September 2020

TOWN OF ABINGTON

COMMUNITY RESILIENCE BUILDING WORKSHOP SUMMARY OF FINDINGS

Prepared for:

Town of Abington
500 Gliniewicz Way
Abington, MA 01940

Contents

Note: *This report has been prepared in accordance with the Community Resilience Building (CRB) Guide and Municipal Vulnerability Program (MVP) "Summary of Findings Template Guidance" provided by the Massachusetts Executive Office of Energy and Environmental Affairs (MA EEA).*

1. Background Information

1.1 MVP Program Overview

In 2016, Massachusetts Governor Charles Baker issued Executive Order 569 to establish a comprehensive statewide approach to reduce greenhouse gas emissions and prepare for the impacts of climate change. As part of this initiative, the Massachusetts Executive Office of Energy and Environmental Affairs administers the Municipal Vulnerability Preparedness (MVP) Program. The MVP Program provides communities with funding to identify vulnerabilities and develop plans to increase climate change resilience. In 2018, a $2.4 billion Environmental Bond Bill authorized over $200 million to fund climate change adaptation, including both planning and implementation aspects of the MVP Program.

To date, 285 of the Commonwealth's 351 municipalities (81%) have participated in the MVP Program. This has resulted in more than $17 million dollars in Planning Grants and Action Grants to implement high priority actions identified during the planning process. Projects funded through Action Grants are wide ranging, including the following priority project categories:

- More detailed vulnerability and risk assessments;
- Community outreach and education projects;
- Local bylaw updates;
- Redesign and retrofits of infrastructure;
- Nature-based solutions for flood protection, drought mitigation, and water quality improvements;
- Nature-based infrastructure and technology solutions for extreme heat and poor air quality.

1.2 Community Resilience Building Workshop

The Town of Abington (Town) received funding through an MVP Planning Grant to compile data for and conduct a Community Resiliency Building (CRB) workshop. The goal of the CRB workshop was to have community stakeholders work collaboratively to complete a climate change and natural hazard vulnerability assessment and develop prioritized actions to address vulnerabilities and improve strengths. Upon completion of the CRB workshop process, Abington will become an "MVP Community" and will be eligible to apply for MVP Action Grant funding from the Commonwealth.

An interdisciplinary team of Town staff (i.e., "Core Team") worked to implement the CRB process with consulting support from Comprehensive Environmental, Inc. (CEI), a certified MVP provider. The Town's MVP Core Team included the following:

Town of Abington – MVP Core Team
Elizabeth Shea, Planning Board
Lt. Kevin Sullivan, Police Department
John Stone, Department of Public Works
Chief John Nuttall, Fire Chief
Jerry Kelliher, Conservation Commission
Marty GoLightly, Health Agent

1.3 Workshop Preparation

The following tasks were performed to prepare for the CRB workshop:

- The Core Team and CEI held a kickoff meeting on March 11, 2020 to plan for the workshop.
- CEI worked with Core Team members to identify potential areas of concern, strengths, and vulnerabilities.
- CEI prepared presentation materials and a set of maps to guide the workshop (Appendix A).
- The Core Team scheduled the workshop, invited stakeholders, and handled logistics.

1.4 Workshop Process

The MVP Planning Workshop was conducted as two web-based virtual meetings due to COVID-19 limitations in accordance with guidance from EOEEA. The workshop sessions followed the format as presented in the CRB guidance[1]. The workshop participants are listed below.

Name	Department/Committee	Part 1 May 12, 2020	Part 2 May 19, 2020
Elizabeth Shea	Planning Board	x	x
Wayne Smith	Planning Board	x	x
Bruce Hughes	Planning Board	x	x
John Stone	Department of Public Works	x	x
Suzanne Djusberg	Council on Aging	x	x
Peter Schafer	Superintendent of Schools	x	x
Lt. Kevin Sullivan	Police Department	x	
Capt. Jack Glynn	Fire Department		x
Steve Wakelin	Strawberry Valley Golf Course	x	x
Jerry Kelliher	Conservation Commission	x	x
Shawn Reilly	Citizen	x	x
Carolyn Meklenburg	Regional MVP Coordinator	x	x
Bob Hartzel	CEI	x	x
Emily DiFranco	CEI	x	x

As listed below, the exercises solicit and organize input from workshop participants through use of the Risk Matrix presented in Appendix B. To help generate ideas and discussion during the planning exercises, workshop attendees were provided with a series of maps (Appendix A) with information such as FEMA flood hazard areas, critical habitat areas, and conservation land within Abington. This information was emailed to the group before the webinars.

[1] CRB Guidance: www.communityresiliencebuilding.com

Introductory information included:

- Description of the MVP program and CRB process.
- Introduction to climate change, including climate change projections for Massachusetts and Plymouth County[2];
- Introduction to nature-based solutions (i.e., green infrastructure).

Upon completion of the second part of the workshop, an email was sent to the group with the vulnerabilities and actions identified as high priority. The workshop attendees responded by email to vote on their top three priority actions for Abington. The votes were then tallied to determine the Town's three top priority climate resiliency actions as presented in Section 5.1 of this report.

This report provides an overview of workshop findings, including a summary of the Town's top hazards related to climate change, current climate resiliency strengths and vulnerabilities, and potential actions to improve the community's resilience to natural and climate-related hazards. The summary of findings described in this report are compiled from feedback from the workshop participants.

Workshop Exercises

Exercise 1: Identify the Town's top local natural and climate-related hazards of concern.

Exercise 2: Identify the Town's strengths and vulnerabilities relative to top hazards.

Exercise 3: Identify and prioritize actions to reduce vulnerabilities or improve strengths.

Exercise 4: Determine the Town's overall top priority actions.

Note: Exercises 1 and 2 were conducted during Part 1 of the workshop held on May 12, 2020. Exercises 3-4 were conducted during Part 2 of the workshop held on May 19, 2020.

[2] Climate Projections obtained from: www.resilientma.org

2. Top Hazards and Vulnerable Areas

2.1 Summary of Top Hazards

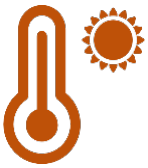
During Exercise 1, workshop participants discussed Abington's top natural hazards and areas of concern. The group then reached consensus on these topics.

The following three hazards were identified as presenting the highest direct and indirect risks to the infrastructure, societal, and environmental resources of Abington:

Abington Town Hall

1. **Flooding:** Flooding was a hazard of concern to Abington. There are multiple areas in town that have experienced historical flooding and others that would be expected to flood under future climate change projections.

2. **Strong Storms:** Extreme weather events, including strong winter storms, heavy rainfall with high winds, and ice storms were a top concern due to their potential for damage to infrastructure and other physical, social, and environmental consequences.



3. **Drought and Extreme Temperatures:** As global temperatures continue along a long-term warming trend, local occurrences of drought and extreme temperature (i.e., days greater than 90º F) are predicted to increase. Drought conditions have the potential to limit water supply availability, increase wildfire risk, and impact agriculture in Abington. Extreme temperatures have the potential to impact vulnerable populations without access to air conditioning.

2.2 Areas of Concern

Key stakeholders developed a preliminary list of Abington's primary climate resiliency vulnerabilities and strengths. These stakeholders were primarily concerned with vulnerabilities relative to flooding and storm induced hazards. Vulnerabilities of concern included potential culvert, dam, and bridge failures, water supply infrastructure, and access to key town-owned properties during an emergency.

The table below lists areas of concern that were identified based on stakeholder feedback. Subsequent sections of this report provide more details on strengths and vulnerabilities (and potential solutions to increase resilience) relative to these areas of concern.

Category	Areas of Concern
 **Infrastructure**	• Stormwater management system (town-wide) • Dam maintenance/repairs needed (Hunts Brook, Beaver Brook, Island Grove Pond) • Bridge repairs (e.g., Central Street Bridge) • Public water supply
 **Societal**	• Senior Housing Centers • Schools • Critical facilities with only one egress
 **Environmental**	• Island Grove area (erosion and tree loss) • Carista property (potential for wild fires) • Loss of tree canopy (town-wide) • Water quality concerns (e.g., algae blooms) • Strawberry Valley Golf Course (loss of pond)

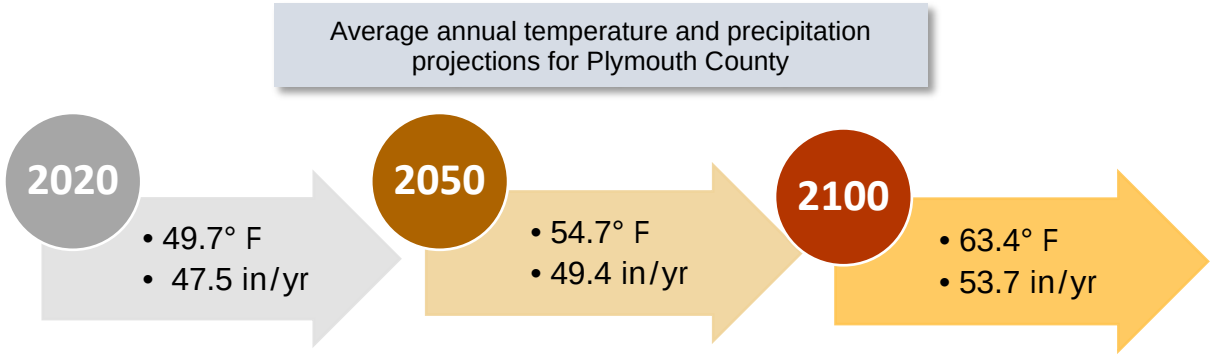
3. Current Concerns and Challenges Presented by Hazards

Abington faces multiple challenges related to potential impacts from natural hazards. In recent years, the Town has experienced multiple disruptive and damaging weather events, including Tropical Storm Irene (August 2011), Tropical Storm Sandy (October 2012), winter Nor'easter Nemo (February 2013), winter Nor'easter Quinn (March 2018), and Hurricane Barry (August 2019). These storms brought heavy rain-induced inland flooding, wind damage to trees, and snow that caused widespread damage to Abington and many other Massachusetts communities.

The intensity and frequency of extreme weather events has increased awareness of Abington's natural hazards and risks associated with climate change, while motivating communities throughout Massachusetts to comprehensively assess and improve resilience at the local level.

The following is a summary of climate change projections for Plymouth County, Massachusetts from the Climate Change Clearinghouse (CCC) for the Commonwealth (www.resilientma.org):

Note: Climate change projections below are based on median modeled results – some models predict higher and lower outcomes.



3.1 Categories of Concerns and Challenges

During the guided exercises, workshop participants identified Abington's vulnerabilities and strengths to natural hazards. As in any community, Abington is not uniformly vulnerable to potential hazards and climate change impacts – certain locations, resources, and populations will be affected to a greater degree than others. Workshop participants identified the following as key areas of concern across three categories – infrastructure, societal, and environmental.

3.1.1 Infrastructure Concerns

- **Stormwater Infrastructure**: Workshop participants expressed concerns about the Town's stormwater management system. Specific areas of concern included the following:
  - Localized flooding historically occurs due to low spots in the roads at Shaw Avenue near the Senior Housing Center, on Ashland Street under Route 123, on Chestnut Street at the bridge, and near the Old Town Dump on Route 123,
  - The Central Street Bridge is at increased risk of failure due to flooding and has been documented as a significant hazard during a recent inspection.
- **Dams**: Workshop participants expressed concerns about multiple dams in town requiring repair

associated with flooding and damage from high peak flows during storms. High priority dams include the following:

- **Hunts Brook Dam**: An Emergency Action Plan (EAP) has been developed for this dam and identifies at-risk downstream properties. This dam is co-owned by the City of Brockton.
- **Island Grove Pond Dam:** An EAP has been developed for this dam and identifies at-risk downstream properties.
- **Beaver Brook Dam (near Elementary School)**: Dam requires rehabilitation per a recent state inspection. This dam does not have an EAP.

- **Ice Build-up from Sump Pumps**: Sump pumps are widely used throughout town and many homeowners discharge water onto roadways causing ice build-up in the winter months. A current town bylaw prohibits pumping into streets but is not strictly enforced.
- **Water Supply**: The town's water supply is brought into Abington from Great Sand Bottom Pond in Pembroke, via a single pipe that crosses ten miles through several adjacent towns. The workshop participants expressed concerns regarding the state of the pipe as well as the reliance on this water supply as the primary source for the town.

3.1.2 Societal Concerns

- **Elderly Population**: Senior housing facilities are vulnerable to extreme heat and impacts from power outages due to strong storms. Specific concerns related to population include:
  - The senior housing facilities do not have central air conditioning. Some residents have window unit air conditioners, but not all residents. During periods of extreme heat, residents are bused to the local Senior Center which is air conditioned, but is not currently available for housing guests overnight due to lack of a generator and storage for cots and other equipment.
  - Senior housing facilities do not have generators, making residents vulnerable to power outages due to strong storms. Many residents rely on electricity for oxygen and other healthcare equipment. Cooling from window air conditioning units would also be impacted.
- **Emergency Alert System**: Workshop participants expressed concern that the current emergency alert system (NIXLE) is not adequate for all residents, as it only works if you are subscribed to the NIXLE system.
- **Access to Critical Facilities**: Flooding of some key arterial streets may limit emergency services and limit access to Abington High School (emergency shelter) and other critical facilities as this road only has one egress. Specific areas of concern are Gliniewicz Way and Lincoln Boulevard.
- **Air Conditioning at Public Schools:** Woodsdale and Beaver Brook Elementary Schools are not air conditioned and are therefore vulnerable to extreme heat. Abington High School has some cooling in the building but it is not extensive.
- **Insect-Related Illnesses**: Workshop participants expressed concern about climate-related

increases in mosquito breeding areas due to increased temperatures and longer periods of standing water due increased precipitation. Increases in other pest insect populations such as ticks were also noted.

3.1.3 Environmental Concerns

- **Erosion and Tree Loss:** Workshop participants expressed concern about the Island Grove area which has been impacted by flooding and damage from strong storms, resulting in erosion of the shoreline of Island Grove Pond and loss of trees.
- **Canopy Management**: Workshop participants indicated that trees are increasingly falling during storms and that many are vulnerable to future loss as they are damaged from wooly adelgid.
- **Risk of Wild Fires**: Workshop participants expressed concern about the potential for an increase risk of wildfires in specific areas of town including the Carista Property (west of Route 18, north of Vineyard Road) due to drought and extreme temperatures.
- **Increased Algal Blooms:** Workshop participants were concerned with increasing levels of phosphorus and associated potential for increased nuisance algal blooms in Island Grove Pond. These impacts may occur due to increased temperatures during the growing season which can exacerbate impairments associated with biological productivity (e.g. algae blooms, low dissolved oxygen), and increased amounts of intense precipitation that can increase nutrient loading and turbidity.
- **Damage to Property:** Workshop participants expressed concern about the town-owned Strawberry Valley Golf Course and the impacts drought and flooding could have on the property. A pond in the center of the property is used to irrigate the greens.

4. Current Strengths and Assets

Workshop participants identified the following as Abington's key climate change resiliency strengths:

- **Tree Canopy:** The Town currently has good tree canopy town-wide. Though some areas of town have been affected by tree loss due to storm or insect damage, the overall canopy is intact.
- **Cooling Stations:** The Town has two cooling stations available for residents during periods of extreme temperatures.

5. Recommendations to Improve Resilience

As summarized below, the final step of the workshop was to develop recommended actions to address identified vulnerabilities and to build upon strengths.

- The workshop participants identified potential actions and assigned each action a priority (i.e., high, medium, low), then differentiated them as short-term, long-term, or ongoing efforts.
- After the workshop, a list of the actions identified as "high priority" were sent by email to the workshop participants. The workshop participants then submitted votes by email for their top three priority actions. The votes were then tallied to determine the Town's three top priority climate resiliency actions as presented in Section 5.1.

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5.1 Top Three Recommendations

1. Repair Island Grove Pond Dam

A recent Emergency Action Plan has identified Island Grove Pond Dam under the Centre Avenue/Route 123 bridge as needing repair. The pond identifies at-risk downstream areas and risk to the dam due to flooding and damage from high peak flows from strong storms.

