Rumney Marsh - Image Source: Kevin Davis

Town of Saugus
Community Resilience Building Workshop
Summary of Findings
May 2021

ACKNOWLEDGEMENTS AND CREDITS

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Jeannie Meredith	Aide, Town Manager's office, Project Co-coordinator
Scott Crabtree	Town Manager
Ronald Giorgetti	Assistant Police Chief
Kevin Murphy	Police Department
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Brendan O'Regan	Director of Public Works
Debbie Nickolas	Inspectional Services
Todd Baldwin	Town Engineer
Michael Newbury	Fire Chief
Paul Rupp	Town Consultant

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Summary of Findings

Overview

Recent years have seen notable weather extremes in Saugus. The record rainfall of April 2010 resulted in a disaster declaration across the Commonwealth of Massachusetts. The winter of 2015 brought record-breaking snow, resulting in downed trees and power outages. The following year the Saugus area was under a drought warning from July to December 2016, the most severe since the 1980s. The winter of 2018 once again brought severe winter storms with a succession of four nor'easters pummeling the town in March, also resulting in a state disaster declaration. Globally, the past five years are the hottest in recorded history.

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

The Town of Saugus, seeking to be proactive in addressing future climate threats, applied for a state grant to complete the Community Resilience Building (CRB) Workshop under the MVP program. Concurrent with the MVP program, Saugus is updating its Hazard Mitigation Plan (HMP). The HMP is a five-year plan, developed under the auspices of FEMA, that identifies strategies to address natural hazards. Upon completion of the projects, the Town of Saugus will be eligible to apply for state and federal grants to address natural hazards and climate risks.

The Town of Saugus is partnering with the Metropolitan Area Planning Council (MAPC) to complete the MVP program and the Hazard Mitigation Plan. The MVP Core Planning Team identified and recruited community stakeholders to participate in the one-day CRB Workshop. Forty-five people representing Saugus town staff, members of Saugus Boards and Commissions, and Saugus community organizations gathered on January 14, 2020. The central objectives of the workshop were to:

- Define top local natural and climate-related hazards of concern;
- Identify existing and future strengths and vulnerabilities;
- Develop prioritized actions for the Community;
- Identify immediate opportunities to collaboratively advance actions to increase resilience.

Materials provided for the workshop included local and regional data for changes in temperature, precipitation, and sea level recorded to date, as well as future projections to the end of the century. Posters provided data and mapping specific to Saugus infrastructure, demographics, and natural resources (see **Appendix A**). The participants considered Saugus' strengths and vulnerabilities focusing on infrastructure, society, and the environment. Working in small groups, and then together in a large group, they prioritized actions designed to increase Saugus' resilience to future extreme weather events.

Top Hazards and Vulnerable Areas

The Core Planning Team identified the top natural hazards. Based on their recent work on the Hazard Mitigation Plan and review of workshop materials, the team identified flooding, heat waves, severe storms (wind, ice, snow) and drought as the climate hazards of greatest concern facing Saugus. Flooding, drought, and severe storms have affected Saugus in recent years. Considering town demographics, the team also included extreme heat as a top hazard.

Top Hazards

- Flooding
- Heat Waves
- Severe Storms (wind, ice, snow)
- Drought

Current Concerns and Challenges Presented By Hazards

Participants and Town officials noted the increasing frequency and intensity of storms, including heavy rain events; the recent period of drought; and nor'easters that brought damaging winds and snowfall. The principal threats from nor'easters are power outages and damage from falling trees and limbs, as well as travel restrictions due to heavy snow. Large rain events result in flooding when local streams exceed their banks, as well as when stormwater drainage capacity is exceeded and when groundwater levels are high. Droughts are harmful to local aquatic resources and vegetation. Participants expressed concern for East Saugus, which experiences chronic flooding during these storm events. As these issues are not new, the Town of Saugus, through its emergency management activities and hazard mitigation planning, has taken many steps to prepare for extreme weather and prevent harm to people and property. Workshop participants shared concerns that climate projections will heighten current challenges, particularly flooding, water quality and supply and, damage to, and from, trees.

AREAS OF CONCERN

Geographic:

Some of Saugus' climate challenges are widespread across the town. These include power outages and damage from falling trees. Most of the geographic areas were identified for their propensity to flood. Saugus is subject to two kinds of flooding; coastal flooding where wind and tide leads to flooding along the shore and tidal waterways and inland flooding where the rate of precipitation or amount of water overwhelms the capacity of natural and structured drainage systems to convey water causing it to overflow the system.

Stormwater flooding, as evidenced by the flood claims from 2010, is concentrated in the more densely developed eastern portion of town. Areas along the Saugus River Participants cited areas along the stretch of Route 1 that runs within Saugus as a source of multiple concerns including flooding and excessive heat. Another concern identified was the potential for toxic releases, particularly in the event of flooding at current or former industrials sites. These include the Salem Turnpike and the Wheelabrator waste facility near Rumney Marsh.

Hurricane Irene

Image Source: https://saugus.wickedlocal.com

Societal:

Potential vulnerable populations identified include older adults, low-income residents, limited English language speakers, people with disabilities, and people who work in Saugus but live elsewhere. Many participants highlighted the large number of assisted living, nursing home, and

senior housing facilities located in Saugus. The other concern identified was the need to communicate with residents for whom English is not their first language.

Participants expressed concern that language and cultural differences impede important emergency preparations and identified the need to overcome cultural differences in developing strong relationships and communication. Workshop participants prioritized outreach and assistance to assure that facilities are prepared to manage emergencies, as well as direct outreach to older adults and limited English language speakers.

Environmental:

Water quality and marsh protection were key environmental concerns. Protection of the Rumney Marsh Area of Critical Environmental Concern (ACEC) was highlighted, as was concern that chemicals or pollutants from industrial areas or previous contamination could impact water quality, particularly in the event of flooding. Participants expressed strong concerns about the Wheelabrator landfill site along Route 107and the effect of its ash on people and the environment, particularly on the Rumney Marsh ACEC.

Potential impact to water quality was also noted, while Saugus has Surface Water Protection Areas around the ponds that supply drinking water for Lynn, the town has no Groundwater Protection Areas. Additionally, the need for forest and tree management was highlighted by several participants. Concerns include managing fire, pests, and invasive species. Strategies to protect existing trees and encourage tree planting were also highlighted.

Infrastructure:

Specific infrastructure concerns included flooding threats to low lying East Saugus neighborhoods, the Hamilton Street bridge, and the tide gate at Ballard Street. Undersized stormwater capacity is an on-going concern however, the town is currently in the process of completing a Stormwater Master Plan that will identify, address, and alleviate several town-wide flooding issues. Other infrastructure concerns highlighted include critical facilities that currently lack generators or generator hookups and the need for a new westside fire station.

CURRENT STRENGTHS AND ASSETS

Workshop participants identified numerous Saugus strengths and assets that will support resilience to future climate impacts. As shown below, participants identified many town strengths across environment, infrastructure and society.

Environment

- This MVP process helps! The last 5-10 years has seen good plans; $25mil to fix sewer system (very well attended MVP!)
- Planting more trees all the time
- Breakheart Reservation, Lynn Woods- tree canopy

- Protected forest land (i.e. Breakheart, Iron Works)
- Solar farm behind DPW provides (25-50% municipal electricity)
- Protection of natural resources including; Breakheart Reservation+ Rumney Marsh (environmentally sensitive)
- Protected open space and Lynn water supply
- Saugus River (recreation fisheries)
- Wildlife in forests
- Tree farm & trees on town land; planting program supported by Town
- Conservation- 42 acres behind mall, town land-wetland
- Breakheart Area: utilities go through a firebreak which provides refuge to inner core, but the state wants to pave the area which would not be good
- MWRA has no water bans; good plans
- Breakheart Reservation, many natural areas Camp Nihan/Saugus Iron Works
- Bike paths; follow Rail Trail
- State management helps maintain open space areas
- Boy Scouts, Saugus Watershed Council; organize several cleanups throughout the year
- Cluster development regulations
- Currently Open Space and Recreation/Master Plan in the works to look at how to strengthen nature-based solutions

Infrastructure

- New Fire Station (westside)
- Steady drinking water supply
- Schools- new high school generator, YMCA, mall (potential shelters)
- Good highway access to Route 1(evacuate 128)
- Good personnel in public safety and public facilities that know what they are doing (all town officials)
- Three schools closing (Waybright, Oaklandvale, Lynnhurst) could be re-used
- Technology offsite storage- Servers, cloud infrastructure
- Ballard School is vacant and could be redeveloped. Housing Authority is interested in it
- Some neighborhoods have steady/reliable electric source (Cliftondale)
- Nice new high school
- Strong schools & public facilities
- New waterline/pump stations
- Ongoing water sewer maintenance program
- Solar farm
- New stormwater guidelines/regulations
- Hired town planner
- Middle & High school for shelter use
- Power is something that is well built out with redundancy connected to other cities/town
- Waste plant in town makes it easy for people to address trash during emergency
- 3 Schools going offline the town can think of ways to repurpose the facilities
- Some town buildings have generators

- Urgent Care on Route 1
- Town is reviewing/assessing all dams
- Looking at communication infrastructure underway

Society

- YMCA provides financial assistance to cover membership
- Senior meals program has an emergency protocol
- Fire Dept.- Emergency Management
- Local TV shows emergency alerts
- Communications support coordination for homebound seniors
- Residential lock box program/need more outreach
- Town resources- $10 Mil. Stabilization
- Active youth sports programs & playgrounds, trails
- Snow removal volunteer program/high school students
- Reverse 911 is in place, the town is working to sign people up town-wide
- Some strong religious congregations
- Home safety programming for seniors
- Senior center, well-used relatively new center
- Multilingual/multi-cultural language programs for seniors
- Senior center in town
- Changing demographics have also helped new projects get passed like the high school
- Nursing home emergency preparedness capacity making efforts
- Youth and recreation center and YMCA that connects with youth and families
- Life support in place that utility has to plan/support people in town
- YMCA
- Strong Veteran support
- Public Safety uses tablet based digital translation and medical flip guides
- Strong church foundation
- Active public library
- Strong veterans programs
- Media communications
- Many community building events
- Blood bank, mutual aid
- Televised local meetings/local TV station, good for communications
- Faith based organizations are in place and have strong ties to the community
- Lots of volunteer programs/infrastructure
- Public library
- Strong Parent Teacher Organization (PTO)
- Healthy Kids programs
- Faith Communities-host community events, have kitchen facilities
- File of Life program
- Food Bank Program

TOP RECOMMENDATIONS TO IMPROVE RESILIENCE

Each of the five workshop groups identified vulnerabilities and suggested solutions. The solutions were prioritized as High, Medium, or Low. Each group then identified their five highest priorities. There was overlap in the top priorities of the five groups. The top five priorities were highlighted by more than one table group. Nine distinct areas of focus emerged from the twenty three highest priorities identified by the groups. The participants voted for their personal top four priorities from among the table group priorities. The highest priorities are listed below in order of the number of votes they received. See Appendix B for all the recommendations.

Highest Priorities

Stormwater: Stormwater management was identified as a top priority. Suggestions included providing adequate funding for recommended stormwater repairs, upgrades, and retrofits identified in the town's upcoming Stormwater Master Plan.

Build a new fire station: Several groups proposed that a new public safety building/fire station be built on the town's westside.

Develop communication strategies: Several groups proposed targeted outreach to specific populations including seniors, low income residents, limited English language speakers, people with disabilities, people with cell phones, and people who work in Saugus but live elsewhere. Suggestions include collaborating with religious, community, and non-governmental organization (NGOs) to develop a plan to ensure effective and comprehensive communication. The plan should identify and address potential barriers to communication including cultural and religious differences.

Create a disaster response plan: The plan should include evacuation strategies and target outreach to residents and vulnerable populations who live along streams and wetland areas known to flood.

Ensure robust infrastructure: Consider cyber security, redundancy, and generator backup.

Marsh and Wetland Protection: Provide public education on the value and importance of wetlands and build support among local and state agencies to implement the Rumney Marsh Restoration Plan

Tree Canopy and Open Space: Care and maintenance of the town's existing tree canopy and planting of new trees were important resilience actions identified at the workshop in addition to the acquisition of open space parcels.

Participate in CRS: Participate in Community Rating System (CRS) to inform and educate residents and businesses and reduce flood insurance rates. Update zoning and floodplain regulations.

Clear brooks and streams of obstructions: Town brooks and streams need to be cleared of debris to prevent flooding. Continue to monitor and review separation of sewer waste and stormwater. Continue and expand annual efforts to prevent infrastructure damage and erosion.

High Priorities

- Examine climate resiliency planning efforts both locally and on state/federal level and develop resilient zoning and climate initiatives.
- Fix drainage problems (infrastructure and operations/maintenance projects)
- Secure funding for a feasibility study and gather community support to build a new westside fire station. Incorporate climate resilience into building design.
- Work with Highway department to elevate town roads and bridges.
- Work with MBTA to elevate the train tracks
- Moving forward with funding and implementation of Rumney Marsh Area planning efforts.
- Improve communications on emergency preparedness and evacuation plans.
- Explore the use of nature-based solutions such as berms to address flooding in East Saugus.
- Work with state & local officials to elevate options for flood control with the least environmental impact.
- Focus on better communication and collaboration between residents, community organizations and state agencies.
- Strategically expand generators to additional public town facilities.
- Increase awareness of town facilities and communications systems.

