



# City of Greenfield



**Municipal Vulnerability Preparedness (MVP) Program**

# **MVP Resiliency Plan**

**June 2021**

Facilitated by the  
Franklin Regional Council of Governments  
A State-Certified MVP Provider



# MVP Resiliency Plan

Including the Summary of Findings from the  
Community Resilience Building Workshop

March 2021

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# City of Greenfield

## Community Resilience Building Workshop

### Summary of Findings

#### **Overview:**

Throughout Franklin County, Massachusetts, communities are experiencing more extreme weather events – especially heavy rains and flooding – along with higher temperatures and other climate-related conditions. These types of conditions are predicted to increase as a result of climate change. According to down-scaled climate data from [resilientMA.org](http://resilientMA.org),<sup>1</sup> the major climate change drivers in Franklin County and Greenfield are:

- An increase in average temperature, as well as more extreme heat and extreme temperature fluctuations;
- An increase in annual precipitation and an increase in very heavy precipitation events – where more rain, snow, or ice falls in a short period of time – interspersed at times with very dry periods;
- Stronger storms with higher winds, due to an overall warmer climate with more moisture in the atmosphere.

In the face of these changes, municipalities are working to increase their resilience and adapt to natural hazards and extreme weather events. Relatively recent events in Franklin County, such as Tropical Storm Irene (August 29-30, 2011) and “Snow-tober” (October 28, 2011), have reinforced the need for resiliency planning and compelled communities like the City of Greenfield to proactively plan and mitigate potential risks. This type of planning will reduce the vulnerability of Greenfield’s people, infrastructure and natural resources, and will empower Greenfield’s officials and citizens to take steps to protect themselves and their community.

With funding from the Massachusetts Executive Office of Energy and Environmental Affairs’ Municipal Vulnerability Preparedness (MVP) program, the City of Greenfield hired the Franklin Regional Council of Governments (FRCOG) to assist the City in completing the planning process to achieve designation as a Municipal Vulnerability Preparedness Community or “MVP” Community. As a State-certified MVP Provider, the FRCOG helped Greenfield engage in a community-driven process that brought together climate change information and local knowledge to conduct community outreach and the Community Resilience Building (CRB) workshop, whose central objectives were to:

- Define top local natural and climate-related hazards of concern;
- Identify existing and future strengths and vulnerabilities;

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<sup>1</sup> <http://www.resilientma.org/map/>

- Develop prioritized actions for the City;
- Identify immediate opportunities to collaboratively advance actions to increase resilience.

This report summarizes the findings of outreach and the City of Greenfield's Community Resilience Building Workshop.

## Community Resilience Building: Stakeholder Outreach & Workshop

### Stakeholder Outreach

The City of Greenfield planned to hold their Community Resilience Building Workshop in early April 2020, but the meeting was ultimately cancelled due to the ongoing COVID-19 pandemic. In place of an in-person workshop, the Committee devised a plan to remotely complete the objectives of the MVP Planning process. The City was committed to gathering input from community members in order to build the recommendations presented in the plan.

Beginning in July, the Committee compiled a list of fifty-five stakeholders, which was representative of Greenfield's local businesses, municipal departments and boards, social service organizations, and community groups. Informational packets about the MVP program, risks associated with climate change, sample interview questions, and findings from Greenfield's recently updated Hazard Mitigation Plan were sent out to each stakeholder.



Committee members gathered information via surveys completed online, phone interviews and a meeting with the Franklin County Resource Network<sup>2</sup> in order to learn about how community members and local services have been impacted by climate change and what their concerns are for the future. Community groups such as Greening Greenfield, the Greenfield Tree Committee, and the Sustainable Master Plan Implementation Committee used the survey at their monthly meetings to gather input from members and submitted detailed responses to help shape the recommendations presented in this plan. Information gathered from all of these sources was displayed in an interactive StoryMap<sup>3</sup>, which was posted on the main page of the City's website, in order to educate residents about this planning process and share findings from the community outreach. Outreach packets and responses are presented in the Appendix.

<sup>2</sup> The Franklin County Resource network is a group that represents over 60 social and human service agencies that serve residents of Greenfield and Franklin County.

<sup>3</sup> <https://storymaps.arcgis.com/stories/10c6c405e6a4475f841757417fd97cad>



## Summary of Findings

The City of Greenfield, population 17,375, has conducted a number of planning projects in previous years, including its 2020 Hazard Mitigation Plan, which enabled the City to identify high priority hazards as well as areas, infrastructure and populations vulnerable to a variety of hazards, and action items to potentially address hazards. Other recent Greenfield plans include: Sustainable Master Plan (2014), Complete Streets Prioritization Plan (2017), and the forthcoming Pollinator Action Plan (2021) and Open Space and Recreation Plan (2021).

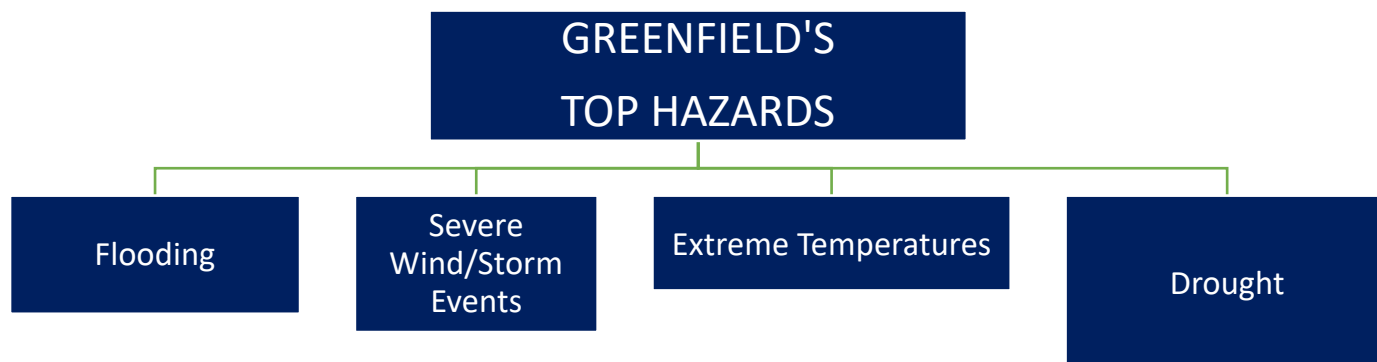
In spite of Greenfield's diligence in completing these planning efforts, there was still a need for the community to conduct a hazard assessment across scales – from individual buildings and bridges to rivers and landscapes, and across sectors – infrastructure, society and environment – looking specifically through the lens of climate change and its likely impacts.

Workshop participants considered climate change impacts most likely to impact Greenfield, including rising and extreme temperatures, extreme weather events and increased precipitation, both in quantity and intensity.

The workshop was critical to enabling participants to think about and engage with people from different sectors and reflect on the information gathered through community outreach. People representing the Planning and Development department, Department of Energy and Sustainability, Recreation Department, Planning Board, Zoning Board of Appeals, Greening Greenfield, the Greenfield Tree Committee, and interested residents came together to discuss the most threatening hazards to the City of Greenfield and to agree upon high priorities and actions to address them.

### ***Top Hazards***

Workshop participants discussed a number of hazards that impact Greenfield, deliberating on how frequent, how intense and how widespread each hazard has been and could potentially be in the future. Hazards discussed included: dam failures, severe winter storms/ice storms, earthquakes, hurricanes, wind storms/microbursts, tornados, ice jams, floods, wild fires, landslides, droughts, human-made hazards and extreme temperatures. Top hazards identified by through community outreach and confirmed by participants are as follows:



## ***Areas of Concern***

### ***Infrastructure and Transportation:***

Undersized culverts that cannot accommodate heavier stormwater flows; aboveground power lines are vulnerable to natural hazards; waste water treatment plant is in need of additional flood proofing due to its location in the floodplain; poor stormwater drainage on gravel and dirt roads; municipal records are not digitized; high hazard trees that pose threats to the City's infrastructure and residents; mudslides due to heavy rain events; high water table downtown; clogged and overflowing stormdrains; inflow/infiltration issues; structural integrity of the Green River retaining walls on Deerfield Street; impervious surfaces in the downtown area.

***Facilities and businesses:*** Economic impacts of flooding, extreme heat, and drought on farms, economic impacts of severe storms on local businesses, extended internet outages may delay important services during a storm; emergency service facilities are old and aren't large enough to meet current demands.

***Public health:*** insect-borne diseases; illness associated with higher temperatures, need for more swimming opportunities to help residents stay cool during heat waves, unhoused people facing the elements.

***People:*** Seniors on fixed incomes who may not be able to make costly repairs due to damage from flooding or severe storms; homes in the floodplain and/or wildland urban interface, vulnerable populations in the City such as the poor, elderly, those recently released from jail, those with addictions or in recovery; urban heat island effect in the downtown area, lack of shade trees along primary walking and biking routes, need for community gardens in the City's urban center, lack of affordable or universally accessible housing for all residents, climate migration to the Northeast; effective emergency communication with residents.

***Ecosystems and natural resources:*** Invasive species crowding out native species (such as non-native bittersweet, Japanese knotweed, Norway maple, non-native barberry, burning



***Impacts of climate change, such as more frequent and intense flooding events and prolonged droughts, were of concern to workshop participants. Photos courtesy of the Greenfield Recorder.***

bush, garlic mustard); unprotected land in the Green River Corridor; unprotected farmland, vegetation (trees and community gardens) are vulnerable during storm events; insects, birds, and pollinators at risk due to habitat degradation; removal of street trees; farms that serve the Western Mass Food bank are stressed due to more frequent and prolonged droughts; northern hardwood forest species are vulnerable to climate change and pests; increased risk of wildfires due to drought and lightning strikes.

## ***Current Concerns & Challenges Presented by Hazards***

Community members and participants in the workshop discussed a number of hazards that have affected Greenfield in recent years, such as:

- Changes in precipitation including more ice and rain in the winter and increased amounts of precipitation falling in a short period
- Short-term, acute weather events including severe wind events, extreme and erratic temperatures
- Prolonged periods of drought and dry conditions, which increase the potential for a wildfire outbreak

Participants in the workshop expressed concern about flooding issues throughout the City. The Green River has flooded in recent years, which has caused property damage and flooded farm fields. Damage to Greenfield from Tropical Storm Irene in 2011 is still in the forefront for many, as damage was widespread throughout the City and took several years to fix.

Temperature extremes, such as high heat and freezing temperatures were another top concern. The elderly are particularly vulnerable to extreme temperatures and may lack air conditioning or ways to adequately heat their homes. Extreme heat can also contribute to poor air quality by trapping emitted pollutants close to the ground, affecting people with asthma and other respiratory diseases as well as young children and the elderly. Workshop participants noted that the heatwaves that have occurred during recent summers pose a health risk for the City's residents.

Severe storms were also identified as a top hazard. Community members recalled recent severe wind events that led to prolonged power outages, downed trees, and other infrastructural damage. Severe windstorms occurred several times in Greenfield during the summer of 2020.

Drought was another top hazard identified by workshop participants. The drought that lasted through much of 2020 was highlighted during workshop discussions. Concerns were also raised with regard to heavy rains after long periods of drought, which can increase the severity of issues with stormwater runoff. Prolonged droughts can also increase the City's vulnerability to a wildfire outbreak. Nearby Towns in Franklin County such as Leverett and Orange experienced wildfires during the July and August of 2020, which burned a total of more than 60 acres of land in each Town. These fires demonstrated how even mild drought conditions can increase the threat of wildfires.

## ***Specific Categories of Concerns and Challenges***

**Rising CO<sub>2</sub> Concentrations in the Atmosphere:** Although the MVP program's primary focus is adapting to natural hazards as they become more frequent and intense due to climate change, many participants in this process advocated to call attention to the current realities of the climate crisis. Therefore, it is also important to highlight the need for the City to continue efforts to reduce greenhouse gas emissions as a part of its climate change resiliency plan. Greenfield has already made a commitment to a fossil free future, and can continue to work on actions outlined in the action plan to reduce emissions.

**Undersized Culverts/Localized Flooding:** Workshop participants raised concerns about the City's culverts, which are undersized and cannot accommodate heavier stormwater flows, leading to localized flooding events throughout the City. Greenfield has a recently updated Hazard Mitigation Plan, which details the need for culvert upsizing, replacement and maintenance at the following locations: Spring Terrace, Crescent Street, Maddison Circle, Green and Cooke Streets and Greenway Lane, and Hastings, Haywood and Riddell Streets neighborhoods where the Maple Brook Culvert backs up during heavy rain events. Greenfield also has several bridges that are vulnerable to flooding, and under-performing bridges are a focus of replacement and upgrade efforts. Bridges on Silver Street, Colrain Street, and Meridian Street have been identified by the committee as requiring assessment and possible improvements or replacement.

According to the Greenfield City Engineer, the Maple Brook culvert is the primary drainage system for 1,000 acres of the City's most urbanized area. The culvert was built in the 1930's. The culvert is in poor condition and studies have shown that it is significantly undersized for the current flows. The City of Greenfield has a Capital Project on the books to replace or rehabilitate the culvert. The estimated project cost as of the 2005 Plan was \$1,750,000.

Other areas in the City that are known to experience chronic localized flooding include the Green River Cemetery, the Meadow's Golf Course, Nash's Mill Road, and the Green River Park.

**Waste Water Treatment Plant:** Located in the flood plain of the Green River, Greenfield's municipal sewer system services the City's central, urbanized area and approximately 75% of the residential dwelling units in the City. This facility underwent a \$9.2 million dollar upgrade – including flood proofing – in 2000. Then in 2011, Tropical Storm Irene's flood waters reached 142 ½ feet, inundating the wastewater treatment plant, which was flood-proofed to elevation 140 feet. As a result of this event, another round of upgrades at the plant was completed in 2014 to raise the flood doors 144.3 ft.<sup>4</sup> However, workshop participants identified that this facility is still of concern and needs additional upgrades in order to build resiliency against future flooding events, and other updates are needed to reduce inflow and infiltration pressure and reduce the risk of combined waste water and storm water hazard events.

**Energy Resilience:** Greenfield's power grid was considered by MVP workshop participants to be vulnerable to natural hazard impacts, such as severe storms that topple trees and bring broken

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<sup>4</sup> 2020 City of Greenfield Hazard Mitigation Plan



branches down on power lines. Snow has been less of an issue compared to ice storms causing power outages in recent years. The City's electrical infrastructure is aboveground and repairs are becoming more expensive. Greenfield has several capital improvement projects planned for the downtown area, during which it may be possible for utilities to be moved underground, which would increase resiliency for many services located in the City's center.

**Extreme Heat/Urban Heat Island Effect:** Greenfield's downtown area is mostly comprised of impervious surfaces, which makes the City center vulnerable to the heat island effect. Heat islands occur when hardscapes (such as buildings, parking lots, and/or) result in conditions that cause land surface temperatures to exceed air temperatures.<sup>5</sup> Workshop participants voiced concerns that this effect is detrimental to public health, and that hardscapes should be replanted with raingardens and street trees to help cool the downtown area for pedestrians and cyclists.

Additionally, as Greenfield continues to experience prolonged heat waves in the summer, there is a need to address the need for more ways for residents to cool off. Suggestions that came up during the workshop included increasing the number of legal swimming areas in the City and continuing to advocate for bus routes that link the downtown area to the Green River Swimming Area.

**Street Trees:** Street trees are also part of the City's critical infrastructure, as they help to slow the intensity of precipitation as it approaches the ground, provide shade to structures and sidewalks during heat waves and reduce the heat island effect as described above, and break the force of wind during storms.<sup>6</sup> Therefore, creating a healthy urban forest is an important strategy for building resilience to climate change. The Greenfield Tree Committee has completed an inventory of the street trees in the urban core of the City, which included a tree health assessment. This assessment found 11% of the City's street trees are in poor condition (meaning some of the following statements are true: the tree trunk has extensive decay or hollow, two or more major limbs are missing, the tree has a partial crown, or two or more diseases are present); 77% of the trees in poor condition are Norway maples.<sup>7</sup>

The draft inventory also states the maintenance needs of the City's street trees on a scale from Critical – Low. A rating of "Critical" indicates that the tree poses an imminent threat to public safety, with large dangling branches over the sidewalks/road or a broken trunk, whereas a rating of "Low" indicates no maintenance is needed. Only 1% of the City's street trees have Critical maintenance needs, and 7% have a High maintenance need.

**Northern Hardwood Forests:** Workshop participants also discussed the ways in which climate change is affecting forests. A longer growing season and increasing temperatures are shifting habitat conditions for trees northward and to higher elevations. Over time, the birch-beech-maple forests typical of New England will decline while oak-hickory forests more typical in areas south of New England will thrive. An expected increase in periods of drought between intense

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<sup>5</sup> Wong, E. (2014). Reducing Urban Heat Islands: Compendium of Strategies Urban Heat Island Basics. Retrieved from <https://www.epa.gov/sites/production/files/2014-06/documents/basicscompendium.pdf>

<sup>6</sup> Input received from the Greenfield Tree Committee. Full comments are included in the Appendix.

<sup>7</sup> Greenfield Tree Committee 2020 Tree Inventory and Report Draft

precipitation events may weaken some trees, leaving them more susceptible to insects and diseases, while it may improve conditions for other trees.

**Impacts of Drought, Heavy Precipitation, and Extreme Temperatures on Farms:** Farmers in Greenfield are well acquainted with disruptions to their operations caused by storms, but outreach conducted over the course of this project identified many farmers are concerned about the impacts of climate change. Farmers in Greenfield are dealing with major challenges related to climate change such as wet fields following heavy rains, increased disease pressure, and increased labor costs due to the increased need for more frequent irrigation.

**Vulnerabilities related to wildfire:** Participants also voiced concerns with regard to the possibility of a wildfire outbreak and the City's ability to manage a fire. Combined with other factors such as more frequent and prolonged droughts, stands of dying Eastern Hemlock trees, and an increase in lightning strikes, wildfire could spread quickly in some areas of the City and pose a threat to emergency evacuation routes.

**Invasive Species:** Norway maples pose a threat to the biodiversity of the City's forests, as they are known to develop dense stands that outcompete native plants. Additionally, Japanese knotweed contributes to the erosion of riverbanks throughout the City and sedimentation in the Green River.

**Vector-borne diseases:** Massachusetts has seen cases of once non-existent or very rare tick-borne illnesses rise, including Anaplasmosis, Babesiosis, Lyme, Powassan, Spotted fever rickettsiosis and Tularemia. Tick activity and tick-borne diseases occur year-round in Massachusetts. Although tick activity is weather dependent, there are two peaks during the year; the first begins in March/April and lasts through August, and the second occurs in October-November. The majority of cases of tick-borne disease occur in June through August. Tick-borne diseases experienced by residents and identified in lab tests of ticks have increased in number and in kind across Franklin County due to climate change over the last ten years. Franklin County's rate of emergency department visits for tick-borne diseases is among the highest in the state.

**Vulnerable Populations:** Responses received during community outreach also discussed how climate change may impact the ability of many seniors to age in place. Flooding was noted to have damaged the homes of seniors in Greenfield, which can be costly to repair. Seniors on fixed incomes may not be able to afford needed repairs. Additionally, concerns were raised about some seniors not having air conditioning in the summer months, and during the winter they may be reluctant to turn on the heat due to the high cost of fuel.

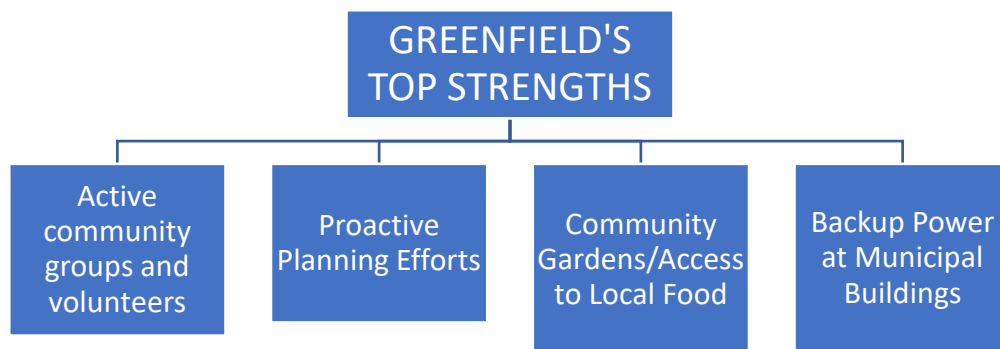
Workshop participants also discussed the need for resources for the homeless in Greenfield so that they are not exposed to the elements (such as warming & cooling centers, recovery services, and public toilets and water.)

**Climate Migration:** The Sustainable Greenfield Implementation Committee raised the important issue of climate migration and climate refugee gentrification in their responses to the MVP survey. Rising sea levels on the coast of Massachusetts and neighboring states may drive people to areas such as interior New England. Rising temperatures, wildfires, and other climate

change impacts could also lead to a migration of people from southern and western parts of the country to the Northeast. With improved broadband service and passenger rail service in the region, Greenfield may become an attractive place for new residents to locate. In order to prevent or plan ahead for rising housing costs associated with climate migration, there is a need to ensure there is enough affordable and universally accessible housing in the City, and continue to seek funding to build more affordable housing. Other opportunities to prepare for climate migration is presented in the Action Plan.

## ***Current Strengths and Assets***

Greenfield's emergency planning and response procedures are regularly reviewed and updated. The City has taken a proactive approach to emergency preparedness, which was evident at the workshop as participants readily provided known vulnerabilities, but also strengths and actions to address these vulnerabilities. Participants cited several strengths and assets that help keep their community resilient in the face of climate change and other challenges. They include:



***Societal Strengths and Assets:*** These include Greenfield's informal community leaders, neighborhood groups and communication networks. Groups such as Greening Greenfield, and the Greenfield Tree Committee are committed to environmental stewardship, habitat conservation, clean energy, native pollinators, and a healthy urban forest. These groups work with residents and City leaders to move projects forward that help increase resilience to climate change. The Greenfield Tree Committee is starting a nursery at the Just Roots Farm and can provide some low cost street trees to the City of Greenfield.

***Proactive Planning Efforts:*** The City recently updated their Hazard Mitigation Plan, and then applied for a Hazard Mitigation Grant through FEMA and received funding for a backup generator at the Millbrook Well site. The addition of the generator will ensure that the municipal water supply will not be interrupted during power outages.

In 2014, Greenfield adopted a Sustainable Master Plan that guides many of the City's climate resilience efforts. There is an active implementation Committee for this plan.

Greenfield's zoning bylaws were recently updated to incorporate requirements for Low Impact Development (LID) and require undergrounding of utilities in new subdivisions. The City was also the first municipality in the state to adopt the Commonwealth's new model floodplain bylaw.

The Department of Energy and Sustainability leads the City's Green Communities work, and has recently installed EV charging stations throughout the City in addition to weatherizing municipal buildings to decrease energy needs. The Department is interested in adding solar panels at parking lots downtown.

The City of Greenfield's municipal departments are collaborative and work together to ensure all projects adhere to the City's Sustainable Master Plan.

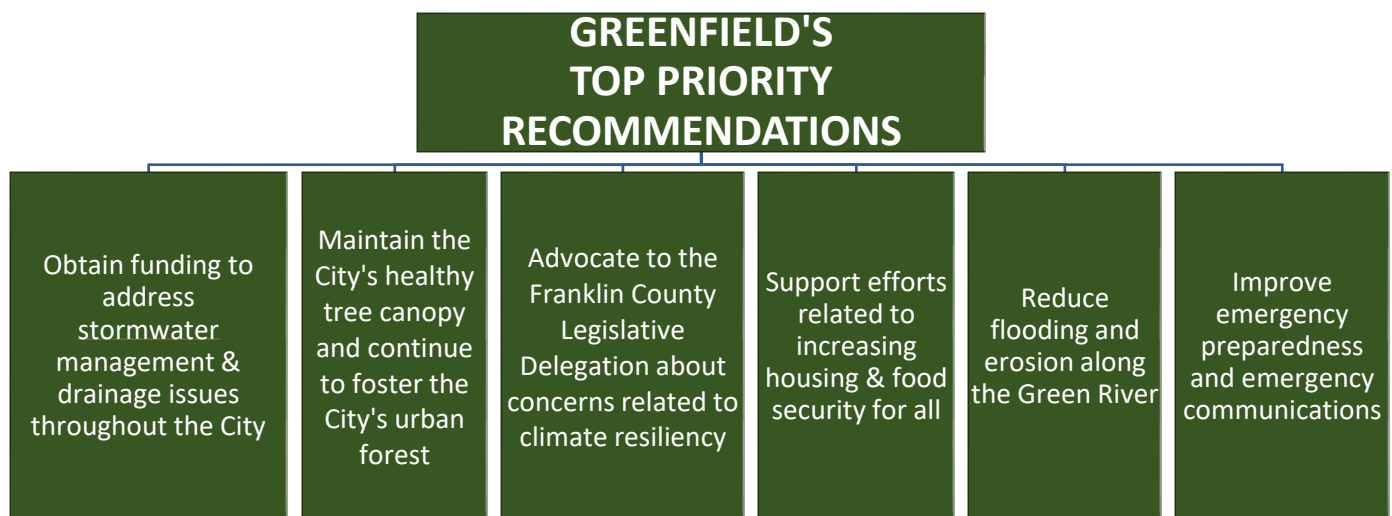
**Access to Local Food:** Access to local food is widespread in Greenfield. The Greenfield Community Farm/Just Roots farm supports over 60 plots for residents and local organizations. The City also has private farmers, farmers markets, Foster's, Community Meals programs, and Green Field's market. Greenfield is a Right-To-Farm Community. Local churches provide meals as well. Efforts to create more community gardens in the City's urban center are currently underway, such as the one by a volunteer group on Chapman Street.

**Backup Power:** The City has recently added generators to the City Hall, Middle School, and DPW building to increase energy resiliency. Greenfield is a Green Community and consistently is working to make City buildings more efficient. A current priority is to install rooftop solar on municipal buildings.



## ***Top Recommendations to Improve Resilience***

At the conclusion of Greenfield's virtual MVP workshop, participants opted to prioritize action items during the Community Listening Session. Action items developed during the workshop were synthesized and presented to Listening Session participants for further discussion in order to determine the City's top priorities. The list of top priority recommendations is aligned with the City's Sustainable Master Plan, Natural Hazard Mitigation Plan, and Open Space and Recreation Plan, all of which prioritize climate resiliency. All recommendations address key vulnerabilities while building upon current strengths. Actions are summarized below and presented in further detail in the Community Resilience Building Matrix.



