

Town of Medfield Municipal Vulnerability Preparedness

**Summary of Findings
Community Resilience Building Workshop
January 31, 2019**



ACKNOWLEDGEMENTS

The project was conducted by the Metropolitan Area Planning Council (MAPC) with funding from Executive Office of Energy and Environmental Affairs Municipal Vulnerability Preparedness Planning Grant. Special thanks to Sarah Raposa for initiating and managing the program for the Town, to the Medfield High School and Catering for providing the food and venue for the workshop and to all the participants who enthusiastically and diligently worked to create a more resilient Medfield.

METROPOLITAN AREA PLANNING COUNCIL

Officers

President	Keith Bergman
Vice President	Erin Wortman
Secretary	Sandra Hackman
Treasurer	Taber Keally
Executive Director	Marc D. Draisen

Senior Environmental Planner	Darci Schofield
GIS/Data Analysis	Darci Schofield
Supporting Materials	Elise Harmon
Workshop Facilitators	Sasha Shyduroff, Josh Fiala, and Courtney Lewis

Town of Medfield

Project Manager	Sarah Raposa, Town Planner
-----------------	----------------------------

Table of Contents

Acknowledgements.....	2
Table of Contents.....	3
List of Tables	3
List of Figures	3
Medfield Existing Conditions	4
Climate Change in Medfield.....	4
Community Resilience Building Workshop	6
Summary of Findings.....	10
Top Hazards and Vulnerable Areas.....	10
Current Concerns and Challenges Presented by Hazards.....	11
Specific Categories of Concerns and Challenges.....	11
Current Strengths and Assets	14
Top Recommendations to Improve Resilience	16
CRB Workshop Participants	22
Appendix A – Medfield CRB Workshop Presentation.....	24
Appendix B –Climate Change Posters and Maps	37
Appendix C- Workshop Risk Matrices.....	41
Appendix D Top Priority Actions Voting Results	54

List of Tables

Table 1. Medfield areas of concern, vulnerable to identified hazards.....	10
Table 2 Summary of all actions by priority, category, and small group.....	17
Table 3 Medfield participants in the Community Resilience Building workshop on January 31, 2019.....	22

List of Figures

Figure 1 Design storm projections for a 10-year, 24-hour storm.	4
Figure 2 Temperature change and projections for days over 90° with two emission scenarios.....	5
Figure 3 Informational posters on climate, environment and people for Medfield MVP workshop.....	7
Figure 4 Medfield Small Group working map	8
Figure 5 Medfield CRB participants voting on their final top priority actions.	16

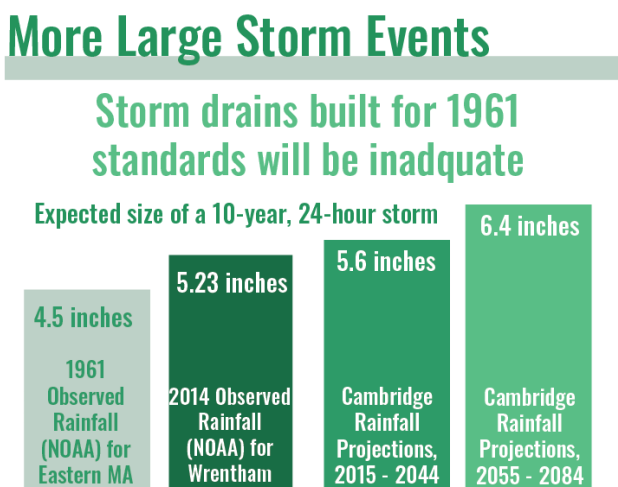
Medfield Existing Conditions

Medfield is a small historic suburban town 17 miles southwest of Boston with a population of approximately 12,610.¹ The Town is located on a rugged upland watershed area for two major rivers, the Neponset River and the Charles River, which creates one-fourth of its Town boundary. The Town is also known for its 18th and 19th century historic assets such as the Peak House and Dwight-Evans house, its vast areas of conservation land like Rocky Woods, and the historic state mental hospital, Medfield State Hospital. Built in 1890, the hospital was once a major employment center, however, it closed in 2003 where after it set several movies such as Shutter Island. Medfield State Hospital is currently an award-winning redevelopment site for conservation, mixed-use, artist, residential and commercial development. Medfield also boasts its Medfield Day, a 40-year tradition, where the community gathers with local and area businesses for a family festival. These are the kinds of assets at risk to climate change in the vibrant community of Medfield.

Climate Change in Medfield

In the last five years, Massachusetts has experienced increasingly more frequent and severe weather events. Record-breaking snowfall in 2015, an extensive and severe drought in 2016, the warmest year on record in 2017, and four Nor'easters in one month and flooding comparable to the Blizzard of 1978 in 2018 are just some examples. Further, the fall of 2018 had the greatest amount of precipitation since 1890 when precipitation was first recorded.² Climate Change is not imminent but affecting the people and cities and towns of the Commonwealth today.

Figure 1 Design storm projections for a 10-year, 24-hour storm.



Because of its location in two major watersheds, the Charles and Neponset River, extreme precipitation events, drought, and changing precipitation patterns will have an important impact on the community and down-river communities as well. For the Boston area there has been a 10% increase in precipitation over the past 50 years³ and a 71% increase in the amount of rain that

¹ American Community Survey 2017.

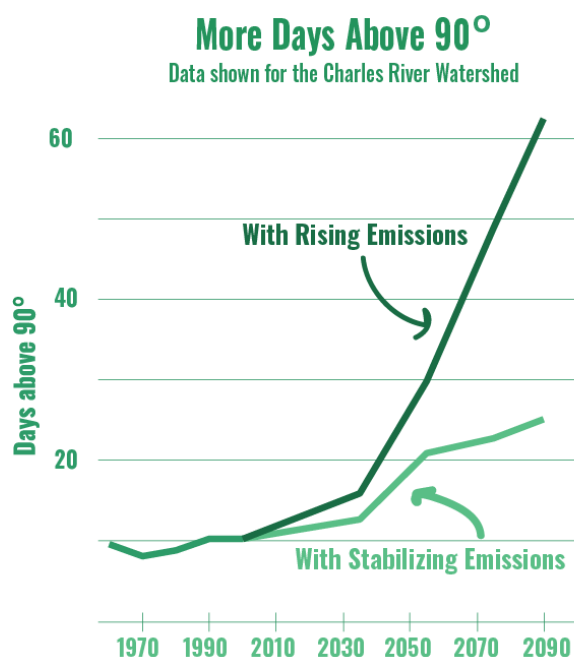
² Blue Hills Observatory

³ Blue Hills Observatory

falls in the top 1% events from 1958 – 2012.⁴ In the future, Medfield will likely experience more frequent and intense precipitation events (Figure 1). By mid to late century, Medfield can anticipate 9-10 days with precipitation events with greater than one inch of rain or an increase in total precipitation from 46 inches to 50.⁵

Global temperatures increased by nearly 2 degrees in the last century⁶ and even small changes in temperature have widespread and significant changes to our climatic system. For example, the northeast has experienced a 10-day increase in the growing season in since 1980.⁷ Due to its 63% tree canopy cover and only 10% impervious surface, urban heat island is not a significant issue for the Town of Medfield. There are three current “hot spots” where the temperature is significantly hotter than surrounding areas. These include the high school, the site of Medfield State Hospital, and the commercial business area. With climate change, the Town can expect 40-50 days over 90 degrees by mid to late century, a significant increase from the baseline of 7 days today (Figure 2).

Figure 2 Temperature change and projections for days over 90° with two emission scenarios.



⁴ USGCRP, 2018: *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018.

⁵ www.Resilientma.org

⁶ USGCRP, 2018: *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018.

⁷ Knuckel, K.E., D.R. Easterling, K. Hubbard, and K. Redmond. 2004. Temporal variations in frost-free season in the United State: 1895-2000. *Geophys. Res. Lett.* 31:L03201.

Finally, though not a coastal community, sea level rise could have important implications on the future community of Medfield if significant loss of coastal land promotes migration to more inland suburban Boston communities such as Medfield. With a high emission scenario, Massachusetts could experience between 11-14 inches of sea level rise by 2030, the same amount of sea level rise experienced in the last 100 years.⁸ The amount of sea level rise increases to 50-90 inches by mid to late century. Hence, the amount of emission reduction measures we pursue will have a significant impact on the extent to which Medfield experiences climate migration.

Medfield is currently challenged with localized flooding in roads, water quality and stormwater management challenges, and widespread loss of electricity during severe storms. However, Medfield has been proactive in planning and incrementally improving its resilience to natural hazards in the last eight years. The Town had to foresight to update its Natural Hazard Mitigation Plan and to pursue the Municipal Vulnerability Preparedness program simultaneously. These combined efforts will minimize loss, maximize recovery, and protect its community in the face of our changing climate. Medfield envisions natural hazards and climate change as opportunities to build an even more vibrant, safe, and healthy community through these planning and action efforts.

Community Resilience Building Workshop

Medfield received a grant from the Massachusetts Executive Office of Energy and Environmental Affairs to participate in the Commonwealth's Municipal Vulnerability Preparedness (MVP) program. The grant also had an expanded scope that enabled the Town to pursue its Natural Hazard Mitigation Plan update simultaneously, with the support of the Federal Emergency Management Administration's Hazard Mitigation Planning Grant. The MVP program provides supports for municipalities to plan and implement key climate resilience actions using a community-based, multi-disciplinary, participatory planning effort through the Community Resilience Building (CRB) platform.⁹ Medfield contracted with the Metropolitan Area Planning Council (MAPC) to administer the program with the community. The process was guided by a core team that also serves as its Natural Hazard Mitigation steering committee, providing synergy and alignment with both processes.

Participants were identified using guidance from the CRB Workshop Participant Worksheet¹⁰ and MAPC's best practices in ensuring equity in climate adaptation planning.¹¹ Medfield gathered 37 participants across 10 municipal departments and committees, interested residents, members of the business community, religious organizations, regional environmental stakeholders, and political leaders to participate in the CRB workshop. Participants were assigned to small teams in a manner that maximize the diversity of sectors in any one given table. The goal in this method was to enhance different perspectives and identify resiliency opportunities that solved multiple vulnerabilities across sectors.

The Core Team outlined the following objectives for its MVP and CRB participatory planning event:

⁸ National Atmospheric and Oceanic Administration. Boston Tide Gage.

<https://water.weather.gov/ahps2/hydrograph.php?wfo=box&gage=bhbm3>

⁹ www.CommunityResilienceBuilding.com

¹⁰ https://docs.wixstatic.com/ugd/29a871_7f4a484414be4e5f87d1041de9c8524f.pdf

¹¹ <https://www.mass.gov/files/mapc-equity-and-climate-planning-mvp-webinar.pdf>

1. Understand connections between ongoing issues, hazard, and local planning and actions in your Community.
2. Identify and map vulnerabilities and strengths of people and places, both buildings and natural environment/parks.
3. Develop and prioritize actions that reduce vulnerabilities and reinforce Medfield strengths.
4. Identify opportunities to advance actions that further reduce the impact of hazards and increase climate resilience in Medfield.

Figure 3 Informational posters on climate, environment and people for Medfield MVP workshop.



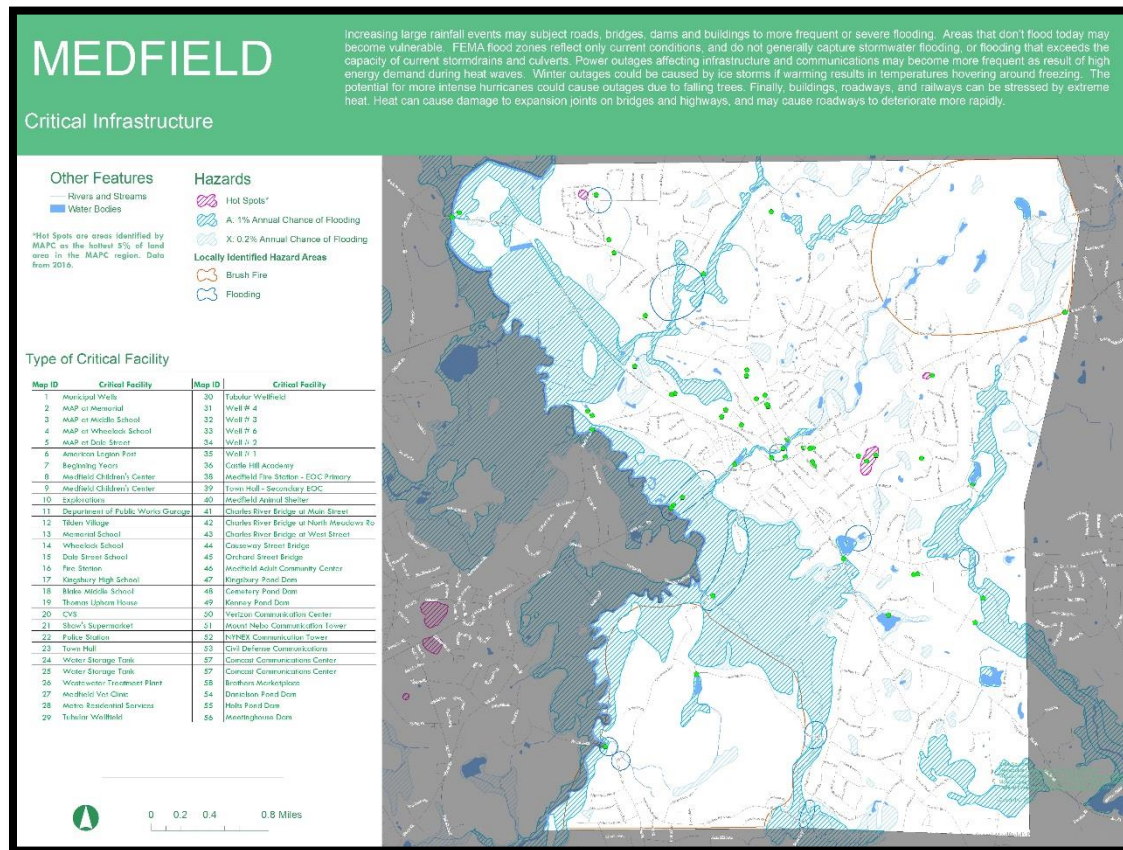
MAPC led and facilitated the workshop with four CRB-trained individuals. They provided to participants an introduction to climate change, climate observations and projections, and implications of these changes on the Town of Medfield's society, infrastructure, and environment. These were presented in both poster form (Figure 1 and Appendix B) and Power Point presentation form (Appendix A). Climate change data used to inform Medfield's risk came from the following sources:

- (i) the Northeast Climate Science Center,
- (ii) National Oceanic and Atmospheric Administration,
- (iii) Cambridge Climate Change Vulnerability Assessment,
- (iv) The Boston Research Advisory Group,

- (v) Massachusetts Office of Coastal Zone Management, and
- (vi) Blue Hill Observatory and Science Center.
- (vii) Fourth National Climate Assessment 2018

Furthermore, each small team had a table map (Figure 2 and Appendix C) that identified Medfield's Critical Infrastructure, 1% Annual Chance Flood, locally identified hazards and areas of extreme heat.¹²

Figure 4 Medfield Small Group working map



Participants brought a wealth of knowledge and expertise from their respective yet diverse local experiences and fields and engaged in a consensus-building effort that gathered to “solve the problem” of climate change as noted by one participant. Driven by those who live and work in Medfield, the opportunity to advance resiliency is greatly enhanced through the CRB workshop platform, a collaborative exercise for Medfield's future. After identifying the Town's vulnerabilities and identifying and prioritizing actions in their small groups using the CRB Risk Matrix (Appendix C), the participants reconvened to vote on their overall top priority actions as a large group.