It is recommended that the Town implement a plan to assess, repair, and maintain Island Grove Pond Dam as outlined in the Emergency Action Plan. Given ongoing efforts, it is recommended that the following phases within this plan be performed concurrently.

Island Grove Pond Dam, located at the southern end of the pond at Centre Ave. (Rt. 123)

- Assess: Expand the assessment conducted in the Emergency Action Plan as needed to include additional information related to the climate resiliency of Island Grove Pond Dam. This could include additional condition inspections and dam engineering assessments, flood modeling relative to potential future higher intensity storms, and prioritized recommendations for repairs.

- Repair: Repair the Island Grove Pond Dam based on recommendations from the assessment. Repair steps would include: engineering feasibility analysis (i.e., modeling, conceptual design), permitting, engineering design, and repair.

2. Senior Center – Provide Generator and Evaluate as Shelter

The Abington Senior Center (441 Summer Street) is currently used as a cooling station during periods of extreme heat for the elderly population living in senior housing facilities in Abington. The two senior housing facilities in Town do not have central air conditioning. The Senior Center is not available to serve as an emergency shelter for this population in the evenings or overnight as it does not have the capacity to serve as an overnight emergency shelter and does not have a back-up generator in the case of a power outage.

Abington Senior Center

It is recommended that the Town:

1. Install a back-up generator with “clean energy” technology (no greenhouse gas emissions) at the Senior Center, with adequate capacity to provide air conditioning and other emergency shelter functions. To be eligible for future MVP Action Grant funding, generators and associated energy storage projects must include clean energy technology such as photo-voltaic with battery storage, microgrids, black start technology, etc.

2. Assess the feasibility of facility improvements needed to provide overnight housing during heat waves and other emergencies.

3. Repair Central Street Bridge

The Central Street Bridge is located at the inlet of the Shumatuscacant River to Island Grove Pond. A recent inspection identified Central Street Bridge as a significant hazard due to flooding and damage from high peak flows during strong storms.

Climate change projections indicate that the frequency and severity of flood conditions and associated peak flow rates will increase in the coming years, putting this structure at heightened risk. A preliminary assessment has been completed and the approximate cost of the rehabilitation is estimated at $450,000.

Central Street Bridge

It is recommended that the Town implement a plan to assess and the Central Street Bridge as outlined in the initial assessment of the bridge. Given ongoing efforts, it is recommended that the following be performed:

- Assess: Expand the assessment conducted in the Emergency Action Plan as needed to include additional information related to the climate resiliency of the Central Street Bridge. This could include additional condition inspections, flood modeling relative to potential future higher intensity storms associated with climate change, and prioritized recommendations for repairs or bridge replacement.
- Rehabilitate: Rehabilitate the Central Street Bridge based on recommendations from the assessment. Steps towards rehabilitation would include: engineering feasibility analysis (i.e., modeling, conceptual design), permitting, engineering design, and rehabilitation.

5.2 Other Prioritized Recommendations

Higher Priority

- Repair Beaver Brook Dam (near Beaver Brook Elementary School) as it was found to require rehabilitation during a recent state inspection. The dam is at-risk due to flooding and damage from high peak flows due to strong storms. An Emergency Action Plan has not yet been developed for the dam.
- Conduct a study to determine climate-related risks to the Town's water supply and alternatives to improve water supply resiliency to climate change. The Town's water supply is supplied by Rockland Water Works and is currently brought into Abington from Great Sandy Bottom Pond in Pembroke through a single pipe that crosses through several adjacent towns. The study should focus on risks from drought, to infrastructure, and to water quality and associated treatment processes to ensure a safe water supply.
- Install a back-up power supply generator and central air conditioning in Senior Housing facilities on Gliniewicz Avenue and Shaw Avenue. Currently, the facilities only have window air conditioning units. Seniors can be bussed to the Senor Center during the day for relief from extreme temperatures, but must return to Senior Housing in the evenings because the Senior

Center is not equipped as an overnight shelter. The lack of a generator at these facilities would impact seniors during power outages as many are reliant on equipment such as oxygen tanks that rely on a power supply.

- Improve the Town's emergency alert system to make it more available to all populations. This could include a system that provides outgoing messages from Town Hall, rather than the current NIXLE system that requires citizens to obtain information from the Town website.
- Implement nutrient loading reduction measures and other algae control measures for Island Grove Pond as recommended in the recently completed study. Phosphorus loading to Island Grove Pond may increase with increased precipitation and nuisance algal blooms and vegetation may be impacted by higher temperatures.

Moderate Priority

- Conduct an engineering assessment of roads in town that flood due to low-points or proximity to surface waters. Specific areas of town include the Senior Housing complex near Shaw Avenue, Ashland Street under Route 123, and Route 123 near the Old Town Dump.
- Develop engineering designs for Chestnut Street Bridge to mitigate risk of failure due to flooding and scour from high velocity flows.
- Repair Hunts Brook Dam per the completed Emergency Action Plan. The dam has been shown to require repair associated with flooding and damage from high peak flows from strong storms. This dam is co-owned by the City of Brockton and any mitigation efforts should include them.
- Assess public safety issues related to ice build-up on the roads due to use of sump pumps by residents and determine the areas of town most affected. Determine solutions such as reviewing bylaws for updates and/or changes or requiring homeowners to redirect sump pump flow onto property. Assess funding options for stormwater retention, infiltration, and drainage structures (e.g., French drains) on private properties.
- Install central air conditioning in the two elementary school buildings to mitigate the effects of increased temperatures.
- Conduct a study of the Island Grove area to determine and prioritize repairs necessary due to increased erosion and tree loss associated with flooding and/or damage from strong storms. This study should focus on shoreline areas along Lake Street and Central Street.
- Develop a town-wide tree planting plan to improve nature-based resiliency to climate change.

Lower Priority

- Install central air conditioning at Abington High School. A cooling system was recently installed, but it is not extensive.
- Conduct a study to evaluate options for a second egress to the Senior Housing facility off of Shaw Avenue. Potential options include access from Route 18, Colonial Road, or Warren Street. A single access at this facility increases risks to vulnerable populations if it is flooded or blocked by a felled tree during a storm.
- Investigate possible solutions to insect-related hazards including revising design, guidance, and regulations to decrease locations for mosquito breeding areas such as detention ponds.

As previously discussed, this list of prioritized recommendations was developed by workshop participants based on identified vulnerabilities.

- It is recommended that the Town create a committee or working group to implement recommendations from this plan. Specifically, the committee or working group would develop an anticipated timeline, determine potential funding requirements, then apply for local, state or federal grant funding to implement prioritized recommendations.
- It is also recommended that this report be reviewed and updated annually as actions are completed and/or new needs are identified.

6. Public Listening Session

Workshop findings were presented to the general public during a listening session held during a meeting of the Abington Board of Selectmen on August 24, 2020. No questions or other feedback on the listening session were received during the session or via the feedback survey described below. Information about the listening session was advertised as follows:

- Included on the publicly noticed Board of Selectmen agenda, posted on the Town website, and published in the local newspaper (Brockton Enterprise, August 10, 2020);
- Advertised on an electronic sign at the end of the road where Town Hall is located;
- Posted in hard copy within the Town Hall building;
- Posted on the Town's Facebook page;
- Advertised on the Town's local access cable channel. The session was also shown live on local access cable.
- The listening session PowerPoint slides and a web-based feedback survey (https://arcg.is/1iua1j) were posted to the Town website.
- In addition to the public listening session, all materials from the MVP Planning Grant project have been made available on the Town of Abington website.

7. Report Citation

Comprehensive Environmental, Inc. (2020). Community Resiliency Building Workshop Summary of Findings. Town of Abington, Massachusetts.

APPENDIX A

INTRODUCTORY PRESENTATION MATERIALS

TOWN OF ABINGTON
MUNICIPAL VULNERABILITY PREPAREDNESS PROGRAM

Climate Change and Natural Hazard Vulnerability Assessment

WORKSHOP MAP PACKAGE – MARCH 2020

List of Maps:

- Town Base Map 24x36
- Town Base Map 11x17
- FEMA National Flood Hazard
- Impervious Surfaces and Open Space
- Wetlands and Critical Habitats
- Public Water Supplies and Wellhead Protection Areas

Map Layer:	Source:
Abington Senior Center	CEI
Town Hall	MassGIS
Fire Stations	MassGIS
Police Stations	MassGIS
Library	MassGIS
Schools	MassGIS
Dams	MassGIS
Public Water Supplies	MassGIS
Certified Vernal Pools	MassGIS
FEMA National Flood Hazard	MassGIS
DEP Wetlands	MassGIS
NHESP Estimated Habitats of Rare Wildlife	MassGIS
NHESP Priority Habitats of Rare Species	MassGIS
BioMap2 Core Habitat	MassGIS
BioMap2 Critical Natural Landscape	MassGIS
Zone I Wellhead Protection Areas	MassGIS
Zone II Wellhead Protection Areas	MassGIS
Interim Wellhead Protection Areas	MassGIS
Impervious Surfaces	MassGIS
Hydrography	MassGIS
Roads	MassGIS

Figure 1
Town Base Map

Municipal Vulnerability Preparedness Program
Abington, MA

Comprehensive Environmental Incorporated

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Miles

- Town Hall
- Local Police
- Fire Stations
- Library
- Senior Center
- Public School
- Private School

Dams
- Significant Hazard
- Low Hazard

Public Water Supplies
- Community Groundwater Source

Data Source: MassGIS

2/25/2020

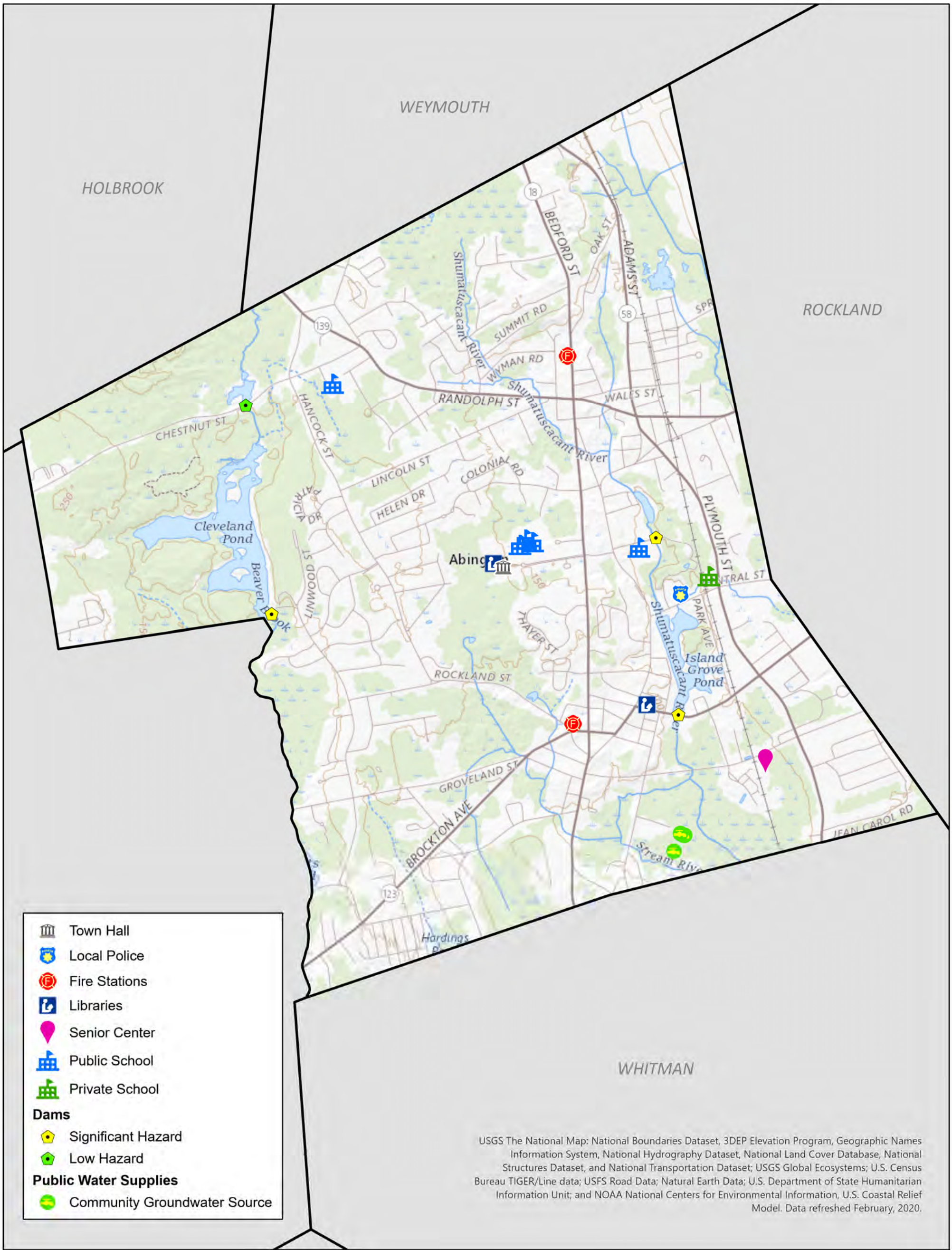

Figure 1
Town Base Map

Municipal Vulnerability Preparedness Program
Abington, MA

Comprehensive Environmental Incorporated

Data Source: MassGIS

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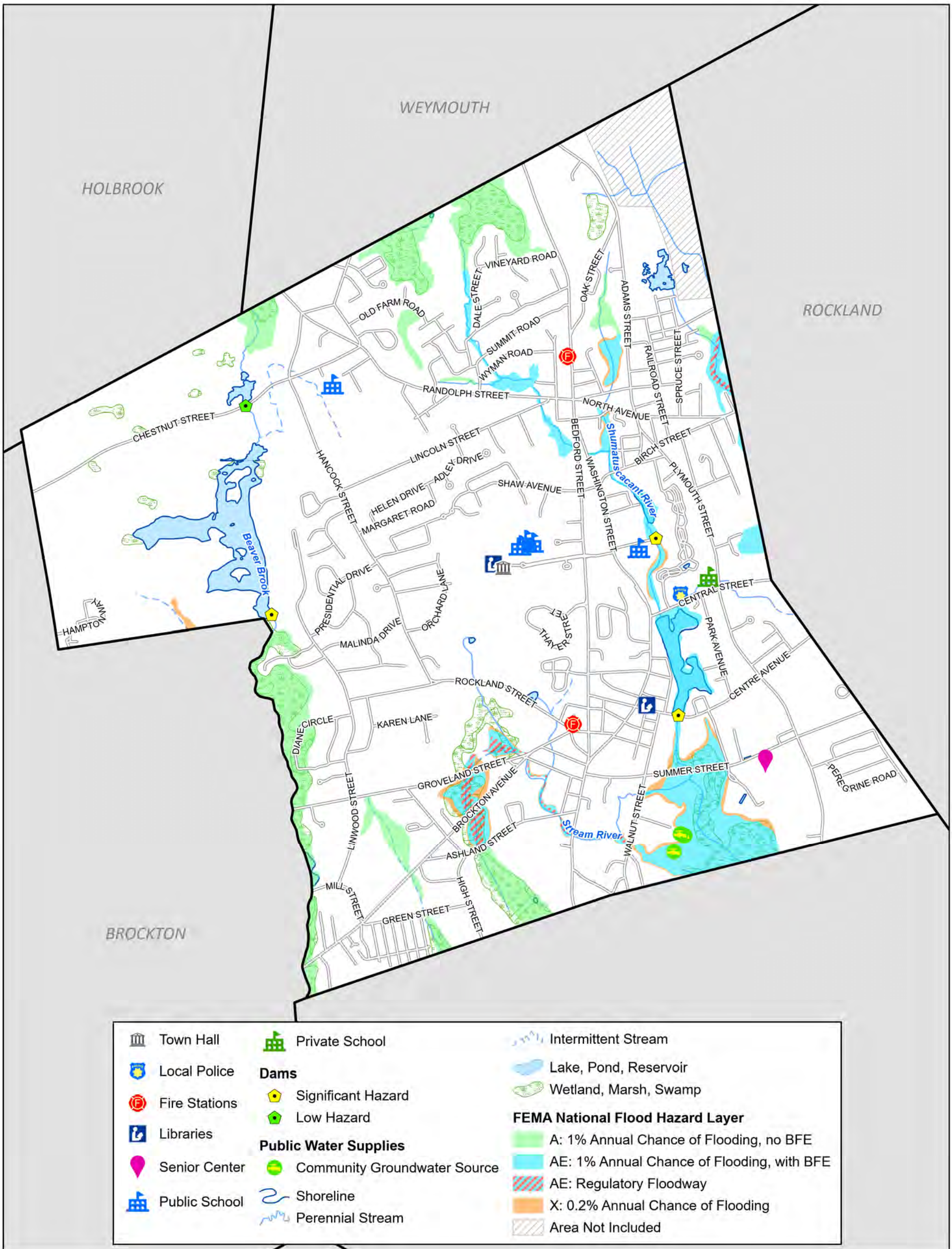

