

# **Town of Topsfield**

## **Community Resilience Building Workshop Summary Report**



June 29, 2021



## ACKNOWLEDGEMENTS & CREDITS

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# 1 OVERVIEW OF THE TOPSFIELD MVP PROJECT

Recent years have seen notable weather extremes in Topsfield and the surrounding region. The record rainfall of March 2010 resulted in a disaster declaration across the Commonwealth of Massachusetts. The winter of 2015 brought record-breaking snow of 110 inches. The following year, the Town and the region was under a drought warning from July to December 2016, the most severe since the 1980s. The winter of 2018 once again brought severe winter storms, including severe nor'easters in January and March, also resulting in a state disaster declaration. Globally, the years 2014 through 2020 were among the hottest years on record.

In 2017, the Commonwealth of Massachusetts inaugurated the Municipal Vulnerability Preparedness (MVP) program to assist municipalities in planning for and implementing strategies to adapt to predicted changes in our warming climate. The predicted changes include both increased flooding from large rain events and a greater likelihood of drought, increased extreme heat days and heat waves, and increased flooding from sea level rise.

The Town of Topsfield, in continuing its proactive efforts to address climate threats, received a state MVP Planning Grant to conduct a Community Resilience Building (CRB) Workshop. In the same general time frame, the Town also received a FEMA planning grant to prepare its first Hazard Mitigation Plan. The town bundled the two projects and sought technical assistance from the Metropolitan Area Planning Council to conduct them both concurrently. Upon completion of the MVP program, Topsfield will be eligible to apply for MVP Action Grants to address identified climate risks, as well as FEMA hazard mitigation grants to implement projects that reduce the community's vulnerability to natural hazards. The Town will also submit its Hazard Mitigation Plan to the Massachusetts Emergency Management Agency (MEMA) and FEMA for review and approval. Upon approval, the Town will be eligible to apply for mitigation project grants under FEMA's Building Resilient Infrastructure and Communities (BRIC) program.

The Town designated an MVP/HMP Core Team, coordinated by the Fire Chief/Emergency Management Director, Jen Collins-Brown. The Core Team identified and recruited community stakeholders to participate in the CRB Workshop. Thirty people representing Topsfield Town staff, Town Boards and Commissions, community organizations, and regional partners participated in a virtual CRB workshop via Zoom on April 14, 2021. The Workshop's central objectives were to:

- Understand extreme weather and climate related hazards
- Identify existing and future strengths and vulnerabilities
- Develop and prioritize opportunities to take action to reduce risk and build resilience

Materials provided for the CRB Workshop included local and regional data on changes in temperature, precipitation, and drought, as well as future projections to the end of the 21<sup>st</sup> century. Maps and infographics provided data and mapping specific to Topsfield's infrastructure, demographics, and natural resources (see Appendix A). The Workshop participants considered Topsfield's strengths and vulnerabilities, focusing on three categories: infrastructure, society, and the environment. Working in three small breakout groups and then together as a large group, the workshop participants identified and prioritized actions designed to increase Topsfield's resilience to future extreme weather events.

## 2 TOP HAZARDS AND VULNERABLE RESOURCES

The Topsfield Core Team identified the top natural hazards for the Town. Based on the concurrent work on the Hazard Mitigation Plan and review of Workshop materials, the Team identified flooding, severe storms (wind, snow, ice), drought, and extreme heat as the climate hazards of greatest concern to Topsfield. As mentioned above, flooding, drought, and severe storms have all affected the Town in recent years. Considering the Town's demographics, the Team also included extreme heat as a top hazard.

### Top Hazards

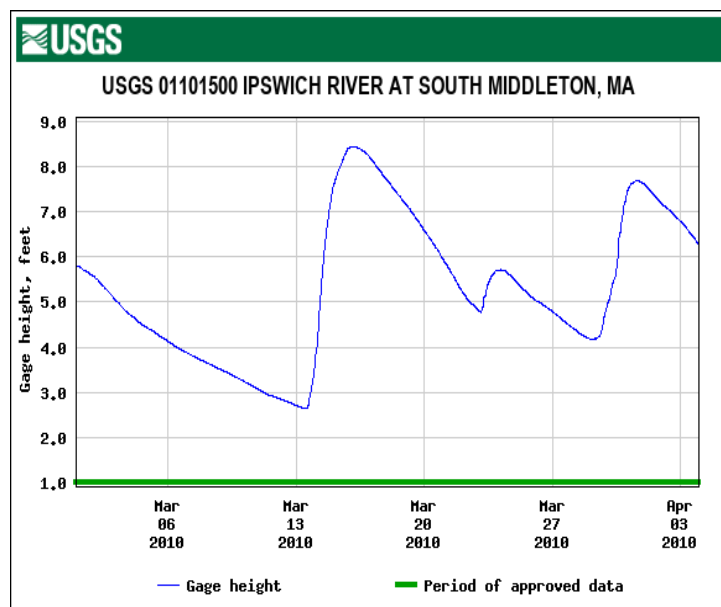
- Flooding
- Severe Storms
- Drought
- Extreme Heat

## 3 CURRENT CONCERNS AND CHALLENGES

Topsfield workshop participants noted the increasing frequency and intensity of storms, including nor'easters that bring damaging winds and snowfall and heavy rain events. The principal challenges of the nor'easters are the threat of power outages from falling trees and limbs, as well as travel restrictions due to heavy snow. Large rain events result in flooding in several locations; the Hazard Mitigation Plan identifies about two dozen of these areas of local flooding.

The most significant recent flooding event occurred in March 2010, as shown in Figure 1, when local rivers such as the Ipswich River exceeded flood stage for a sustained period of 20 days.

Figure 1: Ipswich River USGS Gage Height, March 2010



As these issues are not new, the Town of Topsfield has taken steps to prepare for extreme weather and prevent harm to people and property through its emergency management activities and the preparation of its FEMA Hazard Mitigation Plan, which has been prepared in a coordinated manner with this MVP project. Workshop participants shared concerns that climate projections will heighten current challenges and elevate new concerns, particularly power outages, water supply, and public health issues related to high heat.

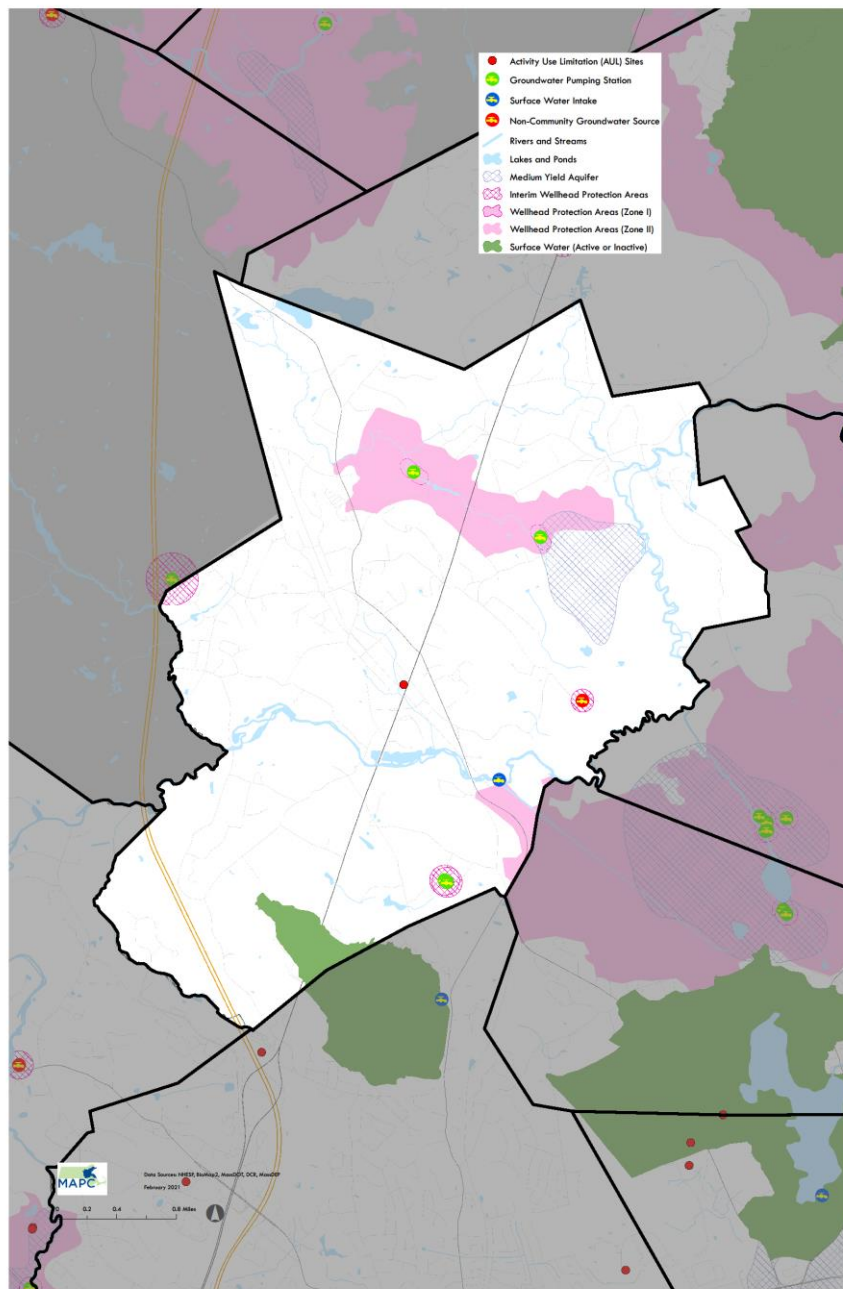


## 4 AREAS OF CONCERN

## Infrastructure

The Town of Topsfield relies on groundwater for all of its water supply needs, principally through its municipal wells, but also some private wells. Figure 2 shows the wells and associated wellhead protection area (Zones I and II, in violet on map). There is no centralized collection and treatment of wastewater; all wastewater is treated on-site by Title 5 septic systems..

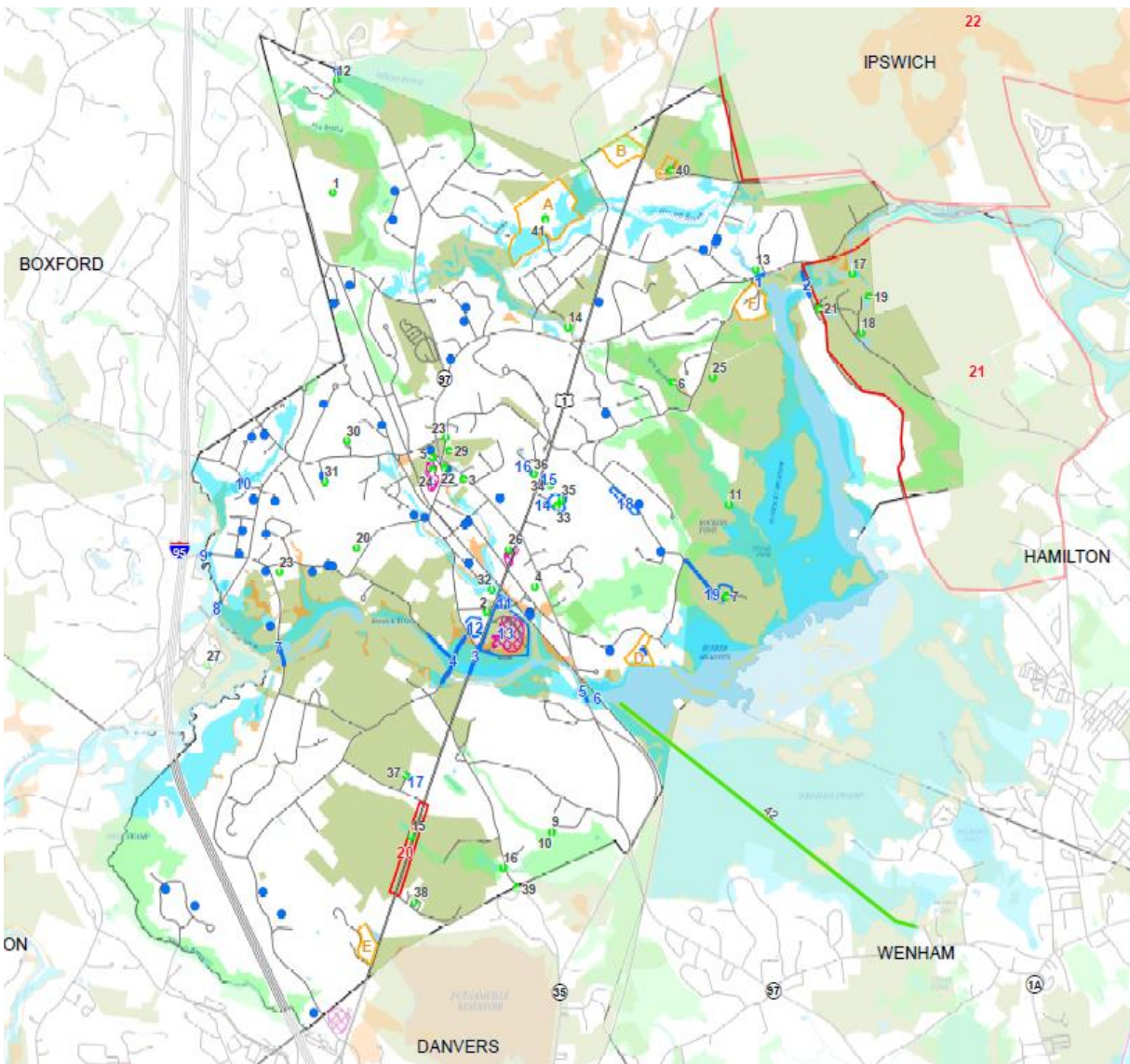
### Figure 2 Topsfield Water Supply



The FEMA Flood Insurance Rate Map shows significant areas of Topsfield within the flood hazard zone for the 1 percent chance of flooding, or “100-year” flood hazard areas (areas in blue in Figure 3). Most of these are associated with the Ipswich River, which flows through the southern and eastern parts of Topsfield. There are very limited areas of the 0.2 percent chance, or “500 year” flood hazard areas (areas in yellow in Figure 3).

Despite having fairly significant areas of flood hazard, the impacts of flooding in Topsfield are partially mitigated because the Town’s land use regulations restrict the amount of development in these flood hazard zone. The significant amount of protected open space (about one-third of the Town) also plays a role in mitigating flood impacts on Topsfield (protected open space is shown in the darker shade of green on Figure 3).

**Figure 3: Topsfield FEMA Flood Hazard Areas**



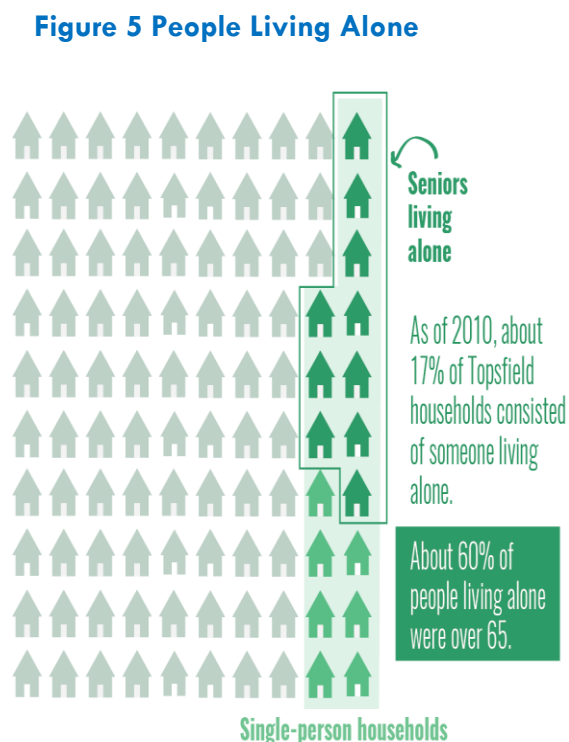
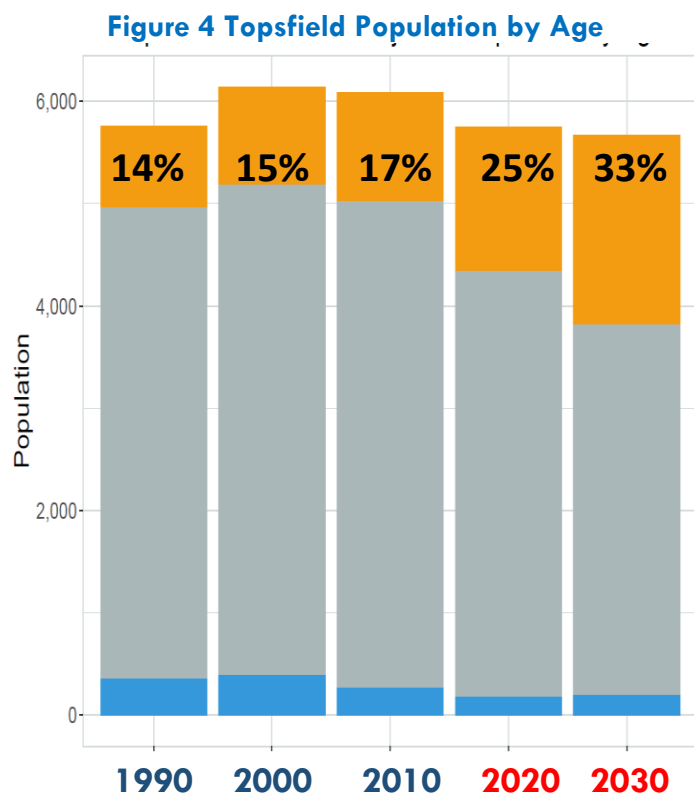
However, the Core Team identified several areas of concern for localized flooding, mostly along roadways related to culverts and roadway drainage, also shown on Figure 3 as blue sites.

Another potential infrastructure issue is the Putnamville Reservoir Dam, which is located in the neighboring Town of Danvers, but is upstream of Topsfield, which could be impacted were there to be a dam failure incident. An Emergency Action Plan has been prepared for this dam.

## Societal

Vulnerable populations identified include seniors, people living alone, and low-income residents. Like most area towns, the population of senior citizens is expected to increase over the next several decades in Topsfield. The percentage of those over 65 increased slightly from 1990 to 2010, but it is projected to double from 2010 to 2030, reaching 33% in that year (Figure 4).

About 17 percent of Topsfield residents live alone, and 60 percent of those are over age 65, which represents 10 percent of the total population (Figure 5). Many of these residents may be more susceptible than the general population to power outages and to extreme heat, which may occur more frequently in the future due to climate change.





Others vulnerable to climate impacts, particularly extreme heat, are people who work outside. These may include landscape contractors, construction workers, farmers, and public works staff. Working outdoors may also expose workers to vector-borne diseases such as Lyme Disease, EEE, and West Nile Virus.

## People Who Work Outside



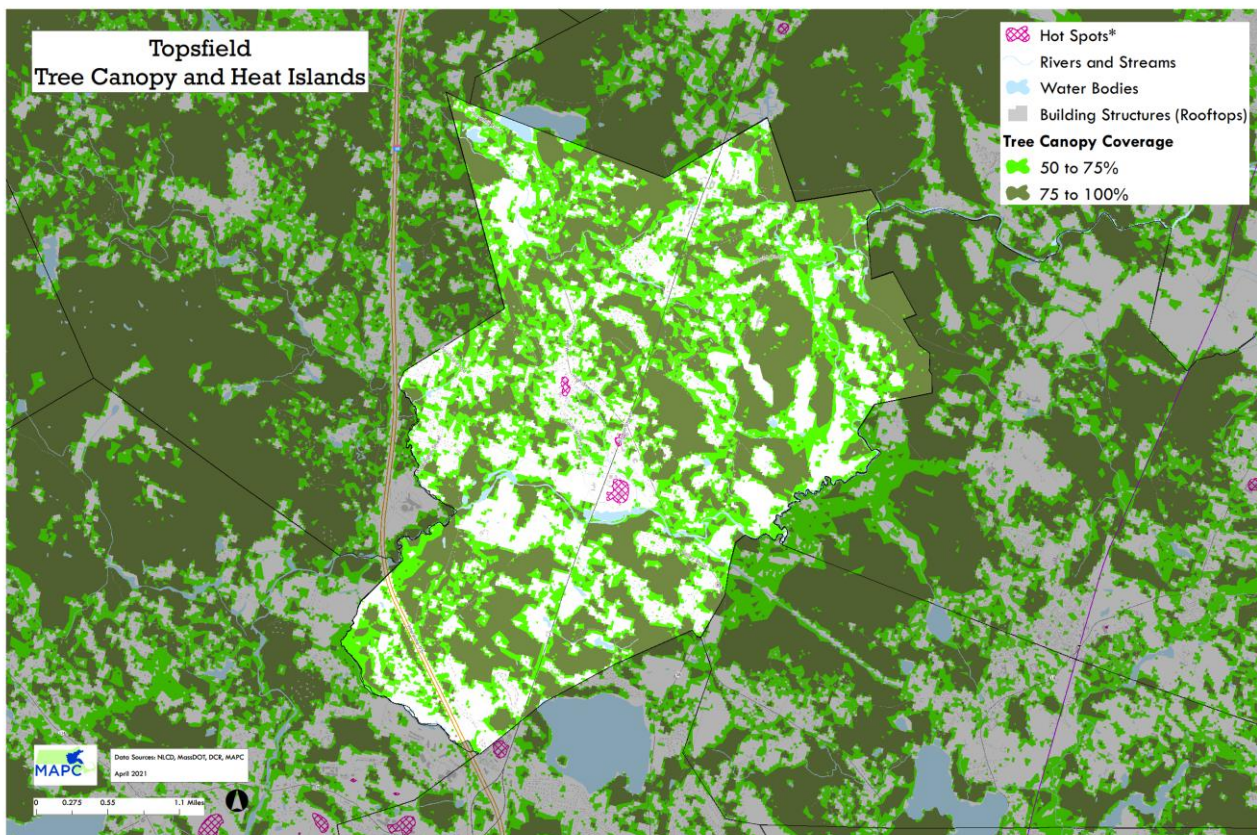
People who primarily work outside, such as parcel delivery people, construction workers, or landscapers, may be at added risk from extra exposure to high heat and poor air quality.