Medium Priorities

- Assess and follow-up on the State's progress for repairing the old tide gate; Outfall at Rumney Marsh
- Conduct outreach to residents to get public input on redevelopment opportunities.
- Continue plant trees strategically and increase tree maintenance.
- Require strong stormwater management for new development, including sewer banks
- Identify older underground water supply pipes; do strategic repairs as recommended in the Stormwater Master Plan.
- Coordinate with FEMA to try and alleviate the costs of flood insurance; educate homeowners on the benefits of flood insurance; incentivize elevated buildings, which reduces premiums.
- Increase funding for schools, consider new/ innovate teaching methods to improve school performance and cultivate better leadership
- Increase outreach and provide translated materials to non-English speaking communities about available town services.
- Job development; provide a commercial fisherman subsidy to account for lobster migration – loss of revenue for fishermen
- Develop a plan for wildfires and brushfires in difficult to access locations; Be preventative, not reactive
- Promote regional coordination with an eye towards resilience, opportunities for green infrastructure
- Maintain pump stations and substations (especially Floyd St./ Bristow St. / Lincoln Ave.) to prevent overwhelming the Saugus River system with stormwater pumping.

- Communication with authorities to address highway flooding near Guard St. neighborhood (Reservoirs w/levees, floodgates)
- Improve communications with National Grid; to address gas leaks, coordinate paving and gas upgrades.
- Organize volunteers to provide education, communication, and assistance to the public on flood preparedness
- Promote the use of more electrical vehicles and charging stations; Promote bike paths and trails to reduce emissions from cars on Route 1
- Provide education and resources around funding to raise homes and evacuation
- Consider solar installations on municipal roofs
- Advocate for future enhancements of Rumney Marsh (influx for years)
- Analyze and plan for the need for additional emergency shelter locations
- Establish alternative strategies for communication with seniors using town services
- Coordinate with MBTA and the state to increase parking at T stations/commuter rail; Support extension of blue line to Lynn; Increase park & ride opportunities.
- Monitor and enforcement illegal dumping; partner with commercial property owners to improve cooperation and enforcement; make it easier to dispose furniture and other large goods by organizing a large waste collection day.
- Study issues associated with Route 1, including, traffic, hot spots, and air quality.
- Assess the need for upgrades to town dams
- Connecting to other communities/state on moving things forward
- Have Planning Department conduct a study that investigates the potential repurposing and programing of school facilities that are going offline
- Clear town rivers and brooks of trees, clear stormwater outfalls, remove sediment.
- Partner with DPW to create a program to collect waste to address illegal dumping

Low Priorities

- Work with seniors, and those who may distrust emergency responders, to make connections to emergency response and use community programs to incentivize sheltering programs during emergencies.
- Establish ESL programs for parents; Provide translation services/resources for emergency notifications
- Investigate how other communities map and track the transport of hazardous materials on roads and highways
- Improve outreach, the town is actively working on outreach to seniors and vulnerable populations; There are active community organizations, but they are not well promoted.
- Look at demographic data going forward to determine how to better serve non-English speaking residents in the future
- Under control and actively being worked on by utilities/partners
- National Grid is doing a good job with outreach and communication with partners
- Find the balance between planting and maintaining older/mature trees in town

No Priority Listed

- Snow removal volunteer program; identify other avenues for volunteer support; Explore partnership w/chamber of commerce/businesses.
- More air pollution monitoring & community-supported analysis of Wheelabrator facility.
- Build a new fire station at Walnut St. or Forest St. Fells; Data informed decision "Verification of data w/call logs for fire; response times"
- Continue water sewer maintenance program, stable funding sources.
- Repaint/repave/ground off faded and damaged crosswalks
- Tree ordinance enforcement
- Public education on flooding risks and protective actions
- Enforce cluster developments to prevent displacement of wildlife.
- Look into flood control of the tides in the area. Dialogue with state and federal partners about sea-level rise
- Protecting coastline/working with state and federal partners; to redesign Hamilton Street bridge.
- Collaborate/Communicate with nonprofit organization (NGOs)to expand the Town's food bank program

LISTENING SESSION

The Saugus Community Resilience Building workshop was held on January 14, 2020, just eight weeks before the Commonwealth of Massachusetts declared a Public Health Emergency due to the COVID-19 pandemic. Normally a Public Listening session would have been held after the workshop, but in the Spring of 2020 the Town had to postpone that due to restrictions on in-person meetings.

Initially it was hoped that the Listening Session might be rescheduled to the Fall of 2020, but when it became apparent that the Coronavirus pandemic would not be over by late 2020, the town moved ahead with an alternative plan. MAPC prepared an online remote Listening Session that consisted of a video recording of a presentation summarizing the workshop and a copy of the draft MVP report, accompanied by an online Qualtrics poll that enabled participants to indicate their highest priority climate actions, and leave other feedback and comments. This process was launched through a dedicated web page for the Saugus MVP project at:

https://www.saugus-ma.gov/planning-and-economic-development/pages/municipal-vulnerability-preparedness-mvp-listening-session and https://www.mapc.org/resource-library/saugus-feedback/

For the online poll, participants were shown the highest priority climate actions identified at the workshop were and asked to vote for the three actions they ranked as most important. The actions included measures related to all three sectors, infrastructure, social, and environmental. The results of the polling preferences are summarized in the following table.

The overall highest preference, with 5 votes, or 23%, was for a disaster response plan that targets residents and vulnerable populations that live along streams and wetland areas that flood.

Two climate actions received 4 votes, or 18% each: stormwater repairs, upgrades, and retrofits identified in the town's upcoming Stormwater Master Plan, and Marsh and Wetland Protection, building support to implement the Rumney Marsh Restoration Plan.

Summary of Online Poll Results to Prioritize Climate Actions

Rank	Climate Action	Number of votes	Percent of Total
1	Create a disaster response plan: The plan should include evacuation strategies and target outreach to residents and vulnerable populations who live along streams and wetland areas known to flood.	5	23%
2	Stormwater: Stormwater management was identified as a top priority. Suggestions included providing adequate funding for recommended stormwater repairs, upgrades, and retrofits identified in the Town's upcoming Stormwater Master Plan.	4	18%
3	Marsh and Wetland Protection: Provide public education on the value and importance of wetlands and build support among local and state agencies to implement the Rumney Marsh Restoration Plan.	4	18%
4	Clear brooks and streams of obstructions: Town brooks and streams need to be cleared of debris to prevent flooding. Continue to monitor and review separation of sewer waste and stormwater. Continue and expand annual efforts to prevent infrastructure damage and erosion.	3	14%
5	Develop communication strategies: Several groups proposed targeted outreach to specific populations including seniors, low-income residents, limited English language speakers, people with disabilities, people with cell phones, and people who work in Saugus but live elsewhere. Suggestions include collaborating with religious, community, and non-governmental organization (NGOs) to develop a plan to ensure effective and comprehensive communication. The plan should identify and address potential barriers to communication including cultural and religious differences.	2	9%
6	Build a new fire station: Several groups proposed that a new public safety building/fire station be built on the town's west side.	1	5%
7	Ensure robust infrastructure: Consider cyber security, redundancy, and generator backup.	1	5%
8	Tree Canopy and Open Space: Care and maintenance of the town's existing tree canopy and planting of new trees were important resilience actions identified at the workshop in addition to the acquisition of open space parcels.	1	5%
9	Participate in CRS: Participate in Community Rating System (CRS) to inform and educate residents and businesses and reduce flood insurance rates. Update zoning and floodplain regulations.	1	5%

In addition to polling on the priority climate actions the survey also provided an opportunity for participants to share comments and suggestions with the town. Comments were received from four participants, and are shown below:

Public Comments on the Saugus MVP Project from the Post-Workshop Poll

November 17, 2020

Q3. Would you like to recommend any additional strategies? Please describe them here

- Marsh and Wetland Protection: Provide public education on the value and importance of wetlands and build support among local and state agencies to implement the Rumney Marsh Restoration Plan

Q4. Please share any further observations, concerns, or questions.

- Dikes may not solve flooding problems as groundwater behind dikes will rise with the sea level changes and tidal forces. New development in the flood plain should be prohibited, or at least, elevated on pilings. The report mentions a state-owned tide gate. I think this is in error. The Town is currently planning on replacing the Ballard Street Tide Gate which is a Town (not state) responsibility. Since salt marshes need salt water for survival and to control invasive species like Phragmites, tide gates if they reduce salt water flow, will cause taller and denser growth of Phragmites which in turn blocks drainage ditches, creates fire hazards, and increases mosquito problems as fish cannot eat the mosquito larvae if they cannot access the marsh.

January 2. 2021

Q3. Would you like to recommend any additional strategies? Please describe them here

- Enact and enforce reality-based Land Subject to Coastal Strom Flowage Bylaws. Discontinue the historic practice of "spot zoning" in the ACEC. Hire a Flood Plain Manager.

Q4. Please share any further observations, concerns, or questions.

- Immediately act to re-establish a robust SEMA group.

December 10, 2020

Q3. Would you like to recommend any additional strategies? Please describe them here

- Flood Gate

Q4. Please share any further observations, concerns, or questions.

- We live on Venice Avenue in Saugus and had horrible flooding into our house twice in 2018.

December 30, 2020

Q3. Would you like to recommend any additional strategies? Please describe them here

- On communication strategies: As a concerned Saugus resident, homeowner, taxpayer and lifelong coastal citizen, I am keen on the success of this MAPC MVP endeavor. I also wonder if my involvement in this effort would be useful. I have done a fair amount of public and private digital and public communication training and leading public and private organizations using well-researched and highly developed communication science and strategy. I have personally helped public and private organizations succeed in making lasting change i.e. making sustainability sustainable (not a typo). I have participated in, and witnessed firsthand the positive economic and societal benefits of, well-designed and well-executed digital and public communications. Sensitivity and active listening to learn how individuals and groups frame understanding and attitudes toward their collective and individual agency and empowerment to enact change has led to some breakthrough and lasting impact. My imminent retirement from my digital marking agency, with a personal involvement in the data driven, analytical approaches, combined with neurolinguistic and brain science ("why people buy"), has been particularly useful in helping numerous organizations, from F/G500 industry leaders to regional and small business operators, gain better traction by learning to serve their constituents and customers better. I know firsthand that the best-funded initiatives, featuring the best-led listening and communications programs, are a formula for success.

Q4. Please share any further observations, concerns, or questions.

- At a grassroots level, I am also available (pending my imminent retirement from my digital media and sustainability support business), to personally participate and support the planning, leadership and rollout of several high-priority initiatives identified in the MVP.

After the poll concluded, the Town provided an opportunity for a live, remote public listening session, combined with a public presentation about the closely-related Hazard Mitigation Plan. On March 18, 2021, the Saugus Planning Board hosted a public meeting via Zoom at which MAPC presented an overview of both the Municipal Vulnerability Project and the Hazard Mitigation Plan. MAPC is assisting the Town on both of these projects under its MVP Planning Grant from the Executive Office of Energy and Environmental Affairs.

Following the presentation, public commenters included Ed Reiner, EPA, and Debra Panetta, Board of Selectmen. Mr. Reiner's remarks focused on higher tides in East Saugus, with water levels higher on the Saugus River than the Pines River. He pointed out that flows have been altered by the Route 107 bridge, the MBTA bridge, and fill in the area, resulting in an increase in the Mean High Water level of 0.6 feet. Debra Panetta addressed the breaching of the I-95 embankment, expressing concern for the potential release of ash into the ACEC (Area of Critical Environmental Concern). She noted that there are about 500 acres behind the embankment that would have to be remediated immediately.

CRB Workshop Invited Participants

First	Last	Title/Dept.
Pola	Andrews	Finance Director for Saugus Public Schools
Todd	Baldwin	Town Engineer
Jean	Bartolo	Town Meeting Precinct 6
Dan	Cameron	National Grid Rep (NGRID)
Anthony	Cogliano	Board of Selectmen Chairman
Jen	Conway	Saugus Family YMCA
Scott	Crabtree	Town Manager
Tom	Deon	Deputy Fire Chief
Ken	DePatto	Chair of the Finance Committee
Stephen	Doherty	Town Meeting Precinct 4
Susan	Dunn	Town Meeting Precinct 1
Janette	Fasano	MAPC Rep for Saugus
Ron	Giorgetti	Assistant Police Chief
Laura	Glynn	Housing Authority
Pam	Goodwin	Town Meeting Precinct 5
Wendy	Hatch	Town Treasurer
James	Hughes	Emergency Management
Vinny	Imperial	Building Maintenance
Mark	Johnson	MWRA
Mary	Lester	Saugus Watershed Council
Bob	Long	Town Meeting Precinct 9
Peter	Manoogian	Town Meeting Precinct 10
Frank	McKinnon	Conservation Commission
Alex	Mello	Town Planner
Jeannie	Meredith	Aide, Town Manager's office
Julie	Mills	Planning & Development for Glss
Debbie	Nickolas	Inspectional Services
Greg	Nickolas	Youth and Recreation Director
Brendan	O'Regan	DPW Director
Joanne	Olsen	Saugus Senior Center
Bob	Palleschi	
Brad	Palmer	MWRA
Debra	Panetta	Selectmen
Scott	Phelan	Emergeny Management
Stephanie	Puracchio	Conservation Commission/Board of Appeals
Ed	Reiner	EPA

First	Last	Title/Dept.
Corinne	Riley	Selectman
Peter	Rossetti	Town Meeting Precinct 2
Mathew	Scrivano	Town Meeting Precinct 6
Mike	Serino	Selectmen
Ricky	Serino	Legislative Aide Office of State Rep RoseLee Vincent
Bill	Stewart	Town Meeting Precinct 3
Alan	Thibeault	Library Director
Joe	Vecchione	Town Meeting Precinct 2
Jack	Walsh	Community Relations Rep.- Wheelabrator
Maureen	Whitcomb	Town Meeting Precinct 4
Judy	Worthley	Town Meeting Precinct 9

CRB Workshop Project Team

Saugus Core Team

Alexander Mello	Senior Planner, Project Co-coordinator
Jeannie Meredith	Aide, Town Manager's office, Project Co-coordinator
Scott Crabtree	Town Manager
Ronald Giorgetti	Assistant Police Chief
Kevin Murphy	Police Department
Fred Varone	Building Commissioner
Frank McKinnon	Conservation Commission
Brendan O'Regan	Director of Public Works
Debbie Nickolas	Inspectional Services
Todd Baldwin	Town Engineer
Michael Newbury	Fire Chief
Paul Rupp	Town Consultant

