



# Town of Georgetown

## Community Resilience Building-Summary of Findings

### Hazard Mitigation Plan Update 2020



*Amesbury Town Hall  
Source: Wikimedia Commons*



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## TABLE OF CONTENTS

EXECUTIVE SUMMARY  
COMMUNITY RESILIENCE BUILDING/HAZARD MITIGATION PLANNING WORKSHOP  
TOP HAZARDS WITHIN GEORGETOWN  
CHARACTERIZING A CLIMATE RESILIENT GEORGETOWN: MUNICIPAL VULNERABILITIES  
AND STRENGTHS  
CATEGORIZING AND PRIORITIZING CHALLENGES AND ACTIONS  
HAZARD MITIGATION GOALS  
FEMA CAPABILITY ASSESSMENT WORKSHEET

## APPENDIX

- MVP CRB WORKSHOP BASE MAPS
- CLIMATE INFOGRAPHIC
- CRB WORKSHOP RISK MATRIX
- ECGA PARCEL PRIORITIZATION MAPS
- MERRIMACK RIVER BASIN CLIMATE PROJECTIONS
- HAZARD MITIGATION PLAN MAPS
- HAZARD MITIGATION WORK SHEET & ACTION PLAN

# EXECUTIVE SUMMARY

In accordance with Executive Order 569, which seeks to build resilience and adapt to the impacts of climate change, the Town of Georgetown, Massachusetts is pleased to submit this Summary of Findings Report. In 2019 - 2020, the Town of Georgetown applied for and received a Municipal Vulnerability Preparedness (MVP) program grant from the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) to (1) complete a vulnerability assessment and action-oriented resilience plan (Findings Report) and (2) update its Hazard Mitigation Plan. Collectively these efforts followed the Community Resilience Building (CRB) framework developed by The Nature Conservancy. The CRB framework uses a community-driven workshop process to identify climate-related hazards, community strengths and vulnerabilities, and develop solutions to address these considerations. Completion of the CRB process enables the Town to achieve MVP community designation status from the EEA and receive preference for future state grant under the MVP program or other participating funding entities. Georgetown was also granted EEA funds to conduct a Natural Resources Infrastructure Assessment (NRIA) project, which entailed assessing the existing natural resource infrastructure assets within Georgetown and evaluating their climate vulnerability and/or resiliency and their capacity to contribute to Georgetown climate resiliency goals. Results of this NRIA project were shared with CRB Workshop attendees at the Workshop and are reported in the Georgetown Natural Resources Infrastructure Assessment Report (Georgetown NRIA Report).

As climate change continues to alter the way municipalities evaluate risk and manage resources, it is important to evaluate the effects of climate change and the solutions to address these challenges in a manner that assesses the interdependency of Georgetown's infrastructural, societal, and environmental features. The Findings Report provides an important first step to establish climate resiliency within the community.



*MVP Core Team Meeting*



*American Legion Park; Source: Georgetown Parks & Recreation*

# COMMUNITY RESILIENCE BUILDING PLANNING AND WORKSHOP

The CRB process began with the establishment of a Core Team comprised of Town Staff from a variety of departments and three Community Members. The Core Team held an in-person strategic planning session on March 5, 2020 at the Georgetown Town Hall. The Core Team meeting involved developing a broad understanding of the Hazards, Vulnerabilities, Strengths that characterize the Town of Georgetown, identifying a list of Preliminary Resilience Actions that the community could consider at the CRB Workshop, and developing Core Team understanding of the CRB process. The Core Team meeting was used to prepare for the upcoming CRB Workshop and to identify the goals of the workshop within the context of community interests and needs. The Core Team decided that it was important to use the workshop as a mechanism to engage with the community using interactive media platforms, including an ESRI GIS community data viewer prepared specifically for the workshop and interactive demonstrations of the Massachusetts Data Clearinghouse Website, [resilientma.org](http://resilientma.org) and The Nature Conservancy's Resilient Land Mapping Tool Website, <http://maps.tnc.org/resilientland/>.

## COVID-19 RESILIENCY

Due to the global COVID-19 pandemic and the Massachusetts Non-Essential Business Order and Stay-at-Home Advisory that went into effect on March 24, 2020, no additional in-person meetings or workshops were feasible following the March 5, 2020 Core Team Meeting. BSC Group, Inc., Georgetown's MVP certified provider, hosted all further meetings, the CRB Workshop, and will host the Listening Sessions via the Zoom platform. Additional online platforms and formats were and are being used to provide information to participants and to solicit feedback. These include: a Georgetown-specific ESRI GIS Data Viewer, ESRI Storymap, Georgetown Community Television, the Georgetown website, a Google Docs online survey, and the Zoom platform.

The Community Resilience Building Workshop was held on April 14, 2020. Due to presenting the workshop via Zoom, the workshop was provided as a two-session event, with a morning session and an afternoon session, to give participants a lunch break and a break from screen. Workshop participants included a diverse set of community stakeholders from a variety of municipal departments and boards, the MVP Regional Coordinator, the Director of the Parker River Clean Water Association, and the Assistant Director of Land Conservation for the Essex County Greenbelt Association. The CRB Workshop followed the format outlined in the "Community Resilience Building Workshop Guide". The workshop started with a presentation by BSC Group to introduce the concept of the CRB process and the agenda for the workshop, after which the attendees identified the top 4 – 5 Hazards facing Georgetown. BSC Group then presented 1) the Hazard Mitigation Plan Update project and solicited additional Hazards from the participants, 2) ecological climate resiliency and natural resource mapping generated during the Georgetown Municipal Vulnerabilities Preparedness Natural Resources Infrastructure Assessment project, 3) a slide show of various approaches to Nature Based Solutions, and 4) the Georgetown Data Viewer. Participants then identified

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Vulnerabilities, Strengths, and associated resiliency Actions and completed a CRB Workshop Risk Matrix. Participants ranked and prioritized Action items as High, Medium or Low priority, and determined whether the timeframe for accomplishing the Action item is Short-term, Long-term, or Ongoing. Climate resilience planning requires an ongoing effort by community stakeholders. Workshop attendees and other interested stakeholders are encouraged to provide comments, corrections, updates, or additional information of findings transcribed in this report to Steve Przyjemski at [sprzyjemski@georgetownma.gov](mailto:sprzyjemski@georgetownma.gov). The success of climate resilience planning in Georgetown is contingent upon ongoing participation of community stakeholders.

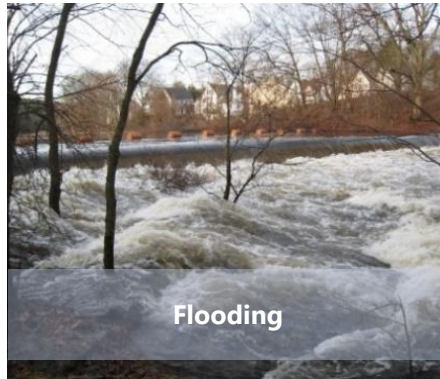
# TOP HAZARDS WITHIN GEORGETOWN

Natural disasters caused by climate hazards can result in the loss of life, damage to infrastructure and have negative consequences for a community's economic, social and environmental well-being. Hazard mitigation planning is the process used by state and local leaders to understand risks from natural hazards and develop long-term strategies to reduce or eliminate the long-term impact and risks to people, infrastructure and the environment from hazards. (FEMA, Local Hazard Mitigation Planning Worksheet 2016).

The Town of Georgetown faces several challenges related to establishing resilience to the effects of climate change. For example, over the past couple of decades, Essex County experienced more than 20 extreme weather-

related events that triggered federal or state disaster relief. Climate change is expected to increase the occurrence and intensity of natural-hazard related weather events. Identifying and preparing for the hazards most prevalent within Georgetown is the first step to prepare for the effects of climate change.

During the Core Team and CRB planning efforts, stakeholders identified the top climate hazards for the Town of Georgetown. Flooding from extreme precipitation events, extreme and variable weather such as extreme snow, ice and freezing rain events, drought, extreme heat, and increased disease vectors (emerald ash borer, ticks, Eastern equine encephalitis, gypsy moths, blue-green algae, etc.) were identified as the top climate exposure hazards and were highlighted as significant concerns for the Town. Flooding, winter storms and northeasters were also identified as the top hazards in Georgetown's 2015 Hazard Mitigation



Plan Update<sup>1</sup>. Additional climate hazards previously incorporated in the HMP were reviewed and ranked by level of risk to the community during the planning process. Moderate hazards were identified and include beavers, wildfires, dam failure and power outages. Low risk natural hazards include earthquakes, tornadoes and landslides.

Since the 2015 HMP, Georgetown has elevated the risk ranking for drought, and has incorporated disease vectors as a new community risk resulting from climate change. Although not explicitly listed as a natural hazard, impacts associated with beavers were incorporated as part of the flooding natural hazard during the 2015 HMP Update.

**2020 HMP Hazard Ranking Table:**

NATURAL HAZARD	COMMUNITY RISK RANKING
Flooding	High
Extreme and Variable Weather (Snow, Ice, Wind, Rain, etc.)	High
Drought/Extreme Heat	High
Disease Vectors (Mosquitos/EEE; Ticks/Lymes Disease; Forest Pests; Crop Pests and Pathogens; Blue Green Algae, etc.)	High
Beavers	Moderate
Wildfires	Moderate
Dam Failure	Moderate
Power Outages	Moderate
Tornadoes	Low
Earthquakes	Low
Landslides	Low

**FLOODING**

Flooding remains a concern for the Georgetown community. Increase flooding has been observed in areas mapped as part of the 100-year floodplain as well as areas near the 100 -year floodplain. Based on land use maps, there are large areas of impermeable surfaces included buildings, roads and parking roads in or near the 100-foot floodplain. However, there are also large areas of open space and undeveloped land in and near the floodplain as well as adjacent to waterways and wetlands. Georgetown attributes flooding to an increase of rainfall in a short time frame, undersized or unmaintained infrastructure such as culverts,

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<sup>1</sup> Merrimack Valley Region, Multi Hazard Mitigation Plan Update (2016) available <https://mvpc.org/wp-content/uploads/April-2016-MV-Multi-Hazard-Mitigation-Plan-Update.pdf>

filling of riverways and waterbodies with sediment from eroding banks and stormwater and dense invasive species, and damming of streams by beaver.