## Environmental

Among the Town's greatest assets are its protected open space and wetlands, and its significant forest cover (see Figure 6), which at about 56 percent, is one of the highest in the MAPC region.

However, the large number of trees is both an asset and a potential vulnerability to hazards such as wind, ice, invasive species, and wildfire. A major concern for Topsfield is managing the town's trees to reduce power outages and mitigating the impacts of climate change on the health and composition of the Town's forests.

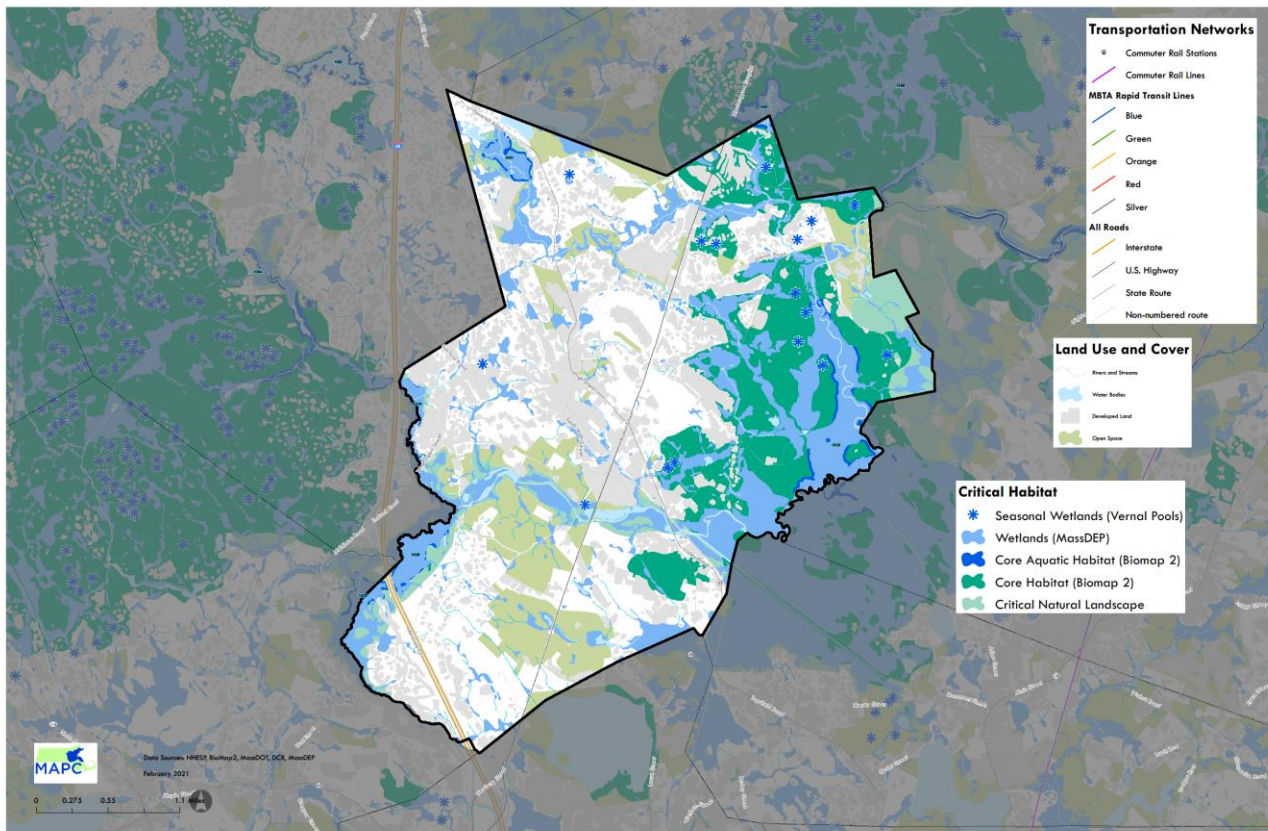
**Figure 6: Topsfield Tree Canopy Cover**



The Town of Topsfield is located in the Ipswich River watershed, just a few miles upstream from the mouth of the river in the Town of Ipswich. The southern part of Topsfield straddles both sides of the Ipswich River, while the river forms part of the eastern border of the town. This section of the Ipswich River includes significant regional open space, including the Ipswich River Wildlife Sanctuary, Bradley Palmer State Park, and Willowdale State Forest.

Topsfield has significant areas of high value aquatic habitat. The state's Biomap 2 identifies Core Habitat, Core Aquatic Habitat, and Critical Natural Landscape areas, particularly in the eastern part of Topsfield near the Ipswich River and its floodplains (Figure 7).

**Figure 7 Topsfield Freshwater and Aquatic Habitat Resources**



## Impacts of Climate Change

Projected future climate trends pose a significant challenge to the Town of Topsfield. Increasing temperatures will bring an increase in the annual number of days over 90 degrees, which will vary depending on future Greenhouse Gas emissions. From about 10 days per year currently, projections range from 25 to 60 days per year by 2100 (Figure 8). The average temperature by 2100 is projected to increase by a range of 3 to 7 degrees Fahrenheit. The resulting temperature regime by the end of the 21<sup>st</sup> century would make the Massachusetts climate equivalent to today's climate in Virginia under the lower GHG emission scenario, and similar to the Carolinas if higher GHG emissions continue to the end of this century (Figure 9).



Figure 8: MA Temperature Projections

## Higher Temperatures

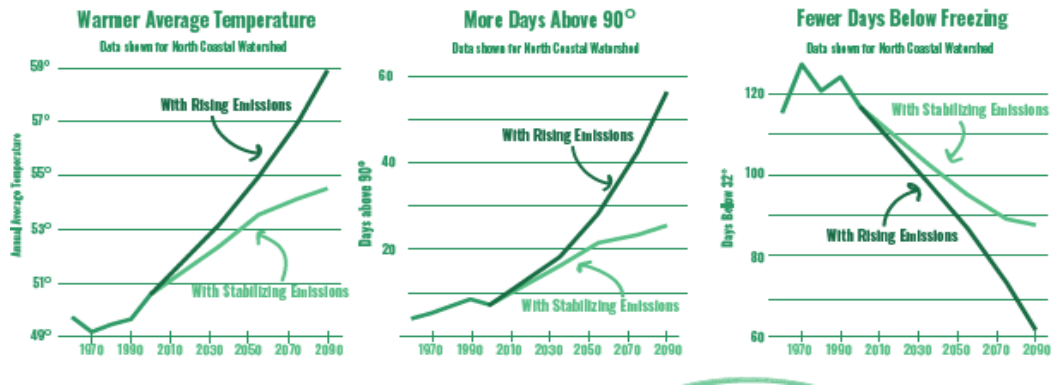


Figure 9: MA Future Heat Scenario

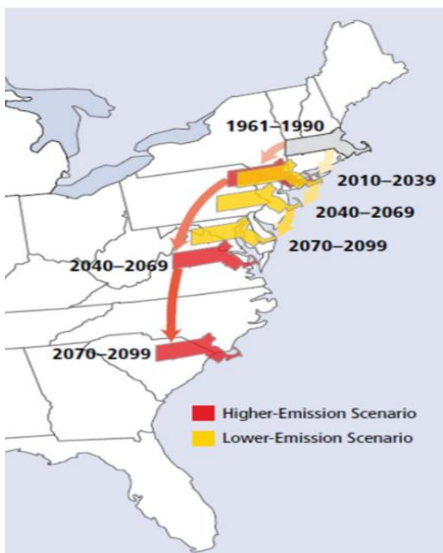
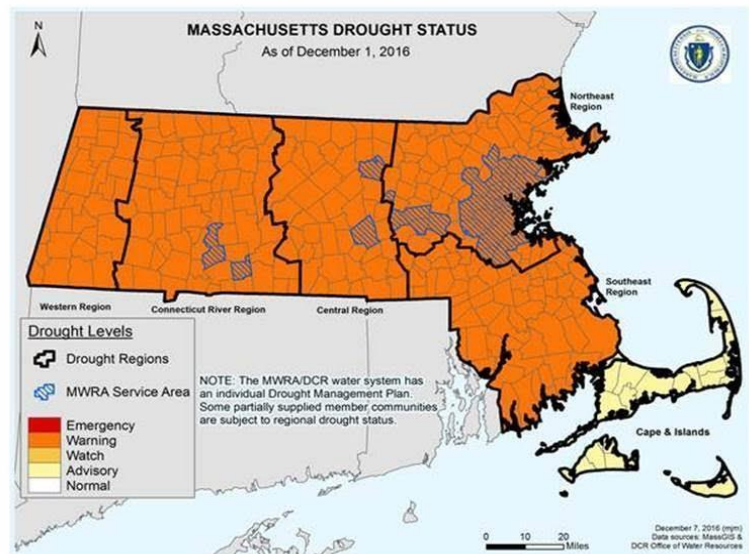


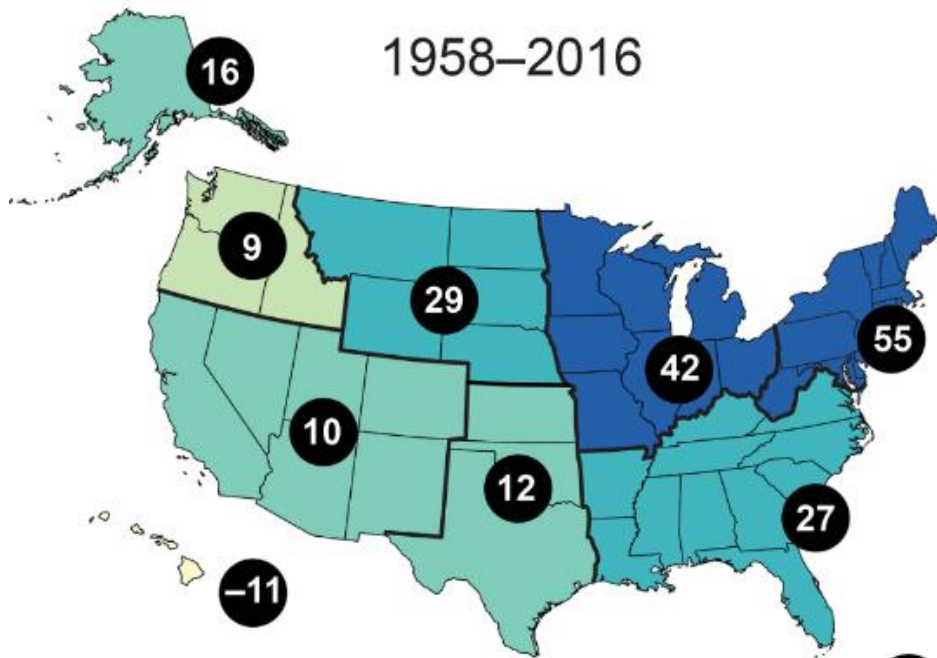
Figure 10: MA Drought of 2016



Climate change also brings changes in precipitation patterns, likely bringing more extremes, from drought to intense rainfall. In 2016 Massachusetts experience the most significant drought since the early 1980's (Figure 10), which was followed by another moderate drought in 2020.

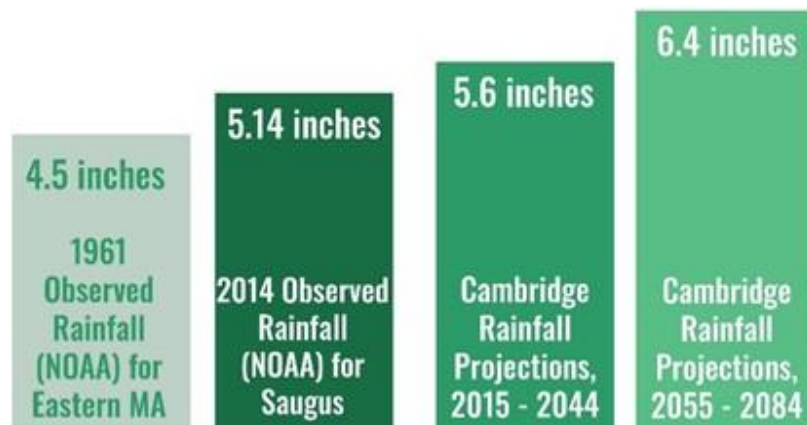
At the other end of the precipitation spectrum, intense rainfall events are becoming more frequent. From 1958 to 2016, the northeast and mid-west regions of the U.S. experienced a 55% increase in the amount of rain that falls in the top 1% events (Figure 11).

### Figure 11: Increase in Intense Precipitation, 19458-2016



Future projections are for this trend in increased intensity of storms to continue through this century. The typical 10-year 24-hour storm, which historically yielded 4.5 inches of rainfall before the 1960s, has already increase by 0.6 inches to 5.14 inches, and could increase to 6.4 inches by the end of the century, according to projections prepared by the City of Cambridge for Eastern Massachusetts (Figure 12). This is considered to be the “design storm,” or the bench-mark storm used to determine the design and size of many stormwater management facilities installed on development sites as well as public infrastructure. Facilities designed to accommodate yesterday’s intense storms, or even today’s, will likely be inadequate in future decades according to the climate projections.

### Figure 12: Projected 10-Year, 24 Hour Storms



## 5 TOPSFIELD CRB WORKSHOP RESULTS

The Topsfield Community Resilience Building Workshop on April 14, 2021 was attended by 30 participants representing various town boards, commissions, and staff, as well as community stakeholders from a wide range of interests. The participants worked in three smaller breakout groups of about ten each, to first identify the town's strengths and weaknesses with respect to the impacts of climate change. In a second session, the breakout groups developed proposed actions to address the Town's vulnerabilities and strengthen the Town's resilience.

Because of the need to hold the CRB workshop remotely by Zoom during the Coronavirus pandemic, the Town took several steps to address the limitations of this format as compared to an in-person event, which is how the CRB program was originally designed by the Nature Conservancy. First, to save time in the workshop, a package of introductory materials was sent to participants before the day of the workshop to familiarize them with some of the climate trends. This is included in Appendix G.

In addition, a post-workshop online survey was conducted to allow participants to prioritize the top climate resilience actions identified by the workshop breakout groups. Results of this survey are found in Appendix F.

### CURRENT TOPSFIELD STRENGTHS AND ASSETS

Workshop participants identified numerous Topsfield strengths and assets that will provide resilience to future climate impacts. As shown below, the workshop identified the Town's many diverse strengths include its large amount of forest cover, wetlands, and open space, strong local organizations (Council on Aging, Fire Department, churches, etc.), local farms, and senior housing. The full list of identified strengths and assets follows:

#### Infrastructure Strengths

##### Red Group

- Building out fiber network - that's a strength, but need Phase II for redundancy
- Aggressive tree management is done, but power outages from trees is a concern

##### White Group

- The Rail Trail; due to flooding it can get shut down.. 3.9 ml in length; it is a public way.
- Other Trails (Connected to Open Space) Recreational resources--they can flood and have culverts associated. Wildfires are also an issue
- Two Elementary Schools are used as evacuation points
- Water treatment plants
- Fire and rescue team and Police Dept ability to work together with others. They are thinking ahead.
- Wildfire program that the town has helps owners with known risk to wildfire.
- Dams have been updated/redone a few years ago

##### Blue Group



- Senior Center has information for residents, but needs to add emergency contacts
- Fire Dept on Rt. 97; Police on Rt. 1 (north of the river) - could access stations; Police Dept. has a generator
- Town library used to flood frequently (old part of building, but work done to mitigate issue); has a generator
- DPW has three generators - pumping station, garage, and treatment plant (plant is new and on high ground)
- Stormwater management plan (2018); culvert replacement and maintenance
- Stormwater and erosion control bylaw recently updated; floodplain bylaw; water protection district; low-impact development
- Cell towers (physical vulnerability and coverage); one main tower by DPW with multiple carriers

## Social Strengths

### RED Group

- COA, food pantry, volunteer network - the town does an excellent job caring for those in need
- Regional dispatch - use disability forms - all town staff encourage use. Regional dispatch provides tremendous services -provided by the commonwealth (multiple professional dispatchers)
- Public Health preparedness booklets - available for outreach - meant to be used in small groups - extensive resources/needs to be used. People need to prepare
- NE Mass Medical reserve corps
- Terrific police and fire leadership/first responders are proactive
- Swift Reach
- Group homes sheltered living. Typically, don't use town resources. Are well managed. In an emergency, will staff be available?
- Individuals requiring assistance - may not have need supports in an emergency. Have database of supports (COIN)

### White Group

- Swift Reach system and Town Facebook page for public notifications
- Churches are very much working to keep people informed using communication tree style of connecting.
- Council on Aging is a key organization in town.
- Ipswich Water Association Educational Approach might be able to help with some the resilience actions.
- Cable Television used for education about the MVP program and climate change. Public Access can also be used for communication.
- Economic Community Development Committee is looking to see how it can make Topsfield more attractive for business. Environmental or Climate resources on the website would help educate folks

### Blue Group

- Warming shelter and cooling stations; Boxford regional high school was a shelter - need to check if still applicable; what happens when school is in session?

- Long-term nursing facilities; group homes/special needs schools (Topsfield Educational Consortium on Rt. 1 and Nike Village)
- Private pre-schools (Trinity, Joyful Noises - they have emergency plans prepared with Fire Dept.
- Senior housing - Housing Authority (Little Brook Village) and Washington
- Over-55 private, higher end housing projects
- Food pantry at Trinity Church run by volunteers; limited hours
- BOH emergency preparedness handbook (important contact info, supply kits, medical and utility info, safety plans)
- Northern Essex Medical Reserve Corp. - assists in emergencies, supply distribution during pandemic - 14 municipalities
- Churches - help with outreach and some have kitchens and/or AC, but not full emergency shelter
- Fire Dept does training for water rescue on the Ipswich River

## Environment Strengths

### Red Group

- Amount of protected land and trees - no heat islands, provides stormwater management
- A lot of protected land in the floodplain (MA Audubon/Essex Green Belt/Town) creates a lot of flood storage capacity
- Recreational spaces: Hoods Pond, rail trail, , soccer and baseball fields (capped landfills - also must be maintained)
- Recreational trail system - reservations, Greenbelt , gets people in nature - also awareness of climate issues
- Working farmland - provides food system resilience . Can have water quality and water use impacts
- Ipswich River - enormous asset as a wetland system and flood storage. very vulnerable to drought, experienced no flow. Upstream water withdrawals are the primary issue for no flow. Also, a resource for recreation.
- State parks - don't follow local building code - Town has a good relationship (hydrants, sprinkling buildings)

### White Group

- Shaded open space in the area is something the town has due to tree coverage. An asset during heat waves.
- Open space and trails. Great for public health, shade, wildlife.
- Path near town cemetery has great shade

### Blue Group

- Lots of wetlands; Ipswich tributaries
- Scenic Road Bylaw - replacement required if one is removed
- Agricultural land - irrigation and farm ponds impacted by drought
- Willowdale and Bradley Palmer State Parks - multi-use open space and recreational resource
- New water treatment facility

- Surface water addressed in stormwater management plan; low dissolved oxygen and high e-coli

## TOP RECOMMENDATIONS TO IMPROVE RESILIENCE

Each of the three workshop breakout groups developed proposed climate resilience actions and prioritized them as High, Medium, or Low. Each group then selected what they considered their five highest priority actions and shared them with the entire workshop. These were recorded by the facilitators on a “Jam Board” digital display that all participants could see (Appendix B).

Following the virtual workshop, the list of priority actions from the three breakout groups was posted online in a Qualtrics survey, and workshop participants were invited to vote on their top three preferred actions. The results of this prioritization of actions are summarized below, showing how many votes each action received in the online survey, and what percentage of the respondents voted for each action.

A review of the final participant voting reveals three actions that garnered significant support from over 40 percent of participants. These included addressing the impacts of intense winds on power lines, developing a watershed solution to water withdrawal issues in the Ipswich River, and addressing flooding issues in the Ipswich River watershed. Two other actions received moderately high support from 38 percent of respondents, including addressing stormwater infrastructure and conducting a housing inventory and a master plan to create zoning that allows people to age in town in appropriate manageable housing. All of the actions identified as high priority by the three breakout groups are listed below in order of the number of votes they received in the online survey. The full list of all actions identified by the workshop at every priority level is shown in the following section.