¹² MAPC uses land surface temperature data during the hottest periods of the summer months in 2016 to ascertain how likely an area may experience the urban heat island effect. We represented the area in Medfield that outlines the top fifth percentile of land surface temperature of the 101 communities in Metro Boston.

This report serves to provide a summary of findings from Medfield's one-day CRB workshop on January 31, 2019. The prioritized actions in this plan represent a collective and collaborate effort to address climate resiliency and natural hazard mitigation from a multi-disciplinary approach.

Summary of Findings

Top Hazards and Vulnerable Areas

The Core Team identified top hazards for the community of Medfield. These hazards were determined by challenges the Town has already experienced from recent events, long-standing issues, and alignment with the Town's Natural Hazard Mitigation Plan update. These top hazards have already affected stormwater management, road flooding, disruption in services, drinking water supply, and risks with downed trees and loss of electricity.

Town of Medfield Climate Hazards include:

- Extreme Heat/ Heat Waves
- Inland and Riverine Flooding
- Extreme Cold and Severe Winter Storms (ice storms, tornados, Nor'easters, blizzards)
- Drought/Fire



These hazards pose greater risks in some areas of the Town than others. Table 1 summarizes participants identified areas of significant concern:

Table 1. Medfield areas of concern, vulnerable to identified hazards.

Medfield Areas of Concern			
Neighborhoods	Society	Infrastructure	Environment
Charles River at Route 109	Senior Citizens	Bridge Over Charles River at Millis/Medfield Boundary	Trees-Management and Protection
Causeway Street Area	Low Income Individuals	Road, bridges, and culverts.	Air Quality
Hartford and Main Street neighborhood	People susceptible to extreme heat	Septic and Sewer	Stormwater Management /Water Quality
High School Campus	New Residents	Danielson Pond Dam	Forest Fires

Current Concerns and Challenges Presented by Hazards

Medfield has been mitigating natural hazards and responding to community concerns, damage, and emergencies from extreme weather events for some time. Participants noted that these extreme events are becoming more frequent and intense more recently than in the past and they were eager to build upon their existing strengths to protect their people, places and economy through our changing climate.

Inland flooding from extreme precipitation events has been an ongoing challenge in the Town, particularly where drainage and stormwater infrastructure has been insufficient to manage the increasing levels of precipitation. Because of its border with the Charles River, riverine flooding is also a challenge in certain locations, such as the Causeway and the route 109 bridge over the Charles at the border of Millis and Medfield. Beavers also contribute to ongoing flooding

With project increases in precipitation, managing water quality and MS4 permit obligations for the Charles River will become more difficult, particularly with insufficient stormwater management bylaws. Related concerns include the viability of the Town's sewer and septic. With higher water tables, concerns arise that onsite wastewater systems may not function properly. This also reinforces the already existing challenges of managing non-point source pollution in the Charles River.

A recent event that had a major impact on the Town is the drought of 2016, one of the worst droughts MA has seen since the 1960s. The Town's aquifer supplies became extremely low with no rainfall and excessively high demand for water use. The Town instituted an outdoor watering ban that only allowed outdoor watering one day a week, otherwise fines were imposed.¹³ The conditions raised concerns for public safety including brush fires and aquifer contamination.

Specific Categories of Concerns and Challenges

Drinking Water Quality and Quantity

Drinking water quality and quantity were raised as challenges that face Medfield. Though one participant noted Medfield has a good sole-source aquifer, past challenges and future climate projections could cause stressors to this functioning system. The Massachusetts drought of 2016 stressed Medfield's drinking water supply and the Town imposed very strict conservation measures and fees for non-compliance. Medfield residents use approximately 66-80 gallons per person per day,¹⁴ above average for the Metro Boston region. Medfield does have assets to mitigate these challenges where much of its protected open space overlay its aquifers and Medfield enforces its Aquifer Protect District zoning in recharge areas to protect the ground water.



¹³ <https://medfield.wickedlocal.com/news/20160728/medfield-water-use-cut-to-one-day-per-week>

¹⁴ <https://datacommon.mapc.org>

However, participants noted that if strict conservation measures for both quantity, such as permits for outdoor irrigation, and quality are not instituted, the Town will require replacing its drinking water plant, an \$8 million expense.

Stormwater Management

Medfield is part of two major watersheds, the Charles River and the Neponset River. They have been working diligently to comply with National Pollution Discharge Elimination System requirements to reduce non-point source pollution and phosphorous loading in the rivers, but also to enhance recharge of local water supplies and reduce stormwater into Medfield's wastewater systems. They are an active participant in the Neponset River Stormwater Partnership and have invested hundreds of thousands of dollars on creating technological and structural upgrades, public outreach and education, and staff training. Medfield has also initiated a process to upgrade its stormwater management bylaw and incorporate green infrastructure and low impact development into its land use, new construction, and retrofits. However, stormwater and wastewater infrastructure capacity remain a top concern for participants. Many participants noted concerns about insufficient culverts, capacity of the stormwater infrastructure to handle extreme precipitation events, and the need for greater public outreach and education on MS4 and water quality challenges in town.

Managing Urban Heat Island effect

One category of concern was managing extreme heat in town. Participants were concerned of public health challenges exacerbated by extreme heat particularly for seniors and children at the schools. Participants noted there was a large population of youth in Town and the high school and its campus is within the top 5% of hottest areas in the Metropolitan Boston region. Children engaged in outdoor recreation during days of extreme heat, which are projected to become more into the school year with 50-70 days by mid to late century, are more exposed to heat and susceptible to heat exhaustion and heat stroke. Some suggestions for mitigation were to reduce the heat absorbing substrates by installing solar panels on the roof, green walls, tree planting, and installing air conditioners in the schools and buses. In addition, Medfield suggested creating and promoting more cooling stations in Town. They noted however that seniors don't like to leave their homes during emergencies.



Rocky Woods Conservation Land,
Medfield. Photo credit NEMBA

Open Space continuity and tree canopy

Sixty-three percent of Medfield is covered by tree canopy, making it an important asset and liability to the Town with climate change. Participants had concern about the future tree canopy and forest on both public and private land. With climate change, participants noted that trees will become more stressed decreasing tree health and increasing mortality. Some climate stressors they noted include excessive precipitation and flooding combined with periods of drought and stress from extreme weather events like hurricanes, blizzards, and nor'easters causing limb loss. Participants also noted that stressors increase infection vulnerability to disease, pests, and fungi. Stressed trees also are more likely to fall during extreme weather events raising

concerns on loss of electricity, road closures, residential damage, and public safety. Tree care, maintenance, and planning were important resilience actions identified at the workshop in addition to creating tree planting requirements on private land.

Community, Connection and Climate Change

Participants identified concerns around community connection and the impact of climate change both on emergency access and response as well as taking action to enhance climate resilience decisions at the municipal level. Firstly, participants noted a need to recruit more community volunteers and staff from the residents in Town. Participants want to ensure representation in municipal-decision making, particularly with climate change challenges and resilience. Some mitigation actions including more outreach at Town Hall and creating welcoming kits and programs for new residents. Another challenge with community connection is a disconnect with low-income residents, such as those that live at the PARC at Medfield apartments. Finally, participants raised serious concerns on the well-being of seniors, particularly those living alone and affordability of Medfield for seniors. One group of participants highlighted there is a strong disconnect between housing stock and the housing requirements for seniors. If affordability is already a stressor for seniors in Medfield, their adaptive capacity to climate change is minimized.

Current Strengths and Assets

Medfield has a solid foundation of assets, services, people and infrastructure that will serve to enhance its resiliency through our changing climate. CRB participants highlighted and sought to enhance these with best practice resiliency efforts to ensure a vibrant future for their community. Assets identified by participants include:

Resilient Infrastructure

Medfield has invested in new municipal infrastructure that is able to withstand the impacts of climate change and participants stressed that regular maintenance and upgrades will ensure their long-term resilience. New infrastructure in Medfield includes the public safety building (fire and police), Senior Center, Library, and Highway Department garage. Participants also noted that the schools are located outside of the floodplain. In addition, well pump #6, located in a flood zone, is raised making it resilient to flooding.

Natural assets and ecosystem services.

Medfield contains over 3,000 acres of conservation land comprising 33% of the land area in Town. In addition, the Town has 1,265 acres of BioMap Core Habitat and 1,052 acres of BioMap Critical Natural Landscape.¹⁵ These are contiguous tracts of exemplary ecosystems more resilient to climate change stressors and provide important ecosystem services for resilience such as flood control, clean water, clean air, and cooling. Medfield also has a prominent tree canopy across the town mitigating the impact of extreme heat, stormwater, and air pollutants from vehicles. These trees sequester 4,473 tons of carbon/year work over \$760,000. The trees mitigate 453,000 pounds per year of air pollutants (CO, NO₂, O₃, PM 2.5, SO₂, PM 10) worth \$1.5 million, and avoid 76 million gallons of runoff a year saving Medfield \$680,000 a year in avoided stormwater runoff expenses.¹⁶ Participants noted these natural assets as strengths in the community particularly the partnership with The Trustees of Reservations, who owns significant conservation land in town as well as the Army Corps of Engineers Charles River Natural Floodplain Storage area lands which provides significant flood storage for Medfield and other down river communities. Participants also noted the Charles and Neponset Rivers as important natural assets to the community.

Community services

A notable outcome of the CRB workshop is the extent of community services provided and available through programs through and around Town. For example, the Medfield Employers & Merchants Organization provides Medfield Day, an important yearly community festival that brings residents, businesses, and families together. Participants also noted a strong recreation program, active community involvement, the farmers market, community garden and diverse religious leadership all enhanced community cohesion in Town. For more vulnerable populations, CRB participants stressed the importance of the Council on Aging, their strong network with seniors, and the strong partnership between Emergency Response and the Council on Aging. Furthermore, a food bank is available to provide food for those in need.

Climate Change Initiatives

Medfield has taken significant steps toward climate resilience. In addition to updating its Natural Hazard Mitigation Plan and pursuing MVP, Medfield is a State-designated Green Community,

¹⁵ http://maps.massgis.state.ma.us/dfg/biomap/pdf/town_core/Medfield.pdf

¹⁶ iTree Landscape. Processed on Dec. 11, 2018

has an Energy Committee, and has installed LED retrofits and other energy conservation measures in municipal buildings. Medfield also installed a 765-array solar farm at the wastewater treatment plant saving residents electricity costs and reducing the Town's greenhouse gas emissions footprint. CRB participants also noted the Town's strong recycling program and the successful Anti-Idling campaign led by the First Parish Unitarian Universalist Church of Medfield. This initiative has been recognized nationally with a Community Inspiration award from the Interfaith Power & Light's Cool Congregations Challenge.

Top Recommendations to Improve Resilience

Once participants completed their CRB risk matrices in their small groups, each group built consensus on their top five priority actions from their risk matrices for each of the three categories: infrastructure, society, and environment. Participants then reconvened as a large group to report on their top resiliency actions. These actions were documented and collated on posters. Participants then voted as a large group with stickers on their top three resiliency actions from the collated actions (Figure 5). Appendix D illustrates the voting results. From this exercise, the Medfield CRB participants designated the following as their top priority actions, listed in order of importance:



Figure 5 Medfield CRB participants voting on their final top priority actions.

Infrastructure

- Raise the Route 109 roadway over the Charles River. Collaborate with the Town of Millis on a feasibility study and State plans for repairs.
- Secure funding and install a generator at Council on Aging.
- Perform a feasibility study on the sewer system capacity and usability with a high water table and extreme precipitation. Align with MS4 compliance.
- Perform a vulnerability study on transportation, bridges, and culverts affected by and/or located in flood zones.
- Cool the High School urban heat island with a green roof, solar panels, and tree planting.
- Perform an engineering study to determine repairs that might be needed for Danielson Pond Dam.

Society

- Improve the relationship between the Town and new residents. Ensure town services are accessible to new residents.
- Perform an evaluation of municipal facilities and sites to develop cooling centers.
- Advocate for climate resiliency in building code.
- Act on Housing Plans to match needs of town, particularly low income and seniors to minimize social vulnerability to climate change.
- Create a communication strategy to vulnerable populations.
- Recruit and improve medical reserve corporation for emergency response and climate change response. Do climate change awareness at Medfield Day.
- Mitigate vector-borne diseases with education and best management practices.

Environment

- Perform a feasibility study on water conservation measures, regulations, and incentives. Require irrigation system permits. Avoid drinking water plant replacement of \$8 million.
- Perform outreach and education on best management practices for MS4 and clean water quality.

