**
  - Lynn Water and Sewer Commission controls downstream dam of the confluence of the Saugus River and Beaverdam Brook
  - Has historically caused flooding within Beaverdam Brook Watershed

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- **Electrical Power Lines**
  - Fallen tree limbs have resulted in localized outages
  - Storm damage is increasing from uniform age trees

# Top Concerns: *Societal*



## ■ **Vulnerable Communities**

- Emergency alerts may not fully reach disabled and elderly demographics
- 

## ■ **Emergency Shelters**

- Need more capacity and amenities (e.g., central air conditioning)
- 

## ■ **Evacuation Routes / Emergency Response**

- Flooding of key arterial streets may impede emergency response
  - Need formalized evacuation routes or alternative emergency response routes
- 

## ■ **Air Conditioning at Public Schools**

- Some Lynnfield schools in Town are not air conditioned and vulnerable to periods of extreme heat

# Top Concerns: *Environmental*



## ■ Ongoing and Future Development

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- Protect undeveloped land and guide development to reduce potential consequences  
*(e.g., loss of floodplain storage, WQ impairments)*

## ■ Vegetation Management

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- Uniform age trees increasingly falling during storms
- 2015 brush fire in Reedy Meadow
- Increase in invasive pests

## ■ Public Drinking Water Supply relative to Lynnfield Center Water District

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- Supply wells impacted by WQ issues (e.g., iron and manganese)
- Water demands is increasing – supply at risk during droughts
- Recharge and WQ concerns from new development
- Unserved area north of Lowell Street = fire risk

## ■ Surface Water Quality

- Septic systems at risk of failure from high groundwater
- Pillings Pond algal blooms

# Top Strengths



## ■ Emergency Services / Town Hall Resources

- Excellent response track record
  - 2018 Hazard Mitigation Plan is current
- 

## ■ Conservation Areas

- 1,663 ac of Town/State Conservation Land and Open Space
- 

## ■ Bylaws and Regulatory Mechanisms

- 2015 Scenic Road Bylaw
- Strong Town stormwater mgt. regs (Article 8 - 375-8.3)
- 2005 Environmental Bylaw
- Currently working on Open Space Residential Development and Tree Preservation Bylaws

# Top Recommended Actions

## 1. Stormwater Infrastructure

- **Assess:**
  - Expand previous studies to include a comprehensive resiliency assessment of Town drainage infrastructure.
  - Prioritized recommendations for repairs / replacements.
  
- **Maintain:**
  - Obtain approvals (incl. easements) to maintain key stormwater infrastructure
  
- **Replace Key Infrastructure**
  - Engineering feasibility analysis, permitting, engineering design, and construction



# Top Recommended Actions

## 2. Reedy Meadow/Beaverdam Brook Management

### ■ Problem:

- Lack of real-time data to coordinate Saugus River Dam operations; beaver dams; sedimentation of conveyance channels
- Brush fire risk
- Invasive species

### ■ Solution:

- Saugus River corridor study: develop decision support protocols for dam operations to balance ecological protection, water supply, and flood mitigation
- Develop additional mitigation measures to reduce flood risk (*e.g., restoration of channel capacity, beaver deceivers*)
- Conduct ecological inventory and develop invasive species management plan



