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CITY OF MALDEN COMMUNITY RESILIENCE BUILDING WORKSHOP SUMMARY OF FINDINGS REPORT

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EXECUTIVE SUMMARY

Per Executive Order 569, on November 7, 2019 the City of Malden facilitated a Community Resilience Building (CRB) Workshop using the Nature Conservancy's CRB guidance. In preparation for the CRB Workshop, the Core Team with assistance from GZA GeoEnvironmental, Inc. (GZA) and the Mystic River Watershed Association (MyRWA) identified and invited over seventy stakeholders. These stakeholders included local and state officials and local and regional representatives from the Malden Works Steering Committee, Chamber of Commerce, Cambridge Health Alliance, Public Utilities, Metropolitan Area Planning Council (MAPC), Malden Public Schools and others. The Workshop's central objectives were to:

- Define the top local natural and climate change-related hazards of concern;
- Identify hazard vulnerabilities;
- Identify existing City capabilities;
- Develop and prioritize actions for the community; and
- Identify opportunities to collaboratively advance actions to increase resilience.

The following is a brief summary of the CRB Workshop results with an emphasis on the top hazards, specific areas of concern and top priorities for climate adaptation actions.

Top Natural and Climate Related Hazards

1. Heat/Extreme Temperatures
2. Flooding
3. High Winds/Storms
4. Air Quality
5. Fire/Drought

Infrastructural Vulnerabilities and Areas of Concern

- Department of Public Works Yard at 356 Commercial Street adjacent to the Malden River
- City-wide Power System & National Grid Site on Commercial Street
- City-wide Drinking and Storm Water Systems
- Forest Street
- Amelia Earhart Dam on the Mystic River
- Tide Gates at Rumney Marsh and Malden River
- Bowman Street Culvert
- Intersection of Eastern Ave. and Broadway
- Intersection of Mountain Ave and Everett Street
- MWRA surcharge into stormwater system

Societal Vulnerabilities and Areas of Concern

- Senior Housing
- Salemwood School and Roosevelt Park
- Additional Public Schools
- Newland and Linden Housing Developments



Environmental Vulnerabilities and Areas of Concern

- Malden River and future economic development of the Commercial Street Corridor
- Roosevelt Park
- Saint Mary's Brook at the border of Malden and Medford where the culvert does not connect to the pond
- Former Malden Hospital Campus
- Town Line Land Acquisition for Nature Trail

Identified Climate Adaptation Action Priorities

1. Department of Public Works (DPW) Site Resiliency Prototype Project that will support and enhance the Malden Works project, a nature-based solutions plan for improving flood resiliency and community parks and recreational open space underway to include flood protection, stormwater quality improvements and energy resilience at the DPW site.
2. Public Housing Resilience Improvements.
3. Heat Mitigation/Tree Plantings Resilience Program.
4. City-wide Stormwater Improvements including a comprehensive vulnerability assessment and action plan
5. Resiliency in Zoning Assessment to evaluate how existing zoning ordinance requirements support or hinder climate resiliency and identify how zoning regulations could be amended to further bolster climate resiliency for the City.



TABLE OF CONTENTS

1.0	OVERVIEW.....	1
1.1	INTRODUCTION.....	1
1.2	CORE PROJECT TEAM.....	2
1.3	WORKSHOP PARTICIPANTS.....	3
1.4	CRB WORKSHOP PROCESS.....	3
2.0	TOP NATURAL AND CLIMATE-RELATED HAZARDS.....	4
3.0	CURRENT CONCERNS AND CHALLENGES PRESENTED BY NATURAL HAZARDS.....	5
4.0	SPECIFIC CATEGORIES OF CONCERNS AND CHALLENGES.....	6
4.1	INFRASTRUCTURE.....	6
4.2	SOCIETAL.....	6
4.3	ENVIRONMENTAL.....	7
5.0	CURRENT STRENGTHS AND ASSETS IN THE CITY OF MALDEN.....	7
5.1	INFRASTRUCTURAL.....	7
5.2	SOCIETAL.....	8
5.3	ENVIRONMENTAL.....	8
6.0	PRIORITY ACTIONS TO IMPROVE RESILIENCE.....	9
6.1	HIGH PRIORITY ACTIONS.....	10
6.2	ADDITIONAL PRIORITY ACTIONS.....	13
7.0	PUBLIC LISTENING SESSION.....	14
7.1	ADDITIONAL PUBLIC COMMENT PRIORITY ACTIONS.....	14
8.0	CITATION.....	16
9.0	ACKNOWLEDGEMENTS.....	16
9.1	WORKSHOP STAKEHOLDERS.....	16

APPENDICES

APPENDIX A	WORKSHOP PRESENTATION AND HANDOUTS
APPENDIX B	BASE MAP, ASSETS INDEX AND STAKEHOLDER GROUP MAPPING
APPENDIX C	COMPLETED RISK MATRICES
APPENDIX D	LISTENING SESSION PRESENTATION, COMMENTS & SIGN-IN SHEET
APPENDIX E	PUBLIC COMMENTS

1.0 OVERVIEW

1.1 INTRODUCTION

The City of Malden is one of 249 municipalities (see **Figure 1**) in the Commonwealth of Massachusetts that are proactively increasing resiliency to natural hazards and climate change at the local level through the Municipal Vulnerability Preparedness (MVP) Program. Natural disasters can cause loss of life and extensive damages to properties and infrastructure, affecting the local, state, and national economic, social, and environmental well-being. Weather natural disasters are likely being impacted by climate change and are expected to be further exacerbated by climate change in the future.

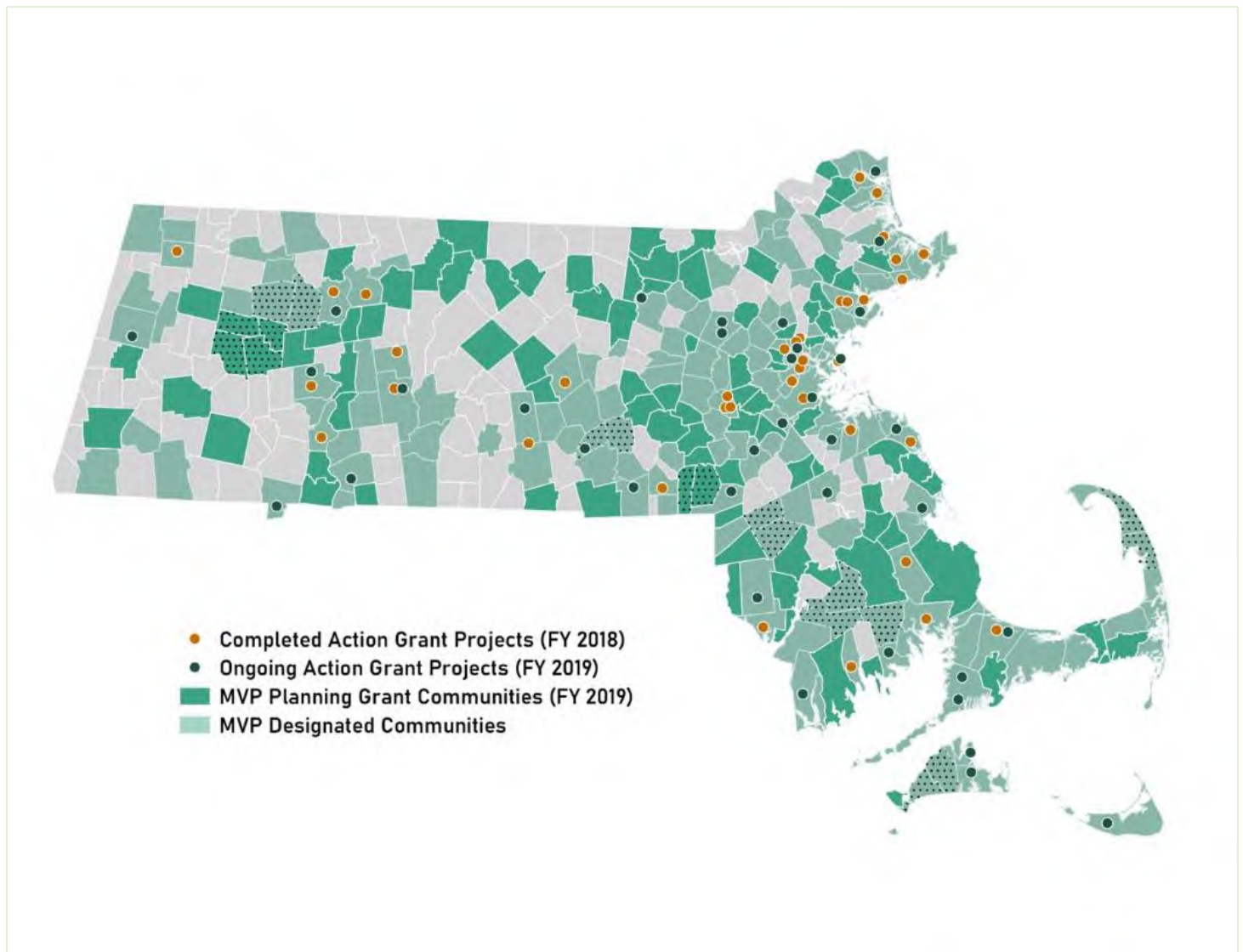


Figure 1. Map of MVP Designated Communities, FY2019 Planning Grant Communities and Locations of MVP Action Grant

Over the last decade Malden has experienced impacts from weather-related natural hazards such as “nor’easters”, severe winter weather, severe weather, and flooding including major storms during March 2010, August 2011, October 2012, February 2013, January 2015, and January and March 2018. The City has been actively identifying the City’s vulnerabilities



from natural hazards through the development of the City's FEMA-approved 2017 Natural Hazard Mitigation Plan (2017 NHMP). The recent impacts from hurricanes Sandy and Irene in New England have increased the urgency for municipalities to increase resilience to address extreme weather and climate change vulnerability. In 2018, the Commonwealth experienced significant impacts from multiple nor'easters that resulted in property damage and utility disruption including power outages that extended from the coast to inland communities in the MetroWest region. New England, including Massachusetts, is expected to experience increased frequency and intensity of rain events, increased temperatures, and rising sea levels, which will increase the City's natural hazard vulnerability. In consideration of these factors, the City is taking the necessary steps to build on the results of the City's 2017 NHMP to develop climate adaptation and resilience priorities as outlined in this Community Resilience Building Summary Findings Report.

As of December 2019, the Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs (EEA) has funded 249 communities (see **Figure 1**) to receive Municipal Vulnerability Preparedness (MVP) planning grants. The purpose of the grant is to provide financial assistance to communities to create a comprehensive, baseline climate change vulnerability assessment and to develop prioritized actions for dealing with climate-related and natural hazards using a field-tested approach, known as the Community Resilience Building (CRB) Workshop guide. In June 2019, the City received an MVP planning grant.

COMMUNITY RESILIENCE BUILDING WORKSHOP

This CRB Workshop guide includes a six-step approach (see [Community Resilience Building Guide](#) for more details) to conduct a vulnerability assessment and develop prioritized actions consistent with EEA requirements to a designated "MVP Community." Receiving MVP designation will enable the City of Malden to apply for future MVP Action grants and will increase Malden's standing for future funding opportunities from the Commonwealth (e.g., the Dams and Seawalls Grant Program). The Malden CRB Summary of Findings Report is the City's completion of the six-step CRB process.

On November 7, 2019 the City completed the CRB Workshop at the Malden Senior City on Pleasant in Malden. The central objectives of the Workshop were to:

- Define the top local natural and climate change-related hazards of concern;
- Identify hazard vulnerabilities;
- Identify existing City capabilities;
- Develop and prioritize actions for the community; and
- Identify opportunities to collaboratively advance actions to increase resilience.

This report summarizes the findings of the CRB Workshop, identifies top natural and climate change related hazards and vulnerabilities, strengths and assets, and recommendations to improve resilience for the City of Malden.

1.2 CORE PROJECT TEAM

The City's Core Project Team for the MVP Planning Grant included the following individuals:

- Ron Cochran, Director of Communications, City of Malden Mayor's Office (MVP Project Lead)
- Yem Lip, Director of Engineering and City Engineer, City of Malden
- Dan Grover, Assistant Controller, City of Malden
- John DeSantis, Water Supervisor, City of Malden
- Gary Stead, Assistant Engineer, City of Malden
- Evan Spetrini, Senior Planner, Malden Redevelopment Authority
- Amber Christoffersen, Mystic River Watershed Association (MyRWA)

The Core Project Team along with technical assistance from State-Certified MVP Providers Wayne Cobleigh, Sam Bell, Dan Stapleton and Bin Wang of GZA, planned and facilitated the single-day workshop. GZA was responsible for preparing the CRB workshop materials, leading presentations, facilitating large group exercises and providing guidance during the small group exercises. Members from the Core Team and workshop participants were responsible for facilitating and documenting key information during the small group exercises and in presenting during the final large group exercise at the conclusion of the workshop.

1.3 WORKSHOP PARTICIPANTS

Over seventy (70) stakeholders were invited to the full-day workshop from various City departments, local and state elected officials, public utilities, neighborhoods, schools/daycares, community centers, regional planning and community groups and other community leaders. Section 8 includes the detailed list of attendees. Close to twenty (20) stakeholders participated in the all-day workshop held November 7, 2019 at the Malden Community Senior Center located on Washington Street in Downtown Malden. These stakeholders included individuals from the Cambridge Health Alliance, Malden Chamber of Commerce, Mystic River Watershed Association, MIT, Friends of the Malden River, and representatives from several City departments including health, public works, housing, engineering, schools, finance and the Mayor's office.

1.4 CRB WORKSHOP PROCESS

The workshop started with a welcome by Mayor Gary Christenson and introductions by Ron Cochran, City Director of Communications. The introductions were followed by presentations by EEA's Carolyn Meklenburg (overview of the MVP program), Wayne Cobleigh, Sam Bell and Dan Stapleton of GZA (overview of natural hazards and vulnerabilities) and Julie Wormser of MyRWA (Mystic River Watershed concerns). The presentation and workshop handouts (see **Appendix A**) included the following:

- MVP Program Overview
- CRB Workshop Process/Small Group Breakout Instructions
- Overview of Natural Hazards and Climate Change



Figure 2. Small Group Breakout Session

After the presentations, GZA led a large group discussion to discuss and prioritize top five hazards for the City of Malden. The hazards were prioritized based on group voting using a web-based Mentimeter poll facilitated by GZA.

The large group exercise was followed by a series of small group breakout sessions during which stakeholders completed risk matrices to identify specific vulnerabilities and actions to reduce vulnerability and enhance the City's resilience and adaptation capabilities. **Appendices B** and **C** include the stakeholder group mapping and completed risk matrices that present the results from the small group exercises. The workshop concluded with a final large group report out of priority actions and identification of the top hazards facing the City based on stakeholder rankings.



Figure 3. Flooding from a December 2014 Nor'easter closed a portion of Route 99 and a snowplow on Lyme Street on March 14, 2017 (images ref: <https://malden.wickedlocal.com>).

2.0 TOP NATURAL AND CLIMATE-RELATED HAZARDS

The Core Team presented hazards for consideration based on those identified from the City's 2017 Hazard Mitigation Plan Update (2017 HMPU) and the Commonwealth of Massachusetts 2018 State Hazard Mitigation and Climate Adaptation Plan (2018 State Plan).

Natural Hazards included:

- severe winter weather hazards (ice, snow, blizzards, extreme cold),
- severe storms (thunderstorms, high winds, hurricanes, nor'easters, tornadoes),
- flooding (urban drainage, riverine, inland, dam failures, ground failures, sea level rise),
- fire (wildfire, urban fire),
- geologic hazards (earthquakes, landslides), and
- climate change (including sea level rise, extreme heat and cold, heavy precipitation frequency, precipitation intensity, severe storms).

Appendix A includes the hazards overview from the workshop presentation and handouts provided to the workshop participants.

Following the hazards overview the workshop participants discussed and identified the top natural and climate-related hazards for the City of Malden that included the following:

- Heat/Extreme Temperatures
- Flooding
- High Winds/Storms
- Air Quality
- Fire/Drought



3.0 CURRENT CONCERNS AND CHALLENGES PRESENTED BY NATURAL HAZARDS

To assist the workshop participants in identifying vulnerabilities and areas of concern, the Core Team and GZA prepared a base map for each group to evaluate during the first small group exercise. Critical assets included in the 2017 HMP Update, areas previously identified as having experienced flooding, and natural resources including open space and parks were presented on the base map. Critical assets from the 2017 HMP Update included public safety facilities (i.e. police, fire etc.), lifeline systems (i.e. electric substations, gas distribution, pump stations, etc.) transportation systems (i.e. state and local roads, MBTA rail lines, community trails), vulnerable populations (i.e. day care facilities, senior housing, assisted living facilities), medical facilities, churches, and hazardous waste sites. GZA also prepared and provided participants with a packet of information that included details on natural hazards in Malden as well as an index of the critical assets (see **Appendix B**). Based on a review of the base map and additional information, the participants identified key areas of concern and challenges posed by hazards in Malden. There was a consensus in that each group identified **inland (urban) flooding** as the greatest concern to the community and the City's infrastructure, societal features and environmental features. Participants noted that the City experienced significant impacts from flooding during the March 2010 heavy rainfall event. The March 2010 flooding event overwhelmed parts of the City's stormwater infrastructure and inundated some major roadways and cut off access to vulnerable population areas (i.e. senior and public housing) of the City during the major flooding event. Participants also identified challenges resulting from flooding along the Malden River and Town Line Brook that has impacted public infrastructure and could significantly impact vulnerable populations and major public infrastructure.

The City is not currently vulnerable to impacts from **coastal flooding**; however, workshop participants voiced concerns on the potential impacts sea level rise will have on coastal flooding impacts to the Amelia Earhart Dam. Participants noted that **sea level rise** may also increase the City's vulnerability along the Malden River and from Rumney Marsh through the Town Line Brook. Stakeholders expressed concern that sea level rise will increase the vulnerability of Industrial Park properties located along the Malden River including the DPW facility and the National Grid site. Stakeholders also expressed concerns that future sea-level rise will have on the Linden Neighborhood from increased flooding from the Town Line Brook at the border with Revere.

Stakeholders also expressed concerns on impacts that **high winds and severe storms** pose to 1) public safety and public works response capabilities; 2) power outage potential at public safety facilities and vulnerable populations including low-income and senior housing; 3) downed transformers will have on public transit. Stakeholders noted that over the last five years Malden has experienced impacts from numerous nor'easters combined with other winter storm events including the blizzard of 2013 (Nemo), back-to-back-to-back snow-storms in 2015, 2017 nor'easter, and multiple nor'easters in January and March of 2018.

Stakeholders expressed concern for the current level of preparedness for future **heat events and extreme temperatures** especially in consideration of vulnerable populations. Stakeholders noted that the public schools and public housing that do not have on-site back-up power or air conditioning will be at greater risk to impacts from extended power outages or heat events lasting multiple days. Stakeholders were aware that the number of days that will exceed 90 degrees will increase for the City in the future which will lead to the need for the City to develop a more comprehensive preparedness approach to addressing **heat/extreme temperatures** for vulnerable populations.

Further details on the specific areas of concern and challenges identified by the stakeholders in relation to infrastructure, societal features and environmental resources are outlined in more detail in Section 5 of this report.



4.0 SPECIFIC CATEGORIES OF CONCERNS AND CHALLENGES

The following significant categories of concern and challenges were identified by stakeholders during the small work group sessions relative to Malden's infrastructure, and societal and environmental features.

4.1 INFRASTRUCTURE

- Stakeholders expressed concern for **roadways** and **public transit areas** that experience flooding caused by **stormwater run-off** and **riverine flooding** including Broadway Corridor (including the Townline Estates and Plaza), Forest Street, Eastern Avenue, Medford Street Bridge, Intersection of Mountain Avenue and Everett Street, intersection of Broadway and Eastern Avenue, Salem Street at Mount Vernon Street, Medford Street MBTA Bridge, MBTA Oak Grove and Wellington Stations. Stakeholders noted that inundated roadways would also **limit the emergency response capabilities** of police, fire and emergency management during and directly after major flood events.
- Stakeholders noted that both the **stormwater and wastewater systems** are **vulnerable to surcharging** during heavy rainfall events combined with riverine flooding. Stormwater surcharges have had a cascading impact on further increasing the vulnerability of roadways (e.g. **Forest, Hadley, Russell, and Bowman Streets**) and some public housing.
- Stakeholders noted that the **Department of Public Works Facility** site is vulnerable to **flooding** from the **Malden River** and expressed concerns regarding the **DPW's capabilities for response during major flooding events**.
- Stakeholders identified the need to have a **resilient power supply** and distribution system as critical, with the understanding that this category of concern is largely controlled by another entity (power supplier/distributor). However, the group cited specific items that could be controlled, such as the need for an Emergency Preparedness Plan, and strong relationships with National Grid, the local supplier, to reinforce the City's priorities for power restoration to healthcare facilities, nursing homes, the emergency shelter, etc. The need for the City to identify locations with portable power generators that could be useful in emergencies was also cited.
- While the **Amelia Earhart Dam** currently reduces the potential impacts from **coastal flooding** today, stakeholders expressed concern that **sea-level-rise will increase the vulnerability** of the dam in the future. To reduce the dam's vulnerability to future coastal flooding stakeholders noted that regional collaboration and collaboration with the Department of Conservation and Recreation will be critical to making the Amelia Earhart Dam more resilient in the future. In addition, representatives from the Mystic River Watershed Association noted that the historic coastal surges of January 4, and March 2, 2018 raised red flags when the dam appeared to be close to overtopping as noted in greater detail in the *Everett Independent* article weblink <https://everettindependent.com/2018/03/16/earhart-dam-draws-attention-during-flooding-events-this-year/>.

4.2 SOCIETAL

- Stakeholders identified the need to determine **back-up power capabilities** at the City's **Senior** and **Public Housing Facilities** with respect to the top hazards.
- Stakeholders raised concerns over the lack of **public shelter space** in the event of a large-scale hazard event especially in consideration of emergency and homeless sheltering capacities.
- Stakeholders expressed the need to communicate across multiple languages to reduce the potential for **language isolation** during hazard events in the City.
- Stakeholders noted that the **Salemwood School** and **Roosevelt Park** are vulnerable to impacts from **flooding**.



- Several Senior and Public Housing developments are vulnerable to flooding from heavy rainfall and riverine flooding. Stakeholders specifically identified housing located in the Linden, Linden Heights, Forestdale, Edgeworth neighborhoods as being particularly vulnerable to flooding.
- Stakeholders identified the **Cambridge Health Alliance** and **South Cove Care Centers** as being within the **FEMA special flood hazard area** as well as sites that are **vulnerable to flooding from stormwater run-off**.

4.3 ENVIRONMENTAL

- Stakeholders identified **flooding** from the **Rumney Marsh** which is in Revere through the **Town Line Brook** increases the vulnerability of properties located in the Linden Neighborhood. The vulnerability is expected to increase in the future from sea-level rise.
- **Flooding** from the **Malden River** increases the vulnerability of several properties located in the Industrial Park District. Specific infrastructure vulnerable to flooding from the river is noted in Section 5.2
- Stakeholders noted that several parks and cemeteries in Malden that are **at risk to flooding** are also near public housing, schools and residential neighborhoods. The ones identified by several stakeholder groups included **Linden, Coytemore Lea** and **Roosevelt Parks** and **Forest Dale** and **Holy Park Cemeteries**.
- The **Saint Mary's Brook** located at the City's western border with Medford was also noted as an area **vulnerable to flooding at Pleasant and Fellsway E**.
- The **Spot Pond Brook** located on the northern border with Melrose was noted as an area **vulnerable to flooding** as well.

5.0 CURRENT STRENGTHS AND ASSETS IN THE CITY OF MALDEN

Based on the results of the small group discussions in evaluating community assets and hazards, the workshop participants identified many infrastructural, societal and environmental strengths in Malden.

5.1 INFRASTRUCTURAL

- Stakeholders identified the **police and fire departments** as a major strength for the City in terms of providing emergency response support for Malden.
- The participants all cited the importance of the **DPW Facility operations and equipment** and the need to maintain those assets in the event of a disaster, but also the importance of maintaining infrastructure to prevent or mitigate potential hazards. The City of Malden was successful in winning the first Norman B. Leventhal City Prize of \$100,000 from MIT for the Malden Works for Waterfront Equity and Resilience (Malden Works) project. Malden Works has proposed a transformation of the city's Department of Public Works (DPW) site on the Malden River into a civic waterfront space. The Malden Works Team will work with the DPW to study and redesign the site and building operations to foster climate change preparedness, improved stormwater management, and the integration of safe public access. The Core Team envisions building on this legacy through the preparation of this report to assist Malden in becoming more resilient to the impacts from future extreme weather and natural hazard events.
- **Tide Gates** located along the Malden River were noted as a strength in **reducing the vulnerability** of the Industrial Park District to flooding from the river.
- Stakeholders also identified the location of key facilities/utilities including the **Telecommunications Switching Station, Police and Fire Stations** as strengths for the City. These assets are in areas less vulnerable to flooding and can assist the City in making the community more resilient during and directly after major hazard events.



- The City's public transportation including the **MBTA Orange Line transit system and Bike Trail** assist in reducing greenhouse gas emissions and reducing traffic as well as provide an alternative means for evacuation.
- Some stakeholders noted that the **Amelia Earhart Dam** currently provides protection from coastal flooding; however, this dam will become increasingly vulnerable to overtopping in the long-term resulting from sea-level-rise as noted in Section 5.2.

5.2 SOCIETAL

- The **Salemwood School** serves as strength as a **shelter** during emergency events especially during extreme temperature and flooding events.
- Stakeholders identified **Cultural and Community Networks** as key strengths for the City that include **Churches** and **Faith-based Networks, Malden Senior Center, Head Start ABCD, ABCD Poverty, and Youth Teen Centers** for Teen Enrichment.
- The medical services provided by **Cambridge Health Alliance** and **South Cove Care Centers** were identified as a strength for Malden to assist in providing care before and after hazard events; however, there was some concern regarding the lack of a major hospital within the City.
- **Malden's MVP Core Team** is a key strength to the City as many team members have taken an active role over the last decade in working together to better understand the community's vulnerabilities and identify suitable natural hazard mitigation options to reduce impacts from hazards. Many of the team members have over a decade each of **institutional knowledge** having worked for the City of Malden in various capacities that will enable the City to successfully implement key priorities outlined in this report. The City plans to leverage the Core Team member's local knowledge and understanding of state and federal funding sources in actively implementing actions resulting from the CRB workshop.
- The City's **Community Emergency Response Team (CERT)** and **Medical Response Corps (MRC)** were also identified as key support systems for Malden by stakeholders.

5.3 ENVIRONMENTAL

- The **City's parks and open space** including cemeteries serve as key assets for reducing the heat island effect in some areas of the City and serve as flood storage areas to assist in reducing the impacts from future flooding. The stakeholders specifically identified **Pine Banks Park, Linden Park, Fellsmere Park & Pond, Forestdale Park, and Roosevelt Park** as key assets.
- The **Malden River** and **Little Creek** are key assets for **future economic redevelopment** along the Commercial Street Corridor.
- **Middlesex Fells** serves as a key community and regional asset serving as a buffer to flooding and providing flood storage.
- The City's existing **water supply** serves as strength for the City where regulations are in place to ensure the quality and an adequate supply of water for the City.
- The **former hospital campus site** serves potential area for future open space for flood storage combined with economic development through resilient redevelopment.



6.0 PRIORITY ACTIONS TO IMPROVE RESILIENCE

During the final small group exercise the stakeholders developed actions to bolster the existing strengths and to improve/mitigate the vulnerabilities outlined in Sections 5 and 6. At the conclusion of the workshop stakeholders from each of the small groups presented a brief summary of their recommended priority actions as a large group and identified the following actions as the five top priorities to improve the City's resilience to natural and climate-related hazards that included:

1. Prepare a Department of Public Works (DPW) Site Resiliency Prototype Project that will support and building from the Malden Works resiliency work underway to include flood protection, stormwater improvement and energy resiliency at the DPW site.
2. Identify and implement resiliency improvements to Public Housing.
3. Develop a City-wide Heat Mitigation/Tree Plantings Resilience Program.
4. Identify and Implement resiliency improvements to the City-wide Stormwater Infrastructure including preparation of comprehensive vulnerability assessment and action plan
5. Conduct a Resiliency in Zoning Assessment to evaluate how existing zoning requirements support or hinder climate resiliency and identify how the zoning regulations could be amended to further bolster climate resiliency for the City.

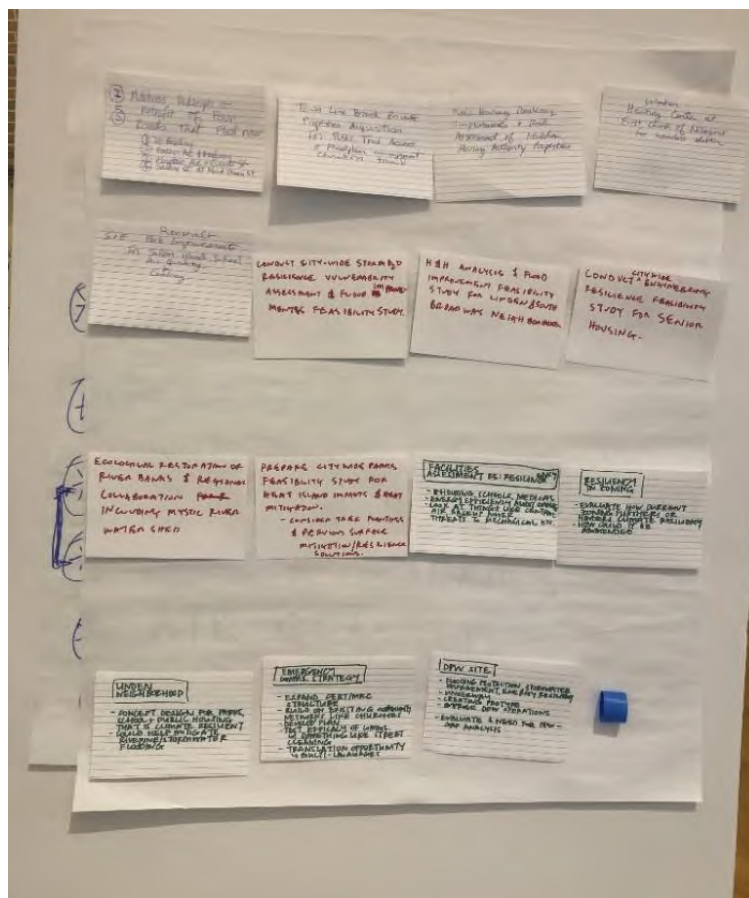


Figure 4. Small Group List of Action Priorities



6.1 HIGH PRIORITY ACTIONS

Action	Type	Lead Department	Support
INFRASTRUCTURAL			
Prepare engineering and redesign and retrofit of four (4) Roads that Flood Frequently Now: 1) 700 Broadway; 2) Intersection of Eastern Avenue and Broadway; 3) Intersection of Mountain Avenue and Everett Street; 4) Intersection of Salem and Mt. Vernon Streets. Step 1: Request that MassDOT to conduct feasibility of road elevation improvements for the 4 roads. Step 2. Apply for Redesign & Retrofit funding	Utility Infrastructure, Transportation	Public Works, MassDOT	Engineering
Conduct a Hydraulic and Hydrology Analysis & Flood Improvement Feasibility Study for Linden and South Broadway Neighborhoods.	Utility Infrastructure, Community Resilience	Public Works	Engineering
Conduct City-Wide Resilience Vulnerability Assessment & Flood Improvements Feasibility Study	Community Resilience	Planning, Public Works	Engineering, Controller, Building, MyRWA
Prepare a Department of Public Works (DPW) Site Resiliency Prototype Project that will support and build from the Malden Works resiliency work underway to include flood protection, stormwater improvement and energy resiliency at the DPW site. Conduct a Gap Analysis to Evaluate Funding Needs for DPW to create a prototype for a Resilient Department of Public Works (DPW) Site on the Malden River.	Utility Infrastructure	Public Works, Malden Redevelopment Authority (MRA)	Engineering
Prepare Emergency Communications Strategy for Resilience Plan to: 1) Expand CERT/MRC Structure; 2) Build on Existing Continuity Networks like Churches; 3) Test the efficacy of communications with something like street cleaning; and Prepare Plan in multiple languages.	Emergency Preparedness and Response	Police, Fire and Emergency Management	
Conduct a Stormwater Vulnerability Assessment and Resilience Feasibility Study that includes the City-wide stormwater infrastructure including 1) Tide Gates, 2) Culverts specifically at Hadley, Russell, Bowman Streets, 3) areas for upsizing of undersized pipes and cleaning of the system.	Utility Infrastructure	Public Works	
Regional Collaboration to improve the resilience of the Amelia Earhart Dam to future Flood Events.	Coastal Resilience	City, MA DCR	MyRWA



Action	Type	Lead Department	Support
Conduct Feasibility Study to evaluate Alternatives for new flood resilience project to channel water into the cemetery at Forest Road; 2) Apply for funding and Prepare Preliminary Engineering and Design for preferred alternative.	Utility Infrastructure	Public Works,	Engineering
SOCIETAL			
Conduct a City-Wide Public Housing Resiliency Feasibility Study & Risk Assessment for Improvements of Malden Housing Authority Properties: 1) 887 Total Elder Disabled Housing Units made including 722 Federally Assisted Program (FAP) Units and 165 State Program Units and 2) 458 Total Family Housing Units all of which are FAP Units. Include a vulnerability assessment and identification of resilience and adaptation strategies and projects to improve community resilience.	Municipal Facilities	Housing Authority	Planning, Public Works
Conduct Facilities Resiliency Assessment including an energy efficiency energy audit of City Facilities, Housing, Schools, Medical Facilities. Evaluate systems like central air back-up power, threats to mechanical systems, etc. Also, include Low-income Housing Resilience Strategies with Mass Saves & Resident Mobility and safety.	Municipal Facilities	Housing Authority, Schools, Public Works	Planning, MyRWA
Prepare Linden Neighborhood Concept Design for Parks, School, and Public Housing that is Climate Resilient. Include Resilience Feasibility Assessment to Mitigate Riverine and Stormwater Flooding.	Neighborhood Resiliency	Parks and Recreation, Public Works	Engineering
Conduct Salemwood Runoff (H&H) Analysis, Vulnerability Assessment and Feasibility Study to include consideration of nature-based infiltration technologies and other nature-based systems.	Utility Infrastructure	Malden Schools, Parks and Recreation	Public Works, Engineering
Add a Winter Heating Center at the Malden First Church of Nazarene for the Homeless Shelter	Neighborhood Resiliency	Malden First Church of Nazarene	
ENVIRONMENTAL			
Conduct resilience feasibility study to assess and identify 1) Nature Based Solutions to address FEMA Flood Hazard Zone at Salemwood School and Park with an evaluation of current plans.	Nature Based Resiliency	Planning, Conservation Commission	Engineering, Public Works
Prepare City-Wide Parks Feasibility Study for Heat Island Impacts and Heat Mitigation. Consider Tree Plantings and Pervious Surface Mitigation/Resilience Solutions.	Energy Resiliency	Park and Recreation	Conservation Commission, Planning, MyRWA



Action	Type	Lead Department	Support
Conduct tree canopy feasibility study for improvements to Roosevelt Park at Salemwood School.	Energy Resiliency	Park and Recreation	Public Works
Develop Malden Hospital Redevelopment Zoning Ordinance to propose green infrastructure and resilience for stormwater flood management (using Category 3) with Conservation Commission.	Regulatory/Planning	Planning Board, Planning	Conservation Commission
Partner with private property owners to discuss voluntary acquisition of Private Properties at Town Line Brook for Public Trail Access and Floodplain Management Education Training.	Community and Nature Based Resiliency		
Ecological Restoration of riverbanks focused along the Malden and Mystic Rivers with an emphasis on Regional Collaboration including the Mystic River Watershed Association.	Nature Based Resiliency	Conservation Commission	MyRWA
Conduct Resiliency in Zoning Study to: 1) Evaluate How Current Zoning Furthers or Hinders Climate Resiliency; and 2) Identify ways in which Current Zoning could be Amended to Encourage Climate Resiliency	Regulatory/Planning	Planning Board, Planning	Conservation Commission



6.2 ADDITIONAL PRIORITY ACTIONS

Action	Type	Lead Department	Support
INFRASTRUCTURAL			
Prepare Shading and Tree Planting Bike Trail Study to include connections of the Bike Trail to other trails in the region.	Energy Resilience	Parks and Recreation	Planning, Engineering
Coordinate with MBTA Resiliency Manager of Oak Grove MBTA Rail Stop Flooding Risk.	Resilience Corridor	Public Works, MBTA	Engineering
Conduct feasibility study to evaluate road lowering to address low bridge for evacuation at the Medford Street MBTA Bridge.	Resilience Corridor	Public Works, MBTA	Engineering
Conduct Water Main Piping System and Shut-off Gate Feasibility Study and Redesign and Retrofit for improvements to undersized Water Main Piping System.	Utility Infrastructure	Public Works	Engineering
Coordinate with MWRA on Redesign of Sanitary Sewer Capacity in relation to flood hazard; 2. Coordinate with MBTA on Redesign & Retrofit Study for MWRA Surcharge to Stormwater.	Utility Infrastructure	Public Works, MWRA	Engineering
SOCIETAL			
Assess Neighbors Helping and Neighborhood Financial Assistance for Heating Center at First Church of Nazarene.	Neighborhood Resilience	First Church of Nazarene	
Conduct an energy and flood resilience feasibility study for Cambridge Health Alliance and South Cove Care Centers to assess 1) Retrofit & Redesign including Nature Based Solution (NBS); 2) Energy Resilience to Flooding. Upon identification of priorities apply for engineering, redesign and retrofit funding.	Community Health and Preparedness	Cambridge Health Alliance and South Cove Care Centers	Health
Prepare Citywide Energy Resilience Plan and Program for all Public Properties/Assets	Energy Resilience	Public Works	Engineering
Develop Energy Resilient Cooling Center at the Malden Senior Center	Energy Resilience	Malden Senior Center	
ENVIRONMENTAL			
Conduct Flood, Energy and Public Health Resilience Feasibility Study and resilience alternatives analysis	Community Resilience	Public Works, Health	Engineering, Planning
Improve storm drainage in low-lying areas of Coytemore Lea Park to redirect to green Infrastructure (i.e. water diversion) in the park	Utility Infrastructure	Public Works, Parks and Recreation	

7.0 PUBLIC LISTENING SESSION

Malden hosted a public listening session at the Malden Community Senior Center on January 7, 2020 from 6:30pm to 8:30pm. The City advertised the public listening session on the City's website, social media and community distribution lists. At the listening session the City led by Ron Cochran, GZA and the Mystic River Watershed Association provided the public with the chance to learn about the CRB Workshop with an overview of the Draft Summary of Findings Report (Draft Report) including the priority actions that resulted from the workshop. Participants had the opportunity to ask questions and provide written feedback in response to the details provided in both the presentation and responses to questions during the second half of the session. **Appendix D** includes the details of the listening session presentation, public comments and the list of attendees.