- Create a town-wide tree plan for tree maintenance, planting, and tree species recommendations on species that are resilient to climate change. Perform public outreach and education on the importance of trees. Create requirement for tree planting with new development. Consider forest management on public and private land.
- Update and strengthen stormwater bylaws and regulations.
- Develop a brush fire mitigation plan including emergency response and mutual aid.
- Work to become a Community Preservation Act Community.
- Increase enforcement on overloaded trucks and idling.

Appendix C contains the risk matrices from the CRB Workshop Small Group, which includes vulnerabilities, strengths, actions, prioritization, and time frame. Table 2 summarizes participant's recommended actions for climate resiliency and their priority ranking/timeframe by small group and category.

Table 2 Summary of all actions by priority, category, and small group.

Table	Category	Resiliency Action	Priority	Time	Table Priority
Blue	Environment	Improve bylaw/regulation on stormwater and promote public awareness	High	Short	Yes
Blue	Environment	Evaluate illicit connections and leaks system wide. Fix with hired contractors.	High	Short	No
Red	Environment	Irrigation regular use via permitting and require recharge systems. Install separate meters for water use and irrigation. Enact consumer education.	High	Long	No
Green	Environment	1. MS4 Process (ongoing), 2. Education programs on water conservation, 3. Green infrastructure and Low Impact Development Guidelines for new construction and retrofits	High	Ongoing Short and Long	No
Green	Environment	Create a long-term plan for drinking water. 1. Programs/pacts voluntary water restrictions 2. Fees and restrictions on use (enforcement) 3. New Well/water sources.	High	Short and Long	No
Blue	Environment	Update and strengthen stormwater bylaw and other regulations.	High	Short	No
Blue	Environment	Water Conservation and water ban, install a quota program.	High	Short	No
Green	Environment	1. Tree Warden-create a town tree plan including street trees and percent coverage requirements for new developments. Types of Species. 2. Public education program for private property owners. 3. Tree replanting requirements/ plan when trees are removed. 4. Guidelines on tree species and education for municipal properties and private properties. 4. Address invasive species.	High	Short and Long	No
Blue	Environment	Expand public awareness and Restoration efforts	High	Short	No

Table	Category	Resiliency Action	Priority	Time	Table Priority
Blue	Environment	Maintain public support for town votes. Improve stormwater bylaw and regulations	High	Short	No
Blue	Environment	Maintain Relationship	High	Ongoing	No
Blue	Environment	Develop a brush fire mitigation plan/emergency preparedness plan, mutual aid	High	Short	No
Blue	Environment	Maintain and expand on municipal properties/ alternative energy and energy efficiency.	Medium	Ongoing	No
Blue	Environment	Encourage private monitoring of sites	Medium	Ongoing	No
Blue	Environment	Increase enforcement with state police truck team	Medium	Short	No
Blue	Environment	Continue, expand, and keep up to date. Start Pay as you Throw program	Medium	Short/Ongoing	No
Red	Environment	Forest management/maintenance or trails and volunteer groups to do clean up. Communication with stakeholders.			No
Green	Environment	Charles River Watershed coalition-formal coalition on climate infrastructure across municipalities. Sharing equipment, joint procurement, etc.			No
Red	Environment	Continue to study and enact community education.			No
Green	Environment	Permitting Guidelines for open burn season		Short	No
Blue	Environment				No
Green	Environment	Examining by-laws and zoning to maintain open space. Transfer of Development Rights (2/3 Town Meeting Vote)		Long	No
Green	Environment	More water testing/monitoring. Public information on water quality of town ponds on town website. Create Lakes and Ponds associations		Ongoing	No
Green	Environment	Downed tree removal along rivers. More information.		Short	No
Blue	Environment	Maintain equipment			No
Green	Infrastructure	Transportation vulnerability Study. Major evacuation routes and elevation of road feasibility.	High	Short/Long	Yes
Blue	Infrastructure	Perform engineering study to determine dam repairs	High	Short	Yes
Blue	Infrastructure	Work with CSX to study and fix.	High	Short/Ongoing	Yes
Blue	Infrastructure	Maintenance and support to building and grounds	High	Ongoing Short and Long	Yes

Table	Category	Resiliency Action	Priority	Time	Table Priority
Blue	Infrastructure	Maintenance and support to building and grounds	High	Ongoing Short and Long	Yes
Blue	Infrastructure	Maintenance and support to building and grounds	High	Ongoing Short and Long	Yes
Blue	Infrastructure	Maintenance and support to building and grounds	High	Ongoing Short and Long	Yes
Blue	Infrastructure	Study road elevation and culvert issues	Medium	Long	Yes
Blue	Infrastructure	Study culvert issues/bylaw review for improvement for culvert replacement.	Medium	Ongoing/ Long	Yes
Blue	Infrastructure	Study road elevation and bridge elevation	Medium	Ongoing	Yes
Blue	Infrastructure	Study Vulnerability and options needed.			Yes
Red	Infrastructure	Complete Engineering Study (underway). Follow up with recommendations.	High	Ongoing	No
Red	Infrastructure	Review Development Regulations and Update to Master Plan	High	Ongoing	No
Red	Infrastructure	Secure funding to install generators	High	Short	No
Red	Infrastructure	Add tress, solar panels, and green roof on building.	High	Short	No
Red	Infrastructure	Repair or replace dam	High	Short	No
Green	Infrastructure	Add water and sewer capacity MS4 study (just started). Create a Water and Sewer Task Force and Plan. Perform a sewage capacity study.	High	Short/Ong oing	No
Green	Infrastructure	Perform a new well study.	High	Short/Ong oing	No
Green	Infrastructure	1. Study (GIS) overlaying flooding and culverts. 2. Create action plan to address the sizing and maintenance of culverts and storm drains replacement and clean outs. Include outreach program. 3. Communication plan will Mill Pond operations/owners.	High	Short	No
Blue	Infrastructure	Advocate for State's planned repair to address climate risk.	High	Short	No
Blue	Infrastructure	Water conservation programs to avoid \$8 million investment	High	Short	No
Blue	Infrastructure	Work with property owners and partner to pursue grants	High	Short	No
Blue	Infrastructure	Maintenance and support to building and grounds	High	Ongoing Short and Long	No
Red	Infrastructure	Creating stormwater Regulation to address new and large developments.	Low	Ongoing	No
Red	Infrastructure	Raze site. Follow up on recommendations of the State Hospital Master Plan	Low	Long	No

Table	Category	Resiliency Action	Priority	Time	Table Priority
Red	Infrastructure	Convert Road to a one-way street. Define Parking	Low	Short	No
Green	Infrastructure	Solar parking canopies-green communities	Medium		No
Blue	Infrastructure	Road engineering study underway	Medium	Ongoing	No
Blue	Infrastructure	Evaluation around value and purpose of these lands. Delineate boundaries, conserve adjacent lands.	Medium	Ongoing	No
Red	Infrastructure	Raise the 109 Roadway. Collaborate with Millis.	Medium /High	Long	No
Blue	Infrastructure	Study well vulnerability and potential options needed for resilience.	Medium /Low	Ongoing	No
Green	Infrastructure	More information needed on risk and vulnerability of gas lines to climate change.			No
Green	Infrastructure				No
Green	Infrastructure	Access bridge vulnerability and prioritize improvements and upgrades		Long	No
Green	Infrastructure	Find out is studies are occurring on beaver population and watershed management			No
Red	Society	Expand communication efforts to new residents. Emphasize town services in place to meet needs.	High	Short	Yes
Green	Society	Medical Reserve Corp (Health Dept.). Strengthen volunteer. Outreach at Medfield Day. Improve communication and website	High	Short/Ongoing	Yes
Blue	Society	Study alternative transportation network systems- Council on Aging Vans, Uses of School buses.	Medium	Long	Yes
Blue	Society	Identify data to assess flood risk of low-income housing. Identify isolated individuals and expand outreach materials.	Medium	Medium	Yes
Blue	Society	Monitor and maintain air quality in town, both indoor and exterior. Support MCAP Youth	Medium	Ongoing	Yes
Blue	Society	Continue and Expand	Medium	Ongoing	Yes
Blue	Society	Expand awareness, signs, and enforcement	Medium	Ongoing	Yes
Green	Society	Education w/insurance provider		Short	Yes
Green	Society	At Wilkins Green-identify their emergency management plan for residents. Air Conditioning.		Short	Yes
Red	Society	See action in Infrastructure (Red Table)			Yes
Blue	Society	Support Programs and Expand Awareness			Yes
Green	Society	Public Meeting-existing program	High	Short	No

Table	Category	Resiliency Action	Priority	Time	Table Priority
Green	Society	Connect with those serving medical and mental rehabilitation center. Emergency Plans. Use social media and Reverse 911 for better communication. Enact good neighbor programs.	High	Short	No
Green	Society	1. Micro grid /islanding feasibility. Identify key sites. 2. Feasibility study on underground utilities and power lines. 3. Energy-efficient heating and cooling for municipally-owned buildings. 4 Improving stretch code to include resilience measures.	High	Short-Long	No
Blue	Society	Study sites/facilities to be designated as cooling centers	High	Short	No
Blue	Society	Create a welcoming volunteer process/ outreach	High	Short	No
Blue	Society	Support Affordable Housing Trust	High	Short	No
Blue	Society	Act on housing studies performed. Incentivize builders.	High	Short	No
Blue	Society	Continue Efforts	High	Short	No
Green	Society	Building and zoning to address density and protect open space	Low		No
Blue	Society	Promote regional study of medical facilities	Medium	Long	No
Blue	Society	Support Programs and Expand Awareness	Medium	Ongoing	No
Green	Society	Air conditioning in schools		Long	No
Green	Society	Home Health care workers outreach/education program.		Short	No
Green	Society	Do they have a generator? What is their preparedness plan during emergencies? Evacuation, sheltering, etc.		Short	No
Green	Society	Tree Canopy, Solar Parking Canopy. Feasibility		Short	No

CRB Workshop Participants

MAPC provided a modified CRB participant worksheet to the Core Team which built an invitation list of 50 potential attendees. This included elected officials, 10 municipal department managers, emergency response, four appointed committees, religious organizations, regional environmental organizations, the business community, and political leaders. In addition, Medfield broadened the invitation to residents of Medfield via social media and flyer postings at municipal buildings around town. Table 3 lists the CRB participants and their affiliation.

Table 3 Medfield participants in the Community Resilience Building workshop on January 31, 2019.

Last	First	Table	Department
Goulet	Maurice	Red	DPW Director
Kennedy	Robert	Blue	DPW Foreman
Thompson	Ann	Green	Former Board of Selectman
Willitts	Leslee	Yellow	Conservation Agent
Raposa	Sarah	Red	Town Planner
Wilhelmi	John, W.	Blue	Police Chief
Colleran	Amy	Green	Facilities Director
Peterson	Pete	Yellow	Board of Selectmen
LaFrancesca	Michael	Red	School Department
Ryder	Kevin	Blue	Parks and Recreation
Trierweiler	Kristine	Green	Town Administrator
Sweet	Bridget	Yellow	Health Agent
Harman	Lieutenant Mike	Red	Fire Department
Festa	Martha	Blue	Resident
Thompson	Newton	Green	Resident
Fisher	Lucille	Yellow	Resident
Ruyle	Jeanette	Red	Resident
Greene	Cynthia	Blue	EPA, Resident
Sullivan	Megan	Green	Resident
Costello	Andrea	Yellow	Resident
Karg	Randy	Red	Resident
Iberall	Thea	Blue	Resident
Borrelli	Diane	Green	Resident
Testa	Greg	Yellow	Resident
Schweickhardt	Rene	Red	Resident
Potts	Eve	Blue	Resident

Last	First	Table	Department
Cook	Tricia	Green	Resident
Nolan	Tara	Yellow	Town of Dover, Planning Board & Open Space
Kent	Justine	Red	Town of Dover Water Resources Study Committee
Synder	Kerry	Blue	Neponset Watershed Association
Kumpf	Lisa	Green	Charles River Watershed Association
Wolters	Maddie	Yellow	Charles River Watershed Association
Dooley	Rep. Shawn	Red	Representative
Geena	Julia	Yellow	Resident
Pelletier	Gary	Red	Building Commissioner
Stevens	Alec	Blue	Resident
Davis	Fred	Green	Medfield Energy Committee
Lynch	Roberta	Red	Director, Council on Aging

CORE TEAM MEMBERS

MICHAEL SULLIVAN
 KRISTINE TRIERWEILER
 MAURICE GOULET
 ROBERT KENNEDY
 ANN THOMPSON
 LESLEE WILLITTS
 JOHN WILHELM
 WILLIAM CARRICO
 ROBERTA LYNCH
 JEFFREY MARSDEN
 GARY PELLETIER
 JON COGAN

FORMER TOWN ADMINISTRATOR
 TOWN ADMINISTRATOR
 DIRECTOR, PUBLIC WORKS
 FOREMAN, PUBLIC WORKS
 ACTIVE CITIZEN
 CONSERVATION COMMISSION
 INTERIM CHIEF OF POLICE
 FIRE CHIEF
 DIRECTOR, COUNCIL ON AGING
 SUPERINTENDENT OF SCHOOLS
 BUILDING COMMISISONER
 VETERAN SERVICES

Citation

Metropolitan Area Planning Council. 2019. *Town of Medfield Municipal Vulnerability Preparedness Program. Community Resilience Building Workshop Summary of Findings*. Medfield, Massachusetts.