Category	Resilience Action	Votes	Percent
Infrastructure	Address impacts of intense winds on powerlines, including tree maintenance (dead and diseased) and pole replacement and maintenance. Prepare the tree canopy for increased pests or other new hazards. Look into tree inventory, emphasize native species.	11	52
Environmental	Work with state and federal officials to find a watershed wide solution to Ipswich River water withdrawal issues	10	48
Infrastructure	Tackle Ipswich River flooding issues. Road elevations and culverts need to be addressed as a system. Identified areas include Route 1, Salem Rd., Rowley Bridge Rd., East St., Pond St. Wildes Rd. Need to find solutions to flooding caused by beavers.	9	43

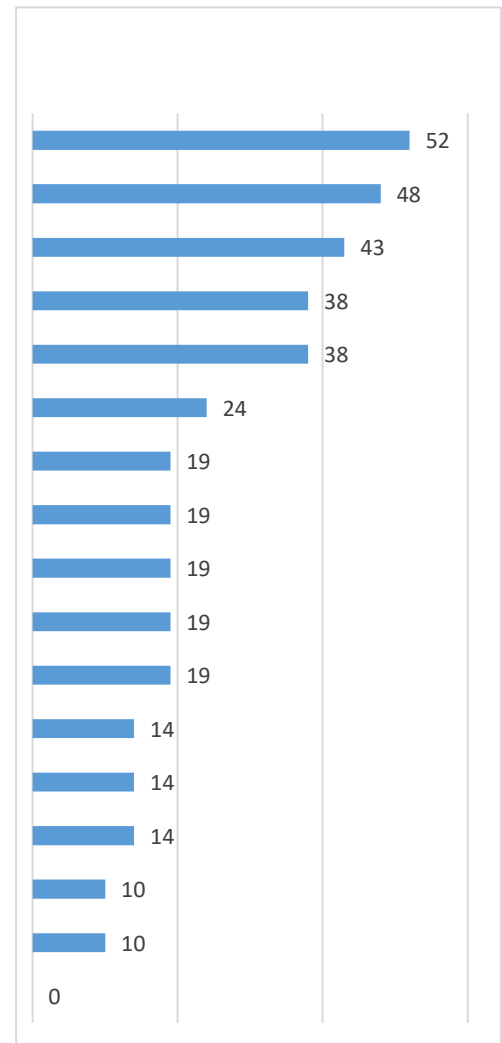
Category	Resilience Action	Votes	Percent
Infrastructure	Storm Water Drainage/Infrastructure: some places don't have stormwater drainage systems. A town-wide drainage model would be beneficial. Look at the design and make sure that it keeps in mind the new reality of increased rainfall. Conservation Commission and Planning Board should also look into the design.	8	38
Societal	Do a housing inventory study and a master plan to create zoning that allows people to age in town in appropriate manageable housing. This could also help address issues of isolation.	8	38
Infrastructure	Consider sewage treatment. Septic systems are increasingly subject to flooding and high groundwater levels.	5	24
Infrastructure	Address flooding on Bridge Road , Rowley Bridge Road, Ipswich and River Road, Washington Street. Look into Improving drainage, and Nature-based solutions. Bridge replacement might be needed.	4	19
Infrastructure	Develop another water source for the town, outside of the Ipswich River watershed	4	19
Infrastructure	Inspect water towers and identify what repairs are needed and how to fund those repairs	4	19
Societal	Expand the existing program and database that identifies vulnerable citizens and how best to provide services in case of emergencies.	4	19
Environmental	Target land purchases for flood storage and other ecosystem services	4	19
Infrastructure	Address drainage concerns along the rail trail to prevent septic issues and harm of flooding in the area. Abutting residential properties experience septic system flooding.	3	14
Societal	A communication Plan is needed for emergency communication; redesigning the town website	3	14

Category	Resilience Action	Votes	Percent
Environmental	Conduct an assessment of the trees across the town, particularly along major roadways, and develop a plan to identify weak trees and replace them. This is a program to be implemented by both the Town and National Grid.	3	14
Societal	Address the needs of Low-income seniors in town, and those who come into town for work, who can be impacted first and worst when there is a climate emergency. Education campaign--establish a stakeholder group/focus group with people connected to these Environmental Justice communities, and blogs for these specific groups.	2	10
Societal	Since the town does not have any full-service shelters, locations should be identified, and plans developed to establish such shelters.	2	10
Infrastructure	Conduct an assessment of the generators in town facilities and identify which ones need to be replaced.	0	0



**Figure 13 Summary of Top Priority Acton Prioritization**

<b>Address impacts of intense winds on powerlines,</b>
<b>Find a watershed solution to Ipswich River withdrawal issues</b>
<b>Tackle Ipswich River flooding issues</b>
<b>Storm Water Drainage/Infrastructure improvements</b>
<b>Housing inventory study and master plan for aging in place.</b>
<b>Consider sewage treatment.</b>
<b>Address flooding on Bridge Road , Rowley Bridge Road, etc.</b>
<b>Develop a water source outside the Ipswich River watershed</b>
<b>Inspect water towers and identify repairs needed</b>
<b>Expand program &amp; database that identifies vulnerable citizens</b>
<b>Target land purchases for flood storage</b>
<b>Address drainage concerns along the rail trail.</b>
<b>A communication Plan is needed</b>
<b>Conduct an assessment of the trees</b>
<b>Address the needs of Low-income seniors and workers.</b>
<b>Identify locations and establish shelters.</b>
<b>Conduct an assessment of the generators in town facilities</b>



## 6 SUMMARY OF ALL ACTIONS BY PRIORITY

All actions developed by the Topsfield Community Resilience Building Workshop are listed here, organized by priority and category (Infrastructure, Society, and Environment):

### HIGH PRIORITY ACTIONS

#### Infrastructure

- 1) Assess status of flooding options, re-engineering, elevating roadways. Then bridges become the choke point. The whole system needs to be examined. Salem Road flooding is mostly north of the bridge. Rowley Bridge Road floods on either side of the bridge.
- 2) East St. culvert is undersized - but then need to address downstream impacts. (Beaver deceiver helps)
- 3) Follow MA DOT monitoring. Salem Rd. bridge - aging issue.
- 4) Purchase generator for Town Hall
- 5) Staffing of Police and Fire, but budget is the issue, possibly find a strategy for outside aid
- 6) Consider options for beaver management; no easy solution, consider trapping
- 7) Capital funding needed for aging Fire and Police stations; will need replacement
- 8) Consider installing sewer treatment
- 9) Make sure the culverts are adequately cleaned. Water should be able to drain from the sides of the trails. Adding / maintaining drainage to the rail trail would help with providing utility truck access in times of emergency.
- 10) Have the committee look at the design of storm water drainage infrastructure and make sure that it keeps in mind the new reality of flooding in the area. Is increased stormwater designed into the system? Conservation Commission and Planning Board should also look into the design. Town wide drainage model is something that would be beneficial.
- 11) Address impacts of intense winds on powerlines. Connect with tree warden on this topic. Tree Maintenance (dead and diseased) and Pole replacement and maintenance. Preparing the tree canopy for increased pest or another new hazard. Look into tree inventory . Emphasize native species
- 12) Address flooding on Bridge Road , Rowley Bridge Road, Ipswich and River Road, Washington Street. Look into Improving drainage, bridge replacement might be needed. Nature based solutions might work or help.
- 13) Find another water sources outside the Ipswich River watershed. Other Communities are also looking into this. Improve resilience with water, looking at regional plan and grants to see how these towns can come together to get another water source. Massachusetts Water Resources Authority has a role to play.
- 14) Inspection of water towers - at least one (Boston St.) has cracks; looking for money to repair
- 15) Tree mitigation (tree warden does not have a big budget); drought weakens trees
- 16) Tree mitigation needed for Route 97(maintain access to Beverly Hospital)

- 17) Tree mitigation - ongoing program; upgraded poles and lines; annual pole inspection and replacement
- 18) Replace generator at Town Hall (to be done this year)

## **Societal**

- 1) Sign up more people for Swift Reach
- 2) Tri-town Council is a good resource for mental health needs - work with them to identify gaps in service and help. But they may be oversubscribed. Look for additional resources.
- 3) Communication Plan and coordinating communication is needed by the town.
- 4) Departments are looking to centralize information online and town needs to look how things can be improved and maintained online for the public. The user should have a say on the design.
- 5) How are different departments and organizations communicating in town? How does the public access information online? Help people find things online in centralized and easy way. The MVP and Emergency Plan need to talk to each other.
- 6) Need to identify locations to develop shelters.

## **Environment**

- 1) More land worthy of protection that would provide flood protection, heat benefits. Need to balance with other land acquisition needs.
- 2) Ipswich River: Work with state and federal leaders to identify solutions; water withdrawal is an enormous regional issue. Town can look at what kind of local water use regulations they may want to revise.
- 3) Identify trees that need care. Building code enforcement. If things are not built correctly when trees go down they can do lots of damage. Research is needed, looking at local bylaws for the highlight of trees.
- 4) Have the Board of Health look at the problems people have with use of chemicals/fertilizers.
- 5) Adopt a hive program
- 6) Find a new water source that is outside the Ipswich River basin.

## **MEDIUM PRIORITY ACTIONS**

### **Infrastructure**

- 1) St. Rose church is identified as a shelter but does not have sprinkler or generator. Consider upgrades or find another location.
- 2) Seek grant funding for a fiber optic Phase 2 loop for redundancy

- 3) Tree management to prevent power outages: good relationship with National Grid, doing good work, always more needed. Put utilities underground; consider for new or replacement work
- 4) Seek funding for treatment of PFAS contaminants
- 5) Trails-drainage and wildfire issues. We need to make sure the culverts are adequately cleaned. Water should be able to drain from the sides of the trails. Mass Audubon has 12 miles. The many owners make it hard to have integrated planning and actions. Maps might be an option for update to help with wildfire
- 6) Look at inter building communications systems (look at Steward and Proctor). What are we using when we need to communicate with the town? Swift reach system and Facebook System.
- 7) Connect with Verizon to confirm how they plan to deal with emergency at their Main Hub Central Building .
- 8) Protection of town wells from flooding (beavers and climate-related)
- 9) Continue to monitor bridges over Ipswich River; some issues may arise soon (stone bridge on Perkins Rd)
- 10) Request emergency contact information for seniors
- 11) Clarify how and where to sign-up for Swift Reach on cell phones
- 12) Ongoing stormwater management - some improvements being funded; keeping up but could use more resources
- 13) Review bylaws and regulations on a regular basis (stormwater, erosion control, floodplain bylaw, water protection district, low impact development)

## Societal

- 1) Advertise Regional Dispatch services more
- 2) Update Public Health booklet/work with community on using the preparedness booklet/ put together outreach program
- 3) Encourage community integration, reach out to ensure emergency planning is in place
- 4) Reestablish the COIN program for support of vulnerable populations
- 5) Board of Health has a role to play in addressing Lyme Disease and other diseases.
- 6) Let more people know of the Swift Reach system and Town Facebook notifications
- 7) Educational and awareness campaign is needed on chemicals used for lawns and landscaping. Connecting with key landscaping employers and see if they have plan or process to keep workers safe from climate and chemicals might help with reducing use of chemicals in town. Consider education for this.
- 8) Public outreach and education around heat readiness and power outage readiness. Elderly folks started to look into home generators. Larger area generators might be better. Not a Red Cross community and should consider what other options the Town has if there is an emergency.
- 9) Helping the nursing and rehab facility become more resilient would not just benefit the facility, it would also help the rest of the community.

- 10) Public outreach and education needed on vulnerable workers, Environmental Justice issues
- 11) Connect with the schools as resource for addressing vulnerable populations, Environmental Justice communities
- 12) Education on enforcement of water use restrictions
- 13) Public Access Channels are going to be made available to people in town. Verizon and Comcast in the process at working out new licensing. Programing can be developed by the town too. It's a communication tool that can be better used.
- 14) Communication/Website update is happening now by the ECDC, and the town should think about how it can use it to educate and share information.
- 15) Key people will be needed to be assigned to maintain the website and share key information.
- 16) Warming shelter and cooling stations need to be publicized before emergencies; need to identify capacity for cooling stations/air conditioners; need MOU for using facilities in other communities; monitor usage.
- 17) Expand food pantry based upon need (confirm usage and ensure availability in emergency situations); Tri-town Council (Middleton, Boxford, and Topsfield) would know about food insecurity; meal programs continued when schools were shut down and opened to seniors as well

## Environment

- 1) Strengthen regulation that supports tree protection and vegetative buffers when lots are developed (planning regs)
- 2) Develop support for agriculture, activate agricultural commission - encourage a farmers' market. Develop ways to encourage environmentally sensitive practices
- 3) Focus on planting disturbed areas. Outreach on protective behaviors residents can take, and to avoid. Methods that aren't reliant on pesticides
- 4) Implement vegetated wooded buffers - outside of wetland jurisdiction
- 5) We need a better understanding of the percentage of different kinds of trees. Should we start replacing them now? We see insect life changing
- 6) Treatment that could be used in Hood Pond might help with invasive species. Pulling the plants might have also been used. Local coordination is need. See [FreindesofHoodPond.org](http://FreindesofHoodPond.org) to learn more.
- 7) Address icing of roads by improving the drainage. Perched water table that has groundwater comes through the road. Drainage issue is something to be addressed.
- 8) Drainage solutions need to be looked at more. Intercepting the water before the water hits the road. Looking at calcium chloride or other chemicals that might be better. Look at French drain systems. Sand has its own issues, and the town has stopped using sand due to wetland impacts.
- 9) Trail Maps that cover the entire town are needed. GIS maps are needed. Free trail maps are available, but it would be nice to have a centralized map. It would help encourage people to get out on the trails. Essex County Trail Association has a free map, but it might



need to be made easier to access. Town needs to look at mapping technology. Making trails more accessible for vulnerable members of the communities.

- 10) Green infrastructure might be able to help with playgrounds and parks during heat waves.
- 11) Public education is needed to get the community to understand impacts on the Ipswich River watershed.
- 12) Adopt a tree replacement policy and program (multiple species, native) and include it for landscaping plans required under site plan review
- 13) Pilot program for testing PFAS treatment; may require additional equipment for the facility (underway)

## **LOW PRIORITY ACTIONS**

### **Infrastructure**

- 1) Wildfire program might be something to look into bringing to the town. It's something that is used out west.
- 2) Investigate replacement of Low Pound Dam.
- 3) Town starting to replace Water Towers. Looking into relocation and enlarging. They are both on top of the highest hills in town. Fire hydrants need the water pressure also. They will be done in the next few years.
- 4) Emergency Plan for the Fairgrounds. Connect with CBO on this topic
- 5) Many people already have generators; town should map to identify areas of vulnerability impacting private wells and septic systems (flooding, drought, loss of electricity).

### **Societal**

- 1) Reduce the amount of lawns and change them to pollinator gardens and connecting them with educational programs. Mandating Composting, is that something Topsfield could do?
- 2) Education campaign on vulnerable low-income seniors and workers who come into town. Create a stakeholder group / focus group with people connected to these Environmental Justice communities; blogs for specific groups.
- 3) Education campaign on extreme heat for outdoor workers. Focus group with these workers to better understand them and the issue.

### **Environment**

- 1) Implement a forest management plan. Management of hazardous trees. Address forest fire, hazard trees. Can DCR be a resource in this regard?
- 2) Public education is needed around disposal of ashes and smoking materials. Prescribed fires to help with built up fuel in the woods. Access to key roads that are needed to get out into the woods needs to be investigated.

## 7 CRB WORKSHOP PARTICIPANTS

<b>Municipal Departments/Boards/Commissions</b>	
Heidi Gaffney	Conservation Commission Administrator
Kathleen Barbarisi	Council on Aging/Senior Services
Travis Good	Public Works
Jen Collins-Brown	Fire Department/Emergency Mgt Director
Capt. Conor Brown	Fire Department
Wendy Hansbury	Health Agent
Sheryl Knutsen	Health Board Chair
Joe Geller	Open Space Committee (& Rail Trail Comm.)
Donna Rich	Planning/Community Development
Greg Krom	Water Department
Neal Hovey	Police Department
<b>Key Community Stakeholders:</b>	
Jim MacDougall	Community volunteer, environmental expert
Rev. Martin Riekert	Congregational Church minister
Rev. Rebecca Homans Blair	Trinity Church, Interim Rector
Bill Whiting	Topsfield Historical Society
Norm Isler	Topsfield Historical Society
Christopher LaPointe	Essex County Greenbelt Association
Zilie Bhujou	GREEN Topsfield
Faith Hassel	National Grid
A. Taubert	Salem-Beverly Water Supply Board
Patrick Lynch	Ipswich River Watershed Association
Martha Sanders	Essex County Trail Association
<b>Business Leadership</b>	
Lynne Bermudez	Economic Community Development Committee
Tim Collins	Ebsco
Jim O'Brien	Topsfield Fair
<b>State and Federal Government</b>	
Michelle Rowden	MVP Regional Coordinator
Ruby Murphy	Rep. Brad Hill's office
Mary Deighan	District Director for Sen. Joan B. Lovely
Sen. Joan B. Lovely	Mass State Senate
Johanna Wakelin	Chief of Staff for Sen. Joan B. Lovely

## 8 TOPSFIELD MVP PROJECT TEAM

### Topsfield MVP Core Team

Jen Collins-Brown, EMT-P	Fire Chief, Emergency Management Director, Core Team Leader
David Bond	Former Highway Superintendent
Heidi Gaffney	Conservation Agent
Wendy Hansbury	Health Agent
Greg Krom	Water Superintendent
Jim MacDougall	Environmental expert, Resident member of many boards
Martha Morrison	Zoning and Planning Board

### MAPC Facilitation Team

Anne Herbst	Principal Environmental Planner
Jennifer Kaplan	Economic Development Planner II
Martin Pillsbury	Environmental Planning Director, Project Manager
Ralph Willmer	Principal Land Use Planner

## CITATION

Metropolitan Area Planning Council. 2021. Town of Topsfield Municipal Vulnerability Preparedness Program. *Community Resilience Building Workshop: Summary of Findings*. Topsfield, Massachusetts

## APPENDIX A: TOP PRIORITY ACTIONS

HIGHEST PRIORITY ACTIONS FROM THE WORKSHOP	VOTES
1. <b>Address impacts of intense winds on powerlines</b> , including tree maintenance (dead and diseased) and pole replacement and maintenance. Prepare the tree canopy for increased pests or other new hazards. Look into tree inventory, emphasize native species.	<b>11</b>
2. <b>Tackle Ipswich River flooding issues.</b> Work with state and federal officials to find a <b>watershed wide solution to Ipswich River water withdrawal issues</b>	<b>10</b>
3. <b>Road elevations and culverts need to be addressed as a system.</b> Identified areas include Rt. 1, Salem Rd., Rowley Bridge Rd., East St., Pond St. Wildes Rd. Need to find solutions to flooding caused by beavers.	<b>9</b>
4. <b>Storm Water Drainage/Infrastructure:</b> some places don't have stormwater drainage systems. A town-wide drainage model would be beneficial. Look at the design and make sure that it keeps in mind the new reality of increased rainfall. Conservation Commission and Planning Board should also look into the design.	<b>8</b>
5.	

6.	
5. <b>Do a housing inventory study and a master plan</b> to create zoning that allows people to age in town in appropriate manageable housing. This could also help address issues of isolation.	8
6. <b>Consider sewage treatment.</b> Septic systems are increasingly subject to flooding and high groundwater levels.	5
7. <b>Address flooding on Bridge Road , Rowley Bridge Road, Ipswich and River Road, Washington Street.</b> Look into Improving drainage, and Nature-based solutions. Bridge replacement might be needed.	4
8. <b>Develop another water source</b> for the town, outside of the Ipswich River watershed	4
9. <b>Inspect water towers</b> and identify what repairs are needed and how to fund those repairs	4
10. <b>Expand the existing program and database that identifies vulnerable citizens</b> and how best to provide services in case of emergencies.	4
11. <b>Target land purchases for flood storage</b> and other ecosystem services	4



12. <b>Address drainage concerns along the rail trail</b> to prevent septic issues and harm of flooding in the area. Abutting residential properties experience septic system flooding.	<b>3</b>
13. <b>A communication plan</b> is needed for emergency communication; redesigning the town website	<b>3</b>
14. <b>Conduct an assessment of the trees</b> across the town, particularly along major roadways, and develop a plan to identify weak trees and replace them. This is a program to be implemented by both the Town and National Grid.	<b>3</b>
15. <b>Address the needs of Low-income seniors</b> in town, and those who come into town for work, who can be impacted first and worst when there is a climate emergency. education campaign. Establish a stakeholder group/focus group with people connected to these Environmental Justice communities, and blogs for these specific groups.	<b>2</b>
16. Since the town does not have any full-service shelters, <b>locations should be identified, and plans developed to establish such shelters.</b>	<b>2</b>
17. <b>Conduct an assessment of the generators</b> in town facilities and identify which ones need to be replaced.	<b>0</b>

## APPENDIX B –JAM BOARD POSTINGS OF BREAKOUT GROUP PRIORITY ACTIONS

### Breakout Group #1 Highest Priority Actions from the Workshop

#### RED GROUP (#1)

Consider sewage treatment. Septic systems are increasingly subject to flooding and high groundwater levels.

Work with state and federal officials to find a watershed wide solution to Ipswich River water withdrawal issues

Do a housing inventory study and then a master plan to create zoning that allow people to age in town in appropriate managable housing. This could also help address issues of isolation.

flooding issues. Road elevations and culverts need to be addresses as a system. Identified areas include: Rt. 1, Salem Rd., Rowley Bridge Rd., East St., Pond St. Wildes Rd. Need to find solutions to flooding caused by

Target land purchases for flood storage and other ecosystem services

## Breakout Group #2

### Highest Priority Actions from the Workshop

#### WHITE GROUP (#2)

Address drainage concerns along the rail trail to prevent septic issues and harm on flooding in the area. Abutting residential properties septic flooding.

Another water source is needed (outside of the basin)...

Powerlines and Substation (National Grid) for access for repair and due to impacts of the intense winds.

The highways (Rt 95, 1, 97)... During Mother Day Flood you had to go north first

Bridge Road , Rowley Bridge Road, Ipswich and River Road, Washington Street (Roads the flood in town)

A communication Plan is needed for emergency communication.. Redesigning the town website

Storm Water Drainage / Infrastructure... Some places don't have any stormwater drainage systems. A Committee is focused on the toipc and comes up with plans.

Low-income seniors in town are high... and those who come into town for work They can be impacted first and worst when there is a climate emergency.