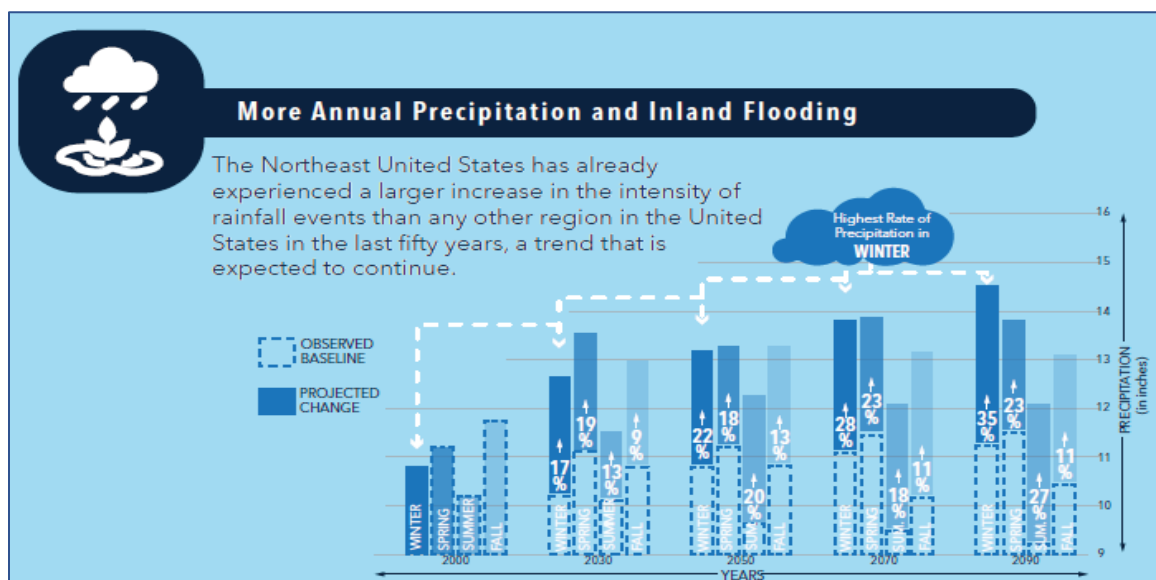
Since the 2015 HMP an increase in roadway flooding has been observed in the following areas:

- West Street and Bailey Lane
- Areas between Rock, Pentucket and Crane Ponds

Additional facilities experiencing flooding include:

- Facilities with hazardous material storage (e.g. gas stations and car repair shops)
- Critical Facilities offering services to the community’s most vulnerable populations including senior citizens, individuals with disabilities and children (e.g. childcare centers, senior living/support activities, health care facilities, etc.)
- Perley Elementary School (gymnasium continues to experience flooding despite multiple upgrades)
- Decommissioned Landfill
- Water Treatment Facility
- Searles Street Substation
- Private wells/potable water resources

According to the Climate Change Clearinghouse, over the past 50 years, New England has experienced a larger increase in the intensity of rainfall events than any other region in the United States. The Commonwealth receives approximately 48 inches of rain per year on average, with average monthly rainfall between 3 and 4 inches for all regions of the state. These precipitation patterns are changing. The changes are likely to become more pronounced in the years ahead. We can expect to see more intense spring downpours, drier summers and more intermittent droughts, increased inland and coastal flooding, diminishing snowfall and higher precipitation in winter and spring months. The following graphic shows precipitation predictions for the Merrimack River basin over the next seven decades.





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## EXTREME AND VARIABLE WEATHER

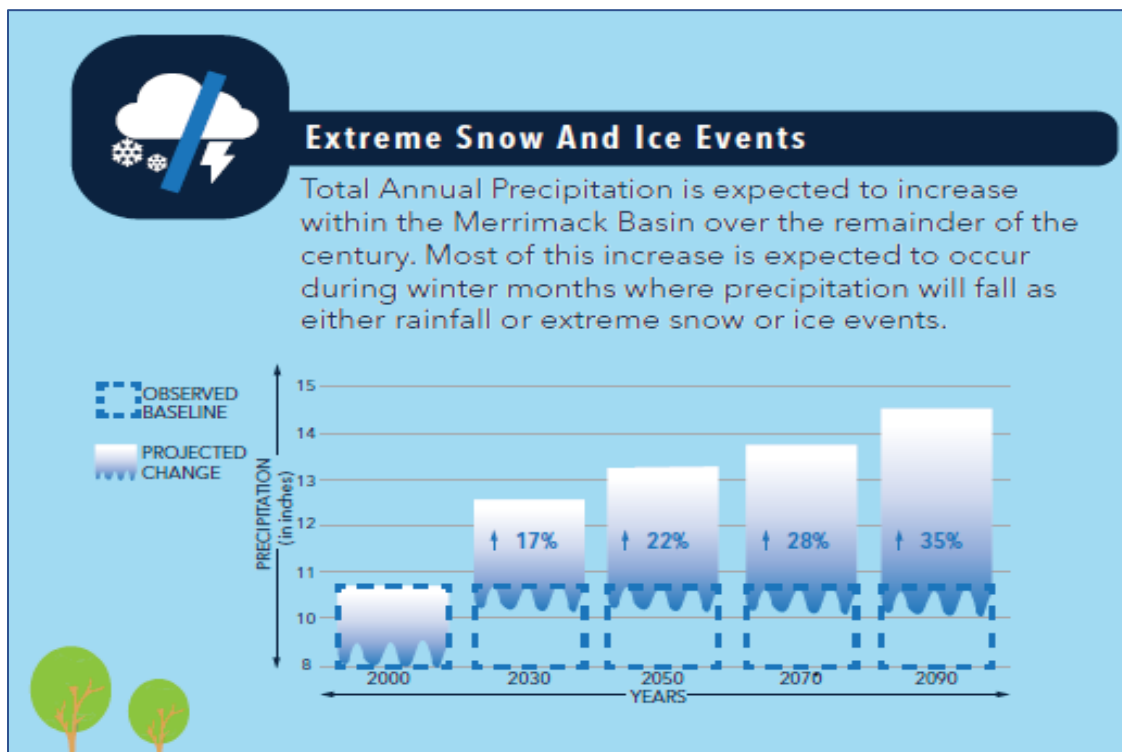
According to FEMA, Essex County experienced more than 20 extreme weather-related events that triggered federal or state disaster relief. Climate change is expected to increase the occurrence and intensity of natural-hazard related weather events. Identifying and preparing for the hazards most prevalent within Georgetown is the first step to prepare for the effects of climate change.

The following information is based on the Climate Change Clearinghouse for the Commonwealth Website:

### BLIZZARDS, BOMBOGENESIS AND EXTREME ICE EVENTS

According to Resilient MA, while the frequency of future blizzards is extremely hard to project, climate scientists have indicated that warmer air currents holding increased levels of moisture are moving north over the Atlantic Ocean. As the warm fronts moving north collide with colder air systems from the north, Massachusetts and other northeastern states are likely to see very intense blizzard events with high levels of snow. Increased snow and ice events have resulted in power outages in Georgetown. Many of the residents of Georgetown obtain water through private wells. Power outages put them at risk of limited access to potable water.

The following graphic shows extreme snow and ice events predictions for the Merrimack River Basin over the next seven decades:



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## **HURRICANES AND NOR'EASTERS**

According to a 2017 U.S. Climate Science Special Report and Resilient MA, there has been an upward trend in North Atlantic hurricane activity since 1970<sup>12</sup>. The report forecasts that future hurricanes forming 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.

Scientists are also studying whether nor'easters along the Atlantic coast are increasing in frequency and intensity, and again there is some evidence of a growing trend. In the future, nor'easter events may become more concentrated in the coldest winter months when atmospheric temperatures are still low enough to result in snowfall rather than rain.

CRB Workshop participants identified the need to review road and emergency facility access to ensure that emergency facilities are accessible during extreme weather events. Extreme weather events have resulted in power outages in Georgetown. Many of the residents of Georgetown obtain water through private wells. Power outages put them at risk of limited access to potable water.

## **DROUGHT/EXTREME HEAT**

According to the Climate Clearinghouse, a small projected decrease in average summer precipitation in Massachusetts could combine with higher temperatures to increase the frequency of episodic droughts. According to the U.S. Drought Monitor, since 2000, the longest duration of drought in Massachusetts lasted 48 weeks beginning on June 7, 2016 and ending on May 2, 2017. The most intense period of drought occurred during the week of September 1, 2017, leading to major crop losses and widespread water shortages and use restrictions.

Droughts will create challenges for local water supply by reducing surface water storage and the recharge of groundwater supplies, including private wells. More frequent droughts could also exacerbate the impacts of flood events by damaging vegetation that could otherwise help mitigate flooding impacts. Droughts may also weaken tree root systems, making them more susceptible to toppling during high wind events.

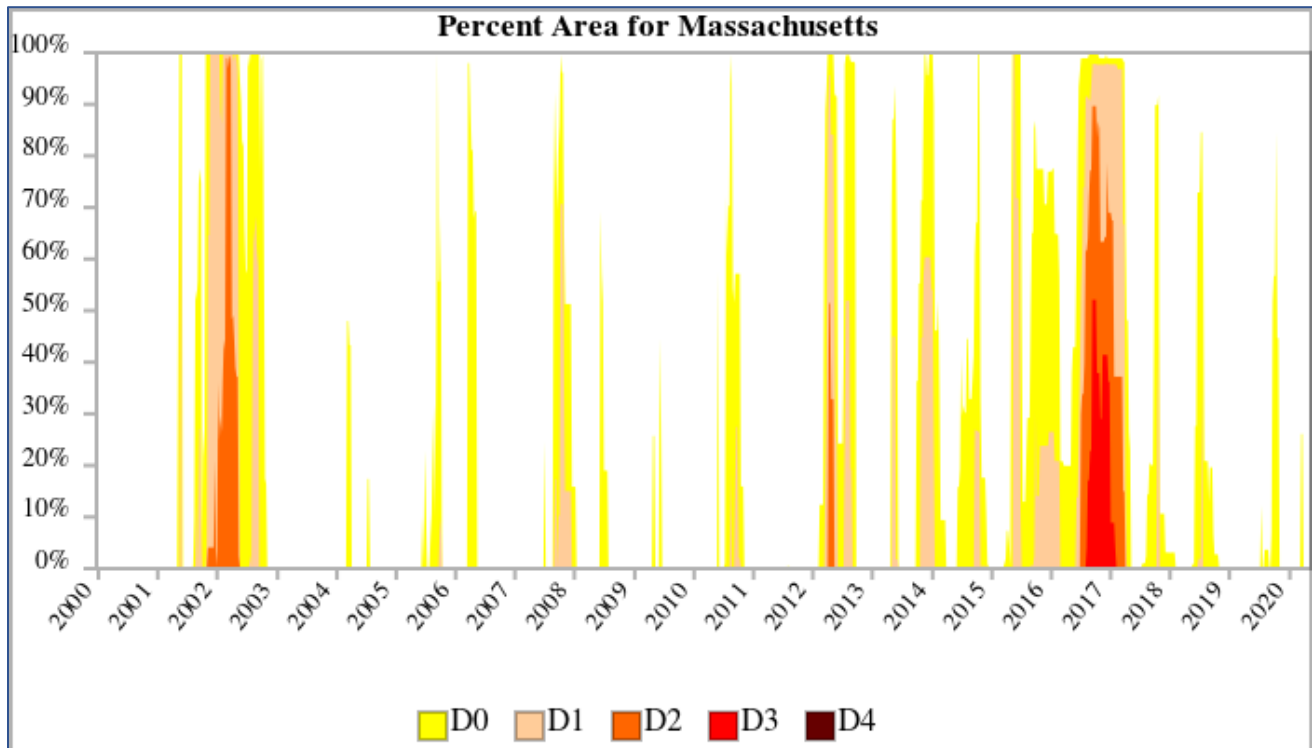
CRB workshop participants identified a reduction in water levels in the Parker River, its tributaries and associated ponds. Reduction in the water table has also led to requests for increasing private well depths. A decrease in water table and increase in heat has resulted in algae blooms, higher concentrations of nutrients and low concentration of oxygen in the water and an increase in aquatic invasive plants.