Appendix A – Medfield CRB Workshop Presentation




Municipal Vulnerability Preparedness Workshop: Presentation Outline

1. Municipal Vulnerability Preparedness Program
2. Climate Change: Observations and Projections
3. Medfield's vulnerability
4. MVP Workshop Instructions




Municipal Vulnerability Preparedness Workshop: Program Description



Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
Municipal Vulnerability Preparedness Program

State and local partnership to build resiliency to climate change



The Municipal Vulnerability Preparedness (MVP) program helps communities in Massachusetts to:

- Define extreme weather and natural and climate related hazards
- Identify existing and future vulnerabilities and strengths
- Develop and prioritize actions for the community
- Identify opportunities to take action to reduce risk and build resilience

<https://www.mass.gov/files/mvp-training-opening.pdf>



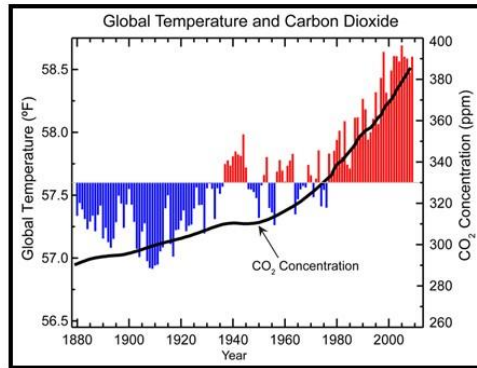
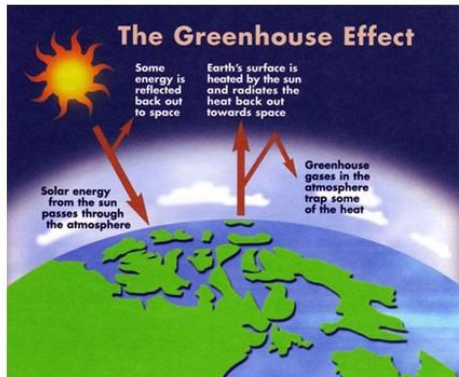
Municipal Vulnerability Preparedness Workshop: Program Description

10:00	Welcome, Introductions
10:15	Climate Change Projections and Implications for Medfield
10:40	Workshop Instructions Presentation
10:50	Small Group Exercise-Identifying Risk Areas and Community Strengths
12:00 pm	Lunch
12:45	Small Group Exercise- Creating Climate Actions
1:30	Small Group Exercise- Prioritizing Climate Actions
2:00	Break
2:15	Large Group Report Out-Community Resilience Building.
2:50	Next Steps, Choose your action priorities with Sticky Dots and Workshop Close



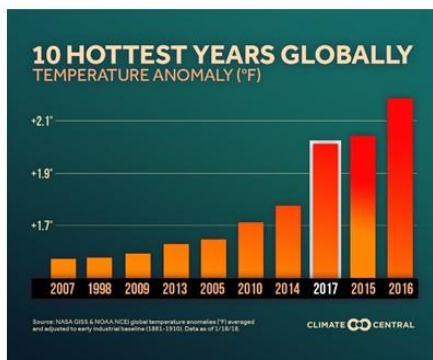
Climate Change:

Emissions and Global Warming



Climate Change:

Temperature Observed and Projected



Source: Nasa GISS & NOAA NCEI global temperature anomalies adjust to early industrial baseline (1881-1910). As of 1/18/18

Length of Growing Season in the Contiguous 48 States, 1895-2015: West Versus East



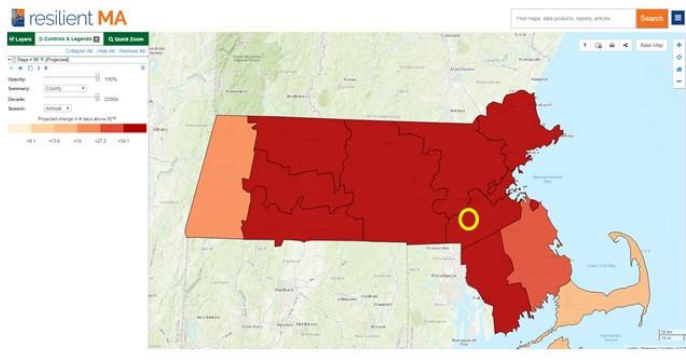
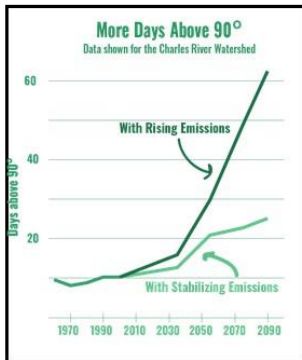
Data source: Kunkel, K.E. 2016 update to data originally published in Kunkel, K.E., D.R. Easterling, K. Hubbard, and K. Redmond. 2004. Temporal variations in frost-free season in the United States: 1895-2000. *Geophys. Res. Lett.* 31:L03201.

For more information, visit U.S. EPA's "Climate Change Indicators in the United States" at www.epa.gov/climate-indicators.



Climate Change:

Temperature Observed and Projected

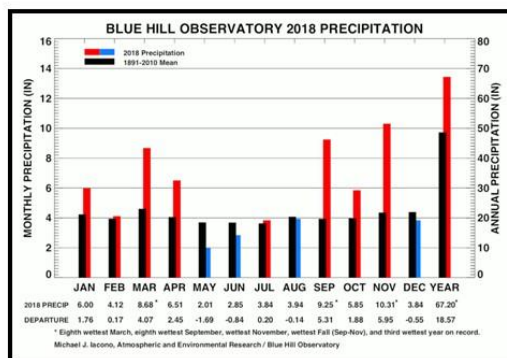


Nearly 50 days over 90 degrees annually by 2090.
www.resilientma.com/map

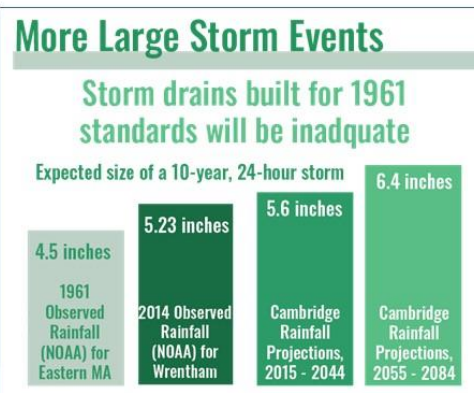


Climate:

Precipitation Observed and Projected



2018-wettest fall and third wettest year on record.

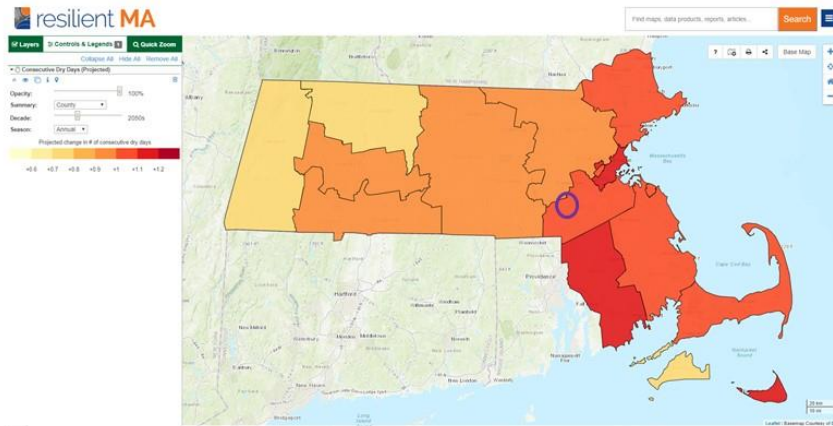


Cambridge Climate Vulnerability Assessment 2015. Kleinfelder based on ATMOS projections November 2015



Climate:

Precipitation Observed and Projected

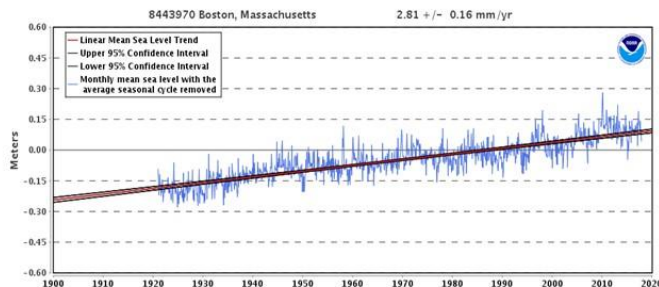


Consecutive Dry Days increases from 17 days to 18 days annually by 2050.
www.resilientma.org/map



Climate:

Sea Level Rise Observed and Projected



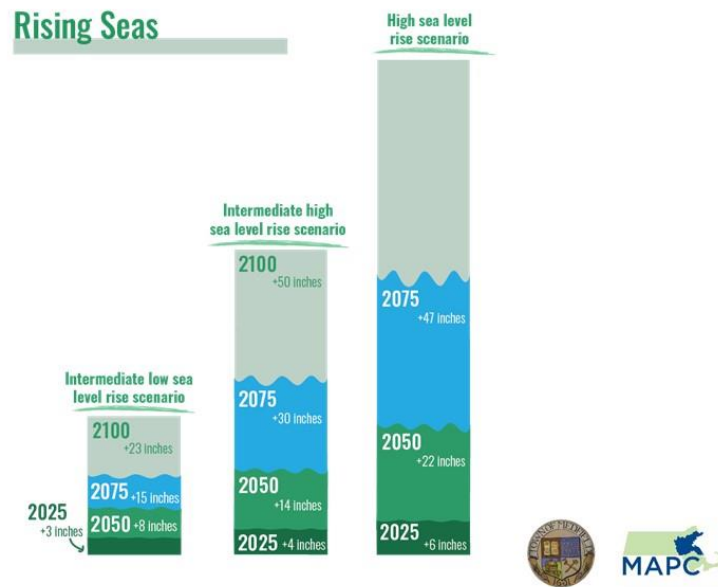
	2030	2050	2070	2100
Boston BH_FRM ¹	8.00 in.	1.50 ft.	3.10 ft.	7.40 ft.
Boston Tide Gauge ²	1.1 ft. -1.3 ft.	2.4 ft.	4.2 ft.	7.0 ft.

¹ Douglas, E.M., Kirshen, P.H., Bosma, K., et al. 2017. Simulating the Impacts and Assessing the Vulnerability of the Central Artery/Tunnel System to Sea Level Rise and Increased Coastal Flooding. J Extreme Events 3 (4): 1650013 (28 pages).
² Northeast Climate Science Center, UMass Amherst. "Massachusetts Climate Change Projections". December 2017



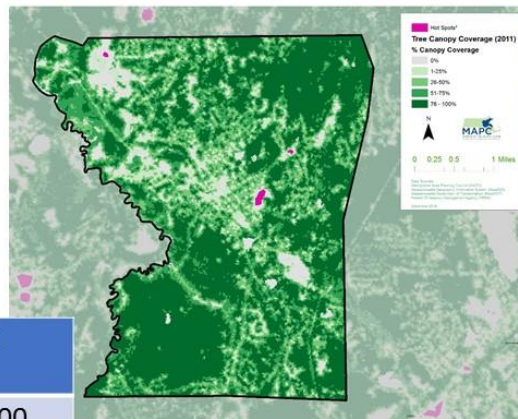
Climate:

Sea Level Rise Observed and Projected



Climate Change:

Temperature vulnerability



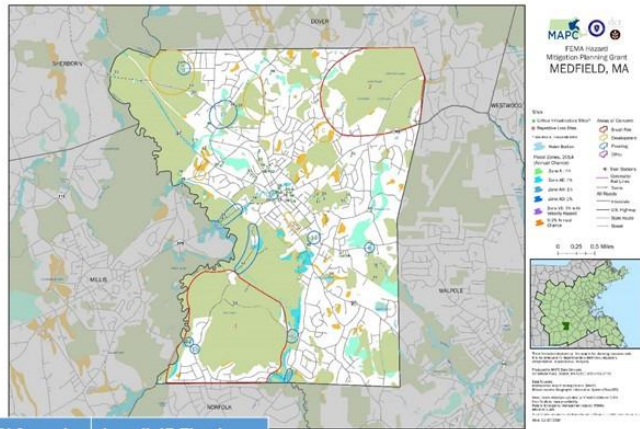
Tree Benefits	Annual Capture	Annual Value
Carbon Sequestration	4,473 tons CO ₂	\$760,000
Air Pollution	453,000 lbs. pollutants	\$1,500,000
Avoided Stormwater Runoff	76MG	\$680,00

Tree Analysis from iTree Landscape. Modeled 2018



Climate Change:

Precipitation vulnerability (Flooding)



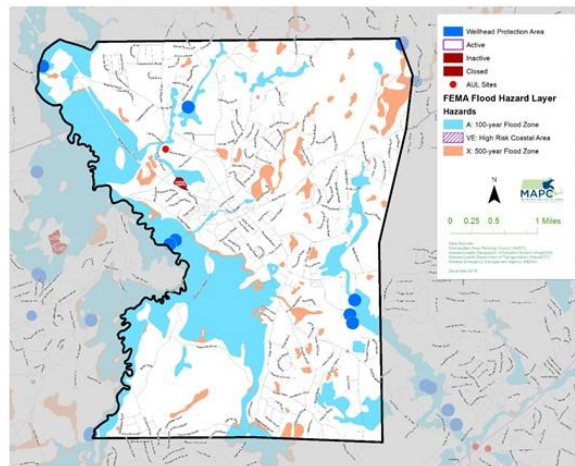
Infrastructure in Flood Zone	1% Annual Chance Flood	0.2% Annual Chance Flood	Locally ID Flood Hazard
Town Critical Facilities	1	1	7
Wells	4	0	0
Bridges	3	0	0
Dams	4	4	0



Climate Change:

Precipitation vulnerability (Flooding)

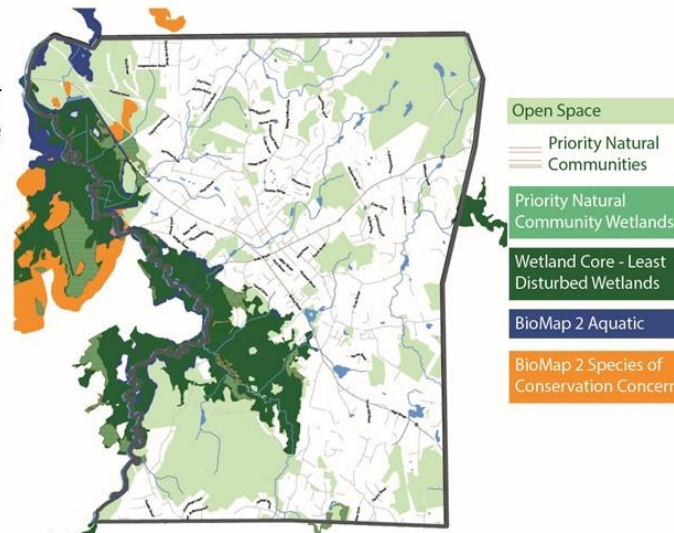
Low Risk of toxic exposure from flooding and contaminated sites.