Figure 2
FEMA National Flood Hazard

Municipal Vulnerability Preparedness Program
Abington, MA

Comprehensive Environmental Incorporated

Data Source: MassGIS

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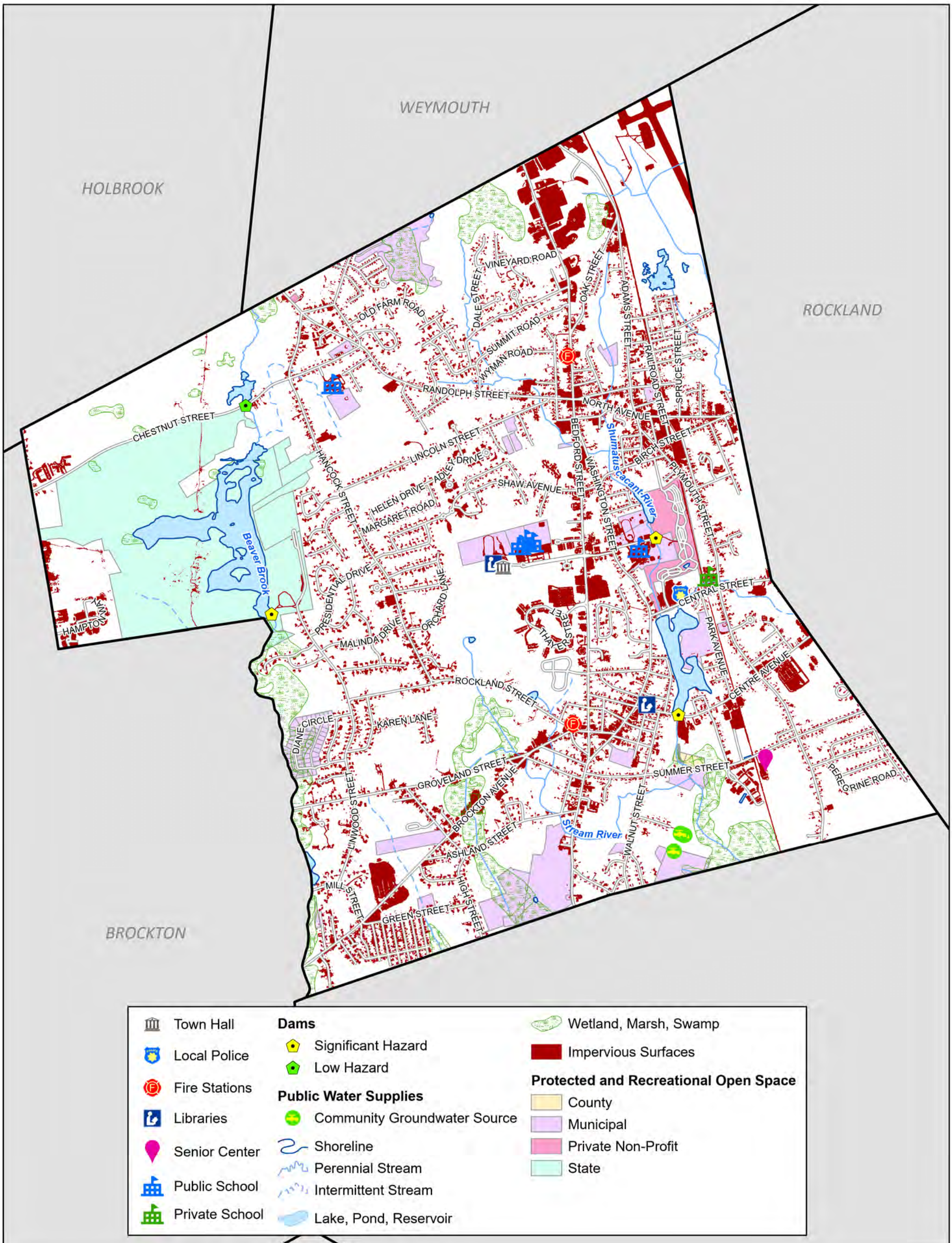

Figure 3
Impervious Surfaces and
Protected and Recreational Open Space

Municipal Vulnerability Preparedness Program
Abington, MA

Comprehensive Environmental Incorporated

Data Source: MassGIS

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2/25/2020

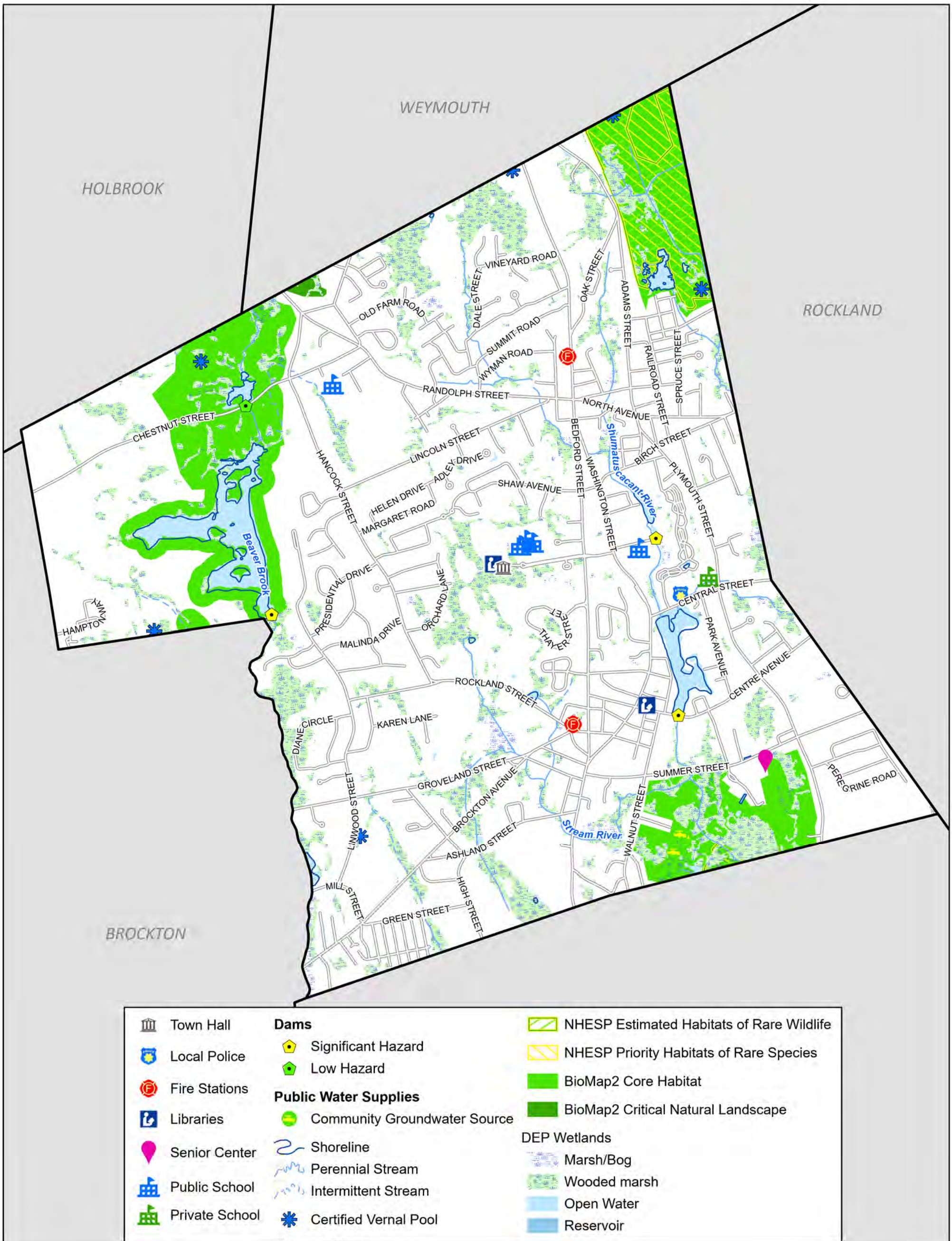

Figure 4
Wetlands, Rare Species, and Critical Habitat Areas

Municipal Vulnerability Preparedness Program
Abington, MA

Comprehensive Environmental Incorporated

Data Source: MassGIS

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2/25/2020

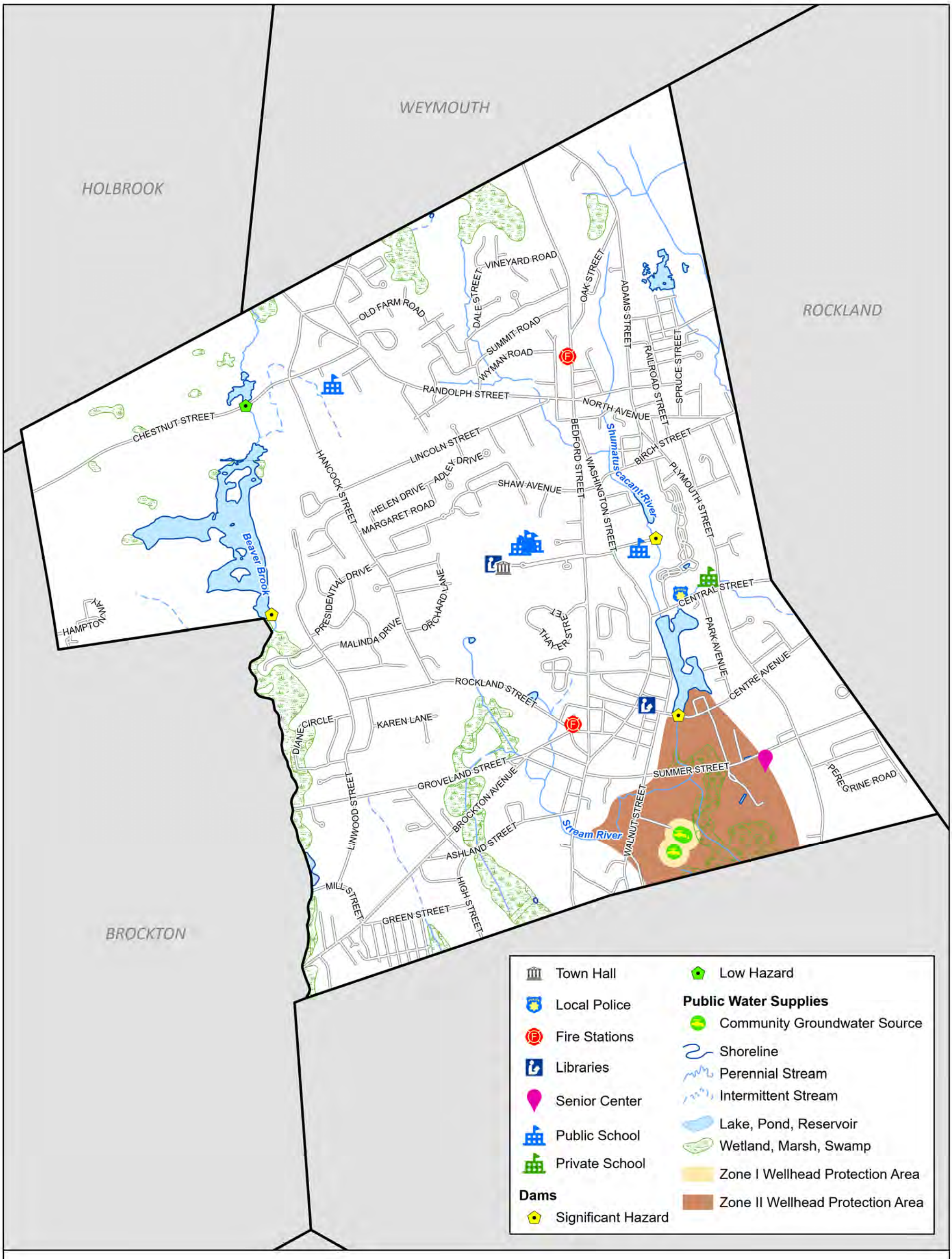

Figure 5
Public Water Supplies and Wellhead Protection Areas

Municipal Vulnerability Preparedness Program
Abington, MA

Comprehensive Environmental Incorporated

Data Source: MassGIS

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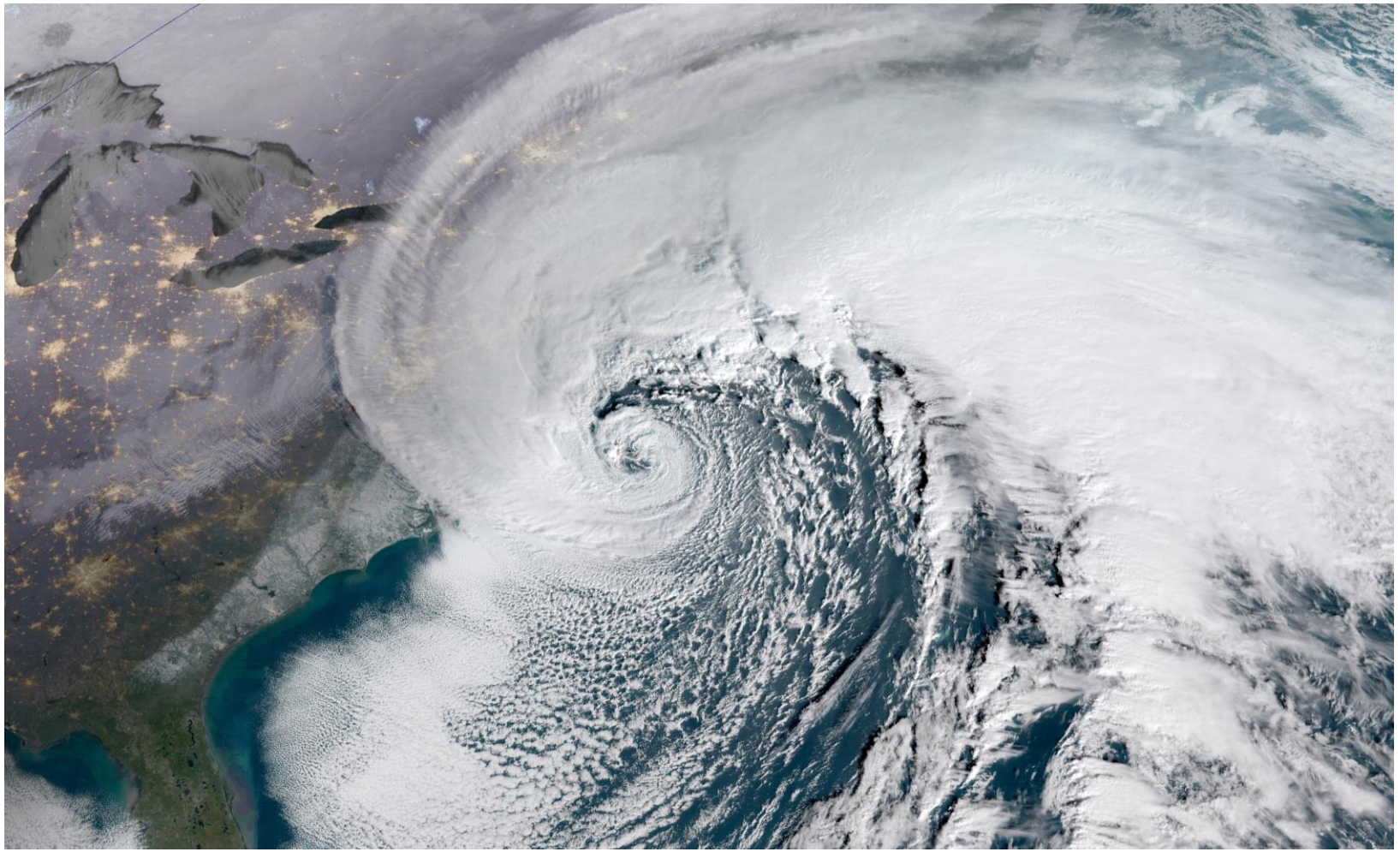
2/25/2020