## **Breakout Group #3**

### **Highest Priority Actions from the Workshop**

#### **BLUE GROUP (#3)**

**Inspect water towers and identify what repairs are needed and how to fund those repairs**

**Conduct an assessment of the trees across the town, particularly along major roadways, and develop a plan to identify weak trees and replace them. This is a program to be implemented by both the Town and National Grid.**

**Conduct an assessment of the generators in town facilities and identify which ones need to be replaced.**








**Since the town does not have any full service shelters, locations should be identified and plans developed to establish such shelters.**

**Expand existing program and database that identifies vulnerable citizens and how best to provide services in case of emergencies.**

## APPENDIX C –TOPSFIELD WORKSHOP MAP

**TOPSFIELD**  
Critical Infrastructure

## Type of Critical Facility

-  Schools (PK - High School)
-  Nursing Home
-  Dams
-  Police Stations
-  Fire Stations
-  Town Halls
-  Libraries

## Hazards

- Hot Spots\*  
A: 1% Annual Chance of Flooding  
X: 0.2% Annual Chance of Flooding

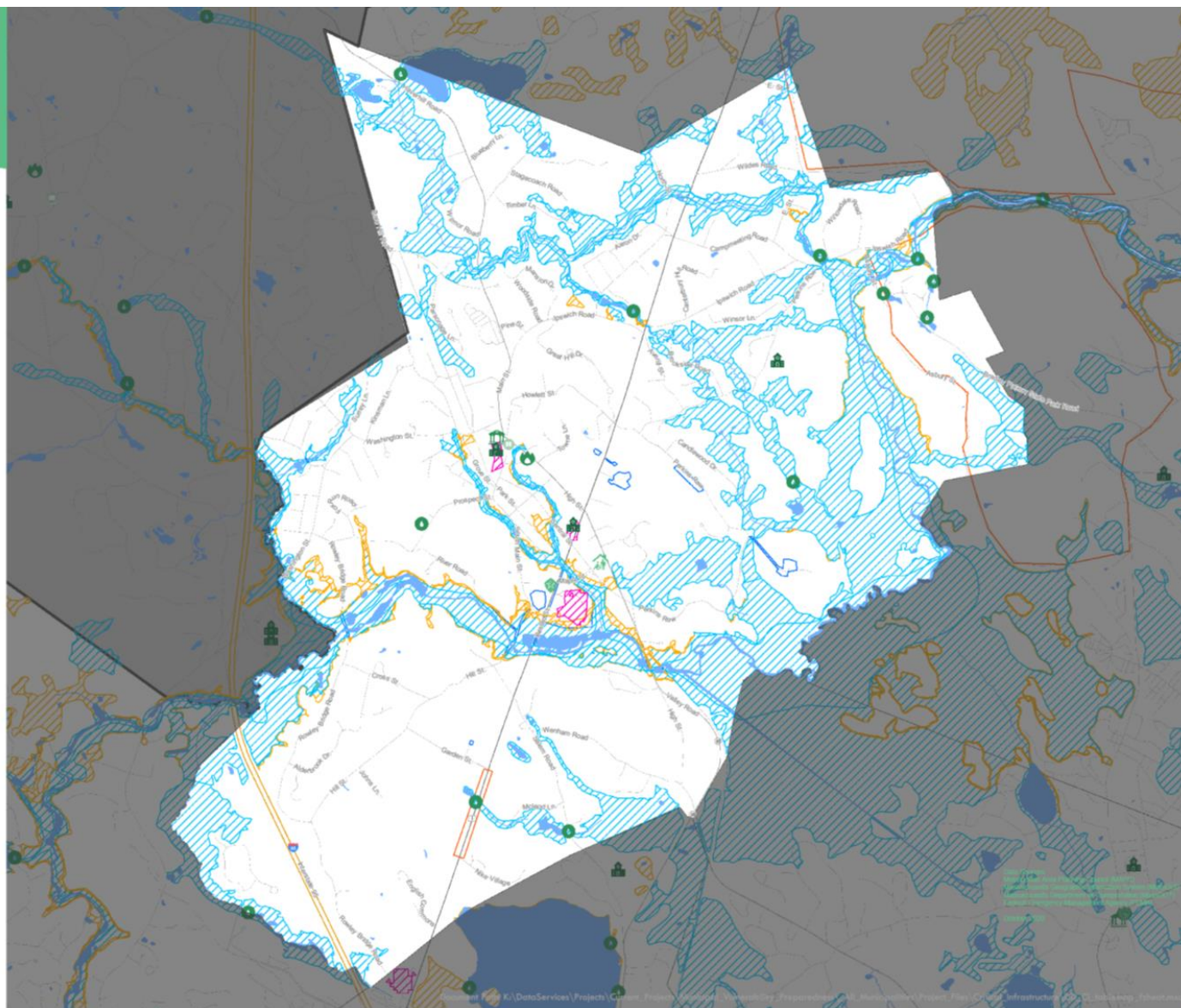
### Locally Identified Hazard Areas

- Brush Fire
- Flooding

\*Hot Spots are areas identified by MAPC as the hottest 5% of land area in the MAPC region. Data from 2016.

## Other Features

- Rivers and Streams
- Water Bodies







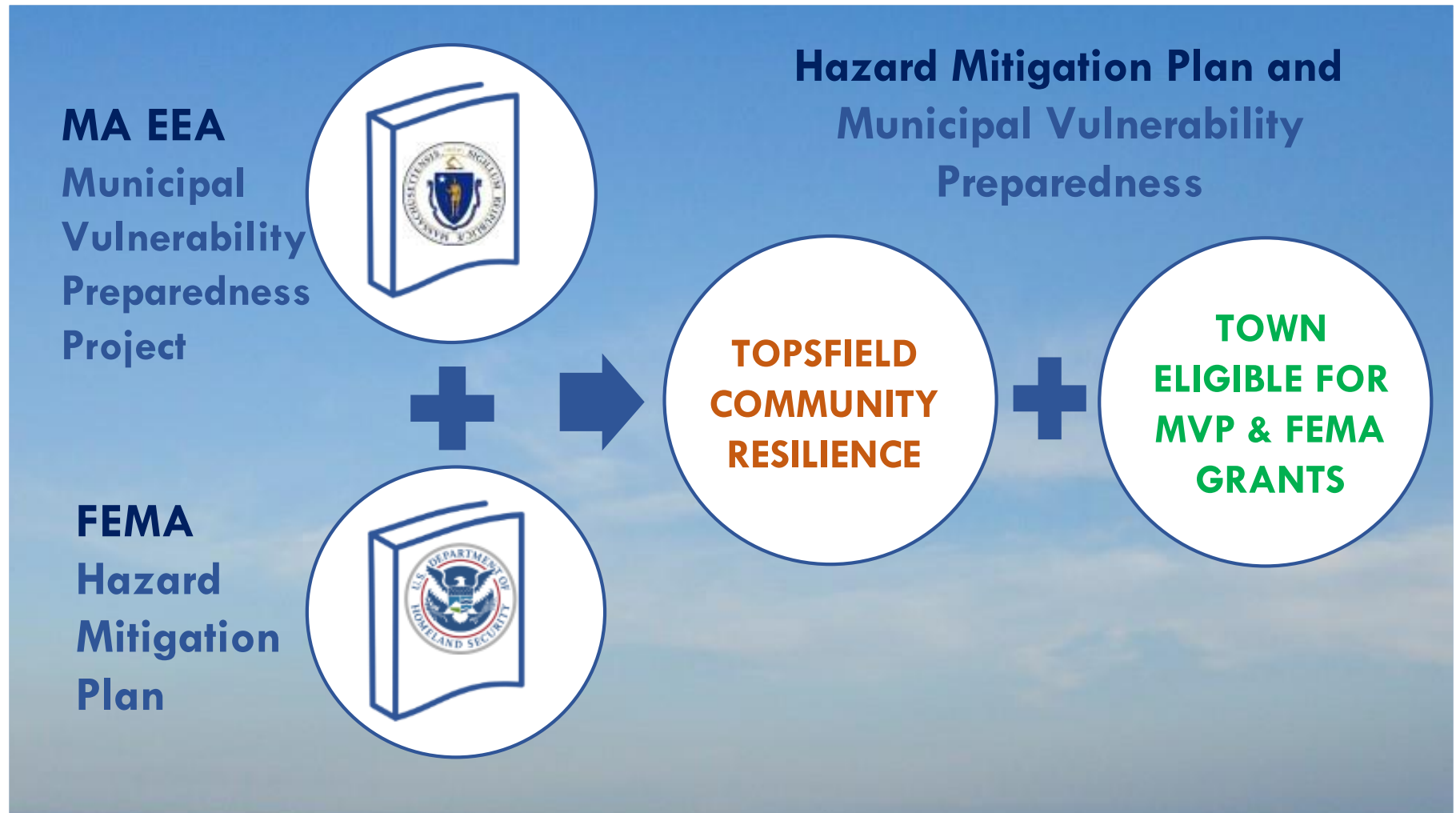
# Municipal Vulnerability Preparedness

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Town of Topsfield, April 14, 2021



## MVP Workshop PowerPoint





## MVP Workshop PowerPoint



### Commonwealth of Massachusetts

Executive Office of Energy and Environmental Affairs

Municipal Vulnerability Preparedness Program  
State Service-Provide Training

#### Workshop Objectives

- Understand extreme weather and climate related hazards
- Identify existing and future vulnerabilities and strengths
- Develop and prioritize opportunities to take action to reduce risk and build resilience

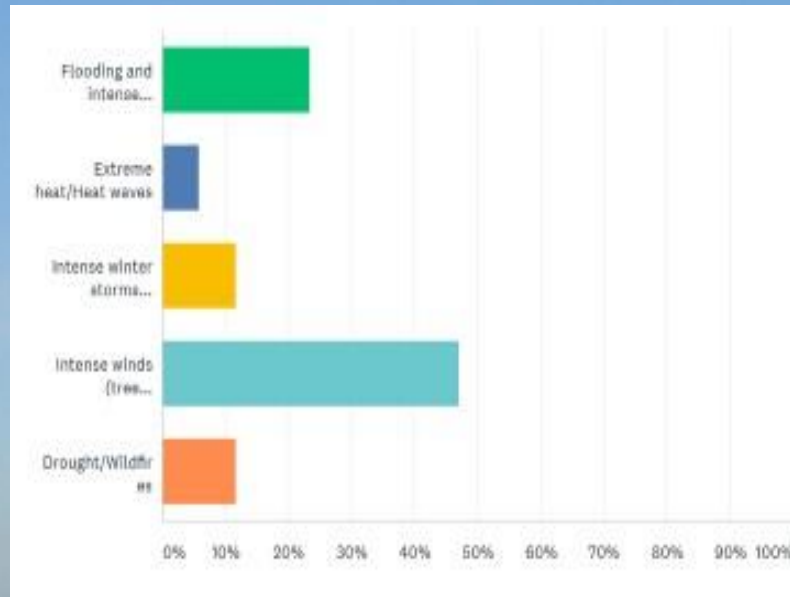
## MVP Workshop PowerPoint

# Agenda For the Day

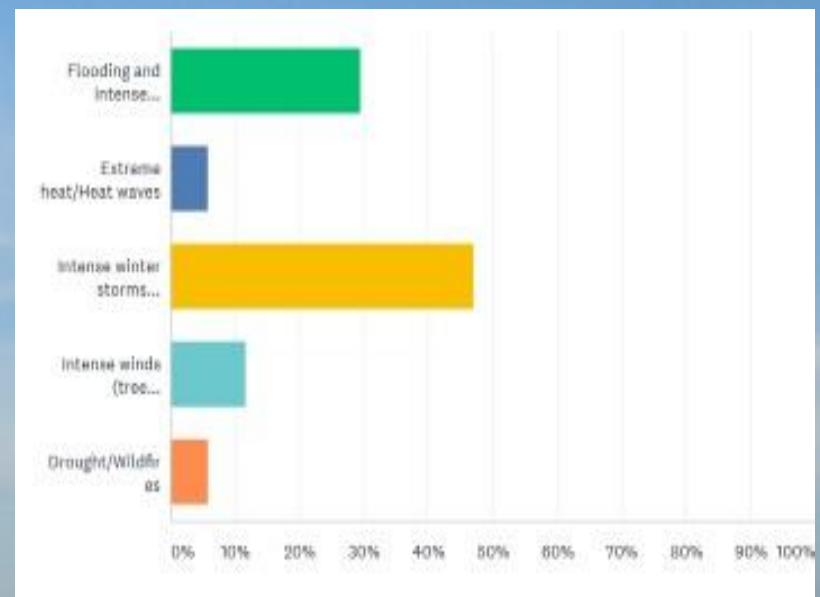
TIME	ACTIVITIES & OBJECTIVES	WHO
12:15	Registration and Welcome (Sign-in to Zoom meeting)	All Participants
12:30 (30 min)	Welcome and Introduction to MVP Workshop process <i>Focus on Infrastructure, Society, and Natural Resources</i>	MAPC Facilitator
1:00 (1 hour)	<u>Small Group Exercise #1 – Infrastructure:</u> Identify Vulnerabilities and Strengths and Actions	Small Groups with MAPC Facilitators
2:00 (1 hour)	<u>Small Group Exercise #2 – Society</u> Identify Vulnerabilities and Strengths and Actions	Small Groups with MAPC Facilitators
3:00 (15 min)	Break	
3:15 (1 hour)	<u>Small Group Exercise #3 – Environment:</u> Identify Vulnerabilities and Strengths and Actions	Small Groups with MAPC Facilitators
4:15 (20 min)	<u>Small Group Exercise #4 – Group Priorities</u> <i>Each small group selects its top 5 priority actions</i>	Small Groups with MAPC Facilitators
4:35 (15 min)	<b>Full Workshop: Report Out Top Actions from Small Groups.</b> <i>Small group spokespersons report out their group's top 5 Actions</i>	Small Group Spokespersons
4:50 (10 min)	<b>Full Workshop: Conclusion:</b> Discuss next steps and opportunities to implement actions	All attendees with MAPC Facilitator
5:00	<b>Next Steps:</b> Post Workshop Survey / Adjourn	MAPC Facilitator

## Pre-Workshop Survey Results

**Which climate hazard  
is your #1 concern?**

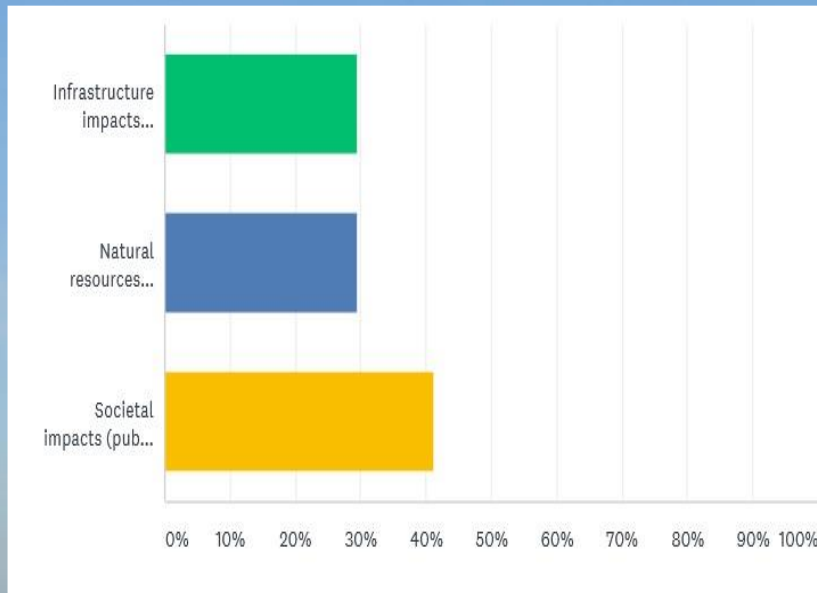


**Which climate hazard  
is your #2 concern?**

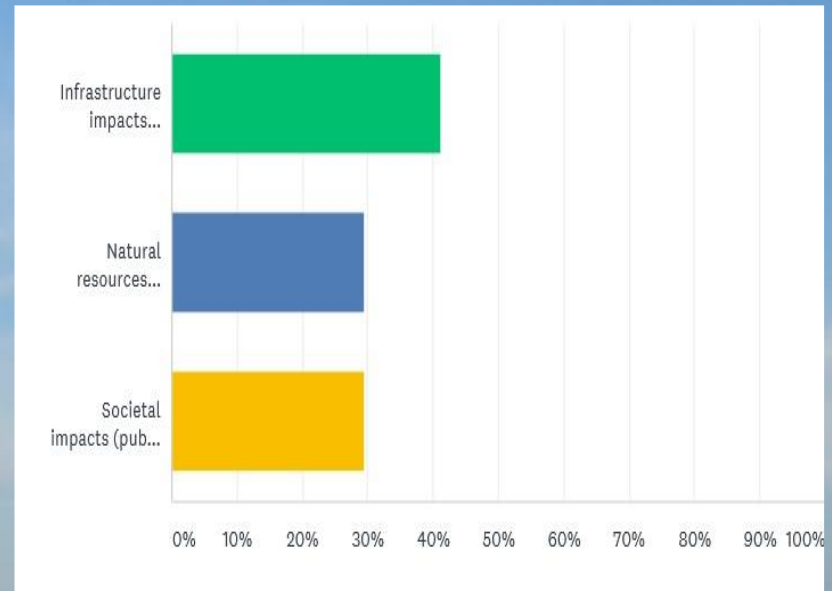


## Pre-Workshop Survey Results

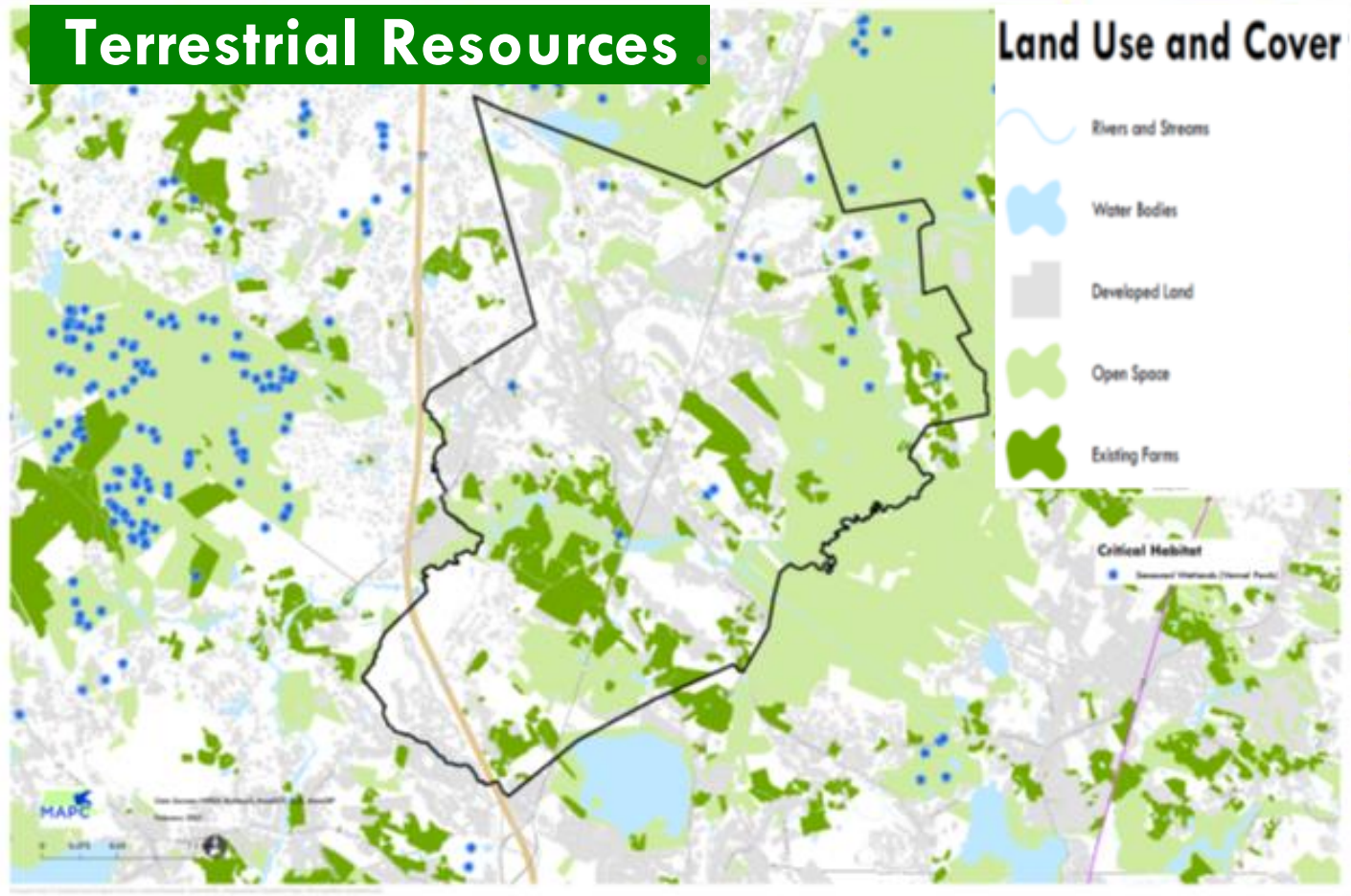
**Which climate impact  
is your #1 concern?**