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<sup>2</sup> Climate Science Special report, Fourth National Climate Assessment (NCA4), Volume prepared by the U.S. Global Change Research Program (USGCRP). Cited on Resilient MA, Climate Change Clearinghouse for the Commonwealth, [https://resilientma.org/changes/extreme-weather#fn\\_1](https://resilientma.org/changes/extreme-weather#fn_1)

Although fish kills have not been observed, these can result from the reduced water levels and increase in temperatures.

CRB workshop participants identified a lack of cooling centers within Georgetown. Opportunities for cooling centers include the library and other town buildings as well as the addition of trees and benches in known areas of gathering such as parks, plazas, markets and bus stops.

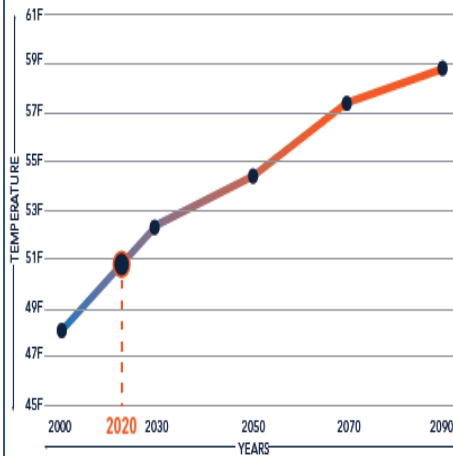


<https://www.drought.gov/drought/data-gallery/us-drought-monitor>

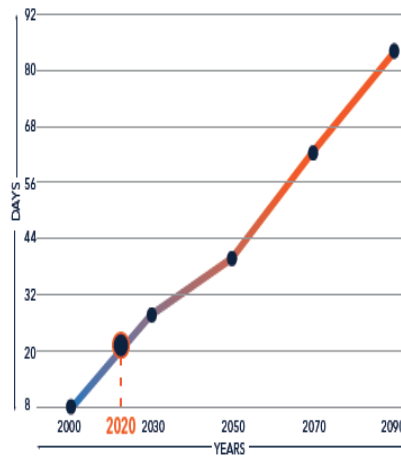
The following graphics show temperature increases for the Merrimack Basin:

## EXTREME TEMPERATURES

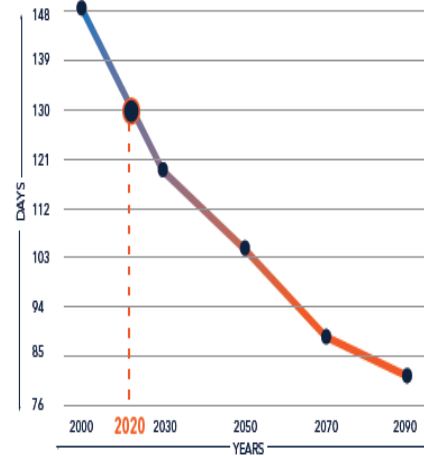
Average Temperatures



Days with Maximum Temperature over 90°F



Fewer Days Below Freezing



## DISEASE VECTORS, BLUE/GREEN ALGAE AND INVASIVE PESTS

According to the CDC, Climate is one of the factors that influences the distribution of diseases borne by vectors (such as fleas, ticks, and mosquitoes, which spread pathogens that cause illness). Daily, seasonal, or year-to-year climate variability can sometimes result in vector/pathogen adaptation and shifts or expansions in their geographic ranges. Such shifts can alter disease incidence depending on vector-host interaction, host immunity, and pathogen evolution. North Americans are currently at risk from numerous vector-borne diseases, including Lyme, dengue fever, West Nile virus disease (WNV), Eastern Equine Encephalitis (EEE), Rocky Mountain spotted fever, plague, and tularemia. Vector-borne pathogens not currently found in the United States, such as chikungunya, Chagas disease, and Rift Valley fever viruses, are potential future threats.

### *Mosquitos Borne Diseases*

The Massachusetts Department of Public routinely tests mosquitoes for WNV and EEE. Routine mosquito testing is typically reported June-October. During 2019, there were 12 reported human cases of Eastern equine encephalitis (EEE), including three deaths. According to the DPH risk level mapper, on October 21, 2019, Georgetown was in a moderate risk level for EEE and at a low risk level for WNV. According to DPH, a moderate risk level means that EEE has occurred in the area within the last year and/or EEE is in mosquitoes in the area as of the map date. The online mapper is updated frequently, especially during the mosquito season and is available at <https://georgetown.wickedlocal.com/news/20190822/interactive-map-find-out-risk-level-for-eee-or-west-nile-in-your-massachusetts-community>.

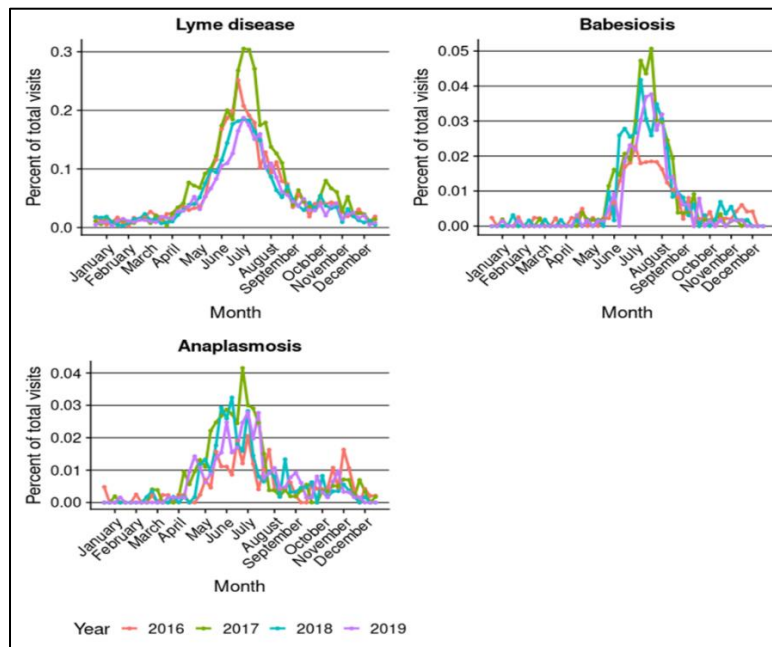
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## Tick Borne Diseases

Ongoing research suggests that shorter winters and warmer winter temperatures may result in earlier tick emergence. As the climate continues to warm and precipitation increases, so will the tick population. According to the Canadian National Health Institute, rising temperatures in Canada have led to improved conditions for survival and reproduction of ticks and faster development leading to an acceleration of the tick lifecycle. This has resulted in an increase tick abundance, has enabled ticks to spread to higher latitudes, and longer seasonal tick activities<sup>3</sup>.

According to the Massachusetts DPH, tick activity and tick-borne diseases like Lyme diseases, anaplasmosis, babesiosis, *Borrelia miyamotoi* and Powassan virus, occur year-round in Massachusetts. According to the December 2019, Tick Exposure and Tick-Borne Disease Syndromic Surveillance Report, there were 133 diagnosed tick-borne diseases in Essex County. Based on the number of patients who were diagnosed with a tick-borne disease during the same time frame, children ages 5- 14 and older adults are more frequently diagnosed with tick-borne diseases. Children are more frequently diagnosed with Lyme disease while older adults are more commonly diagnosed with Lyme disease, anaplasmosis or babesiosis. Based on overall results between 2016 and 2019, the prevalence of tick-borne illnesses appears to be less than in 2017.

The following graphics show the percent of total doctor's visits that resulted in a diagnosis of Lyme disease, babesiosis or anaplasmosis in 2019:



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<sup>3</sup> Bouchard, Dibernardo, Koffi, Wood, Leighton and Lindsay. N Increased risk of tick-borne diseases with climate and environmental changes. Canada Communicable Disease Report (2019), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6587693/>

To review the DPH Tick-Borne Diseases Year End Summary Report for 2019, please visit <https://www.mass.gov/lists/monthly-tickborne-disease-reports#2020->. A 2020 report is also available covering the period between January 1, 2020 and February 18, 2020. Town specific exposure levels are not available.

### Blue/Green Algae

According to the EPA, scientists predict that climate change will have many effects on freshwater and marine environments. These effects, along with nutrient pollution, might cause harmful algal blooms to occur more often, in more waterbodies and to be more intense. Algal blooms endanger human health, the environment and economies across the United States. According to the EPA, algae blooms may be triggered by several climate hazards:

- Warmer water temperatures
- Increased carbon dioxide in the atmosphere
- Changes in rainfall and volume of rainfall in short events leading to erosion and sedimentation of waterways, and stormwater inputs
- Periods of drought

**GIVE OUR PONDS THE BLUES!**  
Protect Rock & Pentucket Ponds from Nonpoint Source Pollution

**Pond Water Quality, Watersheds, and Nonpoint Source Pollution**

A pond's water quality reflects what is happening in its surrounding watershed. A watershed includes all the land – or drainage area – that drains into a stream, pond, or other waterbody. Nonpoint source (NPS) pollution occurs when water (i.e., stormwater, snowmelt, water from a garden hose) flows across the watershed, picking up pollutants and depositing them into streams and ponds. Common types of NPS pollutants include phosphorus and nitrogen in lawn and garden fertilizers, pet waste, phosphorus and bacteria from septic systems, oil and grease from parking lots, and sediment from construction activities and soil erosion.