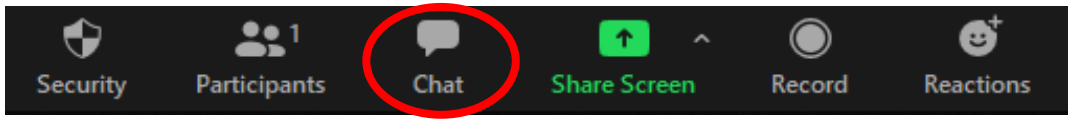
Town of Abington

Municipal Vulnerability Preparedness Program
Community Resiliency Building Workshop

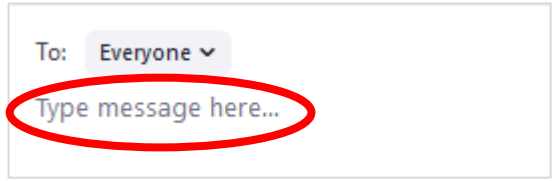


Introductions

1. **Click "Chat" on banner at bottom screen**



2. **Type name and organization** (chat box at lower right corner of screen)



3. **Use chat to ask questions during intro presentation…group discussion at end of presentation**

In case of Zoom problems: edifranco@ceiengineers.com or 603-343-6311

Workshop Agenda

Part 1:
May 12, 2020

- **Introductory Presentations**
- **Group Exercises**

  1: Identify Top Hazards

  2: Identify Vulnerabilities and Strengths

Part 2:
May 19, 2020

3: Identify Actions to Reduce Vulnerabilities

4: Prioritize Top Actions

Workshop Overview

MVP Program Summary

EXECUTIVE ORDER 569 2016

- Reducing greenhouse gas emissions to combat climate change
- Preparing for the impacts of climate change
  - State Adaptation Plan
  - Climate Coordinators
  - Agency Vulnerability Assessments
  - Municipal Support

ENVIRONMENTAL BOND 2018

- $2.4 billion bond bill with focus on climate change resiliency
- Over $200 million authorized for climate change adaptation
- **Codifies EO 569, including the MVP Program**

Source: https://www.mass.gov/files/documents/2019/07/16/mvp-grant-program-overview-2019-mvp-vendor-training.pdf

MVP Process

Obtain Planning Grant

Complete Workshop

- Identify Actions to Address Vulnerabilities
- Write Report

Become Certified MVP Community

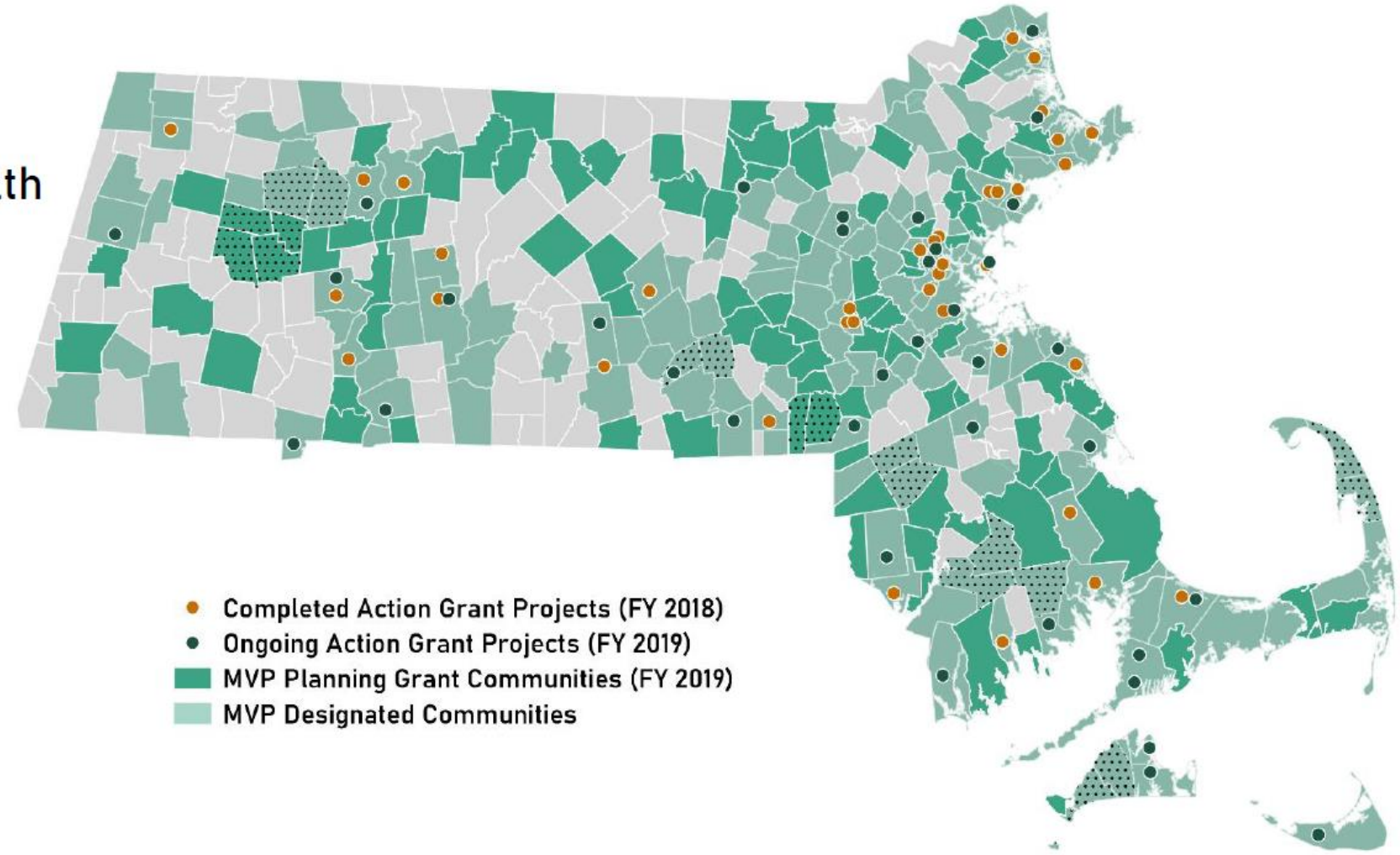
- Eligible for Grant Funding to Implement Actions

Three Years of MVP

MVP Designations
71% of the Commonwealth
249 communities

Action Grant Projects
FY 18: 37
FY 19: 36

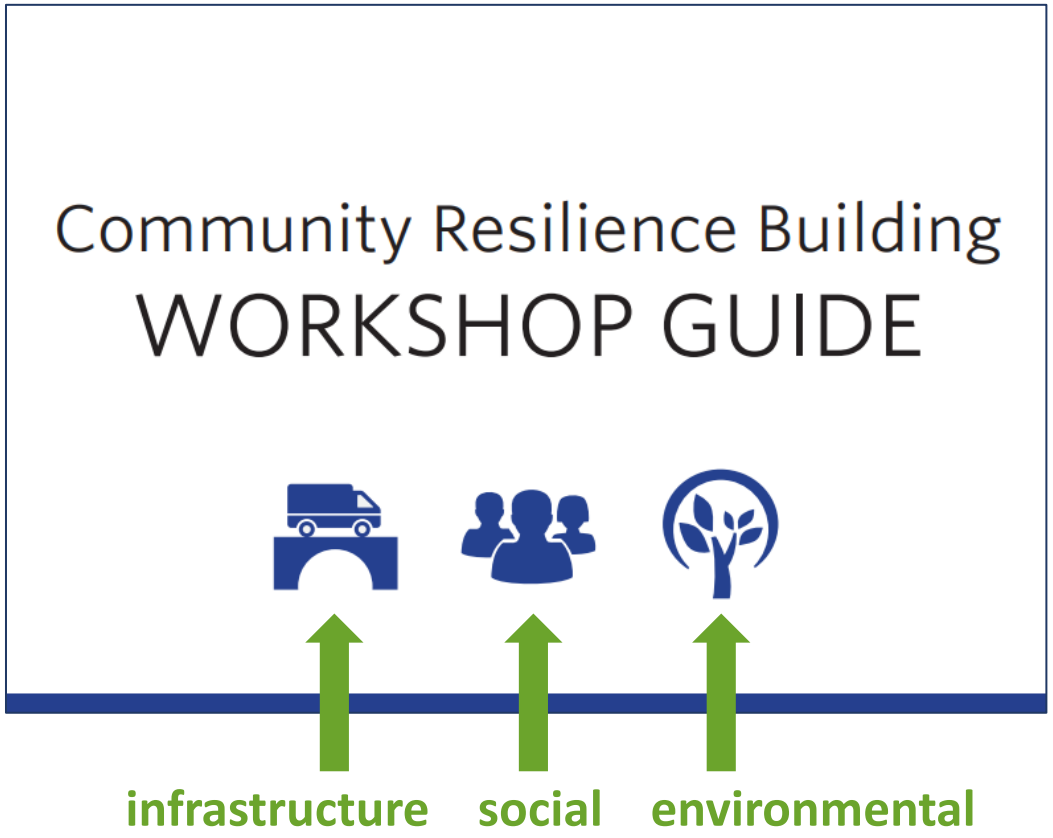
Total Awards
$17M+ in planning and action grants to date



Workshop Purpose

Use Community Resilience Building Workshop Guide to:

- Complete **baseline assessment** of climate change and natural hazard vulnerability
- Develop **specific actions** to address priority hazards/vulnerabilities



MVP Action Grants: Project Types

- Detailed Vulnerability and Risk Assessment*
- Community Outreach and Education
- Local Bylaws, Ordinances, Plans, and Other Management Measures
- Redesigns and Retrofits***
- Nature-Based Flood Protection, Drought Mitigation, Water Quality, and Water Infiltration Techniques**
- Nature-Based, Infrastructure and Technology Solutions to Reduce Vulnerability to Extreme Heat and Poor Air Quality

* Most common project type

** Second-most common project type

***Third-most common project type

MVP Action Grants: Project Types (cont.)

- Nature-Based Solutions to Reduce Vulnerability to other Climate Change Impacts
- Ecological Restoration and Habitat Management to Increase Resiliency

NEW IN 2019

- Energy Resilience
- Chemical Safety
- Land Acquisition for Resilience
- Subsidized Low-Income Housing Resilience Strategies
- Mosquito Control Districts

\+ Expanded eligibility of project location

Example Action Grant Projects

Land Acquisition for Resilience

Mattapoisett

Purchasing 120 acres of forest, streams, freshwater wetlands and coastal salt marsh as conservation land to prevent development in vulnerable areas

Data utilization

Proactive

Example Action Grant Projects

Redesigns and Retrofits

Salisbury

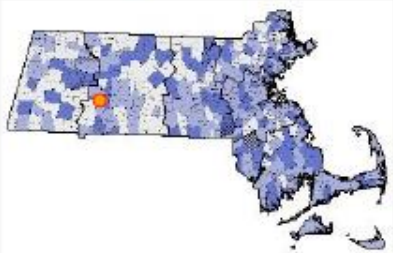
Increasing the resilience of the neighborhood of Ring's Island by raising its access/egress roads and by improving tidal flushing through culvert replacements

Vulnerable communities

FY18 Action Grant Projects

Detailed Vulnerability and Risk Assessment, Further Planning

Holyoke

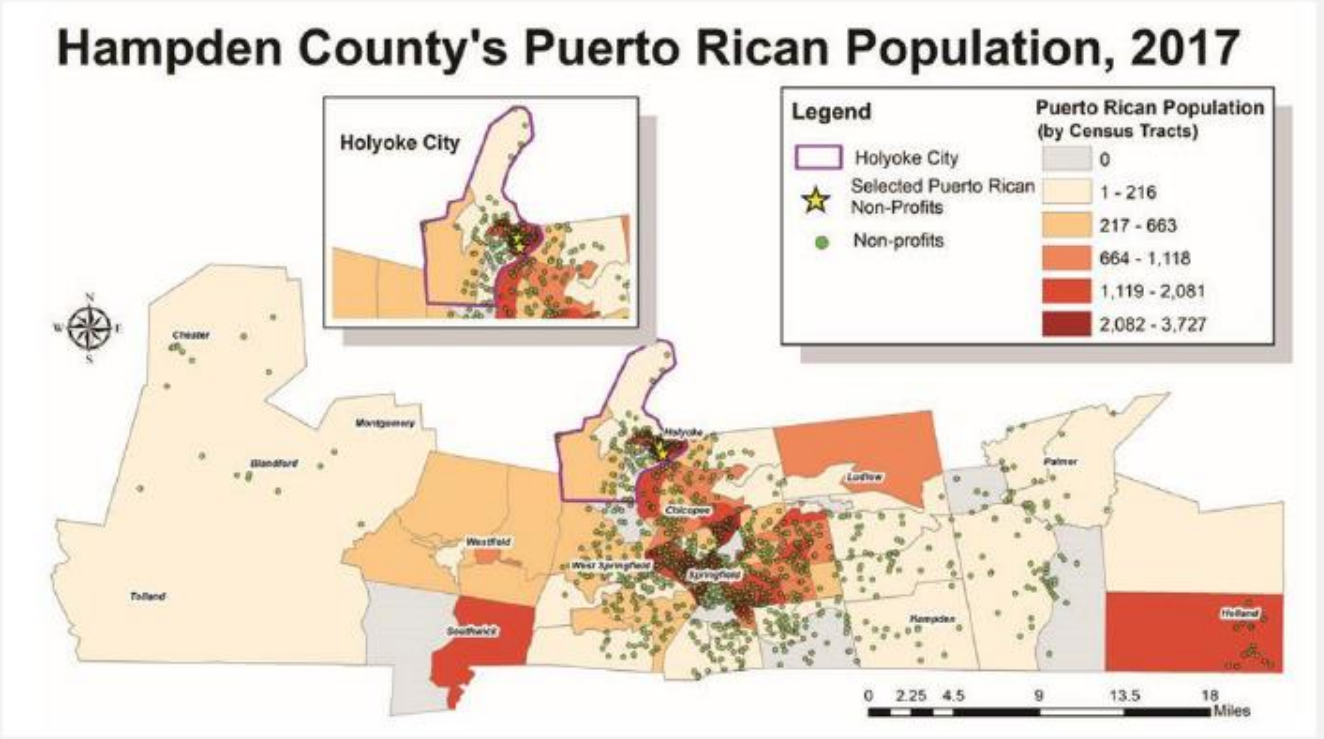


Conducted a detailed demographic analysis of individuals who arrived in Holyoke from Puerto Rico as a result of Hurricane Maria and develop recommendations for planning for future climate change migrants in Holyoke

Informational graphics from Holyoke's final report

Table 12

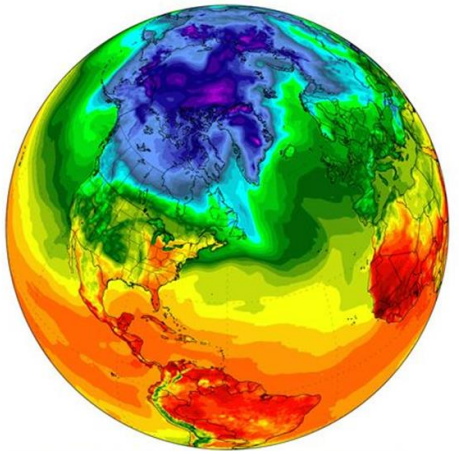
How did the Holyoke municipal government respond to your needs? Was the response...	Freq.	Percent
Helpful	26	63.4
I don't know	7	17.1
Neither helpful nor unhelpful	2	4.9
There was no response from this resource	6	14.6
Total	**41**	**100**



Climate Change 101

WEATHER vs CLIMATE

Atmospheric observations down to the minute	Weather statistics over a period of time (30 years)
Weather is what you get	Climate is what you expect
EX: Nor'easter, hurricane, heat wave	EX: Average high and low temperatures



How Does Climate Change Work?