**Which climate impact  
is your #2 concern?**



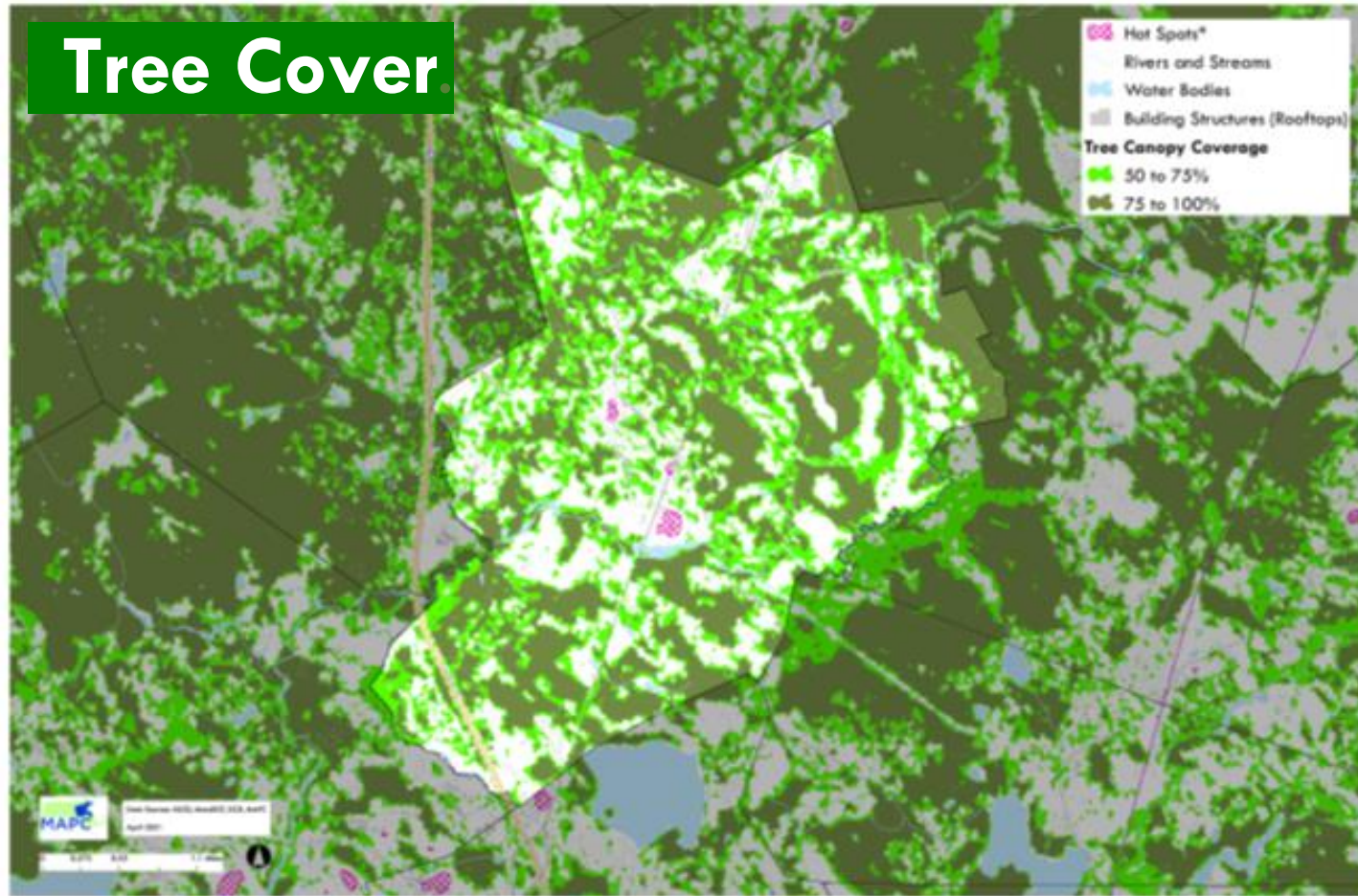
## Terrestrial Resources



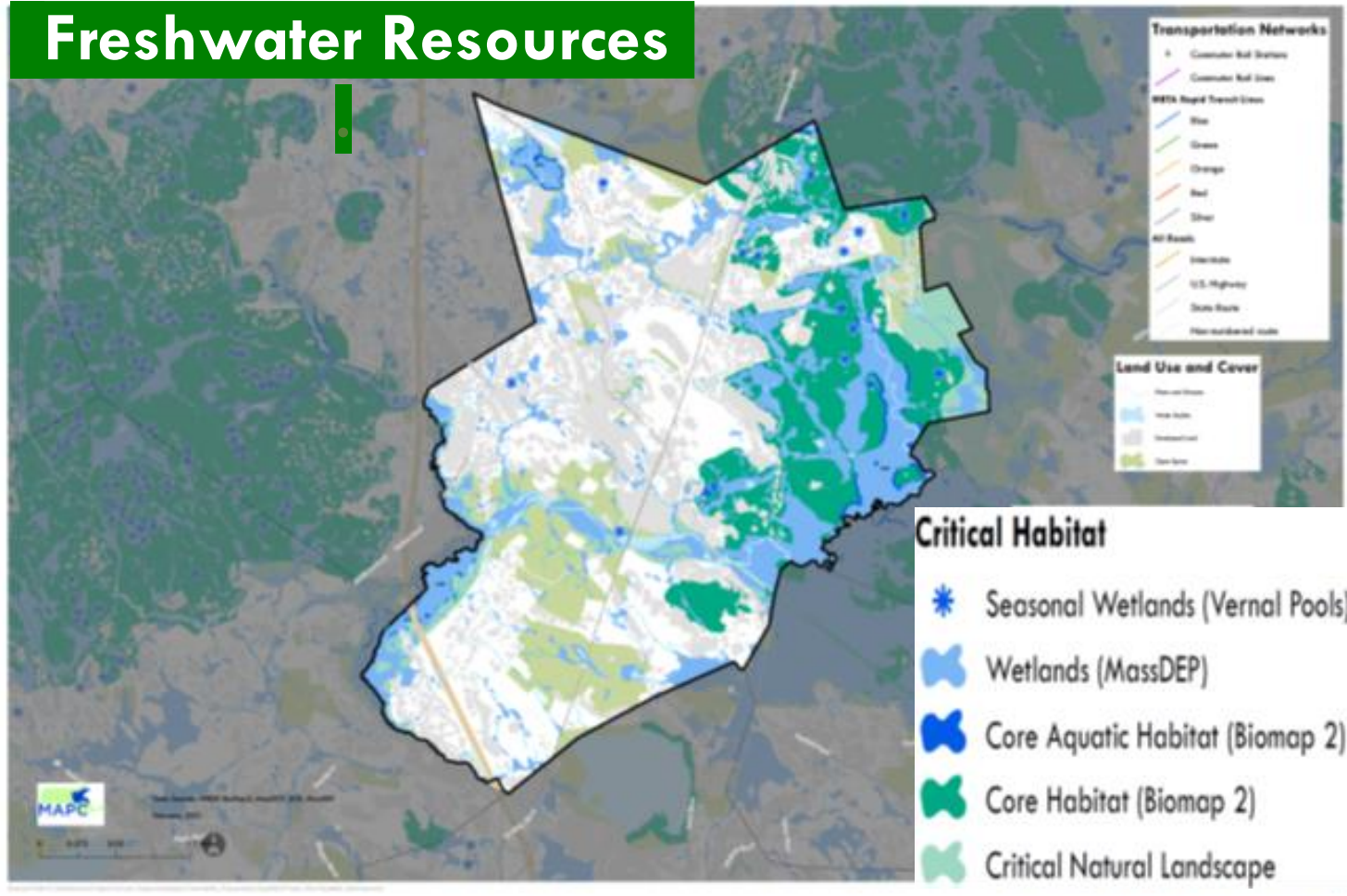


## MVP Workshop PowerPoint

### Tree Cover



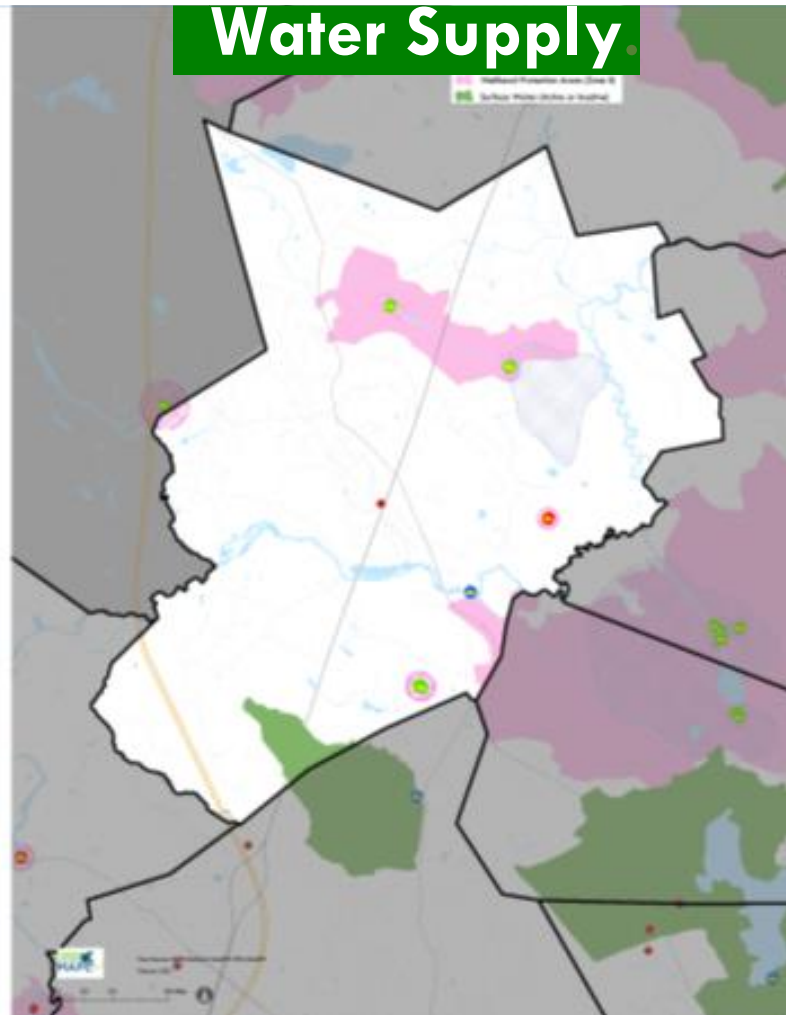
## Freshwater Resources





## MVP Workshop PowerPoint

### Water Supply

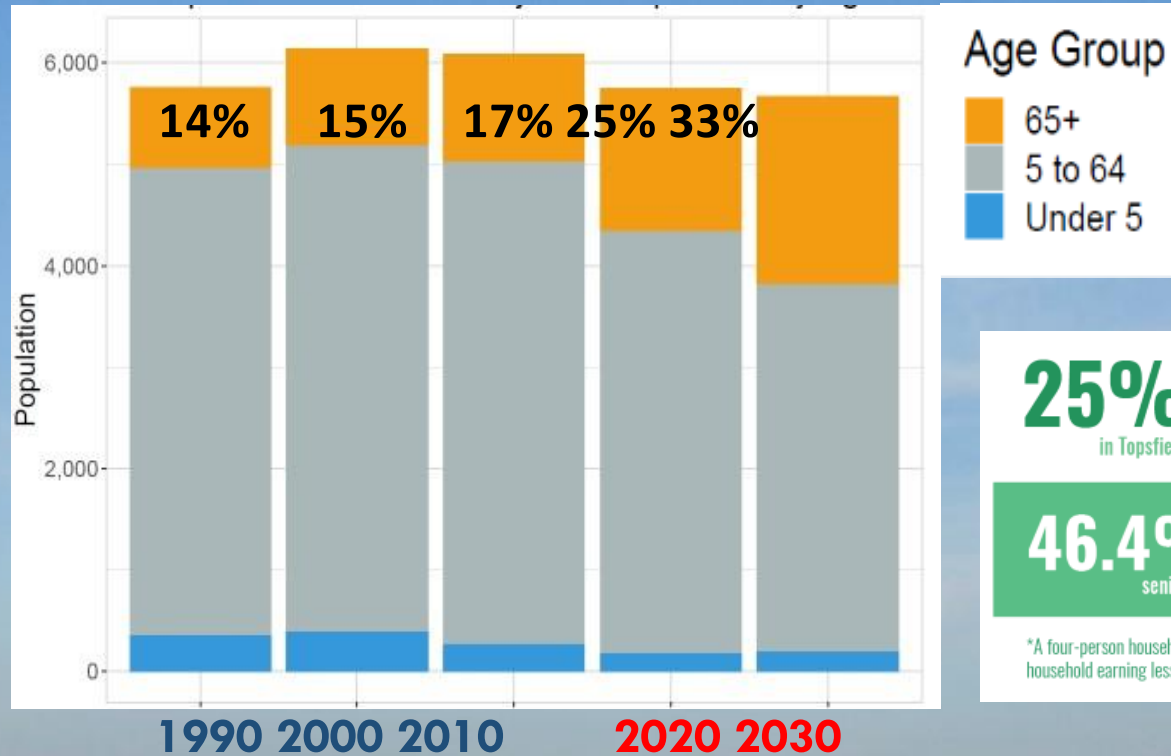


- Activity Use Limitation (AUL) Sites
- Groundwater Pumping Station
- Surface Water Intake
- Non-Community Groundwater Sources
- Rivers and Streams
- Lakes and Ponds
- Medium Yield Aquifer
- Interim Wellhead Protection Areas
- Wellhead Protection Areas (Zone I)
- Wellhead Protection Areas (Zone II)
- Surface Water (Active or Inactive)

## MVP Workshop PowerPoint



## Social Vulnerability: Population & Income by Age



**25%**  $\pm 6.5\%$   
of households  
in Topsfield are low-income

**2.5%**  $\pm 2.4\%$   
of households in  
Topsfield are below the poverty level

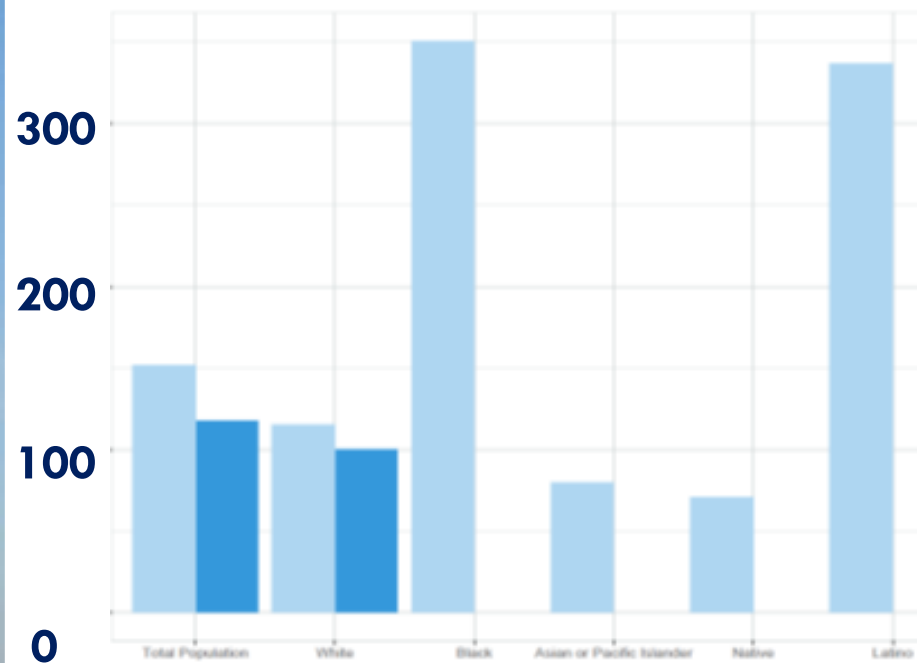
**46.4%**  $\pm 12.7\%$   
of Topsfield  
seniors are low-income

**0%**  $\pm 1.3\%$   
of Topsfield  
seniors are below poverty level

\*A four-person household earning less than \$78,150 is considered low-income; a four-person household earning less than \$24,563 is below poverty level

## Social Vulnerability to Climate Impacts

Asthma Hospitalizations per 100,000



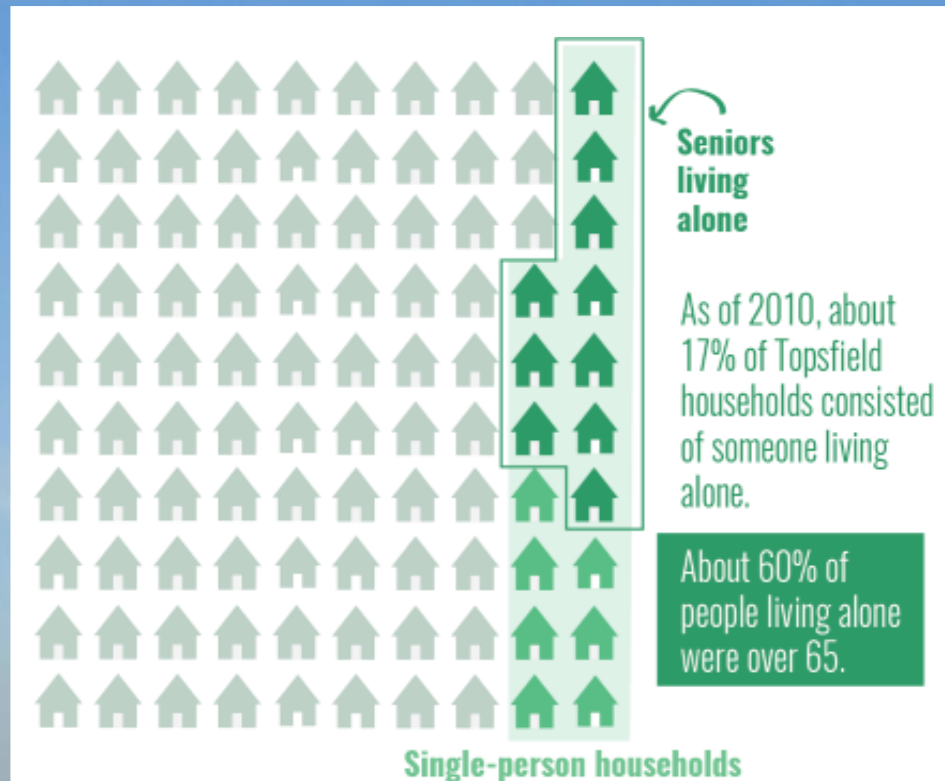
Massachusetts  
Topsfield

### People Who Work Outside

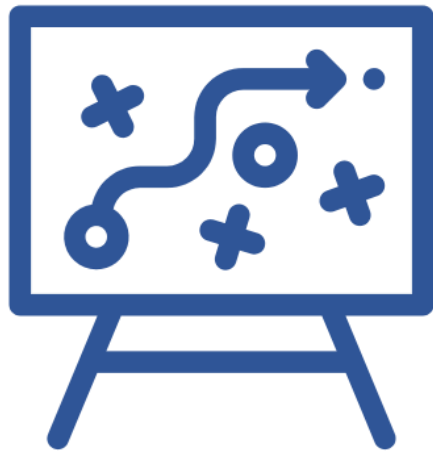


People who primarily work outside, such as parcel delivery people, construction workers, or landscapers, may be at added risk from extra exposure to high heat and poor air quality.

## Social Vulnerability: Living Alone, Language



## Small Group Exercises



**4 Breakout Groups with Facilitators from MAPC**



## Community Resilience Building Workshop


### *The Workshop Considers Climate Hazards:*

- **Flooding; Intense Rain**
- **Extreme Heat**
- **Intense Wind**
- **Winter Storms/Snow/Ice**
- **Drought/Fire Hazard**

### *From the perspectives of:*

- **Infrastructure**
- **Environment**
- **Society**

## Breakout Groups – Risk and Actions Matrix


Carlisle Community Resilience Building Risk and Actions Matrix - GROUP 1										
ITEM #	Matrix 3: Environmental Features	Location	Ownership	V and/or S	Hazard Type(s) FR, EH, WI, WS, DF	Top Priority Hazards				Priority M - M - L
		Describe or note TW Townwide	Town, State, NGO, Private, etc.			FR Flooding, Intense Rainfall	EH Extreme Heat, Heat Waves	WI Intense Winds, Power Outages	WS Winter Storms Snow/Ice	
ACTIONS - list below										
E1										
E2										
E3										
E4										
E5										

**3 Separate Pages for:**

- 1. Infrastructure:** e.g., buildings, roads, bridges, wells
- 2. Society/people:** e.g., elderly citizens, living in flood zone
- 3. Environment:** e.g., wetlands, forest land, flood zones

## MVP Workshop PowerPoint


### Step 1: Identify Vulnerabilities and Strengths

Carlisle Community Resilience Building Risk and Actions Matrix - GROUP 1											
ITEM #	Matrix 3: Environmental Features	Location Describe or note TW Townwide	Ownership Town, State, NGO, Private, etc.	V and/or S	Hazard Type(s) FR, EH, WI, WS, DF	Top Priority Hazards					Priority H - M - L
						FR Flooding, Intense Rainfall	EH Extreme Heat, Heat Waves	WI Intense Winds, Power Outages	WS Winter Storms Snow/Ice	DF Drough t/Fire	
ACTIONS - list below											
E1											
E2											
E3											
E4											
E5											

- Features that are **vulnerable** to climate-related impacts
- Features that are **strengths** relative to climate impacts
- **Location, Ownership, and if Vulnerability +/- or Strength**
- **Type of climate hazard** (flooding, heat, drought, etc)

## MVP Workshop PowerPoint

### Step 2: Develop Actions and Priorities

Carlisle Community Resilience Building Risk and Actions Matrix - GROUP 1											
ITEM #	Matrix 3: Environmental Features	Location Describe or note TW Townwide	Ownership Town, State, NGO, Private, etx.	V and/or S	Hazard Type(s) FR, EH, WI, WS, DF	Top Priority Hazards					Priority H - M - L
						FR Flooding, Intense Rainfall	EH Extreme Heat, Heat Waves	WI Intense Winds, Power Outages	WS Winter Storms Snow/Ice	DF Drought t/Fire	
E1						<div style="border: 2px solid red; border-radius: 15px; padding: 10px;"> <b>ACTIONS - list below</b> </div>					
E2											
E3											
E4											
E5											

1. Develop **ACTIONS** – To reduce vulnerabilities and/or reinforce strengths
2. **PRIORITIZE** Actions as Hgh, Medium, or Low Priority
3. Each breakout group selects its overall **TOP 5 ACTIONS**



## INFRASTRUCTURE EXAMPLES

**Strength:** The town has a well-maintained stormwater facilities

**Vulnerability:** Several areas flood during intense rainfalls

**Potential Actions:** Evaluate benefits of culvert replacements  
Retrofit stormwater facilities with Green Infrastructure  
Update bylaws to require Low Impact Development



## SOCIETY EXAMPLES

**Strength:** The town keeps a list of older adults in need of support during emergencies

**Vulnerability:** Some residents may be isolated during emergencies without transportation to shelters

**Potential Actions:** Partner with community organizations that can help provide transportation services  
Organize volunteers to reach out to neighbors in need of assistance





## ENVIRONMENT EXAMPLES

**Strength:** The town has extensive protected lands that provide a buffer to wetland resources

**Vulnerability:** The town relies on aquifers for drinking water and had to restrict water use during the last drought

**Potential Actions:** Provide incentives for water conservation  
Encourage rain gardens to infiltrate stormwater  
Restrict use of paved surfaces

## Workshop Guidelines

- *Everyone has an equal opportunity to contribute.*
- *Respect others' points of view.*
- *Respect limited time.*
- *Your input is important!*



**Thank you for your participation!**

## APPENDIX E – TOPSFIELD CRB WORKSHOP BREAKOUT GROUP RESULTS

CRB Workshop participants were divided into three breakout groups (on Zoom). The town's vulnerabilities and strengths were categorized as Infrastructure, Societal, or Environmental. Participants in each breakout group identified climate-related strengths and vulnerabilities for Topsfield in each of the three categories. Potential actions were proposed to address the vulnerabilities, and in some cases to augment strengths. Actions were then prioritized as High, Medium, or Low, and each breakout group was asked to identify their top five priorities. The information was recorded on charts by MAPC facilitators for each breakout group and is summarized in the matrix below.