Climate Change:

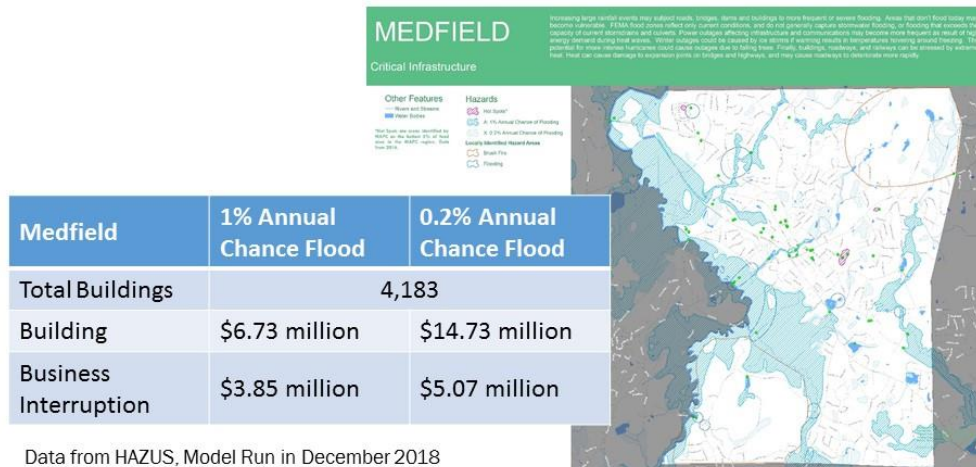
Precipitation vulnerability (Flooding)

Submerged wetlands transform to open water with long-term exposure to flooding



Climate Change:

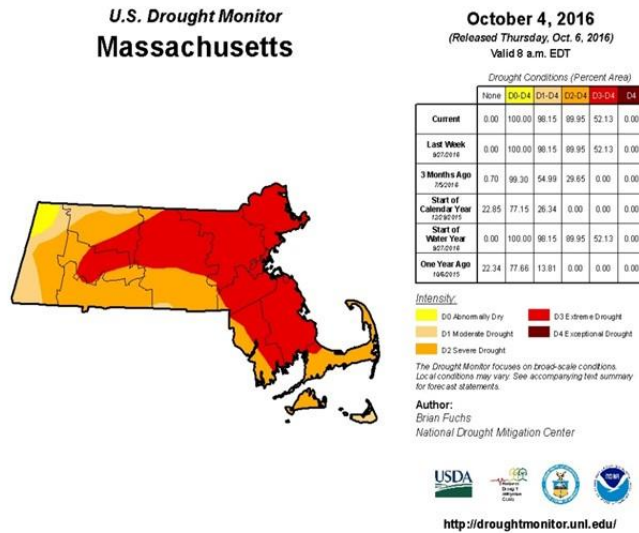
Precipitation vulnerability (Flooding)



Climate Change:

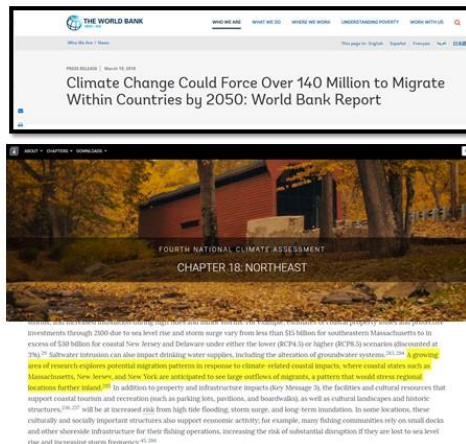
Precipitation vulnerability (Drought)

- 2 critical facilities in area locally identified as prone to fires (well and Holts Pond Dam)



Climate Change:

Sea level rise vulnerability

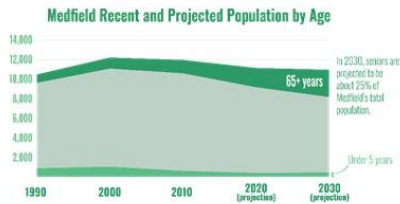


Climate Change:

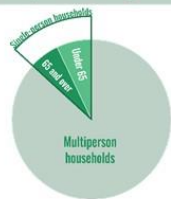
Social vulnerability

Older Adults and Young Children

Adults over 65 and children under 5 are more likely to develop health problems on very hot days or during heat waves. Older adults are also more likely to have disabilities or mobility constraints and may need additional assistance during emergencies. They are also more likely to live alone than younger adults.



People Living Alone



As of 2010, about 13% of Medfield households consisted of someone living alone.

Almost 50% of people living alone were over 65.

Linguistic Isolation

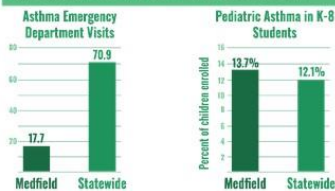
9.5% $\pm 6\%$ of Medfield's residents speak English less than "very well"

Households in Poverty

2.4% $\pm 1\%$ Households in Medfield that are below poverty level
\$147,630 Median Income in Medfield

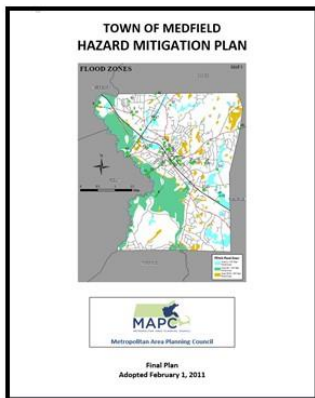
Asthma Hospitalizations

Asthma attacks can be triggered by environmental exposures like air pollution or cigarette smoke. This illness is more common in children than adults and is becoming more common across the state.



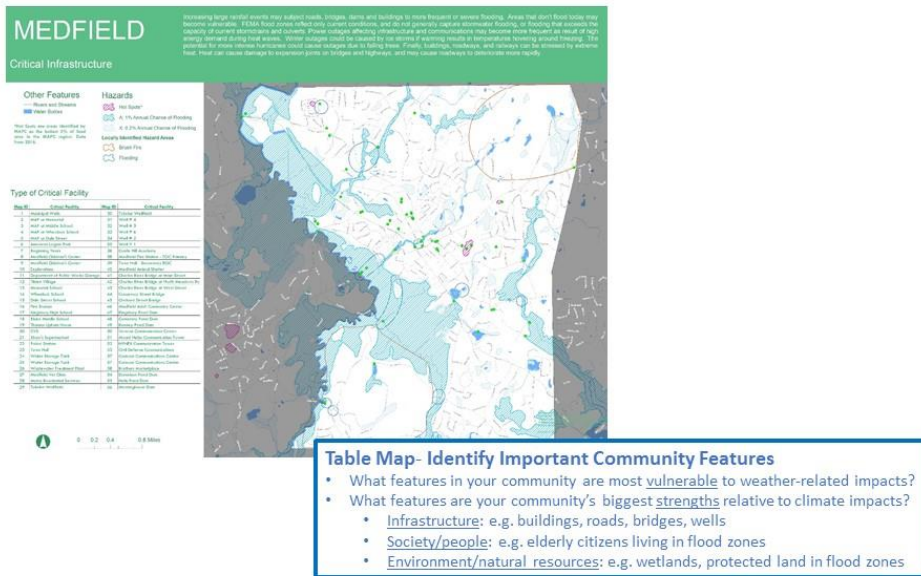
Climate Change:

Medfield Taking Action



Town of Medfield Natural Hazard Mitigation Plan 2011	
Flood-Related Mitigation	
A) The town participates in the National Flood Insurance Program and has adopted the effective FIRM maps. The town actively enforces the floodplain regulations.	J) Protected open space and proactive land preservation programs
B) Annual catch basin cleaning and annual street sweeping	K) Public Education on stormwater through the NPDES Phase II program
C) Long-term stormwater plan and funding, and ongoing system improvements	L) Causeway Street near Sewell Brook-Previously rebuilt and raised roadway. No other mitigation needed at this time.
D) Flood Plain District	M) Orchard Street at Charles River-State has previously rebuilt the roadway, no other mitigation needed at this time.
E) Wetlands Conservancy District	N) Noon Hill Street at Stop River (5)- Previously rebuilt existing bridge. Dirt roadway here, but town sees no sense in paving it at this time.
F) Massachusetts Stormwater Policy	O) South Street at Norfolk Line and Stop River (6)- Town has previously rebuilt the roadway, bridge and replaced a culvert here in the 1990s. Area is part of flood storage project, no other mitigation possible at this time.
G) Stormwater Requirements in Subdivision Regulations and Site Plan Review	P) Main Street at Charles River (7)-Town owned land on both sides and bridge previously raised to avoid flooding.
H) Open Space Residential Developments allowed	Q) Elm Street at Mill Brook (8)-Existing stone culvert in place. This culvert could be replaced to increase drainage capacity, as long as new culvert remains within existing footprint.
I) Groundwater Conservancy District	R) State Hospital property (9)-Division of Capital Asset Management has constructed a swale to help mitigate flooding of the area below the hospital. Town expects other mitigation to take place with development of the hospital site.

Municipal Vulnerability Preparedness: Medfield Taking Action



Municipal Vulnerability Preparedness: Medfield Taking Action

[illegible]

Populate Matrix with Map Info: Identify Important Community Features on Left Four Columns.

- What features in your community are most **vulnerable** to weather-related impacts?
- What features are your community's biggest **strengths** relative to climate impacts?
 - **Infrastructure**: e.g. buildings, roads, bridges, wells
 - **Society/people**: e.g. elderly citizens living in flood zones
 - **Environment/natural resources**: e.g. wetlands, protected land in flood zones



Municipal Vulnerability Preparedness: Medfield Taking Action

Gloucester Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.org					
B & L priority for action over the Short or Long term (and Ongoing) Y = Vulnerability S = Strength				Top Priority Hazards (Tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)					
Infrastructural Features	Location <small>describe here in words or sketch if map usage</small>	Ownership <small>identify private, public, etc.</small>	V <small>and/or S</small>	Coastal Flooding/ Storm Surge/ Sea Level Rise	High Winds	Extreme Cold/ Winter Storms/Snow	Extreme Heat/ Fire/ Drought	Priority <small>H - M - L</small>	Time <small>Short - Long</small>
Example: Waste water treatment plant				ACTIONS - list below					
	Essex Ave.	City	V	Gloucester CC Adaptation Plan : Use existing protective berm and topography to build up dike. Design, permit and construct a higher berm along the southern side of the property. Build a flood wall along Route 133 with a temporary closure at the property entrance.					

COMPLETE right side of matrix: Develop Actions

1. Develop Actions – How should we reduce vulnerability and/or reinforce strengths?
2. Prioritize – Are actions high, medium, or low priority?
3. Determine Urgency – Are actions ongoing? Or a short-term or long-term step?



Municipal Vulnerability Preparedness: Medfield Taking Action

Infrastructure

Strength

Most municipal buildings are not in flood areas.

Vulnerability

The DPW is in a flood zone and has flooded in the past.

Potential Actions

Flood proof the DPW with earthen berms or flood fences.

People

Strength:

The Council on Aging maintains a list of older adults in need of support during emergencies.

Vulnerability:

Some residents are not fluent in English and may not understand emergency notices.

Potential Actions:

Translate emergency materials.
Partner with community
organizations that can provide
services.

Natural Resources

Strength:

The Town has minimal development along the Charles River.

Vulnerability:

Drinking water aquifers are vulnerable to contamination with flooding.

Potential Actions:

Increase purchase of watershed protection lands.



Municipal Vulnerability Preparedness:

Medfield Taking Action



Ground Rules

- Everyone has an equal opportunity to contribute
- Everyone is an expert; respect others' point of view.
- Respect limited time.
- Please work to complete the worksheet and tasks. Your input is important!
- Please turn off your cell phone or keep on vibrate.

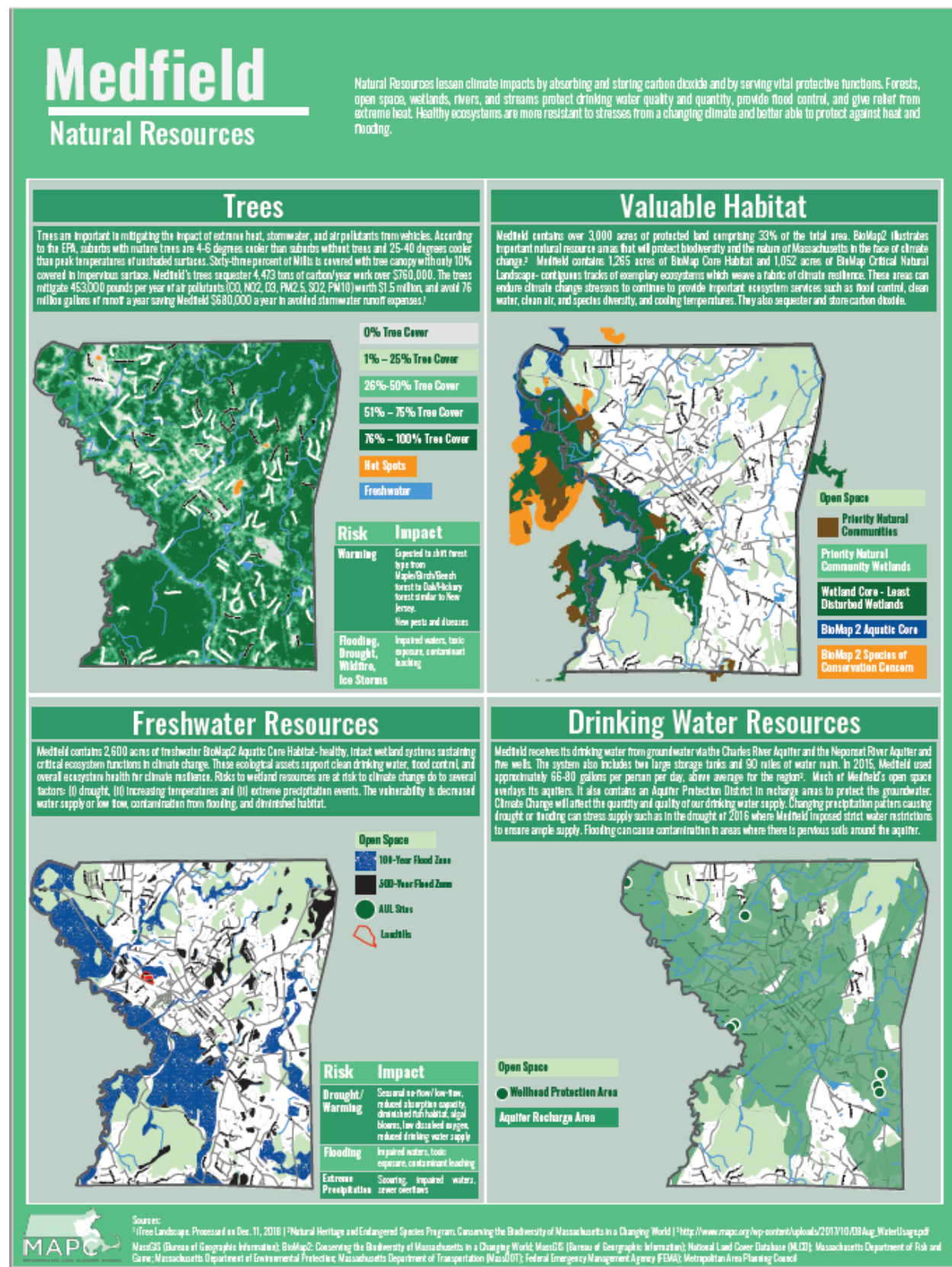
Thank you for your participation!