### ***Obtaining funding to address stormwater management & drainage issues:***

- Hire a consultant to inventory and map all culverts in the City; expand on the High Risk Culvert mapping completed by FRCOG. Prioritize repairs and replacements as needed.
- Hire a consultant to update cost estimates & engineering solutions for the Maple Brook Culvert

### ***Protecting existing trees and plan additional trees in the City center and on public land:***

- Seek funding to continue the systematic planting of primarily native large stature shade trees, including drought tolerant species in priority planting zones in the urban core
- Inventory all trees on municipal and public properties and determine maintenance needs
- Advocate for more tree planting near Baystate Medical Center
- Address the need for shade tolerant and salt tolerant trees at the Jon Zon Community Center
- Complete pruning and/or the removal of identified high hazard trees

### ***Advocate to the Franklin County Legislative Delegation about concerns related to climate resiliency:***

- Work with Franklin County representatives to advocate for a streamlined permitting process for parking lot solar panels
- Aboveground power lines are vulnerable to natural hazards; burying all power lines in the City is a cost prohibitive measure. Advocate to the Franklin County delegation about these issues and request they communicate with utility companies (Eversource/DPU) about these issues
- Advocate to the Franklin County Legislative Delegation to pass legislation that would amend the state school curriculum to include climate change education
- Advocate to the Franklin County Legislative Delegation to work with utility companies to make it easier for residents to set up interconnection agreements to facilitate solar PV installations

### ***Support efforts related to increasing housing & food security for all:***

- Identify locations for community gardens in Environmental Justice neighborhoods
- Create a municipal position for a part-time garden organizer
- Adopt Housing for all & Housing First policies and practices, as detailed in the Action Plan

### ***Protect and preserve agricultural lands:***

- Develop through local zoning, an agricultural overlay district in order to encourage the preservation of agricultural land
- Re-establish the City's fund to pay into the local match for the APR program

### ***Reduce flooding and erosion along the Green River:***

- Address bank stabilization, plant native trees and shrubs, develop and implement a knotweed eradication plan at Millers Meadow (also known as Wedgewood Gardens site)
- Stabilize the river bank and repair the retaining wall at the Green River Swimming Area on Nash's Mill Road
- Hire a consultant to prepare final designs and cost estimates for climate resiliency projects identified in the *Green River Corridor Mapping and Management Report* (2019) and to expand River Corridor mapping to tributaries of the Green River
- Consider zoning changes to add a River Corridor Overlay District to ensure public safety and healthy watershed function along the Green River

### ***Improve emergency preparedness and emergency communications:***

- Develop an emergency communications plan, which would include revitalizing the City's Reverse 911 system and conducting outreach to residents about shelters and other resources
- Develop "Rip and Run" task sheets to efficiently delegate emergency management across City Departments during hazard events

# Community Resilience Building Risk Matrix



www.CommunityResilienceBuilding.org

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

**V** = Vulnerability **S** = Strength

## Top Priority Hazards

<u>H</u> - <u>M</u> - <u>L</u> priority for action over the <u>S</u> hort or <u>L</u> ong term (and <u>O</u> ngoing) <u>V</u> = Vulnerability <u>S</u> = Strength				Recommendations	Flooding	Extreme Temperatures	Drought	Severe Wind	Priority	Time
Features	Location	Ownership	V/S						<u>H</u> - <u>M</u> - <u>L</u>	<u>S</u> hort <u>L</u> ong <u>O</u> ngoing
Infrastructural										
Culverts	City wide	City	S/V	Culverts throughout the City are undersized - both culverts that are subject to MA River & Stream Crossing Standards and smaller drainage infrastructure. Greenfield’s DPW doesn't have adequate resources to address these issues as they arise. The City has major culverts mapped, but does not have a full inventory of all drainage infrastructure. Hire a consultant to inventory and map all culverts in the City; expand on the High Risk Culvert mapping completed by FRCOG. Prioritize repairs and replacements as needed.	X				H	O
	Maple Brook Culvert	City	V	Hire a consultant to update existing cost estimates and engineering solutions (now over 15 years old) for replacement and rehabilitation of the existing Maple Brook Culvert. Work should incorporate NBS and be segmented by priority. Specific areas of concern include: Spring Terrace, Crescent Street, Madison Circle, Green and Cooke Streets and Greenway Lane, and Hastings, Haywood and Riddell Streets neighborhoods where the Maple Brook Culvert backs up during heavy rain events, including near 34 Riddell Street, which is the proposed location of a new climate controlled storage facility.	X				H	L
Stormwater Flooding	Priority Areas	City	V	Hire a consultant to evaluate and prioritize localized stormwater flooding problem areas within the City, data from high-risk culvert inventory prepared by FRCOG, abandoned or tax lien properties, and River Corridor Mapping and develop conceptual designs and cost estimates for stormwater management and flood resilience options, including: infrastructure replacement and upgrades, and nature-based solutions (NBS) such as daylighting streams and creating retention basins to attenuate flood flows, especially in flood-prone areas of the City.	X				M	O
Waste Water Treatment Plant	Deerfield Street	City	S	The City recently completed a Citywide phased Sewer System Evaluation Survey (SSES) to identify Inflow/Infiltration issues. The survey identified necessary repairs to the system and the City is working on moving forward with repairs to sewer pipes and manhole linings.	X				N/A	N/A

# Community Resilience Building Risk Matrix



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

## Top Priority Hazards

Features	Location	Ownership	V/S	Recommendations	Flooding	Extreme Temperatures	Drought	Severe Wind	Priority	Time
									H - M - L	Short Long Ongoing
			V	Continue efforts to separate domestic sump pump outfall from municipal sewer system to reduce pressure on municipal wastewater treatment facilities and to comply with DEP/EPA regulations.	X				H	O
			V	Hire a hydraulic engineer to conduct a feasibility study of retrofits for the Wastewater Treatment Plant that would allow the building to be safely inundated by floodwaters as a necessary flood resilience strategy in addition to having raised the flood doors to maximum possible elevation (144.3 feet).	X				M	L
			V	Develop a plan to replace the wastewater treatment plant.	X				L	O
Green River retaining walls	Deerfield Street	City	V	Hire a structural engineering consultant to assess the integrity of the concrete retaining walls on the streambanks of the Green River along Deerfield Street and Meridian Streets and to develop conceptual designs and cost estimates to repair and/or replace the retaining walls.	X				M	O
Landslide Hazards	Priority areas need to be identified	City	V	Complete an inventory of locations in the City, especially within the Green River Corridor, where critical infrastructure, including roads, buildings and utilities, are vulnerable to fluvial erosion hazards and landslides. Use GIS to analyze soils vs. slope and to identify these potential landslide hazard areas on a map. Indicate where soil borings are needed for more accurate data at significant sites. Hire a consultant to identify retrofitting measures and cost estimates for projects to prevent roadway damage, traffic disruptions, and damage to other critical infrastructure from fluvial erosion hazards and landslides. Update the City's land use regulations to reflect this risk analysis, as appropriate.	X				M	L
Impervious Surfaces	Cemented buffer strips, municipal parking lots, other key areas	City	S	The City's zoning bylaws were updated in January 2021 to incorporate requirements for Low Impact Development.	X	X			N/A	N/A
			V	In order to decrease the amount of impervious surfaces in the downtown area and decrease heat island effect, identify areas within parking lots and other hardscaped areas where some hardscape could be removed, tree planting beds created and trees planted.	X	X			M	O

# Community Resilience Building Risk Matrix



www.CommunityResilienceBuilding.org


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




**V** = Vulnerability **S** = Strength


## Top Priority Hazards


Features	Location	Ownership	V/S	Recommendations	Flooding	Extreme Temperatures	Drought	Severe Wind	Priority	Time
									H - M - L	Short Long Ongoing
			V	Develop and adopt a policy for new and resurfaced municipal and private parking lots that would state the % tree canopy cover rather than requiring a certain number of trees per parking spot. Current zoning bylaws require plantings based on spacing, but revisions should encourage plantings that will support a dense canopy cover.	X	X			M	S
			V	Conduct an analysis of impervious surfaces, slopes, and stormwater drains to determine where the heaviest flows of stormwater enter storm drains, streams and rivers. Determine areas where mass plantings of trees could capture and infiltrate rainfall.	X				L	L
Parking Lots	Downtown Greenfield	City	S/V	Secure funding to cover parking lots downtown with solar panel canopies to decrease the heat island effect and increase renewable energy sources. The City's Department of Energy and Sustainability is working on this project but has not found anything viable yet. Work with Franklin County representatives to advocate for a streamlined permitting process for parking lot solar panels.		X			M	O
Sidewalks	City wide/priority areas	City	V	Sidewalks are in need of repair throughout the City. Develop a policy to require shade tree plantings when sidewalks are repaired or replaced. Require that design and funding for sidewalk and street projects include tree planting. This would improve stormwater management & make sidewalks more walkable for pedestrians.	X	X			M	O
Energy Resiliency	Citywide	Eversource	S	Greenfield's subdivision rules and regulations were recently updated to require undergrounding.				X	N/A	N/A
			S	The Greenfield Tree Committee and DPW collaborated to create an approved tree planting list for sides of the street that have overhead utilities and those that don't.				X	N/A	N/A



Community Resilience Building Risk Matrix				 www.CommunityResilienceBuilding.org						
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					Flooding	Extreme Temperatures	Drought	Severe Wind	Priority	Time
Features	Location	Ownership	V/S						<b>H - M - L</b>	<b>S</b> hort <b>L</b> ong <b>O</b> ngoing
			V	Aboveground power lines are vulnerable to natural hazards; burying all power lines in the City is a cost prohibitive measure. Advocate to the Franklin County delegation about these issues and request they communicate with utility companies (Eversource/DPU) about these issues. Advocate for Eversource to underground lines on Main Street when TIP projects are implemented. Identify other high priority areas for undergrounding and communicate needs to Eversource.				X	H	S
			V	Identify and assess electric boxes located in the 100-year floodplain and ensure they are adequately flood proofed.	X				H	O
			S/V	Advocate to the Franklin County Legislative Delegation to work with utility companies to make it easier for residents to set up interconnection agreements to facilitate solar PV installations.		X		X	H	S
Gravel Roads & Dirt Roads	Priority areas	City	V	Obtain funding for an assessment to determine low cost climate resilient drainage solutions on the City's gravel roads. Identify locations where nature based solutions would be most effective. Drainage solutions should be prioritized on residential gravel roads so residents can safely evacuate.	X			X	M	O
City Buildings	City Hall, Middle School DPW building, other municipal buildings	City	S	The City has recently added generators to the City Hall, Middle School, and DPW building to increase energy resiliency. Greenfield is a Green Community and consistently is working to make City buildings more efficient; a current priority is to install rooftop solar on municipal buildings.		X			N/A	N/A
City Records	Municipal Buildings	City	V	Important City records are not digitized and vulnerable to hazards. Identify municipal records at greatest risk of being damaged during a hazard event and prioritize them for digitization.	X			X	L	O
Public Transit	Downtown and recreation areas	FRTA	S/V	Continue to work with the FRTA to advocate for expanded public transportation options within the City, especially routes that would transport residents from the downtown area to parks and open spaces.		X			H	O

Community Resilience Building Risk Matrix				   www.CommunityResilienceBuilding.org						
<u>H</u> - <u>M</u> - <u>L</u> priority for action over the <u>S</u> hort or <u>L</u> ong term (and <u>O</u> ngoing) <u>V</u> = Vulnerability <u>S</u> = Strength				Recommendations	Flooding	Extreme Temperatures	Drought	Severe Wind	Priority	Time
									<u>H</u> - <u>M</u> - <u>L</u>	<u>S</u> hort <u>L</u> ong <u>O</u> ngoing
Features	Location	Ownership	V/S	Greenfield has recently installed charging stations throughout the City. Seek additional funding to install charging stations at the Jon Zon Community Center, Schools, other frequently visited municipal buildings, and near/on rental properties to increase access for all.					N/A	N/A
EV Charging Stations	Municipal buildings	City	S	The DPW has recently upgraded 4-inch water mains to support firefighting on West Street and Philips Street.		X	X		N/A	N/A
			V	Hire a consultant to update the feasibility study, design, and cost estimates for the West Side Water Project. This project would construct a new 1-3.5 million gallon water storage tank on the west side of City and a 20-inch water transmission main to Main Street to address poor pressure and flows (especially critical for firefighting) as well as provide a backup for the Rocky Mountain Storage Tank.		X	X		M	O
Societal										
Community Gardens/Access to local food	Citywide	Private	S	Access to local food is widespread in Greenfield. The Greenfield Community Farm/Just Roots farm supports over 60 plots for residents and local organizations. The City also has private farmers, farmers markets, Foster's, Community Meals programs, and Green Field's market. Greenfield is a Right-To-Farm Community. Local churches provide meals as well.					N/A	N/A
		Public	S/V	Support Community Gardens: identify viable locations for community gardens and provide municipal land for them, especially Environmental Justice neighborhoods and places with rental housing, where tenants may not have access to land.					H	O
		Public	S	Create a municipal position for a part-time Community Garden organizer to support local food initiatives in the City's urban center.					H	O

Community Resilience Building Risk Matrix				 www.CommunityResilienceBuilding.org						
<b>H-M-L</b> priority for action over the <b>S</b> hort or <b>L</b> ong term (and <b>O</b> ngoing) <b>V</b> = Vulnerability <b>S</b> = Strength				Recommendations	Top Priority Hazards					
					Flooding	Extreme Temperatures	Drought	Severe Wind	Priority	Time
Features	Location	Ownership	V/S						<b>H - M - L</b>	<b>S</b> hort <b>L</b> ong <b>O</b> ngoing
Emergency Notifications	City wide	City	V	The City uses an emergency management system called Greenfield Alert, however it is not frequently used to communicate with residents. Develop a communications plan to determine how and when the system should be used to effectively communicate with residents. Additionally, advocate for increased sign-ups for the system.	X	X	X	X	H	S
			V	Publicize information about sheltering/emergency notifications in multiple languages on the City's website. Develop a universal warning system/alarm system that could quickly notify residents of an emergency.	X	X		X	H	S
Evacuation	Route 91; Routes 5&10	Private	V	Hire a consultant to develop Standard Operating Procedures (SOPs) and checklists of materials, etc. for each City Department to plan for response and evacuating residents, including SOPs to address street closings and sheltering needs. Develop "Rip and Run" task sheets to efficiently delegate emergency management across City Departments during hazard events.	X	X		X	H	S
Emergency preparedness	City wide	Private	V	Continue outreach to residents to improve household disaster preparedness and fire safety. Inform residents and businesses located within flood and dam inundation areas about how to prepare for flooding and safely evacuate. Distribute updated emergency information packets through City Boards and City Council, hold an annual forum at the Council on Aging to better reach vulnerable populations, including seniors and disabled residents, and promote access to the City's Emergency Management website where residents can find out if they live in a flood-prone area and enroll in Greenfield Alert (Emergency Notifications). Utilize the City's website and Cable TV to disseminate information.	X	X	X	X	H	S
			V	Work with the Franklin County Resource Network to make disaster specific pages on the "look4help" website that could assist residents with finding information about sheltering/other resources.	X	X		X	M	O
			V	Make connections & establish communications and trainings in emergency preparedness and de-escalation methods with all local leaders including the Mayor, Councilors, police, fire, churches, medical groups, the	X	X		X	M	O

Community Resilience Building Risk Matrix				 www.CommunityResilienceBuilding.org						
<b>H-M-L</b> priority for action over the <b>Short</b> or <b>Long</b> term (and <b>Ongoing</b> ) <b>V</b> = Vulnerability <b>S</b> = Strength				Recommendations	Top Priority Hazards					
					Flooding	Extreme Temperatures	Drought	Severe Wind	Priority	Time
Features	Location	Ownership	V/S						<b>H - M - L</b>	<b>Short Long Ongoing</b>
				hospital, schools, as well as all civic and social groups so that, in a crisis, everyone has a connection to someone.						
Elderly, isolated, residents with medical / special needs, the homeless and very low income	City wide	Private	V	Promote the formation and maintenance of neighborhood groups. Continue to track vulnerable populations in Greenfield; encourage seniors to sign up with TRIAD.	X	X		X	M	O
			S/V	Adopt Housing for all & Housing First policies and practices: - Seek funding to build more safe & affordable housing - Find creative ways to support homeownership by low-income people such as Land Trusts; Resident Owned Communities (ROC); tiny houses; etc. - Offer public toilets, water, senior center, warming & cooling centers, recovery services. - Prepare for influx of climate refugees: anticipate ways to avoid gentrification/housing cost escalation					H	O
Home heating & cooling	City wide	Private	S/V	Elderly and low-income residents may lack air conditioning and safe ways to heat their homes. Promote Mass Save, including the income-eligible program through Community Action Pioneer Valley, for insulation, air sealing, and heating system/appliance upgrades.		X			H	O
			S/V	Continue to collaborate with the FRCOG's AARC program to assist landlords/owners of multifamily housing units to implement more clean energy technologies.		X			H	O
			V	Adopt a policy to protect renters from utility costs by requiring landlords to disclose utility costs.		X			M	O
Sheltering	Municipal shelters	City	S/V	Review sheltering facilities to ensure they are ADA accessible and make improvements as needed. Additionally, review sheltering spaces and ensure neurodiverse residents are being supported in the shelters. Inventory supplies at sheltering facilities and obtain necessary supplies for children and families.	X	X		X	H	O
Local Food Banks & Distribution Partners	Western Mass Food Bank & Site Partners	Private	V	Run practice drills/scenario role-plays between the Western Mass Food Bank and site partners so that they can be better prepared for natural hazards/emergencies.	X	X	X	X	L	O

## Community Resilience Building Risk Matrix



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**H-M-L** priority for action over the **Short** or **Long** term (and **Ongoing**)

**V** = Vulnerability **S** = Strength

### Top Priority Hazards

Features	Location	Ownership	V/S	Recommendations	Flooding	Extreme Temperatures	Drought	Severe Wind	Priority	Time
									H - M - L	Short Long Ongoing
CDBG Funding for housing safety improvements	Priority areas	Private	S/V	Use CDBG Grants and other funding where available to assist homeowners in storm proofing and rehabilitation of existing homes. The City has CDBG funding and offers a Housing Rehabilitation Program for homeowners to make needed repairs. Information about this program should be advertised to residents.	X	X		X	H	O
Affordable Housing	City wide	Private	V	The City does not have enough affordable or universally accessible housing suitable for all residents. Review zoning bylaws to incentivize developers to build affordable housing in Greenfield. Additionally, identify City parcels that could be used for affordable housing.	X	X		X	H	O
			S	Greenfield adopted the CPA in November, so the City will soon have funds available to build more affordable housing in the City.	X	X		X	N/A	N/A
Safe Swimming Locations	Green River, Connecticut River, Deerfield River, Fall River	Public/Private	S/V	Greenfield has access to 4 rivers within the City, but there are not many legal opportunities for swimming access. Hire a consultant to conduct a feasibility study for additional swimming access points. Creating more safe swimming spaces is a priority for the Recreation Department to ensure residents can cool off during heat waves in the summer.		X			H	L
Climate Change Education in Schools	Greenfield	N/A	S	Work with the School Committee to develop a climate change education program to ensure that young people understand the threat and the opportunities of the climate crisis, with the goal of reducing fear about what their future will look like, and empowering them to be able to make informed decisions, take action, and become active participants in our democracy.	X	X	X	X	L	O
			S/V	Advocate to the Franklin County Legislative Delegation to pass legislation that would amend the state school curriculum to include climate change education.					H	O
Schools	Greenfield Public Schools	Public	S	Air purifiers were recently installed in school buildings.		X			N/A	N/A



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					Flooding	Extreme Temperatures	Drought	Severe Wind	Priority	Time
Features	Location	Ownership	V/S						H - M - L	Short Long Ongoing
			V	Measure and analyze the tree canopy cover (using iTree Canopy) of all public K-12 schools in Greenfield, and develop tree planting plans for each facility with the goals of: decreasing the heat island effect and decreasing heating and cooling costs, providing cooling shade on playgrounds, and improving students' wellbeing and connection to nature.	X	X	X	X	H	O
Coordination between City Departments	Citywide	Public	S	Continue efforts to coordinate between departments to ensure all projects adhere to the policies the City has in place, including supporting the Sustainable Master Plan.	X	X	X	X	N/A	N/A
<b>Environmental</b>										
Shade Trees/Street Trees	Downtown area	City	S/V	Utilize the 2020 Greenfield Tree Inventory Report & 5-year Action Plan to prioritize and guide tree-related decisions. Seek funding to continue the systematic planting of primarily native large stature shade trees, including drought tolerant species in priority planting zones in the urban core. Inventory all trees on municipal/public properties in the urban core and in all City parks and determine need for maintenance and planning.	X	X	X		H	O
	Citywide		V	The neighborhood near the hospital only has 7% tree canopy cover, and there are other neighborhoods that have a low % of tree canopy cover. Advocate for more tree planting by Baystate Medical, and identify high priority areas for tree plantings and obtain funding to complete plantings in those neighborhoods. Aim for at least 40% canopy cover.	X	X	X		H	O
	Jon Zon Community Center,		V	Remove the dead and dying flowering dogwood from the parking lot islands at the Jon Zon Community Center and plant trees that are salt tolerant. <i>Additional details about this project included in the City's Open Space and Recreation Plan.</i>	X	X	X		M	O
	Just Roots Farm	Private	S	The Greenfield Tree Committee is starting a nursery at the Just Roots farm and can provide low cost street trees to the City of Greenfield.	X	X	X		N/A	N/A

## Community Resilience Building Risk Matrix



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### Top Priority Hazards

Features	Location	Ownership	V/S	Recommendations	Flooding	Extreme Temperatures	Drought	Severe Wind	Priority	Time
									H - M - L	Short Long Ongoing
Hazard Trees	Priority areas in the downtown area	City	S/V	The GTC inventoried all high hazard trees in the populated area of the city and identified maintenance needs. Complete tree pruning/removals of trees that are hazardous to roadways and pedestrians.	X			X	H	O
Former Wedgewood Garden Site	Colrain Street	City	S/V	Improve the former Wedgewood Gardens site within the constraints of the floodplain regulations to include the following: <ul style="list-style-type: none"> <li>• Conduct an overall site assessment, to include slopes, drainage, access and circulation, botanical inventory and other such analysis, prior to developing an environmentally sustainable site plan</li> <li>• Continue to address needed riverbank stabilization issues</li> <li>• Develop and implement a Japanese knotweed eradication plan for the river corridor, working with Connecticut River Conservancy as possible</li> <li>• Request the site be prioritized for the annual Green River Clean-Up event.</li> <li>• Plant native tree and shrub species along the river corridor</li> <li>• Assess the possibility of siting a small deck for river viewing and/or fishing on this site</li> <li>• Implement the pollinator planting techniques developed in Greenfield's 2021 Pollinator Plan to plant the steep grassy slope on the east/northeast edge of the site</li> <li>• Ensure adequate space for residents to continue to use the site as a dog-walking area</li> <li>• Work with the relevant entities to identify an alternate overflow parking site for Green River Festival and Wormtown</li> <li>• Design and install interpretive signs that provide info on native pollinator plants</li> </ul>	X	X			H	L

# Community Resilience Building Risk Matrix



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## Top Priority Hazards

Features	Location	Ownership	V/S	Recommendations	Flooding	Extreme Temperatures	Drought	Severe Wind	Priority	Time
									H - M - L	Short Long Ongoing
Pollinator Corridors	Priority areas	City	S/V	Pursue funding to implement actions from Greenfield's completed <i>Pollinator Action Plan</i> , such as: <ul style="list-style-type: none"> <li>Developing support for pollinator habitat demonstration gardens at the Greenfield Public Schools, Greenfield Public Library, and key City-owned open spaces</li> <li>Assessing potential for planting projects on City-owned properties and Right Of Ways</li> <li>Developing and distributing a brochure on incorporating pollinator habitat into the yards and public spaces of businesses</li> <li>Reviewing and updating the City's zoning bylaws to include pollinator friendly language</li> </ul>	X		X		M	L
Contiguous habitat	City wide	City/Private	S	Evaluate parcels for their natural resource value using methods from MassAudubon's MAPPR program, The Nature Conservancy's Resilient Landscapes mapping, and FRCOG's Watershed-Based Plan for the Deerfield River Watershed. Adopt and apply criteria to identify and prioritize protection of land in Greenfield with high-conservation value, such as scenic ridges, farmland, rivers, drinking water, wildlife habitat, unfragmented forest, and upland watershed areas with climate resiliency benefits, such as flood storage. Protect forestland from fragmentation by solar installations and sprawl.	X	X	X		L	L
			S	Combat climate change by increasing the long-term carbon storage of City-owned conservation areas and urban forests by maintaining or increasing forest cover, and exploring opportunities for placing forested lands in carbon trusts.					M	O
Green River Corridor	Green River	Public/Private	S/V	Hire a consultant to prepare final designs and cost estimates for climate resiliency projects identified in the <i>Green River Corridor Mapping and Management Report</i> (2019) and to expand River Corridor mapping to tributaries of the Green River.	X				M	O
			S/V	Consider zoning changes to add a River Corridor Overlay District to ensure public safety and healthy watershed function along the Green River.	X				H	S

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### Top Priority Hazards

Features	Location	Ownership	V/S	Recommendations	Flooding	Extreme Temperatures	Drought	Severe Wind	Priority	Time
									H - M - L	Short Long Ongoing
Farmland	Greenfield, outside of the area bound by Route 91 and Route 2	Private	S/V	Develop through local zoning, an agricultural overlay district in order to encourage the preservation of agricultural land.	X	X	X		H	O
			S/V	Identify high priority parcels that should be conserved, should they come up for right of first refusal under the 61A program.	X				H	S
			S/V	Explore different options for implementing a Transfer of Development Rights (TDR) program, either at the local or regional level. If implemented on the regional level, a feasibility study would need to be completed first in order to identify sending & receiving areas, and determine how to share the tax base between municipalities. If implemented on the local level, the City can explore local models (such Hadley's) to identify appropriate mechanisms to incorporate into their TDR bylaw.	X				M	O
			S/V	Re-establish the City's fund to pay into the local match for the Agricultural Protection Program.	X				H	S
Invasive Species	Priority areas	Public	V	Work to remove invasive species on municipal land. Hire a consultant to work on the following: <ul style="list-style-type: none"> <li>Identifying priority areas with invasive tree and plant species</li> <li>Focus on areas where particular species, including Oriental bittersweet and Japanese knotweed, have overrun the native ecosystem, especially along the Green River</li> <li>Develop management plans for areas such as Temple Woods and Highland Park, where Norway maple trees and exotic plan and shrub species are displacing native species</li> <li>Identify solutions to protect the City's ash Trees from Emerald ash borers without using pesticides</li> </ul>		X	X		H	L
Vector-borne diseases	Citywide	Public	S	Greenfield is a member of the Pioneer Valley Mosquito Control District, which provides trapping and testing services and educational programming.		X			N/A	N/A

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## Top Priority Hazards

Features	Location	Ownership	V/S	Recommendations	Flooding	Extreme Temperatures	Drought	Severe Wind	Priority	Time
									H - M - L	Short Long Ongoing
			V	Explore tick and mosquito control options, and educate residents about risks associated with vector-borne diseases and actions they can take at home to protect their community, such as eliminating sources of standing water.		X			M	O
Greenhouse Gas Emissions	Citywide	Public/Private	V	Reduce climate change emissions wherever possible to achieve state goals and Greenfield's 2009 Commitment to a Fossil-Fuel-Free 100% Renewable Energy Future. In order to prepare of an all-electric future: - Update 2007 Energy Audit to assess energy needs today and in the future. - Create a Climate Action plan to achieve our 2050 goal. - Inventory where solar panels could be placed, and prioritize installations.					H	L

## High Priority Recommendations

- Hire a consultant to inventory and map all culverts in the City; expand on the High Risk Culvert mapping completed by FRCOG. Prioritize repairs and replacements as needed.
- Hire a consultant to update existing cost estimates and engineering solutions (now over 15 years old) for replacement and rehabilitation of the existing Maple Brook Culvert. Work should incorporate NBS and be segmented by priority. Specific areas of concern include: Spring Terrace, Crescent Street, Madison Circle, Green and Cooke Streets and Greenway Lane, and Hastings, Haywood and Riddell Streets neighborhoods where the Maple Brook Culvert backs up during heavy rain events, including near 34 Riddell Street, which is the proposed location of a new climate controlled storage facility.
- Continue efforts to separate domestic sump pump outfall from municipal sewer system to reduce pressure on municipal wastewater treatment facilities and to comply with DEP/EPA regulations.
- Advocate to the Franklin County delegation about these issues and request they communicate with utility companies (Eversource/DPU) about these issues.
- Advocate for Eversource to underground lines on Main Street when TIP projects are implemented. Identify other high priority areas for undergrounding and communicate needs to Eversource.
- Identify and assess electric boxes located in the 100-year floodplain and ensure they are adequately flood proofed.
- Advocate to the Franklin County Legislative Delegation to work with utility companies to make it easier for residents to set up interconnection agreements to facilitate solar PV installations.
- Continue to work with the FRTA to advocate for expanded public transportation options within the City, especially routes that would transport residents from the downtown area to parks and open spaces.
- Support Community Gardens: identify viable locations for community gardens and provide municipal land for them, especially Environmental Justice neighborhoods and places with rental housing, where tenants may not have access to land.
- Create a municipal position for a part-time Community Garden organizer to support local food initiatives in the City's urban center.
- The City uses an emergency management system called Greenfield Alert, however it is not frequently used to communicate with residents. Develop a communications plan to determine how and when the system should be used to effectively communicate with residents. Additionally, advocate for increased sign-ups for the system.
- Publicize information about sheltering/emergency notifications in multiple languages on the City's website.