Facilitation Team

Courtney Lewis	Metropolitan Area Planning Council (Lead Facilitator)
Martin Pillsbury	Metropolitan Area Planning Council
Ella Wise	Metropolitan Area Planning Council
Jennifer Kaplan	Metropolitan Area Planning Council
Iolando Spinola	Metropolitan Area Planning Council
Lizzie Grobbel	Metropolitan Area Planning Council
Jeanette Pantoja	Metropolitan Area Planning Council
Sasha Parodi	Metropolitan Area Planning Council

CITATION

Metropolitan Area Planning Council. 2020. Town of Saugus Municipal Vulnerability Preparedness Program. Community Resilience Building Workshop Summary of Findings. Saugus, Massachusetts

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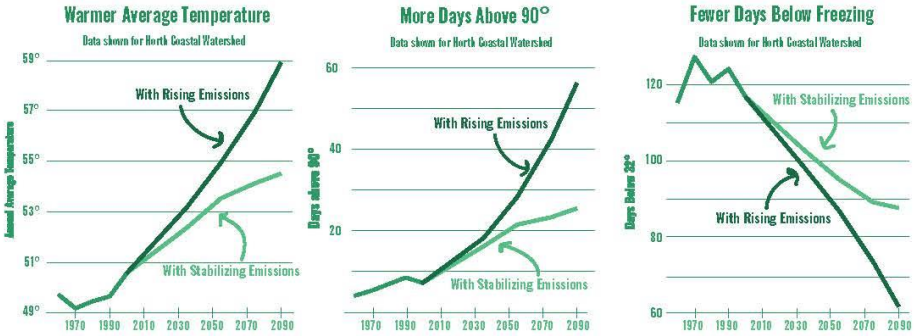
APPENDIX A– BASE MAPS AND WORKSHOP MATERIALS

Climate Change

Saugus and the North Coastal Watershed

Our climate is regulated by "greenhouse gases (GHGs)" that trap heat, including carbon dioxide, methane, and nitrous oxide. In the past century, the combustion of fossil fuels, our primary energy source in the age of industrialization, has increased the concentration of GHGs in the atmosphere, which has caused global temperatures to rise. If people 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, Saugus can expect...

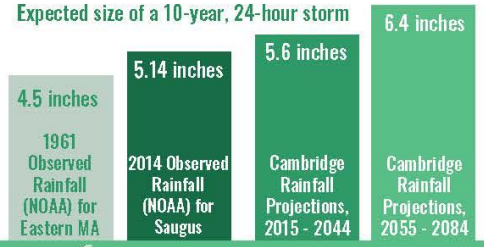
More Large Storm Events

In addition to increasing annual precipitation, climate change will bring more large storm events.

This will lead to more stormwater flooding, as most stormwater drainage has been sized to 1961 standards.

10-year, 24 hour storms refer to the 24-hour rainfall total for the biggest storm expected in a 10-year period.

Storm drains built for 1961 standards will be inadequate as rainfall increases



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 slightly.

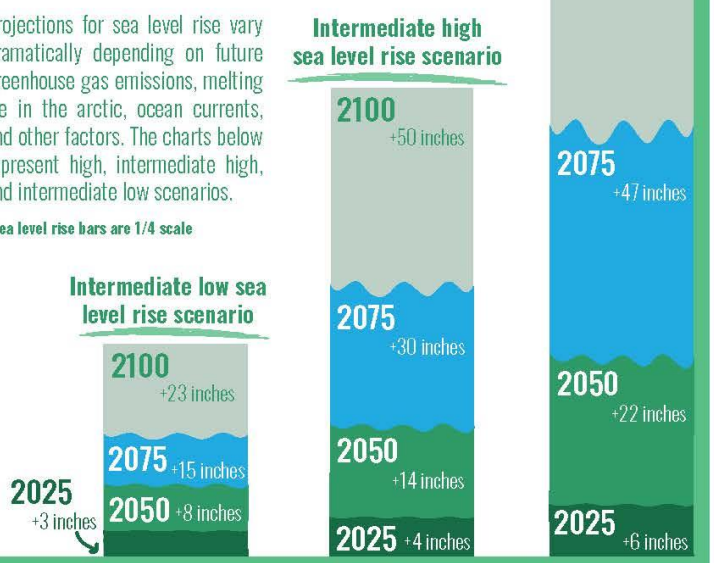
And more frequent droughts...

Due to the combined effects of earlier snowmelt, less rain, and higher temperatures, summer and fall droughts may become 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 high, intermediate high, and intermediate low scenarios.

*Sea level rise bars are 1/4 scale



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

Saugus
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.

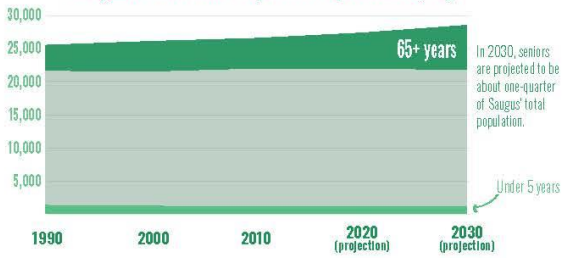
People who may have more difficulty adapting to, preparing for, or recovering from extreme weather events: Socioeconomic characteristics such as income and race can influence vulnerability to climate change. Low-income people are often more susceptible to financial shocks, which can occur after extreme 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 contraints and may need additional assistance during emergencies. They are also more likely to live alone than younger adults.

Saugus Recent and Projected Population by Age



Low-Income Households

37.7% ±1.8% of households in Saugus are low-income

8.5% ±1.8% of households in Saugus are below the poverty level

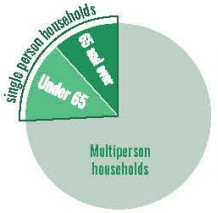
66.3% ±4% of Saugus seniors are low-income

37.7% ±3.5% of Saugus seniors are below poverty level

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

People Living Alone

People living along and people with limited English proficiency may have limited access to critical information, municipal resources, and social support systems that can bolster emergency response.



As of 2010, about 25% of Saugus households consisted of someone living alone.

Almost 50% of people living alone were over 65.

Limited English Speakers

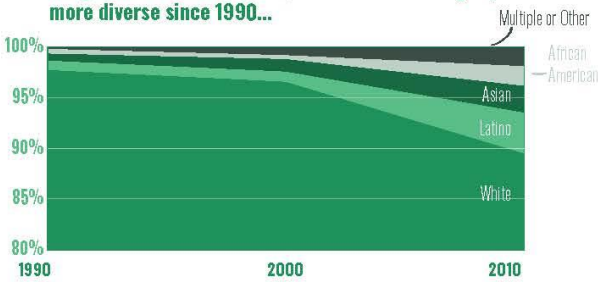
People Who Work Outside

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

Communities of Color

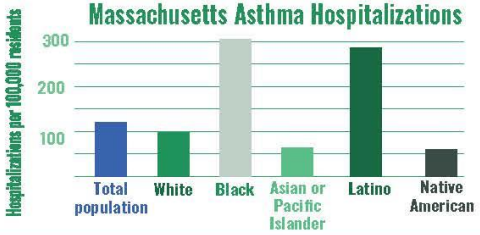
Particular racial or ethnic groups may also be more likely to have certain social vulnerabilities than others. For example, Black and Latino populations have a much higher rate of asthma hospitalizations than other groups. Heat waves and poor air quality can trigger asthma.

Saugus is about 90% white, but has become slightly more diverse since 1990...



People with Health Conditions

Massachusetts Asthma Hospitalizations



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

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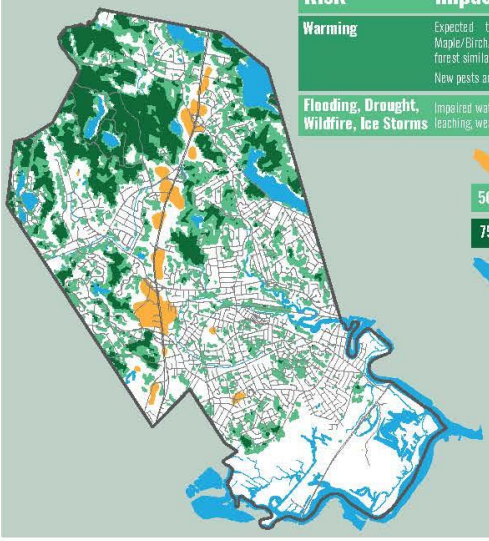
Saugus

Natural Resources

Natural Resources lessen climate impacts by absorbing and storing carbon dioxide and by serving vital protective functions. Forests, open space, wetlands, rivers, and streams protect drinking water quality and quantity, provide flood control, and give relief from extreme heat. Healthy ecosystems are more resistant to stresses from a changing climate and better able to protect against heat and flooding.

Trees

Trees are important in mitigating the impact of heat waves. According to the EPA, suburban areas with mature trees are 4-6 degrees cooler than new suburbs without trees. Shaded surfaces can be 25-40 degrees cooler than the peak temperatures of unshaded surfaces. Trees also absorb remarkable quantities of precipitation. Research has shown that a typical medium-sized tree can intercept as much as 2,380 gallons of rain per year (USDA Forest Service).

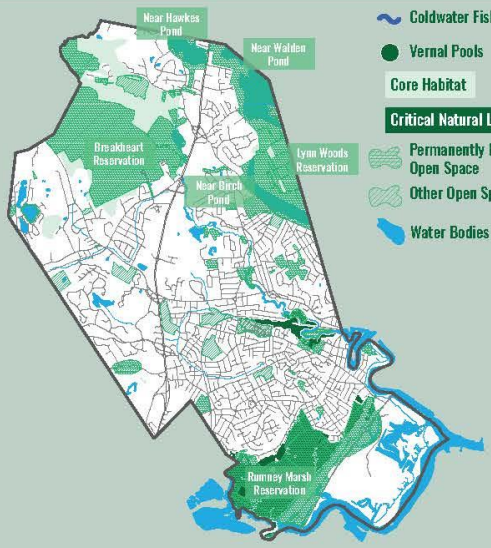


Risk	Impact
Warming	Expected to shift forest type from Maple/Birch/Beech forest to Oak/Hickory forest similar to New Jersey. New pests and diseases
Flooding, Drought, Wildfire, Ice Storms	Impaired waters, toxic exposure, contaminant leaching, weakened and damaged trees

- Hot Spots
- 50% – 75% Tree Cover
- 75% – 100% Tree Cover
- Water Bodies

Valuable Habitat

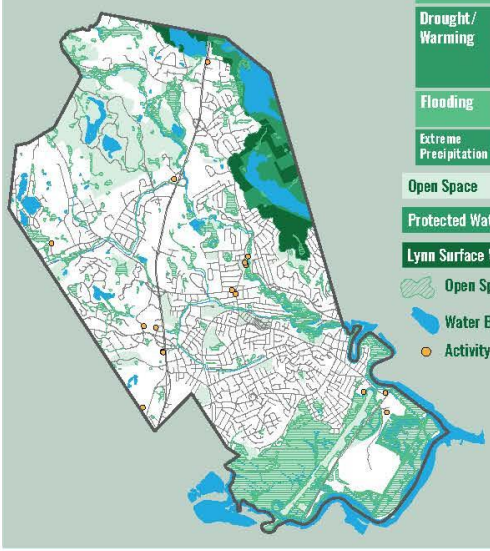
Core Habitat and Critical Natural Landscapes are state-identified intact landscapes, or exemplary natural communities, that are better able to withstand climate stresses, and support the long-term survival of rare species and natural habitats.



- Coldwater Fisheries
- Vernal Pools
- Core Habitat
- Critical Natural Landscape
- Permanently Protected Open Space
- Other Open Space
- Water Bodies

Freshwater Resources

Saugus contains freshwater wetland systems that sustain critical ecosystem functions in climate change. These ecological assets protect drinking water quality and quantity, provide flood control, and maintain overall ecosystem health for climate resilience.

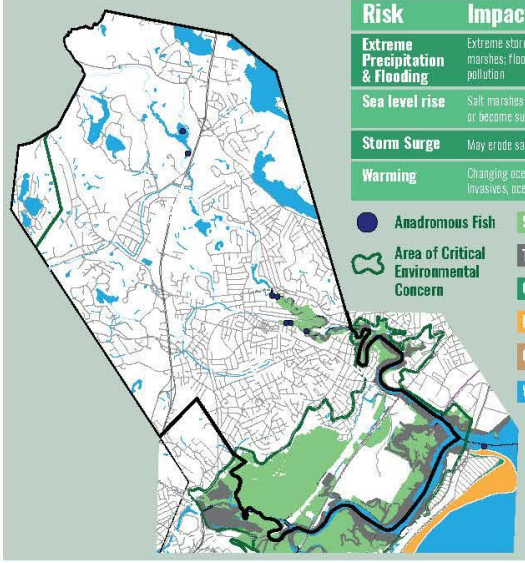


Risk	Impact
Drought/ Warming	Seasonal no-flow/ low-flow, reduced absorption capacity, diminished fish habitat, algal blooms, low dissolved oxygen, reduced drinking water supply
Flooding	Impaired waters, toxic exposure, contaminant leaching
Extreme Precipitation	Scouring, impaired waters, sewer overflows

- Open Space
- Protected Water Supply Area
- Lynn Surface Water Supply Watershed
- Open Space
- Water Bodies
- Activity & Use Limitation Sites

Coastal Resources

Saugus' coastal resources include open ocean, beaches, dunes, salt marsh, tidal flats, and coastal banks. These areas are highly productive ecosystems that provide critical habitat for fish, shellfish, and birds, as well as carbon sequestration and nutrient removal. Beaches, dunes, salt marsh, and bluffs all provide flood protection from storm surges.