Darci Schofield, Senior Environmental Planner
DSchofield@mapc.org



Appendix B –Climate Change Posters and Maps



Medfield

Social Vulnerability

Social vulnerability refers to social, economic, demographic, or health factors that may make groups of people less resilient to climate change impacts. Certain vulnerabilities tend to be correlated; for example, older adults are more likely to have a disability and live alone than younger adults.

Our strategies for adapting to a changing climate should protect these populations in addition to our natural and built environment.

Who is most at risk from climate change impacts?

People who may be more susceptible to negative health effects: These can include older adults, young children, pregnant women, people with disabilities, and people with pre-existing health conditions, as they are more likely to be physically vulnerable to the health impacts of extreme heat and poor air quality caused by climate change. Individuals with physical mobility constraints, such as people with disabilities and seniors, may need additional assistance with emergency response.

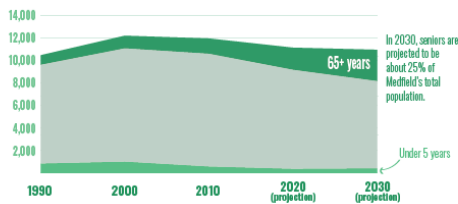
People who may have more difficulty adapting to, preparing for, or recovering from extreme weather events: Socioeconomic characteristics such as income and race can influence vulnerability to climate change. Low-income people are often more susceptible to financial shocks, which can occur after extreme weather and which can impact financial security and the ability to secure safe shelter and meet medical needs. Social isolation can also influence vulnerability, as it limits access to critical information, municipal resources, and social support systems. People at the most risk for social isolation include those living alone and people with limited English language proficiency.

People who live or work in vulnerable locations: Historic or predicted floodplain, urban flooding locations, areas prone to wildfire, heat islands, neighborhoods prone to power outages. Outdoor workers, first responders, those working in hot indoor environments.

Older Adults and Young Children

Adults over 65 and children under 5 are more likely to develop health problems on very hot days or during heat waves. Older adults are also more likely to have disabilities or mobility constraints and may need additional assistance during emergencies. They are also more likely to live alone than younger adults.

Medfield Recent and Projected Population by Age



People Who Work Outside



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

Households in Poverty

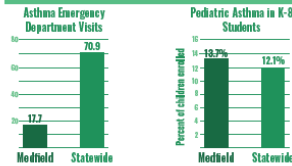
2.4% ±1% Households in Medfield that are below poverty level

\$147,630 Median Income in Medfield

Households that earn poverty-level incomes are more susceptible to financial shocks triggered by extreme weather, which can cause long-lasting financial insecurity and can make it hard to secure safe shelter, sufficient food, and medical care. A four-person household earning less than \$24,563 is below poverty level.

Asthma Hospitalizations

Asthma attacks can be triggered by environmental exposures like air pollution or cigarette smoke. This illness is more common in children than adults and is becoming more common across the state.



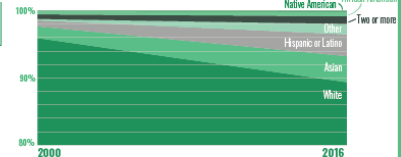
Linguistic Isolation

9.5% ±6% of Medfield's residents speak English less than "very well"

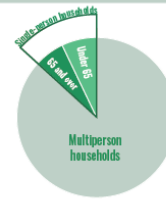
Communities of Color

Particular racial or ethnic groups may also be more likely to have certain social vulnerabilities than others. For example, Black and Latino populations have a much higher rate of asthma hospitalizations than other groups.

Medfield is becoming more diverse...



People Living Alone



As of 2010, about 13% of Medfield households consisted of someone living alone.

Almost 50% of people living alone were over 65.



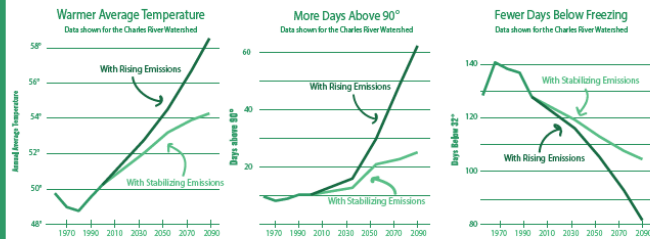
Sources: American Community Survey (ACS) 2012-2016; United States Census 1990, 2000, 2010; MAPC Projections; Massachusetts Department of Public Health Asthma Data, 2008-2012

Climate Change

Medfield and the Charles River Watershed

Our climate is regulated by "greenhouse gases (GHGs)" that trap heat, including carbon dioxide. In the past century through industrialization, fossil fuel combustion, our primary energy source, has increased the concentration of GHGs in the atmosphere, which has caused global temperatures to rise. If we stabilize GHG emissions, global temperatures may rise more slowly. If emissions continue increasing at the same rate, we can expect more extreme changes in the climate.

Higher Temperatures



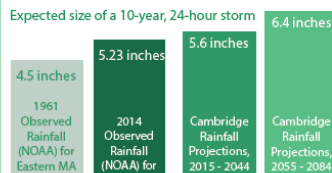
As the climate changes, Medfield can expect...

More Extreme Storms

In addition to increasing annual precipitation, climate change will bring more extreme rain and snow events.

This will lead to more stormwater flooding, as most stormwater drainage is not sized for larger rain events.

Storm drains built for 1961 standards will be inadequate



More Annual Precipitation

But less in the summer and fall...



While total annual rainfall and large rainfall events are projected to increase, summer and fall rain is projected to decrease.

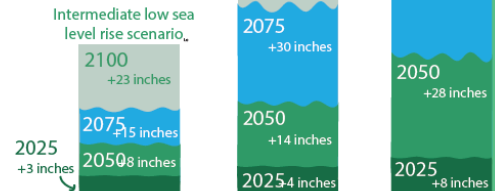
And more frequent droughts...

Due to the combined effects of earlier snowmelt, less rain, and higher temperatures, summer and fall droughts may be more frequent.



Rising Seas

Projections for sea level rise vary dramatically depending on future greenhouse gas emissions, melting ice in the arctic, ocean currents, and other factors. The charts below represent intermediate low, intermediate high, and high emission scenarios.



Sources: Massachusetts Executive Office of Energy and Environmental Affairs; Northeast Climate Science Center; National Ocean and Atmospheric Administration TP 40; National Ocean and Atmospheric Administration Atlas 14; Cambridge CCVA as cited by Boston Research Advisory Group 2016; Massachusetts Office of Coastal Zone Management, "Sea Level Rise: Understanding and Applying Trends and Future Scenarios for Analysis and Planning 2013"

MEDFIELD

Critical Infrastructure

Increasing large rainfall events may subject roads, bridges, dams and buildings to more frequent or severe flooding. Areas that don't flood today may become vulnerable. FEMA flood zones reflect only current conditions, and do not generally capture stormwater flooding, or flooding that exceeds the capacity of current stormdrains and culverts. Power outages affecting infrastructure and communications may become more frequent as result of high energy demand during heat waves. Winter outages could be caused by ice storms if warming results in temperatures hovering around freezing. The potential for more intense hurricanes could cause outages due to falling trees. Finally, buildings, roadways, and railways can be stressed by extreme heat. Heat can cause damage to expansion joints on bridges and highways, and may cause roadways to deteriorate more rapidly.

Other Features

- Rivers and Streams
- Water Bodies

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

Hazards

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

Locally Identified Hazard Areas

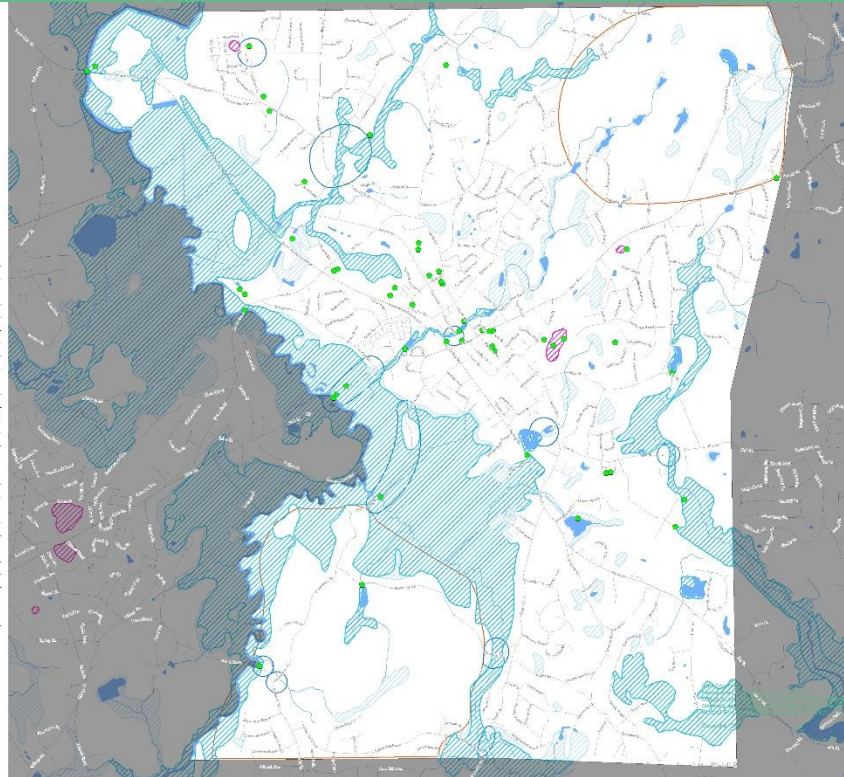
- Brush Fire
- Flooding

Type of Critical Facility

Map ID	Critical Facility	Map ID	Critical Facility
1	Municipal Wells	30	Tubular Wellfield
2	MAP at Memorial	31	Well # 4
3	MAP at Middle School	32	Well # 3
4	MAP at Wheelock School	33	Well # 6
5	MAP at Dale Street	34	Well # 2
6	American Legion Post	35	Well # 1
7	Beginning Years	36	Castle Hill Assembly
8	Medfield Children's Center	38	Medfield Fire Station - EOC Primary
9	Medfield Children's Center	39	Town Hall - Secondary EOC
10	Explorations	40	Medfield Animal Shelter
11	Department of Public Works Garage	41	Charles River Bridge at Main Street
12	Tilden Village	42	Charles River Bridge at North Meadows Rd
13	Memorial School	43	Charles River Bridge at West Street
14	Wheelock School	44	Crookway Street Bridge
15	Dale Street School	45	Orchard Street Bridge
16	Fire Station	46	Medfield Adult Community Center
17	Kingbury High School	47	Kingbury Pond Dam
18	Blake Middle School	48	Carver's Pond Dam
19	Thomas Upham House	49	Kenney Pond Dam
20	CVS	50	Verizon Communication Center
21	Star's Supermarket	51	Mount Neko Communication Tower
22	Police Station	52	NYNEX Communication Tower
23	Town Hall	53	Civil Defense Communications
24	Water Storage Tank	57	Comcast Communications Center
25	Water Storage Tank	57	Comcast Communications Center
26	Wastewater Treatment Plant	58	Brothers Meetinghouse
27	Medfield Vet Clinic	54	Danielson Pond Dam
28	Medfield Residential Services	55	Halls Pond Dam
29	Tubular Wellfield	56	Meetinghouse Dam



0 0.2 0.4 0.8 Miles



Appendix C- Workshop Risk Matrices

- MEDICAL FACILITIES (NONE IN TOWN)

PROMOTE REGIONAL STUDY OR MEDICAL FACILITIES (M) (L)

- HOUSING AFFORDABILITY

SUPPORT AFFORDABLE HOUSING TRUST (H) (S)