The heat-trapping blanket metaphor

- The atmosphere is like a blanket that surrounds the earth.
- Burning fossil fuels adds more carbon dioxide to the atmosphere and makes the blanket thicker.
- The blanket has become too thick. It's trapping in too much heat, and the planet is warming up too fast.

Massachusetts
Observed Climate Changes

Temperature: **2.9°F**

Since 1895 (Statewide)

Growing Season: **15 Days**

Since 1950

Sea Level Rise: **11 inches**

Since 1922 (Boston)

Heavy Precipitation: **55%**

Since 1958

Source: Climate Science Special Report, 2017; NOAA NCEI nClimDiv; NOAA Ocean Service

Consequences

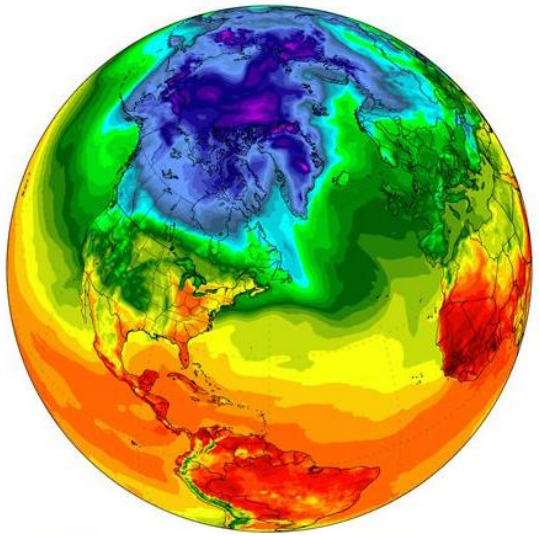
Changes in precipitation
- Inland flooding
- Drought

Rising Temperatures
- Wildfires
- Invasive species/pests

Extreme Weather
- Hurricanes/tornadoes
- Severe winter storms

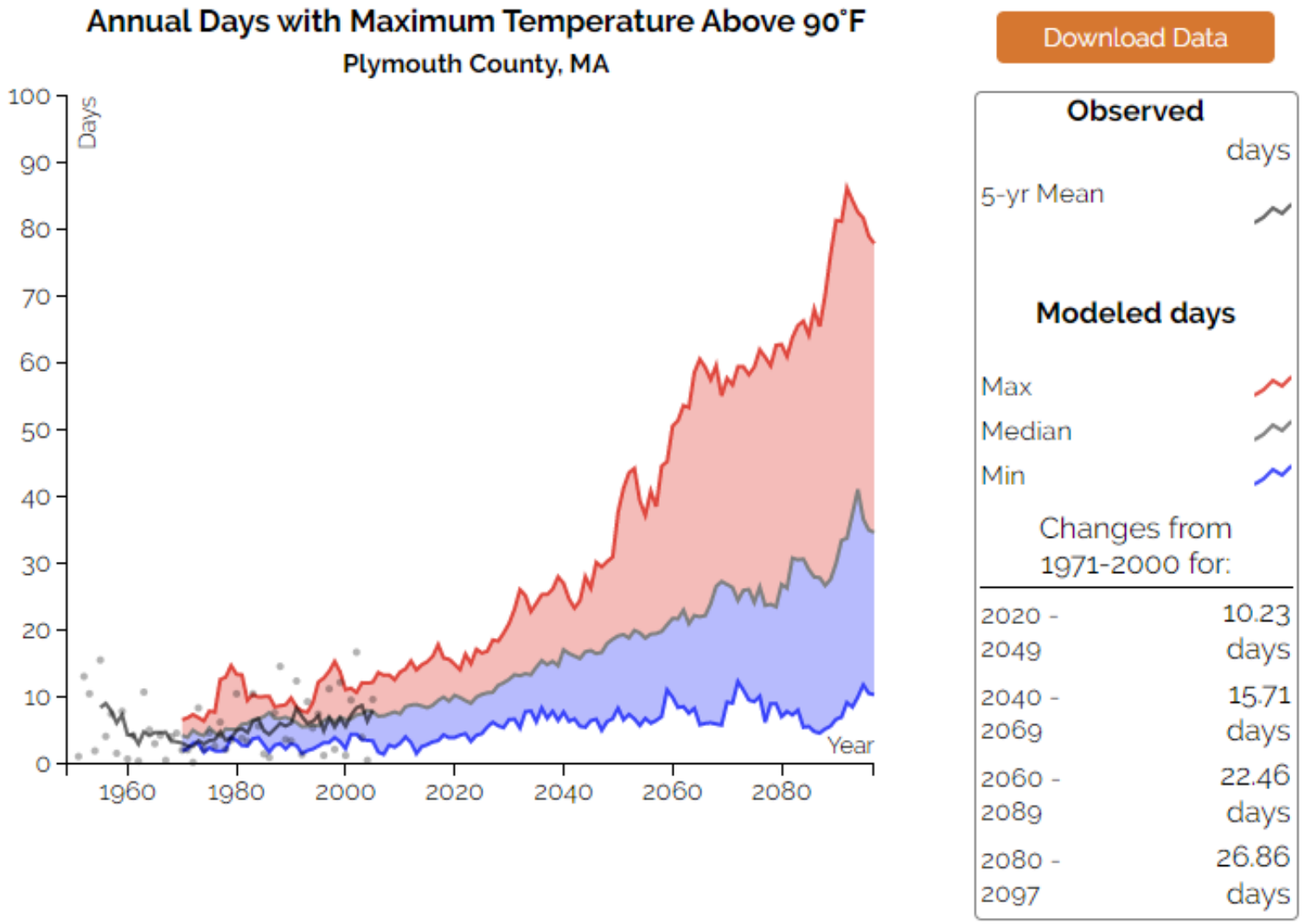
Human-induced hazards
- Loss of habitat/floodplains
- Overuse of fertilizers/pesticides

Abington
Climate Projections



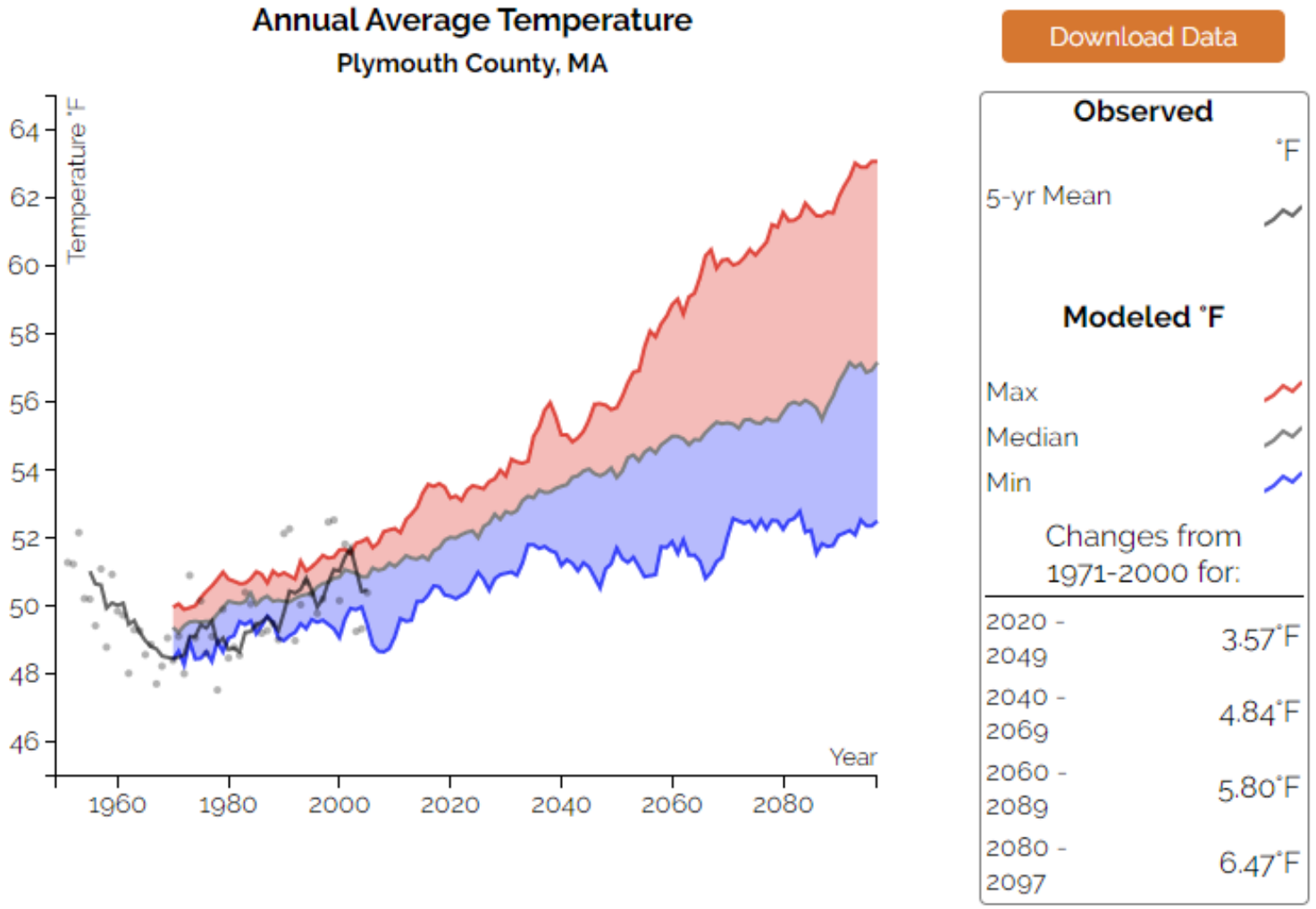
Hotter…by 2040, days per year over 90 F will almost double

TEMPERATURE



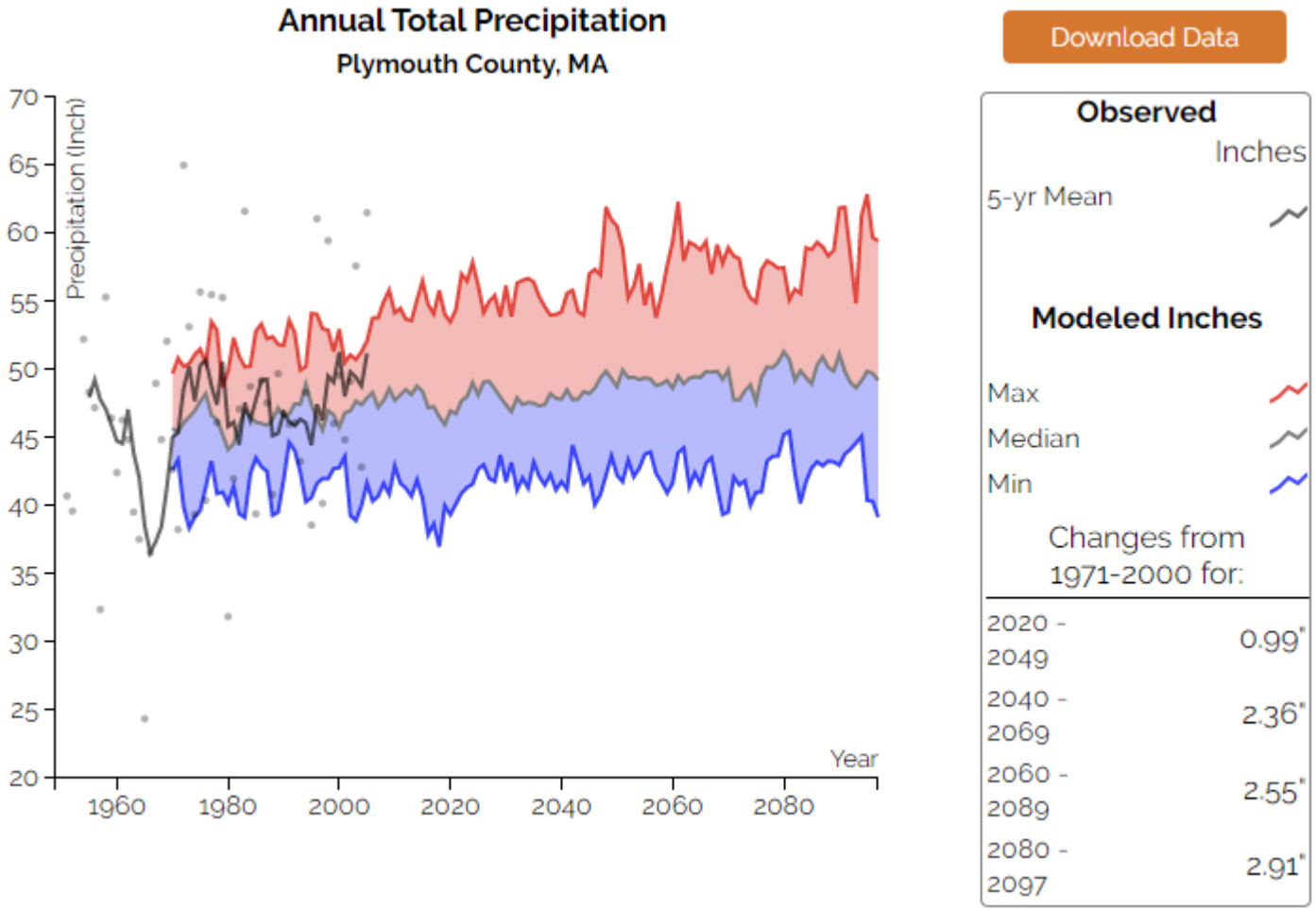
Hotter…average annual temperature steadily increasing