**NPS pollution does not observe property lines. It flows wherever water takes it throughout the watershed – typically into storm drains and then, without any treatment, into nearby streams and ponds.**

**How Does NPS Pollution Affect Pond Water Quality?**

The combined effect of NPS pollutants such as phosphorus, sediment, and bacteria is degraded water quality and loss of recreational use and wildlife habitat. This accelerated degradation as a result of human activity in the watershed is called "cultural eutrophication".

- Excessive nutrients such as phosphorus stimulate algal and plant growth, limiting the recreational use of Rock & Pentucket Ponds (fishing, swimming, and boating) and degrading wildlife habitat.
- Sediment can cause serious damage to the ponds by causing turbidity and filling-in sensitive habitat that is needed for aquatic life. It also transports phosphorus.
- Bacteria from failing or substandard septic systems, pet waste, and waterfowl can cause swimming beach closures, such as at our Pentucket Pond Town Beach at American Legion Park.

During the summer of 2019, the DPH warned dog owners and pond goers to stay away from ponds across the Commonwealth with reported blue algae/cyanobacteria outbreaks. Notices were posted on DPH's website and across freshwater swimming areas indicating the specific locations where toxic algae blooms had been identified.

According to the CRB participants, algae blooms also occurred at Pentucket and Rock Ponds. These may not be the result of cyanobacteria but are still of concern to the Community. Outreach efforts have begun to educate pond goers and abutters about the potential causes of algae blooms. For example, the Georgetown Stormwater Management Program with the assistance of the Merrimack Valley Planning Commission provided outreach and education to Pond abutters about the causes of algae blooms and how to mitigate future blooms.

Complete flyer available:

[https://www.georgetownma.gov/sites/georgetownma/files/uploads/georgetown\\_ponds\\_nps\\_bulletin\\_2-08.pdf](https://www.georgetownma.gov/sites/georgetownma/files/uploads/georgetown_ponds_nps_bulletin_2-08.pdf)



## ROCK POND CLOSED for Milfoil Treatment

Our first treatment by Solitude to combat the Milfoil will take place on **Tuesday, June 7th**. In order for the treatment to have maximum effect and for everyone's safety, it is imperative that we refrain from using the pond for the following periods of time:

- **Boat ramp and the pond will be closed to all activity for two entire days: Tuesday and Wednesday, June 7th and 8th**
- **No swimming or fishing for three days: June 7th, 8th, 9th**
- **No using water for drinking or cooking for five days: June 7th, 8th, 9th, 10th, 11th**
- **No irrigation days for 14 days: June 7th - 20th**

A few things to keep in mind regarding the Milfoil:

- **Stay out of the Milfoil beds.** Do not enter them nor fish in them
- Do not try to pick or pull up any Milfoil. Breaking it up only intensifies the problem
- Clean your boat thoroughly before and after putting it in the pond
- Help spread the word by talking to neighbors and friends
- Approximately 10 days after treatment, the weeds should begin to die back and the buoys will be removed until any new growth starts toward the end of summer

Thank you, from the bottom of our hearts, for helping us save Rock Pond



Questions? Contact RPA at [rockpondassociation@gmail.com](mailto:rockpondassociation@gmail.com)

Find us on Facebook: [facebook.com/RockPondAssociation](https://www.facebook.com/RockPondAssociation)

For more information on Milfoil, please visit  
[www.mass.gov/eeal/docs/dcl/watersupply/lakepond/factsheet/variable-milfoil.pdf](http://www.mass.gov/eeal/docs/dcl/watersupply/lakepond/factsheet/variable-milfoil.pdf)

## Invasive Species

According to the International Union for Conservation of Nature (IUCN), invasive species may be compounded by climate change. Extreme climatic events resulting from climate change, such as hurricanes, floods and droughts can transport these pests to new areas and decrease the resistance of habitats to invasions. Many invasive pests can expand rapidly to higher latitudes and altitudes as the climate warms, out-pacing native species. Increase in the presence of invasive species may affect environmental, societal and infrastructural resources.<sup>4</sup> For example, invasive species such as common reed, *Phragmites australis* may affect wetland hydrology and habitat quality; toxic invasive plants such as Giant Hogweed, *Heracleum mantegazzianum* affect the health and safety people; invasive insects such as the Emerald Ash Borer, *Agilus planipennis*, affect tree livelihood leading to tree falls, infrastructural damage, sun exposed and reduced wildlife habitat; and brown marmorated stinkbugs, *Halyomorpha halys*, affect the quality and survival of crops consumed by people.

In Massachusetts, an emerging initiative of the Northeast Climate Science Center aims to develop management-relevant research to improve invasive species management in the face of climate change. Through working groups, information sharing and targeted research, this project addresses the information needs of invasive species managers in the context of climate change. For more information, please visit <https://necsc.umass.edu/projects/regional-effort-invasive-species-and-climate-change-risc-management>

The CRB team expressed concerns over the increased presence of invasive species in Georgetown. Town volunteers and staff have initiated outreach campaigns associated with aquatic invasive species in Pentucket and Rock Ponds. Both ponds are treated for aquatic invasive plant management. The Emerald Ash Borer was found in Georgetown in 2016.

<sup>4</sup> <https://www.iucn.org/resources/issues-briefs/invasive-alien-species-and-climate-change>

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Collectively, it was agreed upon by the group that the Town of Georgetown's top hazards present ongoing and cumulative adverse impacts on the community's most important infrastructural, societal, and environmental resources. The Appendix for this report includes Merrimack River basin climate projections and associated graphic showing anticipated climate changes for Georgetown over the coming decades.



# CHARACTERIZING A CLIMATE RESILIENT GEORGETOWN

The CRB process involves a robust stakeholder engagement effort and can be used to characterize the vulnerabilities and strengths unique to a given community. The Georgetown CRB process revealed important characteristics that broadly represent the identity and culture of the community. Collectively, these characteristics provide a *snapshot* of the community's vulnerabilities and strengths and is an important starting point to identify community features most at risk to the effects of climate change. The Appendix includes the CRB Workshop Risk Matrix which lists 15 specific climate vulnerabilities and strengths in Georgetown, each of which includes related sub-categories of vulnerability and risk, and also includes base maps used in the CRB Workshop. The vulnerabilities and strengths can be discussed in broad categories as noted below. Most of the vulnerabilities and strengths could be categorized in more than one sectoral grouping (Infrastructure, Societal, and Environmental). For this reason, the Core Team members requested that the MVP Provider (BSC) modify the CRB Workshop Matrix to allow selection of more than one sectoral grouping.

A FEMA Capability Assessment Worksheet was developed utilizing the information collected during the CRB workshop. The FEMA Capability Assessment Worksheet is incorporated and discussed in the HMP section of this report.

## **Critical Facilities**

According to FEMA, for some activities and facilities, even a slight chance of flooding is too great a threat. These facilities should be given special consideration when formulating regulatory alternatives and floodplain management plans. Constructing a critical facility in a floodplain should be avoided to ensure access to and functionality of the facility and its offered services. According to FEMA, if a critical facility must be located in a floodplain it should be provided a higher level of protection so that it can continue to function and provide services after the flood. In addition to flooding, critical facilities are also impacted by all climate hazards. Typical critical facilities include hospitals, fire stations, police stations, storage of critical records, and similar facilities as determined by the community. An updated list of the critical facilities in Georgetown is provided in the following table. The following Climate hazard maps showing the location of critical facilities with respect to climate hazards have been provided in the Appendix. Critical facilities are referenced by the map reference number included in the table below.

- Flooding: 100 and 500-year FEMA Floodplains (MassGIS)
- Population density (2019 MassGIS census blocks)
- Average snow fall (1981-2010- average of reports from Weather Channel Weather Stations)
- Land use and floodplains (2019 Mass GIS)
- Past Hurricane and Tornado Trajectories (MassGIS )
- Landslide Incident Areas and Earthquakes (USGS) have been included in the appendix to this report

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Map Reference	ASSET NAME	ASSET TYPE	ADDRESS	FLOODPLAIN / AREAS PRONE TO FLOODING
1	Georgetown Town Hall	Municipal Building	1 Library Street	
2	Georgetown/Peabody Library	Municipal Building	2 Maple Street	
3	Georgetown Highway Department, Field Yard	Municipal Building	203 East Main Street	*
4	Georgetown Fire Station	Emergency Response	474 North Street	
5	Police/Fire/Emergency Response Facility	Emergency Response	47 Central Street	
6	Mello Transfer Station	Municipal Facility	203 East Main Street	Portions w/n 100-year floodplain
7	Water Treatment Facility	Municipal Facility	75 West Street	100-year floodplain
8	Baldpate Road Water Storage Tanks	Municipal Facility	Baldpate Road	
9	Black Swan Country Club Water Storage Tank	Municipal Facility	Baldpate Road	
10	Searle Street Electrical Substation Electric Department Office	Municipal Facility	94 Searle Street	*
11	Moulton Street Electrical Substation	Municipal Facility	1 Moulton Street	
12	Baldpate Treatment Center	Healthcare Facility	83 Baldpate Road	
13	Fidelity House Human Services	Healthcare Facility	294 Andover Street	
14	Group Home	Healthcare Facility	8 Ordway Street	
15	Bradstreet	Healthcare Facility	111 Jewett Street	
16	Pentucket Pond Dam	High Hazard Dam	Pond Street	100-year floodplain
17	Perley Elementary School	School	51 North Street	Portions w/n 100-year floodplain
18	Georgetown High School	School	11 Winter Street	Portions w/n 100-year floodplain

Map Reference	ASSET NAME	ASSET TYPE	ADDRESS	FLOODPLAIN / AREAS PRONE TO FLOODING
19	Georgetown Middle School	School	11 Winter Street	Portions w/n 100-year floodplain
20	Penn Brook School	School	68 Elm Street	
21	Georgetown High School	Emergency Shelter	11 Winter Street	Portions w/n 100-year floodplain
22	Georgetown Middle School	Emergency Shelter	11 Winter Street	Portions w/n 100-year floodplain
23	Penn Brook School	Emergency Shelter	68 Elm Street	
24	Housing Facility	Housing	23 Trestle Way	Portions w/n 100-year floodplain

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### **Built Infrastructure**

The built infrastructure within Georgetown is characterized by an interdependent network of roads, bridges, dams, municipal buildings (including schools that serve as community shelters), and privately-owned buildings. State and local roadways within Georgetown are often vulnerable to flooding, some of which are located along important local emergency evacuation routes or provide access to community shelters. CRB Workshop participants identified the need to review road and emergency facility access to ensure that emergency facilities are accessible during extreme weather events. Publicly and privately-owned buildings, roads and parking lots in the downtown business district are a source of urban heat island effect. Privately owned buildings throughout the community provide homes to residents. Existing facilities with hazardous materials are located within the 100-year and 500-year floodplains. The municipally owned Searle Street substation is located in a wet area just outside of the historical 100-year floodplain, an area with potential for flooding as storm intensity and flooding increase. Additional details on critical facilities and their location within potential hazard areas has been provided in the HMP section of this report.