Blue Table

Medfield Community Resilience Building Risk Matrix					Top Priority Hazards				Priority	Time
Risk: Likelihood for action over the short or long term (and ongoing)					Extreme Heat/Heat Waves	Inland and Riverine Flooding	Extreme Cold/Winter Storms/Snow	Drought/Fire	H-B-E	Short Long Ongoing
Societal Features (people)					ACTIONS - list below					
STRATEGIC	GOOD COUNCIL ON AGING - PARANAL PRICE/FIRE			S	CONTINUE AND EXPAND					M O
	COMMUNICATION NETWORKS BY SENIORS			S						M O
	EVIDENCE EMERGENCY POWER/PRIORITY LIST			S						M O
	EMERGENCY SHELTER PLAN IN PLACE (HIGH SCHOOL/LIBRARY)			S						M O
	COOLING CENTER/PLAN NEEDED			V	STUDY SITES/FACILITIES TO BE DESIGNATED AS COOLING CENTERS					(H) (S)
	COMMUNITY OUTREACH AT TOWN HALL			S	SUPPORT CONTINUE PROGRAM AND EXPAND AWARENESS					M O
	FOOD BANK AVAILABILITY			S						M O
	ANTI-IDUM/INTIMIDATION COALITION - CHURCHES/TOWN GOV/CITIZENS			S						M O
	DIVERSE RELIGIOUS LEADERSHIP			S	EXPAND AWARENESS/SIGNS AND ENFORCEMENT					M O
	REDUCE IDUM/PRIVACY BEHAVIOR			V						M L
	LACK OF PUBLIC TRANSPORT/NO CAR = AT RISK			V	STUDY ALTERNATIVE TRANSPORTATION NETWORK SYSTEMS - CANCEL IN AGING VANS/USE OF SCHOOL BUSES					
OTHER COMMUNITY ASSETS	MEMO - MEDFIELD DAY AND OTHER EVENTS			S	MONITOR AND MAINTAIN AIR QUALITY (INDOOR AND EXTERIOR) IN TOWN					M O
	HIGH YOUTH (4-10) POPULATION			S						M O
	HIGH YOUTH (11-18) POPULATION			V	IDENTIFY DATA TO ASSESS RISK - IDENTIFY					M M
	PARC - LOW INCOME HOUSING H/ FLOOD RISK - VULNERABLE POPULATION/LABORING KATHAN			V	CREATE A WELCOMING VOLUNTARY PROCESS/OUTREACH					(H) (S)
NEED FOR MORE TOWN EMPLOYMENT	TOWN VOLUNTEER TURN-OVER/RECRUITING			V	SUPPORT AND EXPAND AWARENESS					
	ACTIVE RECREATION ASSETS			S						
	CULTURAL ALLIANCE, SUICIDE PREVENTION COALITION, OTHER STRATEGIC ASSOCIATIONS/NONPROFITS			S	SUPPORT AND EXPAND AWARENESS					
	FARMER'S MARKET			S						
(TO TOP)	COMMUNITY GARDEN			S	ACT ON HOUSING STUDIES PERFORMED INCENTIVIZE BUILDERS CONTINUE EFFORTS					(H) (S)
	POOR MATCH OF HOUSING STOCK AND AGING POPULATION			V						(H) (S)
	40% PROPOSALS/10% MAKING PROGRESS W/O MOUNTAIN			V/S						(H) (S)

BLUE TABLE

Medfield Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.org			
Priority for action over the Short or Long term (and Ongoing)				Top Priority Hazards			
V = Vulnerability S = Strength				Extreme Heat/ Heat Waves	Inland and Riverine Flooding	Extreme Cold/ Winter Storms/Snow	Drought/Fire
Environmental Features	Location (describe here in words or mark # on map)	Ownership (identify private, public, etc.)	V and/or S	Priority			
ACTIONS - list below				Time			
OLDER STORMWATER SYSTEM - INCREASE CAPACITY		TOWN	V	UPDATE AND STRENGTHEN STORMWATER BYLAW AND OTHER REGULATIONS	H	S	
TOWN SENSE NEEDS MAINTENANCE		TOWN	V	ILLUMINATE DETECTION OF LEAKS SYSTEMS THEN FIX W/ CONTRACTORS	H	S	
WASTEWATER TREATMENT PLANT	(18)	TOWN	S	PERFORM THIS WORK, STUDY OF CAPACITY	H	S	
TOWN CENTER SMALL CONTAMINATION SITES	(19)	PRIVATE	V	ENCOURAGE PRIVATE MONITORING OF SITES	M	O	ONGOING
SAFETY @ HASTENWATER AND PUBLIC SAFETY		TOWN	S	MAINTAIN AND EXPAND ON MUNICIPAL PROPERTIES/ ALTERNATIVE ENERGY AND ENERGY EFFICIENCIES	M	O	
ACTIVE RECYCLING PROGRAM		TOWN	S	CONTINUE, EXPAND AND KEEP UP-TO-DATE STUDY PAY-AS-YOU-THROW	M	S/O	
ACTIVE COMMUNITY INVOLVEMENT		TOWN	S				
STRONG SNOW REMOVAL		TOWN	S	MAINTAIN EQUIPMENT	M	O	
CHARLES AND NEPAGET RIVERS		TOWN	S	EXPAND PUBLIC AWARENESS AND EDUCATION EFFORTS	H	S	
1/3 OR TOWN CONSERVATION LAND		TOWN	S		H	S	
RIVER PROHIBIT		PUBLIC	V	WATER CONSERVATION, BAN, QUOTA PROGRAM	H	S	
HIGH WATER USAGE		TOWN	V	SAME	H	S	
AND OTHERS - TRESCA ROAD USE/ TRAFFIC		PRIVATE	V	INCREASE ENFORCEMENT W/ STATE POLICE TRUCK TEAM	M	S	
RIVER WATER QUALITY ISSUES/ BURDEN AND KNOW		PUBLIC	V	IMPROVE BYLAW/REGULATIONS (STORMWATER)	H	S	
WELL-PREPARED FOR NEW STORMWATER REGULATIONS		TOWN	S	PUBLIC AWARENESS MAINTAIN PUBLIC SUPPORT FOR TOWN VOTES (GET THIS DONE)	H	S	
PARTNERSHIP W/ NEPAGET RIVER HARBOR/CHARLES RIVER STORMWATER AND OTHERS		PUBLIC	S	MAINTAIN STRONG RELATIONSHIPS COMMUNITY OUTREACH	H	O	
NO BRUSH FIRE MANAGEMENT PLAN/ ACTIVITY		TOWN	V	DEVELOP A BRUSH FIRE MITIGATION PLAN/ EMERGENCY PREPAREDNESS PLAN, MUTUAL AID	H	S	
PARTNERSHIP FOR OPEN SPACE W/ TRUSTEES/ PROPERTY		TRUSTEE	S	MAINTAIN RELATIONSHIPS	H	O	

OTHER CONSERVATION ENTITIES

BLUE TABLE

Medfield Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.org					
H-M-L: Priority for action over the Short or Long term (and Ongoing) V = Vulnerability S = Strength				Top Priority Hazards					
Environmental Features	Location describe here in words or mark it on map	Ownership identify private, public, etc.	V and/or S	Extreme Heat/ Heat Waves	Inland and Riverine Flooding	Extreme Cold/ Winter Storms/Snow	Drought/Fire	Priority	Time
								H - M - L	Short Long Ongoing
ACTIONS - list below									
OLDER STORMWATER SYSTEM - INCREASE CAPACITY		TOWN	V	UPDATE AND STRENGTHEN STORMWATER BYLAW AND OTHER REGULATIONS				H	S
TOWN SEWER NEEDS MAINTENANCE		TOWN	V	IMMEDIATE DETECTION OF LEAKS SYSTEMS THEN FIX W/ CONTRACTORS				H	S
WASTEWATER TREATMENT PLANT	(18)	TOWN	S	PERFORM THIS WORK, STUDY OF CAPACITY				H	S
TOWN CENTER SMALL CONTAMINATION SITES	(19)	PRIVATE	V	ENCOURAGE PRIVATE MONITORING OF SITES				M	ONGOING
SOURCE WASTEWATER AND PUBLIC SAFETY		TOWN	S	MAINTAIN AND EXPAND ON MUNICIPAL PROPERTIES/ ALTERNATIVE ENERGY AND ENERGY EFFICIENCIES				M	O
ACTIVE RECYCLING PROGRAM		TOWN	S	CONTINUE, EXPAND AND KEEP UP-TO-DATE STUDY AS-YOU-THROW				M	S/O
ACTIVE COMMUNITY INVOLVEMENT		TOWN	S						
STRONG SNOW REMOVAL		TOWN	S	MAINTAIN EQUIPMENT				M	O
CHARLES AND NEPAGUET RIVERS		TOWN	S	EXPAND PUBLIC AWARENESS AND EDUCATION EFFORTS				H	S
1/3 OF TOWN CONSERVATION LAND		TOWN	S					H	S
RIVER PROHIBIT		PUBLIC	V	WATER CONSERVATION, BAN, QUOTA PROGRAM				H	S
HIGH WATER USAGE		TOWN	V	SAME				H	S
TRESCA ROAD USE/ TRAFFIC		PRIVATE	V	INCREASE ENFORCEMENT W/ STATE POLICE TRUCK TEAM				M	S
RIVER WATER QUALITY ISSUES / BURDEN AND RISK OFF		PUBLIC	V	IMPROVE BYLAW / REGULATION (STORMWATER)				H	S
WELL-PREPARED FOR NEW STORMWATER REGULATIONS		TOWN	S	PUBIC AWARENESS - MAINTAIN PUBLIC SUPPORT FOR TOWN VOTES (GET THIS DONE)				H	S
PARTNERSHIP W/ NEPAGUET RIVER WATERSHED/CHARLES RIVER STORMWATER AND OTHERS		PUBLIC	S	MAINTAIN STRONG RELATIONSHIPS w/ COMMUNITY OUTREACH				H	O
NO BRUSH FIRE MANAGEMENT PLAN/ ACTIVITY		TOWN PRIVATE	V	DEVELOP A BRUSH FIRE MITIGATION PLAN / EMERGENCY PREPAREDNESS PLAN, MUTUAL AID				H	S
PARTNERSHIP FOR OPEN SPACE W/ TRUSTEES/ PROPERTY		TRUSTEE	S	MAINTAIN RELATIONSHIPS				H	O
OTHER CONSERVATION									

OTHER CONSERVATION

Medfield Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.org					
H = L priority for action over the Short or Long term (and Ongoing) V = Vulnerability S = Strength				Top Priority Hazards					
Environmental Features	Location describe here in words or mark B on map	Ownership identify private, public, etc.	V and/or S	Extreme Heat/ Heat Waves	Inland and Riverine Flooding	Extreme Cold/ Winter Storms/Snow	Drought/Fire	Priority	Time
								H - M - L	Short Long Ongoing
ACTIONS - list below									
OLDER STORMWATER SYSTEM - INCREASE CAPACITY		TOWN	V	UPDATE AND STRENGTHEN STORMWATER BYLAW AND OTHER REGULATIONS				H	S
TOWN SENSE NEEDS MAINTENANCE		TOWN	V	IMMEDIATE DETECTION OF LEAKS SYSTEMS THEN FIX W/ CONTRACTORS				H	S
WASTEWATER TREATMENT PLANT	(18)	TOWN	S	PERFORM THIS WORK, STUDY OF CAPACITY				H	S
TOWN CENTER SMALL CONTAMINATION SITES	(19)	PRIVATE	V	ENCOURAGE PRIVATE MONITORING OF SITES				M	ONGOING
SAR @ HASTENWATER AND PUBLIC SAFETY		TOWN	S	MAINTAIN AND EXPAND ON MUNICIPAL PROPERTIES/ ALTERNATIVE ENERGY AND ENERGY EFFICIENCIES				M	O
ACTIVE RECYCLING PROGRAM		TOWN	S	CONTINUE, EXPAND AND KEEP UP TO DATE STUDY PAY-AS-YOU-THROW				M	S/O
ACTIVE COMMUNITY INVOLVEMENT		TOWN	S						
STRONG SNOW REMOVAL		TOWN	S	MAINTAIN EQUIPMENT				M	O
CHARLES AND NEPESSET RIVERS		TOWN	S	EXPAND PUBLIC AWARENESS AND EDUCATION EFFORTS				H	S
1/3 OF TOWN CONSERVATION LAND		TOWN	S					H	S
RIVER PROMPT		PUBLIC	V	WATER CONSERVATION, BAN, QUOTA PROGRAM				H	S
HIGH WATER USAGE		TOWN	V	SAME				H	S
TRESCA ROAD USE/ TRAFFIC		PRIVATE	V	INCREASE ENFORCEMENT W/ STATE POLICE TRUCK TEAM				M	S
RIVER WATER QUALITY ISSUES / BURDEN AND R/W OFF		PUBLIC	V	IMPROVE BYLAW / REGULATION (STORMWATER)				H	S
WELL - PREPARED FOR NEW STORMWATER REGULATIONS		TOWN	S	PUBLIC AWARENESS MAINTAIN PUBLIC SUPPORT FOR TOWN VOTES (GET THIS DONE)				H	S
PARTNERSHIP W/ NEPESSET RIVER HATCHERY/ STORMWATER AND OTHERS		PUBLIC	S	MAINTAIN STRONG RELATIONSHIPS & COMMUNITY OUTREACH				H	O
NO BRUSH FIRE MANAGEMENT PLAN/ ACTIVITY		TOWN PRIVATE	V	DEVELOP A BRUSH FIRE MITIGATION PLAN / EMERGENCY PREPAREDNESS PLAN, MUTUAL AID				H	S
PARTNERSHIP FOR OPEN SPACE W/ TRUSTEES/ PROPERTY		TRUSTEE	S	MAINTAIN RELATIONSHIPS				H	O