After the workshop, the top five actions from each of the four breakout groups were posted online and participants were asked to respond to a Qualtrics online survey to vote for their top three actions. **Actions in bold text** were selected as the highest priority by the entire workshop.

Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
<b>RED GROUP #1 - INFRASTRUCTURE</b>					
1	Infrastructure	Ipswich River flooding, bridges Rt. 1 floods occasionally, 2006: 2 deaths - Salem Road, Rowley Bridge road - the only way out of town was Rt.97 north (or 95) roadway height is an issue	V	<b>Assess status of flooding options, re-engineering, elevating roadways. Then bridges become the choke point. The whole system needs to be examined. Salem Road flooding is mostly north of the bridge. Rowley Bridge Road floods on either side of the bridge.</b>	H
2	Infrastructure	East Street floods regularly, Pond Street - new culvert should manage 1% chance storm, Wild Street	V	East St. culvert is undersized - but then need to address downstream impacts. (Beaver deceiver helps)	H
3	Infrastructure	Bridges are impacted at the flooding areas noted above; footings are impacted.	V	Follow MA DOT monitoring. Salem Rd. bridge - aging issue.	H
4	Infrastructure	Town hall does not have a generator - it's secondary Emergency Operations Center	V	Purchase generator for Town Hall	H
5	Infrastructure	Fire and Police staffing is at the lower end - 2 staff people. We have to rely on staff coming in during an emergency, also true for DPW	V	Staffing, but budget is the issue, possibly find a strategy for outside aid	H

Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
6	Infrastructure	Lack of alternate shelter to the Proctor School	V	ST. Rose church is identified as a shelter but does not have sprinkler or generator. Consider upgrades or find another location.	M
7	Infrastructure	Building out fiber network - that's a strength, but need Phase II for redundancy	V/S	Hoping for grant funding for a loop	M
8	Infrastructure	Loss of communication because fiber network is above - tree damage will knock it out (have some backup)	V	Loop will help with this	M
9	Infrastructure	Aggressive tree management is done, but power outages from trees is a concern	S/V	Good relationship with National Grid, doing good work, always more needed. Put utilities underground -consider for new or replacement work	M
10	Infrastructure	Well system - water treatment and distribution - reliant on two wells - flooding or other damage - would lose access. 20% on individual well water. Beavers at Perkins well field	V	Consider options, beaver management is challenging, no easy solution, consider trapping	H
11	Infrastructure	Aging infrastructure Police and Fire Stations are 80+ years old	V	Capital funding need - will need replacement	H
12	Infrastructure	Private Dam, would take out Ipswich Rd deck if it failed (it has in the past) 76 Camp Meeting/also their stone bridge	V	Privately owned - challenge	L
13	Infrastructure	PFAS results, mostly less than 20ppt, potentially may be affected by future flooding	V	Seek funding for treatment	M
14	Infrastructure	Septic systems subject to flooding, rising groundwater	V	Consider installing sewer treatment	H
15	Infrastructure	20% of town doesn't have pressurized water - challenge for fire fighting	V	New development connects to town water - that will be a benefit	

Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
<b>RED GROUP #1 – SOCIETY</b>					
1	Society	COA, food pantry, volunteer network - the town does an excellent job caring for those in need	S		
2	Society	<b>Ensure that the housing inventory can meet demand, especially those who may need to downsize. Can people afford to stay? They won't be safe; building won't be safe.</b>	<b>V and/or S</b>	<b>Do a housing inventory study, do a master plan, work on zoning to create right-size investment to address needs. Get people in safe appropriate housing that they can manage. Address isolation</b>	<b>H</b>
3	Society	Regional dispatch - use disability forms - all town staff encourage use. Regional dispatch provides tremendous services - provided by the Commonwealth (multiple professional dispatchers)	S	Advertise Regional Dispatch services more	M
4	Society	Public Health preparedness booklets - available for outreach - meant to be used in small groups - extensive resources/needs to be used. People need to prepare	S/V	Update Public Health booklet/work with community on using the preparedness booklet/ put together outreach program	M
5	Society	NE Mass Medical reserve corps	S		
6	Society	Terrific police and fire leadership/first responders are proactive	S		
7	Society	Swift Reach	S	Sign up more people for Swift Reach	
8	Society	Mental health needs have grown across the board, can be exacerbated in weather emergencies	V	Tri-town Council is a good resource - work with them to identify gaps in service and	H

Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
				help. But they may be oversubscribed as it is. Look for additional resources.	
9	Society	Group homes sheltered living. Typically, don't use town resources. Are well managed. In an emergency, will staff be available?	V/S	Encourage community integration, reach out to ensure emergency planning is in place	M-L
10	Society	<b>Individuals requiring assistance - may not have need supports in an emergency. Have database of supports (COIN)</b>	V/S	<b>Reestablish the COIN program for support of vulnerable populations</b>	<b>M-L</b>
<b>RED GROUP #1 – ENVIRONMENT</b>					
1	Environment	Amount of protected land and trees - no heat islands, provides stormwater mgmt.	S	Strengthen regulation that supports tree protection and vegetative buffers when lots are developed (planning regs)	M
2	Environment	<b>A lot of protected land in the floodplain (MA Audubon/Essex Green Belt/Town) creates a lot of flood storage capacity</b>	S	<b>More land worthy of protection that would provide flood protection, heat benefits. Need to balance with other land acquisition needs.</b>	<b>H</b>
3	Environment	Recreational spaces: Hood Pond, rail trail, soccer, and baseball fields (capped landfills - also must be maintained)	S		
4	Environment	Recreational trail system - reservations, Greenbelt, gets people in nature - also awareness of climate issues	S		
5	Environment	Working farmland - provides food system resilience. Can have water quality and water use impacts	S/v	Develop support for agriculture, activate agricultural commission - encourage a farmers' market. Develop ways to encourage environmentally sensitive practices	M



Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
6	Environment	Ipswich River - enormous asset as a wetland system and flood storage. very vulnerable to drought, experienced no flow. Upstream water withdrawals are the primary issue for no flow. Also, a resource for recreation.	S//V	Work with state and federal leaders to identify solutions. water withdrawal is an enormous regional issue. Town can look at what kind of local water use regulations they may want to revise.	H
7	Environment	Invasive species - Bittersweet. Lyme disease is prevalent, BOH tracks Lyme. Ticks. Results in heavy pesticide use. Mosquitos (emerging infectious diseases EEE, zika, etc.). Ditching addresses mosquitos but has environmental issues. NEM Mos. Control can do outreach.	V	Focus on planting disturbed areas. Outreach on protective behaviors residents can take, and to avoid. Methods that aren't reliant on pesticides	M-L
8	Environment	Trees are weakened in repetitive droughts, then pests, windstorms. Heat stress will also lead to mortality over time.	V	Implement a forest management plan. Management of hazardous trees. Address forest fire, hazard trees. Can DCR be a resource in this regard?	L
9	Environment	Development encroaches on wetlands and leads to tree removal	V	Implement vegetated wooded buffers - outside of wetland jurisdiction - see E1	
10	Environment	Not a lot of forested land protecting the groundwater resource, and not a lot of opportunity for it	V	no action item	
11	Environment	State parks - don't follow local building code - Town has a good relationship (hydrants, sprinkling bldgs.)	V/S	no action item	
<b>WHITE GROUP #2 - INFRASTRUCTURE</b>					
1	Infrastructure	The Rail Trail; due to flooding it can get shut down, 3.9 ml in length, it is a public way.	Both	We need to make sure the culverts are adequately cleaned. Water should be able to drain from the sides of the trails. Adding / maintaining drainage to the Rail Trail would help with providing utility truck access in times of emergency.	High

Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
2	Infrastructure	Other Trails (Connected to Open Space) Recreational resources, they can flood and have culverts associated. Wildfires are also an issue.	Both	We need to make sure the culverts are adequately cleaned. Water should be able to drain from the sides of the trails. Mass Audubon has 12 miles. The many owners make it hard to have integrated planning and actions. Maps might be an option to help with wildfire	Medium
3	Infrastructure	<b>Storm Water Drainage / Infrastructure...</b> Some places don't have any stormwater drainage systems. A Committee is focused on the topic to come up with plans.	V	<b>Have the committee look at the design and make sure that it keeps in mind the new reality of flooding in the area. Is increased stormwater designed into the system? Conservation Commission and Planning Board should also look into the design. Town wide drainage model is something that would be beneficial.</b>	High
4	Infrastructure	<b>Powerlines and Substation (National Grid) for access for repair and due to impacts of the intense winds.</b>	V	<b>Connect with tree ward on this topic. Tree Maintenance (dead and diseased) and Pole replacement and maintenance. Preparing the tree canopy for increased pest or another new hazard. Look into tree inventory . Emphasize native species</b>	High
5	Infrastructure	The highways (Routes 95, 1, 97). During Mother Day Flood travel restricted; had to go north first	V	Look into Improving drainage, bridge replacement might be needed. Nature based solutions might work or help.	High
6	Infrastructure	<b>Bridge Road , Rowley Bridge Road, Ipswich and River Road, Washington Street (Roads the flood in town)</b>	V	<b>Look into Improving drainage, bridge replacement might be needed. Nature based solutions might work or help.</b>	High
7	Infrastructure	Two Elementary Schools are used as evacuation points	S	Look at inter building communications systems (look at Steward and Proctor). What are we using when we need to	

Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
				Communicate with the town? Switch reach system and Facebook System	
8	Infrastructure	Water treatment plants	S		
9	Infrastructure	<b>Another water source is needed (outside of the Ipswich River basin)</b>	V	<b>Other Communities are also looking to find another water source. Improve resilience with water but looking at regional plan and grants to see how these towns can come together to get another water source. Massachusetts Water Resource Authority has role to play.</b>	High
10	Infrastructure	Fire and rescue team and Police Dept ability to work together with other. They are thinking ahead.	S		
11	Infrastructure	Wildfire program that the town has helps homeowners with known risk to wildfire.	Both	Might be something for the town to look into as program to bring to the town. It's something that is used out west.	Low
12	Infrastructure	Dams have been updated/redone a few years ago	S		
13	Infrastructure	Low Pound Dam over runs at times. It feeds into Topsfield	V	Look at replacement of dam.	Low
14	Infrastructure	Main Hub Verizon Central Building on Central Street in town. It is a very old building, and it might not have what is needed during an emergency.	Both	Connect with Verizon to confirm its situation and how they plan to deal with emergency.	
15	Infrastructure	<b>Two water towers in town. They hold most of town water. The town wants to start replacing them this year.</b>	V	<b>Town starting to replace. Looking into relocation and enlarging. They are both on top of the highest hills in town. Fire hydrants need the water pressure also. They will be done in the next few years.</b>	Low

Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
16	Infrastructure	Fairgrounds, hot spot, microbursts of wind in this area	V	Emergency Plan. Connect with CBO on this topic	Low
<b>WHITE GROUP #2 – SOCIETY</b>					
1	Society	Diseases will increase due to climate change. Increase of Lyme disease is an example.	V	Board health involved in this topic. They have a role to play on this topic.	M
2	Society	Swift Reach system and Town Facebook page for public notifications	S	Let more people know of the Swift Reach system and Town Facebook notifications	M
3	Society	Churches are very much working to keep people informed using communication tree style of connecting.	S		M
4	Society	Impacts of the approach used to care for yards and landscaping management for residential and commercial areas	V	Reduce the amount of lawns and change them to pollinator gardens, connecting them with educational programs. Mandating composting, is that something Topsfield could do?	L
5	Society	Public awareness is needed so that they know what is in the chemicals used for lawns and landscaping and the impacts they have on health.	V	Educational and awareness campaign is needed. Connecting with key landscaping employers to see if they have plan or process to keep workers safe from climate and chemicals might help with reducing use of chemicals in town. Consider education for this.	M
6	Society	The town has 7 communities for age 55 and up. Could be impacted by power outages, heat waves, and rainfall.	V	Public outreach and education around heat readiness and power outage readiness. Elderly folks started to look into home generators. Larger area generators might be better. Not a Red Cross community and	M

Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
				should consider what other options the Town has if there is an emergency.	
7	Society	123 bed nursing and rehab facility, could be impacted by power outages, heat wave, and intense rainfall.	V	Help the facility become more resilient would not just benefit the facility, it would also help the rest of the community.	M
8	Society	Council on Aging is a key organization in town.	S		
9	Society	<b>The number of low-income seniors in town is high, and also low-income people who come into town for work. They can be impacted first and worst when there is a climate emergency.</b>	V	<b>Education campaign. Create a stakeholder group / focus group with people connected to these Environmental Justice communities; blogs for specific groups.</b>	L
10	Society	People working outside: police and fire, landscapers, roofers are vulnerable to extreme heat.	V	Education campaign on extreme heat for outdoor workers. Focus group with these workers to better understand them and the issue.	L
11	Society	10% affordable housing goal has not been met in town and that needs to look at and think about how the town can meet that goal.	V		M
12	Society	Environmental Justice Communities more vulnerable: workers, landscapers coming from other areas, school in town caters to youth from areas that might be EJC	V	Public outreach and education needed	M

Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
13	Society	Ipswich Water Association Educational Approach might be able to help with some the resilience actions.	S	Connect with the schools as resource for addressing vulnerable populations, Environmental Justice communities	M
14	Society	Water use restrictions in town... enforcement and education might be need when it comes to how water is used.	V	Education on enforcement of water use restrictions	M
15	Society	Cable Television used for education about the MVP program and climate change. Public Access can also be used for communication.	S	Public Access Channels are going to be made available to people in town. Verizon and Comcast in the process at working out new licensing. Programing can be developed by the town too. It's a communication tool that can be better used.	M
16	Society	The town does not have social media account.	V	Communication Plan and coordinating communication is needed by the town.	High
17	Society	<b>Redesigning the town website</b>	<b>V</b>	<b>Departments are looking to centralize information on online and town needs to look how things can be improved and maintained online for the public. The user should have a say on the design.</b>	<b>High</b>
18	Society	<b>Communication Plan is needed for emergency communication</b>	<b>V</b>	<b>How are different departments and organizations communicating in town. How does the public access information online? Help people find things online in centralized and easy way. The MVP and Emergency Plan need to talk to each other.</b>	<b>High</b>



Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
19	Society	Economic Community Development Committee is looking to see how it can make Topsfield more attractive for business. Environmental or Climate resources on the website would help educate folks	S	Communication / Website update is happening now by the ECDC, and the town should think about how it can use it to educate and share information.	M
20	Society	The town has single online communication system and that has its downside. Maintenance of the website will need more resources	V	Key people will be needed be assigned to maintain the website and share key information.	M
21	Society	Lack of Solar Power and Storage	V	d	M
<b>WHITE GROUP #2- ENVIRONMENT</b>					
1	Environment	<b>Intense Winds and trees going down. Eastern White Pines get to 100 feet tall at times and do great damage. Red Pine is an issue in town due to beetles. Red Pines are snapping in high winds</b>	V	<b>Identifying trees that need care. Building code enforcement. If things are not built correctly when trees go down they can do lots of damage. Research is needed, looking at local bylaws for the highlight of trees.</b>	H
2	Environment	Fires in the woods are an issue	V	Public education is needed around disposal of ashes and smoking materials. Prescribed fires to help with built up fuel in the woods. Access to key roads that are needed to get out into the woods need to be looked into.	L
3	Environment	<b>Diseases for trees</b>	V	<b>We need a better understanding of the percentage of different kinds of trees. Should we start replacing them now? We see insect life changing</b>	M

Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
4	Environment	Chemicals used on landscaping, impact on ground water. These can include fertilizer and insect control chemicals.	v	Have the board of health look at the problems people have with recommendation.	H
5	Environment	Lack of bees and other insects that are need for the eco system.	v	Adopt a hive program	H
6	Environment	Hood Pond invasive species might be an issue. Plants might be hitchhiking to spread in the area. Overall destructive to ecosystem.	V	See FreindesofHoodPond.org to learn more. Treatment that could be used in the pond might help with invasive species. Pulling the plants might have also been used. Local coordination is need.	M
7	Environment	<b>Drought conditions have impacted the ground water systems. Town has water restrictions every year. Enforcement of water restrictions is hard but cost going up is starting to help</b>	V	<b>Find a new water source that is outside the Ipswich River basin.</b>	H
8	Environment	Ice on roadways. Water flowing over roadways and freezing over, Prospect Street going down to River Road is an example.	V	Improving the drainage. Perched water table that has groundwater comes through the road. Drainage issue is something to be addressed.	M
9	Environment	Deicing Chemicals (sodium and chloride levels going up)	V	Drainage solutions need to be looked at more. Intercepting the water before the water hits the road. Looking at calcium chloride or other chemicals that might be better. Look at French drain systems. Sand has its own issues, and the town has stopped using sand due to wetland impacts.	M
10	Environment	Shaded open space in the area is something the town has due to tree coverage.. During heat wave.	S		M
11	Environment	Open space and trails. Great for public health, shade, wildlife.	S	Trail Maps that cover the entire town are needed. GIS maps are needed. Free tail maps are available, but it would be nice to	M

Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
				have a centralized map. It would help encourage people to get out on the trails. Essex County Trail Association has a free map, but it might need to be made easier to access. Town needs to look at mapping technology. Making trails more accessible for vulnerable members of the communities.	
12	Environment	Playgrounds and parks that are not shaded. You can't enjoy them during a heat wave.	V	Green infrastructure might be able to help with these playgrounds a park during heat waves.	M
13	Environment	Path near town cemetery has great shade	S		M
14	Environment	Ipswich River Watershed	V	Public education is need around MVP is needed to get the community to understand impacts on the Ipswich River watershed.	M
<b>BLUE GROUP #3 – INFRASTRUCTURE</b>					
1	Infrastructure	Town wells - municipal	V	Protection from flooding (beavers and climate-related)	M
2	Infrastructure	<b>Water towers</b>	V	<b>Inspection to happen - at least one (Boston St.) has cracks; looking for money to repair</b>	H
3	Infrastructure	Route 1 - bisects the town	V	Tree mitigation (tree warden does not have a big budget); drought weakens trees	H
4	Infrastructure	Route 97 - route to Beverly Hospital (no hospital in town), nursing home	V	Tree mitigation needed for Route 97 (maintain access to Beverly Hospital)	H
5	Infrastructure	Salem Rd, Rowley Bridge Rd, River Rd, East St, Ipswich Rd at Howlett Brook	V		H

Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
6	Infrastructure	Power grid - located in floodplain (one substation on Rt. 1 north of river and Maple St.)	V, S (given location in town)	Tree mitigation - ongoing program; upgraded poles and lines; station elevated to get out of floodplain; annual pole inspection and replacement	H
7	Infrastructure	Bridges across Ipswich River - inspected by state (4 in the past year); nothing imminently critical at this point	V	Continue to monitor bridges over Ipswich River; some issues may arise soon (stone bridge on Perkins Rd)	M
8	Infrastructure	Private wells and septic systems (flooding, drought, loss of electricity)	V	Many people already have generators; town should map to identify areas of vulnerability impacting private wells and septic systems (flooding, drought, loss of electricity).	L
9	Infrastructure	Flooding of homes from wetlands and Ipswich River tributaries - town has maps of homes that typically need to be pumped; issues with drainage.	V		
10	Infrastructure	Senior Center has information for residents, but needs to add emergency contacts	S	Request emergency contact information for seniors	M
11	Infrastructure	Switch Reach (need to provide cell #) - regular communication during pandemic; school has their own system	S	Clarify how and where to sign-up for Switch Reach on cell phones	M
12	Infrastructure	Verizon and Comcast - another resource for information dissemination (vulnerable with power loss)	S		
13	Infrastructure	Proctor School has a generator (centrally located); proposal for Town Hall to do the same	S	Merging database from all three schools(?)	
14	Infrastructure	AmeriGas and Essex Coop - vulnerable tanks	V		

Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
15	Infrastructure	Fire Dept on Rt. 97; Police on Rt. 1 (north of the river) - could access stations; Police Dept. has a generator	S	New Police generator	
16	Infrastructure	Town library used to flood frequently (old part of building, but work done to mitigate issue); has a generator	S		
17	Infrastructure	DPW has three generators - pumping station, garage, and treatment plant (plant is new and on high ground)	S		
18	Infrastructure	Town Hall can flood - town records in basement	V	Replace generator at Town Hall (to be done this year)	H
19	Infrastructure	Stormwater management plan (2018); culvert replacement and maintenance	S	Ongoing stormwater management - some improvements being funded; keeping up but could use more resources	M
20	Infrastructure	Stormwater and erosion control bylaw recently updated; floodplain bylaw; water protection district; low-impact development	S	Review bylaws and regulations on a regular basis (stormwater, erosion control, floodplain bylaw, water protection district, low impact development)	M
21	Infrastructure	Cell towers (physical vulnerability and coverage); one main tower by DPW with multiple carriers	S/V	Town may need another cell tower	
<b>BLUE GROUP #3 - SOCIETY</b>					
1	Society	Warming shelter and cooling stations; Boxford regional high school was a shelter - need to check if still applicable; what happens when school is in session?	S	Needs to be publicized before emergencies; need to identify capacity for cooling stations/air conditioners; need MOU for using facilities in other communities; monitor usage	M
2	Society	No hospital in Topsfield - nearest is in Beverly and ER in Lahey Peabody; Fire Dept is primary ambulance service	V		

Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
3	Society	No medical clinics/offices in Topsfield; nearest is in Danvers	V		
4	Society	Long-term nursing facilities; group homes/special needs schools (Topsfield Educational Consortium on Rt. 1 and Nike Village)	S		
5	Society	Private pre-schools (Trinity, Joyful Noises - they have emergency plans prepared with Fire Dept.	S		
6	Society	Senior housing - Housing Authority (Little Brook Village) and Washington	S		
7	Society	Over-55 private, higher end housing projects	S		
8	Society	<b>Seniors living alone</b>	<b>V</b>	<b>Need to pair seniors living alone with people that can help them; keeping database updated and coordinate with public safety (people to be helped and people who can volunteer to help)</b>	<b>H</b>
9	Society	<b>No shelters</b>	<b>V</b>	<b>Need to identify locations to develop shelters</b>	<b>H</b>
10	Society	Food pantry at Trinity Church run by volunteers; limited hours	S	Expand based upon need (confirm usage and ensure availability in emergency situations); Tri-town Council (Middleton, Boxford, and Topsfield) would know about food insecurity; meal programs continued when schools were shut down and opened up to seniors as well	M
11	Society	BOH emergency preparedness handbook (important contact info, supply kits, medical and utility info, safety plans)	S		



Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
12	Society	Northern Essex Medical Reserve Corp. - assists in emergencies, supply distribution during pandemic - 14 municipalities	S		
13	Society	Churches - help with outreach and some have kitchens and/or AC, but not full emergency shelter	S		
14	Society	Topsfield Fairgrounds - good relationship and could collaborate if requested, perhaps as staging or training area (it can flood)	S		
15	Society	Fire Dept does training for water rescue on the Ipswich River	S		
<b>BLUE GROUP #3 - ENVIRONMENT</b>					
1	Environment	Lots of wetlands; Ipswich River tributaries	V/S	Conservation Commission implements and enforces town wetland bylaw	
2	Environment	Water table level fluctuates - mounded septic needed in some locations	V		
3	Environment	Trees dying off due to drought conditions and trees become vulnerable in storms; species diversity affected by climate change; insect population (moth defoliation) and disease vulnerability	V	Adopt a tree replacement policy and program (multiple species, native) and include it for landscaping plans required under site plan review	M
5	Environment	Scenic Road Bylaw - replacement required if one is removed	S		
6	Environment	Agricultural land - irrigation and farm ponds impacted by drought	S/V		
7	Environment	Soils impacted by drought and their ability to neutralize carbon emissions	V		
8	Environment	Forest/brush fire threats and ability of fire equipment to access them - Fire Dept has some equipment; DCR does as well	V		

Item#	Category	Strengths & Vulnerabilities	V/S	Actions	Group Priority
		(Bradley Palmer is Essex Co. regional headquarters for forest fires)			
9	Environment	Willowdale and Bradley Palmer State Parks - multi-use open space and recreational resource	S		
10	Environment	New water treatment facility	S	Pilot program for testing PFAS treatment; may require additional equipment for the facility (underway)	M
11	Environment	Hood Pond - invasive vegetation issue; algae blooms (Friends of Hood Pond and Topsfield Beach Association); local beach	V	Pond St. culvert project will mitigate; multi-year project underway by those groups for invasive control)	M
12	Environment	Surface water addressed in stormwater management plan; low dissolved oxygen and high e-coli	S	Non-point source pollution study to determine source of pollution	L

## APPENDIX F – TOPSFIELD PRE-WORKSHOP SURVEY

Since the COVID-19 pandemic made it necessary to hold the CRB workshop remotely via Zoom, the Town supplemented the workshop with a survey to introduce the concepts and gauge participants' priorities for the following:

### Climate Hazard Categories:

- Flooding and intense rainstorms
- Extreme heat
- Intense winter storms
- Intense winds
- Drought/wildfire

### Climate impact categories (from the CRB):

- Infrastructure
- Societal
- Environment

Participants were asked to choose their first and second priorities for each of these categories. They were also asked if there are any specific areas of concern in the town. Following are the responses to these survey questions.

Q7 Is there a specific location, facility, or resource in town that you are most concerned about being impacted by climate change? Please list this in the text box below.

Answered: 10 Skipped: 9

#	RESPONSES	DATE
1	Farm land	4/14/2021 12:14 PM
2	Elderly housing developments/nursing home	4/13/2021 4:34 PM
3	Ipswich River low level	4/13/2021 2:05 PM
4	Ipswich River flooding impacting roads	4/12/2021 10:40 PM
5	private wells and septic systems on individual lots	4/12/2021 2:06 PM
6	N/A	4/12/2021 12:29 PM
7	The Ipswich River, Audubon, Bradley Palmer	4/10/2021 9:01 AM
8	Ipswich river watershed	4/9/2021 5:15 PM
9	Ipswich River, Ipswich River Wildlife Sanctuary	4/8/2021 11:03 AM
10	Not specifically	4/6/2021 6:23 PM

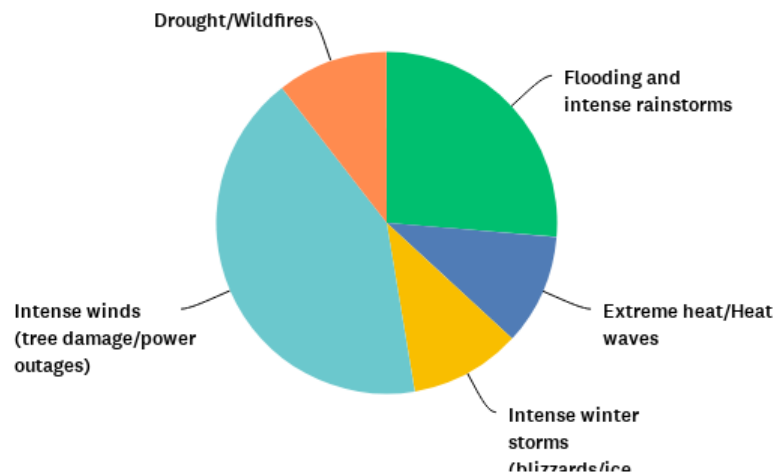
## Questions on participants' #1 and #2 concerns for climate hazards

Participants were asked to prioritize their concerns for flooding and intense rainstorms, extreme heat, intense winter storms, intense winds, and drought/wildfire.

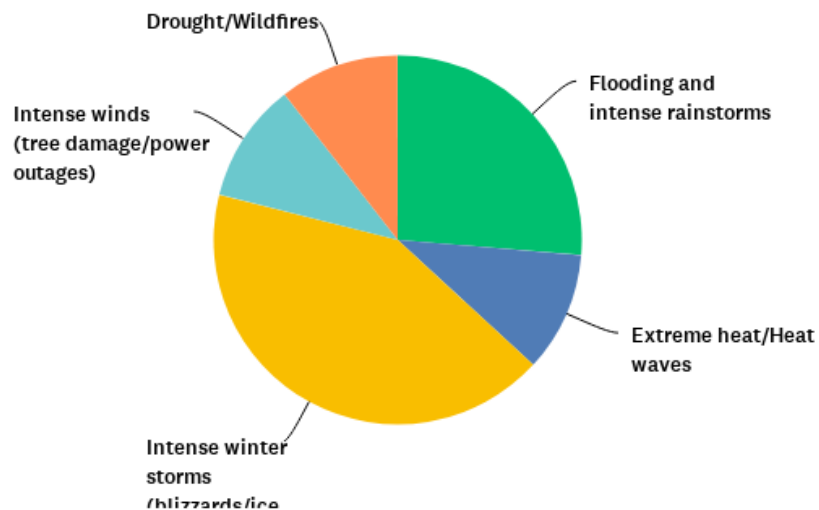
Participants' #1 concern is **intense winds**, followed by **flooding and intense rainstorms**

Their #2 concern is **intense winter storms**, also followed by **flooding and intense rainstorms**

Q1 Please indicate which of the following climate hazards is your #1 concern



Q2 Please indicate which of the following climate hazards is your #2 concern



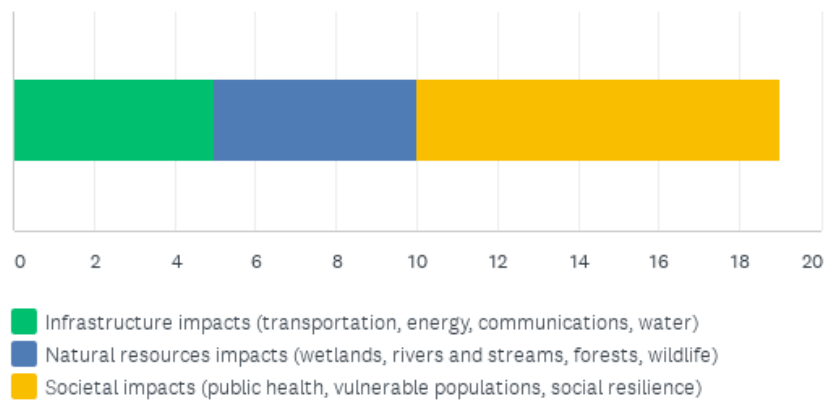
## Questions on participants' #1 and #2 concerns for climate impacts

Participants were asked to prioritize their concerns for infrastructure, society, and environment

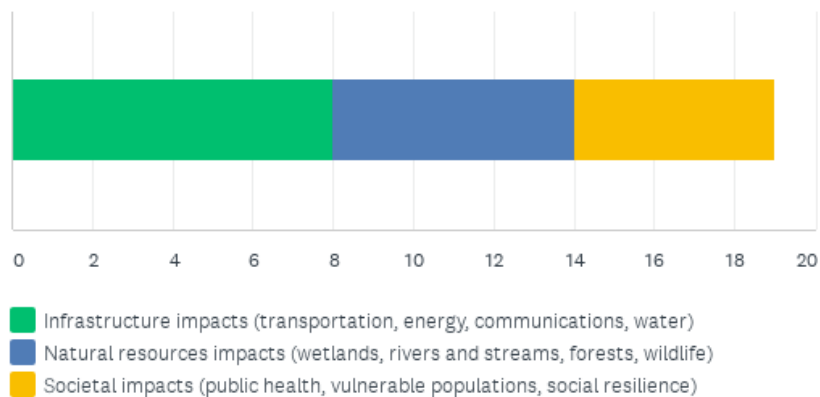
Participants' #1 concern is societal impacts

Their #2 concern is infrastructure impacts

Q4 Please check the category of climate impact that is your #1 concern.



Q5 Please check the category of climate impact that is your #2 concern.



## APPENDIX G – PRE-WORKSHOP BRIEFING MATERIALS

### **Briefing Materials for the** *Topsfield Community Resilience Building Workshop* April 14, 2021



### **Town of Topsfield** **Community Resilience Building Workshop** April 14, 2021, 12:15 to 5:00 PM

#### **Town of Topsfield**

Municipal Vulnerability Preparedness Core Team  
Chief Jen Collins-Brown, Coordinator

With Technical Assistance from the  
**Metropolitan Area Planning Council**

Financial and Program Support from the  
**Massachusetts Municipal Vulnerability Preparedness Program**  
Executive Office of Energy and Environmental Affairs



## INTRODUCTION TO THE WORKSHOP

This **Community Resilience Building (CRB) Workshop** is sponsored by the state's **Municipal Vulnerability Preparedness (MVP)** program, administered by the Executive Office of Energy and Environmental Affairs. Topsfield received a grant from the MVP program to conduct this project. The MVP program was established under Governor Baker's **Executive Order 569**, which instructed state government to provide assistance to cities and towns to complete climate change vulnerability assessments and resiliency action plans. The order was signed in 2016.



The goals for the workshop are to:

- Understand extreme weather and climate related hazards*
- Identify the Town's strengths and vulnerabilities*
- Develop and prioritize opportunities to take action to reduce future risk*

Each participant brings expertise and knowledge of conditions in Topsfield. This is an opportunity to shape the Town's future and ensure that it is prepared for climate change and remains a strong and vibrant community.

The workshop is an opportunity to prepare for extreme weather events such as the flooding, extreme heat, drought, and power outages that the town has experienced in recent years. During the workshop you will have the opportunity to consider how climate change may impact the Town of Topsfield in three important ways:

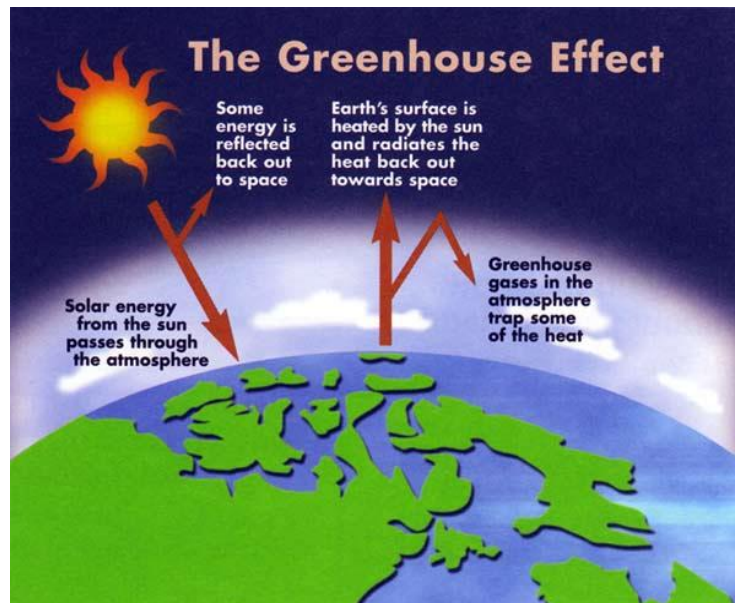
1. Infrastructure impacts
2. Societal impacts
3. Environmental impacts

Participants will discuss suggested actions the Town can take to address these impacts. These actions will be prioritized and will provide a "road map" for the Town's climate preparedness strategy.

## A BRIEF OVERVIEW OF REGIONAL CLIMATE TRENDS

### Our Warming Planet: Historic Trends

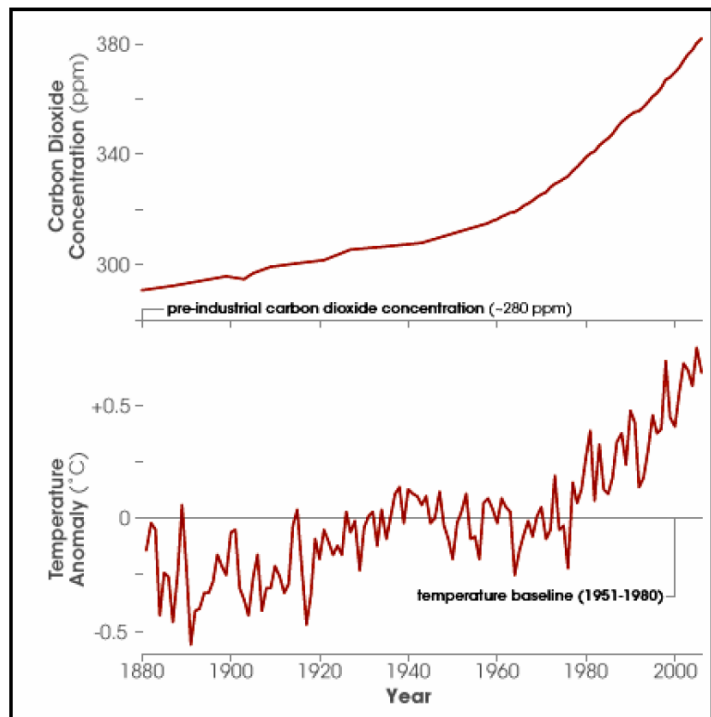
As solar energy strikes the Earth's surface, some of the heat is radiated back to space, and some is trapped by gases in the atmosphere that function like a blanket holding heat in. That is what keeps the planet's temperature regulated. Without these "Greenhouse Gases" (GHG), the planet would be too cold to support life.



However, human activities since the era of industrialization have caused a significant increase in the concentration of greenhouse gases, largely due to the combustion of fossil fuels.

Carbon dioxide ( $\text{CO}_2$ ), which is released by the combustion of fossil fuels, is the most abundant of the greenhouse gases. However, methane and other GHG's also contribute to global warming.

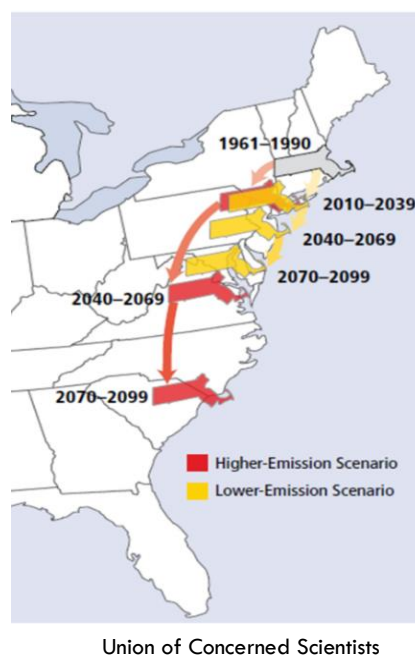
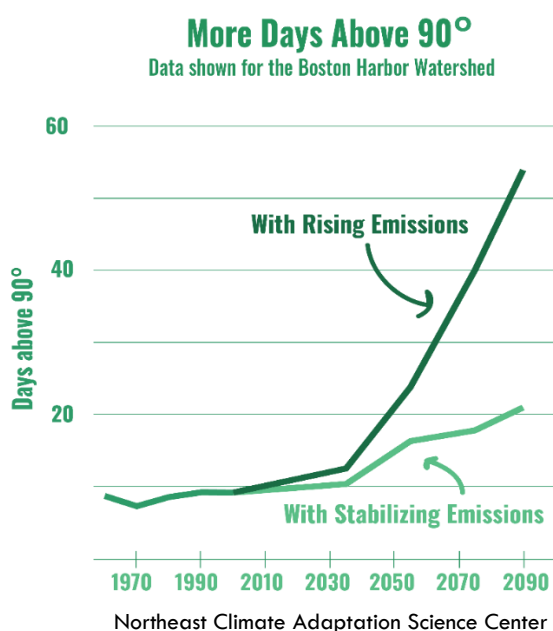
The upper chart on the right shows the observed trend in  $\text{CO}_2$  concentrations starting in 1880. This comes from actual measurements taken in Hawaii. The lower chart shows that global temperatures have been increasing in correlation with rising  $\text{CO}_2$  over the same period.



## Projected Future Temperatures

Climate projections by their nature are not based on empirical data, but on increasingly sophisticated models. Due to inherent uncertainties, projections often provide a range of values. Two sources of uncertainty are: (1) the level of confidence in the model, and (2) the future level of GHG's in the atmosphere, which will depend on our efforts to reduce and eliminate GHG emissions in the coming years. Many climate models therefore provide projections based on lower and higher future GHG emission scenarios.

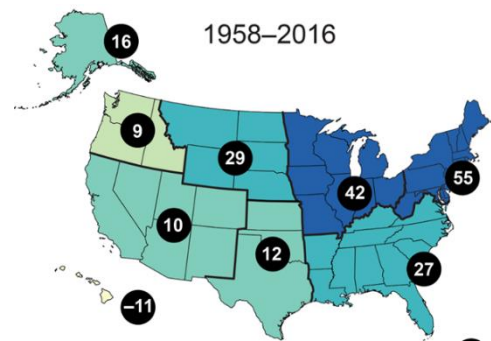
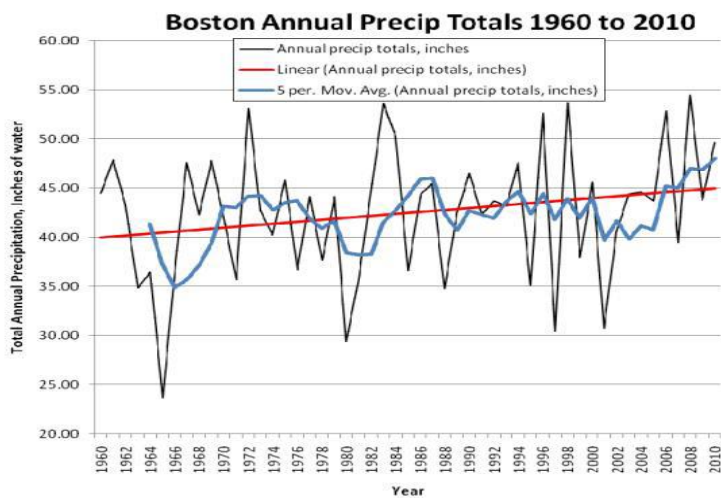
In the greater Boston area future temperature projections estimate an increase in the annual number of days over 90 degrees. These are projected to increase from about 10 days per year currently to a range of 25 to 60 days per year by 2100 (chart below to the left). The resulting temperature regime by the end of the 21<sup>st</sup> century could transform Massachusetts' climate to be like present day Maryland under a low GHG emissions scenario, and similar to South Carolina under a high GHG scenario (figure below to the right).