### **Water Management Infrastructure**

Flooding in much of Georgetown is primarily a result of precipitation and storm water runoff overwhelming the capacity of natural and structured drainage systems to convey water. Under extreme precipitation the drainage system becomes overburdened and street and property flooding result. In some cases, roads that serve as evacuation routes, routes to community shelters, or routes of egress from specific neighborhoods are already experiencing flooding, and this is anticipated to worsen as the climate changes. Workshop participants agreed that the stormwater drainage structures throughout the community are likely undersized and often cannot meet the demands of runoff from extreme precipitation and/or inland and coastal flooding events. Additionally, there was concern that portions of evacuation routes and routes to shelters that are vulnerable to current and future flooding events haven't been fully identified, or if they have been identified, planning to address the flooding problem has not been completed or integrated into emergency response plans.

A dam, owned by Georgetown, is located at Pentucket Pond. According to the Office of Dam Safety, Georgetown's only dam, **Pentucket Pond**

### **Built Infrastructure**

- Roads
- Bridges
- Private Buildings
- Evacuation Routes
- Critical Facilities
  - Municipal Buildings
  - Schools
  - Shelters/Assembly Areas

### **Water Management Infrastructure**

- Stormwater Drainage/MS4
- Natural Infrastructure
- Septic Systems/Wastewater Treatment Package Plan
- Drinking Water/Water Towers
- Private Wells
- Culverts

**Outlet Dam**, is classified as a high Hazard Dam. Pentucket Pond Dam is located where Pond Street borders the pond. All aspects of the dam are accessible from Pond Street. A locked gate in the fence on the upstream side of the road provides access to the top logs, trash rack and fish ladder. An Emergency Action Plan has been developed for the dam (most recent version date December 30, 2019). The plan defines responsibilities and provides procedures for identifying usual and unlikely conditions, which may endanger the Pentucket Pond Outlet Dam and infrastructure downstream of the dam, in time to take mitigated action and to notify appropriate emergency management officials of possible, impending, or actual failure to the dam in order to minimize property damage and loss of life.

This dam contributes to water quality and flood control issues across the community. CRB Workshop participants noted that the number of beaver dams has increased over the past several years, creating additional flooding issues at a number of locations.

Private septic systems and one private wastewater treatment package plant exacerbate water quality issues, particularly since some of the privately owned septic systems occur within the 100-year and 500-year floodplains.



### Repetitive Loss Structures

Six repetitive loss structures (RL Structures) were identified based on records from the National Flood Insurance Program (NFIP). The following table provides the number of repetitive loss structures by flood zone in Georgetown and the payments received in insurance claims under the NFIP.

RL Structure	Flood Areas			Total
	AE, A1-30, AO, AH, A	VE, V1-30, V	B,C, X	
building	4	0	2	<b>6</b>
RL Payment (building)	\$143,096	0	\$47,247.73	<b>\$198,850.37</b>

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What do the Flood Area letters mean? Each flood zone is type is categorized by a letter that describes the flood risk for a particular area, and those flood zones are used to determine insurance and costs.

- Moderate to Low Risk: flood areas beginning with the letters Letters B, C, and X on FEMA Flood maps. In these areas, the risk of being flooded is reduced, but not completely removed.
- High Risk: flood areas beginning with the Letters A or V on FEMA Flood maps. These areas face the highest risk of flooding.

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## ***Emergency Preparedness/Community Preparedness/Vulnerable Populations***

Emergency management for the Town of Georgetown entails coordination between the Police Department, Fire Department, and the Department of Public Works, as well as other departments such as the Health Department as needed. Public Safety services are housed at the Georgetown Public Safety Complex. Georgetown Connect and social media allow emergency communication during public safety events. Community and town services communicate well during emergencies. Georgetown has a Community Emergency Management Plan that is updated every year, as well as a Seabrook Evacuation Plan. As part of this MVP Planning Grant project, Georgetown is integrating climate resiliency into, and updating the Hazard Mitigation Plan. Continuing to build upon established decision-making processes and operations is an important aspect of ongoing climate resilience efforts.

Additionally, CRB workshop participants identified the lack of community education, outreach and awareness about climate resiliency as a vulnerability in the Town of Georgetown. While significant work has been done to promote civic engagement across the public, private, and non-profit sectors in Georgetown, workshop participants viewed the absence of community outreach and education about climate resiliency as a limitation to achieving its climate resilience goals. While there are many community-centric public, private, and non-profit entities engaged in community issues, there is a recognized lack of climate change preparedness and social networks to address the challenges presented.

### **Emergency and Community Preparedness**

Centralized Emergency  
Communications

Evacuation Plan

Communication Plan

Emergency & Non-Emergency  
Outreach

Community Networks and  
Education

Informational Technology  
(cellular applications and  
websites)

Regional Coordination

Coordination with State  
Agencies

Shelters

Backup Fuel Resources



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## **Natural Resources Management**

Workshop participants identified the many natural resources in Georgetown that contribute to water management (both quantity and quality), storm damage prevention and heat mitigation, including the Parker River, Pentucket Pond, Rock Pond, Crane’s Pond Wildlife Management Area, Georgetown-Rowley State Forest, Camp Denison, as well as smaller parks, downtown trees, privately held forested land, wetlands, floodplains and approximately 1,000 acres of conservation land as community strengths, and in some cases, also as vulnerabilities. As a result of the Core Team meetings, Natural Resources Infrastructure Assessment meetings and site walk, and the CRB Workshop, members of the Georgetown community gained a greater understanding of the relationship between these natural resources, the threats from climate change, and community climate resilience.

### **Natural Resource Management**

- Zoning Ordinance Updates
- Wetland & Floodplain Conservation and Restoration
- Increase Tree Canopy
- Bank Erosion
- Water Quality
- Dam Management
- Open Space Connectivity
- Invasive Species/Algal Blooms
- Low-Flow Conditions



### **Local Regulatory Structure & Planning**

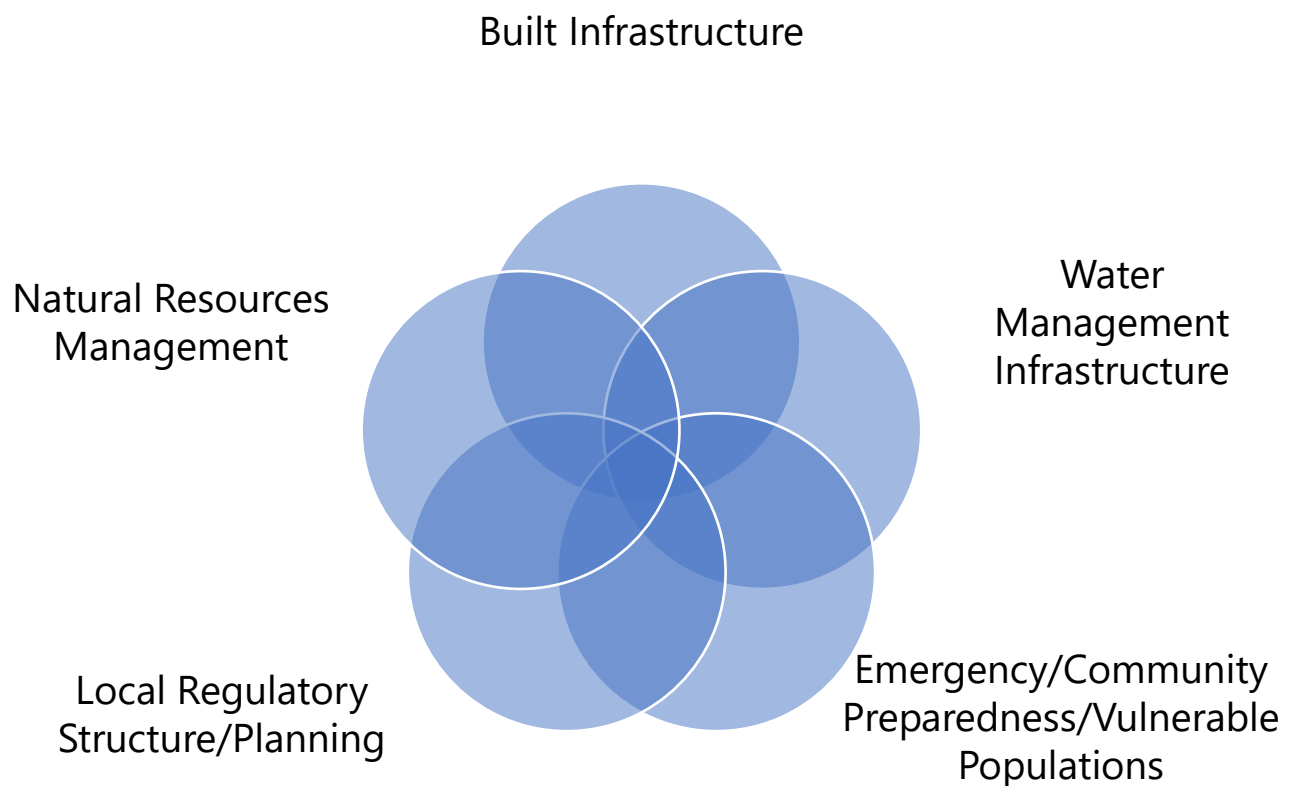
- Open Space Plan
- Master Plan
- Hazard Mitigation Plan
- Climate-Resilient Ordinances & Policies: Zoning, Wetlands, Floodplain
- Invasive Species
- Cross Departmental Planning Partnerships

## **Local Regulatory Structure/Planning**

The Town of Georgetown has a variety of bylaws and policies that serve to direct and guide planning and development throughout the municipality, to protect natural resources such as wetlands and waters, and to plan for hazard mitigation. These existing regulatory and planning instruments represent a strength, but one that can be further strengthened by incorporating climate change, and by updating.

# CATEGORIZING AND PRIORITIZING CHALLENGES

Workshop participants identified 15 action topics (each of which included sub-category actions) as part of the CRB process. These actions can be considered in five categories based on a combination of community characteristics (i.e. strengths and vulnerabilities) and solutions/actions identified by workshop participants. During the Core Team and Natural Resource Infrastructure Assessment Team meetings, the HMP Draft Listening Session and the CRB workshop, an emphasis was placed on the interdependence of these categories that allowed for the development of climate resilience solutions that span infrastructural, societal, and environmental features. Through this lens, overlapping solutions that provide co-benefits were identified and prioritized.