- Develop a universal warning system/alarm system that could quickly notify residents of an emergency.
- Hire a consultant to develop Standard Operating Procedures (SOPs) and checklists of materials, etc. for each City Department to plan for response and evacuating residents, including SOPs to address street closings and sheltering needs.
- Develop “Rip and Run” task sheets to efficiently delegate emergency management across City Departments during hazard events.
- Continue outreach to residents to improve household disaster preparedness and fire safety. Inform residents and businesses located within flood and dam inundation areas about how to prepare for flooding and safely evacuate. Distribute updated emergency information packets through City Boards and City Council, hold an annual forum at the Council on Aging to better reach vulnerable populations, including seniors and disabled residents, and promote access to the City’s Emergency Management website where residents can find out if they live in a flood-prone area and enroll in Greenfield Alert (Emergency Notifications). Utilize the City’s website and Cable TV to disseminate information.
- Adopt Housing for all & Housing First policies and practices:
  - Seek funding to build more safe & affordable housing
  - Find creative ways to support homeownership by low-income people such as Land Trusts; Resident Owned Communities (ROC); tiny houses; etc.
  - Offer public toilets, water, senior center, warming & cooling centers, recovery services.
  - Prepare for influx of climate refugees: anticipate ways to avoid gentrification/housing cost escalation
- Elderly and low-income residents may lack air conditioning and safe ways to heat their homes. Promote Mass Save, including the income-eligible program through Community Action Pioneer Valley, for insulation, air sealing, and heating system/appliance upgrades.
- Continue to collaborate with the FRCOG’s AARC program to assist landlords/owners of multifamily housing units to implement more clean energy technologies.
- Adopt a policy to protect renters from utility costs by requiring landlords to disclose utility costs.
- Review sheltering facilities to ensure they are ADA accessible and make improvements as needed. Additionally, review sheltering spaces and ensure neurodiverse residents are being supported in the shelters. Inventory supplies at sheltering facilities and obtain necessary supplies for children and families.
- Use CDBG Grants and other funding where available to assist homeowners in storm proofing and rehabilitation of existing homes. The City has CDBG funding and offers a Housing Rehabilitation Program for homeowners to make needed repairs. Information about this program should be advertised to residents.
- The City does not have enough affordable or universally accessible housing suitable for all residents. Review zoning bylaws to incentivize developers to build affordable housing



in Greenfield. Additionally, identify City parcels that could be used for affordable housing.

- Greenfield has access to 4 rivers within the City, but there are not many legal opportunities for swimming access. Hire a consultant to conduct a feasibility study for additional swimming access points. Creating more safe swimming spaces is a priority for the Recreation Department to ensure residents can cool off during heat waves in the summer.
- Advocate to the Franklin County Legislative Delegation to pass legislation that would amend the state school curriculum to include climate change education.
- Measure and analyze the tree canopy cover (using iTree Canopy) of all public K-12 schools in Greenfield, and develop tree planting plans for each facility with the goals of: decreasing the heat island effect and decreasing heating and cooling costs, providing cooling shade on playgrounds, and improving students' wellbeing and connection to nature.
- Utilize the 2020 Greenfield Tree Inventory Report & 5-year Action Plan to prioritize and guide tree-related decisions. Seek funding to continue the systematic planting of primarily native large stature shade trees, including drought tolerant species in priority planting zones in the urban core. Inventory all trees on municipal/public properties in the urban core and in all City parks and determine need for maintenance and planning.
- The neighborhood near the hospital only has 7% tree canopy cover, and there are other neighborhoods that have a low % of tree canopy cover. Advocate for more tree planting by Baystate Medical, and identify high priority areas for tree plantings and obtain funding to complete plantings in those neighborhoods. Aim for at least 40% canopy cover.
- The GTC inventoried all high hazard trees in the populated area of the city and identified maintenance needs. Complete tree pruning/removals of trees that are hazardous to roadways and pedestrians.
- Improve the former Wedgewood Gardens site within the constraints of the floodplain regulations to include the following:
  - Conduct an overall site assessment, to include slopes, drainage, access and circulation, botanical inventory and other such analysis, prior to developing an environmentally sustainable site plan
  - Continue to address needed riverbank stabilization issues
  - Develop and implement a Japanese knotweed eradication plan for the river corridor, working with Connecticut River Conservancy as possible
  - Request the site be prioritized for the annual Green River Clean-Up event.
  - Plant native tree and shrub species along the river corridor
  - Assess the possibility of siting a small deck for river viewing and/or fishing on this site
  - Implement the pollinator planting techniques developed in Greenfield's 2021 Pollinator Plan to plant the steep grassy slope on the east/northeast edge of the site
  - Ensure adequate space for residents to continue to use the site as a dog-walking area

- Work with the relevant entities to identify an alternate overflow parking site for Green River Festival and Wormtown
  - Design and install interpretive signs that provide info on native pollinator plants
- Consider zoning changes to add a River Corridor Overlay District to ensure public safety and healthy watershed function along the Green River.
- Develop through local zoning, an agricultural overlay district in order to encourage the preservation of agricultural land.
- Identify high priority parcels that should be conserved, should they come up for right of first refusal under the 61A program.
- Re-establish the City's fund to pay into the local match for the Agricultural Protection Program.
- Reduce climate change emissions wherever possible to achieve state goals and Greenfield's 2009 Commitment to a Fossil-Fuel-Free 100% Renewable Energy Future. In order to prepare for an all-electric future:
  - Update 2007 Energy Audit to assess energy needs today and in the future.
  - Create a Climate Action plan to achieve our 2050 goal.
  - Inventory where solar panels could be placed, and prioritize installations.

### **Medium Priority Recommendations**

- Hire a consultant to evaluate and prioritize localized stormwater flooding problem areas within the City, data from high-risk culvert inventory prepared by FRCOG, abandoned or tax lien properties, and River Corridor Mapping and develop conceptual designs and cost estimates for stormwater management and flood resilience options, including: infrastructure replacement and upgrades, and nature-based solutions (NBS) such as daylighting streams and creating retention basins to attenuate flood flows, especially in flood-prone areas of the City.
- Hire a hydraulic engineer to conduct a feasibility study of retrofits for the Wastewater Treatment Plant that would allow the building to be safely inundated by floodwaters as a necessary flood resilience strategy in addition to having raised the flood doors to maximum possible elevation (144.3 feet).
- Hire a structural engineering consultant to assess the integrity of the concrete retaining walls on the streambanks of the Green River along Deerfield Street and Meridian Streets and to develop conceptual designs and cost estimates to repair and/or replace the retaining walls.
- Complete an inventory of locations in the City, especially within the Green River Corridor, where critical infrastructure, including roads, buildings and utilities, are vulnerable to fluvial erosion hazards and landslides. Use GIS to analyze soils vs. slope and to identify these potential landslide hazard areas on a map. Indicate where soil borings are needed for more accurate data at significant sites. Hire a consultant to identify retrofitting measures and cost estimates for projects to prevent roadway damage, traffic disruptions, and damage to other critical infrastructure from fluvial erosion hazards and

landslides. Update the City's land use regulations to reflect this risk analysis, as appropriate.

- In order to decrease the amount of impervious surfaces in the downtown area and decrease heat island effect, identify areas within parking lots and other hardscaped areas where some hardscape could be removed, tree planting beds created and trees planted.
- Develop and adopt a policy for new and resurfaced municipal and private parking lots that would state the % tree canopy cover rather than requiring a certain number of trees per parking spot. Current zoning bylaws require plantings based on spacing, but revisions should encourage plantings that will support a dense canopy cover.
- Secure funding to cover parking lots downtown with solar panel canopies to decrease the heat island effect and increase renewable energy sources. The City's Department of Energy and Sustainability is working on this project but has not found anything viable yet.
- Work with Franklin County representatives to advocate for a streamlined permitting process for parking lot solar panels.
- Sidewalks are in need of repair throughout the City. Develop a policy to require shade tree plantings when sidewalks are repaired or replaced. Require that design and funding for sidewalk and street projects include tree planting. This would improve stormwater management & make sidewalks more walkable for pedestrians.
- Obtain funding for an assessment to determine low cost climate resilient drainage solutions on the City's gravel roads. Identify locations where nature based solutions would be most effective. Drainage solutions should be prioritized on residential gravel roads so residents can safely evacuate.
- Hire a consultant to update the feasibility study, design, and cost estimates for the West Side Water Project. This project would construct a new 1-3.5 million gallon water storage tank on the west side of City and a 20-inch water transmission main to Main Street to address poor pressure and flows (especially critical for firefighting) as well as provide a backup for the Rocky Mountain Storage Tank.
- Work with the Franklin County Resource Network to make disaster specific pages on the "look4help" website that could assist residents with finding information about sheltering/other resources.
- Make connections & establish communications and trainings in emergency preparedness and de-escalation methods with all local leaders including the Mayor, Councilors, police, fire, churches, medical groups, the hospital, schools, as well as all civic and social groups so that, in a crisis, everyone has a connection to someone.
- Promote the formation and maintenance of neighborhood groups. Continue to track vulnerable populations in Greenfield; encourage seniors to sign up with TRIAD.
- Remove the dead and dying flowering dogwood from the parking lot islands at the Jon Zon Community Center and plant trees that are salt tolerant. *Additional details about this project included in the City's Open Space and Recreation Plan.*
- Pursue funding to implement actions from Greenfield's completed *Pollinator Action Plan*, such as:

- Developing support for pollinator habitat demonstration gardens at the Greenfield Public Schools, Greenfield Public Library, and key City-owned open spaces
  - Assessing potential for planting projects on City-owned properties and Right Of Ways
  - Developing and distributing a brochure on incorporating pollinator habitat into the yards and public spaces of businesses
  - Reviewing and updating the City's zoning bylaws to include pollinator friendly language
- Combat climate change by increasing the long-term carbon storage of City-owned conservation areas and urban forests by maintaining or increasing forest cover, and exploring opportunities for placing forested lands in carbon trusts.
  - Hire a consultant to prepare final designs and cost estimates for climate resiliency projects identified in the *Green River Corridor Mapping and Management Report* (2019) and to expand River Corridor mapping to tributaries of the Green River.
  - Explore different options for implementing a Transfer of Development Rights (TDR) program, either at the local or regional level. If implemented on the regional level, a feasibility study would need to be completed first in order to identify sending & receiving areas, and determine how to share the tax base between municipalities. If implemented on the local level, the City can explore local models (such Hadley's) to identify appropriate mechanisms to incorporate into their TDR bylaw.
  - Explore tick and mosquito control options, and educate residents about risks associated with vector-borne diseases and actions they can take at home to protect their community, such as eliminating sources of standing water.

### Low Priority Recommendations

- Develop a plan to replace the wastewater treatment plant.
- Conduct an analysis of impervious surfaces, slopes, and stormwater drains to determine where the heaviest flows of stormwater enter storm drains, streams and rivers. Determine areas where mass plantings of trees could capture and infiltrate rainfall.
- Important City records are not digitized and vulnerable to hazards. Identify municipal records at greatest risk of being damaged during a hazard event and prioritize them for digitization.
- Run practice drills/scenario role-plays between the Western Mass Food Bank and site partners so that they can be better prepared for natural hazards/emergencies.
- Work with the School Committee to develop a climate change education program to ensure that young people understand the threat and the opportunities of the climate crisis, with the goal of reducing fear about what their future will look like, and empowering them to be able to make informed decisions, take action, and become active participants in our democracy.
- Evaluate parcels for their natural resource value using methods from MassAudubon's MAPPR program, The Nature Conservancy's Resilient Landscapes mapping, and FRCOG's Watershed-Based Plan for the Deerfield River Watershed. Adopt and apply criteria to identify and prioritize protection of land in Greenfield with high-conservation

value, such as scenic ridges, farmland, rivers, drinking water, wildlife habitat, unfragmented forest, and upland watershed areas with climate resiliency benefits, such as flood storage. Protect forestland from fragmentation by solar installations and sprawl.

## ***CRB Workshop Participants -- Department/Commission/Representative:***

Peter Wozniak, Greenfield Resident  
Mark Maloney, Zoning Board of Appeals  
Carole Collins, Department of Energy and Sustainability  
Mary Chicoine, Greenfield Tree Committee  
Edie Heinemann, Greening Greenfield  
Nancy Hazard, Greening Greenfield  
Mark Maloni, Greenfield Planning Board  
Christy Moore, Greenfield Recreation Department  
Eric Twarog, Department of Planning and Development

## ***Interview Respondents:***

Sustainable Greenfield Implementation Committee (Group Response)  
Greening Greenfield (Group Response)  
Greenfield Tree Committee (Group Response)  
Greenfield Historical Commission  
Poet Seat Health Center  
Recreation Department  
Stone Soup Café  
Franklin County Fairgrounds  
Greenfield Public Safety  
Food Bank of Western Massachusetts  
Community Action  
Franklin County Sheriff's Office  
Greenfield Local Cultural Council  
Baystate Franklin Medical Center  
Montague Webworks  
Neatline Consulting

## ***CRB Workshop Project Team: Organization and Role***

### ***City of Greenfield***

Eric Twarog, Director of the Department of Planning and Development, City of Greenfield

### ***Franklin Regional Council of Governments:***

Kimberly Noake MacPhee, Land Use & Natural Resources Program Manager  
Allison Gage, Land Use & Natural Resource Planner  
Alyssa Larose, Senior Land Use & Natural Resource Planner  
Helena Farrell, Land Use & Natural Resource Planner  
Megan Rhodes, Senior Land Use & Transportation Planner  
Ryan Clary, Senior GIS Specialist

***Recommended Citation***

Noake MacPhee K. Gage A. (2021) City of Greenfield Community Resilience Building Workshop Summary of Findings. Franklin Regional Council of Governments.



## **Appendices**

Maps

Outreach Packets

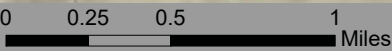
Interview Responses

Exercise Outputs

Workshop Presentation



# Environmental Resources Greenfield, Massachusetts



Greenfield  
Franklin County, MA.



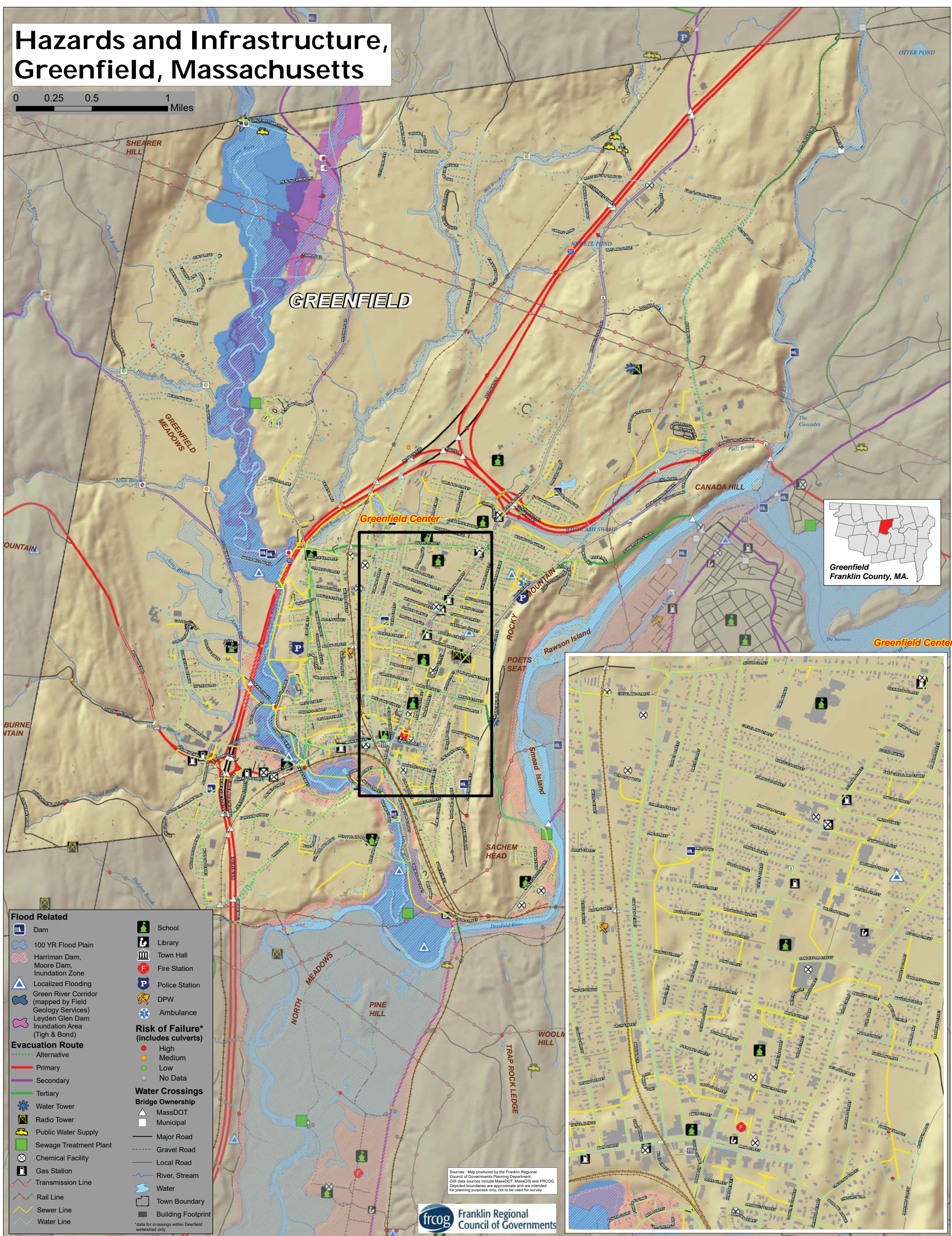
Sources: Map produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include MassDOT, MassGIS and FRCOG. Depicted boundaries are approximate and are intended for planning purposes only, not to be used for survey.

frcoG Franklin Regional Council of Governments



# Hazards and Infrastructure, Greenfield, Massachusetts

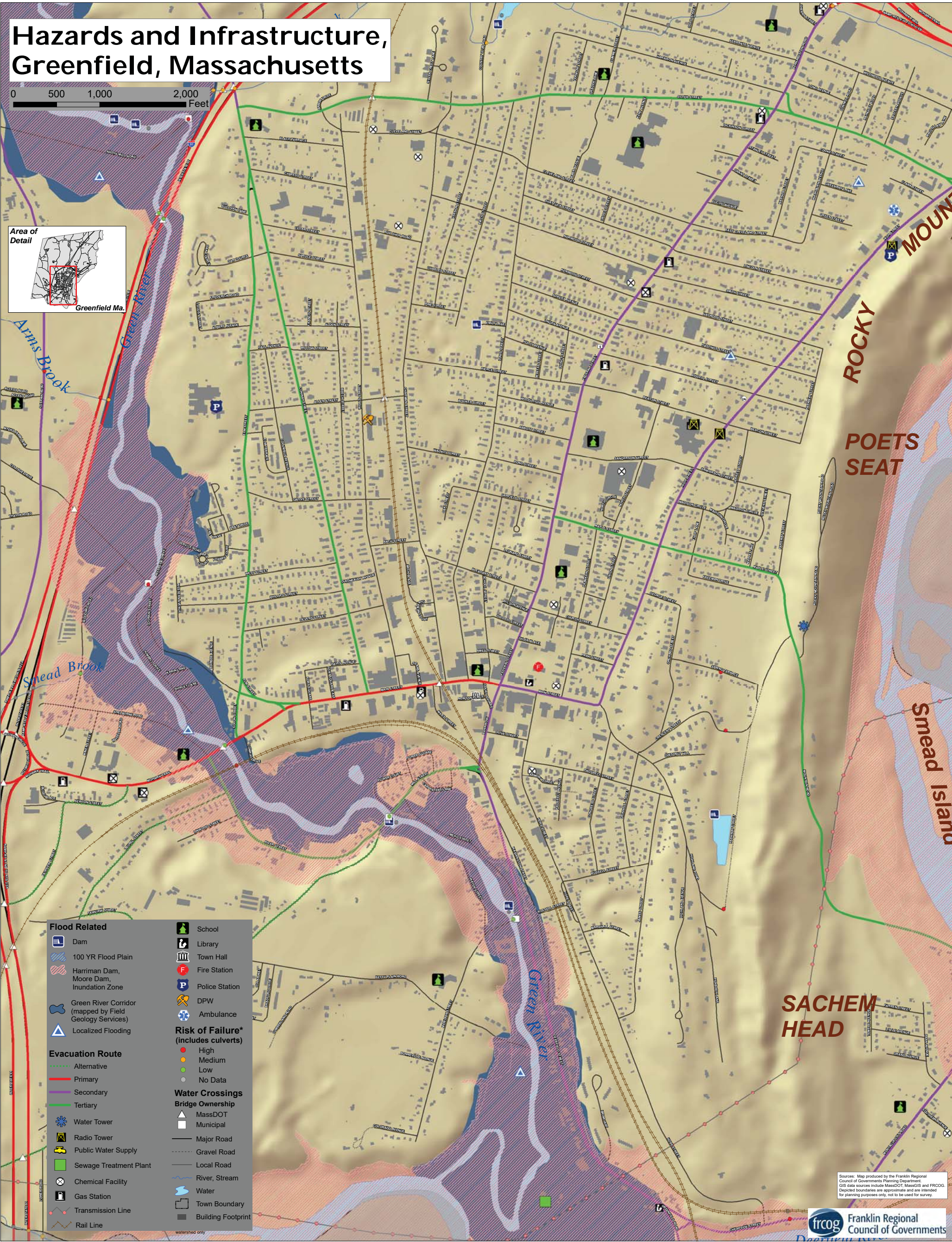
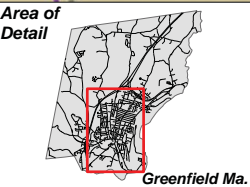
A horizontal scale bar with a black background. It has white tick marks and labels at 0, 0.25, 0.5, and 1. The word "Miles" is written in white at the right end of the bar.





# Hazards and Infrastructure, Greenfield, Massachusetts

0 500 1,000 2,000 Feet



Sources: Map produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include MassDOT, MassGIS and FRCOG. Depicted boundaries are approximate and are intended for planning purposes only, not to be used for survey.



# GREENFIELD RECORDER

(<https://www.recorder.com>)

News > Local (/News/Local/)

## Greenfield receives \$22K for climate change preparation



A tree fell and blocked Cheapside Street in Greenfield, damaging vehicles, in July 2018. The city has been awarded a Municipal Vulnerability Preparedness (MVP) Planning Grant to develop an action plan to increase Greenfield's resiliency against extreme forms of weather caused by climate change. Staff File Photo/Paul Franz » [Buy this Image](#)

By MELINA BOURDEAU (/byline?byline=By MELINA BOURDEAU.)

Staff Writer

Published: 6/12/2019 6:14:11 PM

**GREENFIELD** — The city has been awarded a Municipal Vulnerability Preparedness (MVP) Planning Grant in the amount of \$22,000 by the Executive Office of Energy and Environmental Affairs.

“This grant will pave the way for future grant applications that will guarantee access to funds and city-wide safety for all residents,” Mayor William Martin said in a press release. “We thank our Emergency Preparedness staff and first responders for implementing our plan, and particularly City Planner Eric Twarog for leading our group.”

The city partnered with the Franklin Regional Council of Governments (FRCOG) as its chosen MVP provider.

According to the release, the city has also contracted with FRCOG to update its Local Multi-Hazard Mitigation Plan with a Pre-Disaster Mitigation (PDM) grant from the Federal Emergency Management Agency. Greenfield has until June 30, 2020, to complete the requirements of both grants.

Twarog said the state recommends updating the city's hazard mitigation plan, which is through FEMA, at the same time as the MVP plan is being made.

"The hazard mitigation plan has to be updated every five years," Twarog said. "The plans inform one another, but once we become an MVP community, we can apply for MVP action grants. So instead of having to compete on the federal level, we are only competing within the state."

The climate change hazards in Greenfield include flooding, microbursts, hurricanes or potentially tornados Twarog said.

Potential projects, which could be funded through an action plan grant, include repairing culverts.

"We have to think about events like Hurricane Irene or Sandy," Twarog said. "Culverts in the town, and across the country, were built in a different era, and they are undersized."

Reach Melina Bourdeau at [mbourdeau@recorder.com](mailto:mbourdeau@recorder.com) or 413-772-0261 ext. 263.

[greenfield ma \(/keyword/?keyword=greenfield ma\)](#)

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([https://twitter.com/share?url=https://www.recorder.com/Greenfield-receives-\\$22-000-MVP-grant-26207524&text=Greenfield receives \\$22K for climate change preparation](https://twitter.com/share?url=https://www.recorder.com/Greenfield-receives-$22-000-MVP-grant-26207524&text=Greenfield%20receives%20$22K%20for%20climate%20change%20preparation))

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## **Community Outreach – Mailing Packets**



July 20, 2020

Dear Greenfield Community Member:

Increasingly, we find ourselves working to respond to more unpredictable and severe weather events that damage Greenfield's infrastructure, natural resources, and local economy and threaten the health and welfare of our residents. The costs and impacts to our city remind us that we need to continue working to reduce our risk and increase our resilience – being able to effectively deal with and quickly bounce back from - these extreme storm events.

In order to be as proactive as we can in preparing and protecting our residents, the City of Greenfield is partnering with the Franklin Regional Council of Governments to prepare a Municipal Vulnerability Preparedness (MVP) Plan. This Plan will help us to:

- Understand connections between natural hazards and local and regional planning/mitigation efforts;
- Evaluate strengths and vulnerabilities of residents, infrastructure, and natural resources;
- Develop and prioritize resilient actions for the city, residents and our local organizations and businesses; and
- Identify actions that can reduce the impact of hazards and increase resilience, and later qualify us for funding to implement these important actions.

We previously planned to hold an in person workshop in April to gather stakeholder feedback, but due to the ongoing COVID-19 pandemic we are now gathering information virtually. **We are hoping to gather survey responses from you in order to gain insight on what issues are most important to you.** We want the Plan to reflect the real needs and experiences of Greenfield residents, and your input is critical.

Please find the enclosed materials:

- Municipal Vulnerability Preparedness (MVP) Program & Greenfield Hazard Mitigation Plan Overview
- Survey

By going through this planning process, the city will become “MVP certified” and then eligible for state-funded implementation grants to help us be prepared for the lasting effects of climate change. We are eager to hear what issues are important to you and what projects you think are most important for Greenfield to undertake. Your thoughts will help us to strengthen our climate resiliency plan and prioritize future projects.

We appreciate your time and we look forward to reviewing your survey responses.

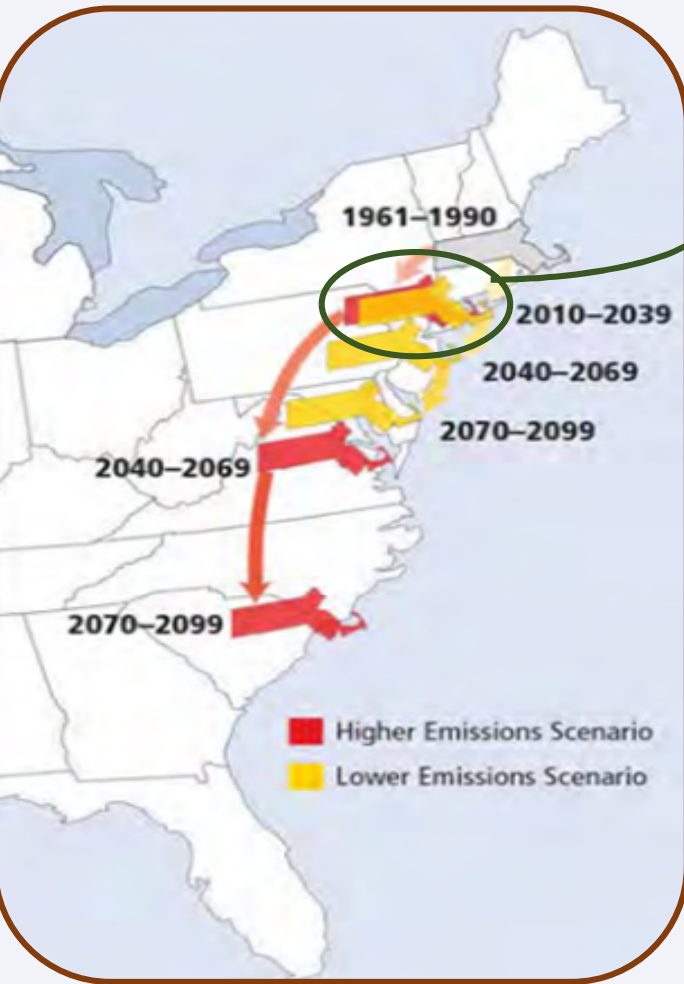
Sincerely,  
Eric Twarog, City of Greenfield  
Kimberly Noake MacPhee, FRCOG  
Allison Gage, FRCOG



# Extreme Temperatures

## Current Conditions

Since the beginning of the century, temperatures in Massachusetts have increased almost 3 degrees Fahrenheit. Perhaps the most noticeable difference most of us have already recognized is that winter temperatures have risen approximately 4 degrees Fahrenheit.