Figure 5. Image of the public listening session participants in attendance

At the end of the public listening session the City made the Draft Summary of Findings Report available for public comment. Feedback provided by community members and leaders on the Draft Report is included in **Appendix E**. Many comments provided in response to both the public listening session and Draft Report highlighted and supported priorities outlined in both the presentation and Draft Report. Based on the additional public feedback presented in **Appendix E** the table presented in section 7.1 outlines additional community priorities for inclusion in this Final Report.

7.1 PUBLIC COMMENT PRIORITY ACTIONS

Action	Type
The City should include a goal of reducing artificial groundcover significantly over the next ten years. Prepare a plan to reduce artificial groundcover over the next 10 years that includes a local mechanism for evaluating	Environmental
Collaborate with the Saugus River Watershed Council on flood mitigation and resilience projects along the Town Line Brook and Saugus River.	Community Resilience
Conduct a Saugus River Flood Mitigation and Resilience Feasibility Study to identify recommendations for reducing impacts from future flooding along the river. This study will include but not be limited to an assessment of natural and nature-based solutions including green infrastructure projects.	Environmental



Action	Type
DPW Site Resiliency presented in Table 6.1 should be looked at in conjunction with the proposed design on new elements to the Malden Waterfront at that location. Some consideration should be given to working with the City of Melrose to potentially co-locate DPW facilities at a less vulnerable location on Broadway on the Melrose / Malden line.	Community and Regional Resilience, Municipal Facilities, Utility Infrastructure
The Malden Housing Authority (MHA) MHA evaluation could also include an evaluation of the use of roof-top solar to help residents keep costs lower for air conditioning.	Societal, Community and Energy Resiliency
The priorities outlined in Table 6.1 related to Salemwood should incorporate information that has been developed in connection with the Roosevelt Park improvement project which includes a mix of both natural and aesthetic man-made solutions to increase flood storage while ensuring recreational facilities can withstand both flooding and the rigors of a heavy recreational use by both the school and sports programs.	Societal, Community Resilience
Include strategic retreat as an option in the voluntary acquisition action already outlined in Table 6.1 of this Plan.	Environmental
Since building codes cannot be more stringent than the Massachusetts State Building Codes, Prepare a flood resilience design guideline for new and substantial improvement. Use City of Boston's design review and resilience guidelines as a model for preparing the City of Malden's guidelines.	Infrastructure
Collaborate with Malden Works to prepare an MVP Community Outreach and Education Program using a multi-lingual approach	Societal
Conduct a rezoning assessment for Commercial Street as a resilience corridor as separate action to protect the Malden River and its coastline. A mandated green space along the Malden River would provide the public with open space, tree plantings, preservation of wetlands (no artificial turf) would act as a sponge both for air and water quality and flood resilience. As a part of this effort, create a climate resilient waterfront public open spaces along the Malden River will ensure that the river can absorb the waters from the rainfall and the storm water system.	Environmental, Municipal Facilities, Utility Infrastructure
Conduct tree canopy feasibility study for improvements that include other areas in addition to those outlined in Table 6.1 including the Forest Dale Cemetery and other cemeteries as a part of the Tree Canopy Study. These areas need to replace the trees that have come down in the past five + years. Also include in this study an evaluation of what Native plantings should replace the trees that have been removed from open spaces and our streets to provide guidance to park maintenance department of the DPW.	Environmental
Conduct a [stormwater utility] enterprise fund feasibility study [and implement if feasible and approved by the City] to improve the City's stormwater system and to improve Malden's financial stability and revenue to take care of its essential storm water system. Include as a part of this study effective community outreach and education to increase awareness among all of Malden residents [of the benefits and the costs of implementing a stormwater utility enterprise fund].	Utility Infrastructure
As a part of the Salemwood Resilience Feasibility Study action outlined in Table 6.1, conduct additional drainage evaluations that would include alternative engineering and designs for improving the grass field at Roosevelt Park.	Environmental
Conduct a more comprehensive community health resilience vulnerability assessment and study to further address the effects of the hazards outlined in this report on the public health of residents including additional public health impacts	Societal



Action	Type
from water and vector borne illnesses, sanitation issues, air pollution, mobility and access to resources, and food security.	

8.0 CITATION

City of Malden (2020) Community Resilience Building Workshop Summary of Findings Report, GZA GeoEnvironmental, Inc. and City of Malden, Massachusetts.

9.0 ACKNOWLEDGEMENTS

This project was made possible through funding from the Massachusetts Executive Office of Energy and Environmental Affairs' Municipal Vulnerability Preparedness (MVP) Grant Program. The City wants to thank EEA for their leadership and funds to support this effort. The City would like to extend a special thanks to the MVP Greater Boston Regional Coordinator, Carolyn Meklenburg for participating in both the workshop and public listening session.

Thank-you to Mayor Gary Christenson for his support throughout this process of making the City more resilient to climate change and for his participation at the CRB Workshop.

Thank-you to the City of Malden community members and leaders and the Mystic River Watershed Association for their commitment and dedication to this process, the Core Team Members identified and Ron Cochran for leading this project for the City. The Core Team would also like to thank the Malden Community Senior Center for providing a place to host the workshop and public listening session.

9.1 WORKSHOP STAKEHOLDERS

The following stakeholders were invited to participate in the CRB Workshop.

MVP STAKHOLDER LIST		
First Name	Last Name	Affiliation
Marie Law	Adams	Leventhal City Prize Team
Souad	Akib	Malden Works Steering Committee
Neal	Anderson	Malden Elected Official
Tom	Arria	Cheverus School
Paul	Brodeur	Malden Elected Official
Karen	Buck	Friends of the Malden River*
David	Camell	Malden Elected Official
Renee	Cammarata Hamilton	Cambridge Health Alliance*
Gary	Christenson	Malden Elected Official*
Amber	Christoffersen	Mystic River Watershed Association*
Sam	Cleaves	Metropolitan Area Planning Council (MAPC)
Ron	Cochran	City of Malden Mayor's Office*
Bill	Coleman	City of Malden
Karen	Colon Hayes	Malden Senior Center
Paul	Condon	Malden Elected Official
Brian	Creamer	City of Malden
Glenn	Cronin	City of Malden
Peg	Crowe	Malden Elected Official
Alex	Dan	Mystic Valley Regional Charter School
Jonathan	Davis	City of Malden
Debbie	DeMaria	Malden Elected Official
John	DeSantis	City of Malden Water*
Paul	Donato	Malden Elected Official



MVP STAKHOLDER LIST

First Name	Last Name	Affiliation
Kevin	Duffy	City of Malden
Kathryn	Fallon	City of Malden
Kevin	Finn	City of Malden
Steve	Finn	Malden Housing Authority*
Joan	Ford Mongeau	Malden Chamber of Commerce*
Melanie	Garate	Mystic River Watershed Association*
Dan	Grover	City of Malden Controller*
Iodiah	Henry	Malden Works Steering Committee
Eric	Henry	Eversource*
Anne	Herbst	MAPC
Patrick	Heron	Mystic River Watershed Association,
Khalil	Kaba	Malden Works Steering Committee
Bobby K	Knox	Malden Works Steering Committee
Robert	Knox, Jr.	City of Malden
Laura	Le	Malden Works Steering Committee
Jason	Lewis	Malden Elected Official
Yem	Lip	City of Malden
Charles	Loven	City of Malden
Marcia	Manong	Leventhal City Prize Team
Emmanuel	Marsh	Malden Works Steering Committee
John	Matheson	Malden Elected Official
Nelson	Miller	City of Malden
Kevin	Molis	City of Malden
Barbara	Murphy	Malden Elected Official
Barbara	Murphy	Malden Works Steering Committee
Ramon	Norales	Malden Works Steering Committee
Ryan	O'Malley	Malden Elected Official
Julianne	Orsino	City of Malden
Julianne	Orsino	Community Preservation Committee
John	Oteri	Malden Public Schools
Peter	Phelps	Malden Public Schools*
Martin	Pillsbury	MAPC
Danny	Riendeau	Cataldo Ambulance
Anthony	Rodrigues	City of Malden
Michele	Romero	City of Malden
Eric	Rubin	City of Malden
Jadeane	Sica	Malden Elected Official
Jadeane	Sica	Malden Elected Official
Dr. Kunwar	Singh	City of Malden
Craig	Spadafora	Malden Elected Official
Evan	Spetrini	Malden Redevelopment Authority*
Gary	Stead	City of Malden*
John K.	Thornburg	Malden Catholic High School
Barbara	Tolstrup	City of Malden
Steven	Ultrino	Malden Elected Official
Kathy	Vandiver	MIT Center for Environmental Health Sciences*
Christopher	Webb	City of Malden*
Stephen	Winslow	Malden Elected Official
Julie	Wormser	Mystic River Watershed Association*



MVP STAKHOLDER LIST		
First Name	Last Name	Affiliation
Josh	Young	ABCD

* November 7, 2019 Workshop Participant



Appendix A

Workshop Presentation and Handouts

Community Resilience Building Workshop

City of Malden, Massachusetts

November 7, 2019

Known for Excellence. Built on Trust.



Wayne Cobleigh
Samuel J. Bell, CFM
GZA GeoEnvironmental, Inc.

1

Workshop Agenda

- 8:00 - 8:30 Registration and Refreshments
- 8:30 - 8:35 Welcome and Introductions
- 8:35 - 9:00 MVP Overview and Workshop Goals
- 9:00 – 9:15 Risk Matrix Overview
- 9:15 – 10:00 Large Group Exercise
 - Presentation Overview Hazards
 - Identify and Prioritize Hazards (Exercise)
- 10:00 – 10:15 Break
- 10:15 – 11:55 Small Group Exercise
 - Introductions (10 minutes)
 - Identify Infrastructure Vulnerabilities and Strengths (30 minutes)
 - Identify Environmental Vulnerabilities and Strengths (30 minutes)
 - Identify Social Vulnerabilities and Strengths (30 minutes)

2

Workshop Agenda

- 11:55 – 12:55 Lunch
- 12:55 – 1:20 Community Actions Overview
- 1:20 – 2:20 Small Group Exercise
 - Define actions
- 2:20 – 2:35 Break
- 2:35-3:25 Small Group Exercise
 - Prioritize Actions
- 3:25 – 3:50 Large Group Exercise
 - Small group report out
 - Finalize Top Action Priorities
- 3:50 – 4:00 Closing Remarks and Next Steps

Welcome and Introductions

Malden Introductions

Ron Cochran, Director of Communications

Core Team Members:

- Yem Lip, City of Malden
- Dan Grover, City of Malden
- John DeSantis, City of Malden
- Gary Stead, City of Malden Redevelopment
- Evan Spetrini, Malden Redevelopment Authority
- Amber Christoffersen, MyRWA

GZA, EEA & Mystic River Watershed Association Introductions

- Wayne Cobleigh, Principal-in-Charge/Facilitator
- Sam Bell, Project Manager/Facilitator
- Carolyn Meklenburg, EEA
- Facilitators:
 - Dan Stapleton, GZA
 - Bin Wang, GZA
 - Julie Wormser, MyRWA
 - Amber Christofferson, MyRWA



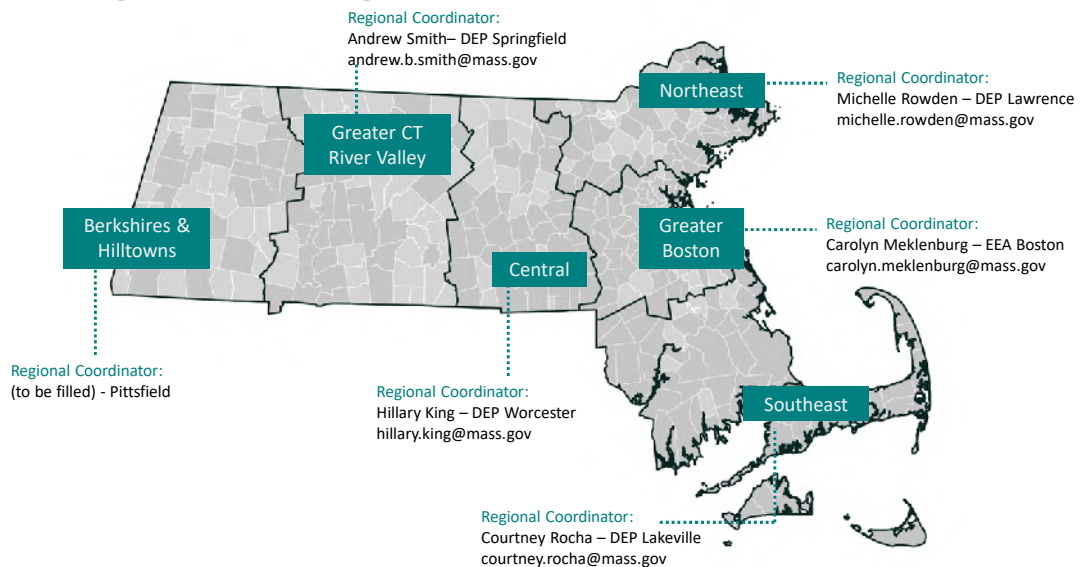
Municipal Vulnerability Preparedness Program



Carolyn Meklenburg
MVP Regional Coordinator for Greater Boston
MA Executive Office of Energy and Environmental Affairs

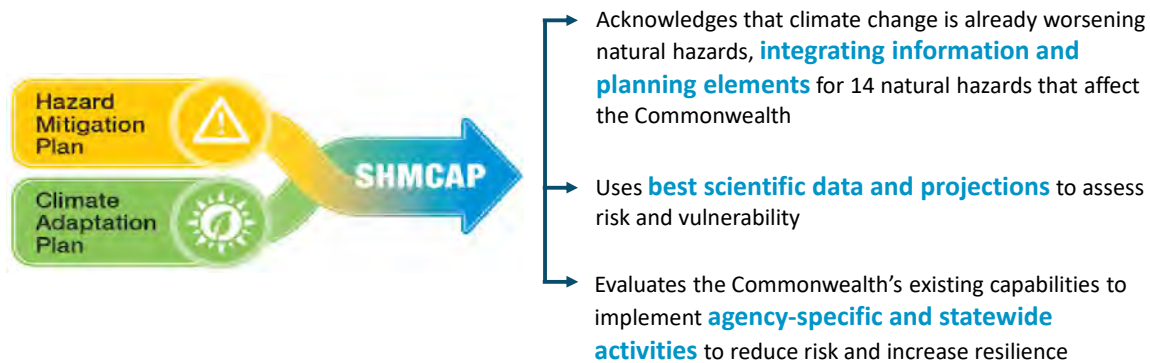
7

MVP Regions & Regional Coordinators



8

Massachusetts State Hazard Mitigation and Climate Adaptation Plan (SHMCAP) - September 2018



9



MA 2050 Decarbonization Plan



EEA is conducting an **80x50 Study** to identify the strategies, policies, and implementation pathways for MA to achieve at least 80% Greenhouse Gas reductions by 2050.

The results of that research will be published in a **2050 Roadmap report** and will inform the setting of a **2030 GHG emissions limit** and the development of the **Clean Energy and Climate Plan for 2030**.

More information and opportunities to get involved:

www.mass.gov/2050Roadmap



10

Next Steps: Climate Change & the Commonwealth

Bill S.10:

An Act for Climate Change Adaptation Infrastructure Investments in the Commonwealth

- Building on success of existing programs like MVP: Proposed new source of revenue for loans, grants, and technical assistance to municipalities and regional partnerships for priority adaptation projects
 - Proposed deeds excise increase → est. \$137M annually (\$1B in ten years)
 - Recurring, long-term revenue stream for multi-year project feasibility



11

MVP Principles

A community-led, accessible process that

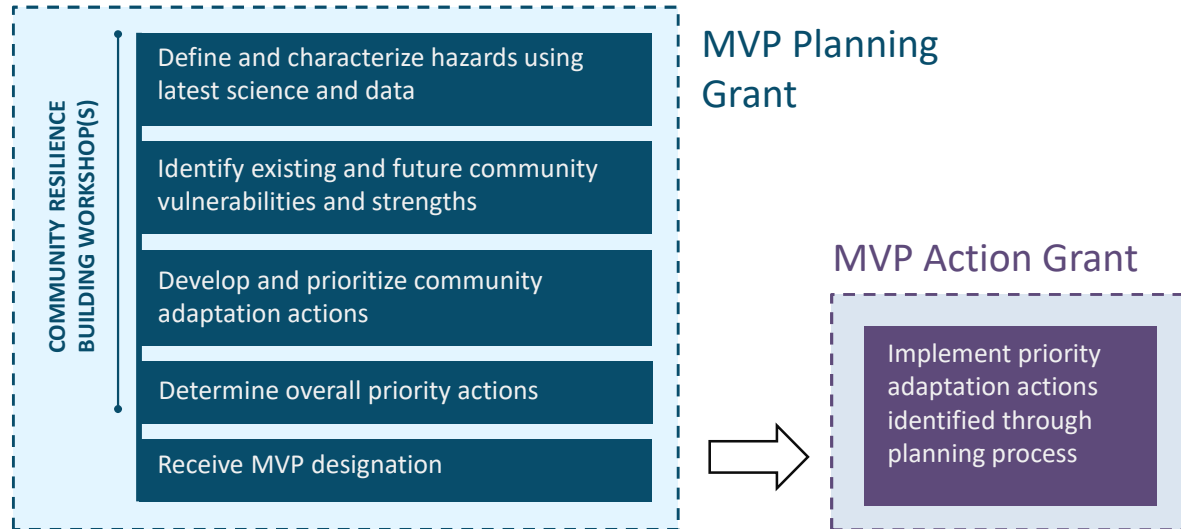
- Employs **local knowledge** and buy-in
- Utilizes **partnerships** and leverages existing efforts
- Is based in **best available climate projections** and data
- Incorporates principles of **nature-based solutions**
- Demonstrates **pilot potential** and is **proactive**
- Reaches and responds to risks faced by **EJ communities and vulnerable populations**

Why nature-based?

Where appropriate, nature-based solutions can be more cost-effective, protect water quality and quantity, sustain lands that provide food and recreation opportunities, reduce erosion, and minimize temperature increases associated with developed areas and climate change.

12

MVP Process/ Grant Types



13

Three Years of MVP

MVP Designations

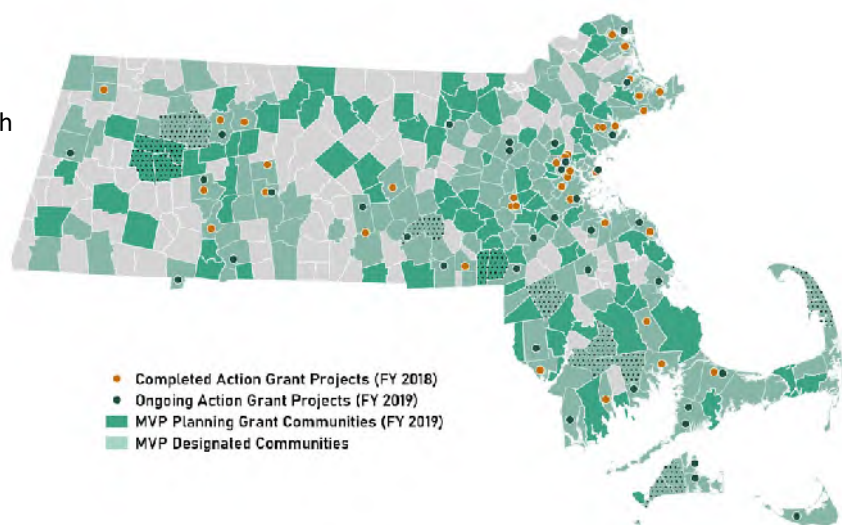
71% of the Commonwealth
249 communities

Action Grant Projects

FY 18: 37
FY 19: 36

Total Awards

\$17M+ in planning and
action grants to date



14

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

15

MVP Action Grants: Project Types (cont.)



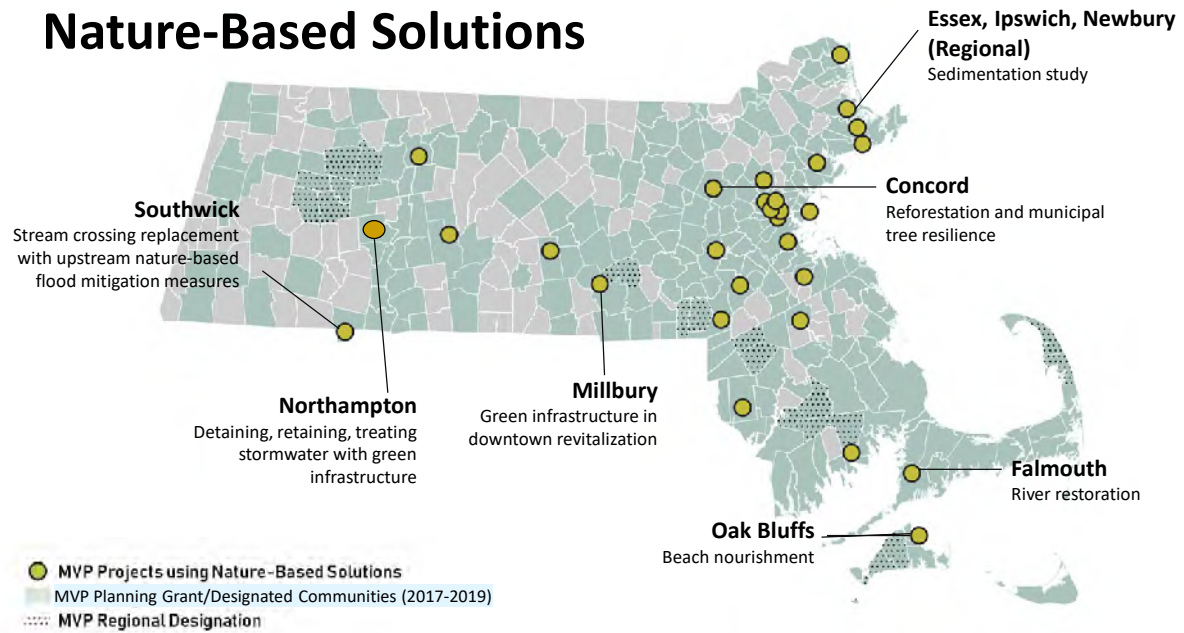
- Nature-Based Solutions to Reduce Vulnerability to other Climate Change Impacts
- Ecological Restoration and Habitat Management to Increase Resiliency

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

16

Nature-Based Solutions



17

Example Action Grant Projects

Nature-Based Flood Protection, Drought Prevention, Water Quality, and Water Infiltration Techniques

Millbury



Utilizing **green infrastructure** like stormwater planters, bioretention bump outs, rain gardens, and other measures like porous pavers and pervious pavement **to reduce heat island effects and stormwater runoff** into the Blackstone River.



Nature-based solutions

18

Example Action Grant Projects

Local Bylaws, Ordinances, Plans, and Other Management Measures
Redesigns and Retrofits

Boston



Developing its **first ever resilient building code** so that development in the future floodplain is prepared for **at least three feet of sea level rise**, the likely scenario by late century.



Proactive

Pilot potential

Retrofitting a major waterfront park into a legacy park that uses **nature-based solutions** to address climate vulnerabilities while providing important access to recreation for residents.



Nature-based solutions

Community co-benefits

19

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

Hampden County's Puerto Rican Population, 2017

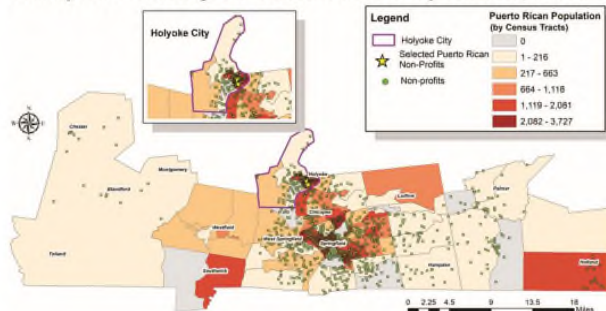


Image credits: Town of Holyoke, Hunter College CUNY, El Instituto UCONN

20



carolyn.meklenburg@mass.gov
<https://www.mass.gov/municipal-vulnerability-preparedness-program>



21

CRB Workshop Overview

Objectives:

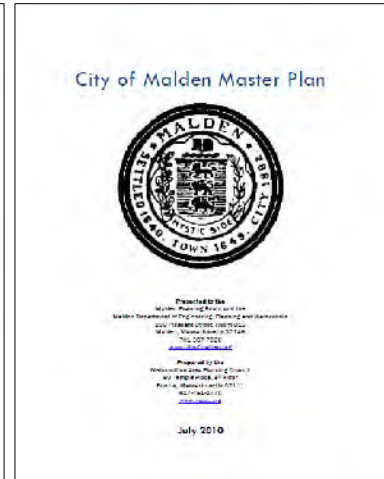
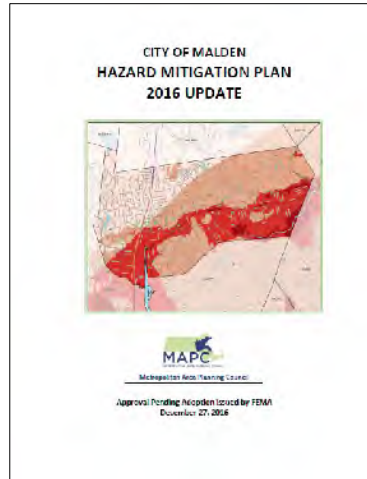
1. **Define top hazards.** Understand connections between ongoing issues, hazards, and local planning and actions in your Community.
2. **Identify and map vulnerabilities and strengths** to develop infrastructure, societal and environmental risk profiles for your Community.
3. **Develop and prioritize actions** that reduce vulnerabilities and reinforce strengths for your community - local organizations, academic institutions, businesses, private citizens, neighborhoods, and community groups.
4. **Identify opportunities** to advance actions that further reduce the impact of hazards and increase resilience in your Community.

22

CRB Workshop Overview

Malden – Resources:

- Malden GIS
- Hazard Mitigation Plan 2016 Update
- City of Malden Master Plan
- Malden Stormwater Management Plan



Risk Matrix Overview

Environmental

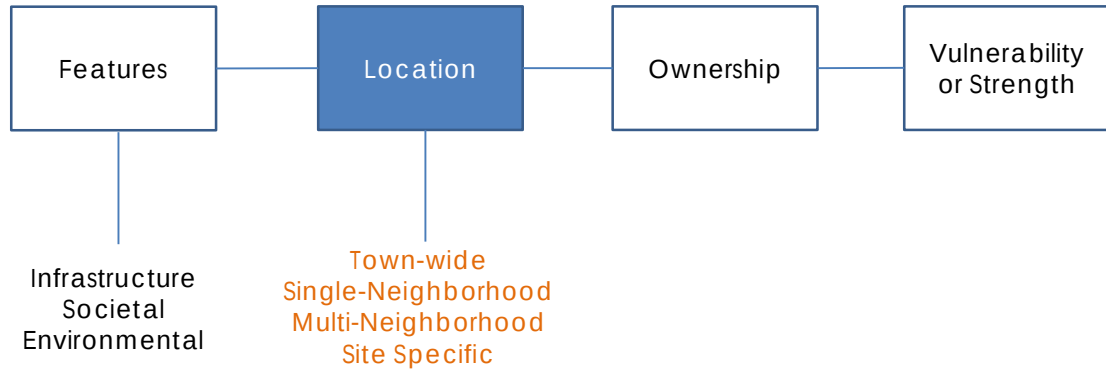
Features	Location	Ownership	Years
Infrastructural			
Societal			
Environmental			

Vulnerability or Strength

Infrastructure
Societal
Environmental

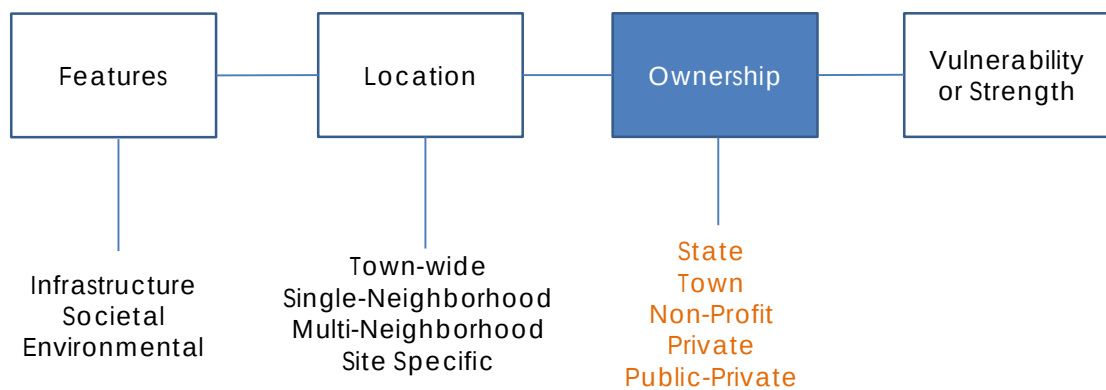
Malden Features

Location



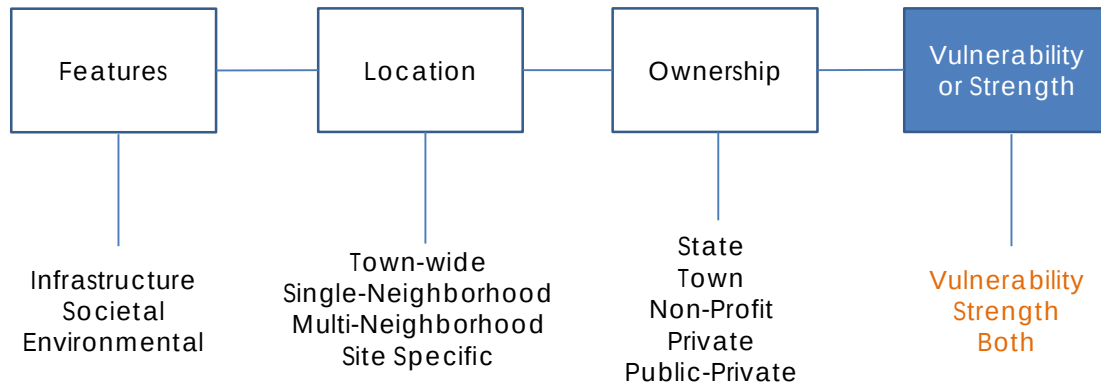
Malden Features

Ownership



Malden Features

Vulnerability or Strength



Infrastructure Features

- Transportation Systems including roadways and bridges
- Utilities including power generation facilities
- Stormwater Infrastructure
- Water supply
- Wastewater and water treatment plants
- Communications Data Centers

Societal Features

- Neighborhoods
- Police and Fire Departments
- Vulnerable Populations including elderly and children
- Emergency Medical Services
- Civic Groups
- Low to Moderate Income Areas
- Special Needs

Environmental Features

- Malden River
- Pines River
- Town Line Brook
- Open Space and Parks
- Cemeteries
- Wetlands



Malden River (Image Ref: Kahl Kaba)

Large Group Exercise

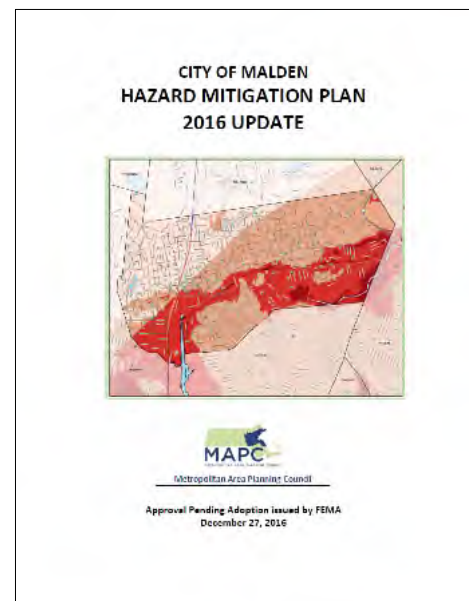
+/- 30 Minutes

Identify and Prioritize Hazards

Malden Natural Hazards Rankings

Top Hazards – 2017 Hazard Mitigation Plan Update (2016 Update) Approved May 25, 2017