Risk	Impact
Extreme Precipitation & Flooding	Extreme storms threaten to harm salt marshes; flooding increases non-point pollution
Sea level rise	Salt marshes need to migrate upland or become submerged
Storm Surge	May erode salt marshes and shoreline
Warming	Changing ocean species, new invasives, ocean acidification

- Anadromous Fish
- Area of Critical Environmental Concern
- Salt Marsh
- Tidal Flats
- Coastal Dune
- Beach
- Coastal Bluff
- Water Body

Sources
MassGIS (Bureau of Geographic Information); BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World; Massachusetts Department of Fish and Game; Massachusetts Department of Environmental

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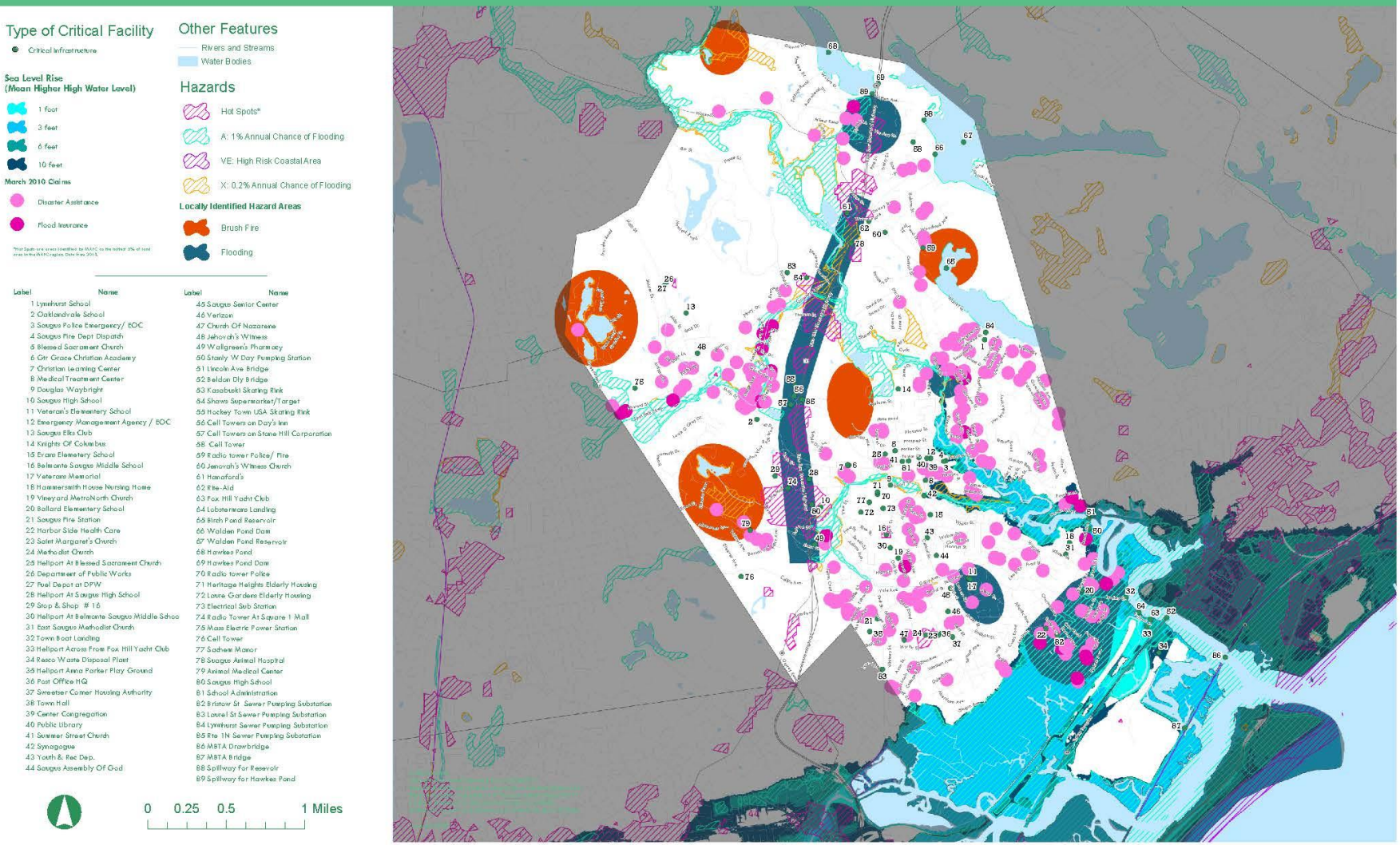
Critical Infrastructure

Infrastructure will be at risk to damage from flooding, and loss of function due to power outages. 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, although the .2% (500-year) flood zones may indicate where future flooding will occur. FEMA flood zones also do not generally capture stormwater flooding. That is, flooding that exceeds the capacity of current stormdrains and culverts. We don't currently have models that project where future flooding from larger rain events will occur. 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.



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Critical Infrastructure

Type of Critical Facility

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

Hazards

- Hot Spots*
- A: 1% Annual Chance of Flooding
- VE: High Risk Coastal Area
- X: 0.2% Annual Chance of Flooding

Locally Identified Hazard Areas

- Brush Fire
- Flooding

March 2010 Claims

- Disaster Assistance
- Flood Insurance

Sea Level Rise (Mean Higher High Water)

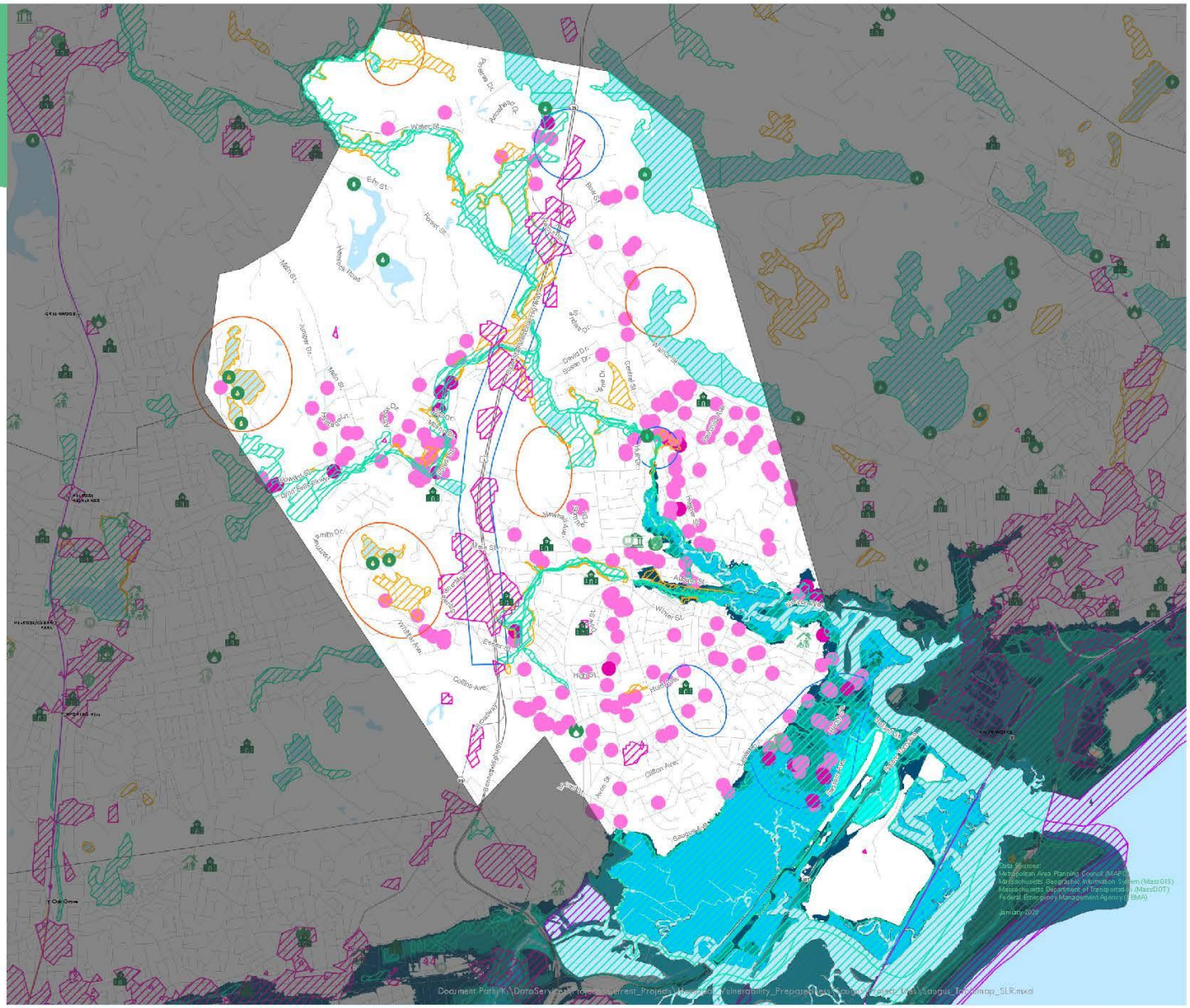
- Sea Level Rise (1 ft.)
- Sea Level Rise (3 ft.)
- Sea Level Rise (6 ft.)
- Sea Level Rise (10 ft.)