TEMPERATURE



Wetter…increasing average annual rainfall

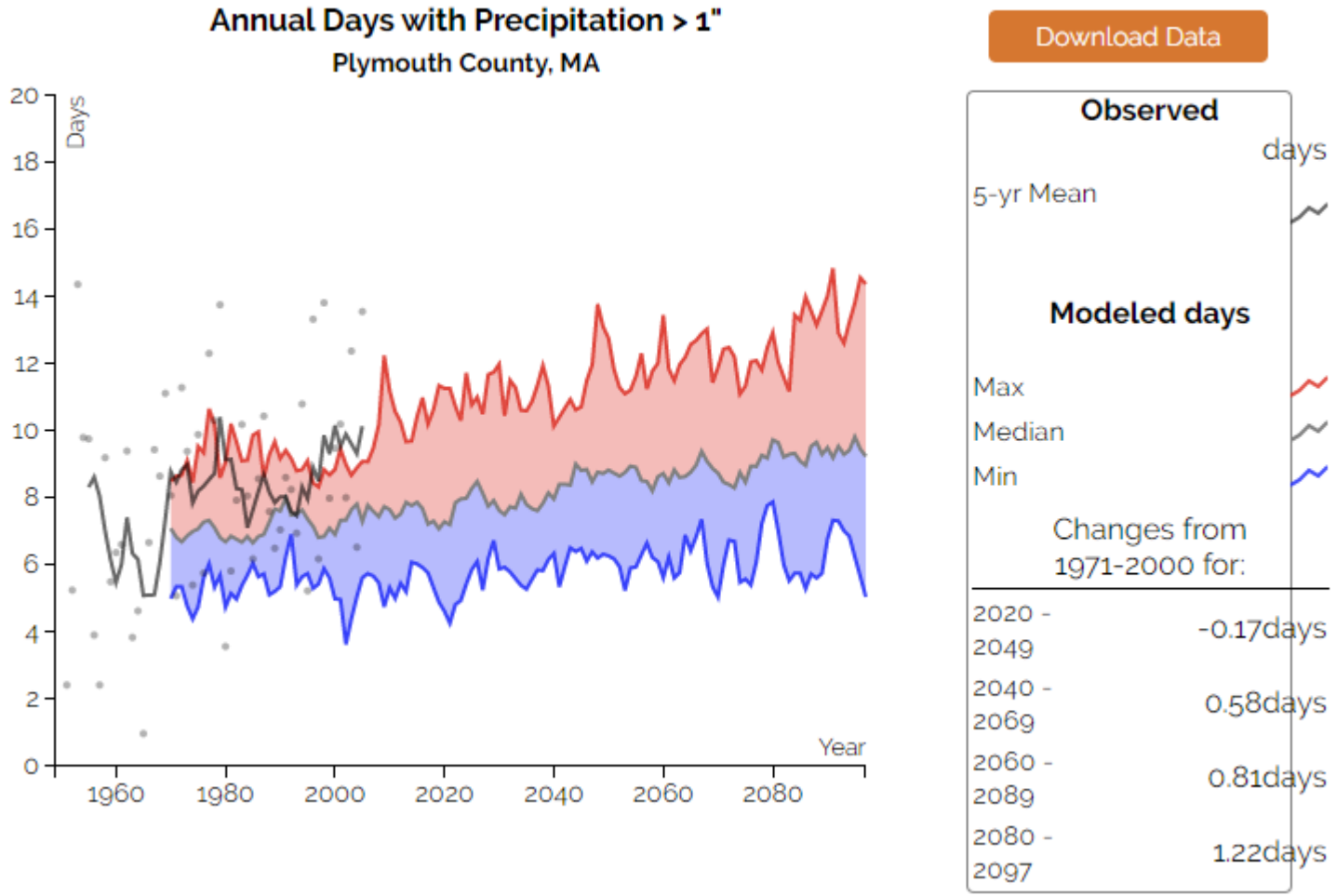
PRECIPITATION



http://climatesmartfarming.org/tools/csf-county-climate-change/

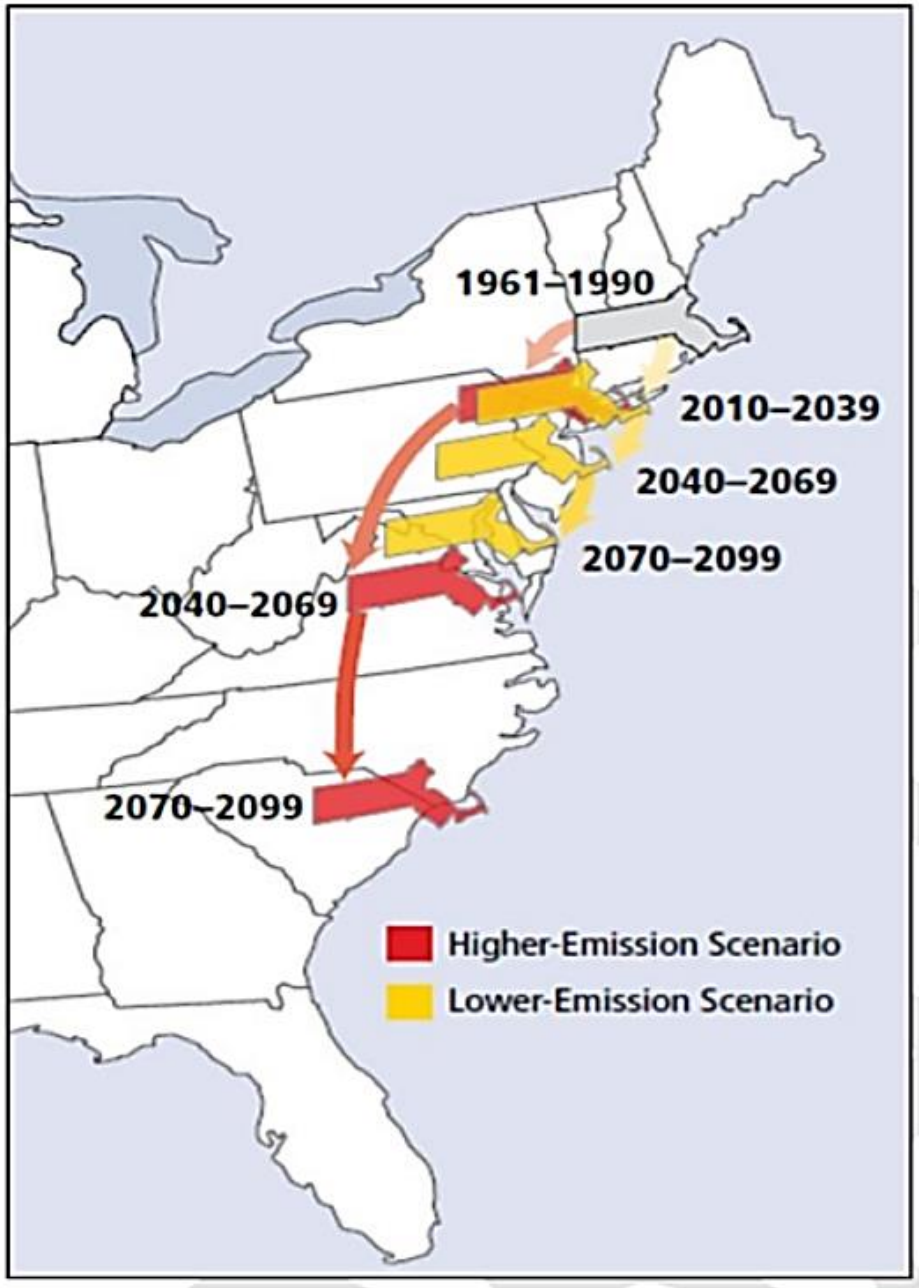
Wetter…more frequent intense precipitation events

PRECIPITATION



What do these Projections Mean?

(relative to temperature)



Source: https://www.yarmouth.ma.us/DocumentCenter/View/11769/MVP-Listening-Session-Presentation?bidId=

Nature Based Green Infrastructure

Vegetated Buffers
(Reforestation, bank restoration, etc.)

- Pollutant Uptake /Filtering
- Habitat / Wildlife Food Source
- Shading
- Aesthetics
- Flood attenuation

Land Protection (acquisition, conservation easements, etc.)

Improved Stream Crossings

- Flood flow passage
- Streambank stability
- Wildlife passage

Low Impact Development (LID)

An ecosystem-based approach to land development and stormwater management

Mimic pre-development site hydrology!





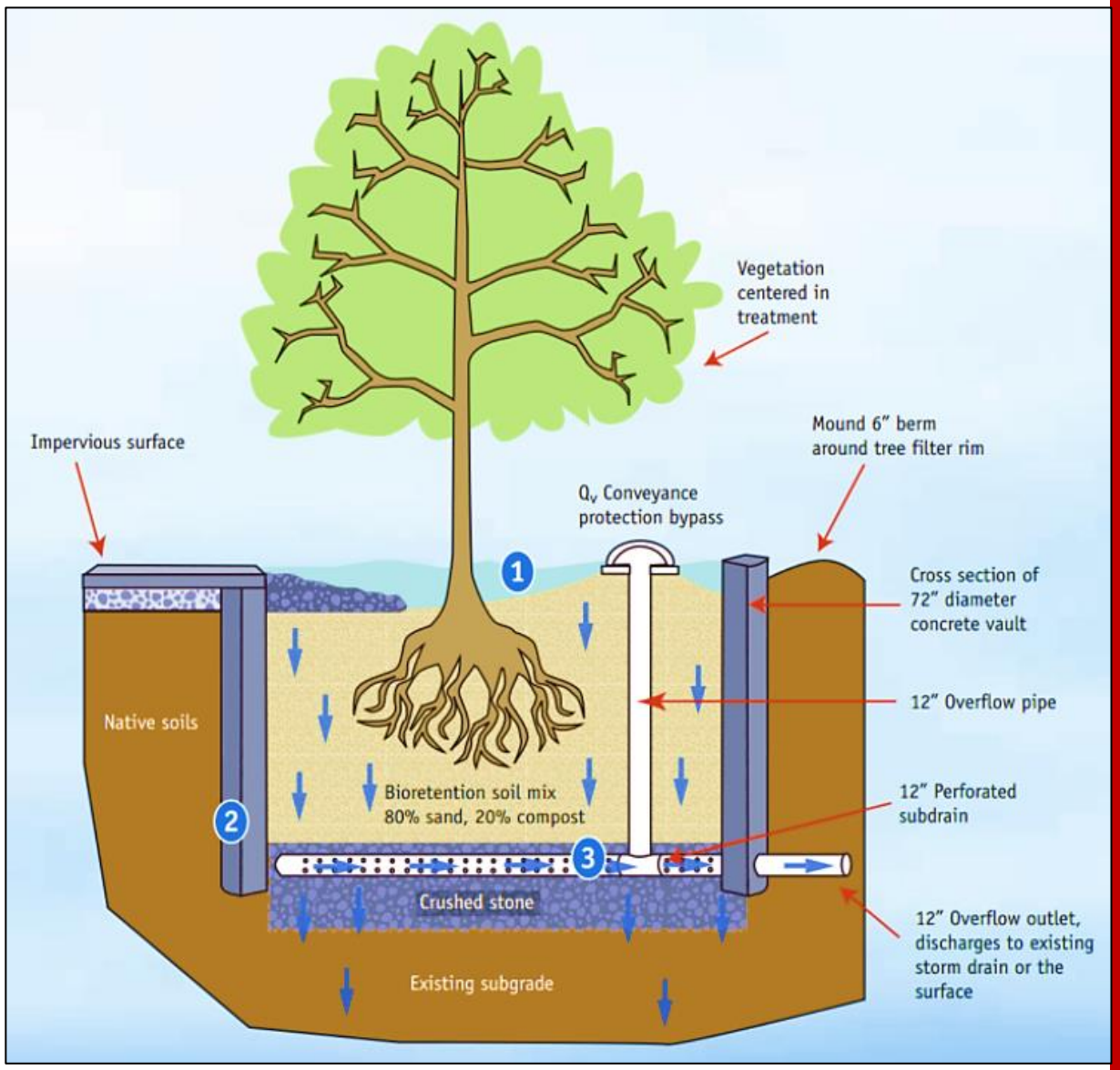

Example
LID Practices

Raingardens / Bioretention Areas

A bowl-shaped garden designed to capture and absorb stormwater.


Lake Shirley Bioretention Cell
Lesson: *Small is beautiful!*

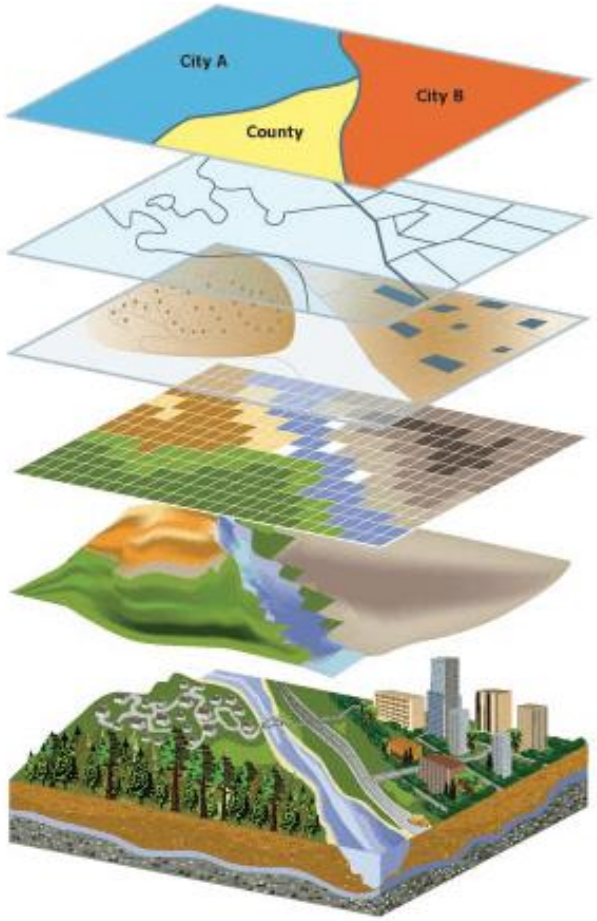
Tree Box Filter (bioretention)



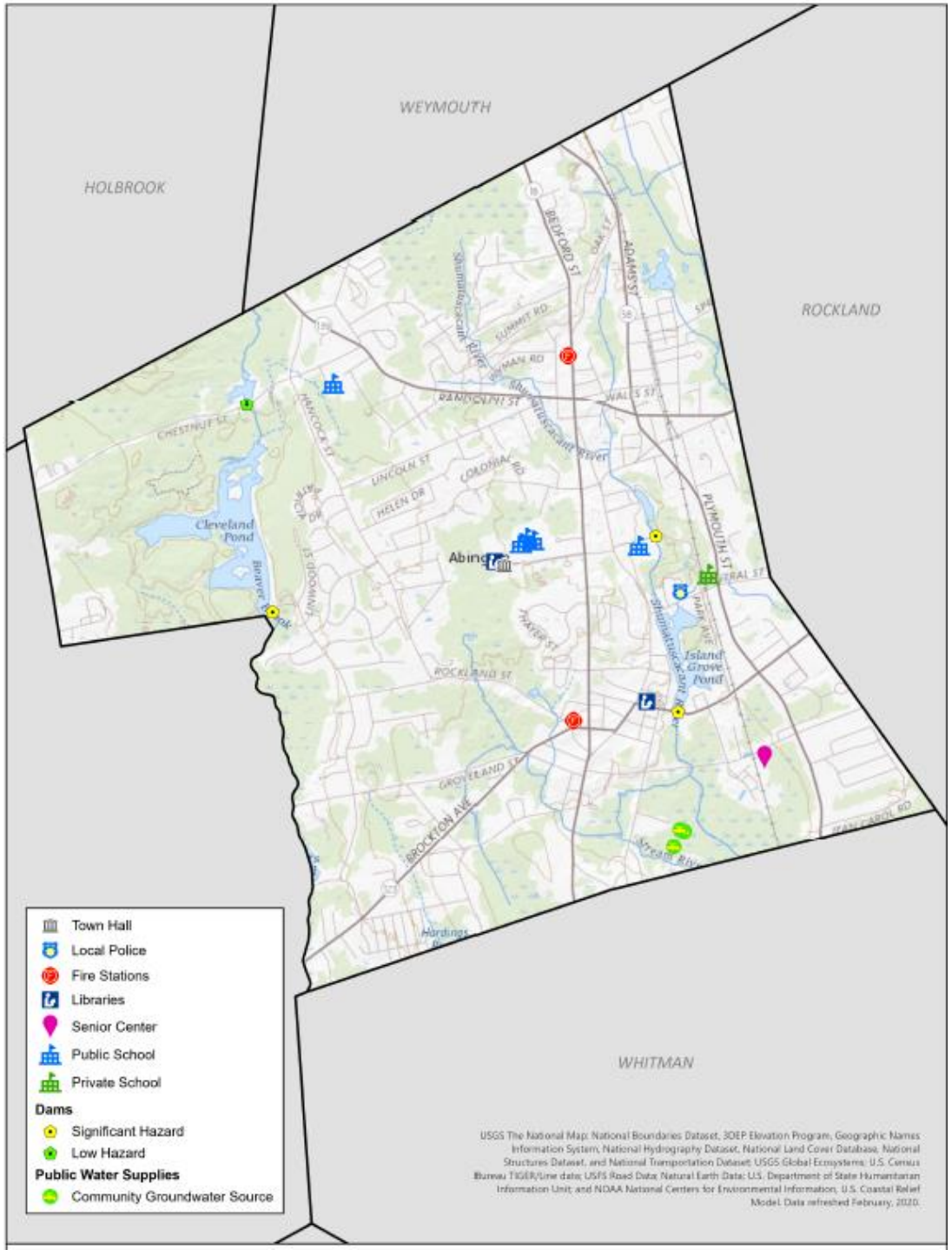
Porous Pavements (Wilmington MA)