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## **Built Infrastructure**

When developing a prioritized list of climate resilient actions, CRB Workshop participants and Core Team members supported initiatives that incorporate green infrastructure, low-impact design, energy efficiency, renewable energy, and avoidance of use of power that derives from fossil fuels or from tree cutting. The Town of Georgetown feels strongly about increasing the climate resiliency of the built infrastructure in town. This category excludes the town's water management infrastructure because of the unique challenges related to the many aspects of water management within the community. Electricity services are municipally owned.



*Georgetown High School; Source: John Phelan*

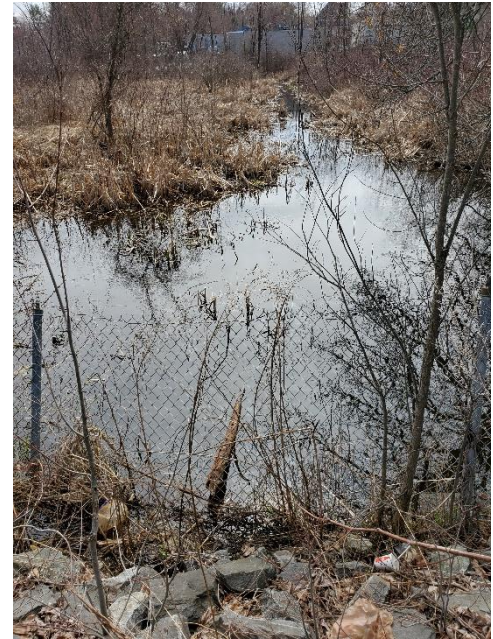
Participants of the CRB Workshop and Core Team meeting identified the following high priority resiliency actions pertaining to built infrastructure (excluding water management):

- Review open space parcels or parcels in the vicinity of the Searle Street substation and implement NBS to minimize flooding risks in the Searle Street area.
- Investigate electrical redundancy and assess upgrade needs with regard to predicted future demands.
- Invest in renewable energy initiatives (car charging stations, hybrid vehicles, solar power, solar power battery cells, wind power, geothermal, etc.).
- Avoid energy sources that involve cutting forests (such as wood-based biofuels) or use of fossil fuels.
- Prioritize locating solar and wind power projects on land that has already been developed and avoid locating solar and wind power projects in forested areas.
- Study possible solutions for Parcel 10\_45 Capped Landfill and Highway Department Facility on-site flooding problems as well as downstream impacts associated with materials storage/leaching/pollution.
- Consider relocating municipal Highway Department's garage and salt shed to an area less prone to flooding.

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## **Water Management Infrastructure**

Through the CRB planning and workshop process, participants gained a new understanding of the connection between natural infrastructure and worsening flooding problems. In particular, there is a new appreciation of the flood storage and water quality ecosystem services provided by wetlands and floodplains in numerous locations in town (see discussion in Natural Resources Management section below), as well as recognition that the increasing number of beaver dams may be exacerbating flooding in some locations. Natural infrastructure can relieve some of the flooding and water quality pressure on the built infrastructure, and participants saw the value of integrating Nature Based Solutions into climate resiliency plans. Water quality issues were a concern for workshop participants, with concern expressed about nutrient loading in town waterways and water bodies. Some of the privately owned septic systems occur within the 100-year and 500-year floodplains, thus posing a risk to water quality.



During the prioritization of actions at the CRB Workshop, one of the top priorities that CRB Workshop participants identified was the need to plan for and implement projects that address existing and future water management infrastructure and flooding issues at numerous locations. Core Team and NRIA Team meeting participants also identified this as a top priority. High priorities included:

- Coordinate with Massachusetts EEA Office of Technical Assistance to address hazardous materials that are located within floodplains (future predicted floodplains as well as historic 100-year and 500-year floodplains).
- Address septic system issues at Pentucket Pond, Rock Pond, and in floodplains.
- Work with Water Department to conduct community education and outreach regarding water conservation.
- Identify potential Nature Based Solutions that would ensure a more plentiful water supply.
- Identify locations for bank stabilization and tree planting that could enhance water quality.
- Engage in public education and outreach to prevent nutrient releases into waterways, water bodies, and wetlands.
- Continue culvert replacement and upgrades to reduce flooding and meet future flood conditions, rather than historical conditions. Implement Massachusetts Stream Crossing Standards/ design for future storms when replacing culverts whenever possible. Coordinate culvert replacements and stormwater management with MassDOT on MassDOT roads and at the MassDOT Park n Ride.
- Prepare MS4 updated inventory/ mapping of catch basins and outfalls and prepare an Illicit Discharge Detection Elimination (IDDE) Plan.

- Increase infiltration of water and improve stormwater management by implementing Nature Based Solutions, green infrastructure, and community education and outreach. Seek implementation assistance and partner with Merrimack Valley Planning Commission.
- Implement erosion control projects, particularly along the banks of waterways, ponds and wetlands.
- *Pentucket Pond Dam*: Emergency Action Plan/ O & M updated in 2019. Ensure Action Plan has been approved by the Office of Dam Safety. Continue implementing O & M plan. Implement an Emergency Action Plan.
- *Baldpate Dam*: Continue outreach efforts to the Office of Dam Safety regarding Baldpate Dam. The Dam is under the care and control of Boxford and National Grid and not Georgetown. Request inspection reports from the Office of Dam Safety. Ensure O & M plan is implemented.

### **Emergency/ Community Preparedness/Vulnerable Populations**

Participants felt strongly that an effort should be undertaken to provide more education and outreach for community members and municipal staff, and particularly for the most vulnerable, such as the elderly, English language learners, and the very young, about climate change vulnerability, preparedness, resources and response. Emergency response plans should include planning for vulnerable populations. Regional coordination should also occur with neighboring communities, and the Town should draw upon the capacity provided by state agencies to enhance its overall capacity to address the needs of climate preparedness.

At the CRB Workshop participants also identified the need to address social vulnerabilities as a priority, such as engaging in actions that will prevent future climate-related events from disproportionately impacting vulnerable populations and proactively providing education and outreach to vulnerable populations. Specific high priority actions that could be taken included:

- Integrate vulnerable population concerns into future MVP Action Grant proposals.
- Integrate climate resiliency information into future Housing Production Plan Updates.
- Work with the state to try to relocate low income, elderly, handicapped living facilities from floodplain areas to higher ground, using mapping based on floodplains predicted for the future rather than historical floodplains.
- Assist vulnerable population facilities with preparation of emergency management plans.
- Expand senior transportation to other vulnerable populations during emergency situations.



Source: Bryan McGonigle, Wicked Local

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### **Local Regulatory Structure/Planning**

Workshop participants felt that many of the ordinances and policies that serve to direct and guide planning and development throughout the municipality to protect natural resources and to plan for hazard mitigation could be updated to incorporate climate resiliency and to improve emergency response. During the prioritization of actions at the CRB Workshop, participants identified the following high priority actions:



*Camp Denison; Source: Essex National Heritage Area*

- Update local zoning and other bylaws/regulations to incorporate climate resiliency (use updated/ projected rainfall and flooding data/ modeling, encourage Nature Based Solutions, etc.) and ensure sustainable development.
- Incorporate climate resiliency into updates of the Open Space and Recreation Plan, Master Plan, and Housing Production Plan.
- Consider implementing additional Low Impact Development techniques and require Nature Based Solutions rather than gray infrastructure solutions.
- Advocate for cross committee and board communication and implementation of municipal climate resiliency objectives.
- Partner with state (e.g. DCR/ MassWildlife), non-profit (e.g. land trust, Parker River Clean Water Association, Essex County Greenbelt), & private land managers (golf course, Ch. 61 landowners), volunteers and stakeholders to coordinate and implement town wide projects that increase use of NBS as well as provide community education and outreach.
- Conduct climate resiliency outreach and education.
- Continue to support use of CPA funds to improve Georgetown's climate resiliency.

### **Natural Resources Management**

Participants at the CRB Workshop, at the Core Team meeting, and at NRIA meetings recognized that the significant natural resource assets in town, including Crane Pond Wildlife Management Area, Georgetown-Rowley State Forest, Baldpate Pond State Park, the Parker River and its shoreline (where undeveloped), Camp Denison, approximately 1,000 acres of conservation land, Pentucket Pond, Rock Pond, and other Open Space, while assets, also face challenges related to climate change, and identified the following high priority actions:

- Expansion of conservation purchases, easements, and conservation restrictions.

- 
- Integrate Essex County Greenbelt parcel prioritization matrix into MVP/ NRIA planning and mapping.
  - Complete ecological reviews of open spaces (such as for forests and wetlands) and draft/ prioritize management recommendations and actions such as Nature Based Solutions that increase climate resilience.
  - Implement the recommendations from the Natural Resources Infrastructure Assessment report, and use as a model for Nature Based Solutions implementation, public outreach and education.
  - Improve universal access to open spaces and recreational facilities including auxiliary structures.
  - Incorporate climate adaptation and MVP findings into the next Open Space and Recreation Plan update.
  - Address nutrient loading of water bodies and waterways, as well as invasive species and algal blooms. Consider and implement management practice alternative solutions to reducing phosphate loads within the Parker River and the ponds.
  - Improve the capacity of the trees in the downtown area to absorb flood waters and to provide shade.
  - Use floating islands/ coir logs to help with nutrient removal and bank protection/ restoration along the Parker River and the two ponds.
  - Assess river and pond hydrology and bathymetry, and determine whether barriers (culvert, dam, walls, sedimentation, dense invasive species, etc.) can be upgraded/managed to increase water flow, water capacity and decrease channelization. Update flood maps in the vicinity of the Parker River by integrating Cornell and National Weather Service Data.
  - Partner with Mosquito Control to identify areas that may serve as disease vector breeding habitats. Develop and implement management recommendations such as ecological restoration projects that reduce the risk of exposure to mosquito borne illnesses.
  - Conduct outreach and education to inform landowners regarding reducing risks of vector-borne diseases. Develop/ enhance partnerships between Georgetown, state and local organizations.
  - Implement best management practices for vegetation management (tree diseases/invasive species).

## CRB Workshop Matrix and Prioritization of Actions

Climate Resiliency Actions to address the concerns and vulnerabilities identified through the workshop process, and build upon existing strengths, were prioritized through workshop activities and coordination with Core Team leadership. Climate Resilience Actions listed in the tables below are organized as High Priority (H), Medium Priority (M), and Low Priority (L) Actions. During the Core Team meeting prior to the CRB Workshop, Core Team members expressed preference for a modified CRB Workshop Risk Matrix spreadsheet to improve clarity and to allow for actions and features to be placed in more than one category, if applicable. The table below and the CRB Workshop Risk Matrix included in the Appendix reflect these modifications. CRB Workshop participants voted on their top priorities, ranking Actions as High, Medium, or Low Priority.