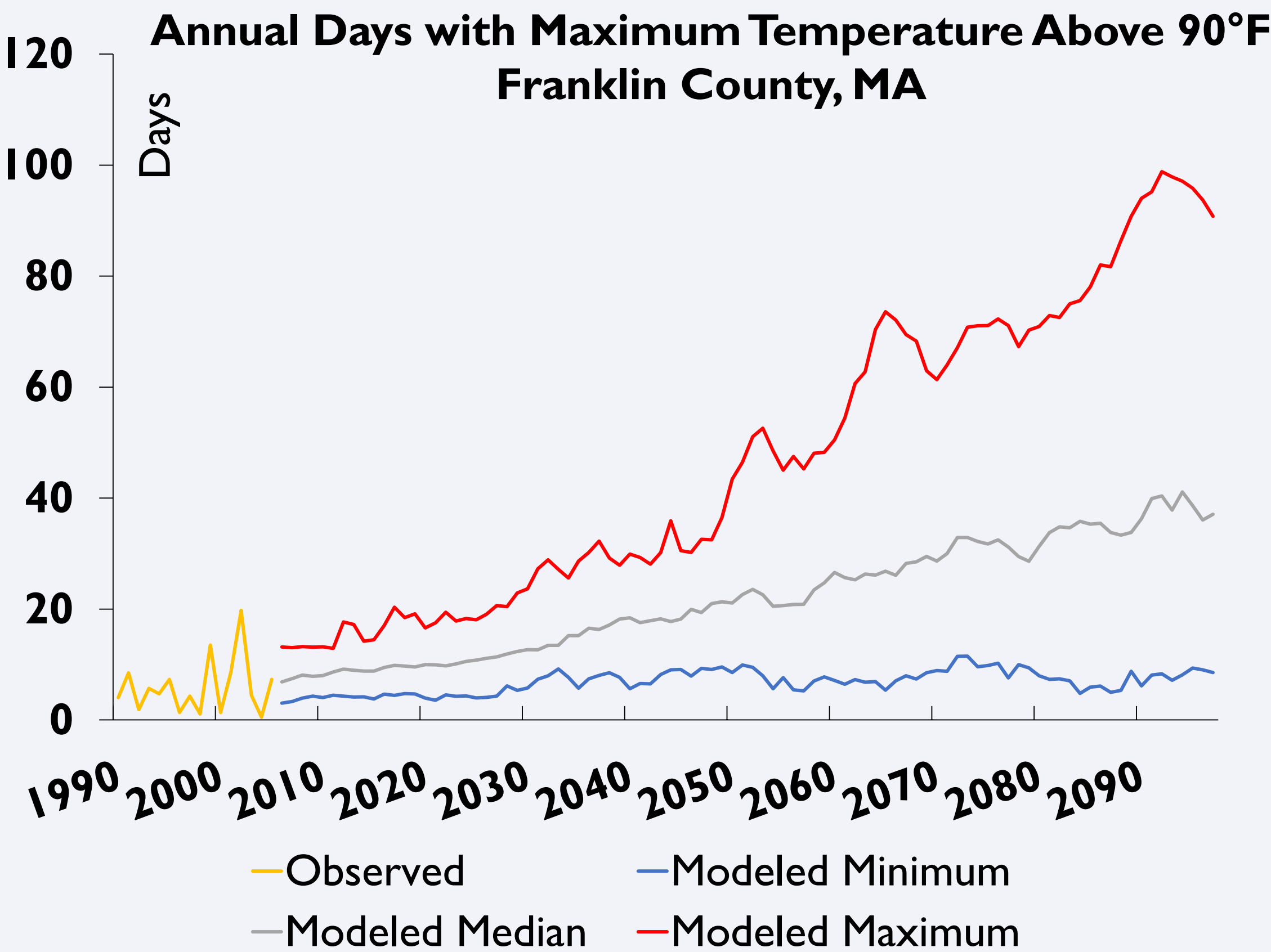
The map on the left shows how summer temperatures in Massachusetts may change through the end of the century. The circled region highlights where we currently are in the modeling scenarios.

Heavily forested areas such as Franklin County may experience more wildfires in the near future due to **drier and hotter conditions**. To the right is an image from a recent wildfire in nearby Leverett, which burned approximately 55 acres.

Photo courtesy of the Greenfield Recorder.



## Future Conditions



The number of days per year with daily maximum temperatures over 90°F is projected to **increase by 18 days by the 2050s, and by 32 days** by the end of the end of the century. Under a high emissions scenario, however, **there could be as many as 100 days** with a maximum temperature above 90°F by the end of the century.

**PREVENT LYME DISEASE!**

- WEAR DEET REPELLENT
- CHECK FOR TICKS DAILY
- SHOWER SOON AFTER BEING OUTDOORS
- TUCK PANTS INTO SOCKS
- CALL YOUR DOCTOR IF YOU ARE BITTEN

Brought to you by your Board of Health and the Cooperative Public Health Service  
A program of the Franklin Regional Council of Governments

Rising temperatures will undoubtedly have an impact on human health. Warmer climates allow populations of invasive pests such as ticks and mosquitoes to grow and live longer due to a delay of the first frost in the Fall. Additionally, an increase in the growing season means favorable habitats for these pests will expand. For example, ticks favor Japanese Barberry for nesting sites.

### TOP HAZARDS RELATED TO EXTREME TEMPERATURES

**Rising Temperatures**

**Wildfire**

**Invasive Species**

How have these hazards impacted your community?

How do you think they will change over time?

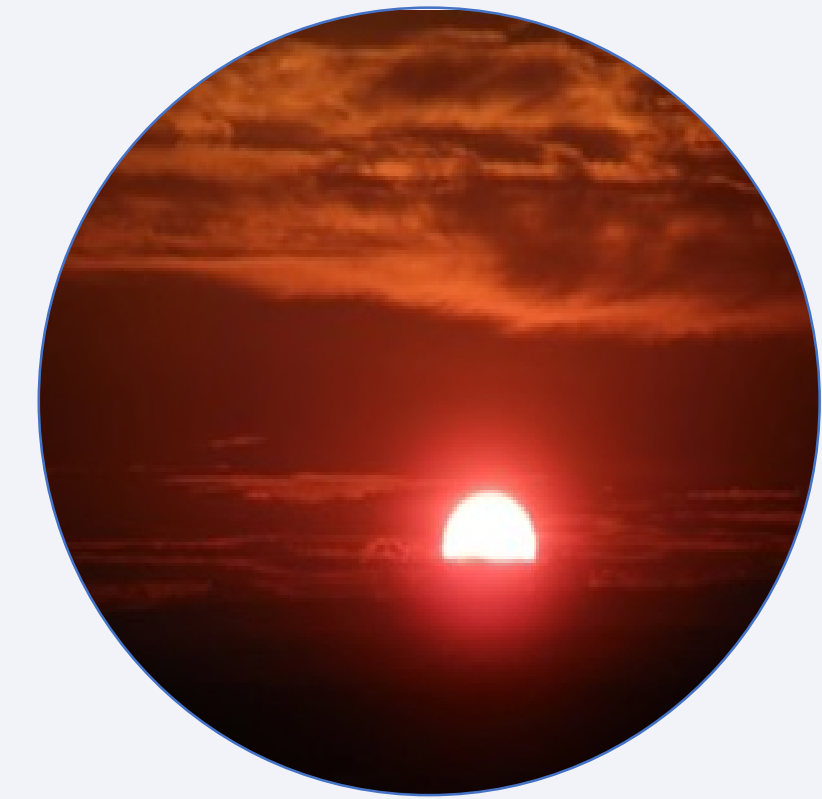
- Some of the potential impacts to our natural resources and habitats:
- Shift in seasons
  - Mismatch of key food sources & wildlife
  - Mismatch of bloom time & pollinators
  - Drying of streams and wetlands
  - Stresses on forest & ecosystem health
  - Loss of ecological diversity

Japanese Barberry

Garlic Mustard

Japanese Knotweed

Many species of invasive plants **that threaten critical biological diversity** thrive in warmer temperatures. A total of twenty-eight invasive species have been identified in Greenfield. Photo courtesy of the Greenfield Recorder.



Information sourced from:

- 2020 Greenfield Hazard Mitigation Plan
- FRCOG's A Framework for Resilience
- ResilientMA: Climate Change Clearing House for the Commonwealth

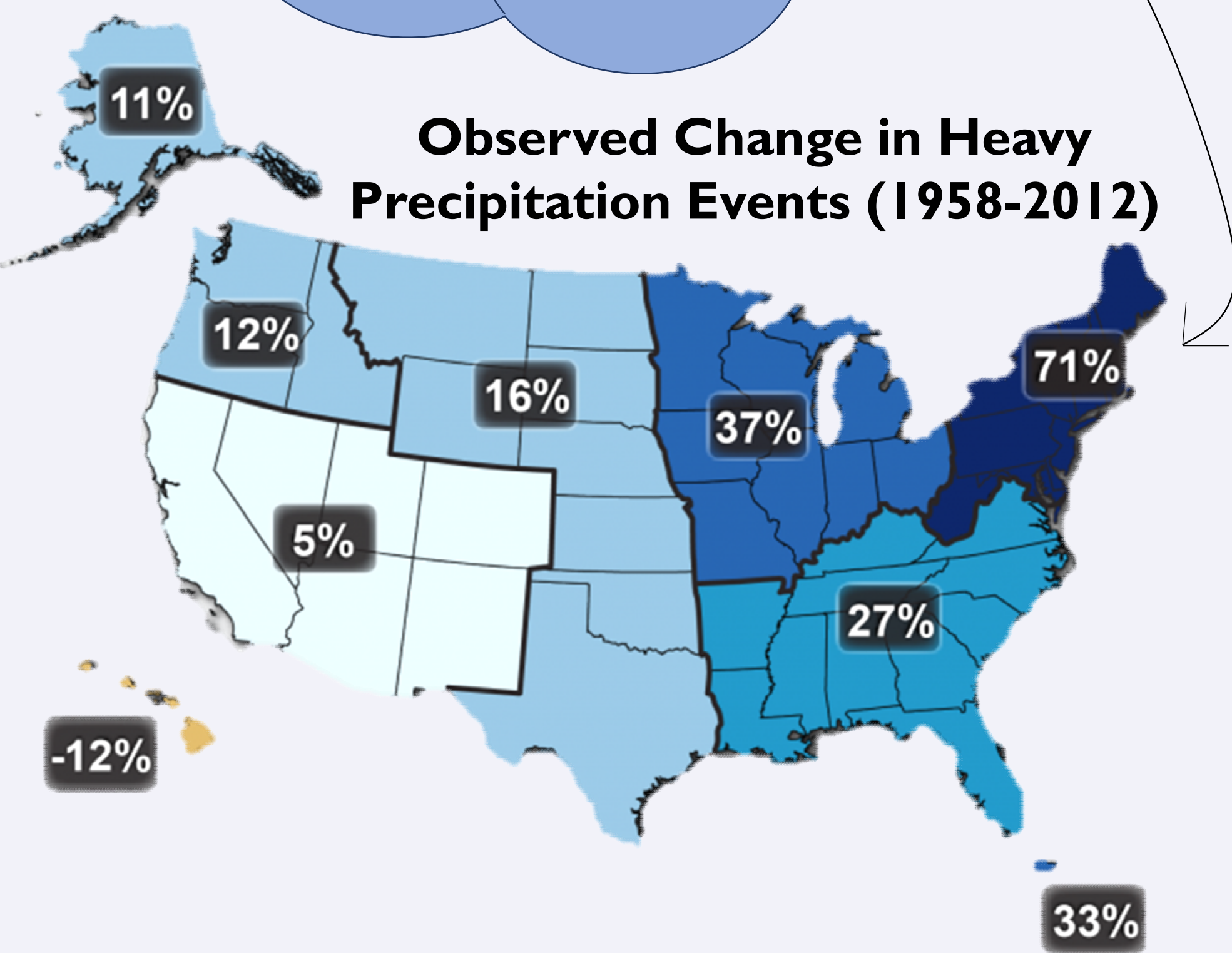


# Changes in Precipitation

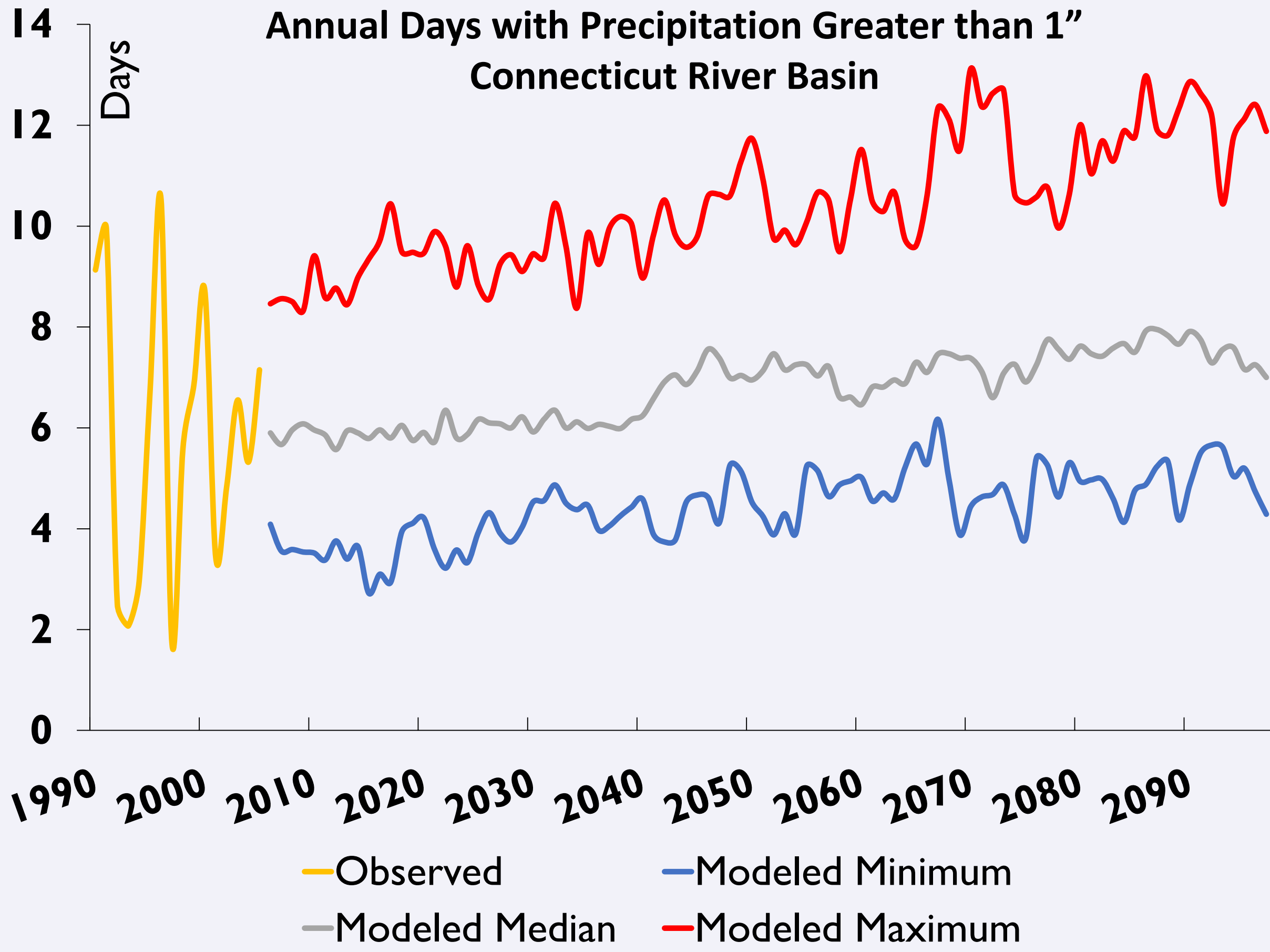
Annual precipitation in Massachusetts is projected to increase by as much as 7.3 inches by the end of this century

## Current Conditions

The Northeast has seen a greater increase in extreme precipitation than any other part of the country, experiencing a **71% increase** in heavy precipitation events between 1958 and 2012.



## Future Conditions

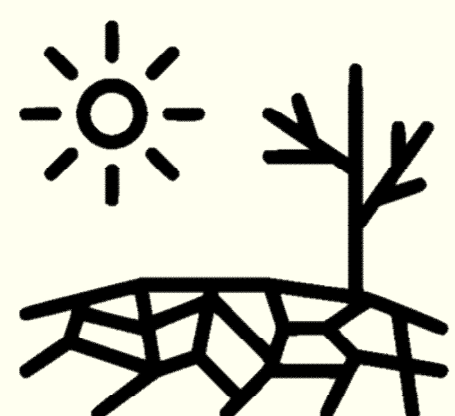


By the end of the century, our area could have **5 additional days** of rainstorms that dump over 1 inch of rain.

### TOP HAZARDS RELATED TO CHANGES IN PRECIPITATION



Flooding



Drought



Landslides

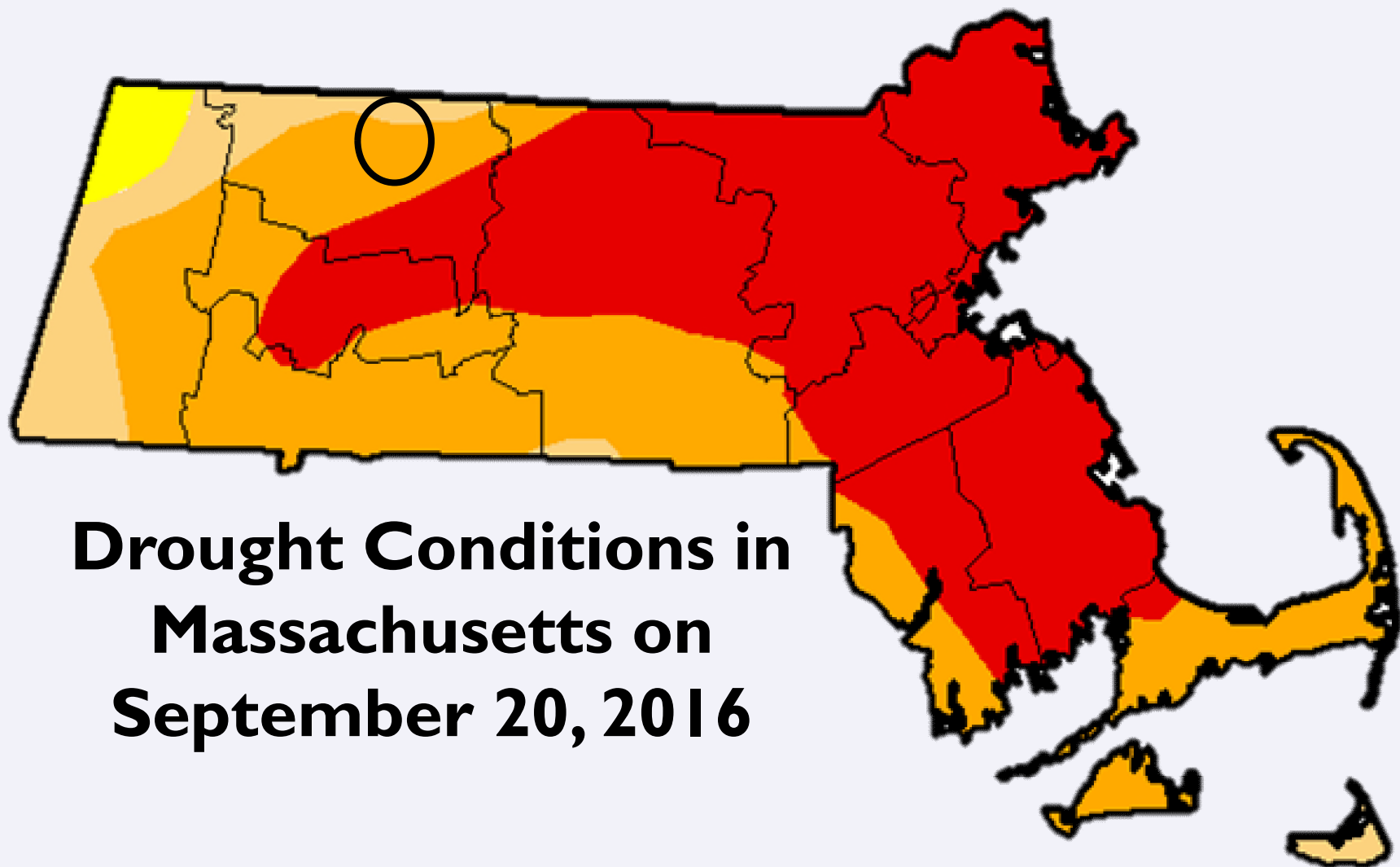
How have these hazards impacted your community?

How do you think they will change over time?

From March 2015 to May 2016, Massachusetts experienced a prolonged drought. By September 2016, the majority of Franklin County entered a “severe drought.” The drought devastated many farms in the region.

Although Massachusetts will see an increase in precipitation, it will likely come in the form of winter rain. Massachusetts is expected to see a **75% increase in drought**.

## What about Drought?



The impacts of increased precipitation can be seen throughout Greenfield. Above are images of damage caused by Tropical Storm Irene. **What other natural or built features in Greenfield are affected by changes in precipitation?**

Information sourced from:  
- 2020 Greenfield Hazard Mitigation Plan  
- FRCOG's A Framework for Resilience  
- ResilientMA: Climate Change Clearing House for the Commonwealth



# Extreme Weather Events

Goal for Building Resilience to a Changing Climate:

Protect life, property, natural resources and the economy

## Current Conditions

Below are some examples of recent extreme weather events that have affected Greenfield and surrounding communities in Franklin County.



Flash flood events have recently occurred throughout Greenfield. The summer of 2018 brought frequent rains to Franklin County; in the month of August alone the City received approximately 9 inches of rain. These events damaged crops on many local farms, as pictured to the left.

Pictured to the right is an example of the aftermath of a microburst that struck Orange in June of 2017. This storm included bouts of intense rain and hail, and caused thousands to lose power.



In February 2017, an EF-1 tornado hit Conway. Wind speeds reached 110 mph, and the tornado severely damaged or destroyed several houses and buildings. The United Congregational Church (pictured on the left) was damaged beyond repair and was eventually demolished.

The 2008 ice storm greatly impacted the Northeast. The ice downed numerous trees, branches, and power lines which resulted in wide spread power outages.



## Future Conditions

Extreme weather events are anticipated to increase due to climate change. Scientists predict the following factors will all **increase** over time:

Frequency

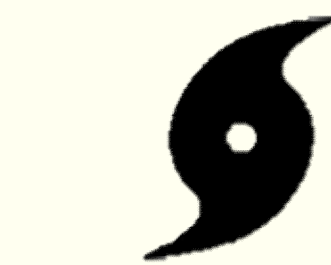
Intensity

Duration

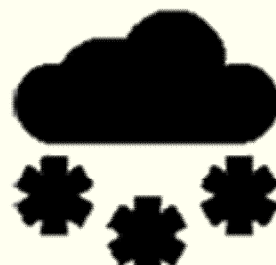
Geographic extent

**Example:** A 2017 U.S. Climate Science Special Report noted that there has been an upward trend in North Atlantic hurricane activity since 1970. The report forecasts that future hurricanes formed in the North Atlantic will drop more rain and may have higher wind speeds. This is because a warmer atmosphere will hold more water, and hurricanes are efficient at wringing water out of the atmosphere and dumping it on land.

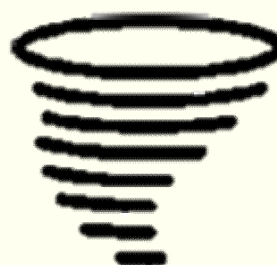
### TOP HAZARDS RELATED TO EXTREME WEATHER EVENTS



Hurricanes



Winter Storms



Tornados

How have these hazards impacted your community?

How do you think they will change over time?

Some of the potential impacts to our infrastructure and local economy:

- Destruction of property and infrastructure
- Disruption of critical services and transportation
  - Crop loss
- Business interruption/economic disruption
  - Dam damage/failure

Information sourced from:  
2020 Greenfield Hazard Mitigation Plan  
FRCOG's A Framework for Resilience  
ResilientMA: Climate Change Clearing House for the Commonwealth

All photos in this panel are courtesy of the Greenfield Recorder.



## Greenfield Municipal Vulnerability Preparedness – Outreach Guiding Questions

### Questions for Greenfield Community Members

---

1. What is your name and role in Greenfield? If a business owner, please name your business.
2. What changes have you seen in the natural environment over the course of your lifetime?
3. How have extreme weather events affected Greenfield? Please use the ranking list below:
  - a. Not at all
  - b. Somewhat
  - c. Moderate
  - d. Frequent
  - e. Extreme
4. Which hazards have affected Greenfield the most?
  - a. Flooding
  - b. Drought
  - c. Severe Wind
  - d. Extreme Temperatures
  - e. Invasive Species
  - f. Other
5. Based on your answer to #3, please provide an example of how your selected hazard(s) affected you or the City.
6. Which aspects of Greenfield (or your business or organization, as applicable) are most vulnerable to hazards?
7. Which aspects of Greenfield (or your business or organization, as applicable) do you think are the most resilient to hazards?

## Greenfield Municipal Vulnerability Preparedness – Outreach Guiding Questions

8. What steps (if any) are you taking to safeguard your home, business, organization services (as applicable) against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)
  - a. If yes, please describe the actions taken.
  - b. If yes, what hazard was the adaptation in response to?
  
9. What resources would be the most beneficial to you?
  - a. Information on funding
  - b. A workshop on how to prepare/enhance protection
  - c. Detailed region/sector impacts
  - d. Contact details for state or city officials
  - e. Details on how future climate changes will impact Greenfield
  - f. A network of other small groups/organizations businesses (as applicable) in the area who face similar risks
  - g. Other
  
10. What actions/projects would you like to see the City undertake?
  
- 11. Any other information you would like to provide?**



# Municipal Vulnerability Preparedness (MVP) Program

## MVP Process Overview &

## Key Takeaways from The City of Greenfield's Hazard Mitigation Plan Update

Facilitated by the  
Franklin Regional Council of Governments  
A State Certified MVP Provider



### Overview

#### Climate Change Impacts

The Municipal Vulnerability Preparedness grant program (MVP) provides support for cities and towns in Massachusetts to begin the process of planning for climate change resiliency and implementing priority projects. Here in Franklin County, communities are experiencing more extreme weather events – especially heavy rains and flooding – along with higher temperatures and other climate-related conditions, increasing the urgency to address resilience and adaptation.

Increased Temperatures

Increased Precipitation

More Extreme Weather

### Your feedback is critical to Greenfield's MVP Planning process!

Consider the following questions when responding to the survey:

- ✓ What hazards have impacted your City in the past?
- ✓ What infrastructure/facilities are exposed to current and future hazards?
- ✓ What are the strengths and vulnerabilities of people in your City?
- ✓ What natural resources are important to your City?



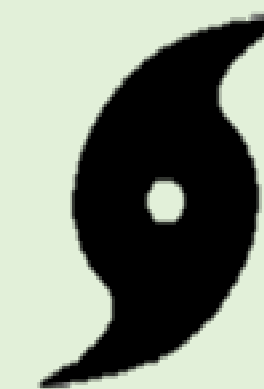
### The City of Greenfield's Top Priority Hazards

The Hazard Mitigation Committee identified and assessed relevant hazards for the city of Greenfield. The Committee considered how different hazards have impacted the community, and how these impacts will become more severe due to climate change. Below is a snapshot of the City's primary hazards, and examples of specific concerns related to high priority hazards.



#### Flooding

Culvert maintenance is continuously needed throughout the City, especially in the Maple Brook Culvert Drainage system to mitigate erosion, debris, and flooding hazards around developed areas.



#### Hurricanes

Many of the City's evacuation routes may be impacted by severe hazard events. There are areas of the City where residents might become isolated if roads, bridges, or culverts were blocked or damaged.



#### Severe Wind

New initiatives are needed to improve household disaster preparedness City-wide and to better reach vulnerable populations, including seniors and disabled residents with lessened mobility or medical needs, as well as homeless or transient people who may be difficult to reach in the event of an emergency.



#### Extreme Temperatures

Many Cities in the region rely on volunteer fire departments and mutual aid to assist in firefighting. During dry spells or drought, firefighting resources in Greenfield and surrounding towns could be strained if multiple wildfires breakout at one time.



#### Landslides

Roads, buildings, and utilities downslope of steep and unstable soils are at risk of damage due to landslides, including areas in Rocky Mountain Park. An inventory is needed to determine what critical infrastructure is at the greatest risk of being damaged during a landslide.