## Changing Precipitation Patterns

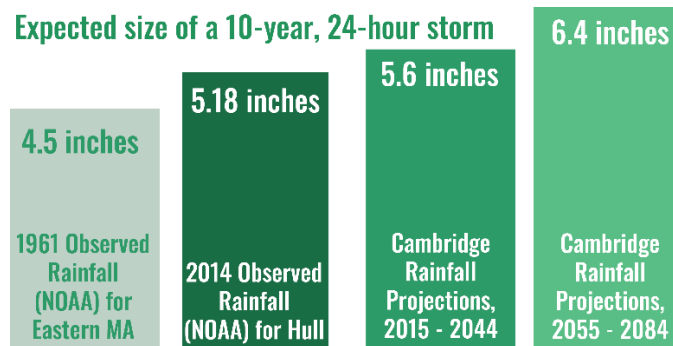
We have already seen an increase in annual precipitation in the Boston area over the past 50 years of about 10 percent (see figure below, left side).

We have also seen a significant increase in the size of our largest rainfall events. For the Northeast from 1958 to 2016, there has been a 55% increase in the amount of precipitation that falls in the top 1% events (figure below, right side). The Northeast is the most affected region of the country.



## Precipitation Projections

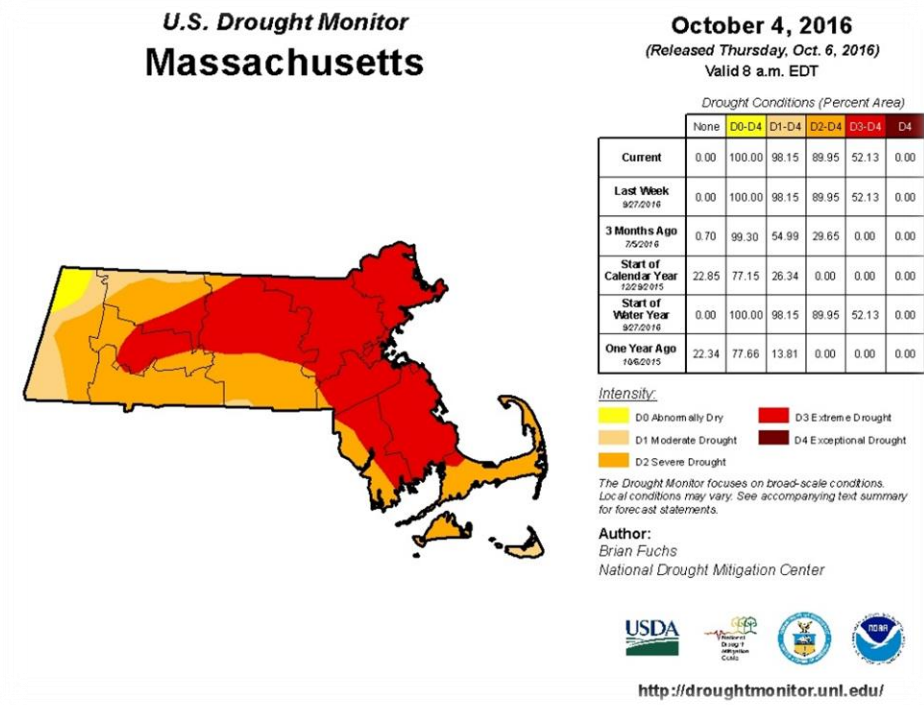
There is less certainty in rainfall projections, but there is general agreement on the future trend for greater Boston: more rain annually, larger rain events, with more winter rainfall and slightly decreased summer rainfall. The figure below shows past trends and projections for the “10-year, 24-hour” storm, which is considered a benchmark for designing stormwater infrastructure. This storm increased from 4.5 inches to 5.18 inches between 1961 and 2014. Future rainfall projections done for the City of Cambridge estimate that the 10-year, 24-hour storm will further increase to 6.4 inches by the end of this century. That’s an increase of 1.9 inches, or a 42 percent increase, over the size of the historic storm in 1961. It’s easy to see why much drainage infrastructure that was designed for mid-20<sup>th</sup> century precipitation patterns is already inadequate and will become more so in future decades.



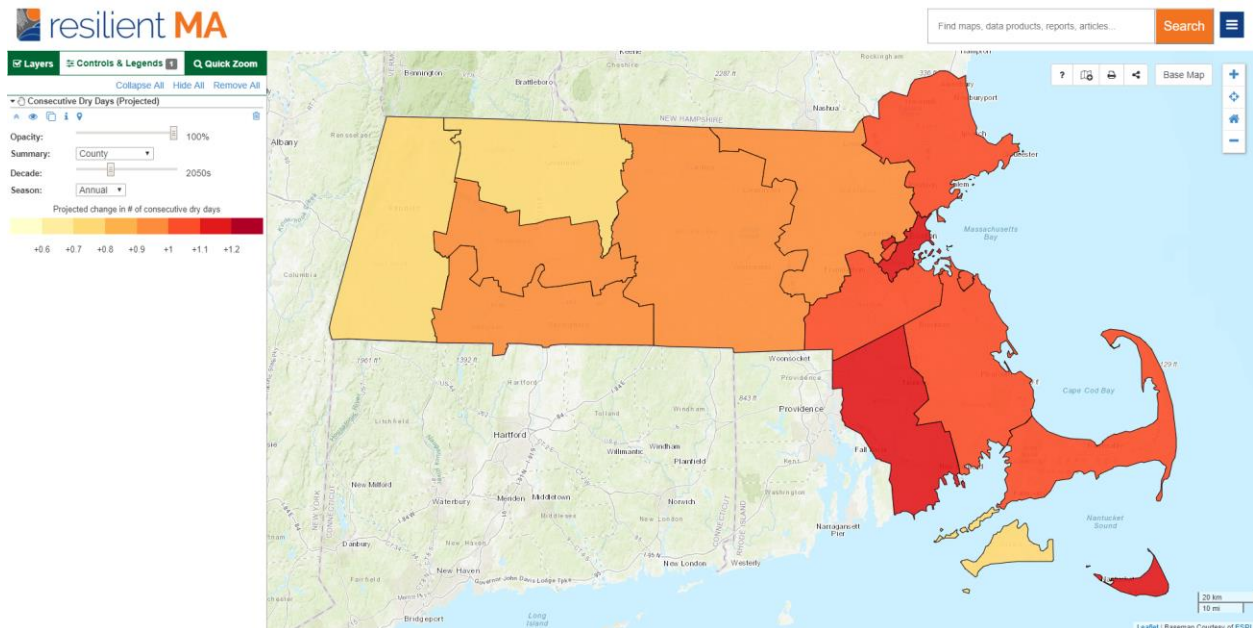
## Drought

While average annual precipitation is likely to increase in the coming years, the pattern of precipitation also expected to include more frequent dry periods and droughts. Massachusetts has already experienced two significant droughts in 2016 (see figure below) and 2020, the most significant since the early 1980’s. The states climate date center, Resilient MA, projects a small increase in the number of consecutive dry days per year (see map below).

## The drought of 2016 was the most significant drought in MA in 34 years



## Projections for Number of Consecutive Dry Days Per Year by MA County (Resilient MA)



## APPENDIX H – TOPSFIELD MVP LISTENING SESSION

The Town of Topsfield held its MVP Public Listening Session on June 24, 2021, as a remote public meeting via Zoom. The session was held in conjunction with a public meeting on the Draft Topsfield Hazard Mitigation Plan 2021 Update, which has been prepared concurrently with the MVP project under the direction of the Topsfield Core Team.

An overview presentation was given on climate trends and vulnerabilities facing Topsfield, highlights of the town's strengths and assets, and a summary of the highest priority actions identified by the Community Resilience Building workshop held on April 14, 2021. After the presentations the draft MVP Summary Report and the draft Hazard Mitigation Plan were available for downloading on the MAPC website.

Below are materials circulated by email and on the Town's website to publicize the Listening Session, followed by highlights of the meeting presentation.



# **Topsfield Hazard Mitigation and Municipal Vulnerability Preparedness Public Listening Session**

*Natural hazards and climate change can have serious impacts on Topsfield's residents and businesses*



The Town of Topsfield has conducted a **Community Resilience Building** workshop to increase its resilience to climate change and has also prepared a draft **FEMA Hazard Mitigation Plan** to reduce the Town's vulnerability to natural hazards such as flooding, hurricanes, and blizzards. Please join the Town for a presentation and public listening session about this important project. Your input is important to the Town, and your questions and comments are welcome.

*All neighboring towns to Topsfield are invited to participate*

Public Listening Session, virtual meeting via Zoom  
Thursday, June 24, 2021 at 1:00 PM

To receive the Zoom meeting link  
Please send an email to [topsfieldresilience@mapc.org](mailto:topsfieldresilience@mapc.org)

For more information, contact Chief Jen Collins-Brown at  
[jcollinsbrown@topsfield-ma.gov](mailto:jcollinsbrown@topsfield-ma.gov)



Amanda Linehan, Communications Manager, Metropolitan Area Planning Council  
617-933-0705, [alinehan@mapc.org](mailto:alinehan@mapc.org)

### CALENDAR LISTING / MEDIA ADVISORY

## **TOPSFIELD'S HAZARD MITIGATION AND COMMUNITY RESILIENCE PROJECTS TO BE PRESENTED AT JUNE 24 PUBLIC MEETING ONLINE VIA ZOOM**

**What:** On June 24 at 1:00 PM the town of Topsfield will host an online public meeting via Zoom to discuss the town's Hazard Mitigation Plan and its Municipal Vulnerability Preparedness project..

The Town of Topsfield has prepared a FEMA Hazard Mitigation Plan as well as a Municipal Vulnerability Preparedness (MVP) project to reduce the town's vulnerability to natural hazards such as flooding, hurricanes, and blizzards, and increase resilience to the impacts of climate change. Please join the meeting for a public presentation about Hazard Mitigation Plan and MVP project at a virtual meeting via Zoom.

**Who:** Topsfield residents, business owners, civic organizations and institutions are invited to participate the public meeting and provide their questions and comments as part of this effort to plan for a resilient future for the Town of Topsfield.

**When:** Thursday, June 24, 2020, 1:00 PM

**Where:** Online meeting via Zoom. To receive the Zoom log on link, please send a request to [topsfieldresilience@mapc.org](mailto:topsfieldresilience@mapc.org)

MAPC is the regional planning agency for 101 communities in the metropolitan Boston area, promoting smart growth and regional collaboration. More information about MAPC is available at [www.mapc.org](http://www.mapc.org).

##



## Municipal Vulnerability Preparedness and Hazard Mitigation Plan

### Topsfield Public Meeting / Listening Session

Jen Collins Brown  
Fire Chief/ Emergency Management Director  
Martin Pillsbury  
MAPC Environmental Planning Director

June 24, 2021



## Natural Hazards and Climate Resilience

**EEA**

**Municipal  
Vulnerability  
Preparedness  
Project**



**Hazard Mitigation Plan &  
Municipal Vulnerability  
Preparedness Project**

**TOPSFIELD  
COMMUNITY  
RESILIENCE**



**TOWN  
ELIGIBLE FOR  
FEMA & MVP  
GRANTS**

**FEMA**

**Hazard  
Mitigation  
Plan**



## **Topsfield Community Resilience Building Workshop**



### **Workshop Objectives**

- **Understand extreme weather and climate hazards**
- **Identify community strengths and vulnerabilities**
- **Develop opportunities to take action to reduce risk and build resilience**

## **Topsfield MVP Project**

**The MVP project addresses  
Topsfield's expected climate  
hazards:**

- **Inland flooding**
- **Extreme Heat**
- **Extreme cold/winter  
storms**
- **Drought**

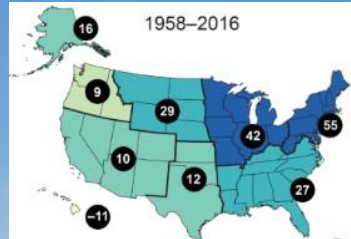
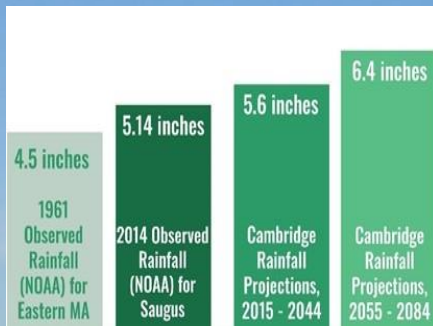
**From the perspectives of:**

- **Infrastructure**
- **Environment**
- **Society**

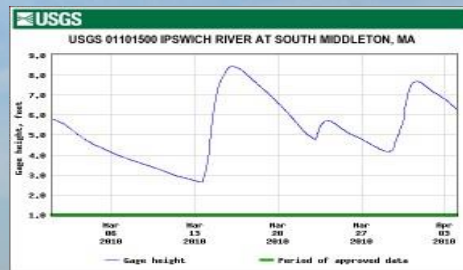


## Climate Trends: Precipitation

**Increase in the 10-year 24-hour "design storm"**



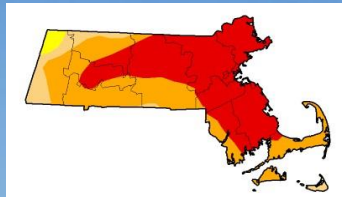
**55% increase in rainfall in the top 1% events, 1958 - 2016**



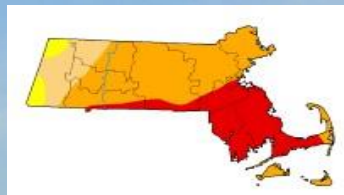
**March 2010 Ipswich River Gage**

## Climate Trends: Drought

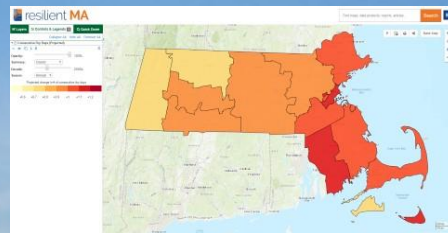
**2016**



**2020**



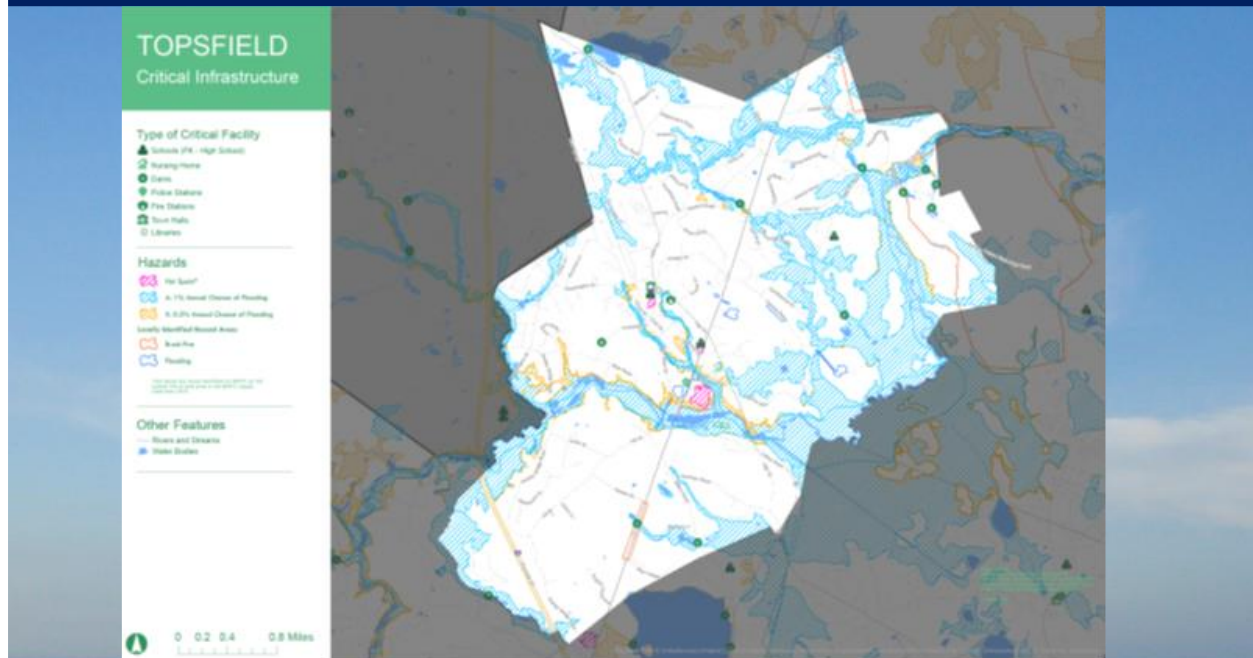
**Projection for 2050**



**Consecutive dry days to increase from 17 days to 18 days annually by 2050.**

**The drought of 2016 was the worst in 35 years, followed by another in 2020**

## FEMA Flood Hazard Areas



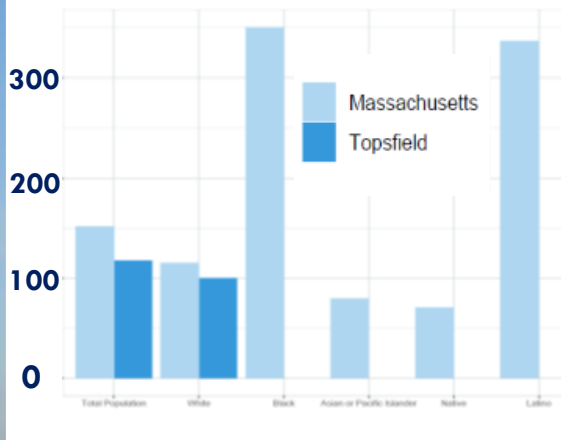
## Tree Canopy



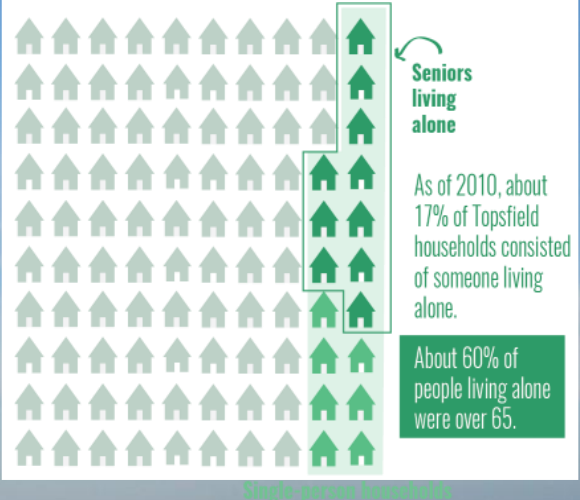


## Social Vulnerability to Climate Impacts

Asthma Hospitalizations per 100,000



People Living Alone in Topsfield



## CRB Workshop: Community Strengths and Assets

- COA, information for seniors., volunteer network
- Fire and rescue team and Police Dept– terrific leadership; thinking ahead.
- DPW has three generators - pumping station, garage, and treatment plant
- New Water treatment plant
- Churches - help with outreach, food pantry
- Northern Essex Mass Medical Reserve Corps
- Regional dispatch provides tremendous services
- Public Health preparedness booklets for outreach
- Switched Reach
- Cable Television used for education
- Senior housing - Housing Authority and Over-55 developments
- A lot of protected land in the floodplain and wetlands
- Recreational trail system and open space
- Working Farmland

### CRB Workshop: Top Priority Actions

<b>Infrastructure</b>	Address impacts of intense winds on powerlines, including tree maintenance and pole replacement. Prepare the tree canopy for increased pests. Look into doing a tree inventory, emphasize native species.
<b>Environmental</b>	Work with state and federal officials to find a watershed-wide solution to Ipswich River water withdrawal issues.
<b>Infrastructure</b>	Tackle Ipswich River flooding issues. Road elevations and culverts need to be addressed as a system. Identified areas include Route 1, Salem Rd., Rowley Bridge Rd., East St., Pond St. Wildes Rd. Need to find solutions to flooding caused by beavers.
<b>Infrastructure</b>	Storm Water Drainage/Infrastructure: some places don't have stormwater drainage systems. A town-wide drainage model would be beneficial. Make sure that design keeps in mind the new reality of increased rainfall.
<b>Societal</b>	Do a housing inventory study and a master plan to create zoning that allows people to age in town in appropriate manageable housing. This could also help address issues of isolation.
<b>Infrastructure</b>	Consider sewage treatment. Septic systems are increasingly subject to flooding and high groundwater levels.

### CRB Workshop: Top Priority Actions

<b>Societal</b>	A communication Plan is needed for emergency communication; redesigning the town website
<b>Infrastructure</b>	Address drainage concerns along the rail trail to prevent flooding.
<b>Environmental</b>	Conduct an assessment of the trees across the town, particularly along major roadways, and develop a plan to identify weak trees and replace them. Program to be implemented by both the Town and National Grid.
<b>Societal</b>	Address the needs of Low-income seniors in town, and those who come into town for work. Education campaign; establish a stakeholder/focus group with people connected to these Environmental Justice communities, and blogs for these groups.
<b>Societal</b>	Since the town does not have any full-service shelters, locations should be identified, and plans developed to establish such shelters
<b>Infrastructure</b>	Conduct an assessment of the generators in town facilities and identify which ones need to be replaced.