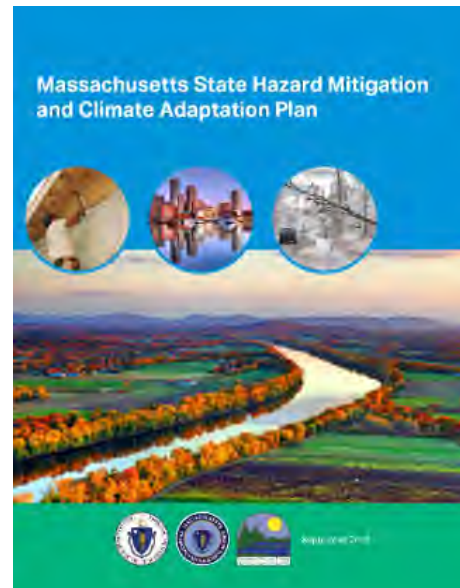
- **Flooding** - High Frequency & Serious Severity
- **Nor'easters** – High Frequency & Minor Severity
- **Winter Hazards** - High Frequency
- **Severe Thunderstorms** – High Frequency and Minor Severity
- **Hurricanes** – Medium Frequency & Serious Severity
- **Extreme Temperatures** – Medium Frequency and Minor Severity



Massachusetts 2018 Hazards Rankings

Top 5 Hazards 2018 State Hazard Mitigation and Climate Adaptation Plan

- Extreme Precipitation
- Hurricanes/Tropical Storms
- Nor'easters
- Ice Storms
- Severe Winter Storm



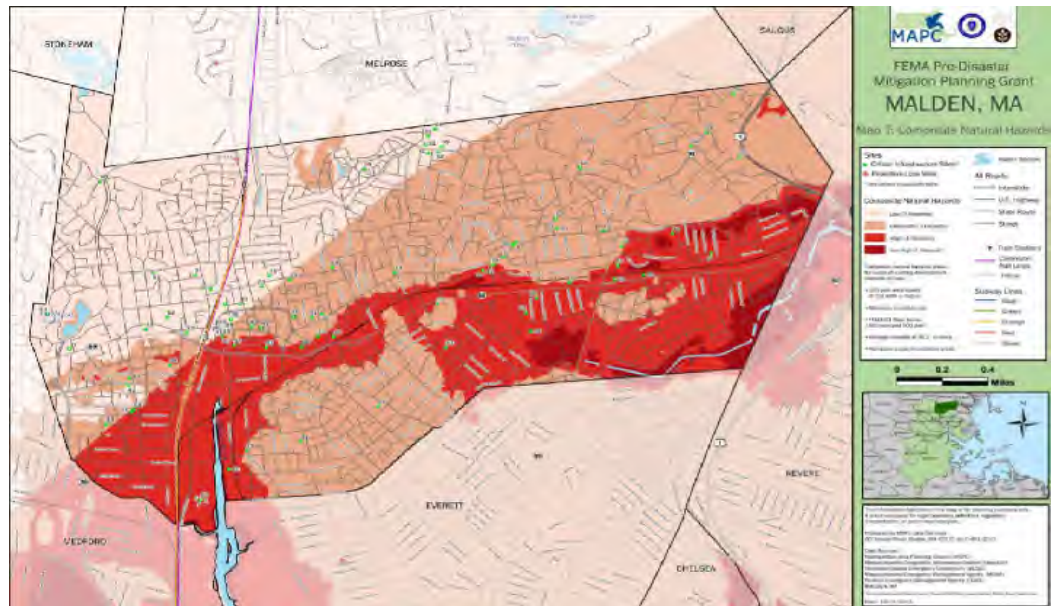
Climate Change

- Hot Temperatures +
- Precipitation Intensity +
- Heavy Precipitation Frequency +
- Sea Level Rise +
- Snowfall -



Photo of pedestrians walking after 2015 winter storm

Malden Composite Natural Hazards



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39

Heat

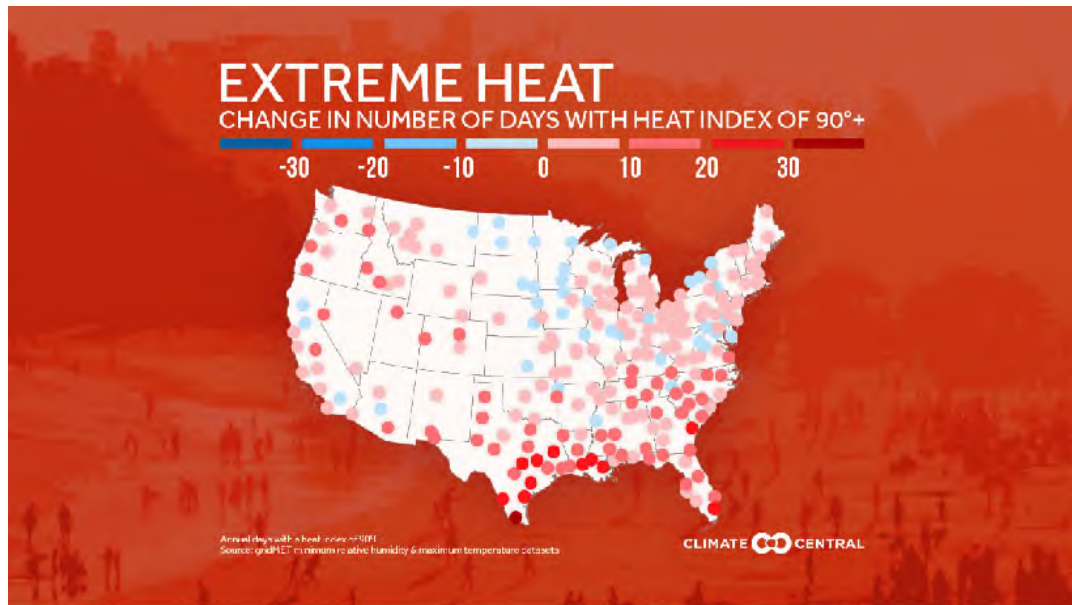


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40

Increased Temperatures/Extreme Heat

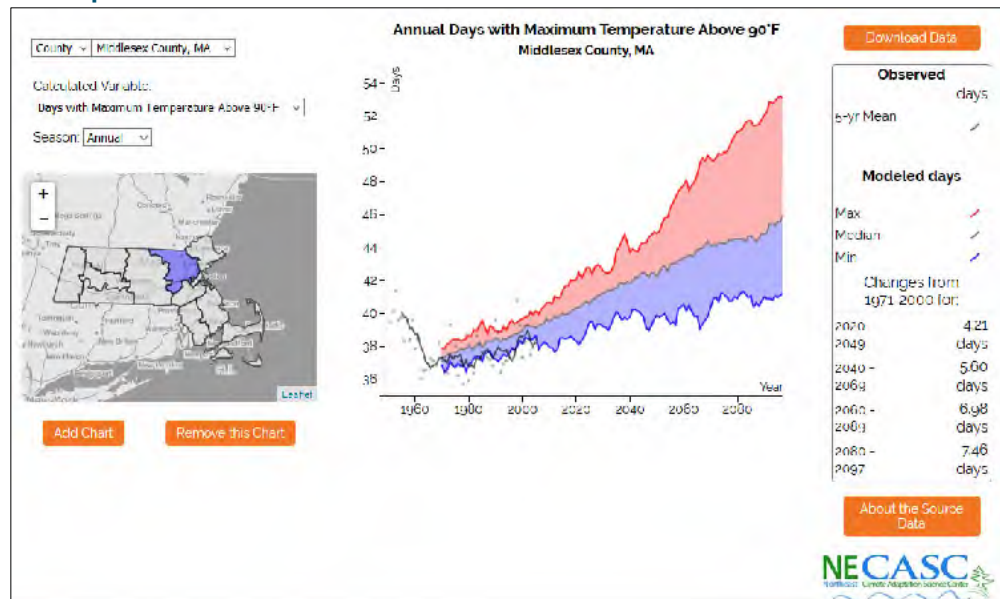


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41

Increased Temperatures/Extreme Heat

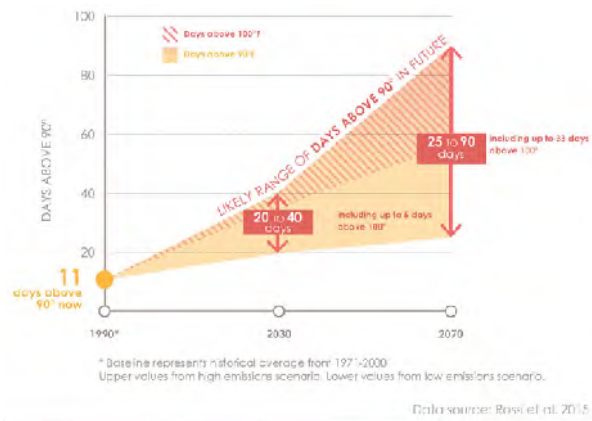


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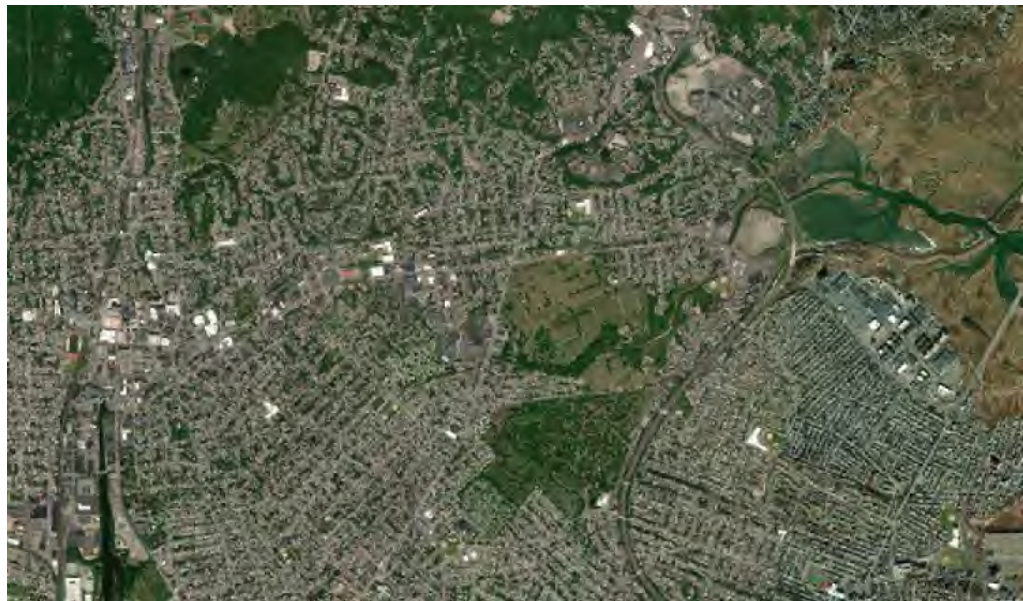
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Increased Temperatures/Extreme Heat



Climate Indicator	Observed Value 1971-2000 Average	Mid-Century Projected Change in 2050s	End of Century Projected Change in 2090s
Maximum temperature	Summer: 78.8 °F	Increase by 2.8 - 6.7 °F	Increase by 3.5 - 12.5 °F
	Fall: 66.8 °F	Increase by 3.4 - 6.8 °F	Increase by 3.8 - 11.8 °F
Minimum temperature	Winter: 14.1 °F	Increase by 3.3 - 8.0 °F	Increase by 4.8 - 11.1 °F
	Fall: 39.4 °F	Increase by 3.5 - 6.5 °F	Increase by 4.0 - 11.4 °F
Days with Maximum temperature > 90°F	4 days	Increase by 6 - 22 days	Increase by 9 - 52 days
Days with Minimum temperature < 32°F	Winter: 84 days	Decrease by 4 - 12 days	Decrease by 6 - 25 days
	Spring: 37 days	Decrease by 6 - 15 days	Decrease by 9 - 20 days
	Fall: 27 days	Decrease by 8 - 13 days	Decrease by 8 - 20 days

Impervious Surface



Impervious Surface



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45

Winter Hazards

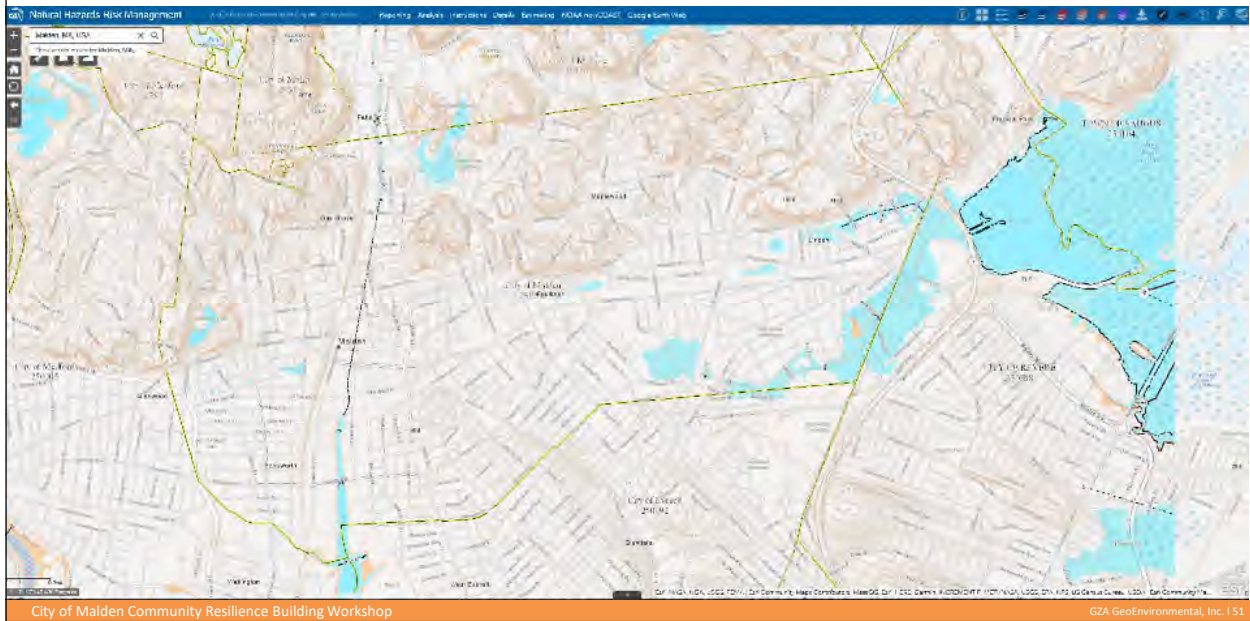


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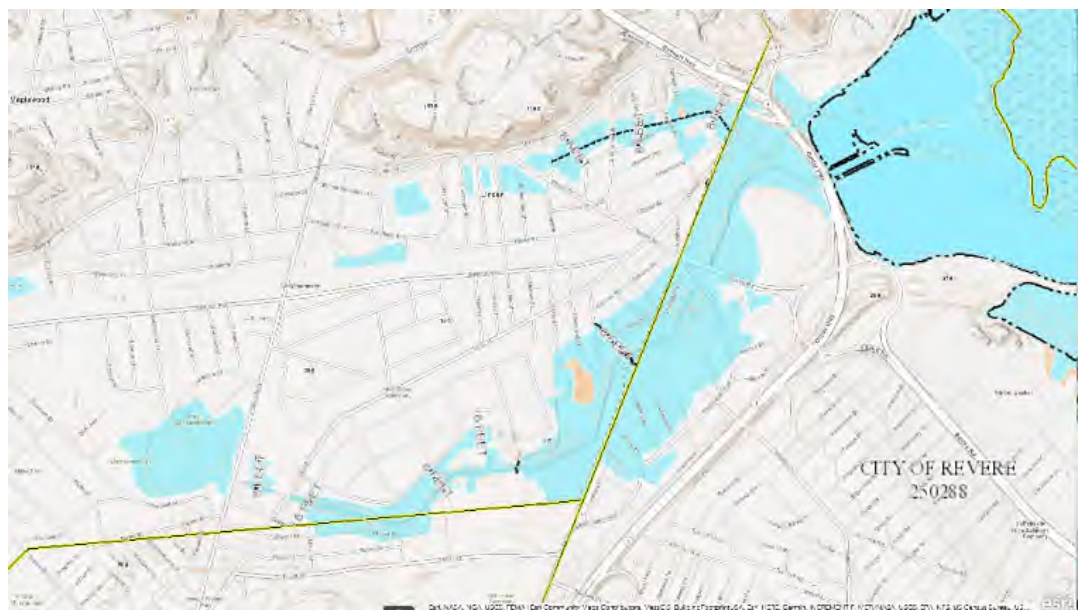
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FEMA Flood Hazard Zones



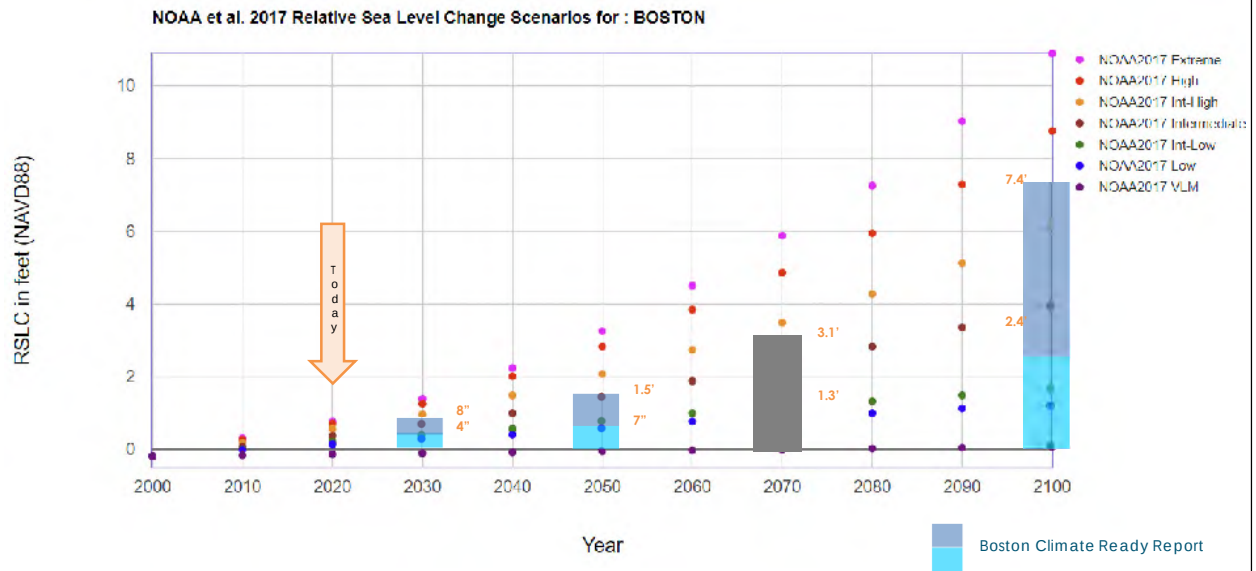
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FEMA Flood Hazard Zones



52

Sea Level Rise

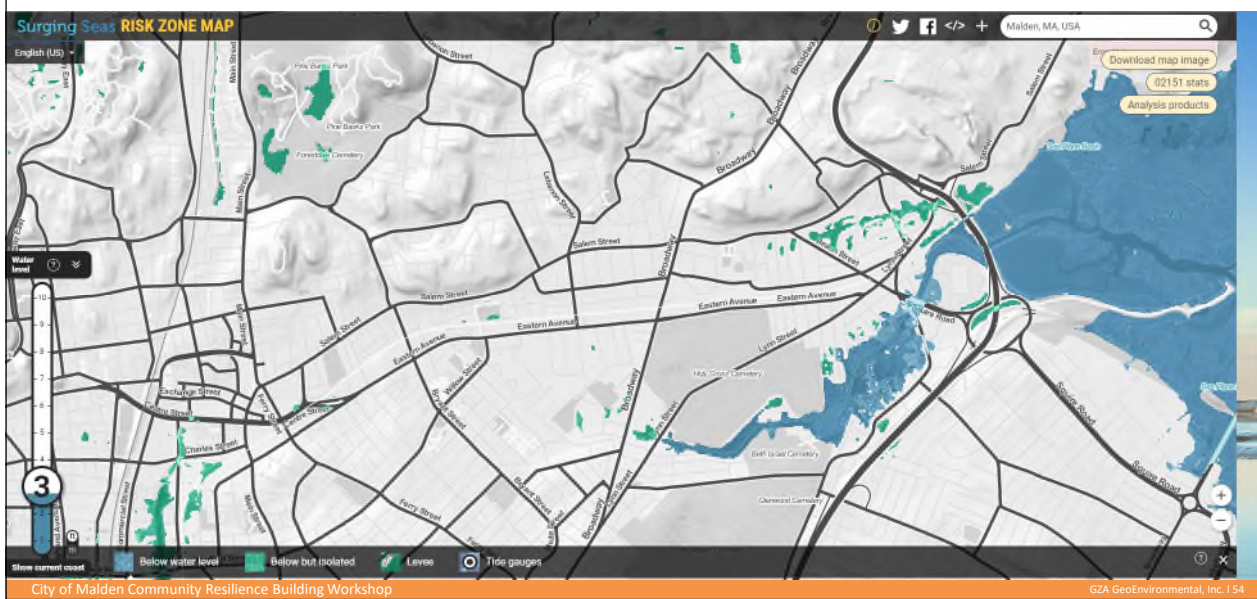


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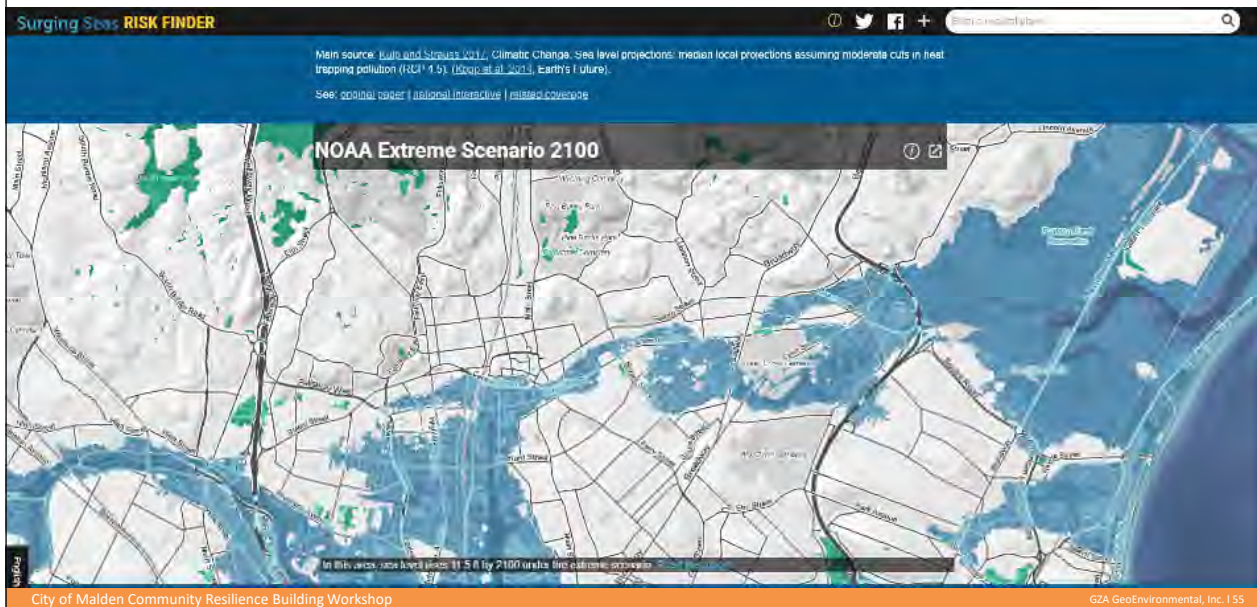
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Nuisance Flooding: 2070



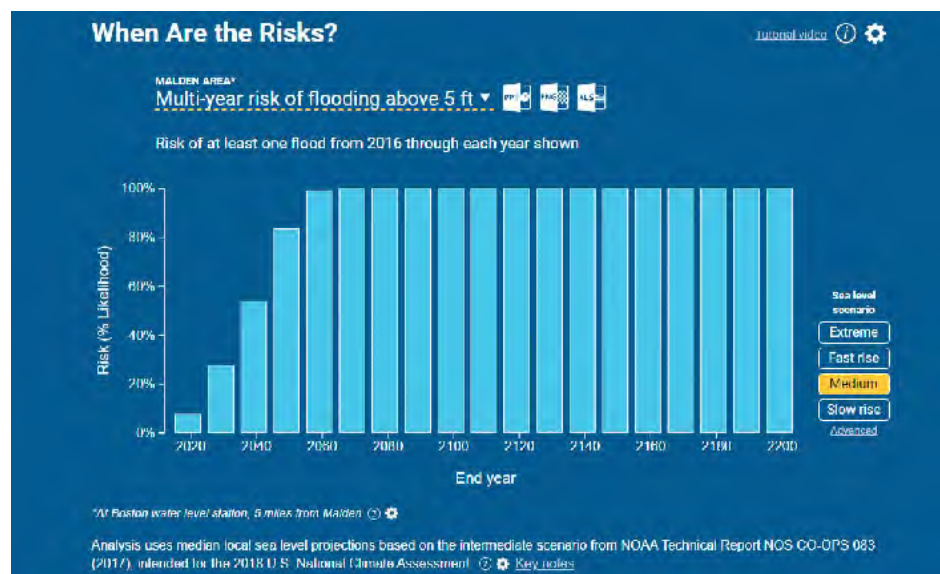
54

Nuisance Flooding: 2100 Extreme Sea Level Rise Scenario



55

Flooding Frequency: Future

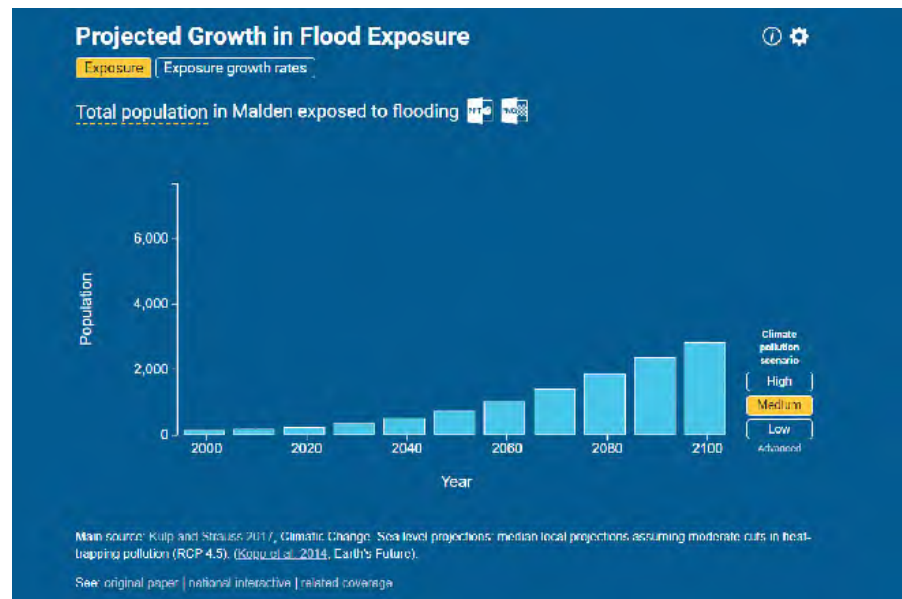


City of Malden Community Resilience Building Workshop

GZA GeoEnvironmental, Inc. 156

56

Flooding Vulnerability: Future



Break 15 Minutes

Small Group Exercise
+/- 1 hr and 30 Minutes
Identify Feature Vulnerabilities and Strengths

LUNCH 11:55AM to 12:55PM

Community Actions Overview

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

63

2017 Hazard Mitigation Plan - Priority Mitigation Actions

– FLOOD Hazard Mitigation Actions

- Dredge the Town Line Brook channel
- Linden Area- increase the storage capacity behind the Revere floodgate
- Increase storage capacity at Bowman/Durso Streets by install underground storage tanks or constructing a parallel second culvert
- Complete flood mitigation work at the Townline Estates Trailer Park on Broadway

– WIND & WINTER STORMS

- Tree Warden Coordination with Utility Companies

– EXTREME TEMPERATURES

- Site Design to increase tree plantings near buildings, increase the percentage of trees used in parking areas, and along public ways
- Promote Green Building and Cool Roof designs

64

2017 Hazard Mitigation Plan - Priority Mitigation Actions

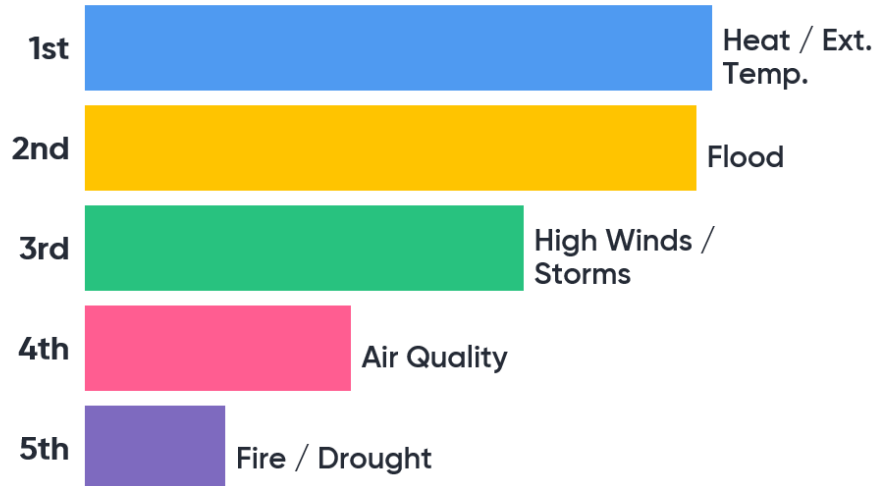
- EXTREME TEMPERATURES (Cont.)
 - Provide facility for additional vulnerable populations (such as disabled populations and in addition to senior residents) during extreme temperature
- DROUGHT
 - Promote drought tolerant landscaping and site design measures
- MULTIPLE HAZARDS
 - Shelter generator hook-ups or clean energy resiliency
 - Regional communications and GIS capability

Small Group Exercise
1 hour
Identify Community Actions

Break 15 Minutes

Small Group Exercise
50 minutes
Prioritize Actions

Prioritizing Hazards

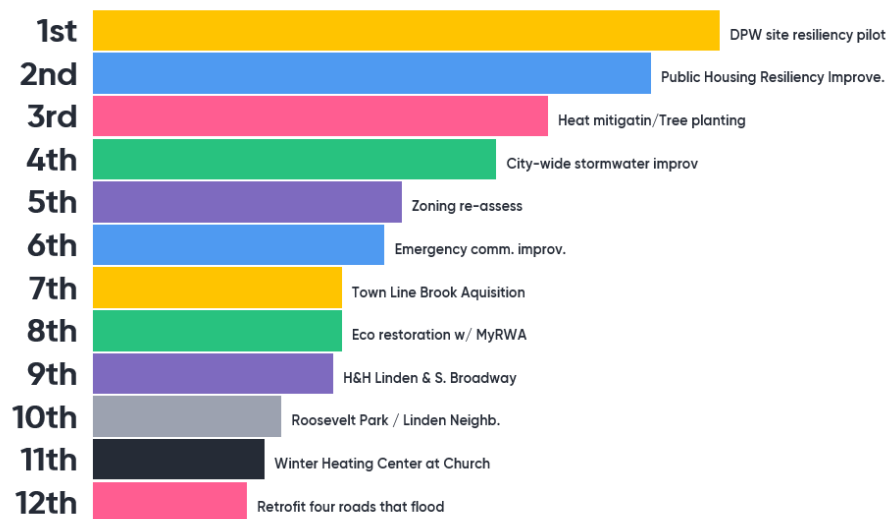


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69

Prioritizing Projects



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70

Closing Remarks and Next Steps

Next Steps

1. Prepare Summary of Findings Report
2. Facilitate Public Listening Session on December 3, 2019
3. Revise Summary of Findings Report
4. Submit Final Summary of Findings Report to EEA
5. Receive MVP Designation by EEA
6. Apply for MVP Action Grants

Handouts

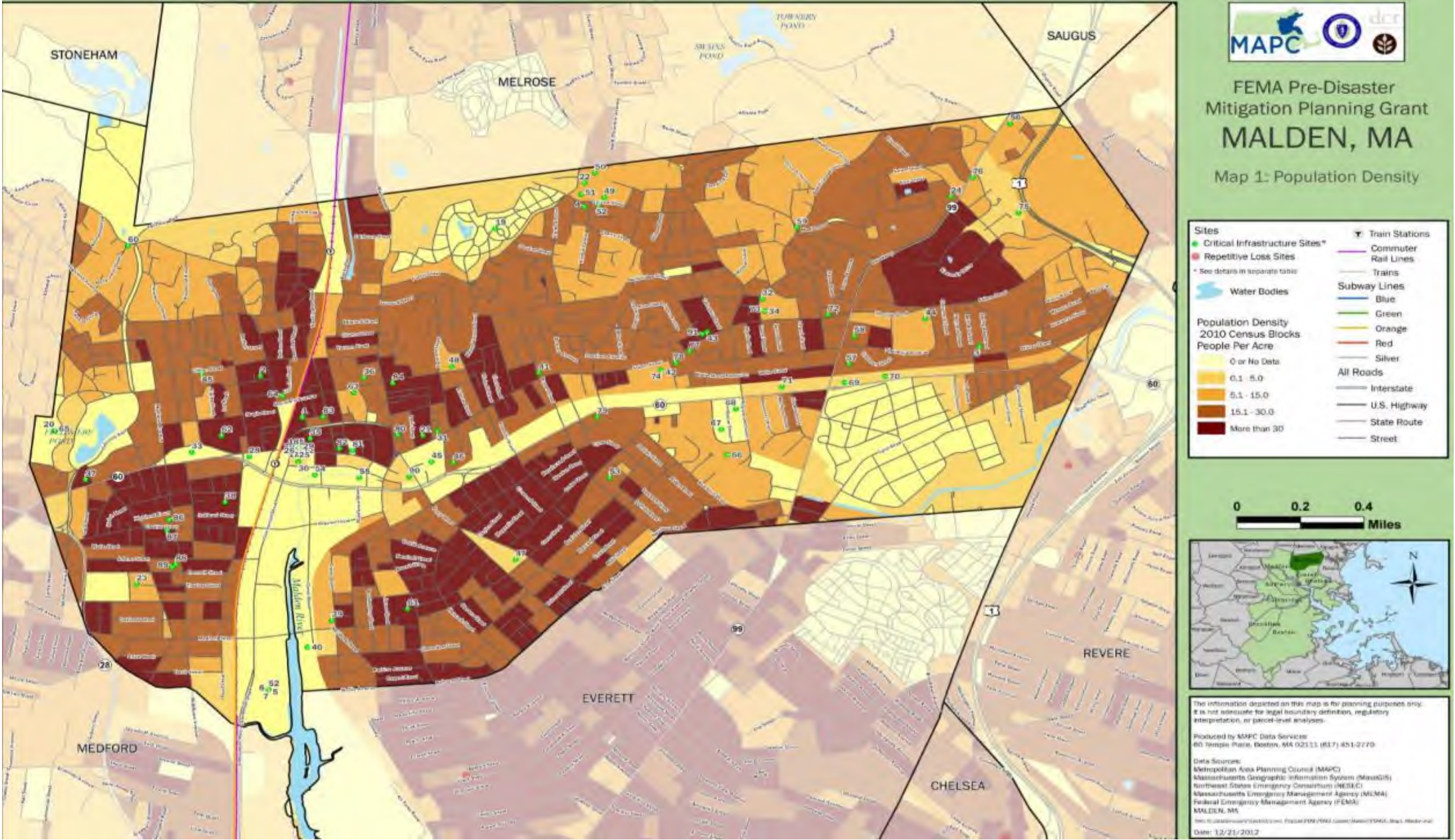
CRB Workshop Overview

Resources:

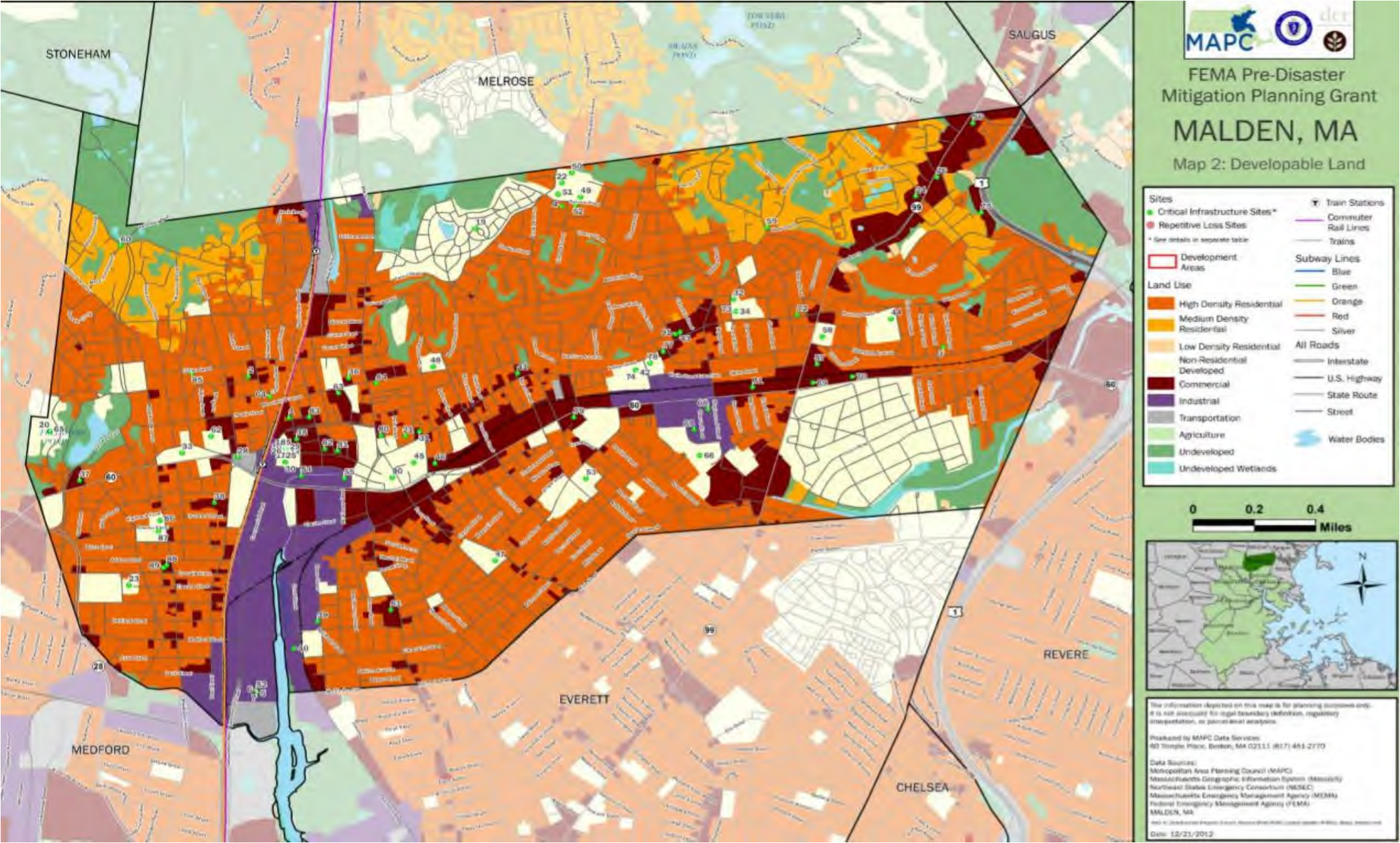
Select resources for Massachusetts

- [Mass.Gov: Climate Change](#)
- [EPA's Resilience and Adaptation in New England \(RAINE\)](#)
- [Massachusetts Ocean Resource Information System \(MORIS\)](#)
- [Comparison Matrix: Sea Level Rise and Coastal Flood Web Tools](#)
- [Adaptation Clearinghouse: sea level rise adaptation](#)
- [Georgetown Climate Center: state climate change preparations and progress](#)
- [Climate Adaptation Knowledge Exchange \(CAKEX\): sea level rise](#)
- [MassGIS: OLIVER - Online Mapping Tool](#)
- [MA CZM: Sea Level Rise: Understanding and Applying Trends and Future Scenarios for Analysis and Planning](#)
- [The Boston Harbor Association: 2013 Preparing for the Rising Tide Report](#)
- [City of Boston: Climate Action Plan](#)
- [City of Boston: Greenovate Boston](#)
- [Cambridge: Climate Change Vulnerability Assessment](#)
- [The Provincetown Center for Coastal Studies](#)
- [Sea Level Rise Viewer | Digital Coast - NOAA Office for Coastal Management](#)
- [Coastal Flood Exposure Mapper | Digital Coast - NOAA Office for Coastal Management](#)
- [MA CZM: StormSmart Coasts - Massachusetts Shoreline Change Project](#)

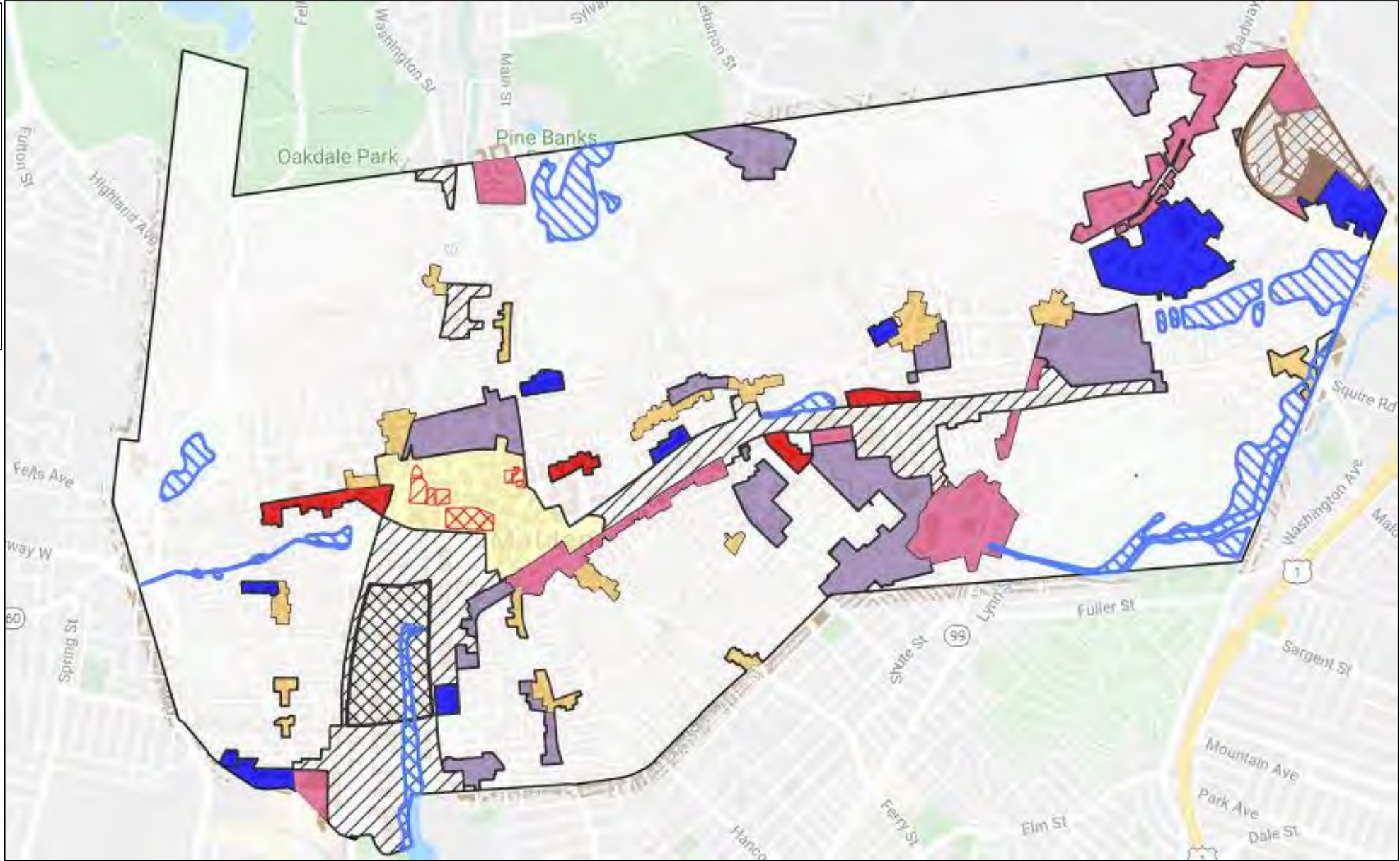
Malden Population



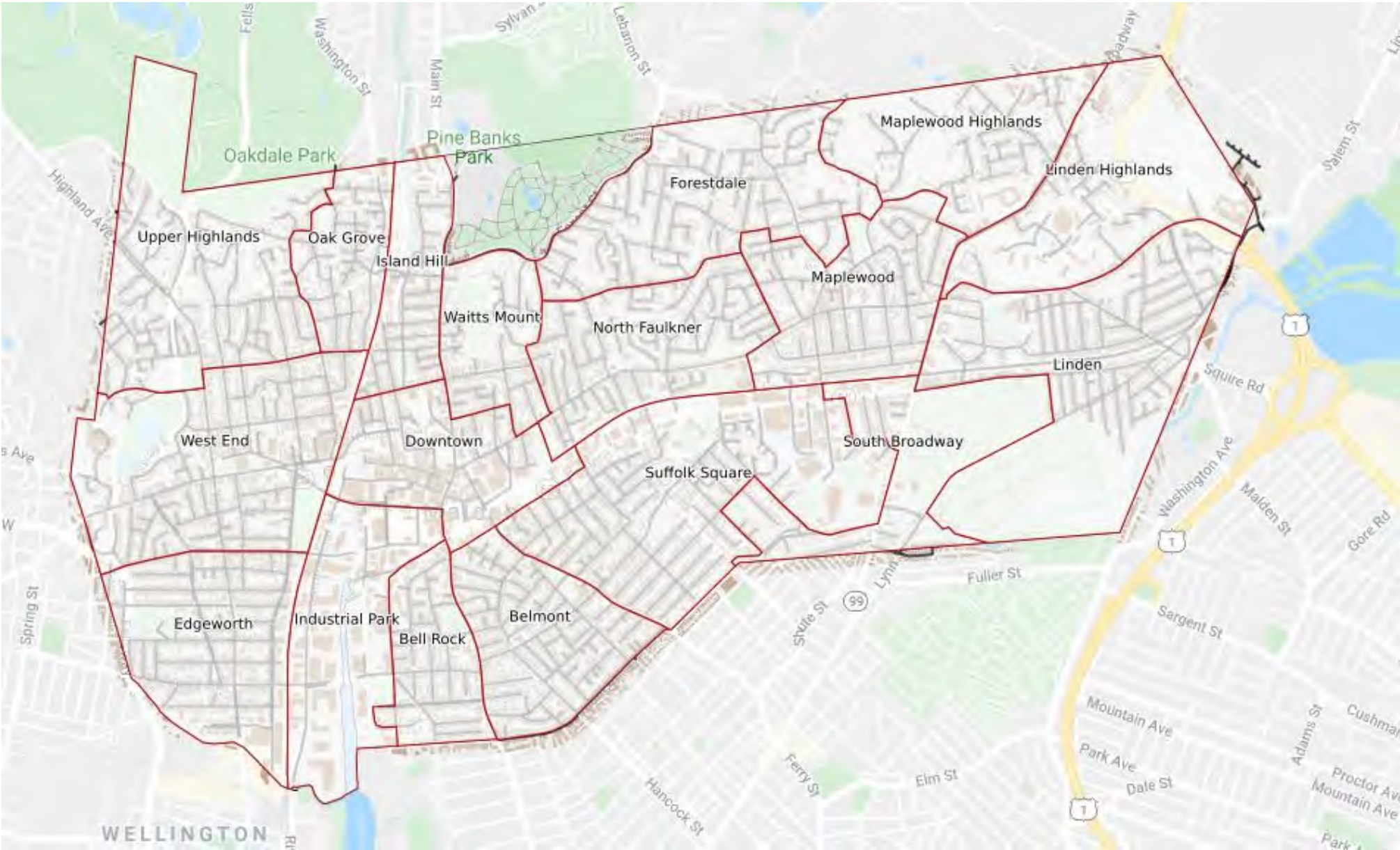
Malden Land Use



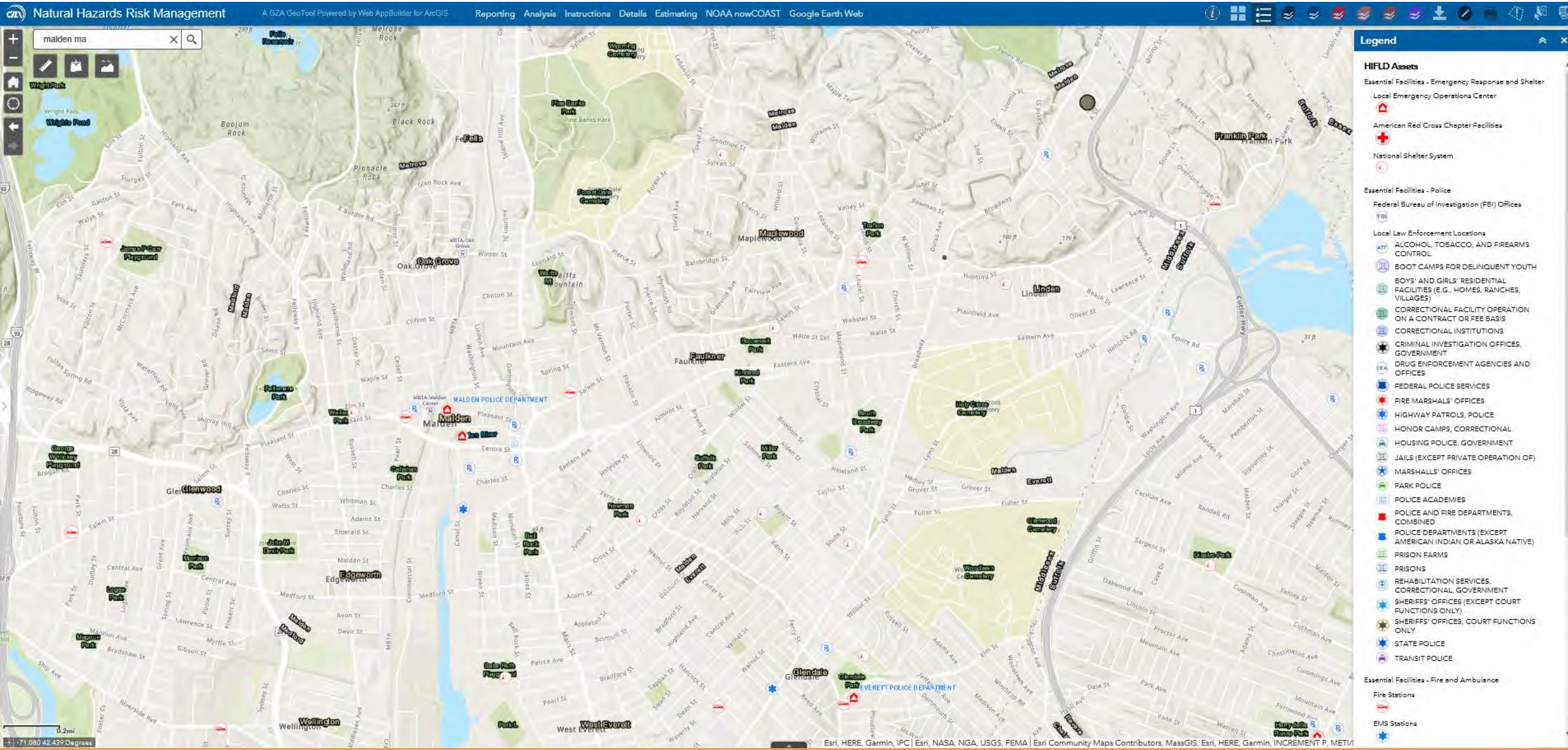
Malden Zoning



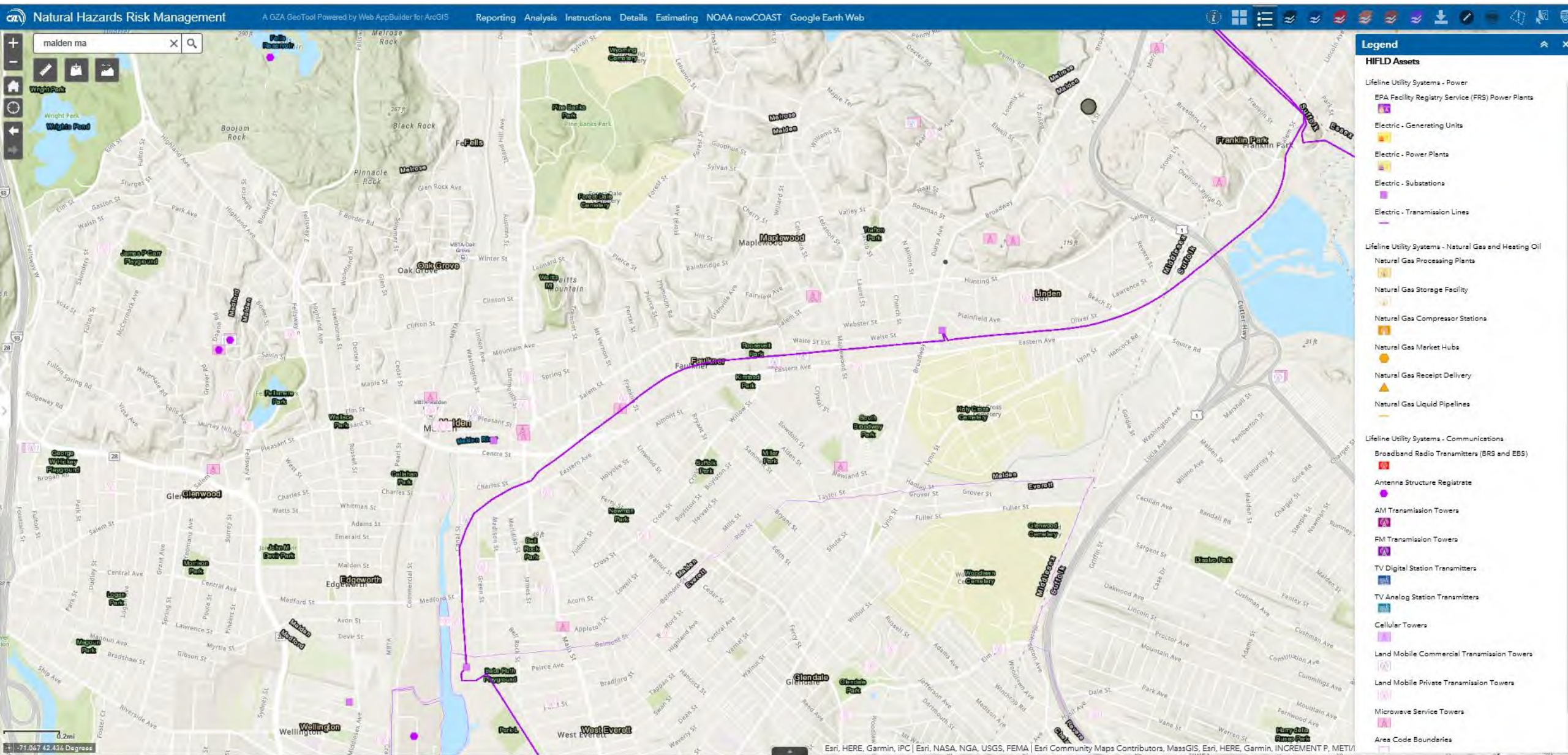
Societal Features: Neighborhoods



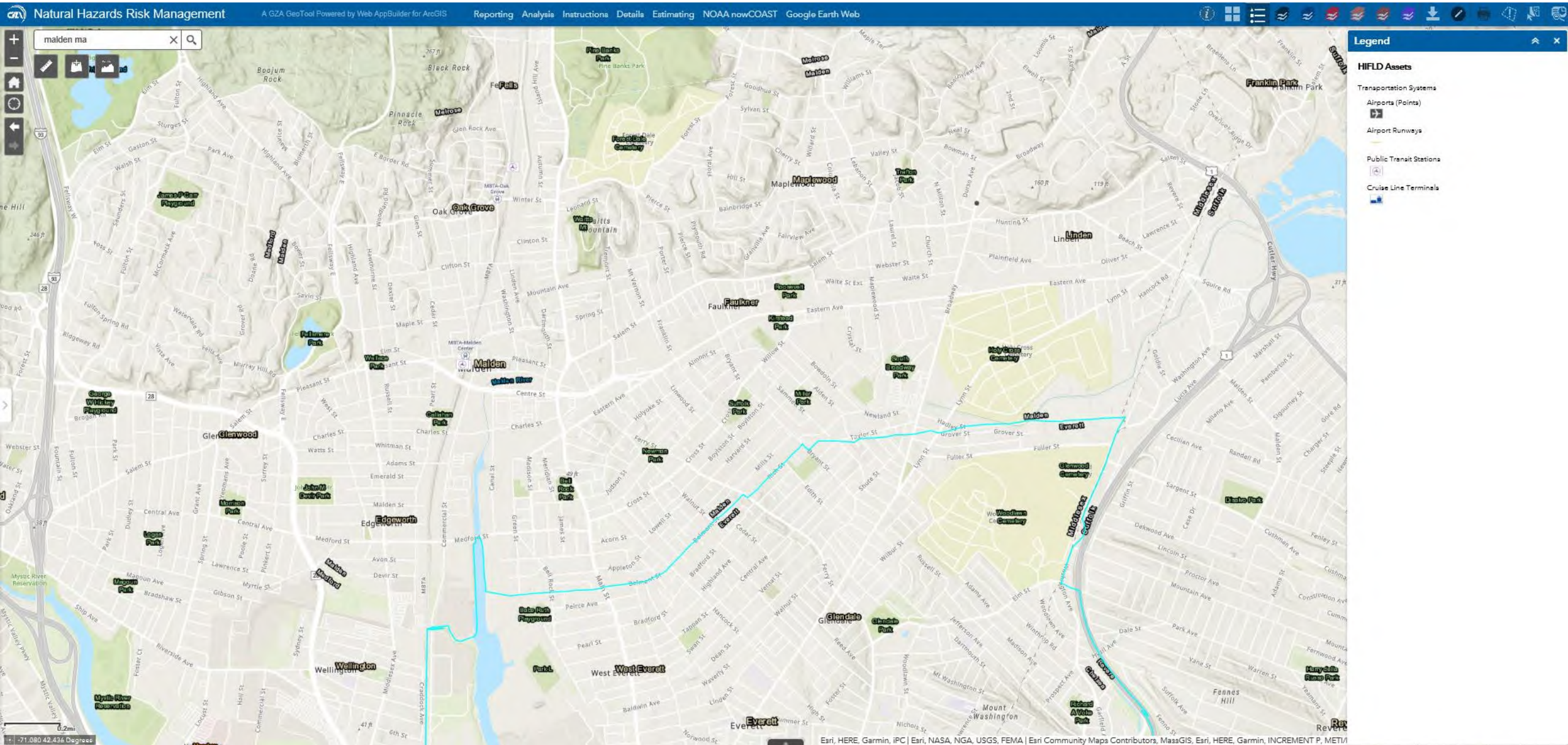
Malden Essential Facilities



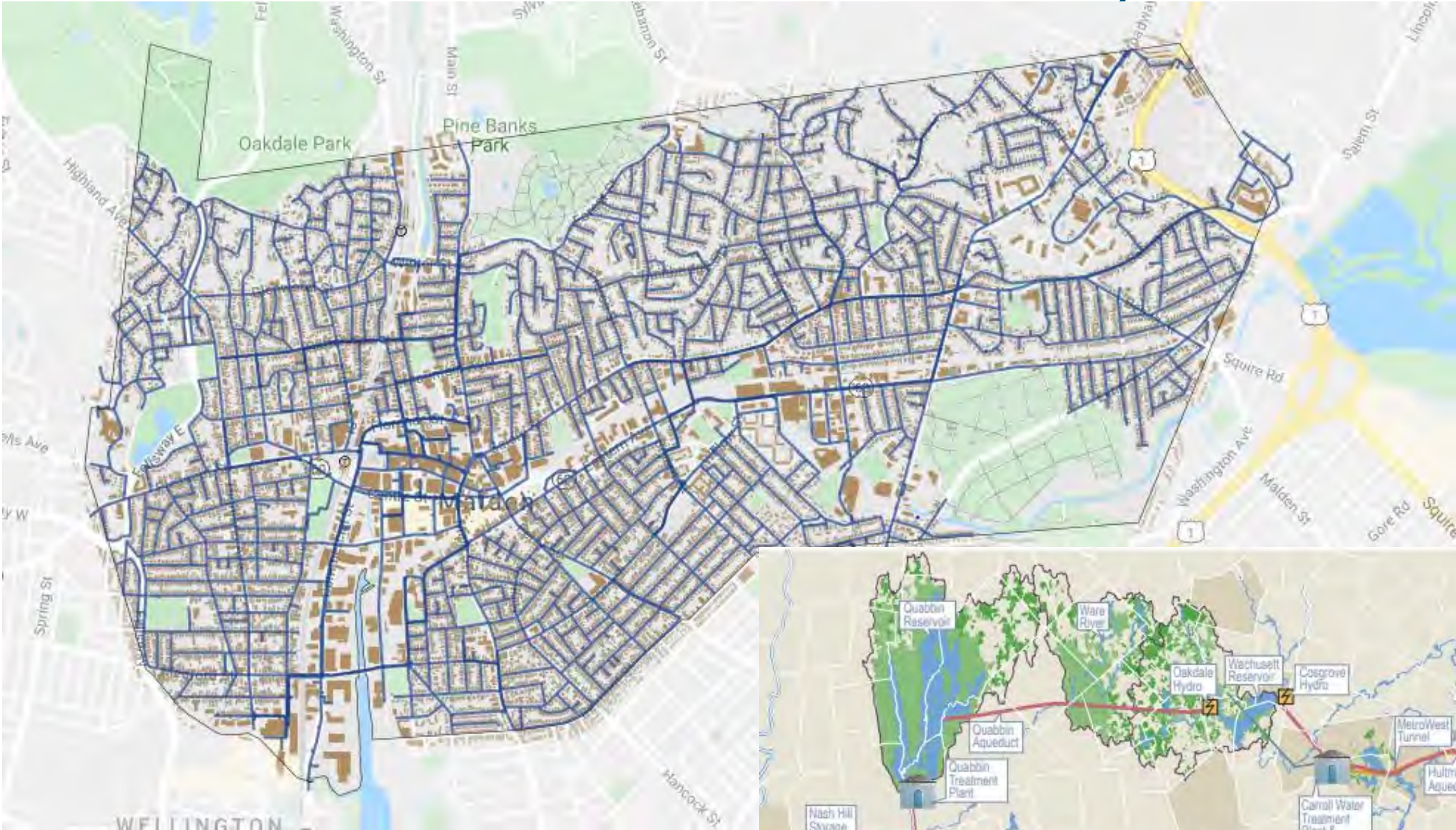
Malden Lifeline Services



Malden Transportation System



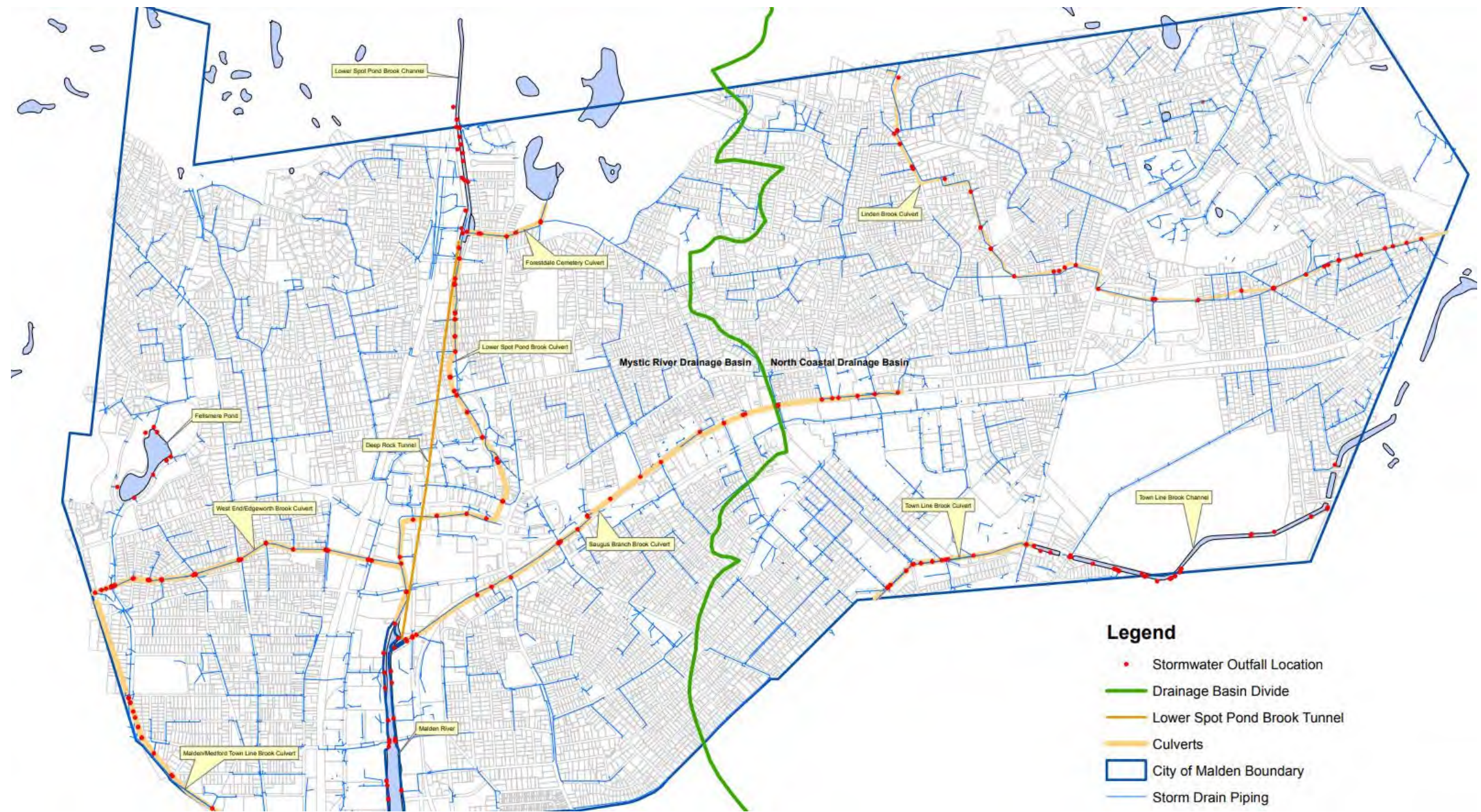
Infrastructure Feature: Malden Water System



Infrastructure Feature: Malden Sewer Infrastructure



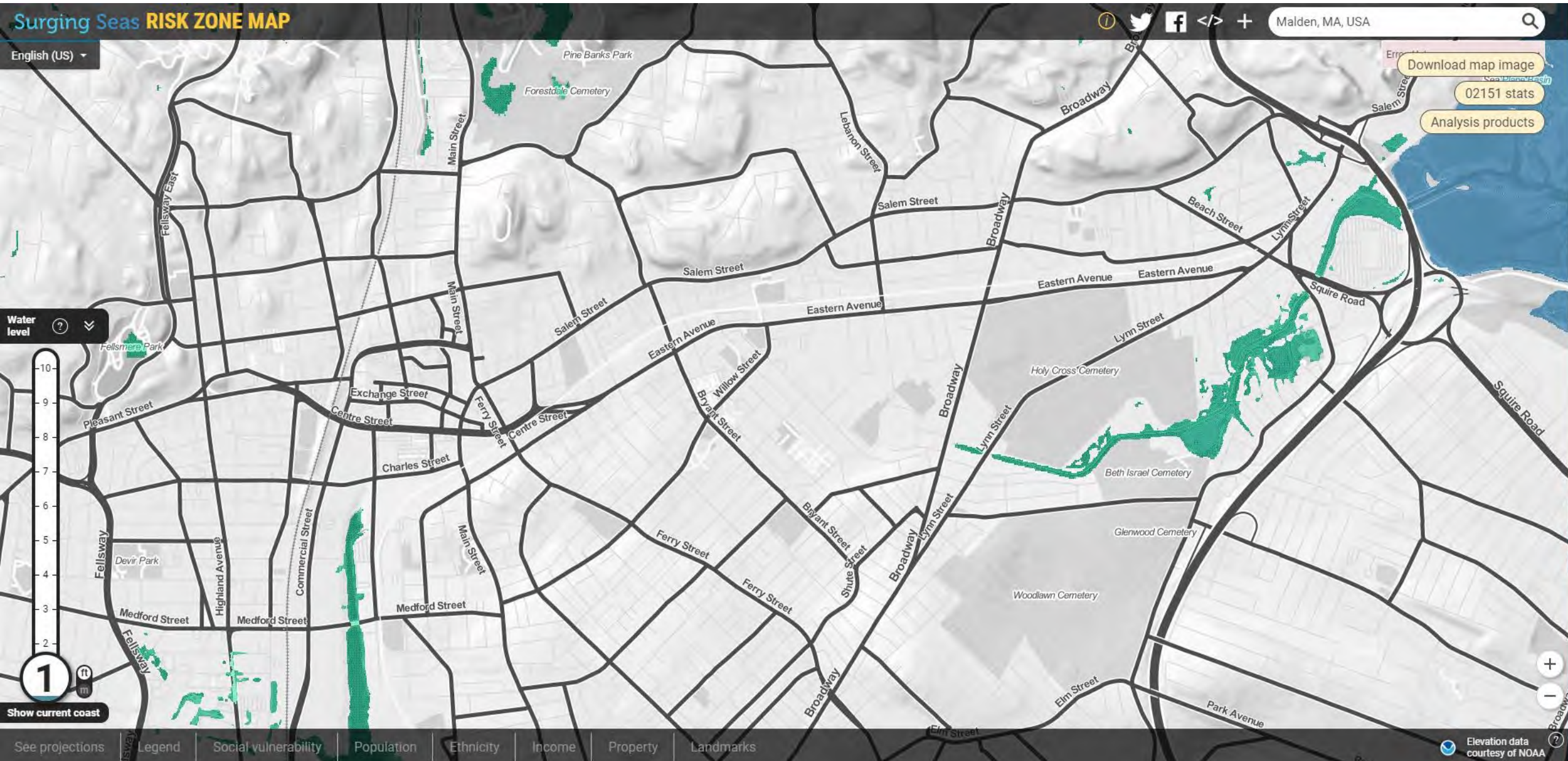
Malden Stormwater Infrastructure



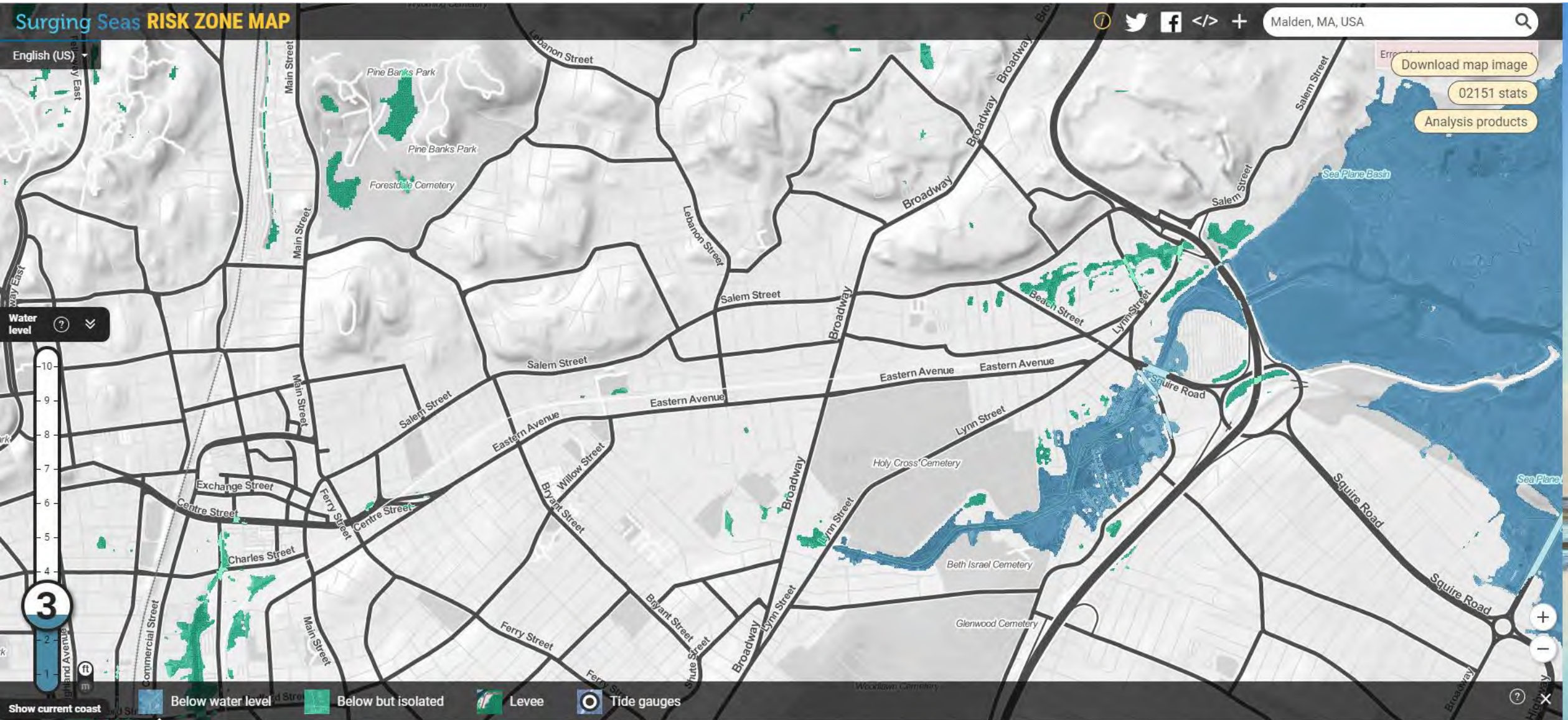
Malden Stormwater Infrastructure: Catch Basins