OTHER CONSERVATION ENTITIES

BLUE Table

Medfield Community Resilience Building Risk Matrix					www.CommunityResilienceBuilding.org			
H-M-L priority for action over the Short or Long term (and Ongoing)					Top Priority Hazards			
V = Vulnerability S = Strength					Extreme Heat/ Heat Waves	Inland and Riverine Flooding	Extreme Cold/ Winter Storms/Snow	Drought/Fire
Infrastructural Features	Location describe here in words or mark it on map	Ownership identify private, public, etc.	V and/or S	ACTIONS - list below	Priority	Time		
CAUSEWAY ST. FLOODING	①	TOWN	V	STUDY ELEVATION ROAD, STUDY CULVERT ISSUES	M	LONG		
ORCHARD ST. FLOODING	②	TOWN	V	"	L	LONG		
MAIN ST./ RT. 109 FLOODING	③	TOWN	V	"	H	SHORT		
RT. 109 BRIDGE FLOODING	④	STATE	V	ADVOCATE FOR STATE'S PLANNED REPAIR TO ADDRESS CLIMATE RISK	H	SHORT		
HARTFORD ST. FLOODING	⑤	TOWN	V	ROAD ENGINEERING STUDY/ UNDERLAY	M	MED.		
BEAVER DAMS/ STANDING WATER	⑥	TOWN	V	STUDY CULVERT ISSUES, BYLAW/ REVIEW/ IMPROVEMENT	M	MED./L		
HARTFORD ST./ MAIN ST. DRAINAGE IMPROVEMENT	⑦	TOWN	V	ENGINEERING STUDY TO DETERMINE DAM REPAIRS - WORK W/ DEP	H	SHORT		
DAM NEEDS REPAIRING, DANIELSON POND	⑧	TOWN	V	ENGINEERING STUDY TO DETERMINE DAM REPAIRS	H	SHORT		
DAM NEEDS REPAIR/ MAINTENANCE KIMS BURY POND	⑨	RAIL/ CSX	V	WORK WITH CSX TO STUDY AND FIX	H	SHORT/ ONGOING		
FLOODING @ CULVERT UNDER RAILROAD TRACKS	⑩	TOWN	V	STUDY VULNERABILITY AND OPTIONS NEEDED	L	LONG		
TRANSFER STATION FLOOD PLAIN RISK (HAS NOT YET FLOODED)	⑪	TOWN	S					
HIGH LEVEL OF TREE COVER/ OPEN SPACE	⑫	TOWN	S	EDUCATION AROUND VALUE/PURPOSE, DELINEATE BOUNDARIES, CONSERVE ADJACENT	M	SHORT		
ARMY CORPS. CHARLES RIVER FLOOD PLAIN FEATURE	⑬	ARMY CORPS	S					
GOOD BRINKING WATER (5 WELLS)	⑭	TOWN	S					
DRINKING WATER WELL @ RISK	⑮	TOWN	V	STUDY VULNERABILITY AND POTENTIAL OPTIONS NEEDED	M/L	ON GOING MED.		
FLOODING AT ELM ST.	⑯	TOWN	V	STUDY ELEVATION ROAD/ BRIDGE	M	MED.		
WATER TREATMENT REQUIRED @ WELL	⑰	TOWN	V	WATER CONSERVATION PROGRAMS TO AVOID \$8M INVESTMENT	H	SHORT		
COMMUNICATION TOWER WELL LOCATED/ NEW REVIEW IT	⑱	TOWN	S					
- WATER TOWER	⑲	TOWN	S					
PRIVATE DAMS ON RIVER	⑳	PRIVATE	V	WORK W/ PROPERTY OWNERS AND PARTNER TO PURSUE GRANTS	H	SHORT		
POLICE STATION BRAND NEW	㉑	TOWN	S	MAINTENANCE AND SUPPORT TO BUILDING AND GRANTS	H	ONGOING		
NEW HIGHWAY GRANT/ NEW SENIOR CENTER		TOWN	S		"	"		
NEW LIBRARY					"	"		
TOWN HALL RECENTLY RENOV.					"	"		





1260 10000



Red Table

Medfield Community Resilience Building Risk Matrix					Top Priority Hazards				Priority	Time
H-M-L Priority for action over the Short or Long term (and Ongoing) V = Vulnerability S = Strength					Extreme Heat/ Heat Waves	Inland and Riverine Flooding	Extreme Cold/ Winter Storms/Snow	Drought/Fire	H - M - L	Short Long Ongoing
Infrastructural Features	Location describe here in words or mark # on map	Ownership identify private, public, etc.	V and/or S	ACTIONS - list below						
Charles River Bridge (109)	41		V	* Raise the roadway (St Road) Town Collab with Millis.					M-H	L
UAW Water Supply			V	* Complete Eng Study (Underway) * Follow up with recommendations					H	O
Sanitary Pipes/Leakage Meters			V	* Review Development Regs * Update to Master Plan					H	O
Growth / Res Development			V	* Design Regs. Creating SW Reg. to address new & large developments.					L	O
Interbasin Watersheds (Moving water between 2 watersheds with development)			V							
No Generator at COA			V	* Secure funding to install gen.					H	S
Well in the FP Pump #6 is elevated	33		S							
Tubular Well Field (Inactive)	30									
State Hospital Health/Safety Issues			V	* Raze site * Follow up recommendations of the MP.					L	L
M. High School (Dark Roof) Hot Spot			V	* Add trees * Add Solar Panels * Green Roof on building					H	S
Solar Farm			S							
Dan Pond Dam Rt 27 Dam Failure	# 45		V	* Repair or replace the dam.					H	S
Schools are located outside the FP			S							
Lack of access/emrg vehicles to Thomas Upham Nursing Home	# 19		V	* Convert Rd to a one way street. * Define parking					L	S

Red Table

Medfield Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.org			
H-M-L priority for action over the Short or Long term (and Ongoing)				Top Priority Hazards			
V = Vulnerability S = Strength							
Infrastructural Features	Location describe here in words or mark # on map	Ownership identify private, public, etc.	V and/or S	Extreme Heat/ Heat Waves	Inland and Riverine Flooding	Extreme Cold/ Winter Storms/Snow	Drought/Fire
				Priority			
				Time			
				H - M - L			
				Short Long Ongoing			
ACTIONS - list below							
11/11  Charles River Bridge (109)	41		V	* Raise the roadway (St Road) Town Collab with Worcester Millis,			M-H L
11/1  UAW Water Supply Sanitary Pipes Leakage Meters			V	* Complete Eng Study (Underway) * Follow up with recommendations			H O
1 Growth / Res Development			V	* Review Development Regs * Update to Master Plan			H O
Interbasin Watersheds (Moving water between 2 watersheds with development)			V	* Design Regs Creating SW Reg. to address new & large developments.			L O
11/11  No Generator at COA			V	* Secure funding to install gen.			H S
Well in the FP Pumping is elevated	33		S				
Tubular Well Field (Inactive)	30						
State Hospital Health/Safety Issues			V	* Raze site * Follow up recommendations of the MP.			L L
11/1  M. High School (Dark Roof) Hot Spot			V	* Add trees * Repair roof * Add Solar Panels * Green Roof on building			H S
Solar Farm			S				
Dam Pond Dam Rt 27 Dam Failure	# 45		V	* Repair Repair or replace the dam,			H S
Schools are located outside the FP			S				
Lack of access/emrg vehicles to Thomas Uppham Nursing Home	# 19		V	* Convert Rd to a one way street. * Define parking			L S

Green

Medfield Community Resilience Building Risk Matrix					www.CommunityResilienceBuilding.org			
H-M-L priority for action over the Short or Long term (and Ongoing)					Top Priority Hazards			
V = Vulnerability S = Strength					Extreme Heat/Heat Waves	Inland and Riverine Flooding	Extreme Cold/Winter Storms/Snow	Drought/Fire
Societal Features (people!)	Location (describe here in words or mark it on map)	Ownership (identify private, public, etc.)	V	S	Priority	Time		
ACTIONS - list below								
Climate migrants - increase population			✓		① connect building + zoning to address density + protect open space			L
Insect borne disease - ticks - mosquitoes			✓		① public meeting - existing program			H S
Senior Citizens			✓		① connect w/ those serving medical + mental rehabilitative center - emergency plans			S
↳ extreme weather					② social media + reverse 911			H S
- Heat					③ Good Neighbor program			
- Isolation								
- Costs - fixed income								
- Transportation								
- Stairs								
Children			✓		① Air conditioning in schools -			L
- extreme heat								
- recreation								
Bus Transportation								
- No A/C								
Electricity Grid		Utility	✓		① Microgrid (standing feasibility @ Keusler)			H S-L
Reliability					② Underground utilities/lines = Feasibility study on this			
- people don't want to leave		Public			③ Energy-efficient heating + cooling for municipally owned buildings			
Sheltering					④ Improving stretch code to include resilience measures			
Insurance Cost increase			✓		① Education w/ insurance providers			S
↳ FEMA Flood Zone + Hurricane Sandy								
Low-income communities			✓		at Wilkins - identify what have in plan			S
					- emergency plan for residents			
					- A.C.			
Upham House (Assisted Living Home)		Private			Do they have a generator?			S
					preparedness during emergencies			
					↳ i.e. evacuation, sheltering, etc...			
Isolated people - seniors			✓		Home health-care workers outreach/education program			S
Impacts on property values								
Heat Island					Medical Reserve Corps (Health Dept.)			H S/ongoing
					↳ strengthen volunteer			
					↳ outreach at Medfield Day			
					↳ improve communication + website			
					rec canopy			S
					solar parking canopy			
					Feasibility			

Green

Medfield Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.org			
H-M-L: Priority for action over the short or long term (and Ongoing) V = Vulnerability S = Strength				Top Priority Hazards			
Environmental Features	Location describe here in words or mark it on map	Ownership identify private, public, etc.	V and/or S	Extreme Heat/ Heat Waves	Inland and Riverine Flooding	Extreme Cold/ Winter Storms/Snow	Drought/Fire
				ACTIONS - list below			
open space protections		Municipal + Trustees/Resident	S/V	- Examining by-laws + zoning to maintain open space - Transfer of Development Rights			
Tree Canopy		private	S/V	# benefits			
→ Flooding/wet				① Tree Warden → Town Tree Plan including requirements for new developments			
- Drought + fire				education programs for private prop. owners			
- Pests/diseases/fungus				② Tree replanting requirements plan when they are removed			
- Storm damage/ice				③ Guidelines on tree species + education for municipal prop. + private property			
Brush Fires - open burn season			V	④ Address invasive species			
Charles River Natural Valley Storage Area	along border of Maloney	Army Corps of Engineers	S/V	① Permitting + guideline for open burn season			
Water Quality restriction + potential run-off			V	① MS4 process (ongoing) ② Education programs ③ Green infrastructure + LID requirements for new construction			
Water - supply (drinking)		Town policy	V	Drought → ① programs/parts (voluntary) created long term plan for drinking water ② over water use (ex. fees/restrictions/enforcement) ③ New well/water sources? storage			
Multi-municipality systems = water			V	① CRMA coalition (starting) ② formal coalition on climate/infra. cross multi share equipment etc... joint procurement			
Hinkley Pond - water quality		Rec Dept.	S/V				
Swimmable Areas				More water testing/monitoring + public information on water quality			
Charles River			S/V	→ town website Lakes + Ponds Association			
Neponset River			S/V	- Downed tree removal along rivers More information			

GREEN

Medfield Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

2-3-15 Priority for action over the Short or Long term (and ongoing)
V = Vulnerability S = Strength

Infrastructural Features	Location (describe here in words or mark it on map)	Ownership (identify private, public, etc.)	V and/or S	Top Priority Hazards				Priority	Time
				Extreme Heat/ Heat Waves	Inland and Riverine Flooding	Extreme Cold/ Winter Storms/Snow	Drought/Fire		
Water + sewer at capacity/ Flooding	#10	private	✓	ACTIONS - list below Loop into study below → water + sewer taskforce + plan → MS4 study (starting now) → sewage capacity study → New well study				H	S/ongoing
Septic - infiltration issues			✓						
Bridge at Flooding			✓						
Wells #6	#10 #2		✓						
RT 109 + Causeway (Flooding)		State + community local + Miller	✓	Transportation Vulnerability study - Major. avac. routes + feasibility - elevation of ROAD (Feasibility)				H	S/L
Gas lines - Bridge crossing		Utility	✓	More information needed on risks/vulnerability					
Capped Landfill			✓/S						
Rail lines		State	✓						
Bridge at Elm St. at Phillip St.			✓	Access bridge vulnerability + promise improvements/upgrades					L
Hotspots at Schools			✓						
Jewels Pond management		private	✓	Solar parking canopy + green community → ACTION @ study (GIS) overlaying flooding + culverts				H	S
Fork Factory Mill pond		Trustees of Reservation	✓	Small 10-12 inch along millbrook rd. * 2 Create action plan to address them → fix + maintenance including outreach program → Storm drains + culverts cleanout → communication plan w/ mill pond operators/owners					S
Underside Retention ponds	at old paper	private	✓						S
Exit Rds to 29 + 109	to 29		✓						

* find out if studies happening on beaver population + watershed management

Appendix D Top Priority Actions Voting Results

Category	Action	Dot Count
Environment	Feasibility on water conservation measures, regulations, and incentives. Require irrigation system permits. Avoid drinking water plant replacement of \$8 million	● ● ● ● ● ● ● ●
Infrastructure	Raise route 109 roadway over Charles River. Collaborate with Millis on a feasibility Study and Stat plan repair	● ● ● ● ● ● ● ●
Infrastructure	Cool the High School Urban Heat Island with Green Roof, Solar Panels, and Tree Planting	● ● ● ● ● ● ● ●
Infrastructure	Generator at Council on Aging-secure funding and install	● ● ● ● ● ● ● ●
Environment	Outreach and education on best management practices for MS4 and clean water quality.	● ● ● ● ● ● ● ●
Society	Welcome new residents with an outreach program. Recruit new volunteers and update the website regularly.	● ● ● ● ● ● ● ●
Environment	Town-wide tree plan for maintenance and Planting, education/outreach on importance of trees and species of trees. Create requirement for tree planting with new development. Consider forest management on public and private land.	● ● ● ● ● ● ● ●
Society	Improve relationship between Town and new residents. Ensure town services are accessible to new residents.	● ● ● ● ● ● ● ●
Environment	Update and Strengthen Stormwater Bylaws and Regulation	● ● ● ● ● ● ● ●
Infrastructure	Engineering study to determine repairs needed for Danielson Pond dam	● ● ● ● ● ● ● ●
Infrastructure	Culvert capacity design and maintenance study	● ● ● ● ● ● ● ●
Infrastructure	Feasibility on sewer system capacity/usability w/high water table and extreme precipitation. Connect to MS4 compliance.	● ● ● ● ● ● ● ●

DRAFT May 2019

Medfield Community Resilience Building Workshop-Summary of Findings.

Category	Action	Dot Count
Environment	Develop Brush Fire Mitigation Plan including emergency response and mutual aid.	
Environment	Work to become a Community Preservation Act Community	
Environment	Increase enforcement on overloaded trucks and idling.	