### High Priority Actions

Priority	Categories			Action
	Infra-structure	Social	Environ-mental	
H	X	X	X	<b>Private Septic/ Hazardous Materials Storage in Floodplain -</b> Coordinate with state program to identify existing facilities with hazardous materials located within the 100- and 500- year floodplain and establish protocols/bylaws for secondary containment and other protective measures. Limit the establishment of such facilities through zoning. Access state support for addressing these issues. Consider extending Board of Health septic disposal regulations to all floodplains. Regulations and requirements currently in place for septic systems within 300- feet of Pentucket and Rock Pond. Identify septic systems located in floodplain and provide incentive for upgrades. Map and plan using predicted floodplain, rather than historical floodplains.
H	X	X	X	<b>Pentucket Pond and Baldpate Pond Dams –</b> Emergency Action Plan/O&M updated in 2019. Ensure Action Plan has been approved by the Office of Dam Safety. Continue implementing O&M plan. Implement an Emergency Action Plan. <i>Baldpate Dam:</i> Continue outreach efforts to the Office of Dam Safety regarding Baldpate Dam. The Dam is under the care and control of National Grid and not Georgetown. Request inspection reports from the Office of Dam Safety. Ensure O&M plan is implemented.



H	X	X	X	<p><b>Open Space &amp; Natural Resources Protection, Restoration, Enhancement and Climate Resiliency</b> - Research actions for property acquisition/easements/conservation restrictions to expand open space/conservation land opportunities and climate resiliency in town. Integrate Essex County Greenbelt parcel prioritization matrix into MVP/NRIA mapping. Consider using the TNC Ecological Climate Resiliency Mapping provided as part of the NRIA as well as the Essex County Greenbelt matrix as a tool to prioritize land protection. Complete ecological reviews of open spaces and draft/ prioritize management recommendations and actions such as NBS that increase climate resilience. For example, in large patches of forests- Forest diversity and health assessment with recommendations on how to improve forest health (e.g. diversified plantings, invasive species removal, forest management, prescribed fires, etc.); in wetlands- wetland assessments with recommendations on how to improve functions and values, etc.) Implement NRIA recommendations and use as a model for NBS solutions implementation, and public outreach and education. Improve universal access to open spaces and recreational facilities including auxiliary structures (parking lots, sanitary facilities, etc.). Incorporate climate adaptation and MVP findings in the next Open Space and Recreation Plan update. Dying and sick trees can create hazards via falling branches and trees. Complete a tree health assessment.</p>
H				<p><b>Municipal Utilities Water and Electricity- Resiliency, Enhancement and Conservation –</b></p> <p><i>Water</i> - Work with the water department to set aside funding for water conservation outreach/education on a yearly basis. Incorporate NBS and outreach to reduce water use and increase water infiltration as part of the water conservation program implementation process.</p> <p><i>Electricity</i> - Review open space parcels or parcels in the vicinity of the substation and implement NBS to minimize flooding risks in the Searle Street area. Investigate electrical redundancy and assess upgrade needs with regard to predicted future demands. Invest in renewable energy initiatives (car charging stations, hybrid vehicles, solar power, solar power battery cells, wind power, geothermal, etc.). Avoid energy sources that involve cutting forests (such as wood-based biofuels) or use of fossil fuels. Prioritize locating solar and wind power projects on land that has already been developed and avoid locating solar and wind power projects in forested areas.</p>

H	X	X	X	<p><b>Parker River, Rock Pond and Pentucket Pond - Water Quality/Water Flow/Ecological Integrity</b> - Assess river and pond hydrology and bathymetry, and determine whether barriers (culvert, dam, walls, sedimentation, dense invasive species, etc.) can be upgraded/managed to increase water flow, water capacity and decrease channelization. Update flood maps in the vicinity of the Parker River by integrating Cornell and National Weather Service Data. Implement use of floating islands/coir logs to help with nutrient removal and bank protection/restoration along the Parker River and the two ponds. Consider and implement management practice alternative solutions to reducing phosphate loads within the Parker River and the ponds. Implement erosion control projects along the banks of waterways, ponds and wetlands. Review river and pond banks to determine where improvements such as NBS (bank stabilization, tree planting, waterway/corridor alterations) could assist with overall water improvements. Partner with MS4 to stress public outreach on preventative steps that homeowners can take to lower nutrient releases into waterways, wetlands and ponds. Increase infiltration of water and improve storm water management by implementing NBS, green infrastructure, and community outreach and education. Implement erosion control projects.</p>
H		X	X	<p><b>Partnerships, Volunteers and Community Education/Engagement</b> - Engage in a climate resiliency focused public outreach and education campaign. Incorporate solutions that reduce the N and P load into the wetlands, rivers and ponds. Integrate public education component in all future MVP action grants. Partner with state (e.g. DCR/ MassWildlife), non-profit (e.g. land trust, PRCWA, Essex County Greenbelt), &amp; private land managers (golf course, Ch. 61 landowners), volunteers and stakeholders to coordinate and implement town wide projects that increase use of NBS as well as provide community education and outreach.</p>

H	X		X	<p><b>Road Infrastructure and MS4</b> - Continue replacing/upgrading culverts to reduce flooding. Implement the Stream Continuity Guidance/design for future storms when replacing culverts whenever possible. Coordinate culvert replacements with MassDOT on MassDOT roads. Coordinate storm water management improvements along roads and at the park and ride.</p> <p>MS4: Prepare MS4 updated inventory/mapping of catch basins and outfalls. Prepare IDDE (illicit discharge detection elimination) Plan. Seek implementation assistance and partner with MVPC.</p>
H	X		X	<p><b>Parcel 10_45 Capped Landfill and Highway Department Facility, Flooding</b> - Study possible solutions to mitigate for impacts associated with site flooding as well as downstream impacts associated with materials storage/leaching/pollution. Consider relocating municipal Highway Department's garage and salt shed to an area less prone to flooding.</p>
H		X	X	<p><b>Diseases, Pests, Invasive Species &amp; Mosquito Control Collaboration/Assistance</b> - Partner with Mosquito Control to identify areas that may serve as disease vector breeding habitats. Develop and implement management recommendations such as ecological restoration projects that reduce the risk of exposure to mosquito borne illnesses.</p> <p>Outreach and education- what can landowners do to reduce the risk of vector diseases? Partnership between municipality, state and local organizations.</p> <p>Vegetation management (tree diseases/invasive)/ implementation of best management practices.</p>

**Medium Priority Actions**

Priority	Categories			Action
	Infra-structure	Social	Environ-mental	
M	X	X	X	<p><b>Vulnerable Populations- Housing, Child Care Centers, Senior Living Facilities</b> - Integrate vulnerable population concerns into future MVP action grant proposals. Integrate MVP information in future Housing Production Plan Updates (Georgetown Affordable</p>

				Housing Trust). Continue assisting facilities with preparation of emergency management plans. Work with the state to try to relocate facility to location away from the 100- and 500- year floodplain. Map and plan using predicted floodplain, rather than historical floodplains.
<b>M</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>Public Safety Complex/ Town Campus Drainage Improvements/NBS &amp; Community Emergency Management Plan</b> - Drainage/run off issues at the Public Safety/Town Campus: Public Safety Building under the review w.r.t. renovations/relocation due to age and access issues. Consider NBS (invasive species management, tree planting, rain gardens, permeable pavers, etc.) to improve drainage within the complex. Expand on public outreach efforts initiated during the COVID 19 emergency (Emergency Management Director Updates). Publicize sections of the town's Emergency Management Plan (those pertaining to shelters, evacuation routes, cooling centers, etc.). Provide maps and wayfinding for evacuation routes and shelters. Continue public engagement regarding vector diseases, etc. through the Board of Health. Consider expanding outreach and education through town partners/volunteers.
<b>M</b>	<b>X</b>	<b>X</b>		<b>Emergency Preparedness - Evacuation Routes, Emergency Shelters, Medical Facilities, Food Pantries and Cooling Centers</b> – Identify evacuation routes and communicate these with the public. Identify emergency equipment needs (cots, back up energy, fuel) for shelters and emergency facilities. Seek funding to fulfill these needs. Consider expanding Senior transportation to other vulnerable populations in emergency situations. Identify options for alternative transportation/cost share (town owned vans). Investigate possibility of using Green Communities funding. Develop alternative cooling facilities: planting of shade trees and installation of benches in high use pedestrian areas (e.g. across high school, commercial areas, bus stops, etc). Review road and facility infrastructure to ensure that emergency facilities are accessible in extreme weather events. For example: the main access to the High School/Middle School is in the Penn Brook floodplain. High School is on high ground, generator-powered, has EMD equipment. Schools have crisis plans. Consider additional shelter in strategic locations outside of the downtown area.
<b>M</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>Local Zoning Overlays, Bylaws, Committees and CPA-Incorporating Climate Resiliency</b> - Update open space plan with

				<p>climate resiliency in mind (discuss option of doing this during the current update). Update local zoning and other bylaws/regulations to incorporate climate resiliency (projected rainfall data, NBS solutions, etc.) Continue implementing, reviewing and updating (as needed) local zoning and other bylaws to ensure sustainable development and resource protection in light of climate change. Consider implementing additional low impact development techniques and require NBS rather than gray infrastructure solutions. Advocate for cross committee and board communication and implementation of municipal climate resiliency objectives. Continue to support use of CPA funds to improve Georgetown's climate resiliency. Consider expanding the existing local vernal pool habitat buffer/set back to 125-feet.</p>
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**Low Priority Actions**

Priority	Categories			Action
	Infra-structure	Social	Environ-mental	
L	X	X	X	<p><b>Increased Beaver Dams &amp; Associated Flooding (many locations)</b> - Inventory beaver dams and prioritize locations for beaver management. Provide public education and outreach regarding beaver management. Partner with MassWildlife and National Grid.</p>
L	X	X	X	<p><b>Baldpate Hill Complex and Long Hill Road –</b>            Baldpate Hill - Erosion along the access road impeding emergency access to the tower and water tanks (secondary issues with sediment migration into wetlands as a result of the eroding access). Additional property ownership issues (multiple owners) impacting access and upgrades. Continue working on access and maintenance plan. Highway Department has re-graded the road in order to secure access for emergency communications and access to water tower. Road plowed by NH Cable Access.</p> <p>Long Hill Road: Future T-1 project on the water tower to enhance radio communications.</p>

# HAZARD MITIGATION GOALS

These goals build upon the 2016 Merrimack Region Hazard Mitigation Plan and are based upon findings from the Municipal Vulnerability Preparedness planning process. Each goal statement is followed by the related Administrative Review Actions identified by the community during its integrated MVP/HMP Planning Process:

- To continue to participate in the National Flood Insurance Program, and to have the flood map periodically update using additional climate projection tools such as the National Weather Service Climate Prediction Center Data.
- To develop a priority list and seek funding through the Hazard Mitigation Grant Program (HMGP) for the replacement of undersized culverts throughout the Town.
- To identify additional funding resources to assist with the implementation of mitigation actions.
- To organize and prepare to provide adequate shelter, water, food and basic first aid to displaced residents, evacuation procedures and route, etc. to residents in the event of a natural disaster.
- To inventory supplies at existing shelters and develop a needs list; and to establish arrangements with local or neighboring vendors for supplying shelters with food and first aid supplied in the event of a natural disaster.
- To increase awareness of hazard mitigation among town officials, private organizations, businesses and the public.
- To continue to assist facilities that provide services to vulnerable populations with the development of independent emergency management plans.
- To increase awareness of critical facilities located within the 100-and 500- year floodplain and work to relocate such facilities. In the future, ensure that critical facilities and hazards materials storage areas are not sited or located in vulnerable locations in the future.
- To study the Parker River, its tributaries and ponds and develop solutions that improve water flow, volume and quality.
- To increase awareness of vector borne diseases and work with state and local organizations to implement ecological restoration projects that reduce the risk of exposure and site vulnerability to vector borne diseases.