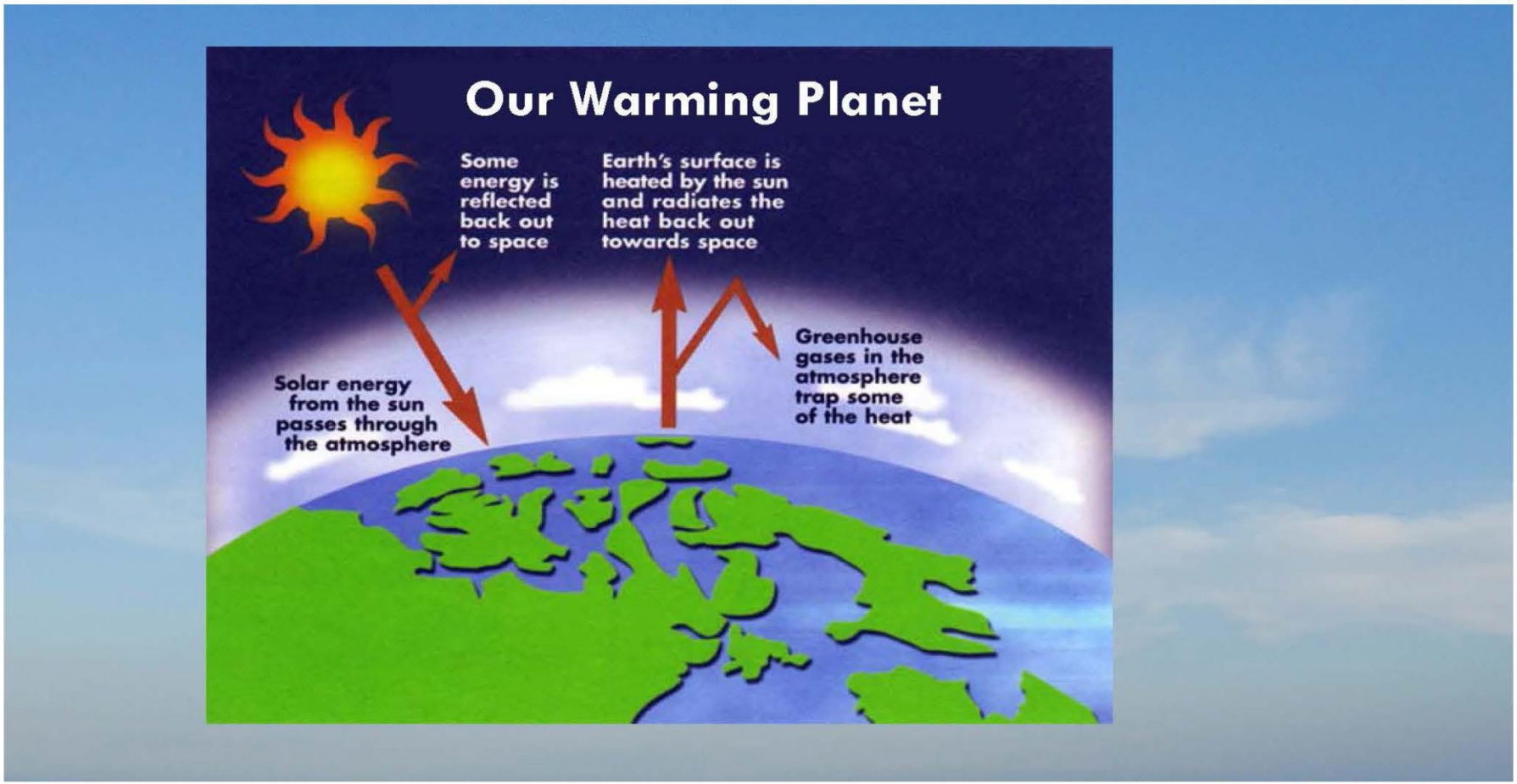
Other Features

- Rivers and Streams
- Water Bodies

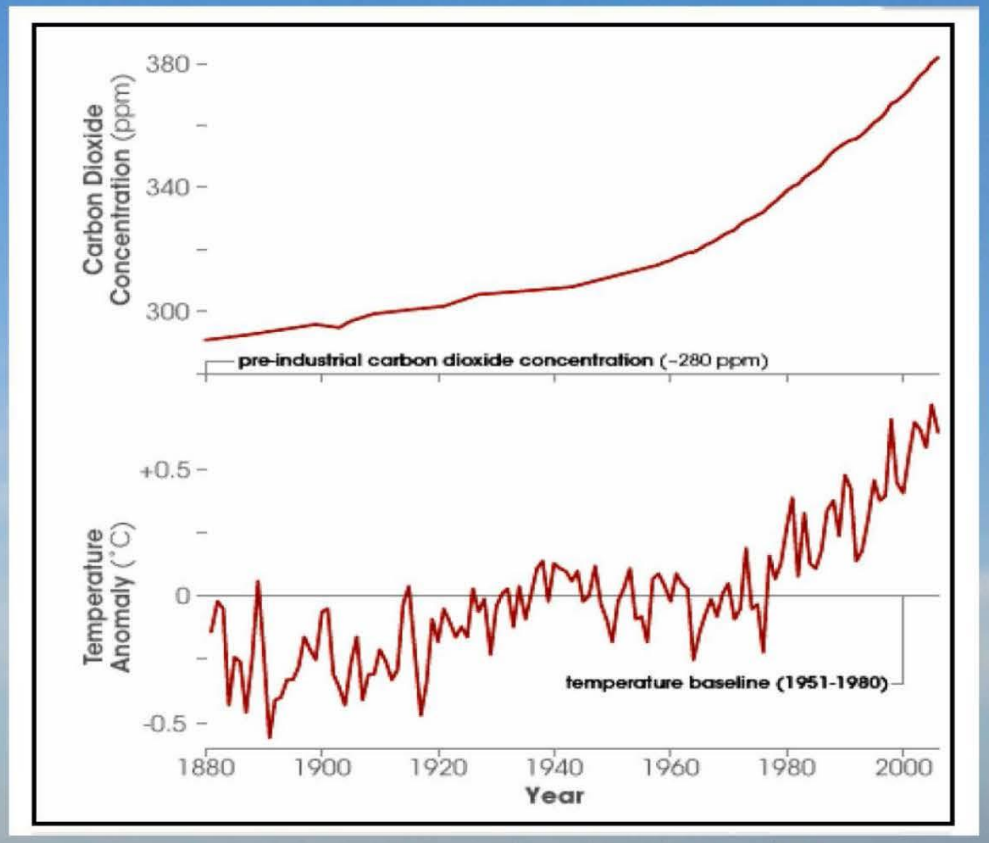
*Hot Spots are areas identified by MAPC as the hottest 5% of land area in the MAPC region. Data from 2016.

0 0.225 0.45 0.9 Miles




Our Warming Planet
Some energy is reflected back out to space
Earth's surface is heated by the sun and radiates the heat back out towards space
Greenhouse gases in the atmosphere trap some of the heat
Solar energy from the sun passes through the atmosphere

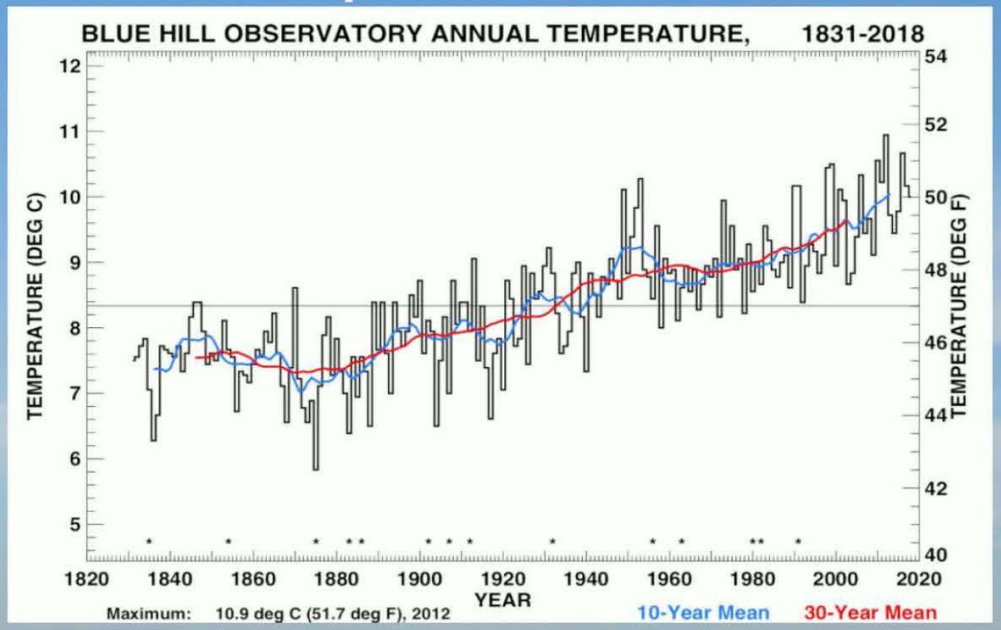
Global Temperature and CO_2 Trends



Source: MA Climate Change Adaptation Report 2011

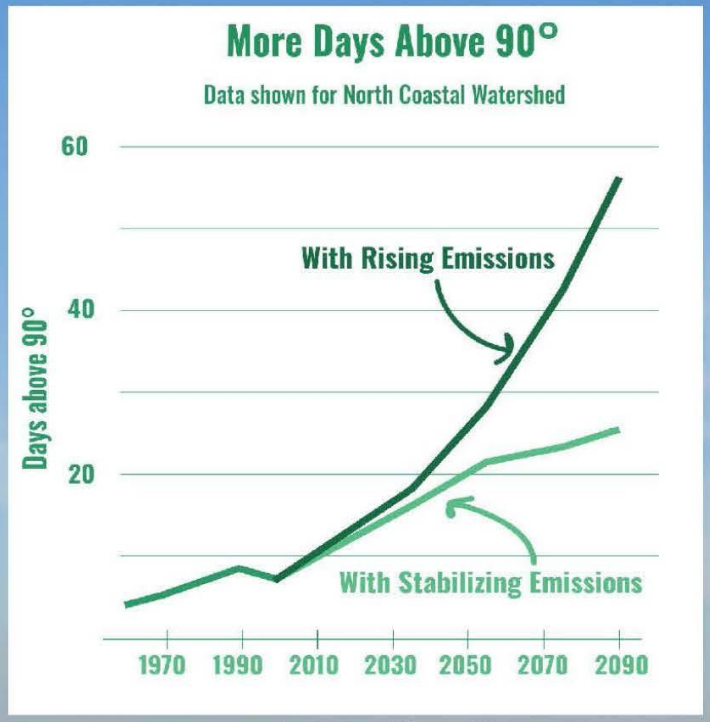
Temperature change: Observed

Nearly 3° F since 1831

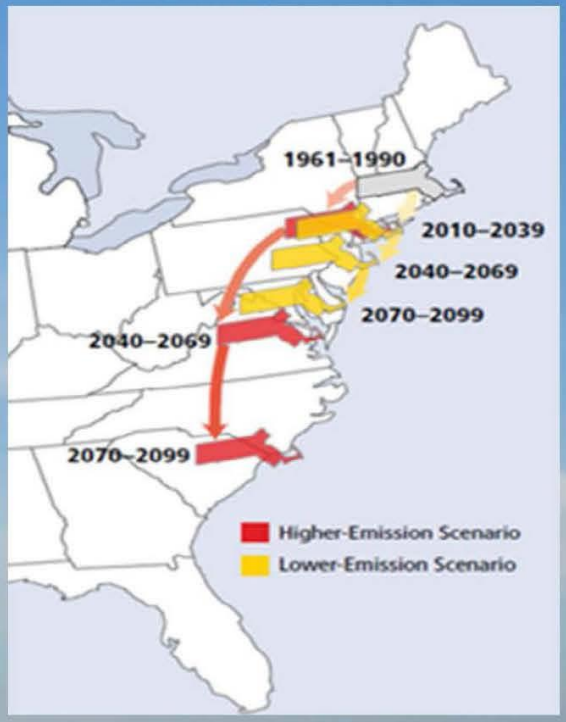


Blue Hill Observatory Annual Temperature, 1831-2018

Climate Change: Temperature Projected

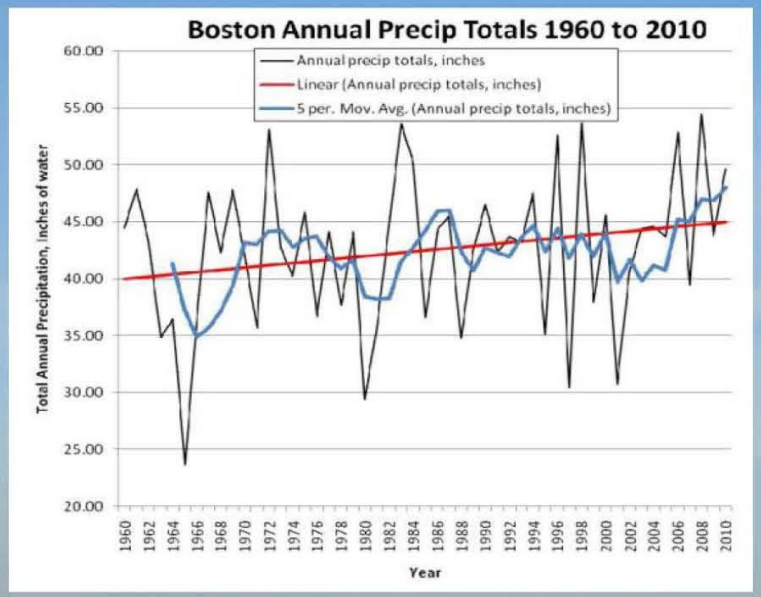


Source: the Northeast Climate Adaptation Science Center

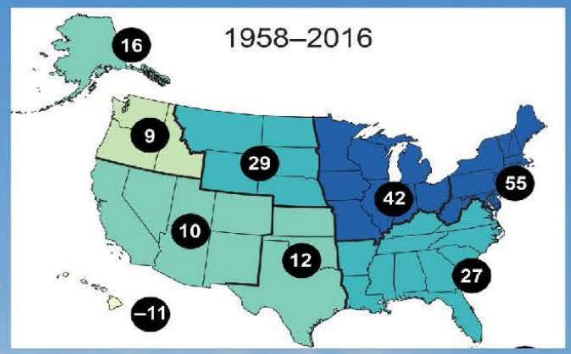


Precipitation Change: Observed

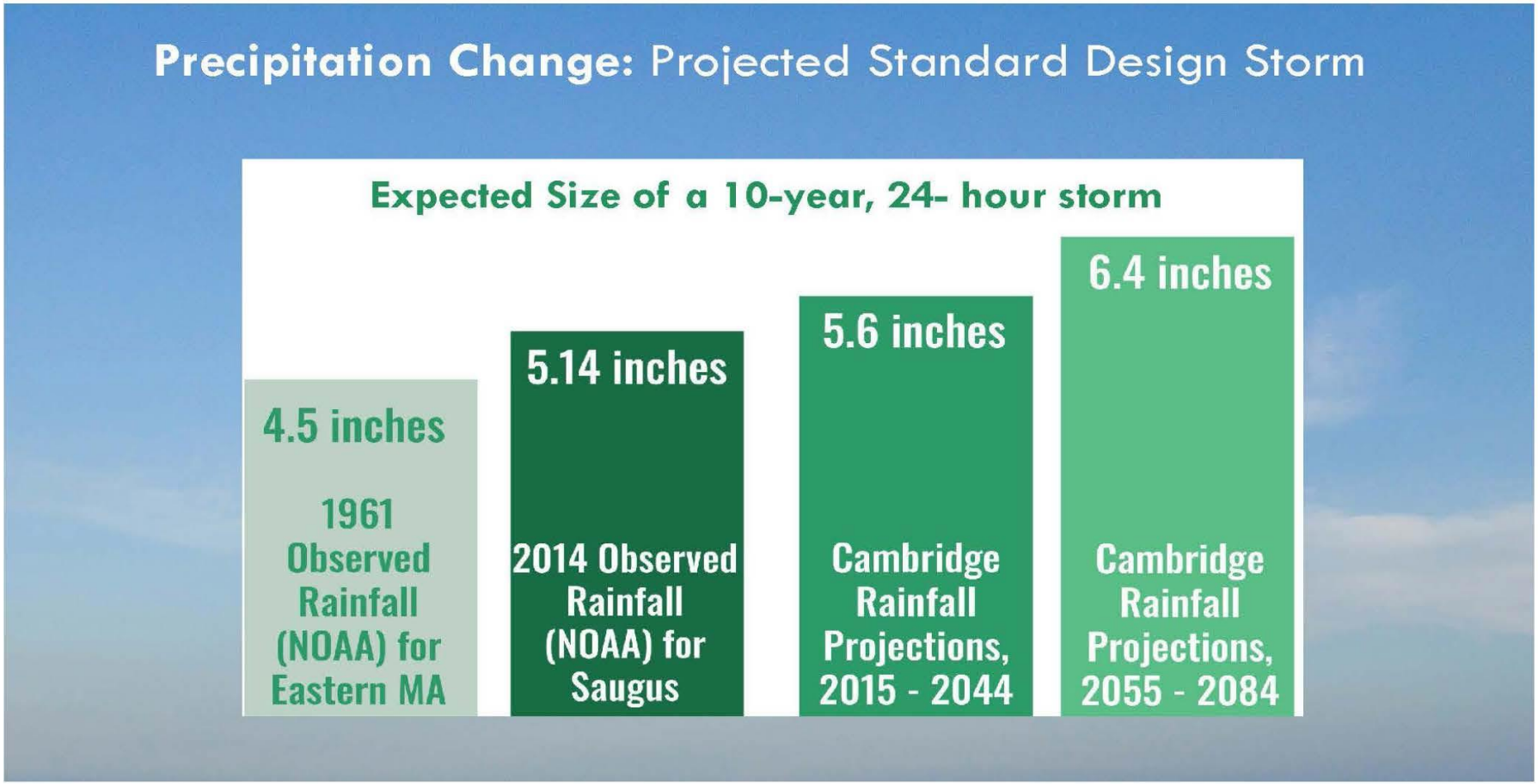
For the northeast US: 55% increase in the amount of rain that falls in the top 1% events from 1958 – 2016
(Source: The Fourth National Climate Assessment, 2018).