## Community Outreach – Interview Responses



October 28, 2020

**To:** Eric Twarog, Greenfield Director of Planning & Development - [ericT@greenfield-ma.gov](mailto:ericT@greenfield-ma.gov)  
Allison Gage, FRCOG - [AGage@frcog.org](mailto:AGage@frcog.org)

**RE:** Sustainable Greenfield Implementation Committee's (SGIC) input into Greenfield's Municipal Vulnerability Preparedness (MVP) plan

Dear Eric and Allison,

Thank you for the opportunity for SGIC to submit comments regarding Greenfield's MVP planning process.

Attached, please find:

1. Responses to survey
2. Climate Migration to the Northeast
3. The Need for Habitat Restoration & Project ideas

As noted in the attached survey, SGIC members agreed with FRCOG's analysis of the need to address our vulnerabilities from climate change, such as severe storms, flooding and drought, high temperatures, and invasive species.

Members also noted concerns about the socio-economic repercussions of the climate crisis such as urban flight to Greenfield, already being seen during COVID; inequity and food insecurity; and the future worsening of the climate crisis. Many of these impact our most vulnerable populations - the poor, elderly, people in recovery or recently released from Jail, followed by people who live in floodplains and sweeping vulnerability to power outages.

Our committee also recognized the decline of insects and birds, and habitats in general, as a threat, rippling out to impact agriculture and food insecurity and the longevity of our trees.

As for actions and projects, the committee focused on topics not deeply covered by FRCOG's 3-page infographics for Greenfield, or in its report *A Framework for Resilience*. Please see the survey for a list of those topics, as well as two documents that expand on two of those action/project ideas, as listed above.

We would be happy to engage more around how the MVP intersects with Greenfield's Master Plan. Please do not hesitate to reach out for this and/or any additional requests for information.

Sincerely,

Hannah Rechtschaffen  
Sustainable Greenfield Implementation Committee, Chair  
[Hannah.Rechtschaffen@gmail.com](mailto:Hannah.Rechtschaffen@gmail.com)

# Need for Habitat Restoration & Project Ideas

*Input into Municipal Vulnerability Preparedness (MVP) plan*

*from* **Sustainable Greenfield Implementation Committee (SGIC)**

***This topic and many of the project ideas are mentioned in Greenfield's Master Plan as follows:***

***Land use strategy #1,2,3,4,5,6,7,8,10 + Facilities Strategy #9 + NHC strategy #1***

## **Need for Habitat Restoration to Build Resilience**

1. **Overarching need:** Scientist, EO Wilson, has named habitat degradation as 2<sup>nd</sup> greatest threat to life on our planet, 2<sup>nd</sup> only to climate change.
2. **Loss of insects and birds:** The loss is well documented, as is the role insects play in our ecosystem in plant reproduction, our food, and food for many birds and other critters. Dr. Desiree Narango found that in order to successfully raise a nest of babies, Chickadees need 70% of the vegetation to be native to the region. Chickadees and other birds feed their young caterpillars, which are part of the moth and butterfly life cycle that live on trees, shrubs, and herbaceous plants.
3. **Flooding:** Greenfield has seen the effects of flooding of the Green River and in many parts of town, which have caused loss of property and damage to agricultural lands.
4. **Temperature:** There is a need to reduce summer temperatures for our health, and to reduce the use of air conditioners, which may contribute to increased global warming.
5. **Conserve Land:** Land is limited in Greenfield. Agricultural land is not adequate to meet our food needs.
6. **Invasive species:** Non-native species do not provide many eco-system services, and take up much needed space for species that are native to our region and important for overall health of our ecosystem
7. **Mental and physical health:** The natural world has been proven to support healing, reduce crime, and encourage people to walk, and engage in other outdoor activities in urban areas.

## **Project Ideas:**

1. **Insects and birds.** As noted above, Dr. Desiree Narango found that in order to successfully raise a nest of babies, Chickadees need 70% of the vegetation to be native to the region. Chickadees feed their young caterpillars, which are part of the moth and butterfly life cycle that live on trees, shrubs, and herbaceous plants.
  - a. City seek grants so that it can continue to re-tree the urban section of town, and plant only trees that are native to our area. The Greenfield Tree Committee has a *recommended list of native, climate resilient trees* <https://www.greenfieldtreecommittee.org/tree-selection>
  - a. Policy: Ensure that our insects, children, and pets are safe. Do not allow the use of toxic insecticides or herbicides.
  - b. Policy: Ensure that all sidewalk and complete street projects include tree planting wherever possible (Greenfield Tree Committee recommendation)
2. **Flooding:** As outlined in FRCOG's report *A Framework for Resilience*, we should manage stormwater everywhere, and embrace nature-based solutions, which are an effective way to address the threat of flooding. Following are thoughts about what Greenfield can do:

- a. Green Infrastructure/Low Impact Development (LID) – DPW adopt LID practices. As of October 2020,. The Planning Board is discussing integrating LID practices into our Zoning Ordinance, Sub-division bylaws, and Floodplain District.
  - b. Conserve and protect land, especially floodplains: increase riparian buffer zones, and forests wherever possible. (Open Space Committee is starting to meet to discuss next Open Space plan)
  - c. Restore Floodplain - Purchase land and Restore the Cheapside Gulf course to a forest floodplain, and include a public access to the Green River in that area. Restore others as needed.
  - d. River Banks – restore eroding riverbanks as needed. For example, a section of the bank has collapsed at the Green River Swimming area. Many banks also destabilized by invasive species.
  - e. Urban trees – Plant trees in the urban area to reduce storm water runoff.
  - f. Forests: Policy: Pass a solar bylaw to protect forests from being clear-cut for large solar projects.
  - g. Agricultural Land: Encourage farmers to embrace regenerative agricultural practices, such as no-till, cover cropping, etc.
  - h. Finish repairing all sewer and stormwater pipes, and ensure sump pumps in buildings are connected to the stormwater system, not the sewer, to comply with EPA regulations and avoid dumping sewage into the Green River when heavy rains occur.
  - i. Sewage plant: Add additional flood protection as needed
3. Land Conservation:
- a. Policy: Adopt policies that make our urban center denser, so as to preserve Agricultural and forested lands. (in process)
  - b. Policy: DPW Manage invasive species using the latest best practices for removal, mowing regimes etc.
  - c. Agricultural land: City urge farmers to put land in Agricultural Preservation Act (APR) program if not already done
  - d. Conserve land wherever possible – see Open Space recommendations
4. Mental and physical health:
- a. Ensure shade is on streets and sidewalks wherever possible to reduce heat island effect, and encourage people to be outdoors in the summertime, get exercise and the psychological benefits of being in nature. See: **\*How Urban Trees Can Save Lives: *Planting Healthy Air* report quantifies health benefits of trees for 245 cities globally.** The Nature Conservancy, October 30, 2016 <https://www.nature.org/en-us/what-we-do/our-insights/perspectives/how-urban-trees-can-save-lives/>
    - i. City seek grants to continue planting street trees native to our region to provide shade and habitat.
  - b. Maintain all parks and wild areas & continue City-organized outdoor activities. Expand Parks where needed.

**Climate Migration to the Northeast:**

Research focused on the Gulf area that includes S. Florida and Miami; the Army Corps of Engineers and other scientists have predicted sea level rises of 12 inches by 2030.

This would result in millions of people losing their homes and livelihood. Where will people go if displaced due to rising sea levels?

- Most will go inland where it is perceived as safer with higher elevation.
- Some will look for areas with no coastline and a viable economic infrastructure such as interior New England.
- Climate scientists have predicted a general migration from southern and western states to the Northeast.
- Greenfield is already seeing people leaving Boston and New York moving to W. Mass to be safer from COVID. Sea level rise will also drive people inland.

**What Disruptions Can We Anticipate?**

Increased need for:

- |                          |                       |
|--------------------------|-----------------------|
| 1. Public transportation | 5. Social services    |
| 2. Housing               | 6. Schools            |
| 3. Employment/Retraining | 7. Food/ Water        |
| 4. Medical Care          | 8. Emergency Services |

**Climate Refugee Gentrification**

So while richer people can afford to move to safer ground, poorer people will have to stay where they are or be forcibly evacuated.

First wave of climate refugees will consist of affluent folks from the Coast or South who have the means to purchase property in New England or those who already have second homes here.

**How Do We Prepare?**

Re-think our community development:

1. Protect agricultural land to provide more food (preserve all the agricultural land that we can).
2. Protect forest blocks and wildlife corridors (to maintain bio-diversity)

3. Improve decision-making around the location of housing (more densely-packed housing). (expand this? MORE housing + location)
4. Embrace the Green New Deal locally to create jobs, keep energy dollars in our community, reduce utility costs especially for vulnerable populations, and cut greenhouse gas emissions to avoid escalating the climate crisis.

### **Adjust**

- We have a small window now, before the effects of climate change deepen, to prepare the ground for this new reality.
- Although the issue of climate migration may come about more slowly in rural New England than the changes in urban and semi-urban areas, it's something to prepare for.
- Steps small cities like Greenfield can take to cope with the upward trend of misplaced arrivals is to provide: housing, opportunities for education, training and jobs. These basic preparations will pay long term dividends to stabilize our community.
- If you live in a small town with a general store, a church or two, and a Grange Hall, you and your decedents will witness a major change in the character of your town.
- Educate ourselves, cut back on our CO<sub>2</sub>, and prepare to make room.

**SUSTAINABLE GREENFIELD IMPLEMENTATION COMMITTEE (SGIC)**  
**Response to**  
**Greenfield Municipal Vulnerability Preparedness – Survey**

- 1. What is your name and role in Greenfield? If a business owner, please name your business.**  
Sustainable Greenfield Implementation Committee (SGIC), Hannah Rechtschaffen, chair

- 2. What changes have you seen in the natural environment over the course of your lifetime?**

We have seen many of changes.

Increased heat; severe weather events; change in precipitation (both drought and floods);

Greenfield much breezier, on a daily basis, than in the past.

Additionally, deer ticks that carry Lyme disease have increased, while other insects (mosquitoes, black flies etc.) have decreased; morning bird chorus has decreased.

- 3. How have extreme weather events affected Greenfield? Please use the ranking list below:**

Committee members chose “moderate” and “frequent” as noted below

- a. Not at all
- b. Somewhat
- c. Moderate - 3
- d. Frequent - 4
- e. Extreme

- 4. Which hazards have affected Greenfield the most?**

Following is a list of how many people thought the hazard listed has affected us

- a. Flooding – 6
- b. Drought – 7
- c. Severe Wind – 4
- d. Extreme Temperatures – 1
- e. Invasive Species - 4
- f. Other –
  - 1. Eutrophication of ponds such as Highland Pond
  - 2. Inequality
  - 3. Urban flight – i.e. folks coming here (covid/climate refugees)
  - 4. Concern RE: the future: Worsening of climate crisis

- 5. Based on your answer to #4, please provide an example of how your selected hazard(s) affected you City. SGIC did not have time to discuss this**

- 6. Which aspects of Greenfield (or your business or organization, as applicable) are most vulnerable to hazards?**

- Vulnerable populations – poor, elderly, those recently released from jail, those with addictions or in recovery
- Agriculture – food security
- Extreme storms – ice storms
- Folks who live on floodplain
- Electrical outages
- Trees – damaged by severe storms – wind – ice
- Insects and birds at risk due to habitat degradation

- 7. Which aspects of Greenfield (or your business or organization, as applicable) do you think are the most resilient to hazards?**



The people who live here  
Unfragmented forests  
Wetlands  
Our rivers

**8. What steps (if any) are you taking to safeguard your home, business, organization services (as applicable) against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)** *SGIC did not address this question*

**9. What resources would be the most beneficial to you?**  
*SGIC did not address this question*

**10. What actions/projects would you like to see the City undertake?**

- Policy: Put policies in place to control gentrification. E.g. Berlin, Germany put legislation in place that has been helpful. To get such policy embraced will involve education and a change in priorities to making decisions that support our ecosystem (*see attached for more: Prepare for Climate Refugee Migration to the Northeast*)
- Improve quality of life: More greenways – bike paths etc.  
(*Sustainable Greenfield, NHC Strategy #3*)\*
- Bury electric lines to reduce conflict between trees and utilities
- Support Food Security: In addition to conserving farmland and supporting farmers markets:
  - City fund a part-time Community Garden Coordinator, and find land for more Community Gardens within the City, especially in Environmental Justice and/or blighted neighborhoods where renters live, many of whom do not have access to land.  
(*Sustainable Greenfield, Land Use strategy #4,5,6,*)\*
- Prepare for Climate Migration to our area - See attached 2-pager
- Habitat Restoration (LID/trees and more)- See attached 2-pager  
(*SG: Land use strategy #1,2,3,4,5,6,7,8,10 + Facilities Strategy #9 + NHC strategy #1*)\*
- Drinking water and sewer
  - City continue to seek funds to build a new/redundant water tank on west side of town
  - City continue to seek cost-effective efforts to manage sewage sludge on-site and turn it into a resource instead of a liability.  
(*Sustainable Greenfield, facilities Strategy #4*)
- Embrace the New Green New Deal to reduce worsening of the climate crisis. Help residents, landlords, and businesses find resources so that they can do what the City has done to move to a fossil-fuel-free future to reduce greenhouse gas emissions, and keep our energy dollars in our pockets; offer job training; explore community solar projects etc. To achieve this goal, work with GCC, FRCOG's Affordable Access to Clean and Efficient Energy (AACEE) program, and seek funds via Green Communities, CDBG, or other sources. FYI – Municipal energy use is only 2.7% of the total energy used by the City. In 2008, \$67 million left our city to pay for fossil fuels and electricity.  
(*Sustainable Greenfield, Facilities Strategy #10 & 11 + NHC strategy #5 + Housing strategy #10*)\*

\* *Sustainable Greenfield, is Greenfield's 2014 Master Plan*



Oct 30, 2020

**To:**

**Eric Twarog**, Greenfield Director of Planning & Development - [ericT@greenfield-ma.gov](mailto:ericT@greenfield-ma.gov)

**Allison Gage**, FRCOG - [AGage@frcog.org](mailto:AGage@frcog.org)

**From:**

**Nancy Hazard**, member Greening Greenfield (GG) - [nancy.hazard@worldsustain.net](mailto:nancy.hazard@worldsustain.net)

For Greening Greenfield's leadership team: Becca King, Dorothy McIver, Carol Letson, Edie Heinemann, Emily Green, Louise Amyot, Peg Hall, Peter Letson, Jan Maher, Sandra Boston, Susan Worgaftik.

**RE: Greening Greenfield's input into Greenfield's Municipal Vulnerability Preparedness (MVP) plan**

Dear Eric and Allison,

Thank you for the opportunity for Greening Greenfield to share our thoughts about our concerns about the climate crisis, and suggestions of what Greenfield can do.

Greening Greenfield has a long history of focusing on climate change. In fact, it was founded in 2007 because of that concern. As our brochure says, "we are a group of concerned citizens working with residents, businesses and town government." As for our mission: *We use the concept of 'Greening' as the economic and inspirational guiding force to build a more sustainable Greenfield, so present and future generations can enjoy life in our beautiful, abundant valley*

As such we have a very broad range of concerns caused by more severe storms, flooding, drought, invasive species and higher temperatures, as well as our concern about the crisis facing nature, and reducing our vulnerability from worsening climate disruption, and the likely arrival of climate refugees. As Hansjorg Wyss, philanthropist and creator of the Wysss Campaign for Nature articulates, *"The climate emergency and the crisis facing nature and wildlife are two sides of the same coin."*

In the attached document, you will find thoughts gathered from Greening Greenfield's leadership team. We regularly communicate with over 1700 people who have participated in our programs.

In addition to a list of concerns, you will find a long list of suggested actions that could help reduce vulnerabilities... from health, safety, food and water, to housing, transportation, waste management, trees, quality of life, and K-12 and public education, as well as thoughts about the connection between energy use and money, which is a large contributor to poverty, which exacerbates our vulnerabilities in Greenfield.

If you have any questions please contact Nancy Hazard at [Nancy.hazard@worldsustain.net](mailto:Nancy.hazard@worldsustain.net) or 774-5667

# Comments From Greening Greenfield

## Greenfield Municipal Vulnerability Preparedness (MV) – Survey

**1. What is your name and role in Greenfield? If a business owner, please name your business.**

Nancy Hazard, member of Greening Greenfield. (Nancy.hazard@worldsustain.net)

Scribe for collecting thoughts from Greening Greenfield leadership team:

Becca King, Dorothy McIver, Carol Letson, Edie Heinemann, Emily Green, Louise Amyot, Peg Hall, Peter Letson, Jan Maher, Sandra Boston, Susan Worgaftik.

**2. What changes have you seen in the natural environment over the course of your lifetime?**

“Weirding of weather” – drought; floods; higher temperatures in summer than previously; wind: microbursts, tornadoes in neighboring towns, and daily breezes we did not have before; less snow, more ice in winter; “first frost” later in the fall, and “last frost” later in the spring; invasive trees and shrubs in our parks, and herbaceous invasives along our streets and in our yards; stronger rain storms when they do occur. More fire watches and alerts, more forest fires, more severe weather alerts and storms with large hail and different, more dangerous lightning patterns, a hurricane, Invasive species of plants and insects with more diseases. More toxic algae blooms in our lakes and ponds.

**3. How have extreme weather events affected Greenfield? Please use the ranking list below:**

- Not at all
- Somewhat
- Moderate - 9
- Frequent -1
- Extreme

**4. Which hazards have affected Greenfield? (we did not ask which was “the most”)**

- a) Flooding - 8
  - b. Drought - 10
- b) Severe Wind -8
- c) Extreme Temperatures - 3
- d) Invasive Species - 8
- e) Other
  - (a) Food insecurity
  - (b) Poverty
  - (c) Drugs

- **Based on your answer to #3, please provide an example of how your selected hazard(s) affected your city.**
- More extensive rain run-off into sewer systems, carrying with it toxins; negative effects on spring flowers which bloom too early and then get killed and unable to recover by time regular bloom season begins; wash-off of good topsoil;
- Increased need to water gardens, lawns, young trees, including Fruit trees - all stressed. Increased fire danger;
- When storm drains flood during a heavy downpour, our water treatment plant is overwhelmed and effluent goes into the Green and Deerfield rivers;
- Both large and small trees are damaged by severe winds, causing property damage and damage to our electric grid;

- More power outages, with some power out for an extended time in parts of town, and trees down or large branches causing damage;
- Flooding caused people in parts of town to lose their homes and others were damaged;
- Fires from lightning strikes, damage from Hurricane Irene.
- **Which aspects of Greenfield (or your business or organization, as applicable) are most vulnerable to hazards?**

- Vegetation (trees, vegetable gardens etc.);
- Loss of electricity is the outcome of damage to our electric grid, which frequently happens during a wind storm;
- Flooding of our river and our homes;
- Those un-housed and facing the elements.

**5. Which aspects of Greenfield (or your business or organization, as applicable) do you think are the most resilient to hazards?**

- The people. So many programs and efforts that kick in to help people affected by a disaster or who are in need of food and other essentials.
- RE: Food security: So many programs &
  - Community gardens;
  - The fact that so many people have vegetable gardens;
  - The fact that food delivery to people in need is a system that has already been put into place.

**6. What steps (if any) are you taking to safeguard your home, business, organization services (as applicable) against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)**

- a) If yes, please describe the actions taken.**
- b) If yes, what hazard was the adaptation in response to?** (see response to question #4, and below for list of actions)

Individual actions

- **House:** use less fossil fuel--added insulation, solar PV and water, added mini-splits;
- **Garden:** Added rain barrels for garden water needs; No-till gardening, cover crops, and mulch to deal with temp extremes and water fluctuations;
- **Transportation:** leased an electric car, bought a hybrid, or more fuel efficient car, or gave up using a car, walk and bike more;
- **Waste:** reduced waste overall through changing buying habits & recycle as much as possible, and composting. Worked on town-wide anti-plastic efforts;
- **Plastic** – stopped using it, or reduced use.

Actions by Greening Greenfield, as an organization

**Our mission:** *We use the concept of “Greening” as the economic and inspirational guiding force to build a more sustainable Greenfield, so present and future generations can enjoy life in our beautiful, abundant valley. We work with residents, businesses, and town government.*

- 2007 – Wrote **Greenfield Energy Audit** with support from the Town;
- 2009 – Started the **10% Challenge**, with a goal of getting 10% of the households to make a commitment to reduce energy use by 10% (We more than achieved our goal! 1000 households committed to take the 10% Challenge!);
- **Energy Smart Homes & Businesses programs**-worked with town to get 3-year grant from the EPA and implement it;
- **Solarize** program – advocated for it and worked with the town;

- **Sustainable Greenfield** – City of Greenfield’s master plan: Advocated and worked to create and implement it through the Sustainable Greenfield Implementation Committee;
- **Transportation** – ongoing advocacy to increase public transportation that offers the service we need – especially adding evening and weekend service;
- **Collective Learning/Education** – held ongoing film series, workshops, and biennial forum on issues of concern to Franklin County and bringing new ideas to our region such as growing food security and our economy, envisioning our world in 2050, and housing for all;
- **Planting for Pollinators!** campaign – aims to build biodiversity and beauty in Greenfield, and help restore healthy habitat for all living things;
- **Reusable Bag** campaign – aims to ban single use plastic bags, offer alternatives at no cost, and work on waste reduction in larger, broader ways;
- **Our schools** – Sit on GMS and GHS School Councils & Support teachers and administration to advocate for the increase content that brings the concept of sustainability and climate change solutions, and understanding of water, waste, and our natural world into the schools such as through the 5<sup>th</sup> grade water unit; High School drama club etc.
- **Nature-** Nature walks to connect people to nature

9. **What resources would be the most beneficial to you?** *(We asked folks to vote for 3)*

- a) Information on funding - 6
- b) A workshop on how to prepare/enhance protection - 3
- c) Detailed region/sector impacts - 4
- d) Contact details for state or city officials -4
- e) Details on how future climate changes will impact Greenfield -10
- f) A network of other small groups/organizations businesses (as applicable) in the area who face similar risks -10
- g) Other

10. **What actions/projects would you like to see the City undertake?**

- **Reduce vulnerability from worsening climate disruption**
  - Make a commitment to reduce greenhouse gas emissions wherever possible, such as:
    - Embracing the Green New Deal locally;
    - Helping residents implement actions that the Municipality has embraced, such as a fossil-fuel-free future. (FYI: In the 2008 Energy Audit, we found that Municipal energy use is only 2.7% of the energy used in Greenfield by residents, businesses, and transportation.);
    - Work with FRCOG’s new Affordable Access to Clean and Efficient Energy (AACEE) program to reach landlords;
    - Work to advocate for updated zero-net-energy stretch code;
    - Ensure appliances that use refrigerants are properly disposed of so refrigerants do not leak into the air.
- **K-12 Education**
  - Work with School Committee to ensure that young people understand the threat and the opportunities of the climate crisis, with the goal of reducing fear what their future will look like, and empowering them to be able to make informed decisions, take action, and become active participants in our democracy.

- **Health –**
  - Shelters to deal with homelessness, power outages, and extreme temperatures such as warming and cooling centers, trees for shade
  - Improve town-wide drainage issues that can cause mold in public buildings, businesses, and residences.
  - More trees and benches in all parts of town especially, in shade for people who are on foot to have a place to comfortably rest.
- **Water –** drinking water and sewer
  - Keep it clean and conserve it in every way possible so we have adequate water in times of drought;
  - Help reduce storm water run-off/embrace Green Infrastructure/Low impact Development (LID) as noted in our Master Plan; & replace old pipes to ensure storm water not getting into sewage lines;
  - Reduce water use: pass a policy that all toilets must be low-flow;
  - Green River: Ensure free flowing/remove dams, & ensure water quality of Green River is NOT degraded while passing through town etc.
- **Food Security –** Help ensure healthy and adequate food for all by growing local food, the City can help by:
  - Supporting Community Gardens
    - provide land for community gardens in neighborhoods especially Environmental Justice neighborhoods and places with rental housing, where tenants may not have access to land;
    - Hire a part-time community garden coordinator;
  - Continuing to offer space for Farmers' Markets;
  - Ensuring our schools, hospital, senior center and other meals programs have the healthiest foods for meals. Not only locally grown veggies but also locally raised meat etc. no factory-farmed meat products;
  - Supporting our schools to offer courses/hands-on experience with farming, gardening, and cooking skills;
  - Supporting community kitchens where people can preserve food;
  - Support local agriculture and collaborate with FCCDC's food processing facility so that local produce can be offered at school lunches and community meals;
  - Conserve farm land; support farmers in whatever way is possible; be prepared to help feed climate refugees that will likely come to Greenfield.
- **Housing –**
  - Embrace a "Housing First" policy and ensure adequate, affordable housing for all;
  - The town set up a mechanism, or incentives, so that houses taken for back taxes are rehabbed into multi-family homes to meet homeless, Low-income, or market-rate housing as appropriate based on size etc.
  - Be prepared to welcome climate refugees from coastal regions such as Boston and New York. This will entail not only building more housing, but changing municipal rules and regulations to make it possible for housing to become denser – such as encouraging row housing/town houses, multi-family housing, smaller homes, etc. which would likely involve changes in Greenfield's social norms;
  - Encourage residents to rethink what they really need for housing and to get to know their neighbors and offer support and friendship and learn to share

resources and tools and perhaps create a neighborhood storage area to reduce space needed to store things in each home with duplicate items.

- **Energy and Money** – work toward Greenfield’s commitment of zero energy dollars leaving our region by 2050. This can be achieved by moving toward a Fossil-fuel-free and 100% renewable future, as outlined in the resolution adopted by the Town Council in 2009.

Some implementation ideas:

- Embrace the Green New Deal locally
  - For low income people who are on fuel assistance for oil or gas, create a program to help them transition to fossil-free heat sources, install solar panels and mini splits, etc. using the savings
  - Protect renters from high and/or unknown utility bills -Adopt an Ordinance that requires all landlords to disclose energy use costs to potential renters.
- 
- **Transportation** –
    - Free public transportation for seniors like in Europe;
    - Improve regional bus service to include weekend and evening service that reaches all our community, and become more frequent overall. Our elder population depends on bus service to get to doctor appointments, etc;
    - Improve bus infrastructure;
    - Utilize electric buses to improve air quality;
    - Open a ticket office at the Olver Transit Center. Approach Amtrak, or others, for finding;
    - More public education around the issue of idling cars and the pollution this causes. I have noted an increase in number of people sitting in idling cars while waiting in parking lots, with windows open. No real understanding of the pollution problems this causes to the community;
    - More education around sharing the road: cars and bicycles;
    - Pedestrian crosswalks are now well marked and the safety issues have improved!
- 
- **Waste** –
    - Reduce, reuse, recycle, refuse, and compost as much as possible is an important way for our community to reduce our town’s carbon/methane Footprint and produce soil amendments ( compost) to use in our gardens and plantings;
    - Continue reducing use of Plastic: Adopt total single-use plastic bans throughout the city, including restaurant take-out containers and supermarket food trays!
- 
- **Quality of Life & Community** is key to enhancing resilience.
    - Continue offering free events and celebrations of our community;
    - More opportunities for our youth. Reinstating our teen center and a skateboard park;
    - Continue offering free events and celebrations of our community;
    - Enhance community neighbor-helping-neighbor, as well as providing facilities and programing for youth, seniors and other vulnerable populations;
    - Continue supporting recreation such as open space for walking and biking, maintaining and enhancing parks for sports and swimming;
    - a vibrant library;
    - on-street dining;



- Opportunities for art and creativity accessible for everyone with affordable options for those with varying income as well as.
- **Safety –**
  - Make connections & establish communications and trainings in emergency preparedness and de-escalation methods with all local leaders including the Mayor, Councilors, police, fire, churches, medical groups, the hospital, schools (incl. Stoneleigh Burnham), as well as all civic and social groups so that, in a crisis, everyone has a connection to someone;
  - Bike safety – more education about sharing the road + more marked bike lanes and bike paths, and a reconfiguration of parking downtown so that bicyclists don't have to bike behind parked cars that are backing out into their space;
  - Pedestrian safety has been improved with better cross walk signage. Thanks!
  - Improve safety: It is very dangerous turning left onto Main St. off Conway and Wells St. as large SUV's and trucks that are parked on that side of Main St, block our view of oncoming traffic;
  - Homeless safety: Make sure there is housing for all those unhoused in the winter months-work for more options besides shelters that folks have to leave in the daytime;
  - Safety in Schools: Institute policies that guarantee all our children feel safe and are treated equitably in our schools. Continue education on racism and teaching tolerance-start in kindergarten;
  - Police: Work on instituting changes in our police force to ensure people of color will not be targeted and treated differently than others and that the kind of unacceptable violence we have seen by police in other communities will not happen here. Create an oversight commission composed of people of color, women and others who are not retired law enforcement personnel-a diverse group.
- **Trees –** Plant more trees native to our region, and maintain them for our physical and emotion health, and to restore habitat for all. Recently, the Greenfield Tree Committee created a recommended tree list for Greenfield residents.  
<https://www.greenfieldtreecommittee.org/tree-selection>
- **Help restore healthy habitat** in our communities, and reverse habitat degradation, which is #2 global threat second only to climate change. For example, since 70% of our landscape must be plants (trees, shrubs, and herbaceous plants) native to our region to enable chickadees to raise a family of four, town should
  - Adopt a policy of removing/managing invasives, which rob us of much-needed space;
  - Plant native plants that flower (trees, shrubs, and herbaceous plants), wherever possible, such as in tree belts and City parks; and
  - Work with others to encourage residents to do the same, as well as reducing lawn and water runoff from their properties.