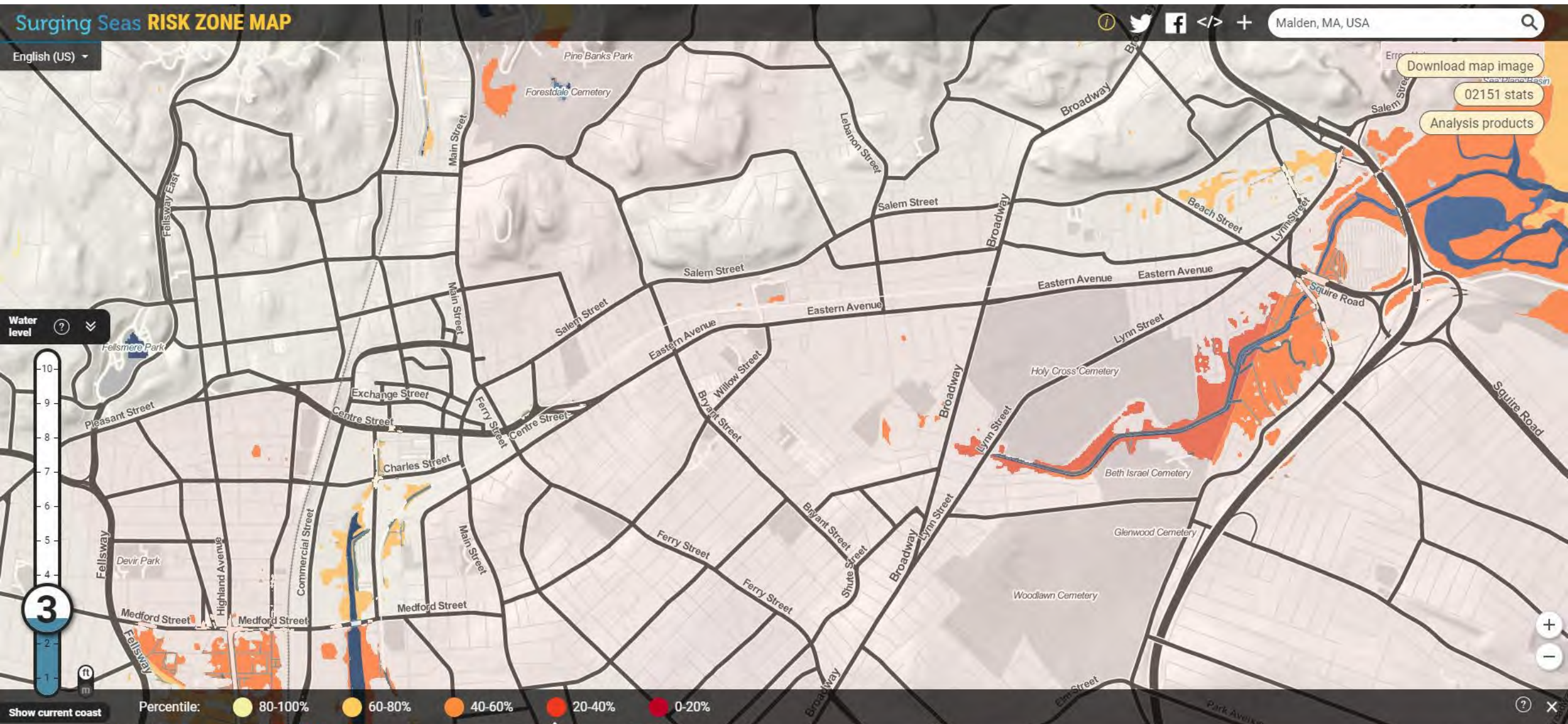
Nuisance Flooding: 2050



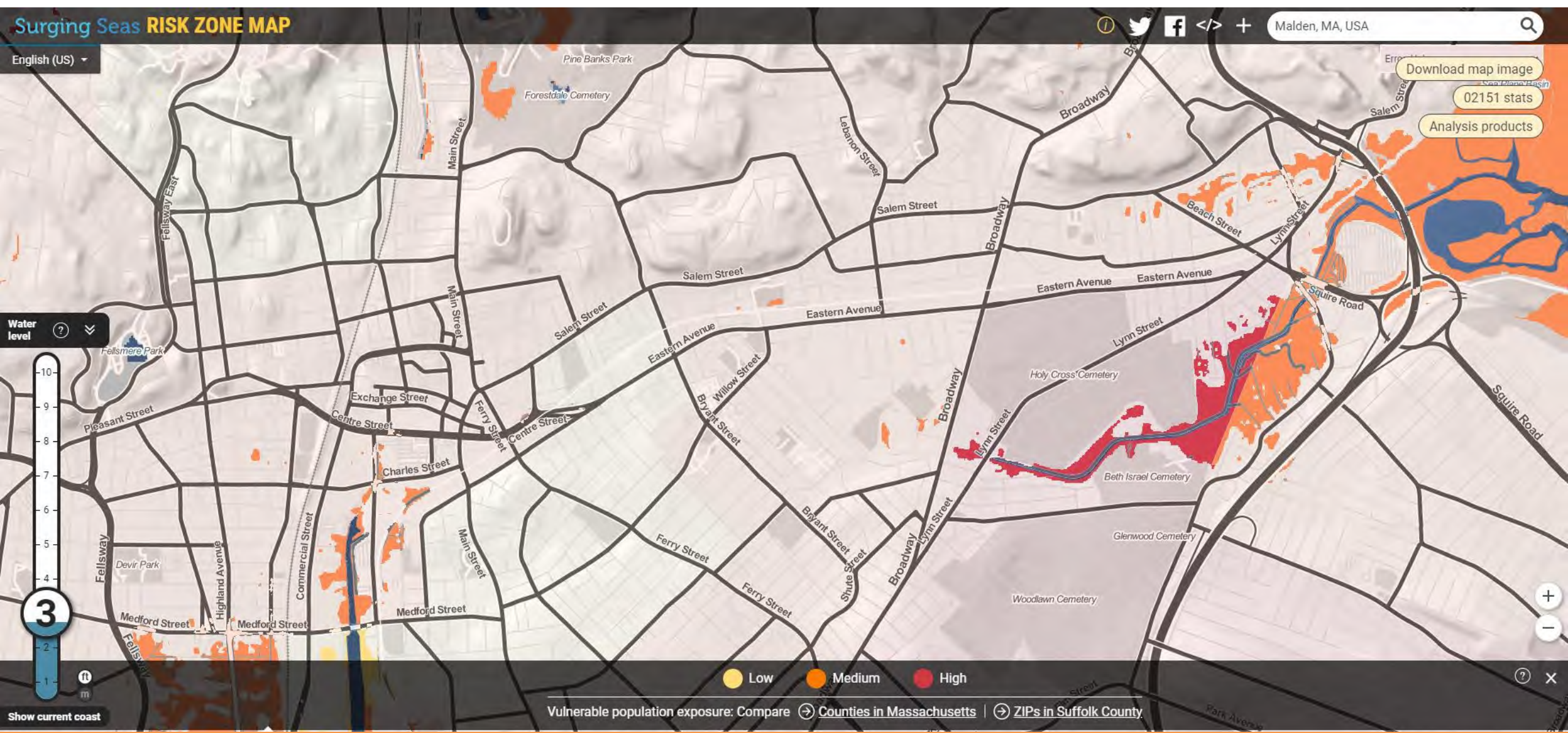
Nuisance Flooding: 2070



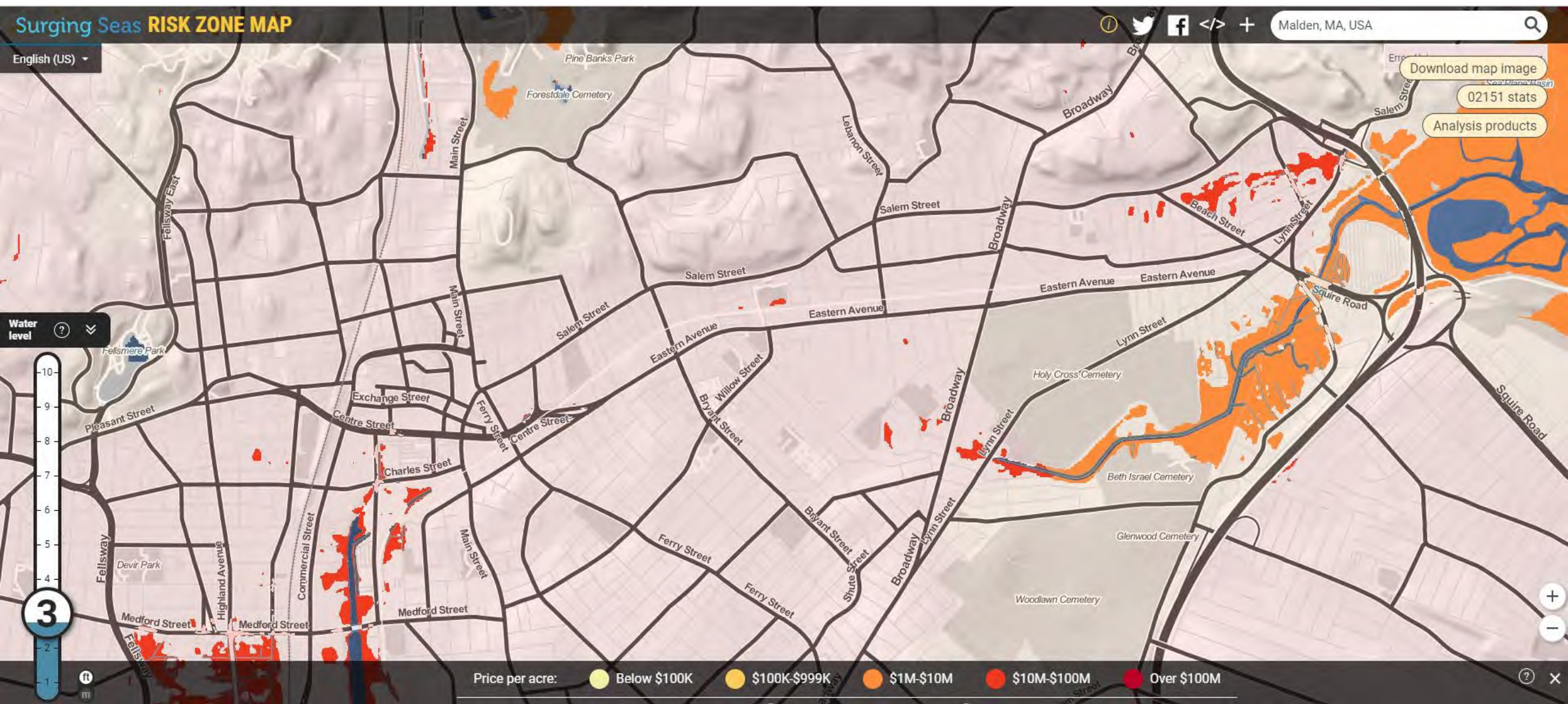
Nuisance Flooding: 2070 – Population



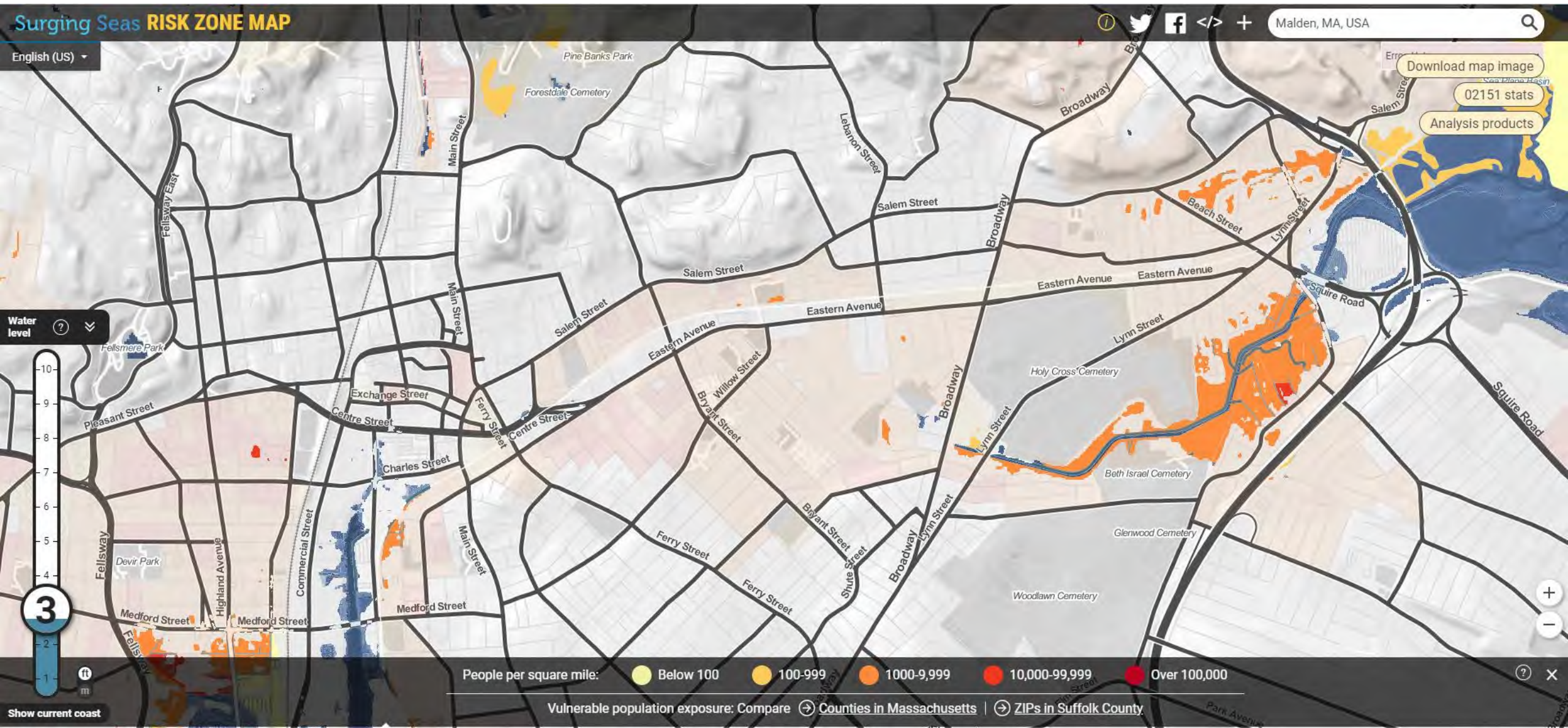
Nuisance Flooding: 2070 – Social Vulnerability



Nuisance Flooding: 2070 – Property

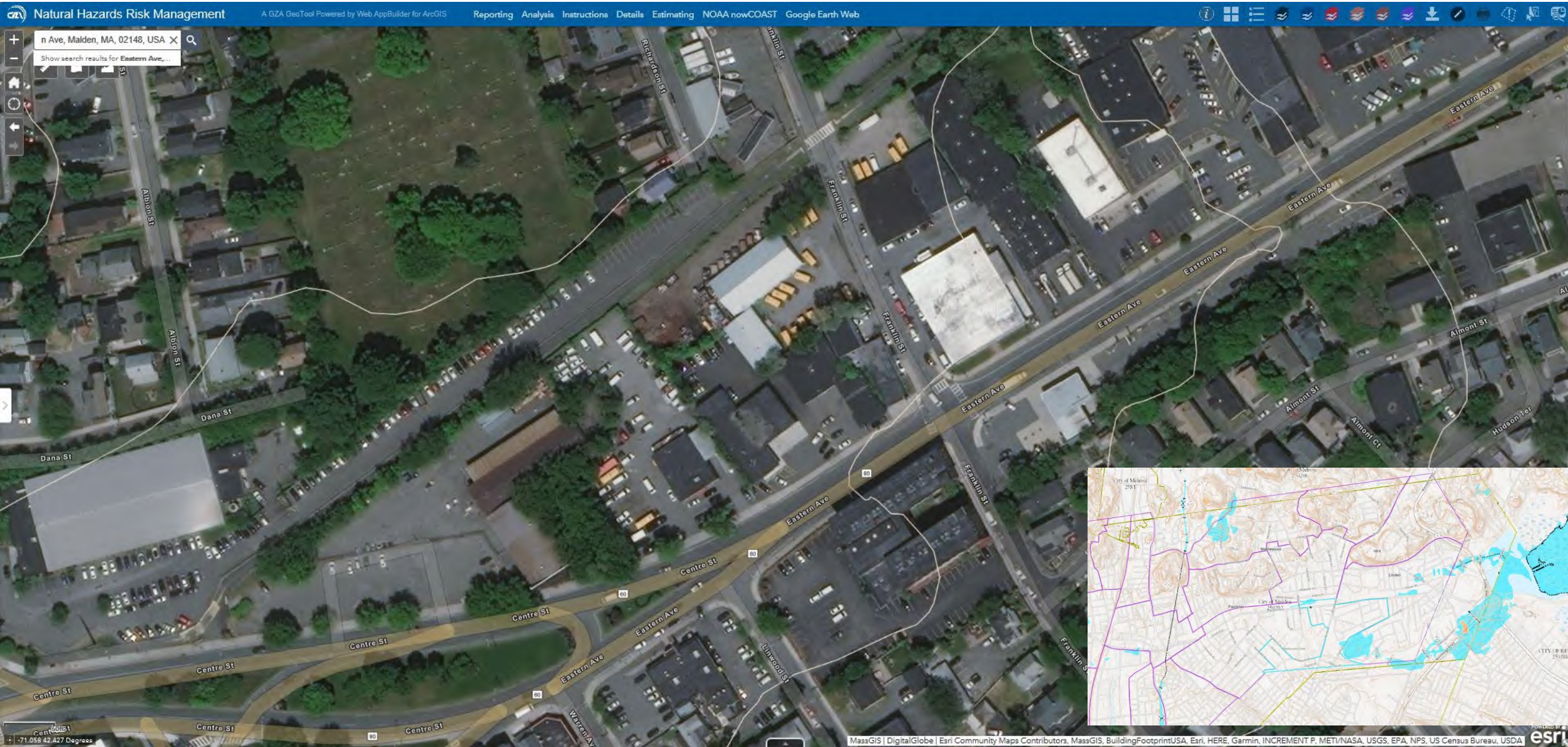


Nuisance Flooding: 2070 – Income



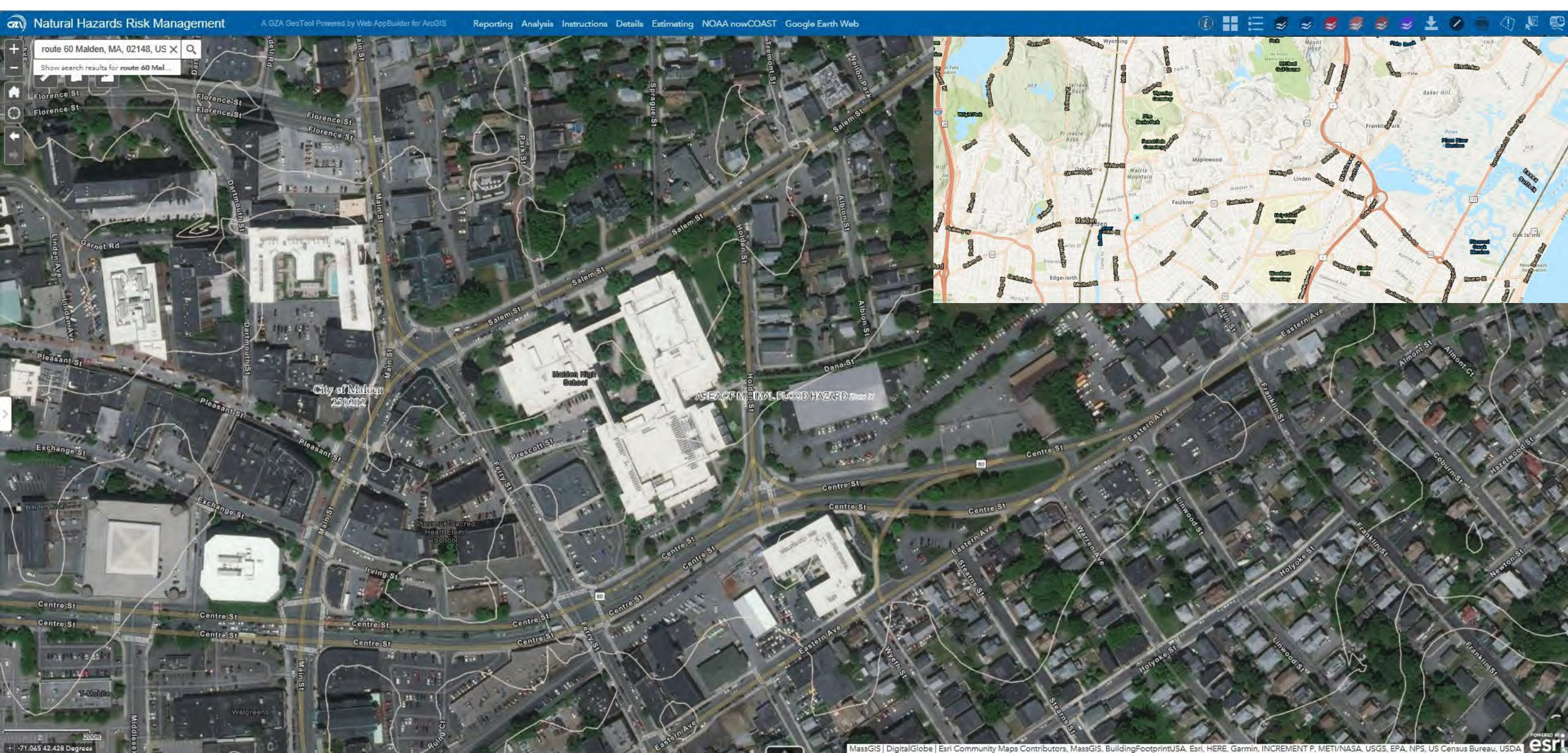
Urban Flooding: Eastern Avenue near Holy Cross Cemetery

Drainage backs up along Eastern Avenue and blocks the roadway during high precipitation events.



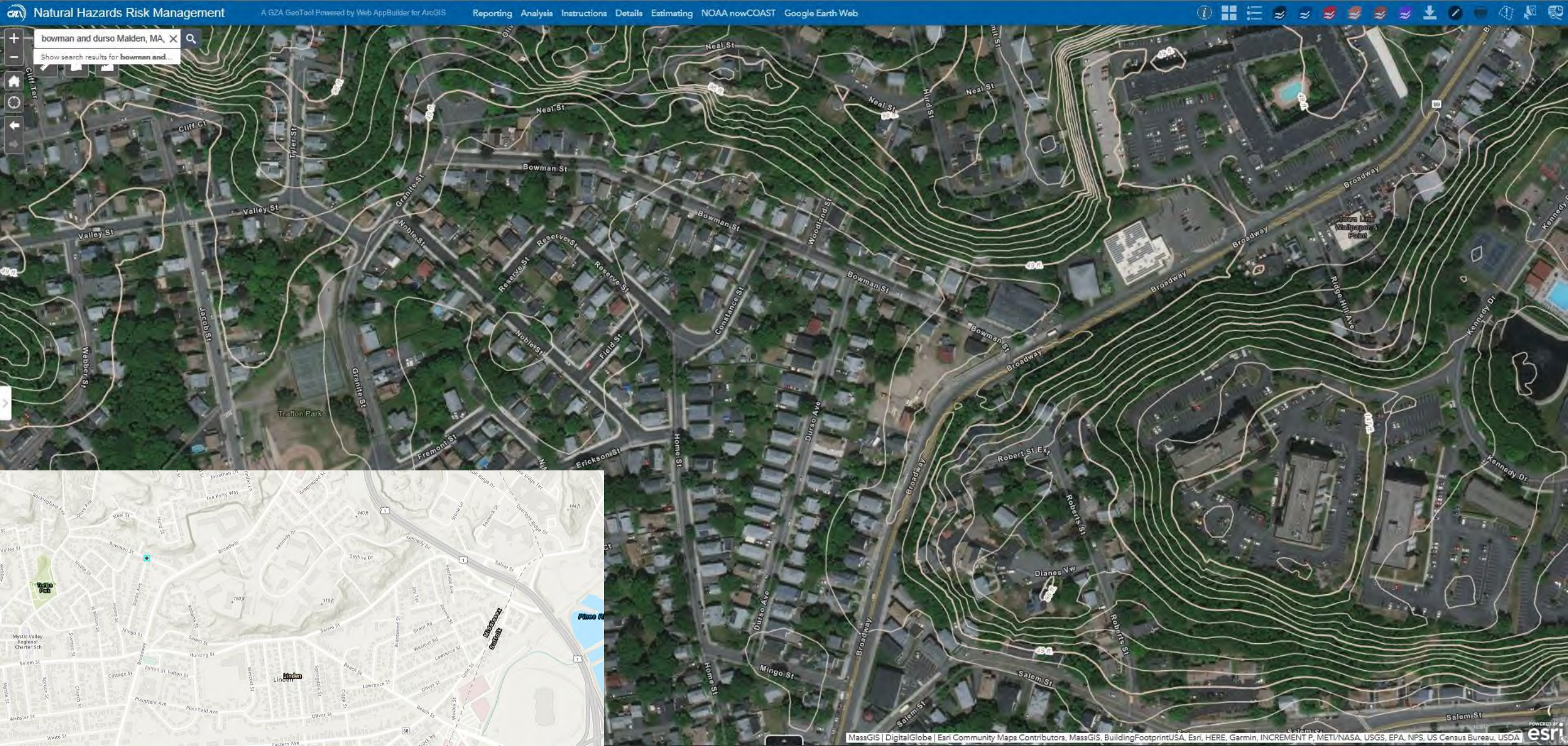
Urban Flooding: East of Rt 60 near Malden High

Low lying area, experiences drainage backups and floods during precipitation events



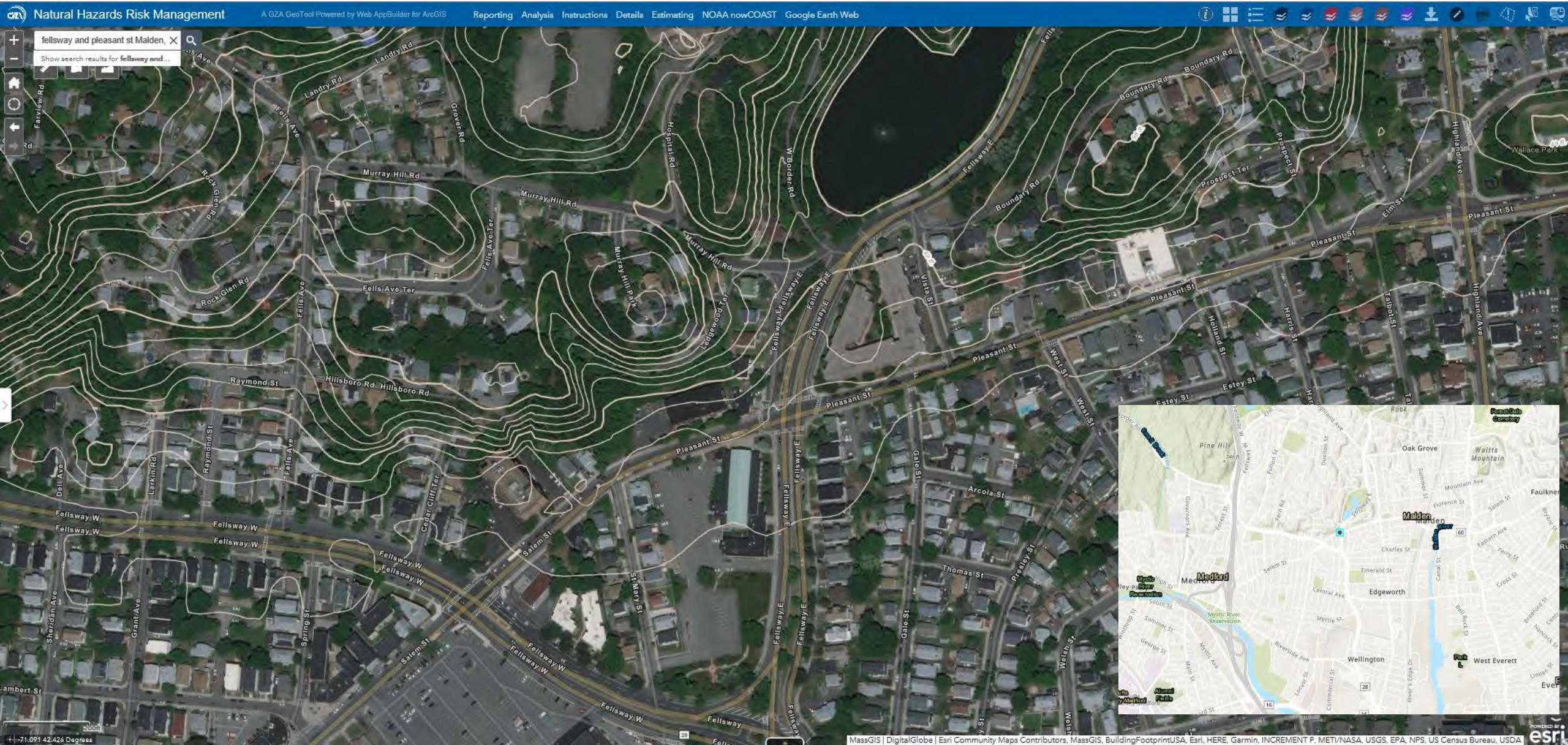
Urban Flooding: Bowman and Durso

Residential neighborhood drained by 48-inch culvert, which drains to the Revere tide gate. Area floods due to run-off and is subject to tidal back-up from the tide gate



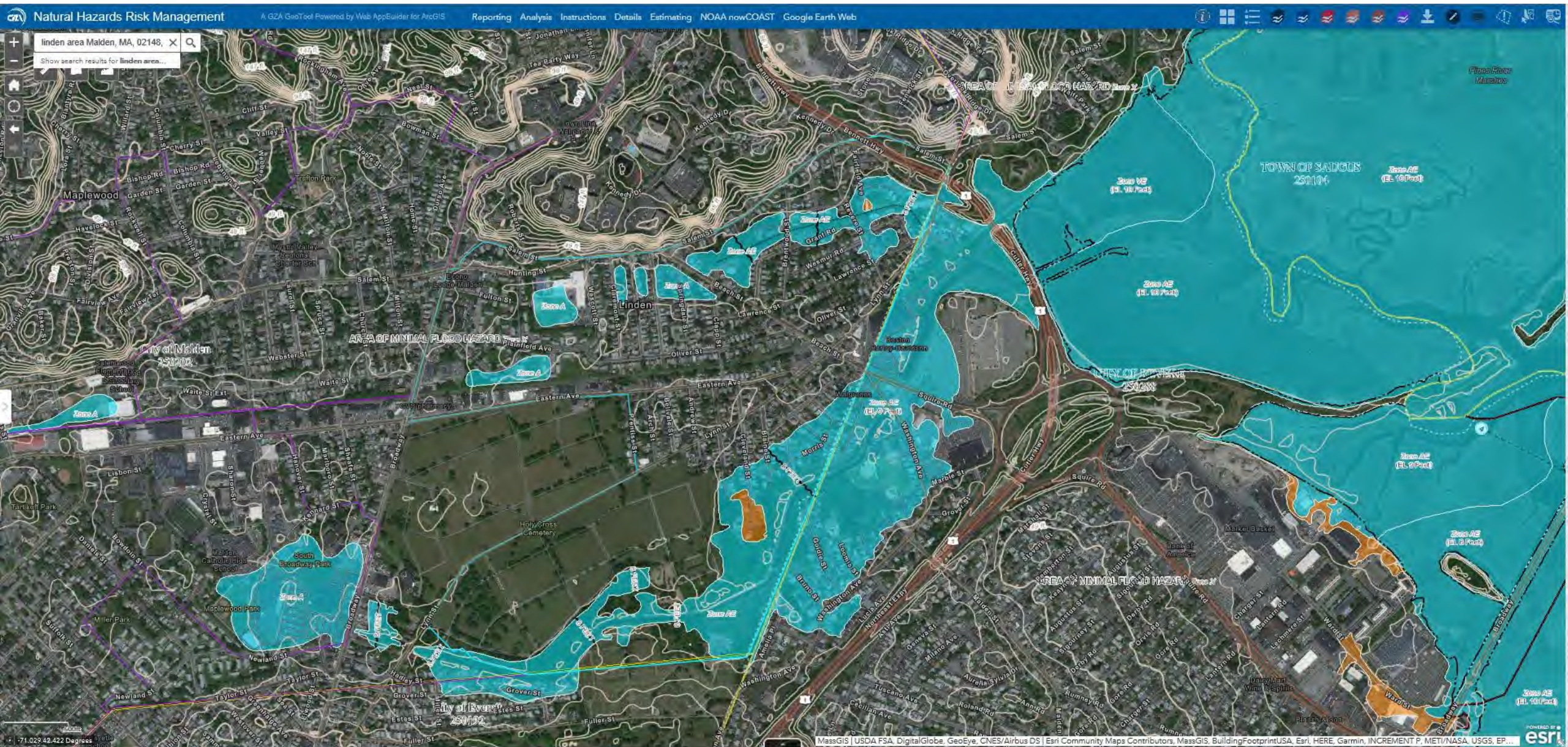
Urban Flooding: Fellsway and Pleasant Streets

Floods due to open brook that backs up during intense precipitation events.