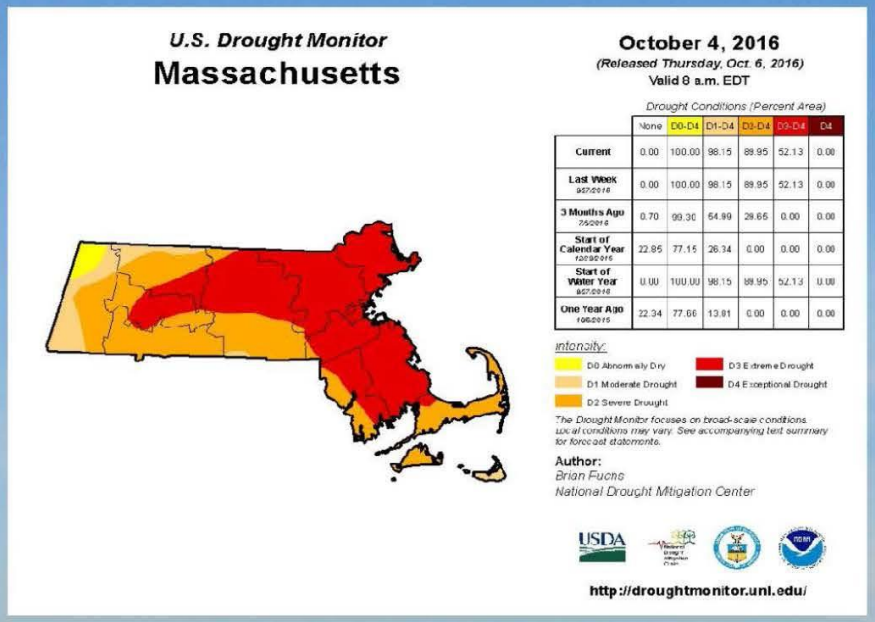
Source: MA Climate Change Adaptation Report 2011

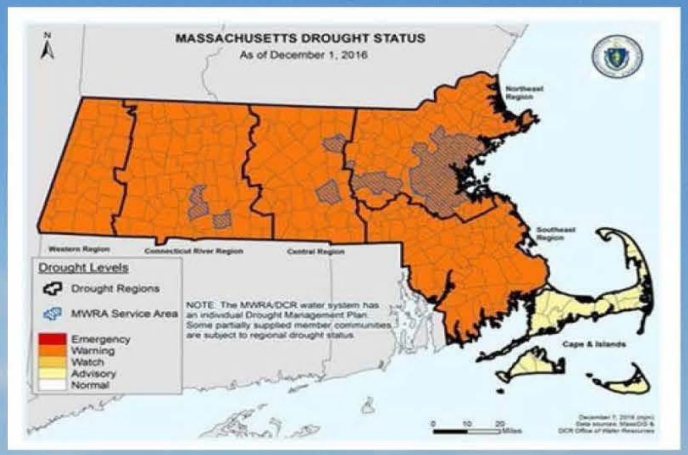


- *Boston area: 10% increase in annual precipitation over 50 years*
- *More extreme high/heavy rain and more deficit/drought*
- *Runoff instead of percolation into groundwater*


Precipitation Change: Projected Standard Design Storm
Expected Size of a 10-year, 24- hour storm
4.5 inches
1961 Observed Rainfall (NOAA) for Eastern MA
5.14 inches
2014 Observed Rainfall (NOAA) for Saugus
5.6 inches
Cambridge Rainfall Projections, 2015 - 2044
6.4 inches
Cambridge Rainfall Projections, 2055 - 2084

Precipitation Change: Drought Observed

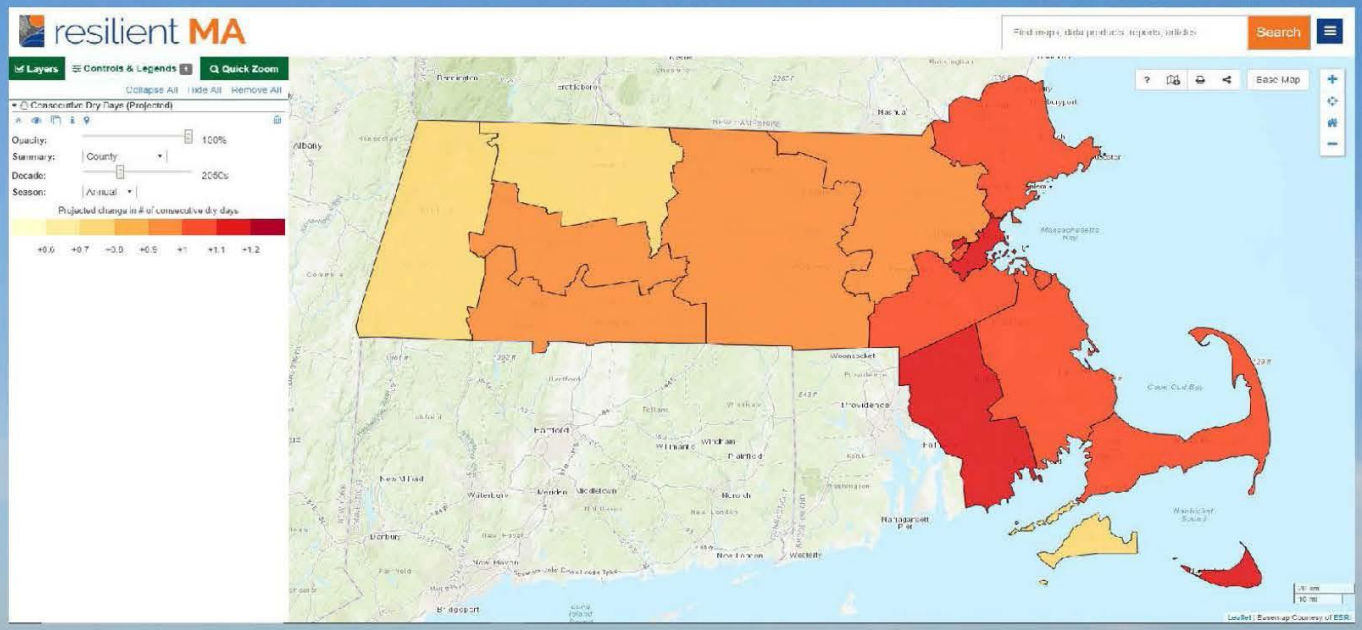




The drought of 2016 was the worst in 35 years.

US Drought Monitor

Precipitation Change: Projected Dry Days 2050

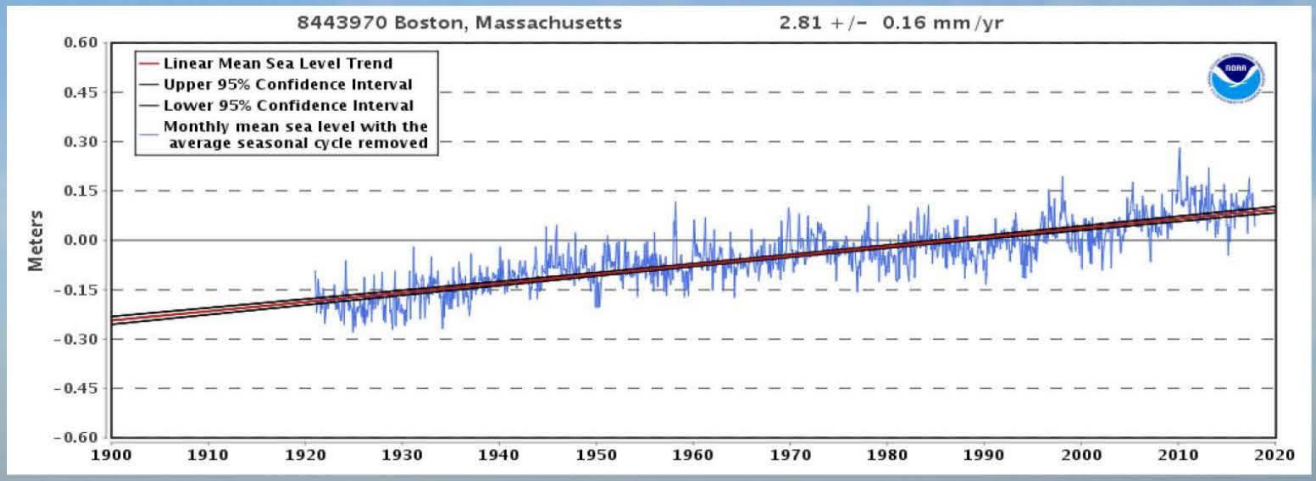


Consecutive dry days increase from 17 days to 18 days annually by 2050.

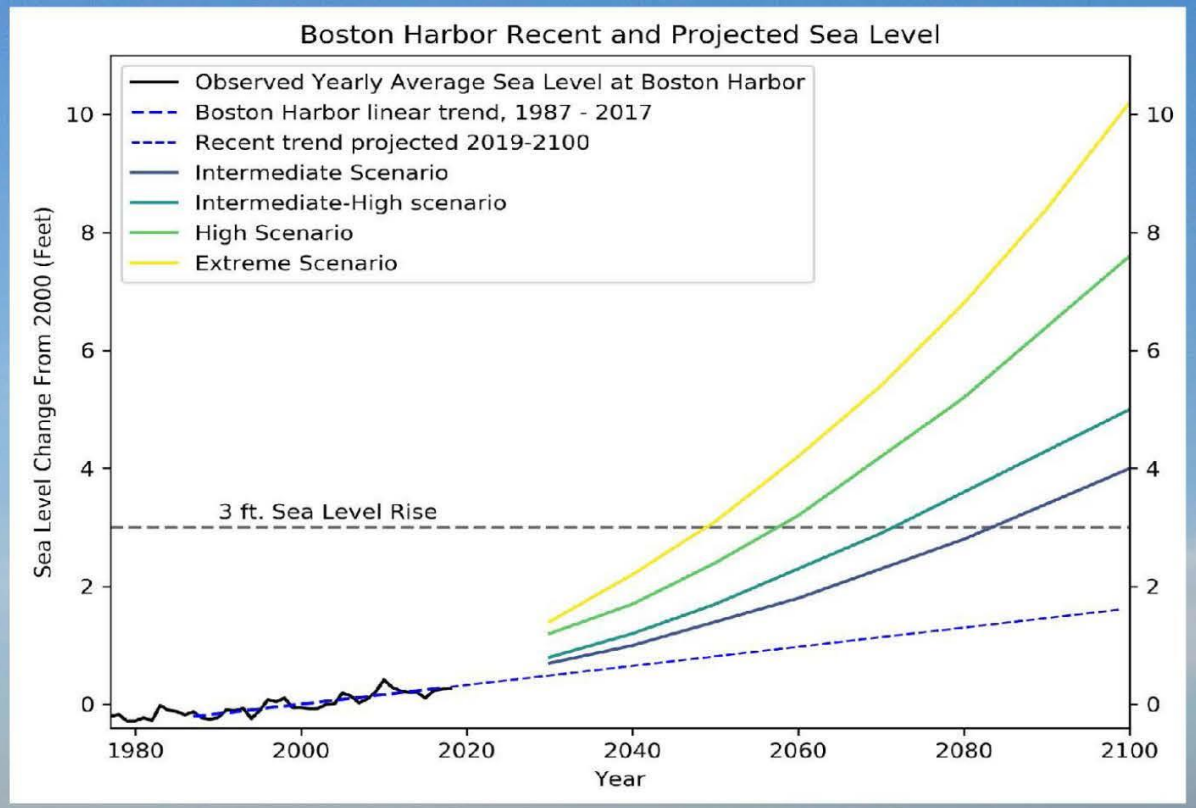
www.resilientma.org/map

Sea Level Rise: Observed

- *Boston tide station*
- *Record from 1921-2016*
- *Equivalent to 11 inches in 100 years*



Sea level rise: Projected to 2100 for Boston Harbor



Source: Northeast Climate Adaptation Science Center and MAPC

APPENDIX B – TABLE MATRIX RESULTS

Participants were divided into small groups identified as Blue, Green, Orange, Yellow, and Red. Concerns were categorized as Environmental, Infrastructure, or Societal. Participants identified climate-related strengths and vulnerabilities for Saugus. Solutions were proposed for the vulnerabilities. Solutions were then prioritized as High, Medium, or Low. Each table was asked to identify their top four priorities. The information was recorded in a matrix for each table and is reproduced in the chart below.