# Top Recommended Actions

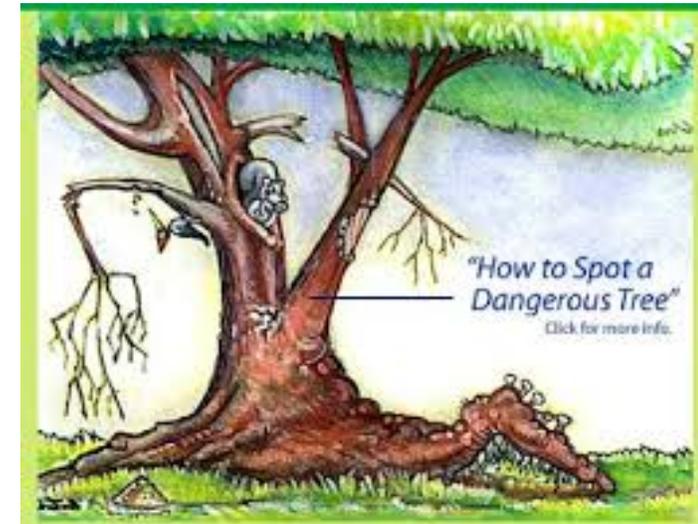
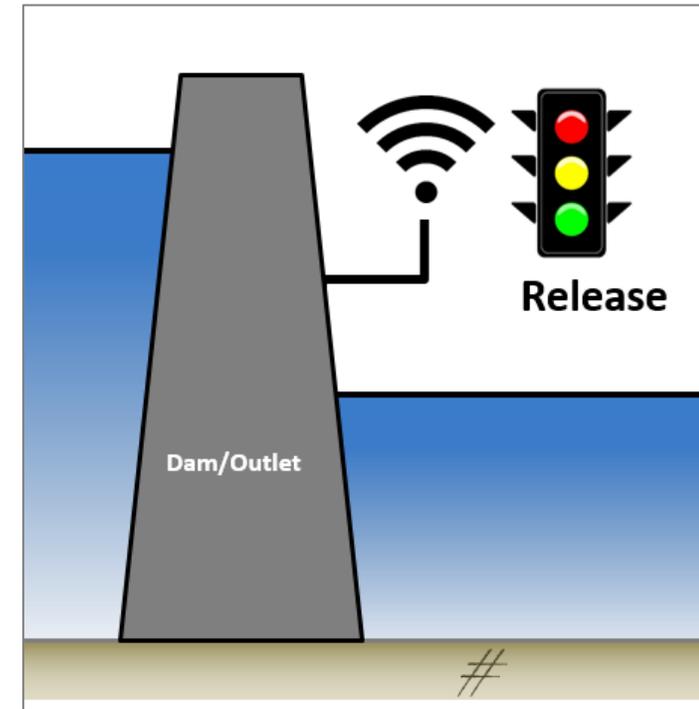
## 3. Evaluate Town-wide Water Supply Resiliency

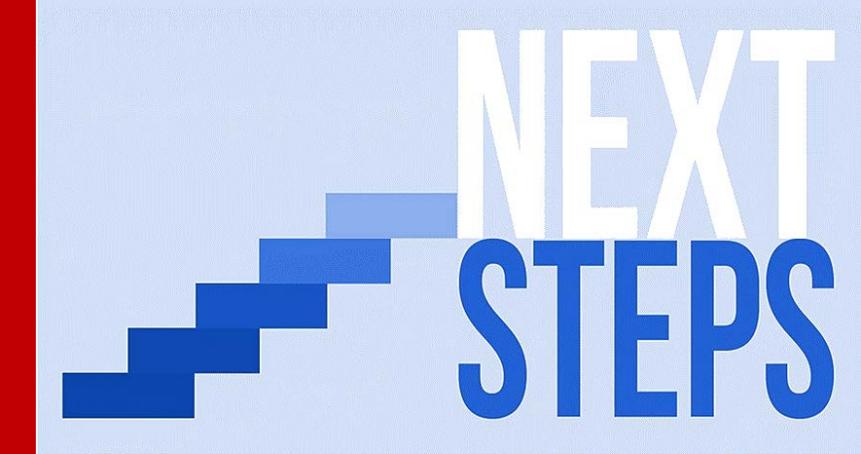
- **Problem:**
  - Lynnfield Center Water District is impacted by water quality and quantity issues
- **Solution:**
  - Evaluate potential alternative supply sources (e.g., interconnection with Lynnfield Water District)
  - Evaluate feasibility of expansion north of Lowell Street for unserved area fire protection
  - Develop long-term water conservation program



# Other High Priority Actions

- **Update Pillings Pond Management Plan to include decision support for dam management based on real-time data and weather forecasts**
- **Perform study to evaluate needs for expanded sheltering capacity and amenities** (*note: study has already been performed to evaluate potential locations*)
- **Continue efforts to pass Open Space Residential Development and Tree Preservation bylaws**
- **Remove hazardous trees as identified by previous study, and replant in accordance with bylaw**





# NEXT STEPS

- MVP Community Designation
- Implement Prioritized Recommendations
- Apply for Action Grant Funding  
*(late April 2020)*

# Questions / Comments

- Take the Feedback Survey!

<https://arcg.is/0eKOq5>



- Contacts:

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Bob Hartzel (CEI): [rhartzel@ceiengineers.com](mailto:rhartzel@ceiengineers.com)