- Interlocking Concrete Pavers
- Porous Asphalt / Concrete
- Flexipave

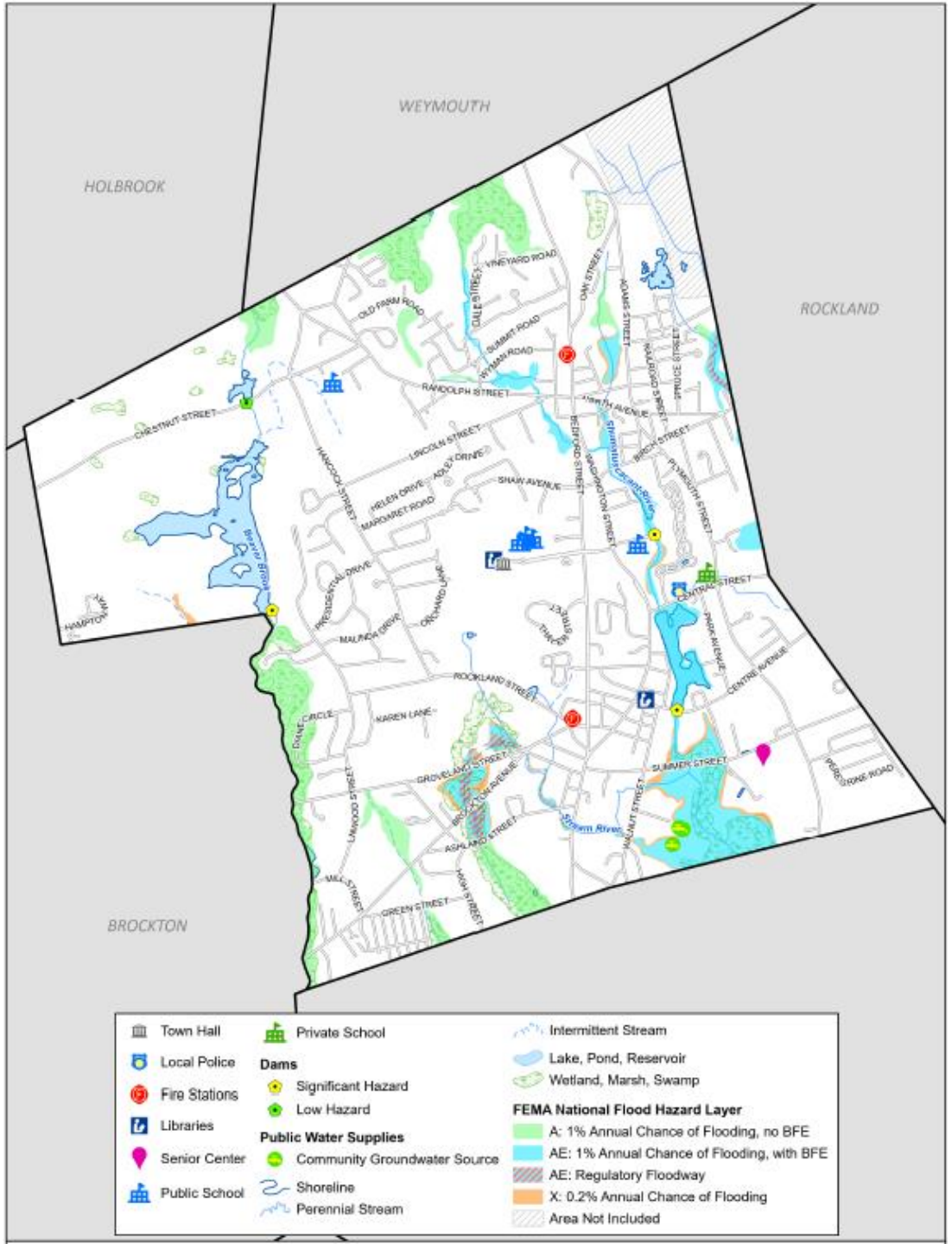
Workshop Map Resources



Basemap


WEYMOUTH
HOLBROOK
ROCKLAND
WHITMAN
Cleveland Pond
Island Grove Pond
Town Hall
Local Police
Fire Stations
Libraries
Senior Center
Public School
Private School
Dams
Significant Hazard
Low Hazard
Public Water Supplies
Community Groundwater Source

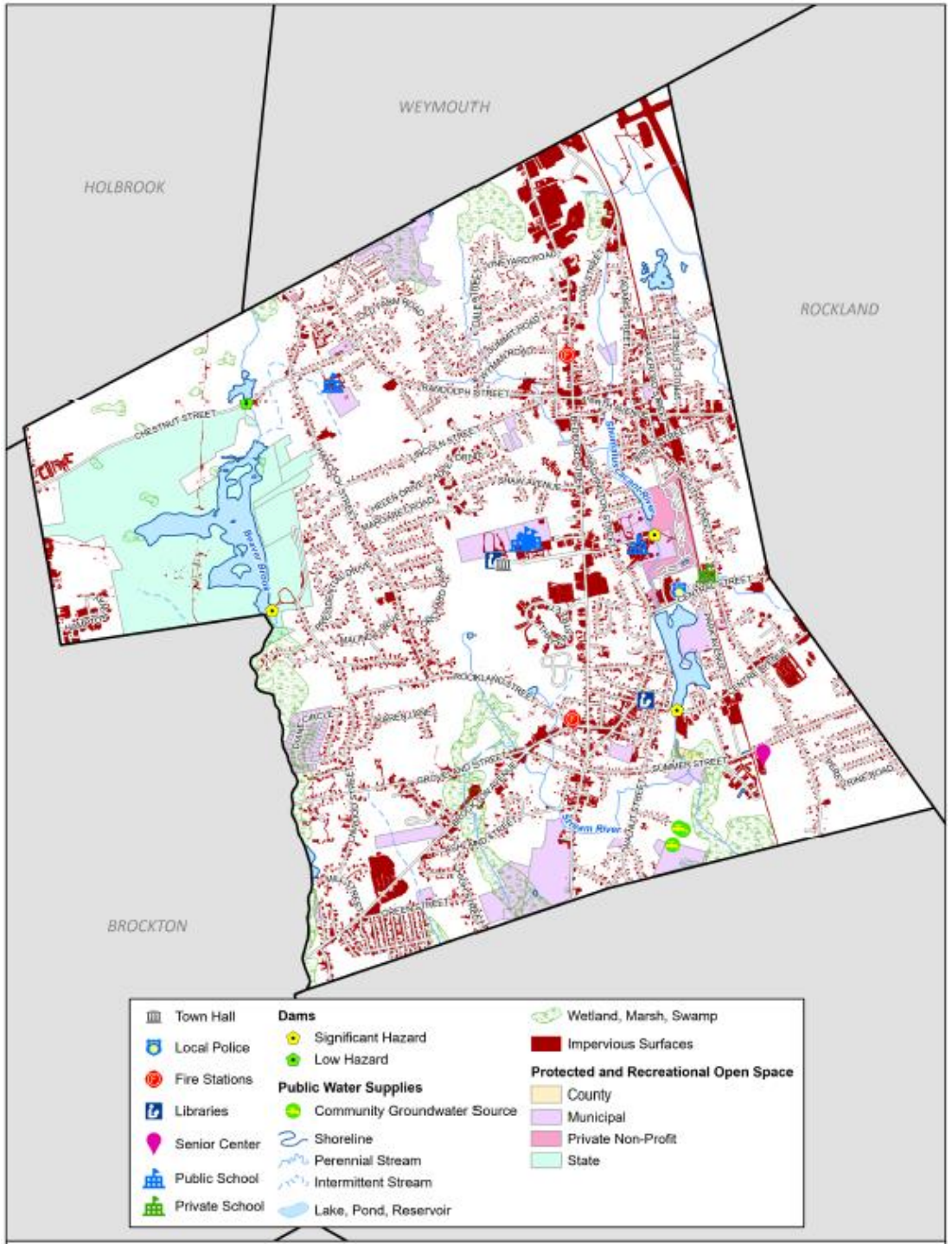
FEMA Flood Zones



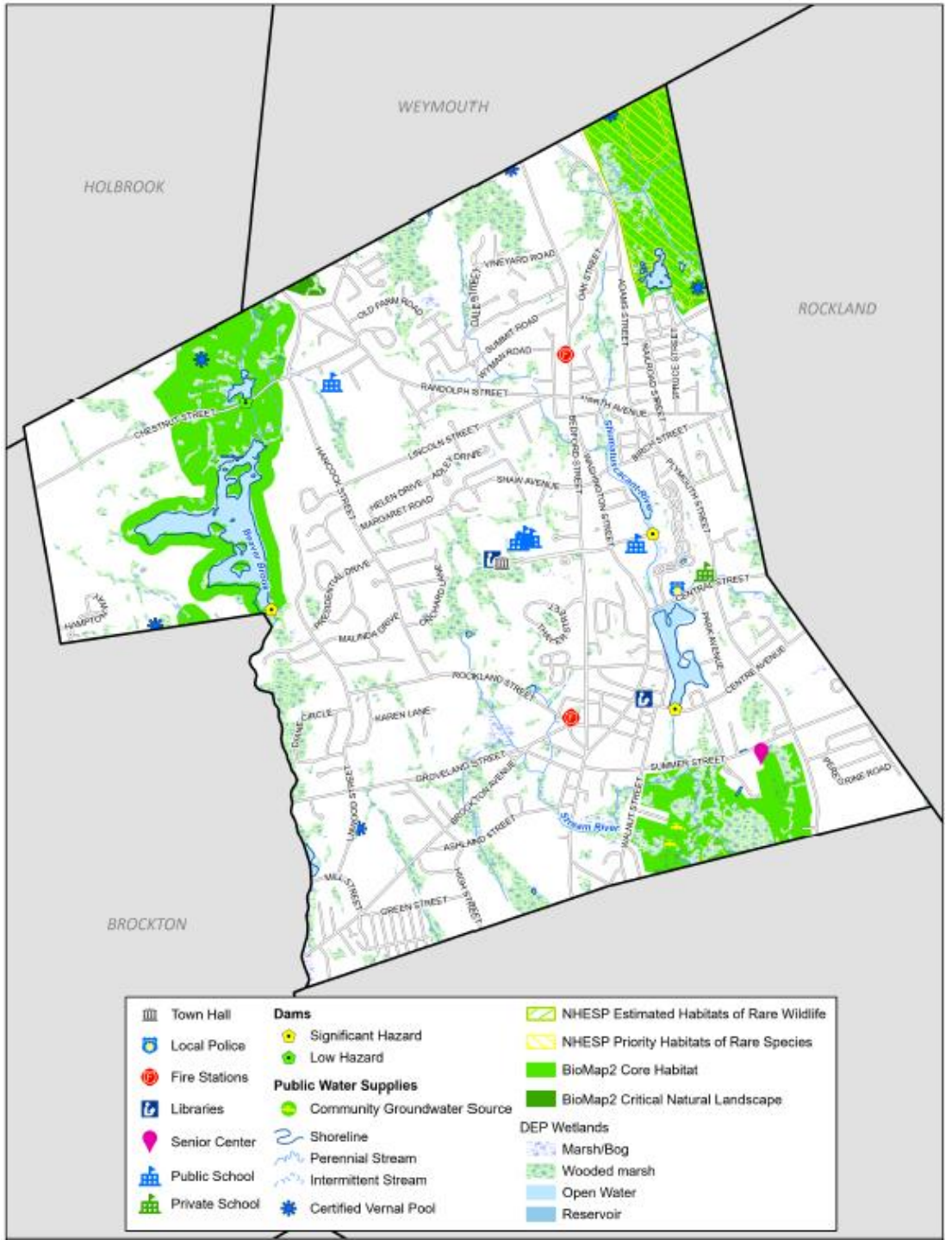
Impervious Surfaces

and

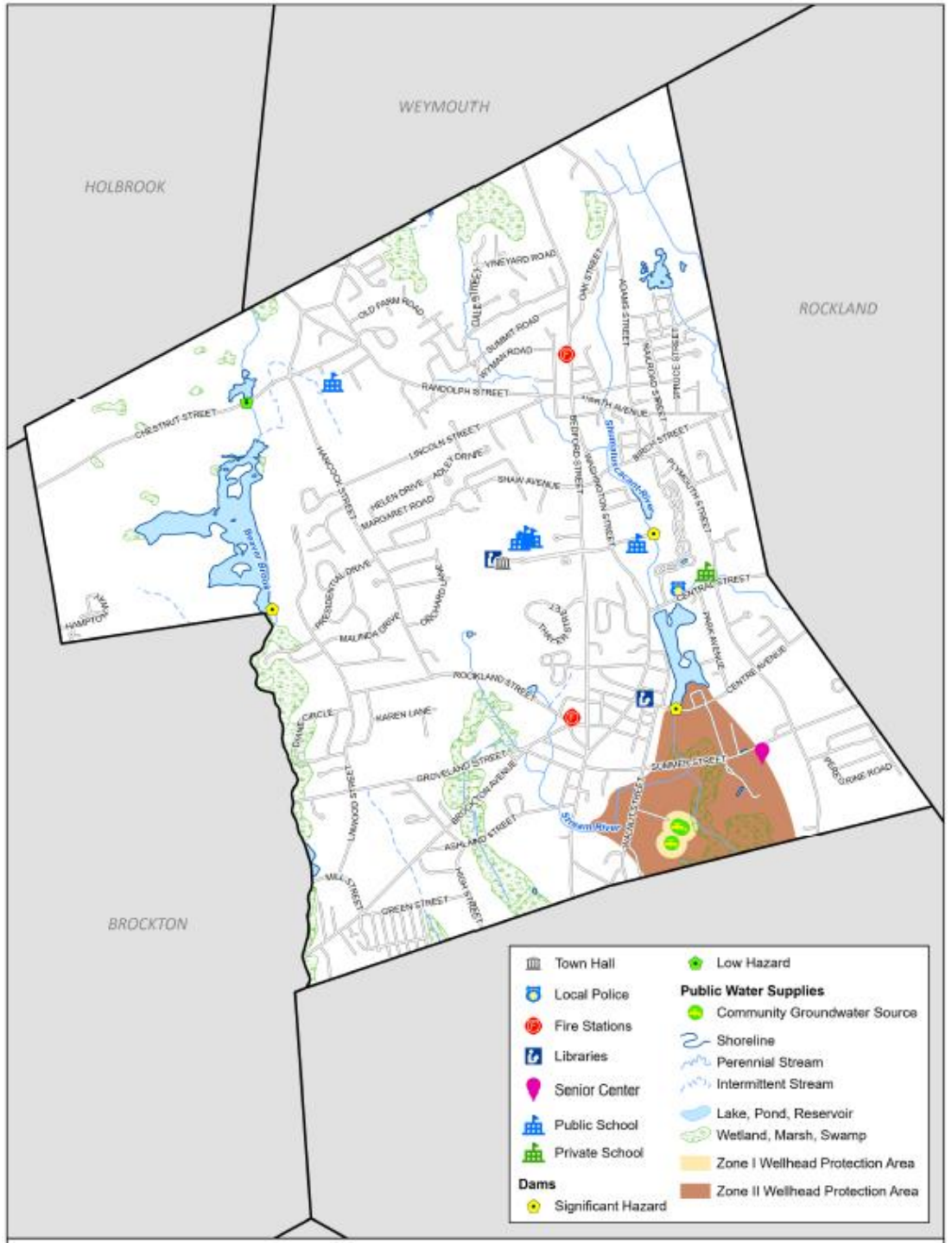
Protected/Recreational Open Space



Wetlands, Critical Habitat, Rare Species



Public Water Supplies



Group Exercises

1: Characterize Hazards

2: Identify Community Vulnerabilities and Strengths

3: Identify and Prioritize Community Actions

4: Determine the Overall Priority Actions

Facilitators:

- Bob Hartzel, CEI
- Emily DiFranco, CEI

Group Exercise #1: Characterize Hazards

Objective: Develop **top 3 Hazards** for facilitated discussions on vulnerabilities and strengths of Abington (infrastructure, natural resources, people, supply chain, etc.)