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Blue	Infrastructure	Major highways provide access for help + traffic + heat + air quality	S/V	Minimizing pinch points Collaborate with the state/federal government on planning for Route 1	M
Blue	Infrastructure	Middle & High school for shelter use	S		
Blue	Infrastructure	Overlay for coastline -protecting Saugus River and low-lying areas from the impacts of flooding	V	Look at planning efforts both locally and on state/federal level and develop resilient zoning and climate initiatives	H
Blue	Infrastructure	Public safety building w/generator, no offsite location	S/V	Work on finding and building an offsite location	M
Blue	Infrastructure	No fire station on the west part of town	V	Put it up to a vote for a new fire station for west side of town.	H
Blue	Infrastructure	Dams if fails would be bad for residents (older)	V	Survey of the dams is needed	M
Blue	Infrastructure	Power is something that is well built out with redundancy connected to other cities/town	S	Look into flood control of the tides in the area. Dialogue with state and federal partners about sea-level rise	
Blue	Infrastructure	Waste plant in town makes it easy for people to address trash during emergency	S		
Blue	Infrastructure	Pumping station is on the Saugus River/might flood	V	Study options	H
Blue	Infrastructure	Bridges in town during hightide have flooded in the past. (Hamilton Street)	V	Protecting coastline/working with state and federal partners; redesign	

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Blue	Infrastructure	Lack of flood control/ need Rumney Marsh Area	V	Moving forward funding and implementation of planning efforts of the past	H
Blue	Infrastructure	3 Schools going offline the town can think of ways to repurpose the facilities	S		
Blue	Infrastructure	All town buildings have generators	S		
Blue	Infrastructure	Town is moving to have more tech/communication on the cloud	S/V	Learning more about the newest tech/communication options and moving things forward	M
Blue	Infrastructure	Natural gas pipes are older, but the town is working with utilities to fix old infrastructure	S/V	Town is working with utilities to move things forward. Maintain relationship/communication	M
Blue	Infrastructure	No hospital is town (would have to connect with other communities on services)	V	Seek support that can be leveraged	L
Blue	Infrastructure	Urgent Care on Route 1	S		
Blue	Infrastructure	Town is reviewing/assessing all dams	S		
Blue	Infrastructure	Traffic is heavily impacting the town planning for transportation (moving slowly heading toward Lynn)	V	Connecting to other communities/state on moving things forward	M
Blue	Infrastructure	Fire department has a list of hazardous materials, but highways move all types of materials	S/V	Look at how other communities with highways track hazardous materials on roads	L
Blue	Infrastructure	Looking at communication infrastructure underway/solar farm at the DPW	S		
Blue	Society	Assisted living/Group Homes in flood zones	V	Action plan should be in place with service providers/ town to make sure people get the support needed. Look at zoning revisions moving forward	H
Blue	Society	Elderly, physical disability and mental disability support needed for emergencies	V	Action plan should be in place with service providers/ town to make sure people get the support needed. Look at zoning revisions moving forward	H

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Blue	Society	Action Plan has been developed but needs more planning for emergencies	S/V	Reassess/revise the Action Plan for future emergencies	
Blue	Society	No community center (hard to connect with people in different age groups)	V	Looking at schools that are going offline Planning and zoning/ look at programming in general	M
Blue	Society	Reverse 911 is in place, the town is working to sign people up town-wide	S		
Blue	Society	Lack of community-based organizations that can connect with seniors and non- English speakers	V	The town is actively working on outreach. There are active community organization, but they are not well promoted	L
Blue	Society	Senior center in town	S		
Blue	Society	Youth and recreation center and YMCA that connects with youth and families	S		
Blue	Society	Life support in place that utility has to plan/support people in town	S		
Blue	Society	Lobstermen live in town and actively work during storm events	V		L
Blue	Society		S		
Blue	Society	There is a lack multi-lingual services provided by the town	V	Look at demographic data going forward to determine how to better serve non-English speaking residents in the future	L
Blue	Society	Faith based organizations are in place and have strong ties to the community	S		
Blue	Society	Public library	S		
Blue	Environment	Rumney Marsh (Flooding/Sea level rise)	V	Bank protection is needed same as mentioned prior	H
Blue	Environment	Low lying areas (inland flooding in town)	V	Same as mentioned prior	H
Blue	Environment	Create berms to protect people in East Saugus	S/V	Method to address flooding	H
Blue	Environment	Open Space/Master Plan in the works to look at how to strengthen nature-based solutions	S		
Blue	Environment	Brooks need to be cleaned/maintained in town	V	Education/enforcement is needed	M

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Blue	Environment	Locals need to be held accountable for illegal dumping (tree limbs and yard waste) into waterways	V	Education/enforcement/ building out groups in town that focus on clean up. Partner with DPW to create a program to collect waste.	M
Blue	Environment	Outfall at Rumney Marsh/Assess older tide gate	V	Assess and follow-up on the State's progress for repairing the old tide gate.	M
Blue	Environment	Beavers building damns and impacting flooding in the area	V	Under control and actively being worked on by utilities/partners	L
Blue	Environment	Need for tree maintenance on private land on town	V	National Grid is doing s good job with outreach and communication with partners	L
Blue	Environment	Public trees in town only have a small number of people maintaining	V	Find the balance between planting and maintaining older/mature trees in town	L
Green	Infrastructure	New Fire Station (East-Side)	S	Get funding & community support to make happen Incorporate climate resilience in building design	H
Green	Infrastructure	Ballard School is vacant and could be redeveloped. Housing Authority is interested in it	S	Outreach to residents to get public input on redevelopment opportunities.	M
Green	Infrastructure	Some neighborhoods have steady/reliable electric source (Cliftondale)	S	Continue whatever is contributing to success. Tree Maintenance?	M
Green	Infrastructure	Some neighborhoods often lose energy during storms	V	Monitor power outages to find out causes	L
Green	Infrastructure	Some neighborhoods often lose cable during storms	V	Monitor	L
Green	Infrastructure	RESCO Trash & Energy Facility is prone to flooding, could become a health problem	V	Shut it down	H
Green	Infrastructure	Route 107 is flood-prone	V	Work with Highway Depart to elevate the road & bridges	H
Green	Infrastructure	60% of roads are unaccepted by the Town therefore lack maintenance	V	Prioritize 5-10% to bring to Town Management to accept	L
Green	Infrastructure	YMCA is floodproof but lacks a generator	S/V	Investigate grant opportunities to become resilient	M/L
Green	Infrastructure	Steady drinking water supply	S	Continue monitoring	H

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Green	Infrastructure	Sewer overflows during big storms, more development adds to sewer.	V	Require strong stormwater management for new development, including sewer banks	M
Green	Infrastructure	Need for local flood protection berm		Elevate options for flood control with the least environmental impact. Work with state & local officials	H
Green	Infrastructure	New bridges on Route 107 changed hydrology/tides & contributes to flooding.	V	Focus on better communication & collaboration between residents, state agencies, etc.	H
Green	Infrastructure	New bridge at Lincoln Ave. restricts flow & could contribute to flooding	V	Build buy-in within community for flood control to have a shovel-ready flood control project to fund.	H
Green	Infrastructure	Broken tide gates -plans to improve one of them (Ballot St. Marsh) them but improvements need to be better designed.	V	Implement Rumney Marsh Restoration Plan	H
Green	Infrastructure	Broken tide gates cause residential flooding & marsh degradation	V	Revisit the Marsh Restoration Plan to build support among state agencies.	H
Green	Infrastructure	Unmaintained ditches contribute to flooding	V	Public outreach & education Limit dumping in ditches	H
Green	Infrastructure	Older underground water supply pipes	V	Ongoing replacement (relates to #10 above)	M
Green	Infrastructure	Two schools closing (Waybright & Lynnhurst) could be re-used	S	Get public input on outreach	L
Green	Infrastructure	Nice new high school	S		
Green	Infrastructure	Unsure whether there is a shelter	V	Plan for shelter and educate public, maybe at the fire station (See#1)	H
Green	Infrastructure	Commuter rail floods	V	Work with MBTA to elevate the train tracks	H
Green	Society	YMCA provides financial assistance to cover membership	S	Keep it up	
Green	Society	37% is low-income (relates to #10 below)	V	Proactively reach out to lower income households for notices & add them to Reverse 911	H
Green	Society	Substantial number of seniors	V	Proactively reach out to lower income households for notices & add them to Reverse 911	H

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Green	Society	Some homeowners have flood insurance, some don't	S/V	Work with FEMA to try to alleviate costs Educate homeowners Incentivize elevated buildings, which reduces premiums	M
Green	Society	Active youth sports programs & playgrounds, trails	S	Keep playing	
Green	Society	Some strong religious congregations	S	Keep praying	
Green	Society	Reverse 911 emergency notification system (might be opt-in, not sure how many people get notifications)	S/V	(See #2 & 3)	H
Green	Society	Senior center, well-used relatively new center	S		
Green	Society	Unsure of list of "sensitive users" or medically-dependent residents to check on during extreme weather	?	Generate a list of medically-dependent residents to check on (See #2,3,7)	H
Green	Society	Very low-rated educational system	V	Improve funding Consider new ideas/ innovate to improve schools cultivate better leadership	M
Green	Society	Lack of communication /awareness of shelters	V	(See # 21 on Infrastructure Matrix)	
Green	Society	Strong Veteran support	S		
Green	Society	Active public library	S		
Green	Society	Increasing linguistic & cultural diversity (20 different languages spoken)	S/V	Outreach & information	M
Green	Society	Lots of lobstering jobs exposed to extreme weather & loss of lobstering jobs	S/V	Job development	M
Green	Environment	Protected forest land (i.e. Breakheart, Iron Works)	S/V	Coordinate w/state to manage for fires. Be preventative, not reactive See if there's a management plan	M
Green	Environment	Protected open space and Lynn water supply	S		
Green	Environment	Saugus River (recreation fisheries)	S		

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Green	Environment	Bad fire access in forests	V	(See #1 above)	
Green	Environment	Wildlife in forests	S		
Green	Environment	Pollution from external sources (i.e. Lynn sewer) damaging costal resources. The pollution will increase with more storms	V	Work with state & DEP to address combine sewer overflows (See #7 on Infrastructure Matrix)	H
Green	Environment	Invasive species damaging wetlands (Phragmites & Pepperweed)	V	Pursue wetland restoration in 2002 Rumney Marsh Restoration Plan (See #15 & 16 on Infrastructure Matrix)	H
Green	Environment	I-95 prevents natural drainage from salt marsh	V	Pursue wetland restoration in 2002 Rumney Marsh Restoration Plan (See #15 & 16 on Infrastructure Matrix)	H
Green	Environment	Beloved trail that complicates marsh restoration	V	Pursue wetland restoration in 2002 Rumney Marsh Restoration Plan (See #15 & 16 on Infrastructure Matrix)	H
Green	Environment	Remote-controlled recreational airfield along I-95 complicates marsh restoration	V	Pursue wetland restoration in 2002 Rumney Marsh Restoration Plan (See #15 & 16 on Infrastructure Matrix)	H
Green	Environment	Tree farm & tree on town land planting program supported by Town	S		
Green	Environment	East Saugus under water (3ft. SLR) in 30-80 years	V	Barriers Elevate houses Managed retreat Review prior plans Regulate/restrict new development Scenario analysis & comprehensive plan for East Saugus	H
Green	Environment	Continued development in areas subject to SLR	V	Barriers Elevate houses Managed retreat Review prior plans Regulate/restrict new development Scenario analysis & comprehensive plan for East Saugus	
Green	Environment	Studies & recommendations for berms/flood barriers have been ignored	V	Regional coordination	M

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Green	Environment	Wheelabrator doesn't have a liner & SLR could release pollution	V	More air pollution monitoring & community-supported analysis	
Orange	Infrastructure	Proximity of Town to major metro services/traffic	S/V	Traffic calming, control cut through, traffic, reduce bottle necks, traffic control	H
Orange	Infrastructure	Lack of west side Fire Station	V	Feasibility study/funding campaign	H
Orange	Infrastructure	No back-up generator in senior center (shelter)/ overall no back-up power	V	Purchase back-up generators, review back-up power options	H
Orange	Infrastructure	Emergency equipment/shelter trailer capacity to serve 80 people	S/V	Address storage needs for my future equipment	L
Orange	Infrastructure	Limited emergency planning	V	Update emergency plan, collaborative public process	H
Orange	Infrastructure	Not enough shelter capacity	V	Integrate/address through emergency plan, identify additional locations	M
Orange	Infrastructure	Insufficient communication services, phone lines go down if Comcast goes down (Especially for senior services)	V	Address w/Comcast, secondary phone services, set up alternative strategy to communicate with seniors using town services	M
Orange	Infrastructure	Stormwater flooding along East Saugus	V	Study to evaluate cause of stormwater flooding and implement recommended actions	H
Orange	Infrastructure	Strong schools & public facilities	S		
Orange	Infrastructure	New waterline/pump stations	S		
Orange	Infrastructure	Ongoing water sewer maintenance program	S	Continue maintenance program, stable funding	
Orange	Infrastructure	Solar farm	S		
Orange	Infrastructure	New stormwater guidelines/regulations	S		
Orange	Infrastructure	Hired town planner	S	Staffing capacity hire additional person	
Orange	Infrastructure	Older schools lack air conditioning	V	(going offline)	
Orange	Infrastructure	Closure if Union Hospital services moved to Salem, less hospital support	V	Attract health center/additional health providers/services to town (maybe) in closed school facilities Cross town coordination to increase medical transport services	H

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Orange	Infrastructure	Public transportation insufficient (some medical transport/some ride)	V	Advocate to MBTA & state Increase parking @ T stations/commuter rail Support extension of blue line to Lynn Increase park & ride opportunities	M
Orange	Infrastructure	Low alternative infrastructure, people walking/biking on Route 1	V		L
Orange	Infrastructure	Painted crosswalks/slippery	V	Repaint/repave/ground off	
Orange	Society	Senior meals program has an emergency protocol	S		
Orange	Society	Communications support coordination for homebound seniors	S		
Orange	Society	Residential lock box program/need more outreach	S	Need more outreach to expand utilization of the program. Integrate outreach into emergency planning Engage business community landlords	H
Orange	Society	Home maintenance support needed for older adults	V	Develop referral lists 10 needs for referral Coordinate w/school to ID volunteer partnership	L/M
Orange	Society	Snow removal volunteer program/high school students	S	Identify other avenues for volunteer support Explore partnership w/chamber of commerce/businesses	
Orange	Society	47 Languages spoken in Saugus; challenges communicating	S/V	Establish language programs for parents Translation services/resources for emergency notifications	L
Orange	Society	Home safety programming for seniors	S		
Orange	Society	Multilingual/multi-cultural language programs for seniors	S		
Orange	Society	Nursing home emergency preparedness capacity biking efforts	S		
Orange	Society	Lots of natural areas, but few cooling infrastructure, splash pads, pools	S/V		
Orange	Society	YMCA	S		