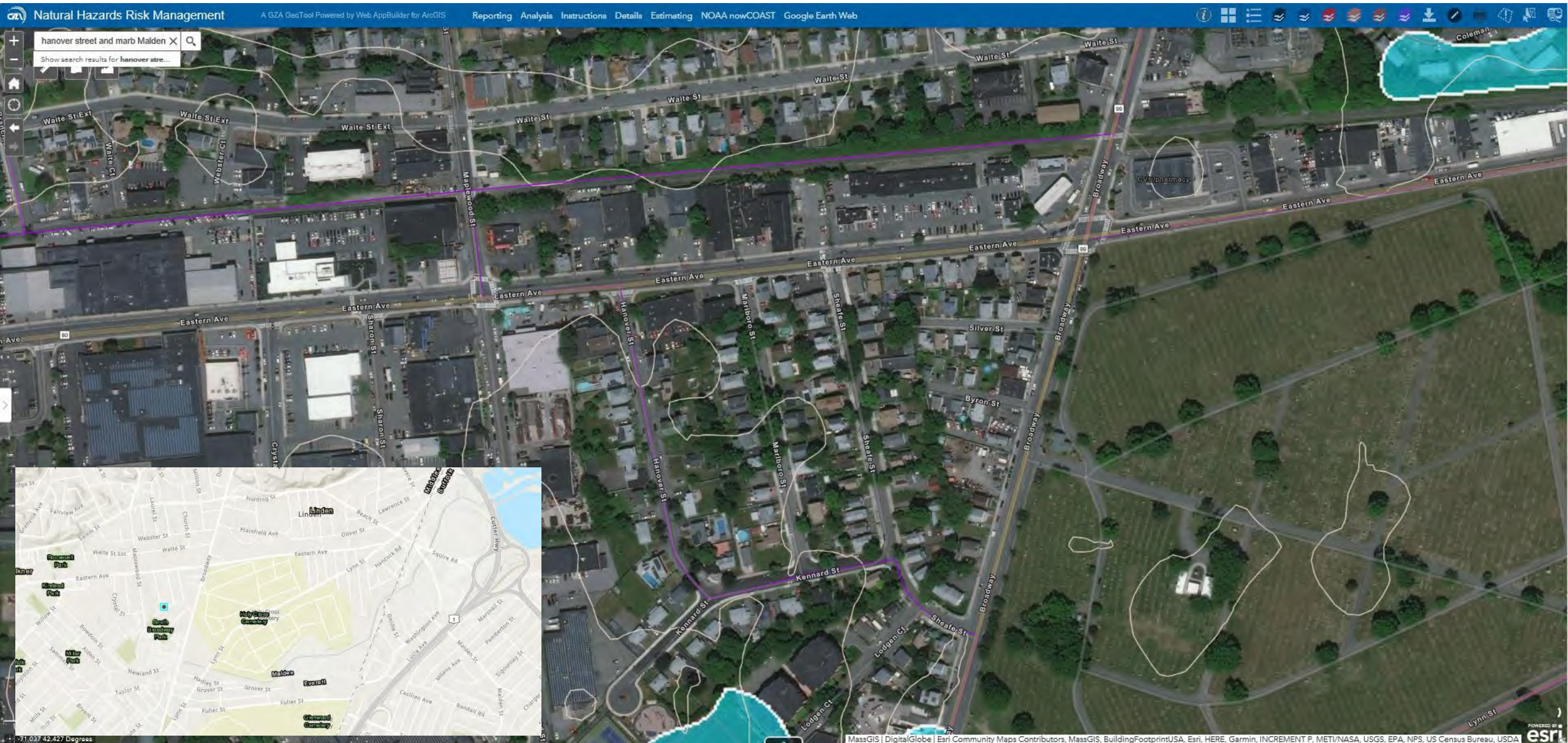
Urban Flooding: Linden Area Neighborhood

Town Line Brook watershed. Floods during intense precipitation events. Insufficient stormwater storage capacity. Also tidal flooding.



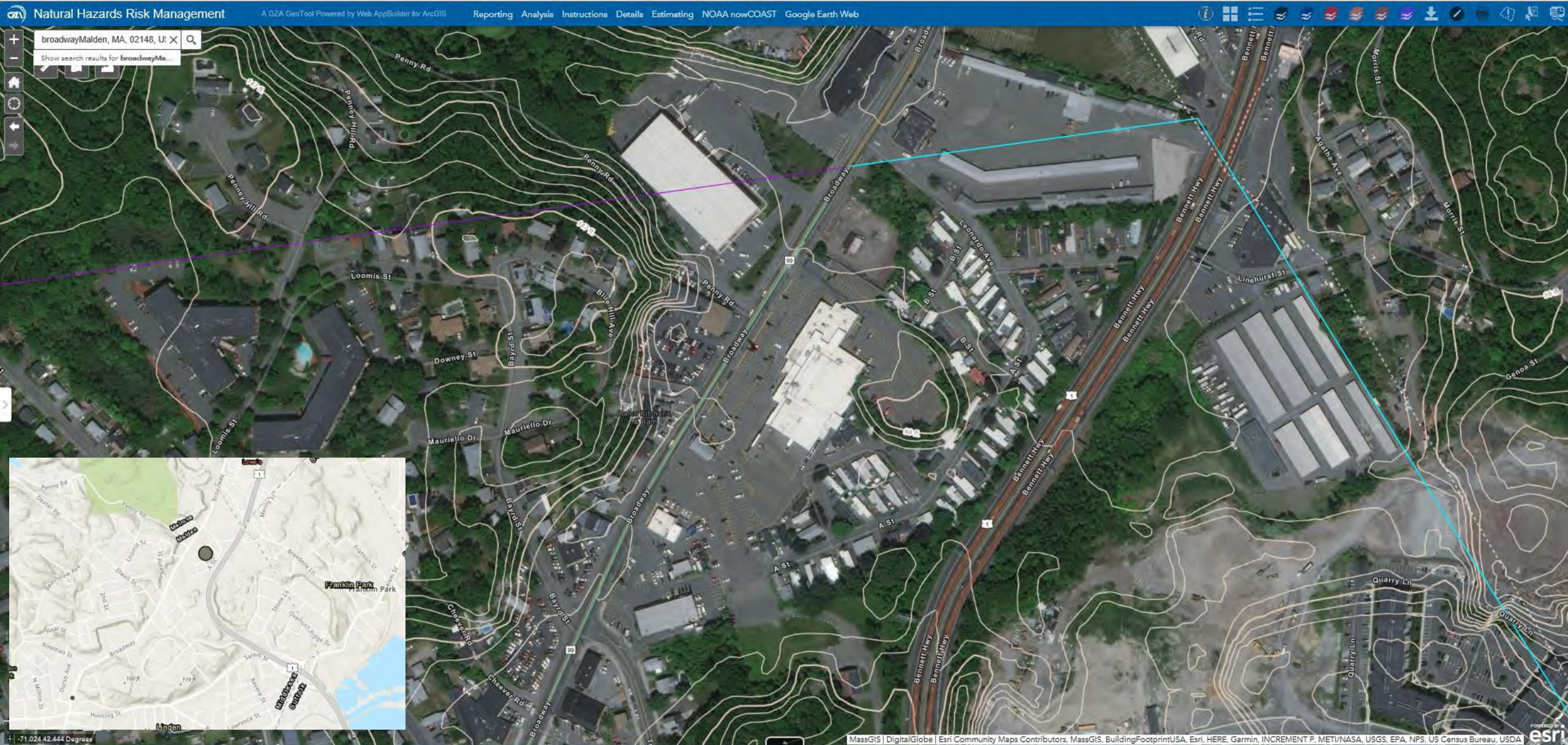
Urban Flooding: Hanover Street/Marlborough/Kennard

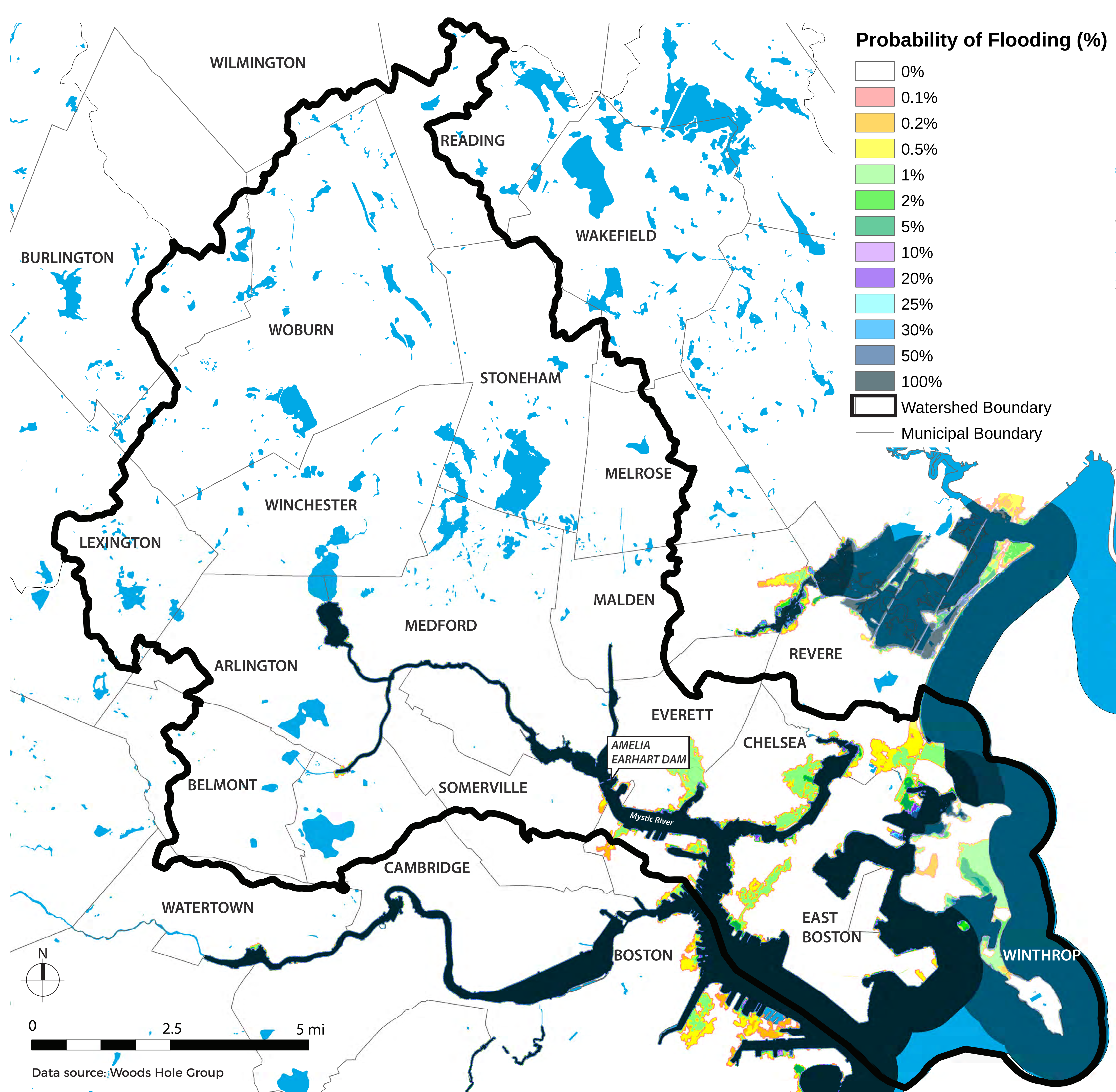
2008 basement backyard and flooding - flood mitigation measures have been taken



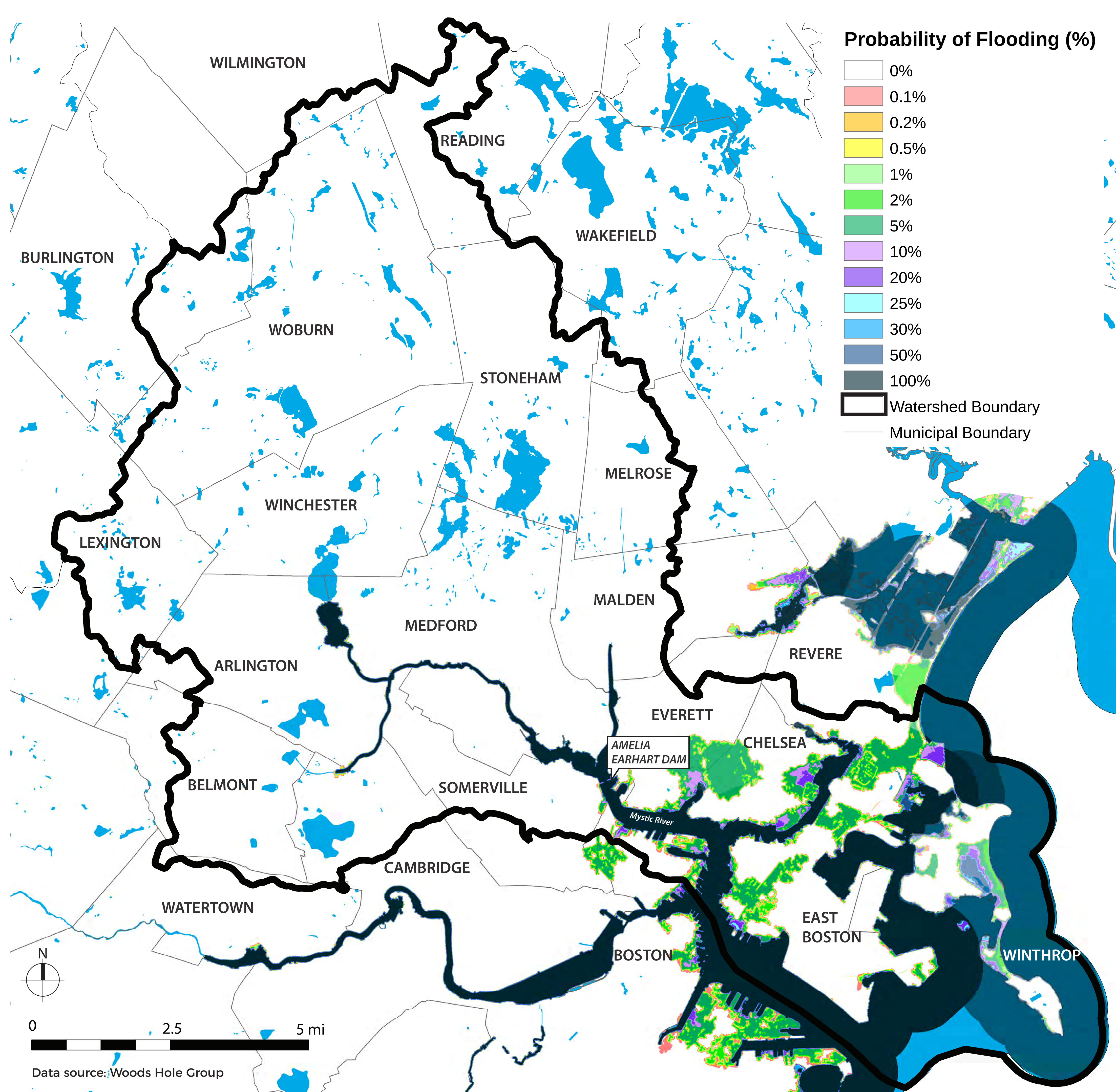
Urban Flooding: Broadway Trailer Park

Stream flooding during heavy precipitation. Mass Dot to dredge creek.

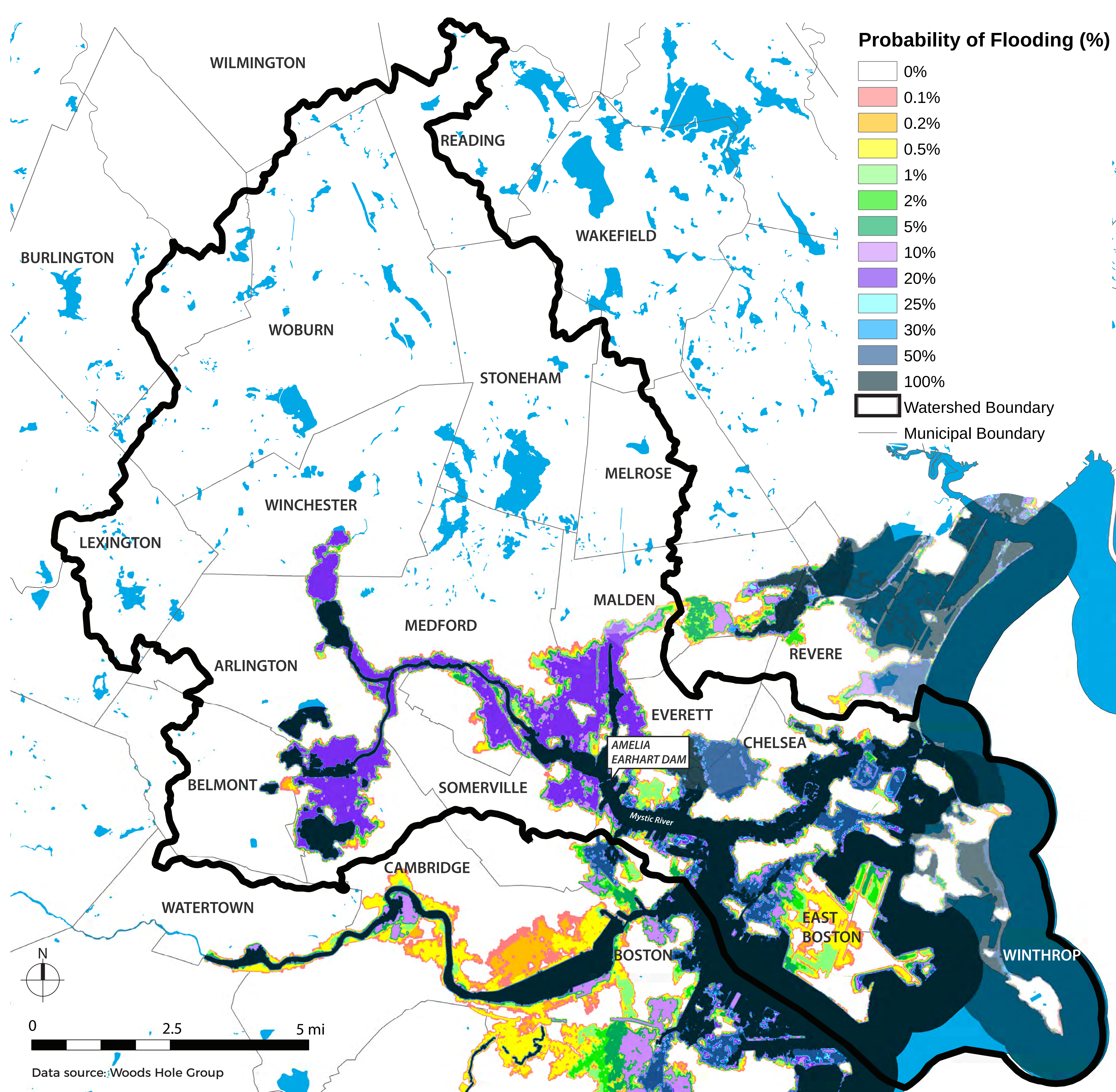




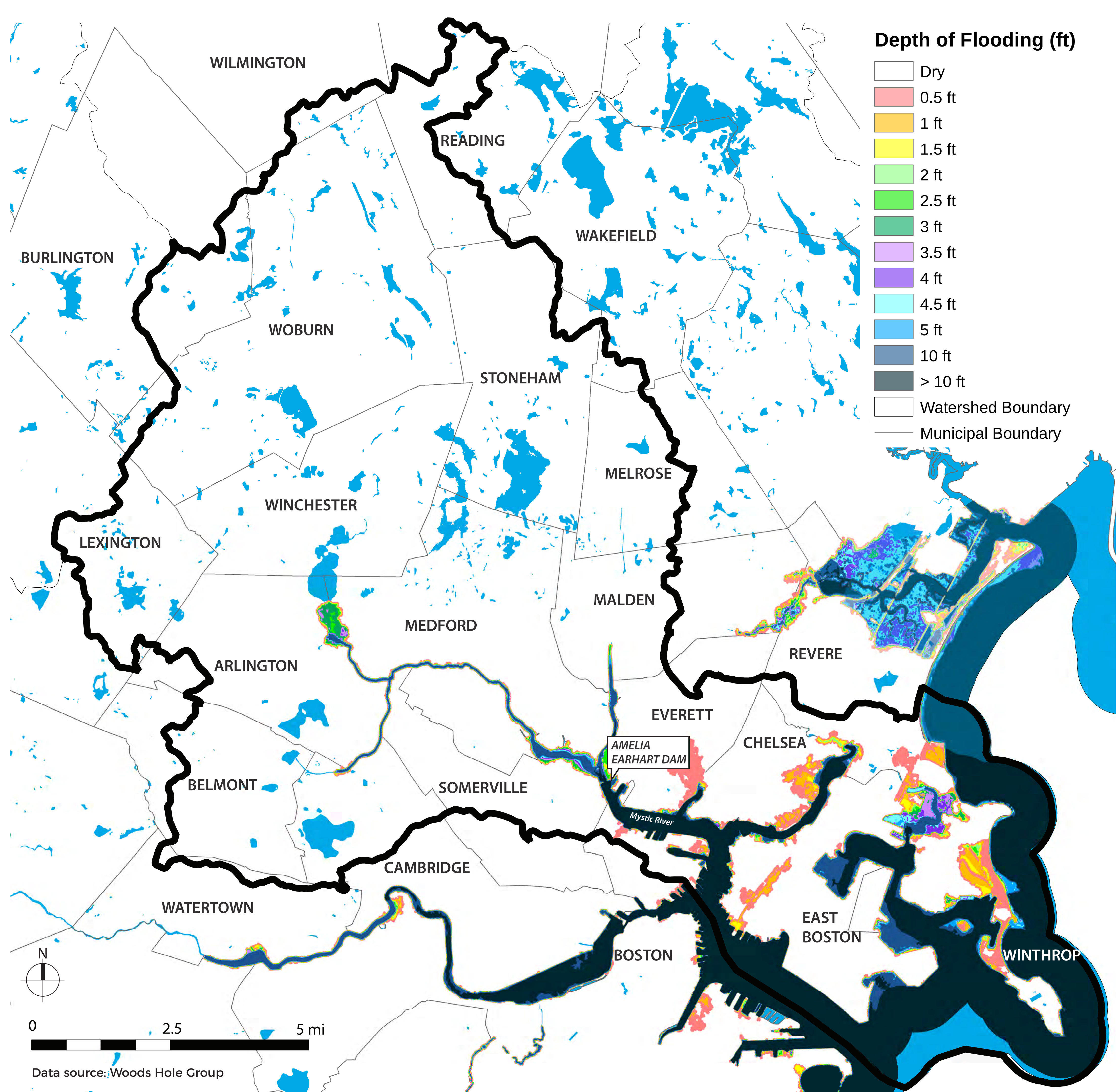
2013 PROBABILITY OF COASTAL FLOODING
MYSTIC RIVER WATERSHED