Hazard:
ultraviolet radiation

- Strong Storms
- Flooding
- Drought
- Sea level rise
- Extreme temps

Vulnerability: exposed skin

- Undersized culverts
- Crop failure
- Low-lying properties
- Vulnerable population health

Actions:

- apply sunscreen
- seek shade

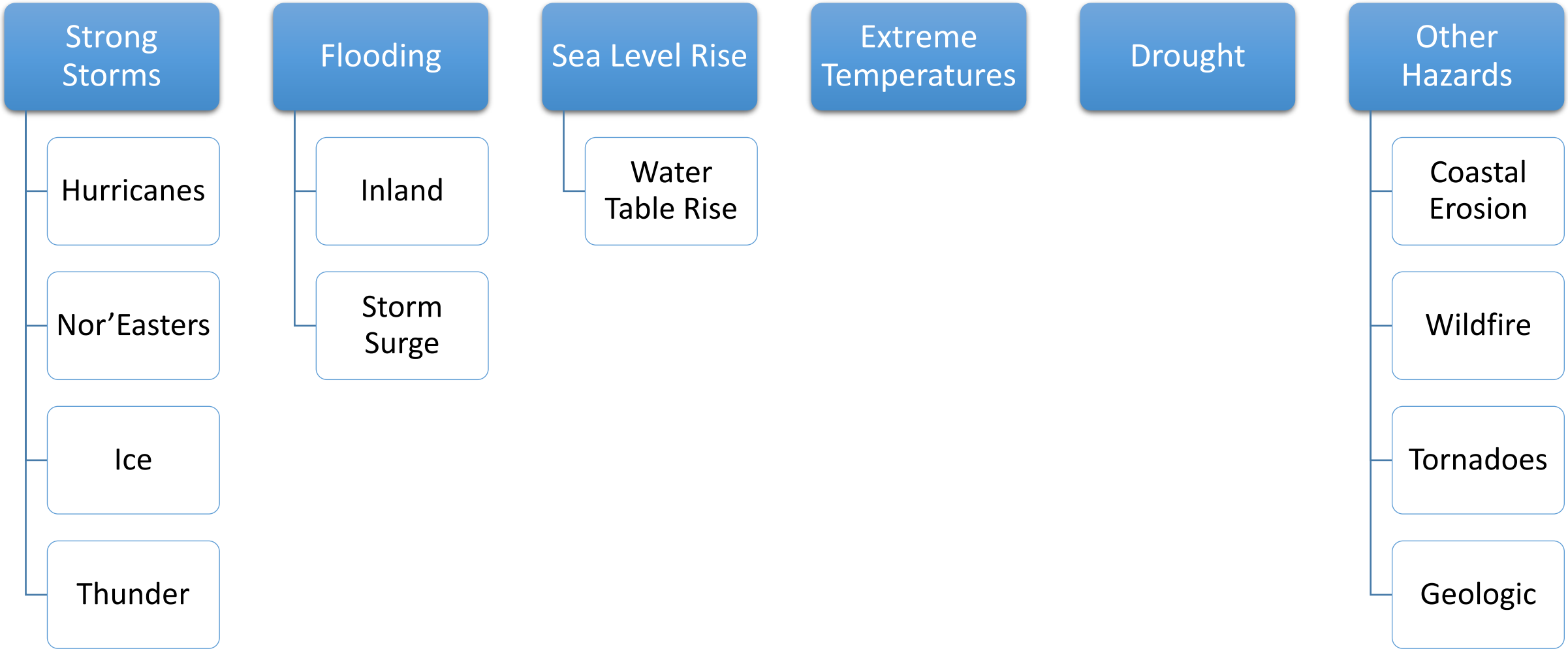
- Upgrade culverts
- Irrigation improvements
- Floodproofing
- Cooling stations

Action Categories:

Hypothetical Example:
Fire Department floods during extreme storm events

Resiliency	Mitigation	Adaptation
• **Improve floodplain function**: ➢ riparian land conservation ➢ green stormwater infrastructure	• **Actions to reduce GHG** ➢ convert to electric municipal vehicles ➢ install solar panels on municipal buildings	• Flood-proof building • Relocate facility outside of 500-yr floodplain

Potential Natural Hazards - Vote on the Top 4!



Group Exercise #2:
Identify Community Vulnerabilities and Strengths

Objective: Develop a **profile** of Abington's infrastructural, societal, and environmental components **that are impacted by the Top 3 Hazards.**

1. Begin in first column of the matrix and identify vulnerabilities (V) and strengths (S).
2. Determine location of V/S and list it on the Risk Matrix and mark it on the Base Map
3. Identify ownership of issue/asset/location

Example Vulnerabilities:

- Main road floods, blocking emergency response
- Power outage during heat waves lead to health concerns
- Wildfire and high winds cause supply chain interruptions
- Sewer pump stations become inoperable
- Compromised rail system due to heat-related track warping

Example Strengths:

- Main road elevated and passable by emergency vehicles
- Hurricane roof installed at school – improved sheltering capacity
- Hardened utility lines reduce ice storm outages
- Undersized culver replaced – reduces flooding at key intersection
- Improvement to communications system during extreme weather

Community Resilience Building Risk Matrix

Abington, Massachusetts

www.CommunityResilienceBuilding.org

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Features	Location	Ownership	V or S	Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)			Priority	Time
							H - M - L	Short Long Ongoing
				Proposed Actions				
INFRASTRUCTURE								
SOCIETAL								
ENVIRONMENTAL								

Thank you for your time!

WORKSHOP PART 2:
May 19, 10am – 12pm

- **CEI will send draft matrix to group by Friday, 5/15**
- **Please review and start thinking about actions**

Group Exercise #3:
Identify and Prioritize Community Actions

Objective: Identify and prioritize **actions** to help reduce vulnerability or reinforce strengths for each of the Top 3 Hazards

1. Begin on right side of the Matrix – "Actions"
2. Under the "Hazards" column, identify the actions needed to reduce V or reinforce S represented by each feature/asset
3. After completing "Hazards" column, consider Priority (High, Medium, Low) and Urgency (Ongoing, Short-term, Long-term) of each action
4. Identify 3-4 Priority Actions per team

Action Categories:

Hypothetical Example:
Fire Department floods during extreme storm events

Resiliency	Mitigation	Adaptation
• **Improve floodplain function**: ➢ riparian land conservation ➢ green stormwater infrastructure	• **Actions to reduce GHG** ➢ convert to electric municipal vehicles ➢ install solar panels on municipal buildings	• **Flood-proof building** • **Relocate facility outside of 500-yr floodplain**

Example Actions:

- Improved access to high-risk locations
- Reduce housing stock in vulnerable areas
- Prioritize development in low-risk areas
- Integrate future risks in capital improvement plans
- Flood-proof manhole covers
- Secure new generators for critical facilities

MVP Action Grants: Project Types

- Detailed Vulnerability and Risk Assessment*
- Community Outreach and Education
- Local Bylaws, Ordinances, Plans, and Other Management Measures
- Redesigns and Retrofits***
- Nature-Based Flood Protection, Drought Mitigation, Water Quality, and Water Infiltration Techniques**
- Nature-Based, Infrastructure and Technology Solutions to Reduce Vulnerability to Extreme Heat and Poor Air Quality

* Most common project type

** Second-most common project type

***Third-most common project type

Group Exercise #4:
Determine the Overall Priority Actions

Objective: Present the findings of each group and collectively discuss identified opportunities to reduce current and future hazard risks and improve resilience

1. Spokesperson from each team presents findings to Large Group
2. Spokesperson presents 3-4 priority action cards to Lead Facilitator
3. Large Group Discussion to further define Highest Priority action list:
    i. **Top 3-5 actions** to implement for Town of Lynnfield

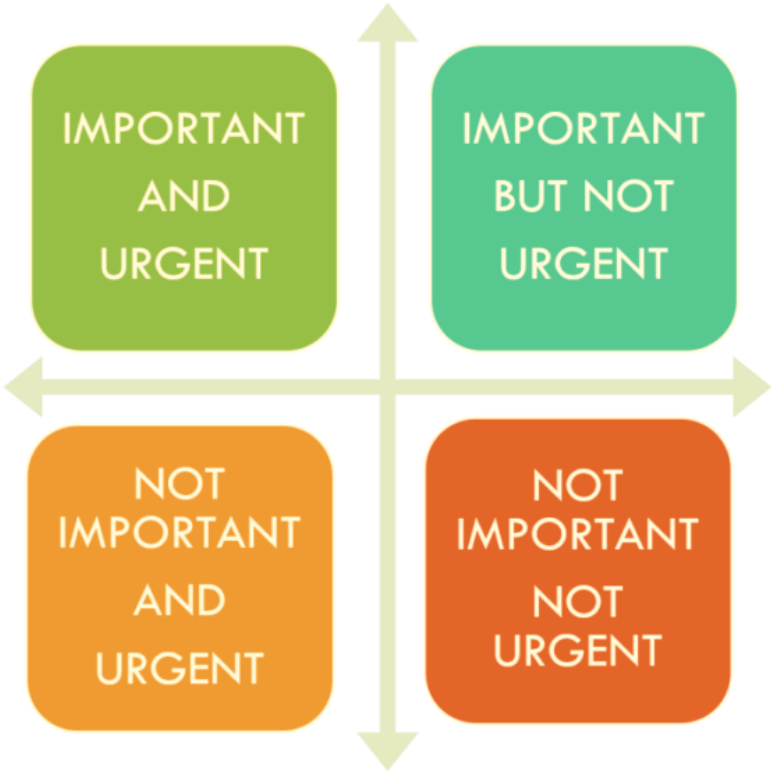
Prioritization Factors

Consider factors such as:

- Funding availability / terms
- Agreement on outstanding impacts from recent hazard
- Necessity for advancing long-term outcomes
- Contribution to meeting existing local /regional planning objectives

Examples of urgency:

- Current project to install hurricane-proof roof on school is ongoing **(O)** action.
- Ensuring evacuation procedures are updated annually is considered a short-term **(S)** action.
- Reducing housing stock in high-risk areas, elevating a road, or replacing a bridge are long-term **(L)** actions.



Wrap-Up

Next Steps:

- Develop Report
- Hold Listening Session
- Become MVP Community

Apply for Action Grant Funding!

APPENDIX B

COMPLETED RISK MATRIX

Community Resilience Building Risk Matrix

Abington, Massachusetts

www.CommunityResilienceBuilding.org

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

V = Vulnerability **S** = Strength

Features	Location	Ownership	V or S	Top Priority Climate-Related Hazards: Strong Storms	Inland Flooding	Extreme Temperatures	Drought	Priority (H-M-L)	Time (Short Long Ongoing)
INFRASTRUCTURE									
Road flooding due to low-point in road or proximity to surface waters	Chestnut Street	Town	V	Conduct an engineering assessment of roads in town that flood due to low-points and/or proximity to surface waters. Prepare engineering designs to mitigate flooding at high priority sites (Chestnut Street noted as highest priority based on past flooding).				M	S
	Ashland Street - under Rte. 123	Town	V						
	Rte. 123, near Old Town Dump	Town	V						
	Shaw Ave. (near Senior Housing)	Town	V					M	S
Significant hazard bridge at increased risk of failure due to flooding and scour from high velocity flows	Central Street Bridge	Town	V	Repair Central Street Bridge, documented as significant hazard in recent inspection and was shown to have major deficiencies. Approximate cost $450K; article in 2020 Town Warrant to repair the bridge.				H	S
Dams requiring repair associated with flooding and/or damage from high peak flows during/following strong storms	Hunts Brook Dam	Town	V	Repair Hunts Brook Dam per the Emergency Action Plan. Dam is co-owned by City of Brockton (*possible regional action item*).				M	S
	Beaver Brook Dam (near Beaver Brook Elementary School)	Town	V	Repair Beaver Brook Dam as it was found to require rehabilitation during a recent state inspection. Currently no Emergency Action Plan.				H	S
	Island Grove Pond Dam (under Centre Ave./Rte. 123 Bridge)	Town	V	Repair Island Grove Pond Dam per recent Draft Emergency Action Plan. Draft EAP has been completed and identifies at-risk downstream areas.				H	S
Ice build-up on roads due to increased use of sump pumps by residents as water table rises.	Town-wide	Private	V	Assess magnitude of the problem throughout town to identify/prioritize problem areas. Current bylaw prohibits pumping directly to street. Determine fixes such as reviewing bylaws for update/changes or requiring homeowners to redirect sump pump flow onto property. Assess funding options for stormwater retention, infiltration, and drainage structures (e.g., French drains) on private properties.				M	O
Water supply brought into Abington from Great Sandy Bottom Pond (Pembroke) through single pipe that crosses several adjacent towns.	Town-wide	Abington/Rockland Water Works	V	Conduct study to determine climate-related risks to the Town's water supply and alternatives to improve water supply resiliency to climate change. These risks include drought, risks to infrastructure (e.g. single pipe conveying water from Great Sandy Bottom Pond in Pembroke), and risks to water quality and associated treatment processes to ensure safe water supply. Funding request currently pending for Meyers Ave. facility (limited reserve capacity during drought).				H	O
SOCIETAL									
Lack of/inadequate air conditioning (AC) in key facilities for vulnerable populations	Senior Housing (no cooling) on Gliniewicz Way and Shaw Ave.	Town	V	Install back-up power supply generator (top priority) to ensure power is not interrupted to window AC units and oxygen supplies.		Install central air conditioning. Seniors can be bussed to the Senior Center (cooling center) during day but must return home at night. Evaluate feasibility of construction new cooling center.		H	S
	Two elementary school buildings (no cooling);	Town	V			Install central AC.		M	S
	High School (parts of building lack AC sufficient for heat wave)	Town	V			Install central AC.		L	L
Multiple town-owned properties currently available as cooling stations	Town-owned pool	Town	S						
	Senior Center	Town	S/V	Install large generator to improve capacity for air conditioning and other emergency shelter functions. Assess feasibility of facility improvements needed to provide overnight housing (e.g., cot storage, etc.) during heat waves and other emergencies. Currently, Senior Center is only available during the day.				H	S
Improvements to emergency alert system needed to reduce risk to vulnerable populations	Town-wide	Town	V	Improve the Town's emergency alert system to make it more available to all populations. This could include a system that provides outgoing messages from Town Hall, rather than the current NIXLE system that requires citizens to obtain information from the Town website.				H	S
Critical facilities with only one egress; Risk (including risk to vulnerable populations and emergency shelter) if flooded or blocked by felled tree during a storm	Gliniewicz Way/Lincoln Blvd.	Town	V	Conduct feasibility study to evaluate options for second emergency egress via Hancock St. to Town properties. Currently only one road to access Town offices, Library, and Abington High School (emergency shelter). Second egress would promote use of bikes and walking to these facilities, reducing greenhouse gas emissions.				H	S
	Senior Housing (off Shaw Ave.)	Town	V	Conduct study to evaluate options for second egress via Rt. 18, Colonial Rd., or Warren Street.				L	L
Warmer climate and increased rainfall will increase mosquito breeding, length of mosquito season, and associated human health impacts. Increases in other insect-related issues such as illness from ticks.	Town-wide	Town	V		Investigate possible solutions to insect-related hazards including revising design guidance, regulations, directing downspouts into ground to reduce standing water, etc.			L	O
ENVIRONMENTAL									
Increased erosion and tree loss associated with flooding and/or damage from strong storms.	Island Grove area	Town	V	Conduct study of Island Grove area to assess and prioritize repair actions needed. Particular focus on Lake Street and Central Street. Areas on perimeter of pond at highest risk to storm damage due to wind exposure.				M	S
Increased phosphorus load to waterbodies due to increased precipitation; Higher temps. increases nuisance algal blooms and nuisance vegetation.	Island Grove Pond	Town	V	Implement nutrient loading reduction measures and other algae control measures for Island Grove Pond as recommended in recently completed study.				H	O
Increased risk of wildfires due to drought and extreme temperatures	Carista Property (west of Rt. 18, north of Vineyard Rd.)	Town	V			Explore feasibility of installing a fire road or a gated emergency access trail (off of Hjelm Street). Concern with increased fire risk associated with increasing the number of trails and public access.		L	L
Increased risk of damage to property due to drought (pond on course), flooding of property.	Strawberry Valley Golf Course	Town	V			Conduct a feasibility assessment to increase pond capacity by dredging or excavating upland areas.		L	L
Loss of street trees and other trees town-wide (e.g. hemlocks lost to due to damage from woolly adelgid)	Town-wide	Town	V			Develop/implement Town tree planting plan to improve nature-based resiliency to climate change.		M	O
Overall good tree canopy town-wide.	Town-wide	Town	S						