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Orange	Society	Strong church foundation	S		
Orange	Society	Strong veterans programs	S		
Orange	Society	Many community building events	S		
Orange	Society	Televised local meetings/local TV station; good for communications	S		
Orange	Society	Lots of volunteer programs/infrastructure	S		
Orange	Society	Healthy kids programs	S		
Orange	Society	File of Life program	S		
Orange	Environment	New residents/private popery owners cutting trees	V	Tree ordinance enforcement	
Orange	Environment	Dumping along waterways	V	Enforcement (road dumping) Commercial property owner cooperation and enforcement Environmental police enforcing Make it easier to dispose furniture & other large goods Hazardous waste day	M
Orange	Environment	Breakheart Reservation, many natural areas Camp Nihan/Saugus Iron Works	S		
Orange	Environment	Bike paths; follow railroad tracks	S		
Orange	Environment	Marsh is a big flooding threat/losing buffer	V	Civil engineer study and advertise on strategies	H
Orange	Environment	Sea Level Rise (SLR); culverts have nowhere to drain	V	Public education on flooding risks and protective actions	
Orange	Environment	Unlined ash fill pollution risk in storms; incinerator; health impact	V	Closure plan	H
Orange	Environment	State management helps maintain open space areas	S		
Orange	Environment	Lack warden for Prankers Pond	V		L
Orange	Environment	Heat hot spots = trash dumping hot spots	V		

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Orange	Environment	Boy Scouts, Saugus Watershed Council; a lot of organized cleanups	S		
Orange	Environment	Development displaced wildlife	V	Zoning to force cluster developments	
Orange	Environment	Cluster development regulations underutilized	S/V		
Yellow	Infrastructure		V	Bridge assessment & public awareness document & rating system (Planning Dept?) Periodic replacement – State delegation	L
Yellow	Infrastructure	Sewer pump station & substations (Floyd St./Bristol St.)- ACO violation - prevent pumping into river	V	Maintain pump stations- Town Maintenance Plan? Shield/waterproofing Generator Security CIP-Scheduled replace	M
Yellow	Infrastructure	Drainage Issues- Bristol St., Pevwell Dr.	V	Drainage plan & funding CRS Policies for new development, sewer capacity- PD & DPW Stop selling capacity	H
Yellow	Infrastructure	Reservoirs w/levees, floodgates Guard St. neighborhood- flooded out highway		Communication w/authorities, contact info., concern about impact	M
Yellow	Infrastructure	Natural gas leaks- Rt. 1 gas mains (Summer too) high pressure gas main & step-down station.		Respond & mitigate leaks, encourage repair, communication & maintenance (National Grid)	M
Yellow	Infrastructure	Sewer/water		Reengineer areas, better system regulating/enforce discharge to public way/ sewer system	M
Yellow	Infrastructure	Sanitation of drinking water			
Yellow	Infrastructure	Radio repeaters- lightning knocks out communication Tower Rd., emergency communications		Upgrade equipment	H
Yellow	Infrastructure	Spring St. culvert- 50 years- (2) 48" culverts- Hawkes Brook & pond		Town secure funding to repair/maintain structures/reassess	H

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Yellow	Infrastructure	New development & loss of infiltration	V	Require impervious surfaces/driveways/regs INI/impact fees	H
Yellow	Infrastructure	Adequate emergency equipment- dewatering pumps, amphibious vehicles, rescue vehicles, motorboats	S/V	Amphibious vehicle? Do a study on flood response	L
Yellow	Infrastructure	Power outages- generator		Town should direct residents where to go w/public generator (Robo Call, Access TV) Mock drill	H
Yellow	Infrastructure	Senior Center lacks a generator and needs a special electrical outlet Shelter manager, kitchen and bathrooms		Add generator (from Town grant) Stage emergency management supplies	H
Yellow	Infrastructure	Heritage Heights, Laurel Towers (2 Rice St.): (Floodplain-25 units) Community rooms, generators and shelter.	S/V	Write a plan (Housing Authority) & communicate w/ EAP team & survey system	H
Yellow	Infrastructure	Commercial docks, freezers for lobster, piers rise w/water	S/V	Early notification – communication	L
Yellow	Infrastructure	Technology offsite storage- Servers, cloud infrastructure	S	Cloud storage Hard copy redundancy- backup	L
Yellow	Infrastructure	Schools- new high school generator, YMCA, mall (potential shelters)	S	EAP, Fire Dept. & Police Dept.	H
Yellow	Infrastructure	Quabbin Reservoir- bacteria, boil water water cache	S/V		
Yellow	Infrastructure	Trash plant- on river/marsh 20 communities	S/V	Address in renewed vendor contract emergency drop-off	M
Yellow	Infrastructure	Route 107- public health access to trash	S/V	Other communities	
Yellow	Society	Community Rating System- discount flood insurance expensive flood insurance parkway, E. Saugus	V	Buyout program & Community Rating System National benchmarks flooding Don't build in flood zone Communicate about risk and have individuals proactively protect homes	H

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Yellow	Society	Fire Dept.- Emergency Management	S	Study to check feasibility of 3rd fire station/ more capacity	L
Yellow	Society	Volunteers- liable, Free Staff- accountability	S/V	Volunteers can educate the public on flood preparedness – engage appropriately	M
Yellow	Society	Town resources- $10 Mil. Stabilization	S	Targeted stabilization fund for flood mitigation- Town Meeting	H
Yellow	Society	Public safety highly trained DPW understaffed	S/V	Hire people-Town Manager should execute recommendations from study staff to coordinate flood management Town Hall	H
Yellow	Society	Aging population -321 elderly in 3 public housing- ID who is on oxygen redundancy lose power, can't access computer systems	V	Communicate w/staff & resident management Voluntary system to ID who needs help in emergencies- Database of vulnerable individuals	H
Yellow	Society	Disabilities, wheelchairs, cognitive/mental health, DMH/DSS group homes, nursing homes, group homes (Vine St., Bristol St.)	S/V	Contact DHM/DDS Helpline to find locations, Greater Lynn Senior Service, Meals on Wheels Coordinate with Police and Fire Depts. to identify group homes and nursing facilities	H
Yellow	Society	Transportation for individuals' w/disabilities- busses, senior center van	S/V	Identify unlicensed facilities then communicate with and train staff on what to do when something happens. Produce an annual flyer, Saugus Cable, alongside excise tax. Use in town vans/resources, contact if needed.	H
Yellow	Society	25% of town seniors living alone	V	Contact Senior Center/ Greater Lynn Senior Service, town clerk office to conduct a census for those greater than 65. Organize annual volunteers to reach out/create buddy systems (churches) communicate w/ police and fire department on wellness checks	H
Yellow	Society	Housing Authority needs Cambodian, Haitian Creole translators and translated materials (Schools as well)	S/V	Use up to date technology to communicate during emergencies (i.e. translate robo-calls/ reverse 911 notifications/ cable announcements and flyers)	H
Yellow	Society	Public safety uses tablet based digital translation and medical flip guides	S		
Yellow	Society	Reverse 911 w/call back, MEMA email not translated census/town hall	S/V	Enforce census, door to door follow up	H

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Yellow	Society	Media communications	S	Electronic billboards at key locations, impervious to power outages. Schools and library use an app to translate emergency notices.	H
Yellow	Society	Blood bank, mutual aid	S	Collaborate/Communicate with nonprofit organization (NGOs)	H
Yellow	Society	Lower volunteerism, no central connectivity with volunteer groups/fraternal orders (American Legion, Rotary Club, Veterans groups, Italian American Shrine, Lions Club etc.)	S/V	Collaborate/Communicate with nonprofit organization (NGOs)	
Yellow	Society	Strong Parent Teacher Organization (PTO)	S	Collaborate/Communicate with nonprofit organization (NGOs)	
Yellow	Society	Faith Communities-host community events, have kitchen facilities	S	Collaborate/Communicate with nonprofit organization (NGOs)	
Yellow	Society	Food Bank Program	S	Collaborate/Communicate with nonprofit organization (NGOs)	
Yellow	Society	Asthma, allergies- more data and information needed on preventative measures for seniors and children	V	More data/demographics on who and where	
Yellow	Environment	Lack of trees in flood-prone areas- Elm loss of trees	V	Plant more trees Tree farm Prioritize locations, grants	H
Yellow	Environment	Surrounded by water		Increase storage	H
Yellow	Environment	Hazardous substance migration- E Saugus recycling facility, toxic ash, landfill		ID & Mitigate	H
Yellow	Environment	Open space loss- building moratorium Zoning allows for open space loss, 40B		Conservation Land acquisition fund CPA	H
Yellow	Environment	Mash Restoration- after I-95 hundreds of acres, sand pile in the way		Remove sand pile Do marsh restoration	H
Yellow	Environment	Coyotes, beavers, turkey, fisher cats (Fairmount)	V	Hunting	M

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Yellow	Environment	26 Acres- Pranker Pond adjacent- loss of open space	V	Update floodplain regulations, building codes Free boarding Encourage minimalism	H
Yellow	Environment	Update floodplain regulations, building codes Free boarding Encourage minimalism	V	INI Remove 2:1 Reduce leaks	H
Yellow	Environment	Erosion- Conservation Land, Hillside Protection	V	Enforce hillside protection Setbacks Regulate Shrubbery	H
Yellow	Environment	Saugus River- contamination flooding- Last 2 years, worsening, property damage	V	Cleanup	H
Yellow	Environment	Conservation- 42 acres behind mall, town land- wetland stopped land acquisition fund	S/V		
Yellow	Environment	Breakheart Lynn Woods- trees Fire risks, lakes Large parcels not built out- brush	S/V	Education Clear out dead wood Control burn	L
Yellow	Environment	Emissions from cars on Route 1	V	More electrical vehicles & charging stations Promote bike paths & trails Doublecheck	M
Yellow	Environment	Marsh fires, high winds near ocean	V		
Yellow	Environment	Neighborhood built on marsh land up to Lincoln Ave.	V	Avoid building	H
Yellow	Environment	I-95 Cemetery- Ticks, EEE Virus, West Nile Virus, Deer		Indian Runner Chickens Public Education Spraying	H
Red	Infrastructure	40 areas don't have drainage capacity (everything east of Lincoln Ave.)	V	Alternatives (2-3) to those areas and make recommendations and develop financial component of how they would pay for (drainage masterplan); 18 months for the plan to be available	H

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Red	Infrastructure	But drainage master plan to identify funding & solutions	S	Education around funding	
Red	Infrastructure	DPW is located in brush fire area	V		
Red	Infrastructure	No fire station in area; Precinct 9	V	Verification of data w/call logs for fire; response times New station at Walnut St. or Forest St. Fells (Data informed decision)	
Red	Infrastructure	Good highway access to Route 1(evacuate 128)	S	Look at water route Work with the state on a regional evacuation study that avoids Route 1 and other clogged streets Moving people from immediate traffic area to shelter area Has to be staged studied by the state	H
Red	Infrastructure	Town is being proactive in identifying and resolving drainage issues from excessive weather	S/V	Complete MP; town meeting; educate to high approval rating identify who has had claims; get them behind education	H
Red	Infrastructure	How is this putting stresses on municipal budget/expenses. But spend money now, save money later. Will people accept higher rates? ($25m in sewer rehab			
Red	Infrastructure	Lower rates because of shared sewer system w/Lynn. Not MWRA			
Red	Infrastructure	Good personnel in public safety and public facilities that know what they are doing (all town officials)	S	Continue making training available to great people so they can improve their skills	H
Red	Society	2010 Census does not report/reflect growing diversity; no cell phone #'s; language is not represented	V	Program in language to software Local churches & social groups to improve census participation Get more people (civilian defense/public safety) out on the streets to support emergency response Blue lights for snow emergency for parking bans. Education + outreach from schools and senior center	H
Red	Society	Local TV shows emergency alerts	S		

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Red	Society	Evacuation facilities are not all equipped with generators (portable generators are available)	S/V	Facilities with no generators need to prepare (senior center) to be generator ready Studies happening /seek state/federal funding	H
Red	Society	High school being reconstructed	S/V		
Red	Society	Mutual aid with surrounding communities; with extreme event; we have to stand alone for 72 hours	V	Look at volunteer public safety; depends on how far you have to go and what kind of emergency	H
Red	Society	Group homes within flood zones (at least 5)	V	Early warning Education around funding to raise homes and evacuation MVP grant to elevate street	M
Red	Society	No mapping of group homes & day care facilities; can't reach for emergencies	V	Voluntarily ask for their information for emergency response purposes cable channel/local paper public safety could also share info/sign ups when they do respond to emergencies (outreach; flyer)	M
Red	Society	Changing demographics have also helped new projects get passed like the high school	S		
Red	Society	Medical response on westside			
Red	Environment	Fellsway & all streets off of it get flooded (floodplains)	V	Drainage plan; improved maintenance & capital; enhanced DCR participation	H
Red	Environment	Breakheart Reservation gets lots of runoff	V	DCR parking lot will work on drainage	
Red	Environment	East Saugus (Winston, Venice, Seger, Houston) is projected to be under water	V	Drainage plan; improved maintenance & capital; enhanced DCR participation	
Red	Environment	Tidal issues (one tide gate at end of Ballard but no helping)	V	Drainage plan; improved maintenance & capital; enhanced DCR participation	
Red	Environment	Intersection of Venice & Seger is lowest point in Essex County	V	Drainage master plan (may or may not) recommend more tidal gates as part of the solution.	H

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Red	Environment	Breakheart Area: utilities go through a firebreak which provides refuge to inner core but the state wants to pave the area which would not be good	S/V	Nothing for now	
Red	Environment	This process helps! The last 5-10 years has seen good plans; $25mil to fix sewer system (very well attended MVP!)	S	Finish & follow through; include public	H
Red	Environment	Planting more trees all the time	S	Keep the tree farm going and keep planting trees	H
Red	Environment	Solar farm behind DPW (25-50% municipal electricity)	S	Municipal roofs could install solar panels	M
Red	Environment	MRWA has no water bans; good plans	S		
Red	Environment	Two protected area; Breakheart Reservation+ Rumney Marsh (environmentally sensitive)	S	Future enhancements of Rumney Marsh (influx for years)	M