The Hazard Mitigation Plan Action Plan/Capability Assessment Worksheets was developed with information collected during the CRB Workshop and the HMP Listening Session. The Plan/Worksheet has been provided in the Appendix.

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## Community Resilience Building Workshop Participants

Name	Affiliation
Mike Farrell	Town of Georgetown, Town Administrator
Steve Przyjemski	Town of Georgetown, Conservation Agent
Donald Cudmore	Town of Georgetown, Chief of Police
Carol Jacobs	Town of Georgetown, Superintendent of Georgetown Public Schools
Michelle Rowden	EEA MVP Regional Coordinator
Rebecca Chane	Georgetown Conservation Commission Member
Harry LaCortiglia	Georgetown Planning Board Chair, Community Preservation Committee
Dave Schofield	Georgetown Municipal Light Department, Light Plant General Manager
George Comiskey	Parker River Clean Water Association, Director
Vanessa Johnson-Hall	Essex County Greenbelt Association, Ass't Director of Land Conservation

# LISTENING SESSIONS

Due to the COVID-19 pandemic, the DRAFT HMP Listening Session was held via Zoom on Tuesday, April 28, 2020 from 7:00pm – 8:00pm. This session was recorded and the recording published on the Georgetown Community Television’s website. Following the session, a survey was published to solicit additional public feedback. Below are snapshots of the Public Listening Session and Survey Flyers. These were both posted on the Town Website and shared with community members, including stakeholders from Georgetown’s abutting municipalities:

FLOODING
 EXTREME HEAT
 EXTREME SNOW ICE
 WIND

Please visit the Massachusetts Vulnerability Preparedness Program Website to learn more at: <https://www.mass.gov/municipal-vulnerability-preparedness-mvp-program>

**TAKE ACTION!** **Community Resilience Building**

Get on the right path to resilience today...

**Integrated MVP and Hazard Mitigation Planning PUBLIC LISTENING SESSION**

The Town of Georgetown is actively engaged in an Integrated Municipal Vulnerability Preparedness (MVP) and Hazard Mitigation Planning (HMP) effort. As a project stakeholder, your attendance is requested at this public listening session.

TO HELP US PRIORITIZE ACTIONS TO INCREASE THE CLIMATE RESILIENCY OF OUR COMMUNITY.

**WHERE:** <https://zoom.us/j/6728163243>

**WHEN:** Thursday, May 21, 2020

**TIME:** 7:00pm-8:30pm

FLOODING
 EXTREME HEAT
 EXTREME STORMS
 DROUGHT

**MISSED THE 4/28 LISTENING SESSION?**  
We recorded it!  
Please review the presentation and complete the online survey!

**TAKE ACTION!** **HAZARD MITIGATION PLAN UPDATE PUBLIC LISTENING SESSION RECORDING AND FOLLOW UP SURVEY!**

The Town of Georgetown is actively engaged in an Integrated Municipal Vulnerability Preparedness (MVP) Hazard Mitigation Planning (HMP) effort. As a Georgetown resident or abutter, your feedback is requested!

TO HELP US PRIORITIZE ACTIONS TO INCREASE THE CLIMATE RESILIENCY OF OUR COMMUNITY AND UPDATE OUR HAZARD MITIGATION PLAN

Meeting Recording Available at: <http://gctv.georgetownma.gov>

Survey Available at: <https://PollEv.com/surveys/kWIXzZYzGbGZ17UodSo46/respond>

**PLEASE RESPOND BY MAY 8th**

PLEASE DIRECT QUESTIONS OR COMMENTS TO STEVE PRZYBYLSKI  
GEORGETOWN CONSERVATION COMMISSION, [spрызjmski@gorgetownma.gov](mailto:spрызjmski@gorgetownma.gov)



The final MVP/HMP Listening Session was held via Zoom on Thursday, May 21, 2020 from 7 pm – 8:30 pm (see invitation below). This session allowed members of the public to hear presentations on the MVP/HMP Update process in Georgetown, and to provide feedback to Georgetown leaders that can further inform the Community Resilience Building process. Ideas from the public were recorded on a flip board, and are noted in the table below:




**COMMUNITY RESILIENCE BUILDING WORKSHOP**  
A PATH TO CLIMATE RESILIENCE

Georgetown, Massachusetts  
Merrimack Watershed Basin

The Town of Georgetown has received a Municipal Vulnerability Preparedness (MVP) Planning Grant from the Commonwealth of Massachusetts. With this grant, our community will engage in a planning initiative to better understand HOW WE ARE VULNERABLE TO THE EFFECTS OF CLIMATE CHANGE AND PRIORITIZE ACTIONS TO INCREASE THE CLIMATE RESILIENCE OF OUR TOWN. As a project stakeholder, your attendance is requested at this online workshop.

**Where:**  
Online- Zoom  
See e-mail invitation for details

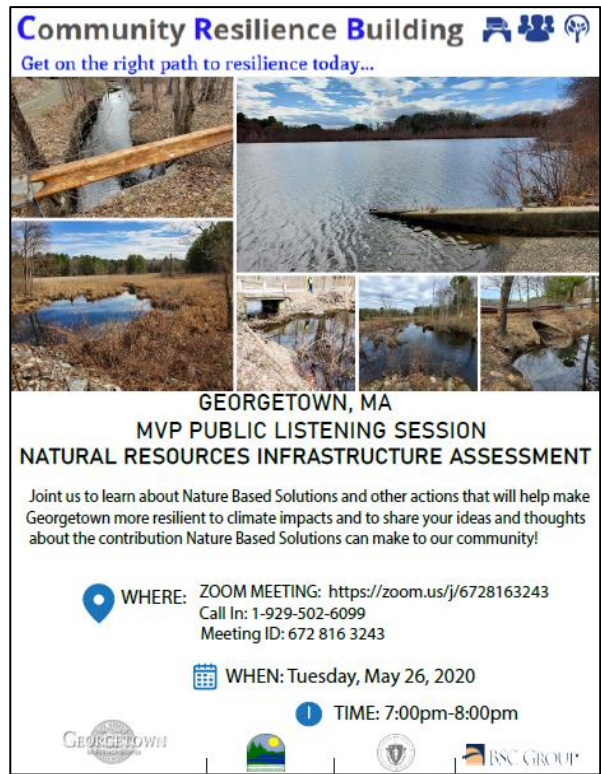
**When: April 14, 2020**  
**Time\*:**  
8:30am-11:30am  
&  
1:30pm-4:30pm

\* Please participate in both scheduled times \*

For additional information please contact:  
Steve Przyjemski  
Conservation Administrator @ sprzyjemski@georgetownma.gov  
\*Please inform Steve if you have online capacity. Otherwise, we will mail you the forms we will be discussing during the online meeting.

**GEORGETOWN MASSACHUSETTS**

**BSC GROUP**



**Community Resilience Building**

Get on the right path to resilience today...

**GEORGETOWN, MA**  
**MVP PUBLIC LISTENING SESSION**  
**NATURAL RESOURCES INFRASTRUCTURE ASSESSMENT**

Joint us to learn about Nature Based Solutions and other actions that will help make Georgetown more resilient to climate impacts and to share your ideas and thoughts about the contribution Nature Based Solutions can make to our community!

**WHERE:** ZOOM MEETING: <https://zoom.us/j/6728163243>  
Call In: 1-929-502-6099  
Meeting ID: 672 816 3243

**WHEN:** Tuesday, May 26, 2020

**TIME:** 7:00pm-8:00pm

**GEORGETOWN**

**BSC GROUP**

Invitation to MVP and Hazard Mitigation Planning Public Listening Session and Invitation to the Natural Resources Infrastructure Assessment Listening Session

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### **Citation**

Georgetown (2020) Community Resilience Building Workshop Summary of Findings, BSC Group, Inc. and Town of Georgetown. Georgetown, Massachusetts

### **MVP Core Team Working Group**

Mike Farrell, Town Administrator, Town of Georgetown  
Steve Przyjemski, Conservation Agent, Town of Georgetown  
John Cashell, Town Planner, Town of Georgetown  
Peter Durkee, Supervisor, Department of Public Works, Town of Georgetown  
Donald Cudmore, Chief of Police, Town of Georgetown  
Scott Hatch, Police Department, Town of Georgetown  
Suzanne Sutherland, Supervisor, Water Department, Town of Georgetown  
Bret Moyer, Town of Georgetown  
David Schofield, Light Plant General Manager, Municipal Light Department, Town of Georgetown  
Marlene Ladderbush, Town of Georgetown  
George Comiskey, Director, Parker River Clean Water Association  
Vanessa Johnson, Ass't Director of Land Conservation, Essex County Greenbelt Association  
Gillian T. Davies, Senior Ecological Scientist, BSC Group, Inc.  
Ale Echandi, Ecologist, BSC Group, Inc.

### **Workshop Facilitators**

Gillian T. Davies, BSC Group, Inc.  
Ale Echandi, BSC Group, Inc.  
Jeanette Tozer, BSC Group, Inc.

### **Acknowledgements**

This project was made possible through funding from the Massachusetts Executive Office of Energy and Environmental Affairs' Municipal Vulnerability Preparedness (MVP) Grant Program. Thank you for providing the leadership and funds to support this process. The Town of Georgetown values your partnership.

Thank you to the community leaders within Georgetown who attended the Georgetown CRB Workshop. The institutional knowledge provided by workshop participants was essential to the success of this process.