We agree strongly with Hansjorg Wyss, philanthropist and creator of the Wysss Campaign for Nature who said '*The climate emergency and the crisis facing nature and wildlife are two sides of the same coin.*'
- **Public education/technical support** to help everyone to take action on the many issues above that affect everyone in our community.

**11. Any other information you would like to provide?**

October 29, 2020

City of Greenfield Municipal Vulnerability Preparedness Committee  
Eric Twarog, Director of Planning & Development, City of Greenfield  
Allision Gage, Land Use and Natural Resources Planner, FRCOG

Dear Eric and Allison:

The Greenfield Tree Committee is excited to submit its responses to the MVP public survey for incorporation into the City of Greenfield's Municipal Vulnerability Preparedness (MVP) Plan. The Greenfield Tree Committee (GTC) is a non-profit, volunteer group of citizens working to promote a strong and resilient urban forest in the City of Greenfield. Members of GTC bring to this topic education and experience in areas such as sustainable design, natural resource and land use planning, environmental planning, forestry, ecological agriculture, landscape design and biology. These comments are submitted in support of GTC's position that the city's urban forest must receive prominent consideration in the MVP Plan.

With proper recognition, planning, and investment, trees are a proven and low-cost way to fortify Greenfield's resilience to a changing environment. Therefore, the GTC urges the MVP Committee to identify trees as a vulnerable component of the City's infrastructure in need of protection in the MVP plan. Just as importantly, the GTC also urges the MVP Committee to incorporate the restoration of the city's urban forest as a key climate mitigation and adaptation strategy for the city.

- **Trees Need Protection:** The GTC views street trees and forested areas within the City of Greenfield as integral components of the City's infrastructure – on par with culverts, roads, and bridges. Just as with other types of infrastructure, trees are vulnerable to the hazards presented by a changing climate, as detailed in the attached survey responses. These vulnerabilities include susceptibility to droughts, storms, invasive species, as well as a public perception of danger associated with trees that leads to their removal.
- **Trees Help Mitigate Climate Change:** But unlike other traditional types of infrastructure, trees can serve to help mitigate the advance of climate change. Tree canopies can help slow the intensity of precipitation as it approaches the ground, provide shade to structures and sidewalks during high temperatures, and break the force of wind during storms. Trees also absorb stormwater, filter particulate matter from the air, provide wildlife habitat, and sequester carbon and produce oxygen to counteract climate change. Overall, restoring Greenfield's urban forest is a fundamental approach to climate preparedness. Moreover, trees also provide ancillary benefits of increased property values, mental health benefits, and beautification.

In its comments the GTC provides practical, achievable strategies to re-grow a healthy and resilient urban forest in order to enable a healthy and resilient city. The GTC looks forward to the incorporation of these strategies into the MVP Plan as much as possible. Please contact us if you have any questions about these strategies or would like further supportive information regarding the importance of trees to climate resiliency.

Sincerely,

Members of the Greenfield Tree Committee

Helaina Balcanoff  
Richard Brown  
Tracy Grammer  
Susan Miller-King

Jaimye Bartak  
Mary Chicoine  
Nancy Hazard  
Becca Tishler

John Bottomley  
Dave Gott  
Margo Jones  
Kurt Schellenberg

**Greenfield Municipal Vulnerability Preparedness – Outreach Guiding Questions**  
**GREENFIELD TREE COMMITTEE RESPONSES**

**Questions for Greenfield Community Members**

- 1. What is your name and role in Greenfield? If a business owner, please name your business.**

Greenfield Tree Committee

- 2. What changes have you seen in the natural environment over the course of your lifetime?**

We have seen many changes:

- Increased heat
- Severe weather events
- Change in precipitation extremes (both drought and floods)
- Greenfield much breezier, on a daily basis, than in the past
- Increase of disease-carrying insects (i.e. deer ticks) while native insects such as moths and butterflies have decreased
- Decrease of morning bird chorus
- Increase of invasive plant species such as non-native bittersweet, Japanese knotweed, Norway maple, non-native barberry, burning bush, garlic mustard, etc.
- Loss of farmland and forests to housing development
- Loss of older, streetside trees

- 3. How have extreme weather events affected Greenfield? Please use the ranking list below:**

Most committee members chose “moderate” while one chose somewhat, and one chose frequent.

1. Not at all
2. Somewhat (1)
3. Moderate (most common response)
4. Frequent (1)
5. Extreme

- 4. Which hazards have affected Greenfield the most?**

All of them! See comments below

- a. Flooding – Somewhat—During Irene, the Green River flooded the sewage treatment plant! Arch Street, under the RR tracks, used to flood regularly. Mobile home park near the Green River destroyed by flooding. Farmland impacted by flooding, including extensive crop loss, loss of topsoil and contamination of farm fields from polluted waters and debris flooding fields.
- b. Drought – Drought has stressed street trees, especially recently planted ones, and makes mature trees in forested areas susceptible to damaging pests such as gypsy moths. Drought is also impacting local farmers, increasing watering demands and negatively impacting crop quality.
- c. Severe Wind – We have seen an increase in downed trees causing electrical outages, and damaging trees to the extent that they are lost or cut down
- d. Extreme Temperatures – Combined with drought have stressed street trees, and will over time change the composition of trees that can survive in the region

- e. Invasive Species -Norway maples have contributed to loss of habitat; Bittersweet, burning bush, Japanese knotweed, Japanese honeysuckle, and barberry have invaded our forests in parks, and less urbanized sections of town, displacing native species that have many eco-system roles and benefits.
- f. Other –
  - 1. Due to warmer temperatures, ice storms have increased instead of snow
  - 2. Utility tree pruning often increases vulnerability, rather than decreasing it, making trees susceptible to pests and damage

**5. Based on your answer to #4, please provide an example of how your selected hazard(s) affected your City.**

Overall street tree and forest health have been compromised causing a degradation of our ecosystem, reduced tree, forest and human health, and reduced resilience of forests. The reduction of street trees means that the many benefits of street trees are compromised.

For example, summer shade is diminished, which causes urban temperatures to rise, and people are less likely to walk and receive the health benefits and low-cost mobility benefits of that activity. Having less trees also negatively impacts air quality, exacerbating respiratory illnesses in elders and other vulnerable populations. Other ecosystem benefits of trees include reducing air pollution, slowing and absorbing storm water runoff, and enhancing psychological well-being. Reducing stormwater runoff is especially critical as our wastewater treatment facility is already unable to accommodate current flows during large rain events. Additionally, trees serve as host to thousands of beneficial pollinators, moths, butterflies and supply shelter and food to birds and numerous mammals. See question #4 for more examples.

Not only do trees help mitigate the impacts of climate change, but they can also help slow the advance of climate change itself by absorbing carbon dioxide.

**6. Which aspects of Greenfield (or your business or organization, as applicable) are most vulnerable to hazards?**

The Greenfield Tree Committee views street trees as most vulnerable to both climate change and human hazards. The latter include people who request removal of trees because they fear that with more severe storms, the tree may fall on their home or cause other damage.

**7. Which aspects of Greenfield (or your business or organization, as applicable) do you think are the most resilient to hazards?**

Unfragmented forests, and healthy street trees are highly resilient.

**8. What steps (if any) are you taking to safeguard your home, business, organization services (as applicable) against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)**

The Greenfield Tree Committee (GTC) and the DPW are taking many steps to build resilience in our street trees.

- a. DPW has purchased water bags for new trees, has purchased a water truck and waters newly-planted trees during the summer months two times/week

- b. GTC has researched and developed a list of recommended trees that are climate resilient, and native to our area, so that they support our ecosystem. This list is available at [www.greenfieldtreecommittee.org/tree-selection](http://www.greenfieldtreecommittee.org/tree-selection).
- c. The DPW and GTC are planting smaller trees under power lines to reduce power outages caused by trees in the future.
- d. GTC is working on an Inventory of all our street trees that include tree health, size, condition and maintenance needs. This list can be used to plan future plantings and to monetize the value of the loss of street trees caused by severe storms, drought etc.
- e. GTC and DPW are working together to proactively increase the number of street trees planted each year. The DPW seeks grants so that it can both plant more street trees and offer free trees for front yards. The GTC proactively plants trees with community members, as well as offer education on the importance of and how to care for trees. The newly planted trees provide habitat for birds, insects, and pollinators as well

**9. What resources would be the most beneficial to you?**

- o Information on funding- most important
- o A workshop on how to prepare/enhance protection
- o Detailed region/sector impacts
- o Contact details for state or city officials
- o Details on how future climate changes will impact Greenfield
- o A network of other small groups/organizations businesses (as applicable) in the area who face similar risks
- o Other It would be helpful if City officials and other prominent businesses, institutions, etc. helped promote the importance of Greenfield's urban forest.
- o FYI- DCR provides lots of technical support to DPWs and tree committees
- o

**10. What actions/projects would you like to see the City undertake?**

**Green infrastructure**, such as street trees, is identified as a key strategy to build resilience and both mitigate the effects of climate change as well as sequester carbon and produce oxygen to help slow the relentless increase in greenhouse gas emissions. (<https://doi.org/10.1111/gcb.14612>, <https://www.theguardian.com/environment/2019/jul/04/planting-billions-trees-best-tackle-climate-crisis-scientists-canopy-emissions>)

The City of Greenfield must protect and improve Greenfield's urban trees and forest in the following ways:

1. Increase City budget for tree planting and maintenance, and regularly update the tree inventory. Due to past street tree loss, we should plant about 2,500 new trees over the next decade. Additionally, according to a 2014 inventory, 50% of our existing street trees are aging non-native Norway maples, which will need to be replaced in the coming years.
2. Support the Greenfield Tree Committee's (GTC) new tree nursery by paying a nominal fee to purchase young trees from GTC for the City of Greenfield.

3. Adopt a policy that requires all City sidewalk and street projects to include a tree protection and planting plan and budget. And that no sidewalk and street projects are to be implemented without street tree planting.
4. Adopt a zoning policy that parking lots alongside sidewalks must have a vegetative buffer that includes street trees
5. Adopt a policy that spells out a goal of what % of parking lots etc. must be shaded. The number of trees/square foot is important, but not adequate. Tree size/species matters. This policy should be enforced by the zoning enforcement officer each time a permit is requested related to a new or rehabbed property. A similar approach should be taken for streets.
6. Modify and adopt a street tree list that includes more native trees and eliminates known invasive trees and other undesirable trees.
7. Protect our public forests (Temple Woods, Highland Park, and others) from logging and other human impacts. Keep them from being further fragmented by human impacts.
8. Participate in or establish a carbon trust that would provide incentives to land owners to keep forests intact. Instead of incentivizing logging (as Chapter 61 does), incentivize forest growth and health.
9. Increase the capacity of the DPW to water young trees as part of regular maintenance by providing extra summertime staff.
10. Increase the capacity of the DPW to regularly maintain/prune older trees in routine fashion to prevent avoidable issues leading to unnecessary tree removal.
11. Implement an online, real-time tree inventory, maintained by GTC and DPW
12. Heritage tree program: Honor, protect, and maintain older trees on our streets, and urge residents to do the same with large trees in their yards.
13. Public education about the benefits of trees and how to maintain them so that people will take care of their trees, rather than remove them.
14. City could advocate that Eversource, our electric utility, bury electric lines when possible to improve resilience by reducing the incidence of power outages due to severe storms

## **11. Any other information you would like to provide?**

Trees have many health and ecosystem benefits that greatly outweigh any liabilities, and planting trees is more cost-effective than many high-tech solutions to climate change impacts (such heating/cooling/gray infrastructure), costing only \$4/resident.\* As noted elsewhere, tree choice and maintenance are key to building and maintaining a healthy tree canopy and reducing tree hazards caused by more extreme weather events.

The Greenfield Tree Committee believes that street trees and its urban forest should be identified as key components of Greenfield's infrastructure that need both protection and enhancement. Trees should be at the forefront of how this City will both adapt to climate change, and at the same time reduce greenhouse gas emissions, the cause of climate change..

1. The benefits of trees in urban areas of Greenfield
  - a. Reducing heat:
    1. Health benefits: "Heatwaves kill more people worldwide than any other weather-related event"\* Additionally, people will walk and bike more, providing both health benefits and a no-cost transportation alternative for low-income residents

2. Reducing heat reduces use of energy for cooling, often a source of additional greenhouse gas emissions. (FYI in Gfld, we have Greenfield Light & Power, so our electricity does NOT increase CO2 emissions)
  - b. Storm water – Trees reduce stormwater runoff
  - c. Air pollution – Trees reduce air pollution, especially fine particulate matter (PM) which causes asthma and exacerbates heart conditions
  - d. Mental health – Many studies have shown benefits such as faster healing, reduced crime etc.
  - e. Physical health - Trees improve air quality and reduce asthma and other respiratory illnesses.
  - f. Ecosystem support – Native trees are host to a majority of the moths and butterflies, and provide food and shelter to other pollinators and insects, birds, and mammals.
2. Benefits of trees in more rural areas of Greenfield
    - a. Flooding - Trees reduce flooding because healthy forests hold water in the soil, which reduces water runoff and flooding. Trees also help hold river banks and steep slopes in place.
    - b. Droughts – Healthy forests reduce severity of droughts by holding water in the soil/replenishing aquifers etc.
    - c. Ecosystem benefits as noted above.
    - d. Other? Provides closeby access to nature for people who live in Greenfield. Spending time in nature has been shown to improve physical and mental wellbeing.

## **OTHER:**

## **NOTES:**

### **\*How Urban Trees Can Save Lives**

*Planting Healthy Air report quantifies health benefits of trees for 245 cities globally*

**The Nature Conservancy, October 30, 2016**

<https://www.nature.org/en-us/what-we-do/our-insights/perspectives/how-urban-trees-can-save-lives/>

## Greenfield Municipal Vulnerability Preparedness – Community Services Survey

**Instructions:** You may complete the survey **online** or by **mail**. Should you respond via mail, please use the enclosed envelope to do so. If you would like to quickly respond online please navigate to SurveyMonkey site via the following link:

<https://www.surveymonkey.com/r/Greenfield>.

You can also access the survey via the QR code if you use a smartphone. Open your rear-facing camera and hover it above this image and then open the link that pops up:



Thank you for your time!

*Sorry for the delay —*

1. What is your name and the name of your organization?

*BETH HAWKINS  
PUBLIC SAFETY COMMISSION*

2. What type of service do you manage?

- a. Community mental health
- b. Assisted living
- c. General community services
- d. Medical services

☒ e. Other *PUBLIC SAFETY - POLICE/FIRE/EMS*

3. Extreme weather events in recent years have affected your service in recent years

- a. Not at all
- b. Somewhat
- ☒ c. Moderate
- d. Frequent
- e. Extreme

*WHEN AN EVENT HAPPENS IT'S EXTREME  
ON OUR AGENCIES TO DELIVER SERVICES*

4. Which hazards have interrupted your service in recent years?

☒ a. Flooding



## Greenfield Municipal Vulnerability Preparedness – Community Services Survey

- b. Drought
- ☒ c. Extreme Temperatures
- d. Invasive Species
- e. Other *TROPICAL STORMS*

5. Which aspects of your service are the most vulnerable to hazards?

- a. Treatment plans
- b. Access to clients
- ☒ c. Infrastructure
- d. Other (please detail)

6. Are you aware of how extreme weather or changes in climate could impact your services?

- a. Do you feel that you have adequate information on how your business could be impacted in the future? *YES*

7. What steps (if any) are you taking to safeguard your services against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses) *YES*

- a. If yes, please describe the actions taken.
- b. If yes, what hazard was the adaptation in response to?

*FIRE CHIEF (EDD)  
EMERGENCY OP. DIR.  
WORKS ON PLANS —*

8. Are there any steps you are planning to take?

- a. If yes, do you project any barriers to implement the changes?

*YES — FINANCIAL NEEDS*

## Greenfield Municipal Vulnerability Preparedness – Community Services Survey

9. What resources would be the most beneficial to you?

- a. Information on funding
- b. A workshop on how to prepare/enhance protection
- c. Detailed region/sector impacts
- d. Contact details for state or city officials
- e. Details on how future climate changes will impact my business
- f. A network of other small businesses in the area who face similar risks

10. Have you previously engaged your clients in issues relate to climate change or resiliency?

- a. If yes, what was your approach? *FIRE CHIEF*
- b. If not, has your organization considered conducting outreach?

11. What could the City do to support your continued success?

*FINANCIAL SUPPORT IS KEY TO SUCCESS IN MEETING DEMAND*

12. Any other information you would like to provide?

*OUR FACILITIES ARE OLD AND CREATE DIFFICULTY IN MEETING CURRENT DEMAND WITHIN POLICE, FIRE AND EMERGENCY ROOM SERVICE - WHICH IS TERRIBLE! -*

*THE HOSPITAL CANNOT MEET REGULAR DEMAND FOR SERVICE IN THE ER - WHEN MINI DISASTER OCCUR THEY ARE ILL PREPARED - NOT ENOUGH ROOMS IN ER OR STAFF TO HANDLE EMERGENCIES*



#1

COMPLETE

**Collector:** Web Link 1 (Web Link)  
**Started:** Tuesday, July 28, 2020 8:32:14 AM  
**Last Modified:** Tuesday, July 28, 2020 8:35:56 AM  
**Time Spent:** 00:03:41  
**IP Address:** 50.245.20.162

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Page 1

Q1

What is your name and the name of your organization?

Franklin County Sheriff's Office

Q2

What type of service do you manage?

Other (please specify):  
Incarcerated Population

Q3

7

Extreme weather events in recent years have affected my service

Q4

Other

Which hazards have interrupted your service in recent years?

Q5

Infrastructure

Which aspects of your organization are the most vulnerable to hazards?

Q6

Do you feel that you have adequate information on how your organization could be impacted by climate change in the future?

Yes

**Q7**

What steps (if any) are you taking to safeguard your service against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses/organizations)

None, we do have a disorder management plan that speaks to different types of weather disturbances. These plans are reviewed at least annually, or as needed.

---

**Q8**

If you answered "yes" to Question 6, do you project any barriers to implement the changes?

no

---

**Q9**

Respondent skipped this question

What resources would be the most beneficial to you?

---

**Q10**

Respondent skipped this question

What could the City do to support your continued success?

---

**Q11**

Respondent skipped this question

Any other information you would like to provide?

---

## #2

**COMPLETE**

**Collector:** Web Link 1 (Web Link)  
**Started:** Monday, August 03, 2020 8:39:39 AM  
**Last Modified:** Monday, August 03, 2020 8:43:46 AM  
**Time Spent:** 00:04:06  
**IP Address:** 71.235.176.8

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Page 1

**Q1**

What is your name and the name of your organization?

Greenfield Local Cultural Council

**Q2**

What type of service do you manage?

Other (please specify):  
Distribution of LCC monies**Q3****0**

Extreme weather events in recent years have affected my service

**Q4****Respondent skipped this question**

Which hazards have interrupted your service in recent years?

**Q5****Respondent skipped this question**

Which aspects of your organization are the most vulnerable to hazards?

**Q6**

Do you feel that you have adequate information on how your organization could be impacted by climate change in the future?

Yes

**Q7**

What steps (if any) are you taking to safeguard your service against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses/organizations)

I volunteer from my home where we have a generator for use in power outages.

---

**Q8****Respondent skipped this question**

If you answered "yes" to Question 6, do you project any barriers to implement the changes?

---

**Q9****Detailed region/sector impacts**

What resources would be the most beneficial to you?

---

**Q10****Respondent skipped this question**

What could the City do to support your continued success?

---

**Q11****Respondent skipped this question**

Any other information you would like to provide?

---

#3

COMPLETE

**Collector:** Web Link 1 (Web Link)  
**Started:** Monday, August 03, 2020 11:36:45 AM  
**Last Modified:** Monday, August 03, 2020 11:42:05 AM  
**Time Spent:** 00:05:19  
**IP Address:** 208.99.255.70

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Page 1

Q1

What is your name and the name of your organization?

Baystate Franklin Medical Center

Q2

Medical services

What type of service do you manage?

Q3

29

Extreme weather events in recent years have affected my service

Q4

Extreme Temperatures,

Which hazards have interrupted your service in recent years?

Other

Q5

Infrastructure,

Which aspects of your organization are the most vulnerable to hazards?

Other (please specify):  
staffing can be difficult during bad weather

Q6

Do you feel that you have adequate information on how your organization could be impacted by climate change in the future?

Yes



**Q7**

What steps (if any) are you taking to safeguard your service against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses/organizations)

We have developed an emergency management plan, perform routine hazardous vulnerability assessments, set up letters of agreement with suppliers, and maintain a plan to be completely self sufficient for up to 96 hours.

---

**Q8**

If you answered "yes" to Question 6, do you project any barriers to implement the changes?

no

---

**Q9**

What resources would be the most beneficial to you?

**Information on funding,**

**Contact details for state or city officials,**

**A network of other small businesses in the area who face similar risks**

---

**Q10**

What could the City do to support your continued success?

**Respondent skipped this question**

---

**Q11**

Any other information you would like to provide?

**Respondent skipped this question**

---

## #4

**COMPLETE**

**Collector:** Web Link 1 (Web Link)  
**Started:** Wednesday, September 09, 2020 10:55:45 AM  
**Last Modified:** Wednesday, September 09, 2020 11:00:31 AM  
**Time Spent:** 00:04:46  
**IP Address:** 172.103.79.145

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Page 1

**Q1**

What is your name and the name of your organization?

Montague WebWorks

**Q2**

What type of service do you manage?

Other (please specify):  
Design and Host Websites**Q3****10**

Extreme weather events in recent years have affected my service

**Q4****Other**

Which hazards have interrupted your service in recent years?

**Q5****Infrastructure,**

Which aspects of your organization are the most vulnerable to hazards?

Other (please specify):  
Roads to get to work; Internet to accomplish work**Q6**

Do you feel that you have adequate information on how your organization could be impacted by climate change in the future?

Not sure

**Q7**

What steps (if any) are you taking to safeguard your service against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses/organizations)

None, yet.

---

**Q8**

If you answered "yes" to Question 6, do you project any barriers to implement the changes?

n/a

---

**Q9**

What resources would be the most beneficial to you?

**Information on funding,**

**A workshop on how to prepare/enhance protection,**

**Detailed region/sector impacts,**

**Details on how future climate changes will impact my business**

,

**A network of other small businesses in the area who face similar risks**

---

**Q10**

What could the City do to support your continued success?

Provide links to all the above (question 9)

---

**Q11**

Any other information you would like to provide?

BTW, you used the words "in recent years" twice in question 3: "Extreme weather events in recent years have affected my service in recent years"

---

#5

**COMPLETE**

**Collector:** Web Link 1 (Web Link)  
**Started:** Tuesday, October 13, 2020 9:22:28 PM  
**Last Modified:** Tuesday, October 13, 2020 9:28:12 PM  
**Time Spent:** 00:05:43  
**IP Address:** 8.2.72.65

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Page 1

**Q1**

What is your name and the name of your organization?

Neatline Consulting

**Q2**

What type of service do you manage?

Other (please specify):

Geospatial Analyses, Modeling, Geo-referencing

**Q3****50**

Extreme weather events in recent years have affected my service

**Q4****Severe wind/microbursts**

Which hazards have interrupted your service in recent years?

**Q5****Infrastructure**

Which aspects of your organization are the most vulnerable to hazards?

**Q6**

Do you feel that you have adequate information on how your organization could be impacted by climate change in the future?

No. Electricity and Internet are the foundation upon which Neatline Consulting operates.

**Q7**

What steps (if any) are you taking to safeguard your service against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses/organizations)

Emergency work load outsourcing would be necessary, and aside from immediate threats to life/limb is the most important to maintaining business operations in the long term.

---

**Q8**

If you answered "yes" to Question 6, do you project any barriers to implement the changes?

Barriers would be the geographic location of other Neatline staff/competitors who could take on the work.

---

**Q9**

What resources would be the most beneficial to you?

**Detailed region/sector impacts,**

**A network of other small businesses in the area who face similar risks**

---

**Q10**

What could the City do to support your continued success?

GCET specific EAP.

---

**Q11**

Any other information you would like to provide?

Thank you

---

## Greenfield Municipal Vulnerability Preparedness – Outreach Guiding Questions

### Questions for Greenfield Community Members

---

1. What is your name and role in City? If a business owner, please name your business.

Andrew Morehouse – Foodbank of Western MA - Foodbank serves all of Franklin County

2. What changes have you seen in the natural environment over the course of your lifetime?

Warmer temperatures – new birds he's never seen before

Very unpredictable weather

3. How have extreme weather events affected Greenfield? Please use the ranking list below:

- a. Not at all
- b. Somewhat
- c. Moderate
- d. Frequent
- e. Extreme

4. Which hazards have affected Greenfield the most?

- a. Flooding
- b. Drought
- c. Severe Wind
- d. Extreme Temperatures
- e. Invasive Species
- f. Other – Severe weather events
  - i. Ice storms – affected hill towns
  - ii. October blizzard

5. Based on your answer to #3, please provide an example of how your selected hazard(s) affected you or the City.

October blizzard shut them down for the first time ever, for three days

Blowdowns up in the hilldowns affected their ability to distribute food

Tornado that struck Springfield – very difficult to distribute food

6. Which aspects of the City (or your business or organization, as applicable) are most vulnerable to hazards?

Transportation, food distribution, their facilities and shutdowns

## Greenfield Municipal Vulnerability Preparedness – Outreach Guiding Questions

Own two farms – both farms are in Hadley, crops are vulnerable, local resources can be strained – if they are adversely affected then donations and purchased

1 million pounds from local – ½ donated and ½ purchased

Drought this fall has impacted their two farms – made for a harder crop season

1 farm has access to irrigation, but don't want to fully use it until they have a well for irrigation

7. Which aspects of the City (or your business or organization, as applicable) do you think are the most resilient to hazards?

Contingency plans, continuity of business plans, covers power losses, they do have a generator and test it regularly and to test emergency operations out

8. What steps (if any) are you taking to safeguard your home, business, organization services (as applicable) against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)
- If yes, please describe the actions taken.
  - If yes, what hazard was the adaptation in response to?

Have a generator

Would like to have more time to do scenario playing

Pioneer Valley Coalition of Organizations Assisting in Disaster – organization Tracy is involved with, there are quarterly meetings, with an emergency operations plan, incident command team

9. What resources would be the most beneficial to you?
- Information on funding
  - A workshop on how to prepare/enhance protection
  - Detailed region/sector impacts
  - Contact details for state or city officials
  - Details on how future climate changes will impact Greenfield
  - A network of other small groups/organizations businesses (as applicable) in the area who face similar risks
  - Other

## Greenfield Municipal Vulnerability Preparedness – Outreach Guiding Questions

10. What actions/projects would you like to see the City undertake?

We need to prepare for an isolated natural disaster – how would PV COAD and how would the food bank respond to site partners who need help? Complete a scenario role play between food bank and emergency site partners and related partners would be great

- a. Brown Bag Site – food distribution to elders, senior center
- b. Blessed Sacrament Church 133 Main street
- c. Community Action Center for self Reliance
- d. Community Builders at Leyden Woods
- e. Dial Self Franklin County
- f. Salvation Army
- g. FC Community Meals program
- h. Mobile Food Bank at Oak Court

11. ***Any other information you would like to provide?***

Getting to know EMD director in Greenfield would be helpful



## Greenfield Municipal Vulnerability Preparedness – Outreach Guiding Questions

### Questions for Greenfield Community Members

---

1. What is your name and role in City? If a business owner, please name your business.

Becky Himlin - Planning and Development Director, management role, also works on the agency's community needs and assessment plan. Looking at emergency preparedness as a part of the strategic planning process.