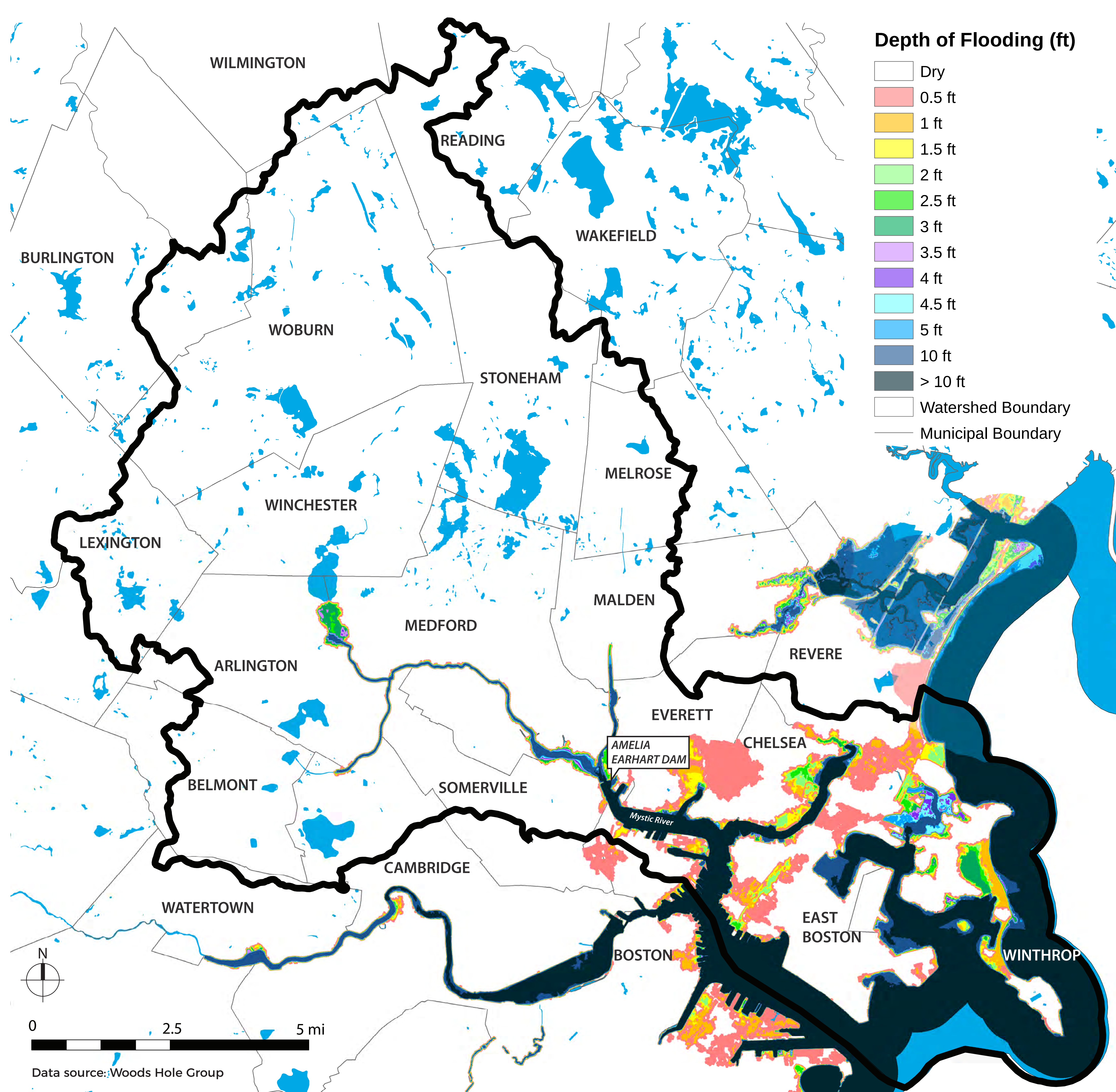
2030 PROBABILITY OF COASTAL FLOODING
MYSTIC RIVER WATERSHED



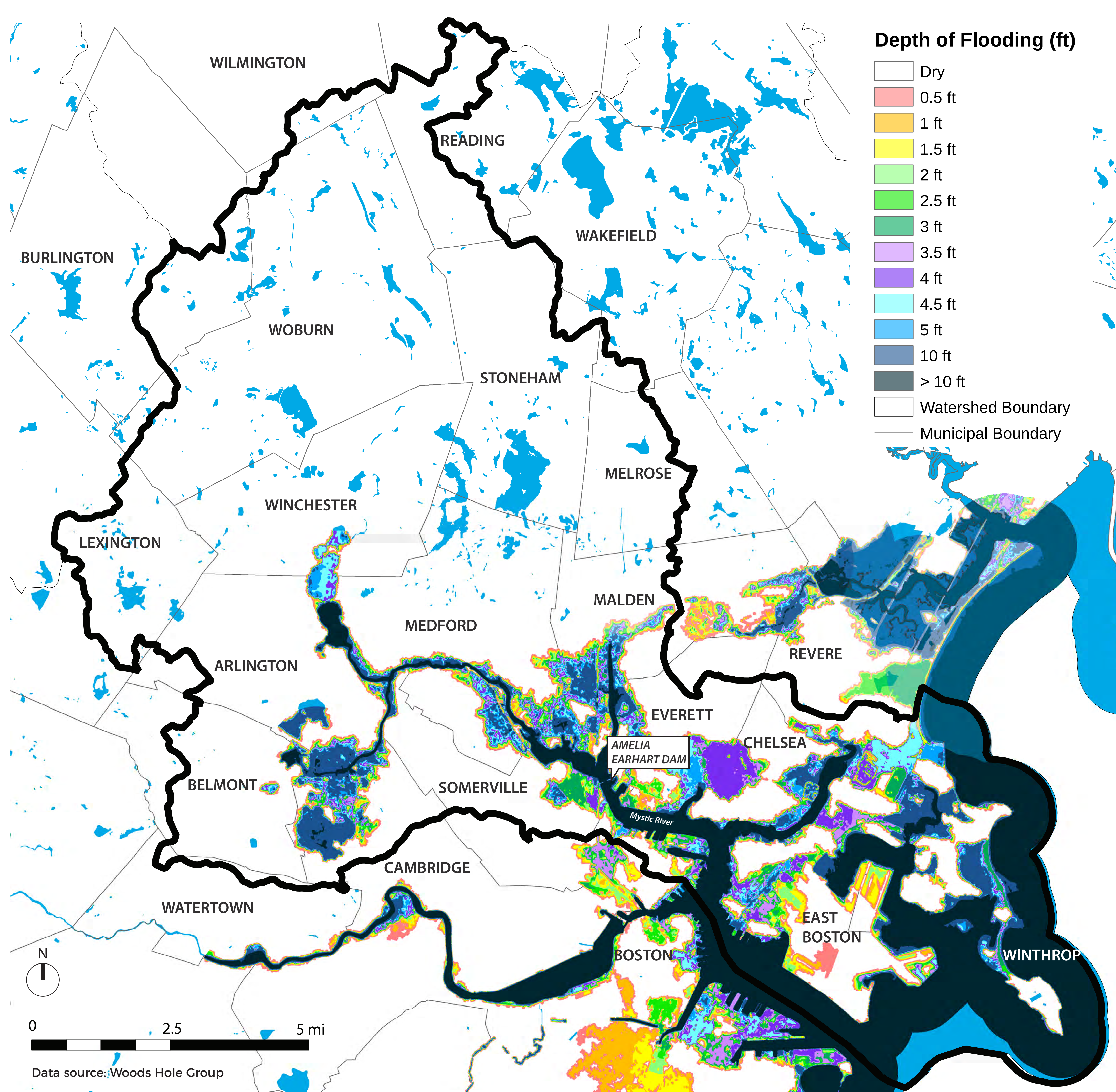
2070 PROBABILITY OF COASTAL FLOODING
MYSTIC RIVER WATERSHED



2013 COASTAL FLOODING FROM a 1% STORM
MYSTIC RIVER WATERSHED

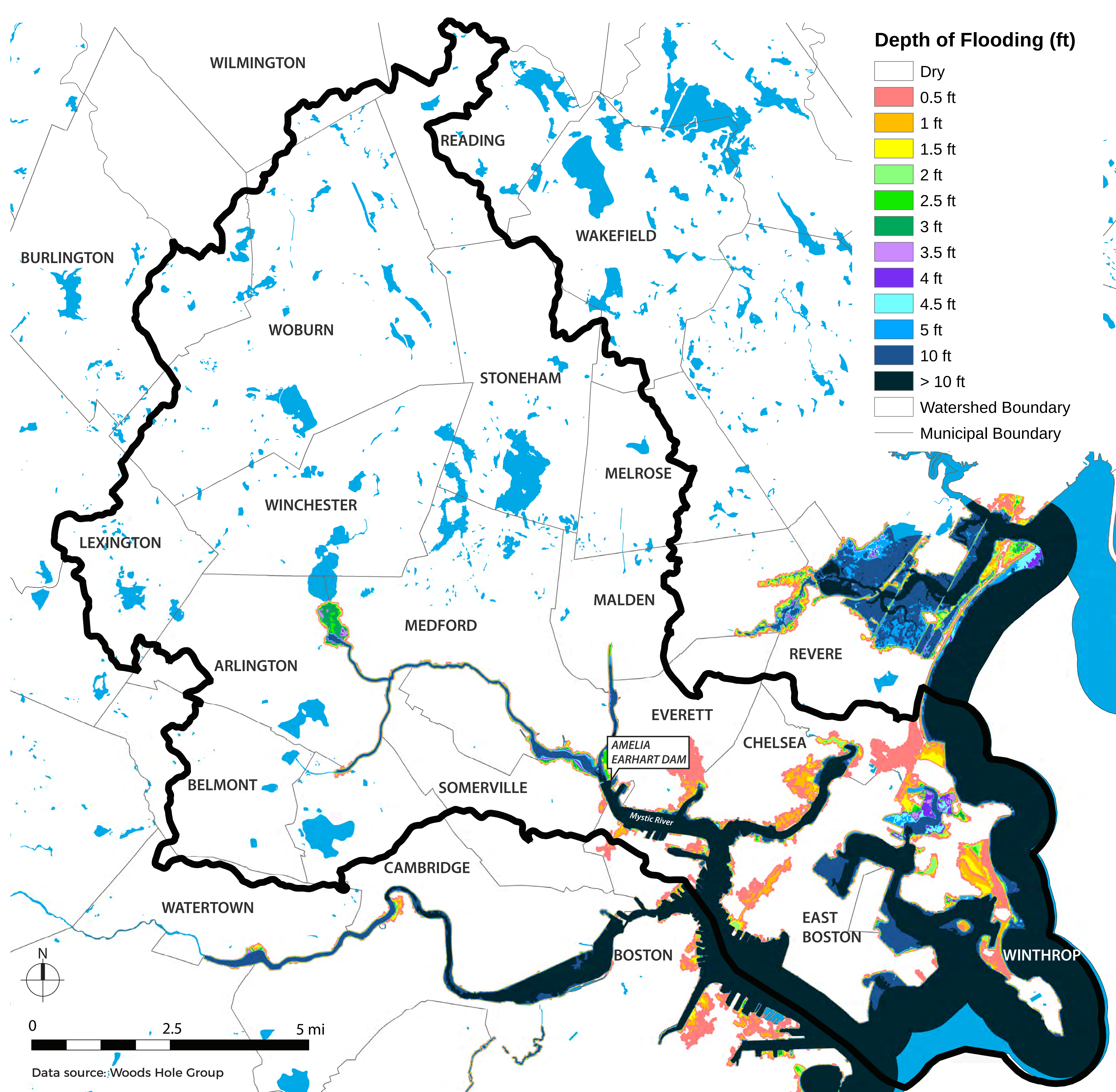


2030 COASTAL FLOODING FROM a 1% STORM
MYSTIC RIVER WATERSHED

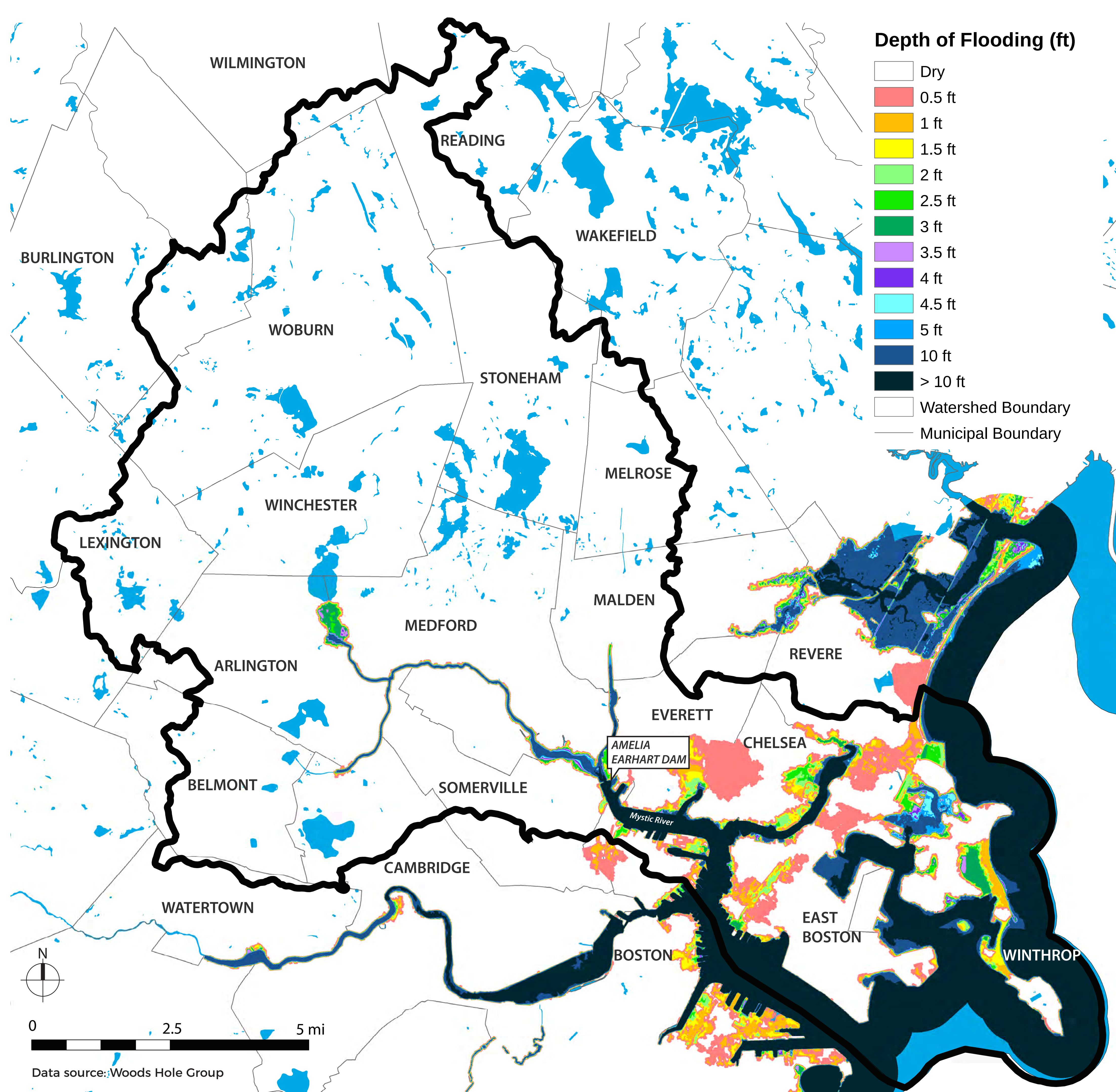


Data source: Woods Hole Group

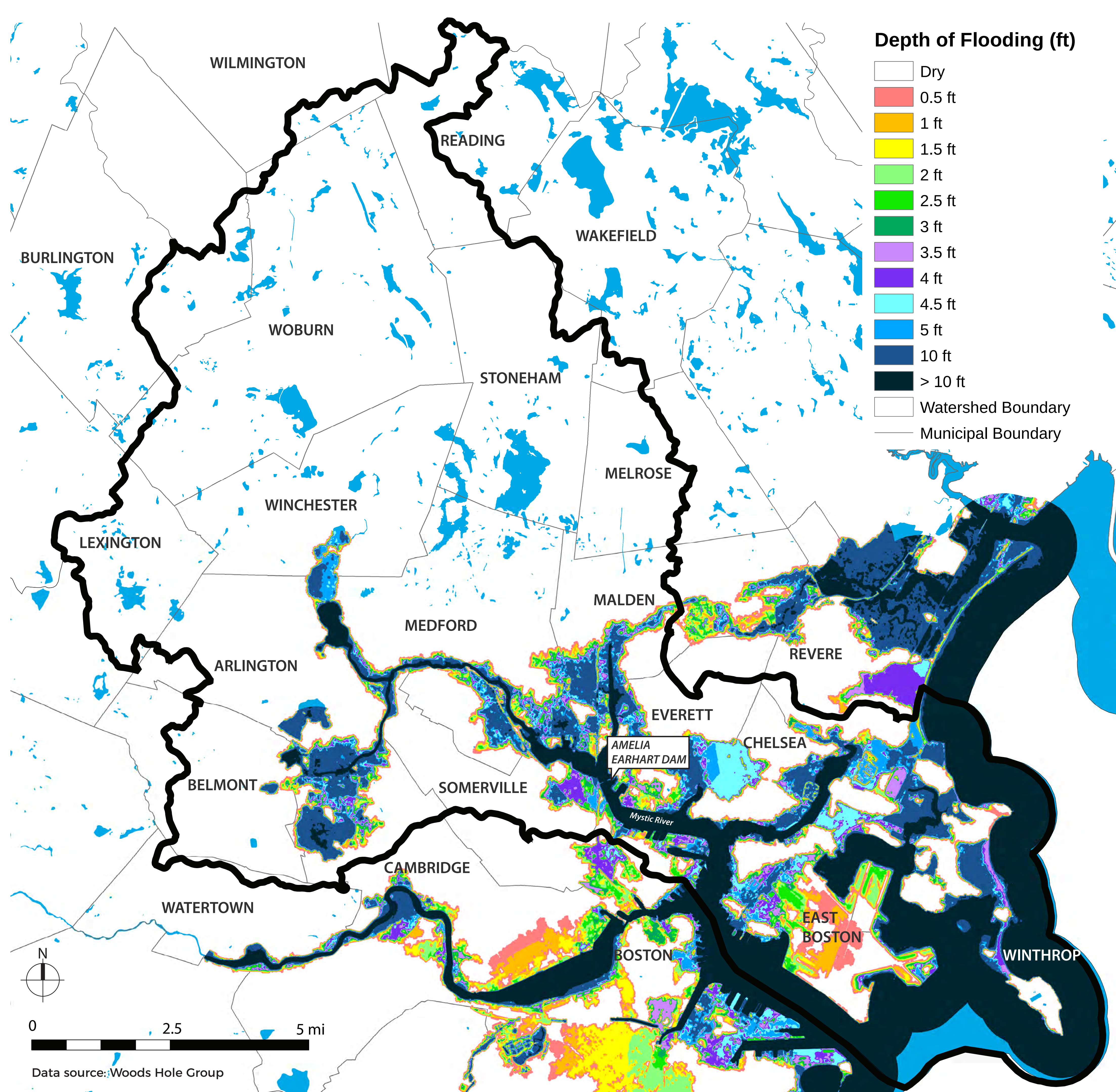
2070 COASTAL FLOODING FROM a 1% STORM
MYSTIC RIVER WATERSHED



2013 COASTAL FLOODING FROM a .2% STORM
MYSTIC RIVER WATERSHED



2030 COASTAL FLOODING FROM a .2% STORM
MYSTIC RIVER WATERSHED



2070 COASTAL FLOODING FROM a .2% STORM
MYSTIC RIVER WATERSHED



Appendix B

Base Map, Assets Index and Stakeholder Group Mapping

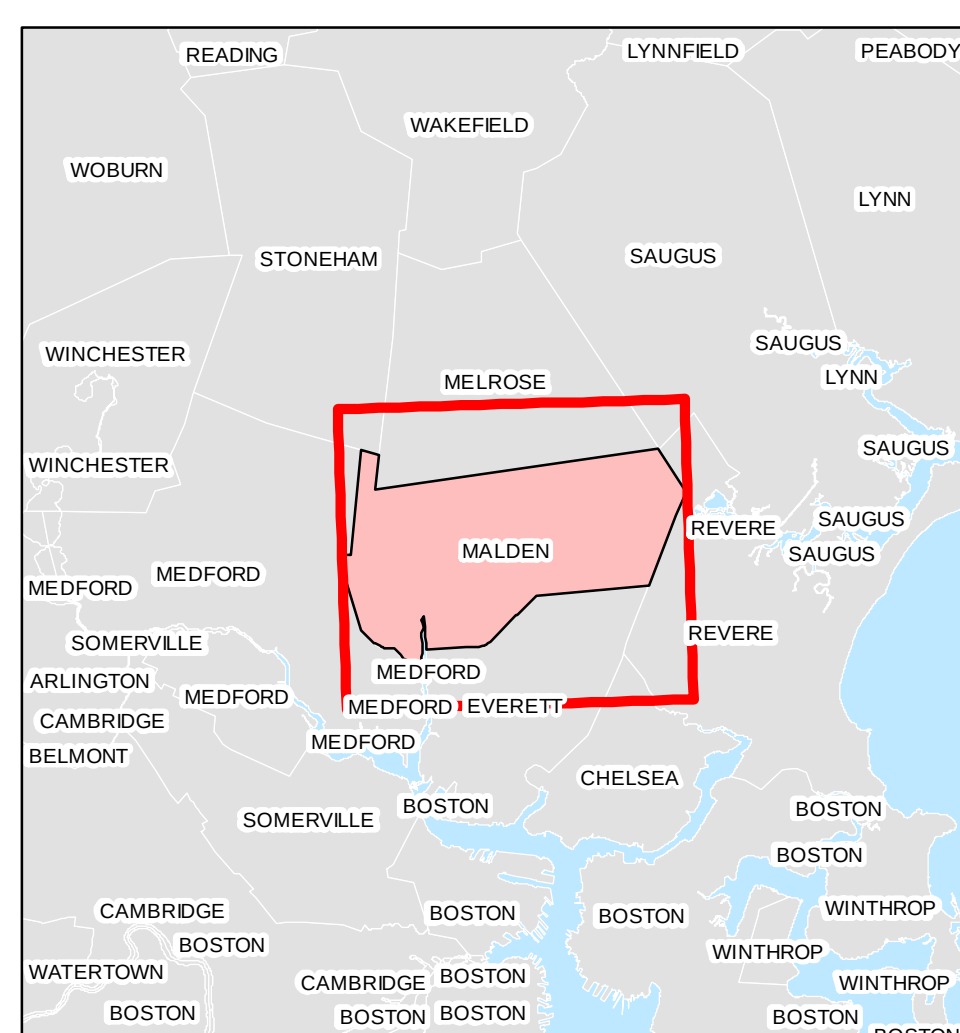
COMMENTS

LEGEND

-  Malden_open_space
CRITICAL ASSETS
 After School Program
 Assisted Living
 Cemetery
 Child Care
 Cold Storage
 Elder Housing
 Emergency Operations Center
 Fire Station
 Gas Distribution
 Hazardous Material Site
 Medical Facility
 Municipal
 Place of Assembly
 Police Station
 Power Plant
 Power Substation
 School
 Telecommunications Switching Station
 Water Pump Station

FLOOD ZONE

- Zone A: 1%
- Zone AE: 1%
- Zone AO: 1%
- Zone VE: 1% with Velocity Hazard
- 0.2% Annual Chance



NOTES:

1. DATA PROVIDED BY:
MASSACHUSETTS GEOGRAPHIC
INFORMATION SYSTEM (MASSGIS)
METROPOLITAN AREA PLANNING COUNCIL (MAPC)
FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)
2. LOCATION OF CRITICAL INFRASTRUCTURE
WAS PROVIDED BY METROPOLITAN AREA
PLANNING COUNSEL (MAPC).
3. THE PURPOSE OF THIS DRAWING IS TO LOCATE,
DESCRIBE, AND REPRESENT THE POSITIONS OF
CRITICAL INFRASTRUCTURE AND FLOOD ZONES IN
RELATION TO THE SUBJECT SITE. THIS
DRAWING IS NOT CONSIDERED A LAND SURVEY.
THE LOCATIONS SHOWN SHOULD BE CONSIDERED
APPROXIMATE ONLY TO THE DEGREE IMPLIED BY THE
METHOD USED.
5. PROJECTION COORDINATE SYSTEM NAD 1983
MASSACHUSETTS US FOOT.

FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)
 2. LOCATION OF CRITICAL INFRASTRUCTURE
 WAS PROVIDED BY METROPOLITAN AREA
 PLANNING COUNSEL (MAPC).
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CITY OF MALDEN - MVP PLANNING GRANT, CITY-WIDE
MALDEN, MASSACHUSETTS

CITY-WIDE BASE MAP

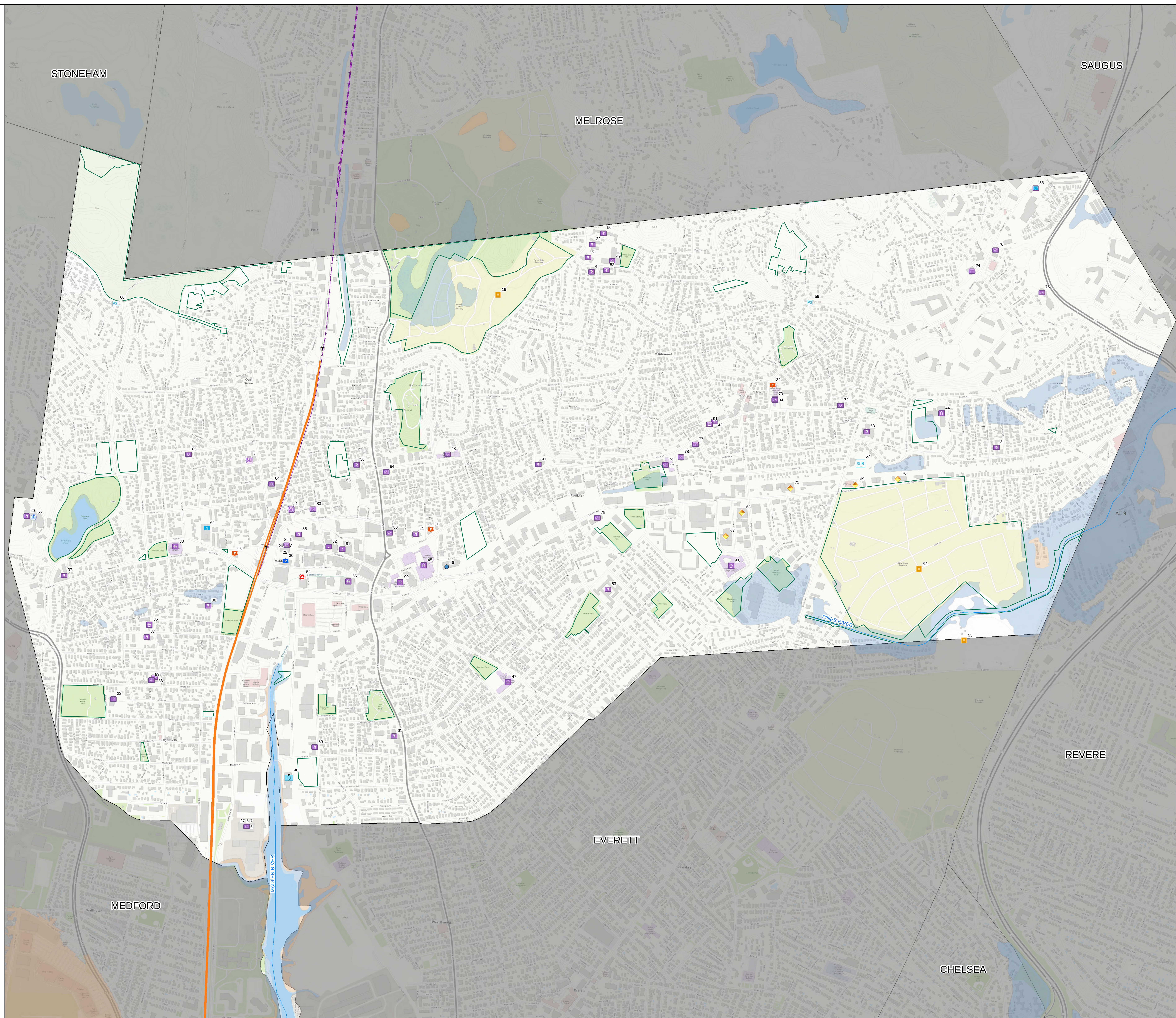
CITY OF MALDEN

PREPARED BY:

 **GZA GeoEnvironmental, Inc.**
Engineers and Scientists
www.gza.com

PROJ MGR: SJB	REVIEWED BY:
DESIGNED BY: KJS	DRAWN BY:
DATE: November 05, 2010	PROJECT NO: 10-0434000-00

1



1
Malden Critical Assets



OBJECTID	PDM_ID	Map Number	CRITICAL ASSET NAME	ADDRESS	CRB CATEGORY	TYPE
1	165-001	1	14-16 Clement Street Single Room Occupancy	14 Clement Street	Societal	Assisted Living
2	165-002	2	13 Rockland Avenue	13 Rockland Avenue	Societal	Assisted Living
3	165-003	3	Springdale Elder Housing	Springdale Street	Societal	Elder Housing
4	165-004	4	Graham Elder Housing - D	Sylvan Street	Societal	Elder Housing
5	165-005	5	Malden Street & Water Commission	356 Commercial Street	Infrastructural	Municipal
6	165-006	6	Malden City Yard	356 Commercial Street	Infrastructural	Municipal
7	165-007	7	Malden Traffic Maintenance	356 Commercial Street	Infrastructural	Municipal
8	165-008	8	Malden Re-Development Authority	200 Pleasant Street	Infrastructural/Societal	Municipal
9	165-009	9	Malden Wire Department	200 Pleasant Street	Infrastructural	Municipal
10	165-010	10	Malden Planning Office	200 Pleasant Street	Infrastructural/Societal	Municipal
11	165-011	11	Malden Building Dept	200 Pleasant Street	Infrastructural	Municipal
12	165-012	12	Malden Code Enforcement	200 Pleasant Street	Infrastructural	Municipal
13	165-013	13	Malden Engineering Department	200 Pleasant Street	Infrastructural	Municipal
14	165-014	14	Malden Clerk Of The City	200 Pleasant Street	Infrastructural	Municipal
15	165-015	15	Malden Plumbing Department	200 Pleasant Street	Infrastructural	Municipal
16	165-016	16	Veteran's Services	200 Pleasant Street	Societal	Municipal
17	165-017	17	Malden Government Center Commission	200 Pleasant Street	Infrastructural	Municipal
18	165-018	18	Malden Weights & Measures	200 Pleasant Street	Societal	Municipal
19	165-019	19	City Cemetery	Forest Street	Environmental	Cemetery
20	165-020	20	Hallmark Health Hospice	100 Hospital Road	Societal	Elder Housing
21	165-021	21	Davenport Memorial Home	Salem Street	Societal	Elder Housing
22	165-022	22	McFadden Memorial Manor	341 Forest Street	Societal	Elder Housing
23	165-023	23	Irish American Association	177 West Street	Societal	Place of Assembly
24	165-024	24	Loyal Order of Moose	562 Broadway	Societal	Place of Assembly
25	165-025	25	Malden Water Department	200 Pleasant Street	Infrastructural	Municipal
26	165-026	26	Malden Mayor's Office	200 Pleasant Street	Societal/Infrastructural	Municipal
27	165-052	52	Department of Public Works	356 Commercial Street	Infrastructural	Municipal
28	165-028	28	Fire Station - West Side - District 3	332 Pleasant Street	Societal	Fire Station
29	165-029	29	City Hall	200 Pleasant Street	Societal	Municipal
30	165-030	30	Police Station	200 Pleasant Street	Societal	Municipal
31	165-031	31	Fire Station - Central - District 1	1 Sprague Street	Societal	Fire Station
32	165-032	32	Fire Station - Maplewood - District 2	4 Laurel Street	Societal	Fire Station
33	165-033	33	Beebe School	401 Pleasant Street	Societal	School
34	165-034	34	Mystic Valley Charter School	770 Salem Street	Societal	School
35	165-035	35	Heritage Apartments	195 Pleasant Street	Societal	Elder Housing
36	165-036	36	120 Mountain Avenue	120 Mountain Avenue	Societal	Elder Housing
37	165-037	37	Malden Housing Authority	557 Pleasant Avenue	Societal	Elder Housing
38	165-038	38	89 Pearl Street	89 Pearl Street	Societal	Elder Housing
39	165-039	39	Cuticura Apartment	59 Green Street	Societal	Elder Housing
40	165-040	40	Mass Electric	180 Medford Street	Infrastructural	Power Plant
41	165-041	41	Salem Towers	280 Salem Street	Societal	Elder Housing
42	165-042	42	Salemwood School	529 Salem Street	Societal	School
43	165-043	43	Maplewood Elderly High-rise	630 Salem Street	Societal	Elder Housing
44	165-044	44	Linden School	29 Wescott Street	Societal	School
45	165-045	45	Malden High School	77 Salem Street	Societal	School
46	165-046	46	Valley Forum II	50 Holden Street	Societal	Cold Storage
47	165-047	47	Ferryway School	150 Cross Street	Societal	School
48	165-048	48	Early Learning Center	257 Mountain Avenue	Societal	Child Care
49	165-049	49	Forestdale School	74 Sylvan Street	Societal	School



OBJECTID	PDM_ID	Map Number	CRITICAL ASSET NAME	ADDRESS	CRB CATEGORY	TYPE
50	165-050	50	Graham Elder Housing - B	377 Forest Street	Societal	Elder Housing
51	165-051	51	Graham Elder Housing - A	26 Sylvan Street	Societal	Elder Housing
52	165-052	52	Graham Elder Housing - C	Sylvan Street	Societal	Elder Housing
53	165-053	53	Suffolk Manor	312 Bryant Street	Societal	Elder Housing
54	165-054	54	Emergency Operations Center	7 Jackson Street	Societal	Emergency Operations Center
55	165-055	55	Alternative High School	Centre Street	Societal	School
56	165-056	56	Tennessee Gas Pipeline	705 Broadway	Infrastructural	Gas Distribution
57	165-057	57	Mass Electric Substation	221 Broadway	Infrastructural	Power Substation
58	165-058	58	Maplewood Place	295 Broadway	Societal	Elder Housing
59	165-059	59	Pump Station 1	Neal Street and Rockingham Avenue	Infrastructural	Water Pump Station
60	165-060	60	Pump Station 2	McCormack Street and Fellsway East	Infrastructural	Water Pump Station
61	165-061	61	Dexter House Nursing Home	120 Main Street	Societal	Elder Housing
62	165-062	62	AT&T Switching Station	7 Elm Street	Infrastructural	Telecommunications Switching Station
63	165-063	63	Post Office	117 Mountain Avenue	Societal	Post Office
64	165-064	64	Court House	80 Summer Street	Societal	Municipal
65	165-065	65	Malden Medical Facility Center	100 Hospital Road	Societal	Medical Facility
66	165-066	66	Malden Catholic High School	99 Crystal Street	Societal	School
67	165-067	67	Viking Seafood	50 Crystal Street	Societal/Environmental	Hazardous Material Site
68	165-068	68	F. M. Callahan	22 Sharon Street	Societal/Environmental	Hazardous Material Site
69	165-069	69	Eastern Chemical Lacquers	1100 Eastern Avenue	Societal/Environmental	Hazardous Material Site
70	165-070	70	Arco Welding	1200 Eastern Avenue	Societal/Environmental	Hazardous Material Site
71	165-071	71	Ace-Lon Corporation	960 Eastern Avenue	Societal/Environmental	Hazardous Material Site
72	165-072	72	ABC Nursery and Day Care Center	852 Salem Street	Societal	Child Care
73	165-073	73	Edsolutions Incorporated at Mystic Valley	30 Laurel Street	Societal	Child Care
74	165-074	74	Salemwood School Aged Child Care Program	529 Salem Street	Societal	Child Care
75	165-075	75	Kids Place at the North Shore Assembly of God	77 Kennedy Drive	Societal	Child Care
76	165-076	76	Metro North Child Learning	605 Rear Broadway	Societal	Child Care
77	165-077	77	International Child Care Exchange	577 Salem Street	Societal	Child Care
78	165-078	78	Tri Cap Head Start	539 Salem Street	Societal	Child Care
79	165-079	79	Sunshine Christian Day Care	529 Eastern Avenue	Societal	Child Care
80	165-080	80	Tri Cap Head Start	493 Main Street	Societal	Child Care
81	165-081	81	YMCA Outreach School Age Program	83 Pleasant Street	Societal	After School Program
82	165-082	82	YMCA Outreach School Age Program	7 Washington Street	Societal	After School Program
83	165-083	83	YWCA After School Day Care	54 Washington Street	Societal	Child Care
84	165-084	84	Kiddie Koop	165 Mountain Avenue	Societal	Child Care
85	165-085	85	Rockland Nursery School	254 Clifton Street	Societal	Child Care
86	165-086	86	Immaculate Conception School	Highland Avenue	Societal	School
87	165-087	87	Monsignor Negle Apartments	Medford Street	Societal	Elder Housing
88	165-088	88	Independence Route Day Care	238 Highland Avenue	Societal	Child Care
89	165-089	89	The Kids' Stop	238 Highland Avenue	Societal	Child Care
90	165-090	90	Cheverus School	30 Irving Street	Societal	School
91	165-091	91	Malden Housing Authority Office	630 Salem Street	Infrastructural	Municipal
92		92	Holy Cross Cemetery	175 Broadway	Environmental	Cemetery
93		93	Beth Isreal Cemetery	232 Fuller St, Everett, MA	Environmental	Cemetery

③

- LEGEND**
- Shaded areas: 1990, 2000, 2010
 - CRITICAL ASSETS**
 - After School Programs
 - Alcohol Abuse
 - Childhood
 - Child Care
 - Care Storage
 - Flammable Liquids
 - Emergency Operations Center
 - Fire Station
 - Gas Distribution
 - Hazardous Material Site
 - Health Facility
 - Municipal
 - Place of Assembly
 - Police Station
 - Power Plant
 - Power Substation
 - Quarry
 - Telecommunications Switching Station
 - Water Pump Station
 - POISON**
 - MDA Orange Line Station
 - MDA Orange Line Station
 - MDA Orange Line Station
 - Community Trail
 - POISON**
 - Line A: 1%
Line B: 1%
Line C: 1%
Line D: 1%
Line E: 1%
Line F: 1%
Line G: 1%
Line H: 1%
Line I: 1%
Line J: 1%
Line K: 1%
Line L: 1%
Line M: 1%
Line N: 1%
Line O: 1%
Line P: 1%
Line Q: 1%
Line R: 1%
Line S: 1%
Line T: 1%
Line U: 1%
Line V: 1%
Line W: 1%
Line X: 1%
Line Y: 1%
Line Z: 1%



1. DATA PROVIDED BY MASSACHUSETTS GEOGRAPHIC INFORMATION SYSTEM ANALYSIS METROPOLITAN AREA PLANNING BOARD (MAPC) FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

2. LOCATION OF CRITICAL INFRASTRUCTURE WAS PROVIDED BY METROPOLITAN AREA PLANNING BOARD (MAPC)

4. THE PURPOSE OF THIS MAPPING IS TO LOCATE DEBRIS, AND REPRESENT THE POSITIONS OF CRITICAL INFRASTRUCTURE AND LAND ZONES IN RELATION TO THE SITE. THIS MAPPING IS NOT CONSIDERED A FLOOD SURVEY. THE LOCATIONS SHOWN SHOULD BE CONSIDERED APPROXIMATE ONLY TO THE DEGREE SHOWN BY THE METHOD USED.

PROJECTION COORDINATE SYSTEM NAD 1983 MASSACHUSETTS UTM ZONE

THE ABOVE INFORMATION WAS OBTAINED FROM THE RECORDS OF THE BUREAU OF LAND MANAGEMENT, U.S. DEPARTMENT OF THE INTERIOR, AND THE BUREAU OF REVENUE, U.S. DEPARTMENT OF THE TREASURY. THE INFORMATION WAS OBTAINED FROM THE RECORDS OF THE BUREAU OF LAND MANAGEMENT, U.S. DEPARTMENT OF THE INTERIOR, AND THE BUREAU OF REVENUE, U.S. DEPARTMENT OF THE TREASURY. THE INFORMATION WAS OBTAINED FROM THE RECORDS OF THE BUREAU OF LAND MANAGEMENT, U.S. DEPARTMENT OF THE INTERIOR, AND THE BUREAU OF REVENUE, U.S. DEPARTMENT OF THE TREASURY.

CITY OF MALDEN - MVP PLANNING GRANT CITY-WIDE
MALDEN, MASSACHUSETTS

CITY-WIDE RACE MAP

 GSA 2015 GreenEnvironmental, Inc. Engineers and Scientists www.gsa.com		CITY OF MALDEN PROJECT NO. 15-001 DATE 10-1-2015 PREPARED BY: [blank] CHECKED BY: [blank] APPROVED BY: [blank]	
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STONEHAM

MELROSE

SAUCUS

MEDFORD

EVERETT

CHELSEA

REVERE



Appendix C

Completed Risk Matrices

www.CommunityResilienceBuilding.org

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

[illegible]

Top Priority Hazards

www.CommunityResilienceBuilding.org

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

[illegible]

Top Priority Haz

www.CommunityResilienceBuilding.org

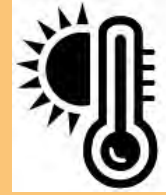
Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

[illegible]



Appendix D

Listening Session Presentation, Comments and Sign-In Sheet



MALDEN'S MUNICIPAL VULNERABILITY PREPAREDNESS MVP PUBLIC LISTENING SESSION

The City of Malden will host a Public Listening Session on

Tuesday January 7, 2020 at 6:30pm to 7:30pm

Malden Senior Community Center Cafeteria, 7 Washington Street, Malden, MA 02148

On Tuesday, January 7th at 6:30 pm in the Malden Senior Community Center Cafeteria, the City of Malden will host a public "listening session" to let us hear your ideas and comments on a brief presentation summarizing the results of the recently completed MVP Community Resilience Building Workshop. You may share your ideas in person or anonymously. A full-day MVP workshop took place on Thursday November 7, 2019 that resulted in: 1) identification of the top natural and climate related hazards facing the City, 2) evaluation of strengths and vulnerabilities that exist in the City in terms of the top hazards; 3) development and prioritization of actions designed to make the City more resilient to the top hazards today and in the future.

The City's MVP Planning Team will integrate your comments and ideas into the final MVP Plan Report. Completion of the MVP planning project will make the City eligible to apply for MVP action project grants from the Commonwealth to address the City's key priorities. The event is free of charge.

The workshop was organized and led by a core team of local, regional and state officials, City residents and businesses and the City's consultant, GZA. This planning project is funded by the Commonwealth's Executive Office of Energy and Environmental Affairs (EEA) MVP Planning Grant.

For More Information, Contact:

Ron Cochran, Communications Director at rcochran@cityofmalden.org



MVP Public Listening Session

City of Malden, Massachusetts

January 7, 2020

Known for Excellence. Built on Trust.



Wayne Cobleigh
Samuel J. Bell, CFM
GZA GeoEnvironmental, Inc.

1

Public Listening Session Agenda

- MVP Program Overview
- Summary of Findings Report
 - Core Team
 - Project Timeline
 - Stakeholders
 - Hazards
 - Strengths and Vulnerabilities
 - Priority Actions
- Next Steps
- Public Comments and Questions

2

MVP Program Overview

MVP Principles

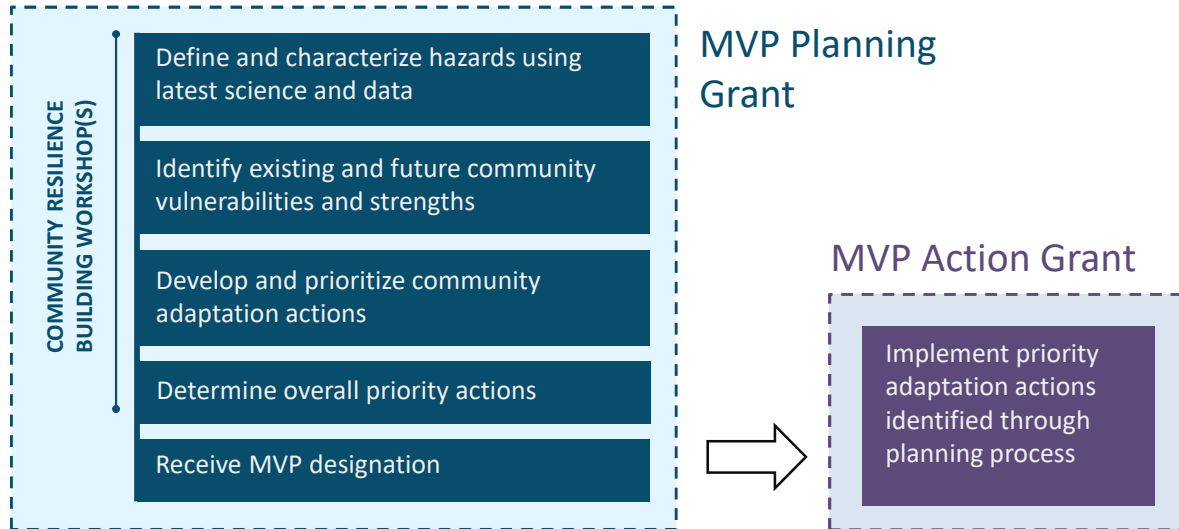
A community-led, accessible process that

- Employs **local knowledge** and buy-in
- Utilizes **partnerships** and leverages existing efforts
- Is based in **best available climate projections** and data
- Incorporates principles of **nature-based solutions**
- Demonstrates **pilot potential** and is **proactive**
- Reaches and responds to risks faced by **Environmental Justice communities and vulnerable populations**

Why nature-based?

Where appropriate, nature-based solutions can be more cost-effective, protect water quality and quantity, sustain lands that provide food and recreation opportunities, reduce erosion, and minimize temperature increases associated with developed areas and climate change.