2. What changes have you seen in the natural environment over the course of your lifetime?
3. How have extreme weather events affected Greenfield? Please use the ranking list below:
  - a. Not at all
  - b. Somewhat
  - c. Moderate
  - d. Frequent
  - e. Extreme
4. Which hazards have affected Greenfield the most?
  - a. Flooding
  - b. Drought
  - c. Severe Wind
    - i. Impacts on power, food spoilage, heat crises
    - ii. Severity of snow storms has affected people negatively
    - iii. Roads are not often cleared quickly, with the risk of ice storms, same type of risks around power and downed lines.
  - d. Extreme Temperatures
  - e. Invasive Species
  - f. Other
5. Based on your answer to #3, please provide an example of how your selected hazard(s) affected you or the City.
6. Which aspects of the City (or your business or organization, as applicable) are most vulnerable to hazards?

## Greenfield Municipal Vulnerability Preparedness – Outreach Guiding Questions

She feels that their operations are severely hurt when there are outages, it's very destructive if there's not WIFI, or can't reach people. Have not noted that the properties have faced significant storm damage. There are buildings that are in need of repair, but it's not necessarily hazard related.

Just being available and having their systems in place so that people in need is really important.

They do emergency heating repairs that they do throughout the winter season, and if they can't reach them that's a big issue. Especially if their phone systems go down in addition to the computer going down.

7. Which aspects of the City (or your business or organization, as applicable) do you think are the most resilient to hazards?

We had a local presence before COVID, people could come physically to contact us. We still have a presence but are not seeing folks in person. They have a good IT department that fixes problems quickly and can get them back going. Improves availability.

They do have remote availability; people can work from home and still do their jobs. Invested in a lot more mobile devices.

8. What steps (if any) are you taking to safeguard your home, business, organization services (as applicable) against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)
- If yes, please describe the actions taken.
  - If yes, what hazard was the adaptation in response to?

Strategic planning and climate change – haven't done the internal part. Just been gathering information for the community assessment, which is about what affects their target population. These populations are more impacted by climate change due to poor quality housing, may be isolated, may have fewer food resources on hand. In the past they have also looked specifically at how do we prepare for emergencies, for example when frozen food goes bad.

Issues that affects their community – that's going into the plan.

Have also talked to other munis, talking to Northampton about a resilience hub. They would like CA to be involved in pulling them together. Times without emergencies could be for homeless to access services in one place. Then in a crisis it would have the ability to shelter there.

Purchases ACs for folks who were vulnerable – raised funds for COVID and were able to use it that way.

## Greenfield Municipal Vulnerability Preparedness – Outreach Guiding Questions

What resources would be the most beneficial to you?

- c. Information on funding
- d. A workshop on how to prepare/enhance protection
- e. Detailed region/sector impacts
- f. Contact details for state or city officials
- g. Details on how future climate changes will impact Greenfield
- h. A network of other small groups/organizations businesses (as applicable) in the area who face similar risks
- i. Other
  - i. Coordination around the most vulnerable populations – people with low incomes. Communication is tight within the agency. But would want to know what's going on with the city – coordinated information hub would be really helpful if the city does this. They have the Look for Help Directory – when an organization is doing something, they try to highlight those changes. Need more publicly available resource information.
    - 1. Coordinate with the City on this.

9. What actions/projects would you like to see the City undertake?

Resilience hub – a flexible space that could be used. There is a need to connect resources.

**10. Any other information you would like to provide?**

## Greenfield Municipal Vulnerability Preparedness – Outreach Guiding Questions

### Questions for Greenfield Community Members

---

1. What is your name and role in Greenfield? If a business owner, please name your business.

Michael Nelson, President, Franklin County Fairgrounds

2. What changes have you seen in the natural environment over the course of your lifetime?

In our area of Greenfield, we continue to see landslides as the top issue. The Green River Cemetery washed out ten or so years ago, Wisdom Way is collapsing, and we have a major erosion/mudslide issue at the fairgrounds. Across town, I recall the Wedgewood Gardens flood some fifteen years ago in which the Green River destroyed that entire complex.

3. How have extreme weather events affected Greenfield? Please use the ranking list below:

- a. Not at all
- b. Somewhat
- c. Moderate
- d. Frequent
- e. Extreme

4. Which hazards have affected Greenfield the most?

- a. Flooding
- b. Drought
- c. Severe Wind
- d. Extreme Temperatures
- e. Invasive Species
- f. Other - Mudslides/Landslides

5. Based on your answer to #3, please provide an example of how your selected hazard(s) affected you or the City.

As noted above, we have an ongoing landslide issue at the fairgrounds.

6. Which aspects of Greenfield (or your business or organization, as applicable) are most vulnerable to hazards?

Currently the mudslide/landslide is our greatest vulnerability. Additionally when the fairgrounds is occupied with events severe weather is a great concern. Strong winds, strong thunderstorms, and tornados could cause serious damage or injury.

7. Which aspects of Greenfield (or your business or organization, as applicable) do you think are the most resilient to hazards?

No opinion

1

### Greenfield Municipal Vulnerability Preparedness – Outreach Guiding Questions

8. What steps (if any) are you taking to safeguard your home, business, organization services (as applicable) against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)
- If yes, please describe the actions taken.
  - If yes, what hazard was the adaptation in response to?

We are currently working with state and federal partners to engineer plans for remediating our mudslide issue. We anticipate work commencing in Spring 2021.

9. What resources would be the most beneficial to you?

- Information on funding
- A workshop on how to prepare/enhance protection
- Detailed region/sector impacts
- Contact details for state or city officials
- Details on how future climate changes will impact Greenfield
- A network of other small groups/organizations businesses (as applicable) in the area who face similar risks
- Other

10. What actions/projects would you like to see the City undertake?



Steps to address any further movement of the Green River Ridge near the fairgrounds that continues to produce landslides.

11. ***Any other information you would like to provide?***

## Greenfield Municipal Vulnerability Preparedness – Community Services Survey

**Instructions:** You may complete the survey **online** or by **mail**. Should you respond via mail, please use the enclosed envelope to do so. If you would like to quickly respond online please navigate to SurveyMonkey site via the following link:

<https://www.surveymonkey.com/r/Greenfield>.

You can also access the survey via the QR code if you use a smartphone. Open your rear-facing camera and hover it above this image and then open the link that pops up:



**Thank you for your time!**

1. What is your name and the name of your organization?

John S. Passiglia  
Greenfield Historical Commission

2. What type of service do you manage?

- a. Community mental health
- b. Assisted living
- ☒ c. General community services
- d. Medical services
- e. Other

3. Extreme weather events in recent years have affected your service in recent years

- a. Not at all
- ☒ b. Somewhat
- c. Moderate
- d. Frequent
- e. Extreme

4. Which hazards have interrupted your service in recent years?

- a. Flooding

## Greenfield Municipal Vulnerability Preparedness – Community Services Survey

- b. Drought
- c. Extreme Temperatures
- d. Invasive Species
- ☒ e. Other

5. Which aspects of your service are the most vulnerable to hazards?

- a. Treatment plans
- b. Access to clients
- ☒ c. Infrastructure
- d. Other (please detail)

6. Are you aware of how extreme weather or changes in climate could impact your services?

- a. Do you feel that you have adequate information on how your business could be impacted in the future?

The historical commission  
works to preserve structures  
and sites most of which are  
affected by climate change

7. What steps (if any) are you taking to safeguard your services against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)

- a. If yes, please describe the actions taken.
- b. If yes, what hazard was the adaptation in response to?

We do not have a plan to help  
safeguard sites but would like  
to develop one

8. Are there any steps you are planning to take?

- a. If yes, do you project any barriers to implement the changes?

## Greenfield Municipal Vulnerability Preparedness – Community Services Survey

9. What resources would be the most beneficial to you?

- a. Information on funding
- b. A workshop on how to prepare/enhance protection
- c. Detailed region/sector impacts
- d. Contact details for state or city officials
- e. Details on how future climate changes will impact my business
- f. A network of other small businesses in the area who face similar risks

10. Have you previously engaged your clients in issues relate to climate change or resiliency?

- a. If yes, what was your approach?
- b. If not, has your organization considered conducting outreach?

*we have worked with owners  
to put solar on ~~the~~ roofs*

11. What could the City do to support your continued success?

*keep the commission informed*

12. Any other information you would like to provide?

*no thanks!*  
*John J. Passafium*



## Greenfield Municipal Vulnerability Preparedness – Community Services Survey

**Instructions:** You may complete the survey **online** or by **mail**. Should you respond via mail, please use the enclosed envelope to do so. If you would like to quickly respond online please navigate to SurveyMonkey site via the following link:

<https://www.surveymonkey.com/r/Greenfield>.

You can also access the survey via the QR code if you use a smartphone. Open your rear-facing camera and hover it above this image and then open the link that pops up:



**Thank you for your time!**

1. What is your name and the name of your organization?

Poet's Seat Health Care Center  
359 High St  
Greenfield MA

2. What type of service do you manage?

- a. Community mental health
- b. Assisted living
- c. General community services
- d. Medical services

e. Other

Nursing home

63 Bed  
skilled  
Nursing  
facility

3. Extreme weather events in recent years have affected your service in recent years

- a. Not at all
- b. Somewhat
- c. Moderate
- d. Frequent
- e. Extreme

4. Which hazards have interrupted your service in recent years?

- a. Flooding

electrical outages



## Greenfield Municipal Vulnerability Preparedness – Community Services Survey

- b. Drought
  - ☒ c. Extreme Temperatures
  - d. Invasive Species
  - ☒ e. Other
- 5. Which aspects of your service are the most vulnerable to hazards?
  - a. Treatment plans
  - b. Access to clients
  - ☒ c. Infrastructure
  - d. Other (please detail)
- 6. Are you aware of how extreme weather or changes in climate could impact your services?
  - a. Do you feel that you have adequate information on how your business could be impacted in the future?

yes -  
we have so many regulations  
+ requirements that must be  
followed. we participate  
in many DRILLS!

- 7. What steps (if any) are you taking to safeguard your services against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)
  - a. If yes, please describe the actions taken.
  - b. If yes, what hazard was the adaptation in response to?

ALL - again nursing homes  
have Disaster Plans in  
place for all potential  
disasters.

- 8. Are there any steps you are planning to take?
  - a. If yes, do you project any barriers to implement the changes?

NO - we stay updated  
through MASS DPH  
+ Local Fire  
+ civil  
Defense  
groups

## Greenfield Municipal Vulnerability Preparedness – Community Services Survey

9. What resources would be the most beneficial to you?

- a. Information on funding
- b. A workshop on how to prepare/enhance protection
- c. Detailed region/sector impacts
- d. Contact details for state or city officials
- ☒ e. Details on how future climate changes will impact my business
- f. A network of other small businesses in the area who face similar risks

10. Have you previously engaged your clients in issues relate to climate change or resiliency?

- a. If yes, what was your approach?
- b. If not, has your organization considered conducting outreach?

Nursing Home?

11. What could the City do to support your continued success?

Make resources available when needed supplies information personnel.

12. Any other information you would like to provide?

Alu



## Greenfield Municipal Vulnerability Preparedness – Community Services Survey

**Instructions:** You may complete the survey **online** or by **mail**. Should you respond via mail, please use the enclosed envelope to do so. If you would like to quickly respond online please navigate to SurveyMonkey site via the following link:

<https://www.surveymonkey.com/r/Greenfield>.

You can also access the survey via the QR code if you use a smartphone. Open your rear-facing camera and hover it above this image and then open the link that pops up:



**Thank you for your time!**

1. What is your name and the name of your organization?

*Christy Moore  
City of Greenfield  
Recreation Director*

2. What type of service do you manage?

- a. Community mental health
- b. Assisted living
- ☒ c. General community services
- d. Medical services
- e. Other

3. Extreme weather events in recent years have affected your service in recent years

- a. Not at all
- ☒ b. Somewhat
- c. Moderate
- d. Frequent
- e. Extreme

4. Which hazards have interrupted your service in recent years?

- ☒ a. Flooding

## Greenfield Municipal Vulnerability Preparedness – Community Services Survey

- b. Drought
  - c. Extreme Temperatures
  - d. Invasive Species
  - e. Other
5. Which aspects of your service are the most vulnerable to hazards?
- a. Treatment plans
  - b. Access to clients
  - ☒ c. Infrastructure
  - d. Other (please detail)
6. Are you aware of how extreme weather or changes in climate could impact your services? *Yes*
- a. Do you feel that you have adequate information on how your business could be impacted in the future? *Yes*
7. What steps (if any) are you taking to safeguard your services against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)
- ☒ a. If yes, please describe the actions taken. *Developed emergency plans.*
  - b. If yes, what hazard was the adaptation in response to?  
*Flooding*
8. Are there any steps you are planning to take?
- a. If yes, do you project any barriers to implement the changes?

## Greenfield Municipal Vulnerability Preparedness – Community Services Survey

9. What resources would be the most beneficial to you?

- ☒ a. Information on funding
- ☒ b. A workshop on how to prepare/enhance protection
- c. Detailed region/sector impacts
- d. Contact details for state or city officials
- e. Details on how future climate changes will impact my business
- f. A network of other small businesses in the area who face similar risks

10. Have you previously engaged your clients in issues relate to climate change or resiliency?


- a. If yes, what was your approach?
- ☒ b. If not, has your organization considered conducting outreach? **No**

11. What could the City do to support your continued success?

12. *Any other information you would like to provide?*








# Greenfield's Municipal Vulnerability Preparedness (MVP) Plan


## Franklin County Resource Network

February 11<sup>th</sup>, 2021




Photos courtesy of the Greenfield Recorder

### Municipal Vulnerability Preparedness (MVP)



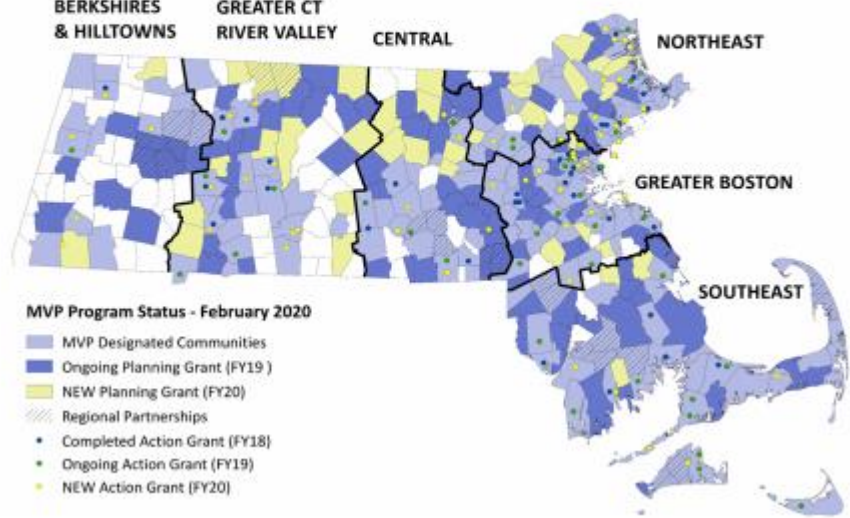
- ✓ Provides support for MA municipalities to plan for climate change resiliency and implement priority projects.
- ✓ Provides a simple, straightforward process
- ✓ Certifies municipalities as MVP communities
- ✓ Provides funding to complete design & implementation of resiliency projects



1. Engage Community
2. Identify impacts & hazards
3. Assess vulnerabilities & strengths
4. Develop & prioritize actions
5. Take action

### Massachusetts Municipal Vulnerability Preparedness (MVP) Program Launched 2017

\$44 Million to cities and towns since 2017



BERKSHIRES & HILLTOWNS GREATER CT RIVER VALLEY CENTRAL NORTHEAST GREATER BOSTON SOUTHEAST

MVP Program Status - February 2020

- MVP Designated Communities
- Ongoing Planning Grant (FY19)
- NEW Planning Grant (FY20)
- Regional Partnerships
- Completed Action Grant (FY18)
- Ongoing Action Grant (FY19)
- NEW Action Grant (FY20)

### Building Climate Resilience in the Commonwealth

#### CLIMATE MITIGATION (GWSA & Green Communities)

- Energy conservation & efficiency
- Increased renewables in electric grid
- Onsite renewable energy
- Sustainable transportation / improved fuel efficiency
- Capture and use of landfill and digester gas
- Carbon sinks

#### CLIMATE ADAPTATION (EO 569 & MVP)

- Utilizing climate projections in planning and design
- Water/energy conservation
- Microgrids
- Strategic electrification
- Storage for peak demand response
- Resilience hubs

#### HAZARD MITIGATION (SHMCA, MEMA/FEMA)

- Dry floodproofing
- Dam rehabilitation
- Slope stabilization
- Removal or reduction of flammable vegetation
- Generators for critical facilities


#### CROSS-CUTTING STRATEGIES:

- Smart Growth
- Community Outreach, Engagement and Education
- Building Code Updates (including development, enforcement, and public education)
- Green infrastructure
- Evaluating adoption and/or implementation of bylaws/ordinances that reduce risk and increase resilience

Source: EoEEA MVP Program

### Plan Outcomes

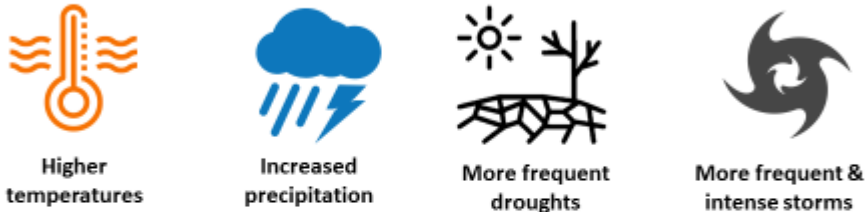
A climate resilient town will be able to maintain functions, protect its residents and emerge stronger and better prepared for a changing climate.



RESILIENCE

Source: NJ Climate Change Resiliency Study

### Changing Climate Variables



Higher temperatures Increased precipitation More frequent droughts More frequent & intense storms

Climate change increases existing risks  
Greenfield and Franklin County Towns are already facing

Plan Outcomes

Main goal: build resilience!

1. Understand strengths and vulnerabilities in three sectors



2. Actions to build on strengths and address vulnerabilities

Action Grants

Montague



MVP Grant: \$33,750  
Match Amount: \$11,250  
Total Project Cost: \$45,000

Montague City Road Flooding Protection Project: Design and Permitting



Deerfield



MVP Grant: \$47,325  
Match Amount: \$19,611  
Total Project Cost: \$66,936

Culvert Redesign and Retrofit and Bylaw Update



Action Grants

RESILIENCE HUB BUSINESS PLAN



Ready for Heat?

PREPAREDNESS FOR EXTREME WEATHER

1. ARE YOU AT RISK OF EXTREME HEAT?

**YOUR HOME**

You have experienced an extreme heat event or want to proactively protect your home from the impacts of extreme heat.

**CHECKLIST TO ASSESS RISK**

- ☐ Your house has little or no insulation
- ☐ Your home is surrounded by pavement
- ☐ You don't have A/C
- ☐ You are unable to install or replace A/C
- ☐ You rely on public transportation
- ☐ You have pets

**SO, YOUR TOWN?**

Shelters causing greater vulnerability include:

- ☐ Lack of emergency funds, poor health or limited mobility, limited English skills, children, adults at risk of isolation

Ready for Flooding?

PREPAREDNESS FOR EXTREME WEATHER

1. ARE YOU AT RISK OF FLOODING?

**YOUR HOME**

You have experienced a flooding event or want to proactively protect your home from the impacts of flooding.

**CHECKLIST TO ASSESS RISK**

- ☐ Your living area is on the 1st floor or basement
- ☐ Your building mechanical/electrical is in the basement
- ☐ Your doors/windows are at grade
- ☐ You have basement storage
- ☐ You rely on public transportation
- ☐ You have pets
- ☐ You have livestock
- ☐ You are used to Canine Mops
- ☐ You rely on medical equipment that requires power

**SO, YOUR TOWN?**

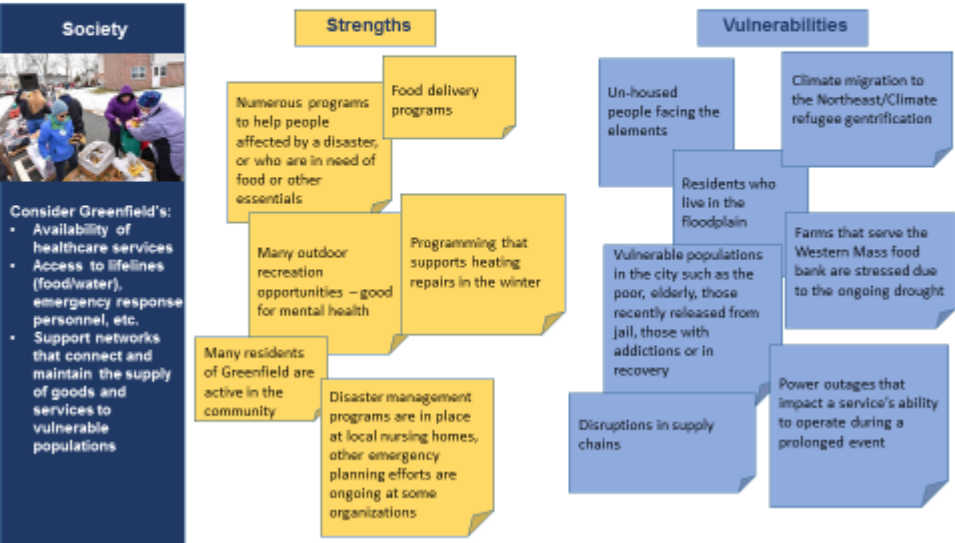
Shelters causing greater vulnerability include:

- ☐ Lack of emergency funds, poor health or limited mobility, limited English skills, children, adults at risk of isolation

Community Outreach



Community Outreach Feedback



Municipal Vulnerability Preparedness (MVP)

Questions?





Discussion Questions	Discussion Questions	Discussion Questions
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Are there resources that would be beneficial to your services during a hazard event?

Or to support the populations you serve with the impacts of climate change?

When a hazard event occurs, do organizations work together to respond? Are efforts coordinated with the City?

What works well?

Do you see opportunities to work together to provide services during a hazard event?

Discussion Questions
----------------------

As a part of your regular programming do you support household emergency preparedness?

## Notes from FCRN Meeting 2/11/21

Conversation mostly focused on vulnerabilities meeting participants have noticed in their line of work:

- Need to pay attention to the needs of folks who are disabled, address the needs of residents who have medical needs/equipment needs
- Conservation on sheltering:
  - Need to make sure shelters are ADA accessible – can all residents safely shelter, sleep, eat, etc.
  - Issue of transportation – how are people being transported to shelters if they don't have a car?
  - Children/families need to be considered – does the shelter have diapers?
  - Are people who are neurodiverse being supported in the shelter? Are there spaces that could be used if needed?
  - Sustaining the typical warming/cooling shelters during the pandemic has been especially difficult
- Where are the City's brownfields? Are they at risk of contaminating the City's water supply?
- There is a great need for digitally backing up City records. Many are in boxes and not well protected. Also a concern about other services such as the Franklin County Courthouse is in the City and those records could be ruined as well.
- Information about sheltering/emergency preparedness should be available in multiple languages
- There is no universal warning system – for example a tornado warning sent out via Reverse 911 would not get to everyone at a time when it is critical to shelter. Could the City implement some sort of alarm system?
- Greenfield is home to many services, is the County Seat, so if they were to be impacted by a disaster many essential services to people throughout the county would be critically impacted. An example provided was the DMV being closed for a long period of time due to the pandemic.
- Concerns about evacuation routes
- How many residents are on private wells and at risk of losing water? Evaluate options for a backup municipal water supply – which means something other than handing out plastic bottles.

In terms of how agencies respond to events, they don't necessarily work together but the FCRN exists and helps the agencies coordinate. This is relatively new after the pandemic broke out.

- Look4help.org is a resource page available to coordinate resources
- Could make a more specific page during a disaster (hurricane or tornado) to point people to resources



February 25<sup>th</sup>, 2021

Dear Greenfield Community Member:

Increasingly, we find ourselves working to respond to more unpredictable and severe weather events that damage Greenfield's infrastructure, natural resources, and local economy and threaten the health and welfare of our residents. The costs and impacts to our City remind us that we need to continue working to reduce our risk and increase our to these extreme storm events.

In order to be as proactive as we can in preparing and protecting our residents, the City of Greenfield is partnering with the Franklin Regional Council of Governments to prepare a Municipal Vulnerability Preparedness (MVP) Plan. This Plan will help us to:

- Understand connections between natural hazards and local and regional planning/mitigation efforts;
- Evaluate strengths and vulnerabilities of residents, infrastructure, and natural resources;
- Develop and prioritize resilient actions for the City, residents and our local organizations and businesses; and
- Identify actions that can reduce the impact of hazards and increase resilience, and later qualify us for funding to implement these important actions.

In order to complete the City's plan, we are holding a virtual workshop on Tuesday, March 30 from 3:00pm – 5:00pm. We want the Plan to reflect the real needs and experiences of Greenfield community members, and your input is critical. We hope you can join us; please see the attached flyer for registration information.

By going through this planning process, the City will become "MVP certified" and then eligible for state-funded implementation grants to help us be prepared for the lasting effects of climate change. We are eager to hear what issues are important to you and what projects you think are most important for Greenfield to undertake. Your thoughts will help us to strengthen our climate resiliency plan and prioritize future projects.

We appreciate your time and we look forward to speaking with you.

Sincerely,

Eric Twarog, Director of Planning and Development, City of Greenfield  
Kimberly Noake MacPhee, Land Use & Natural Resources Program Manager, FRCOG  
Allison Gage, Land Use & Natural Resources Planner, FRCOG



Please save the date and come to our  
**MVP COMMUNITY RESILIENCE BUILDING WORKSHOP**

Join via zoom on Tuesday, March 30, 2021

3:00pm – 5:00pm

Please join us for a public workshop to discuss your experiences with climate related threats, such as flooding, severe winter storms, and extreme temperatures. Your thoughts will help to strengthen our climate resiliency plan.

This workshop is a part of Greenfield's effort to become a designated MVP Community. During the workshop we will:

- ✓ Review the natural hazards impacting Greenfield and how climate change is interacting with these hazards
- ✓ Discuss responses gathered from stakeholder outreach and further outline our strengths and vulnerabilities
- ✓ Brainstorm resiliency actions



**WE NEED YOUR INPUT!**

**Register in advance for this workshop:** <http://bit.ly/GreenfieldMVP>

**Please register for the workshop by March 19<sup>th</sup> at 5pm.**

Questions? Please contact Eric Twarog, Director of Planning and Development for the City of Greenfield ([eric.twarog@greenfield-ma.gov](mailto:eric.twarog@greenfield-ma.gov))

**Learn more about this project:** <http://bit.ly/GreenfieldMVPStory>

Community Resilience Building Workshop

City of Greenfield

March 30 2021

### Zoom Housekeeping

Unmute/mute yourself – please stay muted if not speaking

Ask questions/report issues

Turn on/off video function

Prevents videos from blocking presentation

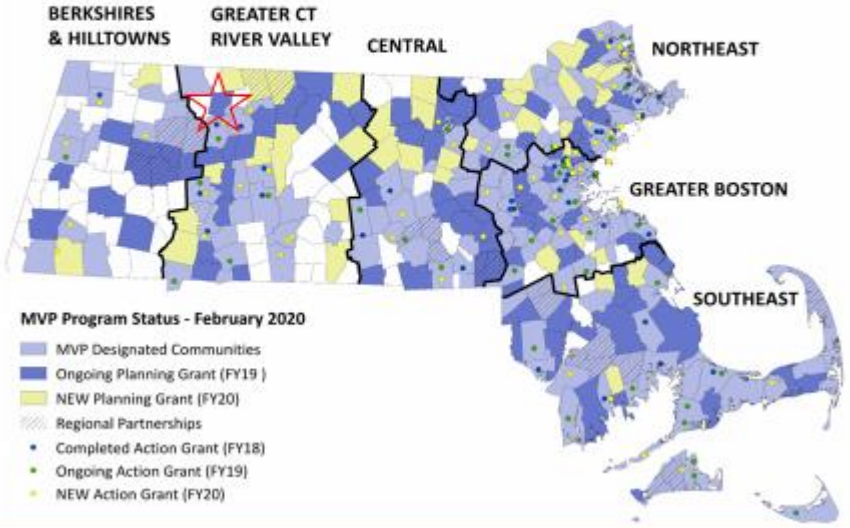
### Agenda

- Overview of the Municipal Vulnerability Preparedness (MVP) Program
- Review Massachusetts’ changing climate
- Review community outreach and top hazards
- Identify Strengths and Vulnerabilities
- Brainstorm Resiliency Actions



### Municipal Vulnerability Preparedness (MVP) Program

\$44 Million to cities and towns since 2017



**MVP Program Status - February 2020**

- MVP Designated Communities
- Ongoing Planning Grant (FY19)
- NEW Planning Grant (FY20)
- Regional Partnerships
- Completed Action Grant (FY18)
- Ongoing Action Grant (FY19)
- NEW Action Grant (FY20)

### \$44 Million to cities and towns since 2017

#### Montague

Montague City Road Flooding Protection Project: Design and Permitting



MVP Grant: \$33,750  
Match Amount: \$11,250  
Total Project Cost: \$45,000

#### Deerfield


Culvert Redesign and Retrofit and Bylaw Update



MVP Grant: \$47,325  
Match Amount: \$19,611  
Total Project Cost: \$66,936

### Why the MVP Program?

A climate resilient town will be able to maintain functions, protect its residents and emerge stronger and better prepared for a changing climate.



Source: NJ Climate Change Resiliency Study

## Changing Climate Variables



Changing precipitation



Higher temperatures



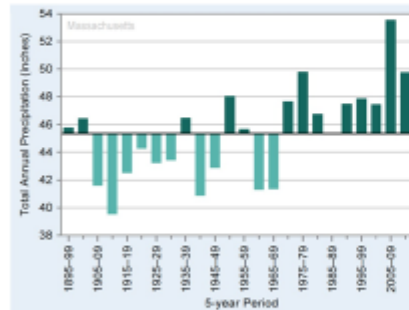
More frequent & intense storms

Climate change **increases** existing risks  
Greenfield is already facing

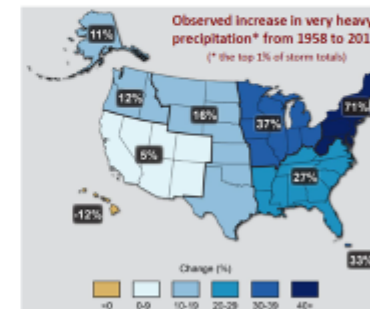


## Changing Precipitation

### Observed Annual Precipitation



### Observed Increase in Heavy Precipitation



## Impacts from Changing Precipitation

- Increased total rainfall
  - Impact on the frequency of minor but disruptive flooding events
  - Impact agriculture, forestry, and natural ecosystems
- More intense downpours
  - Increased risk of flooding
  - Increased damage to property and critical infrastructure
  - Impacts to water quality
- Changes to rainfall and snowfall patterns
  - Impacts to certain habitats and species with specific physiological requirements
  - Reduced snow cover for recreation and tourism
  - Potential increase in frequency of episodic droughts



## Past & Recent Events

### 2011 Tropical Storm Irene

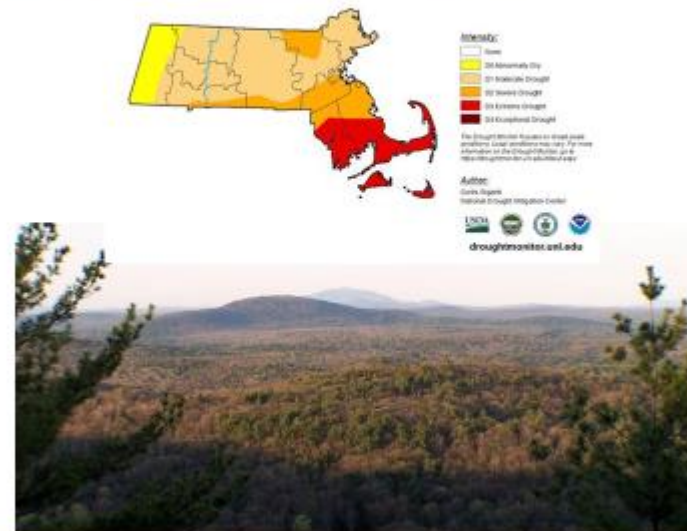


Greenfield's Wastewater Treatment Plant was floodproofed to 14.0 feet but flooding from Irene reached 14.5 feet

The Green River's rushing waters cut new channels in the nearby land

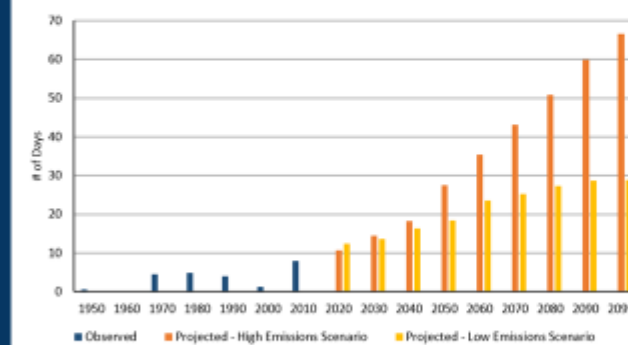
## Past & Recent Events

### Statewide Drought – June to November 2020



## Higher Temperatures

### Number of Days with Temperatures over 90° Fahrenheit



• Number of days >90° are predicted to increase.

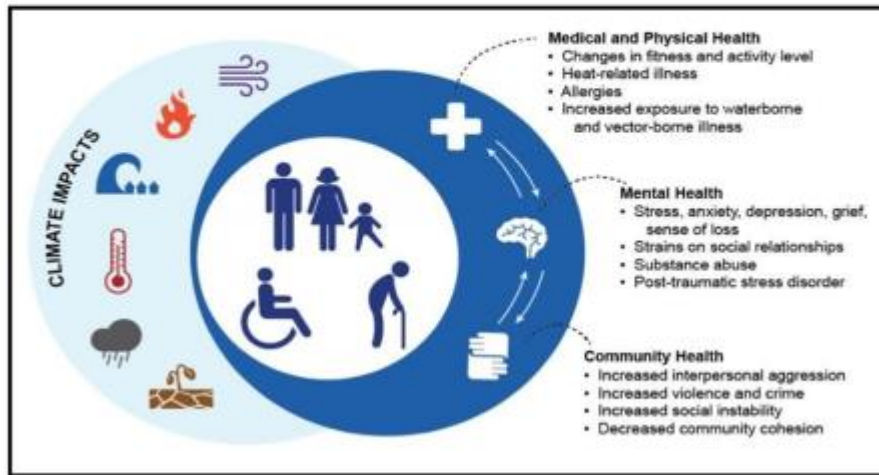
• By 2050: ~18 more days

By 2100: ~28 more days





## Impacts from Higher Temperatures



## Extreme Weather Events



Flash flooding,  
tropical storms



Severe wind,  
thunderstorms



Tornadoes



The frequency,  
intensity,  
duration and  
geographic  
extent of these  
extreme storms  
is likely to  
increase.

Photo credit for bottom two photos: The Greenfield Recorder

## Past & Recent Events



Microburst with 60-70 MPH winds, June 2020



Damage from heavy winds & a thunderstorm at the Franklin County Fairgrounds, October 2020



9 inches of rain fell in Greenfield during August 2018

## ResilientMA Climate Change Clearinghouse [www.resilientma.org](http://www.resilientma.org)



## Participant Input



- Name
- Position/Department
- What concerns do you have about *climate change and natural hazards* and their impact on Greenfield?
  - ✓ Infrastructure
  - ✓ Residents
  - ✓ Environment

Overview of Community Outreach





# Community Outreach

- Committee developed a list of 50+ community stakeholders
- Community groups, social service organizations, local businesses, City departments
- Asked how they/community members have been impacted by hazards and what their concerns are for the future
- Heard a variety of perspectives and concerns



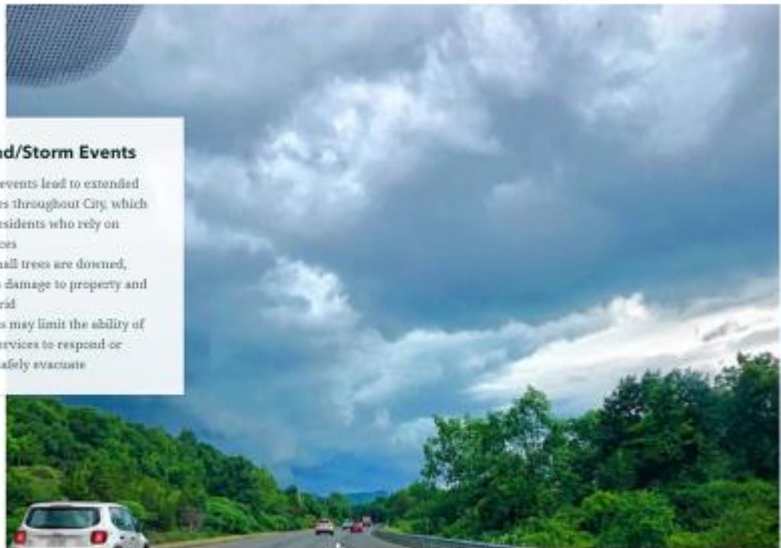
## Flooding

- Storm drains are often flooded during heavy rain events, which can overwhelm the water treatment plant and effluent goes into the Green and Deerfield Rivers
- Residents have lost their homes in parts of town due to flooding
- Impacts on local farms include crop loss, loss of topsoil, and flooded fields
- Flooding has caused landslides and mudslides at the fairgrounds



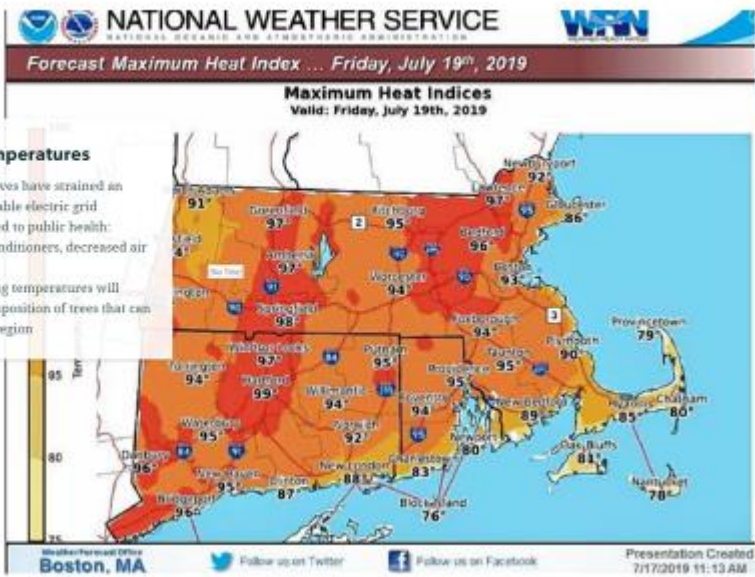
## Severe Wind/Storm Events

- Severe wind events lead to extended power outages throughout City, which can impact residents who rely on medical devices
- Large and small trees are downed, which causes damage to property and the electric grid
- Severe storms may limit the ability of emergency services to respond or residents to safely evacuate



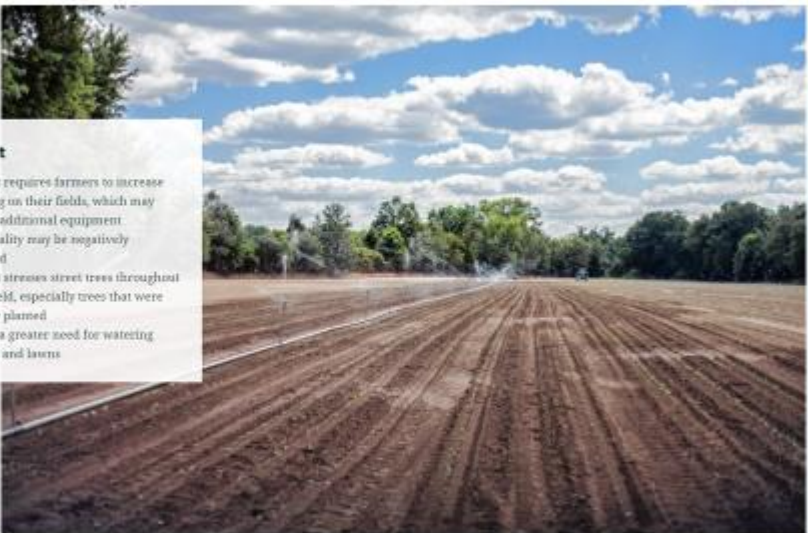
## Extreme Temperatures

- Recent heat waves have strained an already vulnerable electric grid
- Concerns related to public health: access to air conditioners, decreased air quality
- Over time, rising temperatures will change the composition of trees that can survive in the region



## Drought

- Drought requires farmers to increase watering on their fields, which may require additional equipment
- Crop quality may be negatively impacted
- Drought stresses street trees throughout Greenfield, especially trees that were recently planted
- Creates a greater need for watering gardens and lawns



# Workshop Agenda

- Overview of the Municipal Vulnerability Preparedness (MVP) Program ★
- Review Massachusetts' changing climate ★
- Identify Top Hazards ★
- Identify Strengths and Vulnerabilities
- Brainstorm Resiliency Actions ←



Workshop Outcomes

Main goal: build resilience!

1. Understand strengths and vulnerabilities in three sectors



2. Brainstorm actions to build on strengths and address vulnerabilities




Identify strengths and vulnerabilities

What is it?

 Infrastructure	<ul style="list-style-type: none"><li>• Roads and bridges</li><li>• Power grid</li><li>• Drinking Water</li><li>• Wastewater Treatment</li></ul>	<ul style="list-style-type: none"><li>• Communications</li><li>• Housing</li><li>• Emergency Response</li><li>• Schools</li></ul>
 Environment	<ul style="list-style-type: none"><li>• Coldwater streams</li><li>• Forests</li><li>• Farmland</li><li>• Floodplains</li></ul>	<ul style="list-style-type: none"><li>• Habitat</li><li>• Wetlands</li><li>• Aquifers</li></ul>
 Society	<ul style="list-style-type: none"><li>• Availability of health care services</li><li>• Access to lifelines (food/water, emergency response personnel, etc.)</li></ul>	<ul style="list-style-type: none"><li>• Support networks that connect and maintain the supply of goods and services to vulnerable populations</li></ul>

Identify strengths and vulnerabilities

Examples

	Strength	Vulnerability
 Infrastructure	<ul style="list-style-type: none"><li>• Municipal wells have a backup generator</li></ul>	<ul style="list-style-type: none"><li>• Undersized culverts or bridges</li></ul>
 Environment	<ul style="list-style-type: none"><li>• Unfragmented forests/continuous habitat</li></ul>	<ul style="list-style-type: none"><li>• Invasive species crowding out native species</li></ul>
 Society	<ul style="list-style-type: none"><li>• Numerous programs to help people affected by disasters</li></ul>	<ul style="list-style-type: none"><li>• Isolated residents</li></ul>

Brainstorm Resiliency Projects

- Planning, Assessments, and Regulatory Updates
- Nature-based Solutions for Ecological and Public Health
- Resilient Redesigns and Retrofits for Critical Facilities and Infrastructure



Photo credit: Mass DER

Nature Based Solutions

Projects that restore, protect, and/or manage natural systems and/or mimic natural processes to address hazards like flooding, erosion, drought, and heat islands in ways that are cost-effective, low maintenance, and multibeneficial for public health, safety, and well-being.




Riverbank restoration on the North River, Colrain MA



Low impact development project, Greenfield MA

Workshop Activity

Community Resilience Building Risk Matrix  [www.CommunityResilienceBuilding.org](http://www.CommunityResilienceBuilding.org)

ALL HAZARDS: severe winter storms, flooding, hurricanes, dam failure, hurricanes/tropical storms, thunderstorms/windstorms, wildfires, earthquakes, tsunamis, drought, natural temperature extremes, invasive species  
⬆️ = Priority for action over the Short or Long term (and Ongoing)  
⬇️ = Vulnerability ⬆️ = Strength

Features	Location	V or S	Identified Strength or Vulnerability	Resiliency Action
Infrastructure				
Culverts				
Power lines				
Drinking water				
Wastewater Treatment Plant				
Emergency Communications/Backup communication infrastructure				



# Community Resilience Building Matrix

Information collected will be transposed into the matrix for the final MVP Plan

Community Resilience Building Risk Matrix									
www.CommunityResilienceBuilding.com									
Top Priority Hazards (hazards, floods, wildfires, hurricanes, earthquakes, drought, sea level rise, heat wave, etc.)									
Priority: 1 = Low, 2 = Medium, 3 = High, 4 = Very High									
X = Vulnerability, S = Strength									
Features	Location	Ownership	V or S	Priority	1	2	3	4	Notes
Infrastructure									
Societal									

# Post Workshop Prioritization

1. Please rank the action items

- Culvert mapping
- Upstream bio-remediation
- Education and outreach on climate change
- Obtain a generator for the shelter
- Distribute tick collars to seniors with pets
- Streambank stabilization

Done

- Survey will include all action items brainstormed today + ideas provided by community members

# Ongoing Outreach



StoryMap with a summary of the project & community feedback is posted on the City's website – access via the homepage

# Greenfield's Virtual MVP Planning Process



## Next Steps

TODAY: MVP Workshop ★

Draft Report & Send out for review

April 27 2021: Public Listening Session

## **Public Comment Period**

A public listening session and public comment period were held to provide Greenfield residents and City Officials an opportunity to review and comment upon the draft Greenfield MVP Resiliency Plan.

The public listening session was held as a standalone meeting on April 27, 2021 at 6:30pm via Zoom. FRCOG Staff provided an overview of the MVP program and summarized findings from the workshop. The majority of the listening session was spent discussing the Action Plan and determining the City's top priority recommendations, which are summarized in the Plan.

The public comment period was held from April 27, 2021 to May 11, 2021, during which the public was invited to submit comments via email. All comments received during the listening session were incorporated into the plan.

The public listening session and public comment period were advertised on the City of Greenfield's website. The press release, shown below, was published in the Greenfield Recorder. A copy of the presentation and prioritization notes are below.

# **Greenfield**

## **Municipal Vulnerability Preparedness (MVP)**

### **Public Meeting**



*Photo courtesy of the Greenfield Recorder*

***The City of Greenfield and the Franklin Regional Council of Governments invite Greenfield residents to hear about and comment on the MVP Plan:***

- ✓ **Attend the public meeting: April 27<sup>st</sup> at 6pm via Zoom**
- ✓ **Provide public comment between April 27 – May 11:**
  - **MVP Plan will be posted at [www.greenfield-ma.gov](http://www.greenfield-ma.gov)**
  - **Submit a comment via email to Eric Twarog, Greenfield Director of Planning and Development, [eric.twarog@greenfield-ma.gov](mailto:eric.twarog@greenfield-ma.gov)**

## **WE WANT YOUR FEEDBACK!**

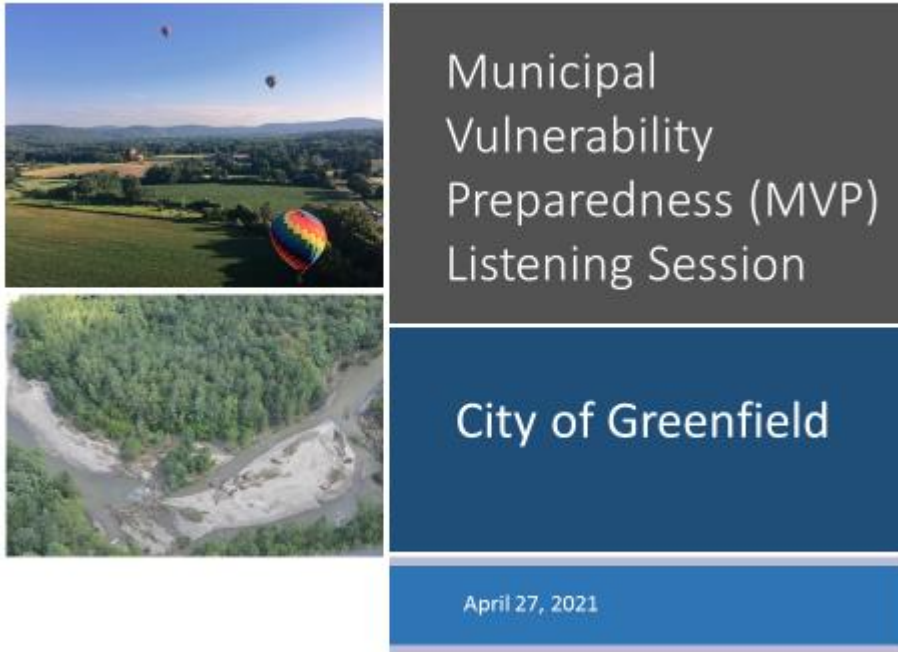
**Tuesday, April 27, 2021 6:00 p.m.**

**Zoom Meeting**

***Please register in advance of the meeting***

**<http://bit.ly/GreenfieldMVPForum>**




## MVP Listening Session Presentation







Municipal Vulnerability Preparedness (MVP) Listening Session

City of Greenfield

April 27, 2021

Agenda	Municipal Vulnerability Preparedness (MVP)
<ul style="list-style-type: none"> <li>• Overview of the Municipal Vulnerability Preparedness (MVP) Program</li> <li>• Overview of Greenfield's MVP Planning Process</li> <li>• Summary of Outreach &amp; Workshop Findings</li> <li>• Determine the City's top priorities</li> </ul>	 <ul style="list-style-type: none"> <li>✓ Provides support for MA municipalities to plan for climate change resiliency and implement priority projects</li> <li>✓ Provides a simple, straightforward process</li> <li>✓ Certifies municipalities as MVP communities</li> <li>✓ Provides funding to complete design &amp; implementation of resiliency projects</li> </ul> 
	

### Changing Climate Variables

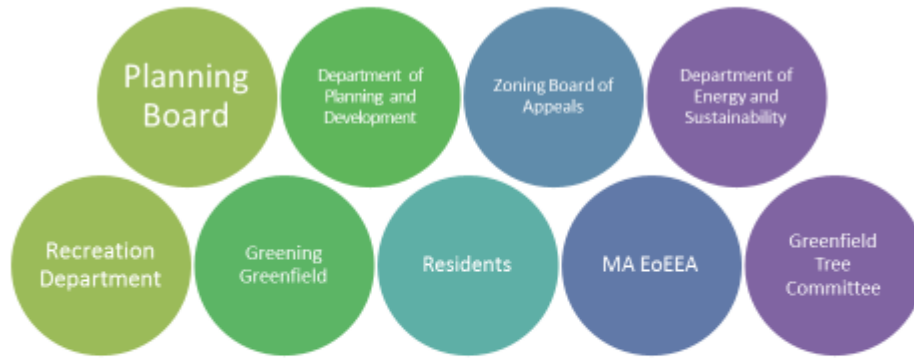
			
Increased precipitation	More frequent droughts	Higher temperatures	More frequent & intense storms

Climate change **increases** existing risks Greenfield is already facing

Municipal Vulnerability Preparedness (MVP)	Municipal Vulnerability Preparedness (MVP)
<p><b>Greenfield Community Outreach</b> July – October 2020</p> <ul style="list-style-type: none"> <li>• Community groups, social service organizations, local businesses, City departments</li> <li>• Asked how they/community members have been impacted by hazards and what their concerns are for the future</li> </ul> 	<p><b>Greenfield Community Resilience Building Workshop – March 30, 2021</b></p> <div> <p>Community Components</p> <ul style="list-style-type: none"> <li>Infrastructural</li> <li>Societal</li> <li>Environmental</li> </ul> </div> <ul style="list-style-type: none"> <li>✓ Identify top local natural and climate-related hazards of concern</li> <li>✓ Identify existing and future strengths and vulnerabilities</li> <li>✓ Develop a list of resiliency actions for the Community</li> </ul>



## Workshop Participants



### Benefits of having participants from different sectors/departments:

- Local knowledge and experience
- Working across departments / sectors
- Reaching consensus

## Greenfield's Vulnerabilities



Infrastructure

- Undersized culverts
- Waste water treatment plant
- Power outages
- Hardscapes in the downtown area



Society

- Lack of affordable and universally accessible housing
- Insect-borne diseases
- Illness associated with higher temperatures



Environment

- Invasive species
- Insects, birds, and pollinators are at risk due to habitat degradation
- Riverbank erosion & sedimentation of the Green River

## Workshop Outcomes

A climate resilient city will be able to **maintain** functions, **protect** its residents and emerge **stronger and better prepared** for a changing climate.

RESILIENCE



### GREENFIELD'S TOP STRENGTHS



Photos courtesy of Mary Choline and Just Roots



### GREENFIELD'S TOP HAZARDS



Photos courtesy of the Greenfield Recorder

## Greenfield's MVP Action Plan



1. Summarize the Draft Recommendations

2. Hear your ideas about top priority actions for Greenfield

## Draft Recommendations - Infrastructure

### Feature/Category

### Summary of Action Items

Stormwater management & drainage issues

1. Example 1
2. Example 2
3. Example 3

Subcategory

Pick the highest priority from this list

## Draft Recommendations - Infrastructure

### Feature/Category

### Summary of Action Items

Stormwater management & drainage issues

1. Assess & inventory culverts, develop prioritization plan for repairs
2. Hire a consultant to update cost estimates & engineering solutions for the Maple Brook Culvert
3. Evaluate and prioritize localized stormwater flooding problem areas and identify Nature Based Solutions
4. Remove & replant hardscapes in the downtown area
5. Adopt a policy for tree canopy cover in parking lots

Waste Water Treatment Plant

1. Continue efforts to separate domestic sump pump outfall from municipal sewer system
2. Conduct a feasibility study of retrofits for the WWTP to mitigate flood damage
3. Develop a plan to replace/rebuild WWTP

Electric Grid

1. Advocate to FC legislative delegation about concerns related to aboveground utilities
2. Underground power lines when TIP projects are implemented

Water Resiliency

1. Hire a consultant to update the feasibility study, design, and cost estimates for the West Side Water project

## Draft Recommendations - Society

### Feature/Category

### Summary of Action Items

Emergency Preparedness

1. Communications plan – increase use of Reverse 911 system and conduct outreach about sheltering/resources
2. Develop SOPs/Rip and Run task sheets for evacuation
3. Establish communications and trainings in emergency preparedness and de-escalation methods
4. Run practice drills/scenario role plays w/ food bank

Vulnerable Populations

1. Promote the formation and maintenance of neighborhood groups
2. Adopt housing for all & housing first policies
3. Review sheltering facilities to ensure they are ADA accessible and make improvements as needed/inventory supplies
4. Hire a consultant to ID additional safe river access locations

Schools

1. Work with the school committee to develop a climate change education program
2. Measure and analyze the tree canopy cover of all public K-12 schools and develop tree planting plans

## Draft Recommendations - Environment

### Feature/Category

### Summary of Action Items

Shade Trees/Street Trees

1. Inventory all trees on muni/public properties and determine maintenance needs
2. Advocate for more tree planting near Baystate Medical
3. Address need for shade trees @ Jon Zon C.C.
4. Complete pruning/removal of high hazard trees

Conservation/Restoration

1. Address bank stabilization issues, plant native trees and shrubs, develop and implement a knotweed eradication plan @ former Wedgewoods Garden Site
2. Pursue funding to implement priority projects from Greenfield's Pollinator Action Plan
3. ID locations for community gardens in EJ neighborhoods
4. Create a municipal position for a part-time garden organizer

Farmland

1. Develop an agricultural overlay district
2. ID high priority parcels that should be conserved, should they come up for right of first refusal
3. Investigate opportunities to implement a Transfer of Development Rights program
4. Re-establish the City's fund to pay into the local match for the APR program

## Incorporating feedback into the MVP Report

3 PUBLIC REVIEW DRAFT APRIL 2021

Community Resiliency Building Risk Matrix

11 15 Likelihood for action over the short or long term (not required)

Y = Vulnerability S = Strength


Features Location Ownership Y/S


			Recommendations	Flooding	Extreme Temperatures	Drought	Severe Wind	Priority	Time
Infrastructure									
Culverts	City-wide	City	Y	X					
	Maple Brook Culvert	City	Y	X					
Stormwater Flooding	Priority Areas	City	Y	X					
Waste Water Treatment Plant	Deerfield Street	City	Y	X				N/A	N/A

www.greenfield-ma.gov/mvp

## We need your input!

- 2 Week Public Comment Period through May 11<sup>th</sup>
- The full draft is posted on the Department of Planning & Development webpage
- Submit comments to Eric Twarog, eric.twarog@greenfield-ma.gov

 **City of Greenfield**




Municipal Vulnerability Preparedness (MVP) Program

**MVP Resiliency Plan**

DRAFT: April 2021

Facilitated by the Franklin Regional Council of Governments A State-Certified MVP Provider



**[Placeholder for Certificate of Adoption]**