MVP Process/ Grant Types



City of Malden Public Listening Session

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5

Three Years of MVP

MVP Designations

71% of the Commonwealth
249 communities

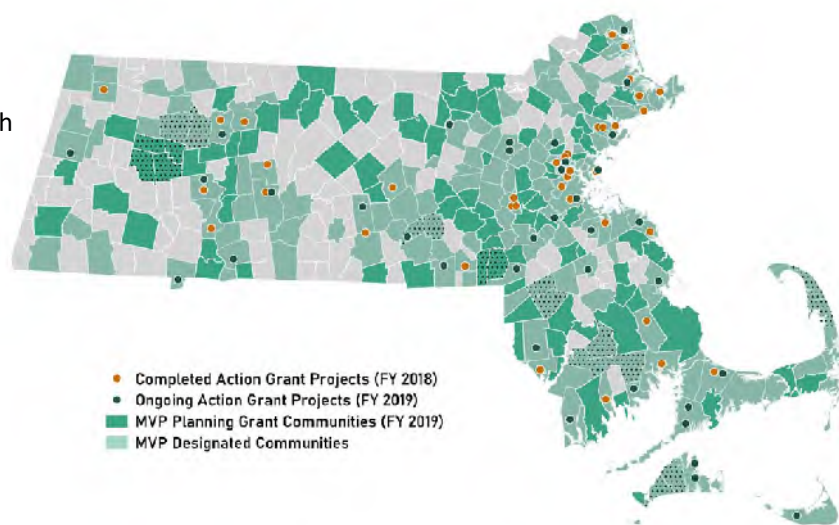
Action Grant Projects

FY 18: **37**

FY 19: **36**

Total Awards

\$17M+ in planning and
action grants to date



City of Malden Public Listening Session

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6

Summary of Findings Report

Malden MVP Core Team

Core Team Members:

- Ron Cochran, City of Malden
- Yem Lip, City of Malden
- Dan Grover, City of Malden
- John DeSantis, City of Malden
- Gary Stead, City of Malden Redevelopment
- Evan Spetrini, Malden Redevelopment Authority
- Amber Christoffersen, MyRWA

Project Timeline

- City receives MVP Planning Grant – July 2019
- City establishes Core Team – July – August 2019
- Project Kick-off Meeting – September 2019
- Stakeholder Outreach – September – October 2019
- Community Resilience Building Workshop – November 7, 2019
- Public Listening Session – January 7, 2020
- Final Summary of Findings Report – February 2020

Stakeholders

LOCAL PUBLIC

- Malden Mayor's Office
- Malden City Council
- Malden School Committee
- Malden Public Works Commission
- Malden Planning Board
- Malden Redevelopment Authority
- Malden Housing Authority
- Malden Board of Health
- Malden Public Works Department
- Malden Engineering Department
- Malden Planning Department
- Malden Police and Fire Departments
- Malden Emergency Management
- Malden Controller's Office
- Malden Chamber of Commerce
- Malden Building Commissioner
- Malden Public Facilities



REGIONAL/STATE PUBLIC

- Massachusetts Executive Office of Energy and Environmental Affairs (EEA)
- Mystic River Watershed Association (MyRWA)
- Metropolitan Area Planning Council (MAPC)

PRIVATE/NON-PROFIT

- Cambridge Health Alliance
- Eversource
- MIT
- Cataldo Ambulance
- Friends of the Malden River

CRB Workshop Overview

Objectives:

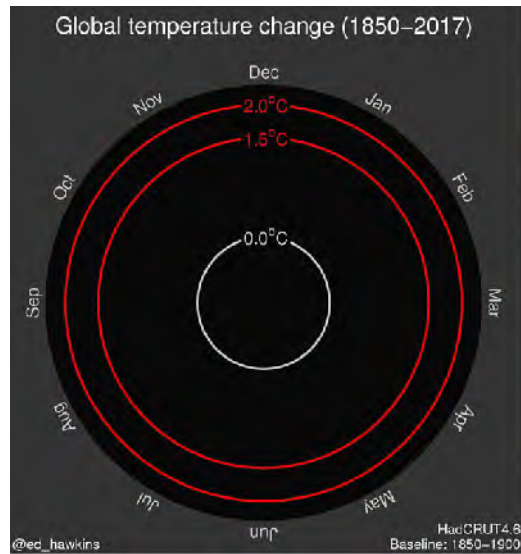
1. **Define top hazards.** Understand connections between ongoing issues, hazards, and local planning and actions in your Community.
2. **Identify and map vulnerabilities and strengths** to develop infrastructure, societal and environmental risk profiles for your Community.
3. **Develop and prioritize actions** that reduce vulnerabilities and reinforce strengths for your community - local organizations, academic institutions, businesses, private citizens, neighborhoods, and community groups.
4. **Identify opportunities** to advance actions that further reduce the impact of hazards and increase resilience in your Community.

Climate Resilience in the Mystic River Watershed

Julie Wormser, Deputy Director

Credit: Caleb Dresser





**We know the
earth is
getting
warmer.**

Credit: Ed Hawkins

13



**What does
more heat
globally do to
our local
weather?**

Credit: Alastair McLean

14

Well, big storms.



15



Levees fail.

Hurricane Katrina,
New Orleans 2005

Credit: Washington Post

16



**Know where
the high
ground is.**

Credit: Charles Sykes

Superstorm Sandy,
New York, 2012

17



**Storms are
hardest on
low-income
people.**

Credit: Nicolaus Czarnecki

Snowmageddon,
Greater Boston, 2015

18



**Weather is not
racist; housing
patterns can be.**

Credit: Washington Post

Hurricane Harvey,
Houston, 2017

19



**We need a
new name for
"100-year"
storms**

Credit: Greg St. Louis

Nor'easter Riley,
Everett, MA 2018

20



**Get toxics
out of flood
plains.**

Credit: Joshua Stevens / NASA

Hurricane Florence,
North Carolina, 2018

21



**Building codes
matter.**

Credit: Johnny Milano

Hurricane Matthew,
Florida, 2018

22

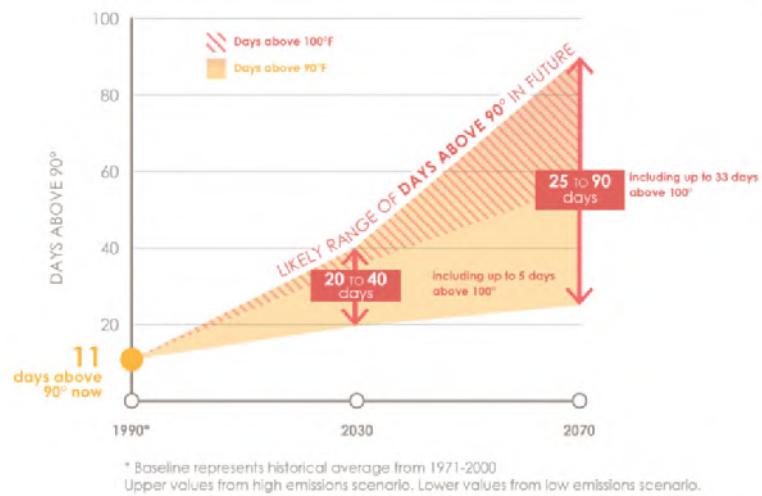


23



24

Hotter summers

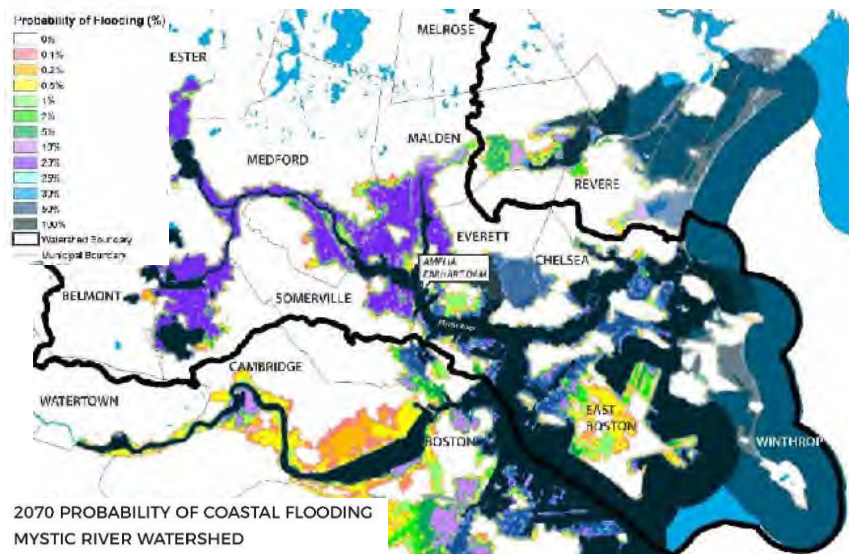


Credit: Climate Ready Boston

Data source: Rossi et al. 2015

25

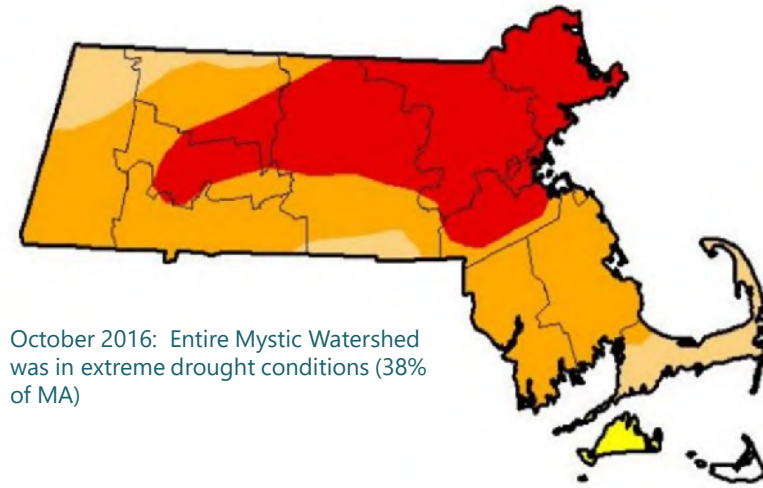
Projected coastal flooding



Credit: Woods Hole Group

26

Flash floods, flash droughts

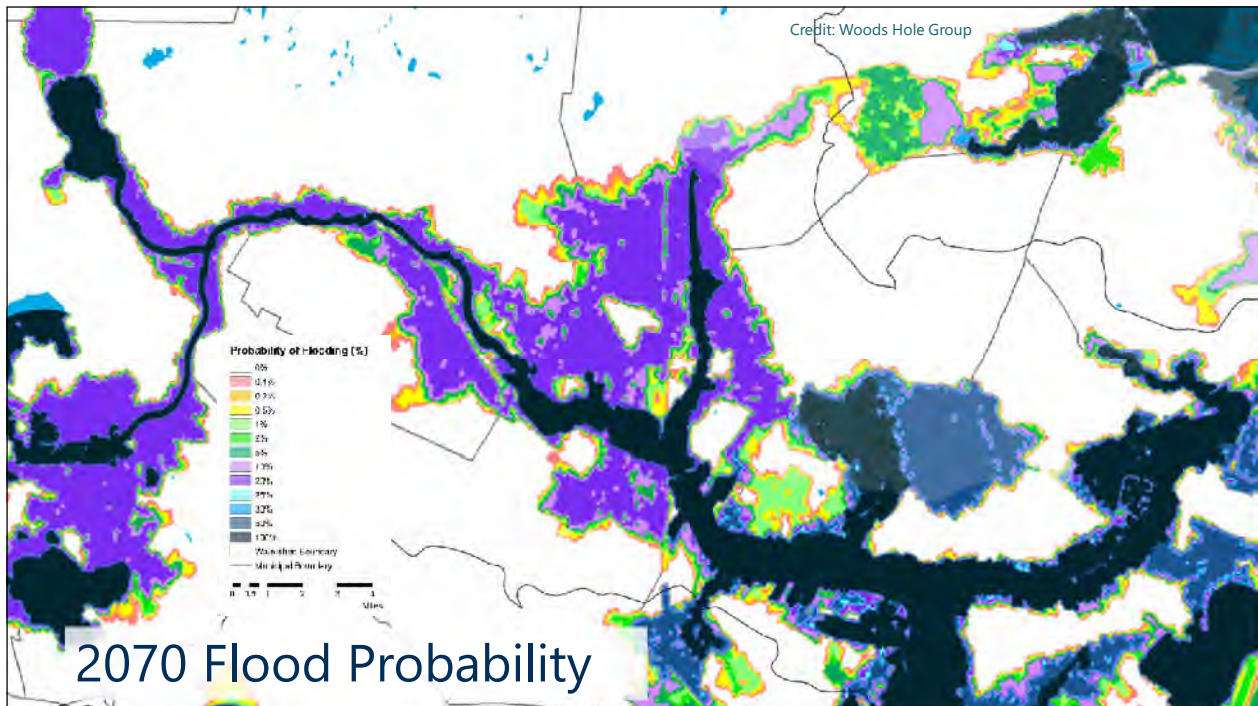


Credit US Drought Monitor

27



28



29



30

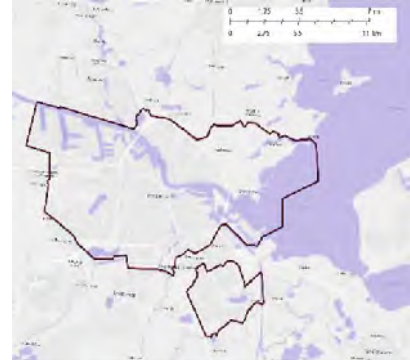
Do we have a governance challenge.

Mystic River Watershed



- 76 square miles
- 600,000+ people
- 21 municipalities

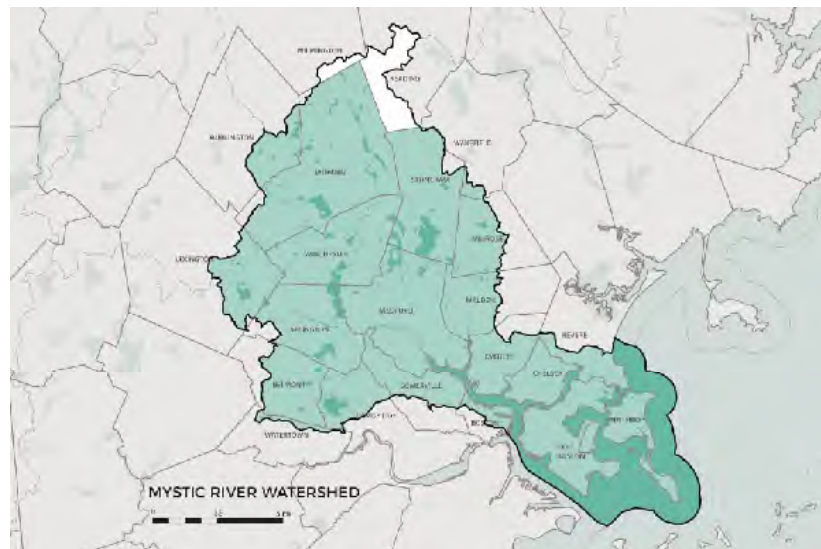
Amsterdam



- 85 square miles
- 800,000+ people
- 1 municipality

31

- Voluntary partnership among 19 Mystic communities
- Founded in Sept 2018
- 95%+ of watershed
- Secured \$1.7 million in regional funding



32

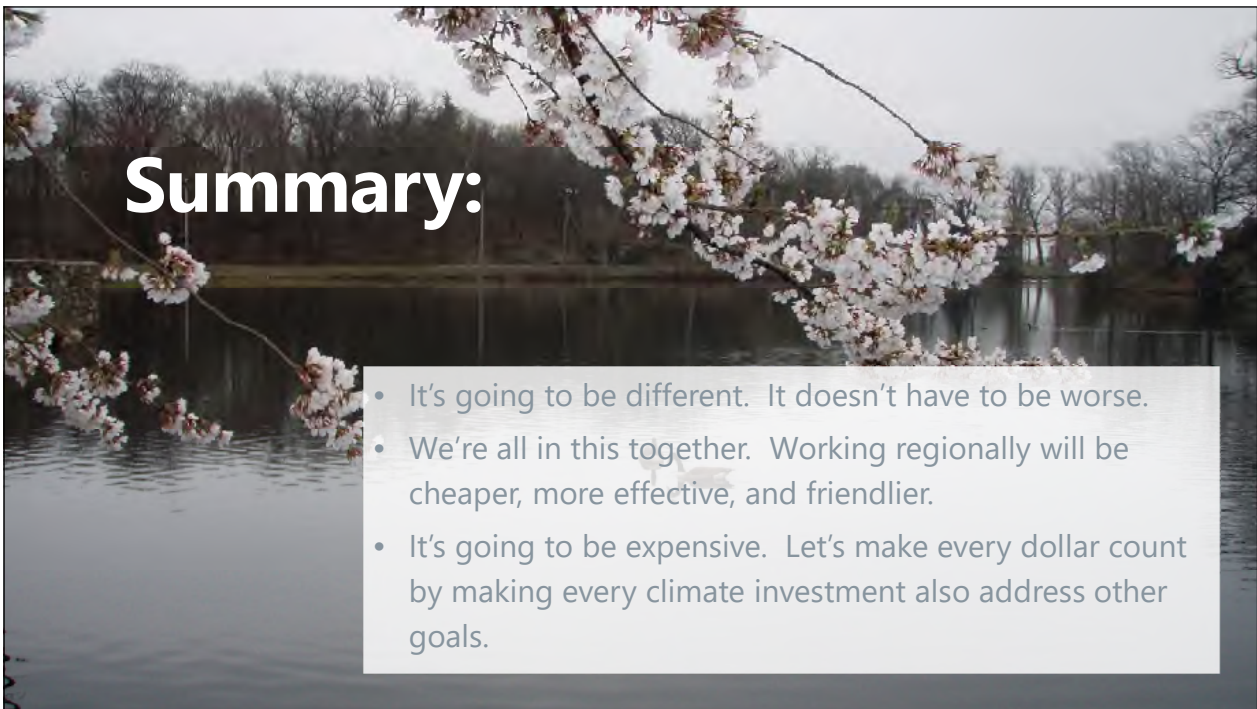


Vision

Credit: David Mussina

- We are data-driven and action-oriented.
- We share a pragmatic, optimistic vision that recognizes the Mystic River as a tremendous asset.
- We are mutually supportive.
- We have the governance, trust, and participation to maximize our effectiveness.

33



Summary:

- It's going to be different. It doesn't have to be worse.
- We're all in this together. Working regionally will be cheaper, more effective, and friendlier.
- It's going to be expensive. Let's make every dollar count by making every climate investment also address other goals.

34

Highest Ranked Hazards

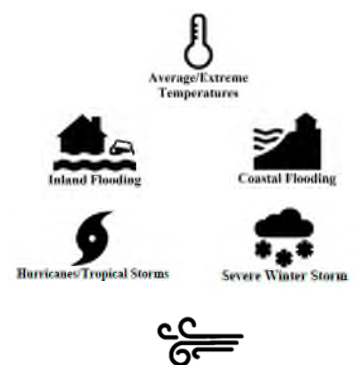
Highest Ranked Hazards

Heat/Extreme Temperature

Flooding

High Winds / Storms

Air Quality



Vulnerabilities and Strengths

Vulnerabilities & Strengths – Infrastructure

Infrastructure Vulnerabilities

- Roadways and MBTA Public Transit
- Stormwater and Wastewater Systems
- Department of Public Works (DPW) Facility on Commercial Street
- Power Supply
- Amelia Earhart Dam



Infrastructure Strengths

- Police and Fire Stations
- DPW Facility on Commercial Street
- Tide Gates
- Amelia Earhart Dam
- MBTA Public Transit and Bike Trail



Vulnerabilities & Strengths – Societal

Societal Vulnerabilities

- Senior and Public Housing Facilities
- Lack of Public Sheltering Space
- Language Isolation
- Salemwood School & Roosevelt Park
- Cambridge Health Alliance (CHA) & South Cove (SC) Care Centers



Societal Strengths

- Cultural and Community Networks
- Community Emergency Response Team & Medical Response Corps
- Salemwood School and Roosevelt Park
- CHA and SC Care Centers



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39

Vulnerabilities & Strengths – Environmental

Environmental Vulnerabilities

- Town Line Brook and Rumney Marsh
- Malden River
- Parks & Cemeteries – Linden & Coytemore Lea, & Forest Dale and Holy Park
- St. Mary's and Spot Pond Brooks



Environmental Strengths

- City Parks and Open Space
- Malden River and Little Creek – Future Economic Development
- Middlesex Fells
- Water Supply
- Former Hospital Campus Site



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40

Priority Actions

Top Priorities Actions

- Identify and Implement resiliency improvements to the City-wide Stormwater Infrastructure including preparation of comprehensive vulnerability assessment and action plan.
- Conduct a Resiliency in Zoning Assessment to evaluate how existing zoning requirements support or hinder climate resiliency and identify how the zoning regulations could be amended to further bolster climate resiliency for the City.

Top Priorities Actions

- Prepare a Department of Public Works (DPW) Site Resiliency Prototype Project that will support and build from the **Malden Works** resiliency project underway to include flood protection, stormwater improvement and energy resiliency at the DPW site.
- Identify and implement resiliency improvements to Public Housing.
- Develop a City-wide Heat Mitigation/Tree Planting Resilience Program.

Priority Infrastructure Actions

- 13 Total Priority Actions
 - 8 High Priority Actions
 - 5 Medium Priority Actions
 - No Low Priority Actions



High Priority Infrastructure Actions

- **Prepare engineering and redesign and retrofit of Four (4) Roads** that Flood Frequently Now: 1) 700 Broadway; 2) Intersection of Eastern Avenue and Broadway; 3) Intersection of Mountain Avenue and Everett Street; 4) Intersection of Salem and Mt. Vernon Streets.
- **Conduct a Hydraulic and Hydrology Analysis & Flood Improvement Feasibility Study for Linden and South Broadway Neighborhoods.**
- **Conduct City-Wide Resilience Vulnerability Assessment & Flood Improvements Feasibility Study.**
- **Regional Collaboration to improve the resilience of the Amelia Earhart Dam to future Flood Events.**

High Priority Infrastructure Actions

- **Prepare a Department of Public Works (DPW) Site Resiliency Prototype Project** that will support and build from the **Malden Works** resiliency project underway to include flood protection, stormwater improvement and energy resiliency at the DPW site.
- **Prepare Emergency Communications Strategy for Resilience Plan** to: 1) Expand CERT/MRC Structure; 2) Build on Existing Continuity Networks like Churches; 3) Test the efficacy of communications with something like street cleaning; and Prepare Plan in multiple languages.
- **Conduct a Stormwater Vulnerability Assessment and Resilience Feasibility Study** that includes the City-wide stormwater infrastructure including 1) Tide Gates, 2) Culverts specifically at Hadley, Russell, Bowman Streets, 3) areas for upsizing of undersized pipes and cleaning of the system.
- **Conduct Feasibility Study** to evaluate Alternatives for **new flood resilience project to channel water into the cemetery at Forest Road**; 2) Apply for funding and Prepare Preliminary Engineering and Design for preferred alternative.

Priority Societal Actions

- 9 Total Priority Actions
 - 5 High Priority Actions
 - 2 Medium Priority Actions
 - 2 Low Priority Actions



High Priority Societal Actions

- **Conduct a City-Wide Public Housing Resiliency Feasibility Study & Risk Assessment** for Improvements of Malden Housing Authority Properties.
- **Conduct Facilities Resiliency Assessment** including an energy efficiency energy audit of City Facilities, Housing, Schools, Medical Facilities.
- **Prepare Linden Neighborhood Concept Design for Parks, School, and Public Housing** that is Climate Resilient. Include Resilience Feasibility Assessment to Mitigate Riverine and Stormwater Flooding.
- **Conduct Salemwood Runoff (H&H) Analysis, Vulnerability Assessment and Feasibility Study** to include consideration of nature-based infiltration technologies and other nature-based systems.
- **Add a Winter Heating Center** at the Malden First Church of Nazarene for the Homeless Shelter.

Priority Environmental Actions

- 10 Total Priority Actions
 - 8 High Priority Actions
 - 1 Medium Priority Actions
 - 1 Low Priority Actions



High Priority Environmental Actions

- **Conduct resilience feasibility study to assess and identify 1) Nature Based Solutions** to address FEMA Flood Hazard Zone **at Salemwood School and Park** with an evaluation of current plans.
- **Prepare City-Wide Parks Feasibility Study for Heat Island Impacts and Heat Mitigation.** Consider Tree Plantings and Pervious Surface Mitigation/Resilience Solutions.
- **Conduct tree canopy feasibility study for improvements** to Roosevelt Park at Salemwood School.
- **Develop Malden Hospital Redevelopment Zoning Ordinance** to propose green infrastructure and resilience for stormwater flood management (using Category 3) with Conservation Commission.

High Priority Environmental Actions

- **Partner with private property owners to discuss voluntary acquisition** of Private Properties **at Town Line Brook for Public Trail Access** and Floodplain Management Education Training.
- **Ecological Restoration of riverbanks** focused along the Malden and Mystic Rivers with an emphasis on Regional Collaboration including the Mystic River Watershed Association.
- **Conduct Resiliency in Zoning Study** to: 1) Evaluate How Current Zoning Furthers or Hinders Climate Resiliency; and 2) Identify ways in which Current Zoning could be Amended to Encourage Climate Resiliency.
- **Prepare Malden Hospital Redevelopment Zoning Ordinance** to propose green infrastructure and resilience for stormwater flood management (using Category 3) with Conservation Commission.

MVP Action Grants: Project Types

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

Local Bylaws, Ordinances, Plans, and Other Management Measures
Redesigns and Retrofits

Boston



Developing its **first ever resilient building code** so that development in the future floodplain is prepared for **at least three feet of sea level rise**, the likely scenario by late century.



Proactive

Pilot potential

Retrofitting a major waterfront park into a legacy park that uses **nature-based solutions** to address climate vulnerabilities while providing important access to recreation for residents.



Nature-based solutions

Community co-benefits

Next Steps

Next Steps

1. Draft Summary of Findings Report available at www.cityofmaiden.org/mvp
2. Submit your ideas and comments to rcochran@cityofmaiden.org by January 31, 2020
3. Provide Report to EEA for review
4. Receive Designation as an MVP Community
5. Prepare to Apply for MVP Action Grants in April 2020

57

Questions and Answers

58



COMMENTS

- Population growth needs to be a consideration of Planning Process
 - You mention IDAHSy + implement resilience or improvements to Public and Senior Housing. This is critical ~~and~~ keeping in mind environmental justice communities is just about all of Malden.
 - We need considerable more attention to be given to Community Outreach and education of awareness. If you want Community Networks to communicate during Emergency events then they need education/training of awareness and to understand their role during emergencies.
 - I urge you to not leave our most vulnerable communities vulnerable in Res plan. Don't leave us out
 - Education - Education - Education - / Awareness Advertisement
Let's make preparedness a Common knowledge awareness and how it affect each resident
- Thank you

Send any additional comments to Sam Bell at samuel.bell@eza.com



COMMENTS

Are there benefits of being in an environmentally just area
We should look @ drought. => we are getting hotter!!

we need more free accessible
cooling locations including shade in
parks / schools, spray decks & water-
features in open spaces / playgrounds, &
public pools / splash pads that are
open & available to people who
don't drive / in all neighborhoods.
our parks are hot, & we've lost access to
Wright's Pond & our public pool has limited
hours.

Send any additional comments to Sam Bell at samuel.bell@gza.com



COMMENTS

Organics + Nutrient Management Plan to improve soil health on public + private land. (Heating soils have higher water infiltration rates and water holding capacities - A 1% increase in soil carbon holds 20,000 gallons of water per acre.)

Question - we talk a lot about where water goes, but Malden has a lot of ~~high~~ very high-land, some of which has housing on it - this is an erosion risk. Are there plans to deal with these water flaws?

Planning and implementation of stormwater utility for Malden, using funding to incentivize pervious surface (a fee structure based on pervious surface.) Regional Watershed ^{stormwater} Utility.

Programs to reward private property owners for tree cover?



COMMENTS

- Storm water Management infrastructure in low lying areas like Coytenore Lea Park. -Leverage other funding sources like CPA.
- Passive Storm Water techniques like bio-swales & rain gardens as public infrastructure.
- Coytenore Lea Park to be used as emergency storm water storage facility for neighborhood.

Send any additional comments to Sam Bell at samuel.bell@gza.com

COMMENTS

Expand report to include MAPC heat maps + ^{extreme} heat vulnerability including city design plans for ~~the~~ converting natural grass fields to artificial turf, and ~~current~~ current artificial turf fields.

Send any additional comments to Sam Bell at samuel.bell@gza.com

Community Resilience Building



Please ^{*}See the work, which is conceptual and preliminary that

COMMENTS BOSTON ARCHITECTURAL COLLEGE conducted RE: MALDEN HOSPITAL
Go to fellsmereheights.org to ACCESS Community SURVEY & BAC

Thank you for your work & for the presentation. I appreciate the comprehensive approach and the priorities that you've identified.

My concern — and it begs the question — is whether the city's current governmental departments, organizational structure and staff is being assessed as part of this process to not only implement, but to maintain and sustain, the ^{needed} necessary improvements and expanded services that will be ~~necessary~~ administered and supported over time. For

instance, increased tree planting and improving the canopy is critical citywide — but we have no city arborist or Parks Dept. to assess and maintain ~~the~~ what we already have in place at present. Will recommendations be made to city government on how they can improve, expend, fund and administer these priorities? I'm less confident on this

Send any additional comments to Sam Bell at samuel.bell@gza.com

side of the equation that Malden

will be able to respond and adapt quickly enough & maintain the services that will be required ^{infrastructure}

OPTIONS
for
community
based
redevelopment
ment of
the pro-
perty —
Thanks
again!

**Resolution that Urban Infrastructure Choices
to Combat Deadly Heat Waves Shall Take Precedence:**

Where as, heat waves are growing in frequency and intensity, and pose the most danger to the lives of the most vulnerable in our communities, such as the elderly, small children, and people without reliable means to seek cooling shelter, and

Where as, it is well documented that accelerated fossil fuel combustion has created a climate emergency, and deadly heat wave events are expected to increase in frequency and intensity in coming years, and

Whereas, sometimes the power grid fails and air conditioning fails, leaving many stranded in deadly hot temperatures, and furthermore, avoiding the deadly health effects heat waves is often impossible, especially at night.

Where as, the City of Malden is densely developed with asphalt shingled buildings, paved with asphalt, concrete, plastic artificial turf or landscaped with black mulch, surfaces which convert light energy into heat energy, amplifying the intensity of heat waves, causing an urban heat island effect, such that, on hot summer nights, the difference can be as high as 22°F (12°C). Also, waste heat from traffic, air conditioning systems, and other machinery further exaggerates the temperature difference between cities and the surrounding rural areas, and

Where as, artificial turf traps the sun's light energy and converts it to heat to achieve temperatures significantly higher than even asphalt (blacktop) which also is known to trap heat and

Where as, natural, living grass fields, shade trees, and live green plants remove light energy from the air and instead convert light energy into plant matter, preventing heat from forming, and remove heat-trapping carbon dioxide from the air, and also during photosynthesis, emit oxygen and cooling water vapor, and

Whereas, the City of Malden has a duty to take every reasonable civic action to protect its most vulnerable population from increasing exposure to preventable death,

Therefore, it is resolved that the goal of lessening urban heat intensification should take precedence with every decision and choice of civic infrastructure by the City of Malden on behalf of its citizens, so

Therefore, it is resolved that there should be an immediate moratorium on removal of live grass athletic fields, parks or play areas, currently planned and in the future, and no plans for artificial turf field should be entertained, and

Therefore, it is resolved that all plastic artificial turf fields should be returned to live grass as opportunities arise with the need for aging turf replacement, and

Therefore, the preservation and maintenance of all existing shade trees should take priority, and all options to facilitate the preservation of mature urban tree canopy should be employed, including but not limited to the hiring of a city arborist, and

Therefore, it is resolved that all designs for new or re-designed municipal parking lots and all new city owed pedestrian walkways should be required or incentivized to plant and maintain shade trees, at a minimum of one shade tree for 4 cars or one shade tree for every 20 feet, as part of their design, and

Therefore, it is resolved that, all newly constructed buildings should be required or incentivized to have either white roofs, solar panels, or be planted with live plants (green roof),

Resolved, that with any new project for improvement being entertained by the City of Malden, steps lessening the heat island effect and preserving living green infrastructure for the health of the Citizens of Malden, especially those most vulnerable populations such as young children, the elderly and those in environmental justice neighborhoods, should take precedence as a matter of course in all policy decisions.

Respectfully submitted by

Kari Percival
4 Seaview Ave.
Malden, MA 02148

Sofia R. Alberto
137 Laurel St. #137A
Malden, MA 02148

Kathleen Sullivan
27 Oliver St
Malden, MA 02148

Ann Schiro
34 Oliver St
Malden, MA
02148

John Saia
39 Pierce St.
Malden, MA 02148



City of Malden, Massachusetts

Public Listening Session

January 7, 2020, 6:30PM-7:30PM

Malden Senior Community Center, 7 Washington Street, Malden, MA 02418

~ Sign-in Sheet ~

Name (Please print)	Department/Group	Email Address
Dan Riendeau	Cataldo Amb	driendeau@cataldoambulance.com
Brent & Jane Robie	Malden residents	janebluebird@gmail.com
Gufraan Bulbul	CREW (Community Response to Extreme Weather)	gufraan@climatecrew.org
Ann Schiro	Malden Resident	asluay@aol.com
Kathleen Sullivan	Malden Resident	KMS818@aol.com
KHALIL KABA	CONSERVATION (UNHISQU)	KHALILKABA11@GMAIL.COM
KARI PERCIVAL	Malden Resident	Karipercival@hotmail.com

Community Resilience Building



Name (Please print)	Department/Group	Email Address
Nare Adams	MIT	lawm@mit.edu
Steven Keloti	Malden resident / Friends of Fellsmere Heights	skeleti@comcast.net
Lauren McAllister	Malden resident / Lantern	lmcgill@gmail.com
Eric Henry	Malden resident	eric.henry10200@gmail.com
Debbie DeMoria	City Council	debbiedemoria@aol.com
Amanda Uinehan	city Council	alinehan@cityofMalden.org
Stephen Winslow	City Council	swinslow@cityofMalden.org
Adiah Henry	Resident	shkhenry@hotmail.com
Marcia Manong	Malden River Works	marcia.manong@gmail.com
Deborah Campbell	Resident	Deborahcampbell@comcast.net
Leah Emerson	Resident / Friends of Fellsmere Heights	info@fellsmereheights.org
Carolyn Meklenburg	MA EEA	carolyn.meklenburg@mass.gov
Ron Cochran	City of Malden	



Name (Please print)	Department/Group	Email Address
Stefanie R. Alberto	resident	StefanieRGrace@hotmail.com



Appendix E

Public Comments

[REDACTED]

From: Ron Cochran <rcochran@CITYOFMALDEN.ORG>
Sent: Friday, January 31, 2020 11:00 AM
To: [REDACTED]
Subject: FW: Input to the Vulnerability Preparedness Grant Program
Attachments: Vulnerability, 1_31_2020.pdf; BostonCityCouncilResolution.png; MaldenLandSurfTemperatureHotSpots-01.png

More comments to be added.

From: Brian DeLacey <bdelacey@gmail.com>
Date: Friday, January 31, 2020 at 10:58 AM
To: Ron Cochran <rcochran@CITYOFMALDEN.ORG>
Cc: "mayor@cityofmalden.org" <mayor@cityofmalden.org>, "Lisa M. Cagno" <lcagno@CITYOFMALDEN.ORG>, "sdorai@maldenps.org" <sdorai@maldenps.org>, "Christopher J. Webb" <cwebb@cityofmalden.org>
Subject: Input to the Vulnerability Preparedness Grant Program

January 31, 2020

Mr. Ron Cochran
Emergency Management Department
City of Malden

Cc: Mayor Gary Christenson and Malden City Council, School Committee, Health Department

Please accept my attached comments concerning the City of Malden's participation in the State's Municipal Vulnerability Preparedness grant program (MVP).

I ask you to incorporate these remarks in your final report.

Thank you,
Brian DeLacey

January 31, 2020

Mr. Ron Cochran
Emergency Management Department
City of Malden

Cc: Mayor Gary Christenson and Malden City Council, School Committee, Health Department

Please accept my comments to the City of Malden's participation in the State's Municipal Vulnerability Preparedness grant program (MVP). I ask you to incorporate these remarks in your final report.

Malden can learn a great deal from how our neighbors are addressing vulnerabilities arising from climate change. While we can learn from others, we also should lead in these crucial activities.

A January 28, 2020 news story asked, "WHY IS SOMERVILLE STILL INSTALLING TURF FIELDS IN INCREASINGLY HOT CLIMATES?" Malden needs to ask itself the same question.

Malden's answer to this question is simple: Malden needs to cap the square footage of artificial turf citywide. Malden's upper limit on artificial turf should be set at what exists today, and no more.

Detrimental impacts of artificial turf on air temperature and the environment is well known.

Further, as part of Malden's Vulnerability planning, the city should include a goal of reducing artificial groundcover significantly over the next ten years. This is easily achievable and should be planned.

In January 2020, the Boston City Council passed a resolution declaring the climate crisis is a Health Emergency. The Malden City Council should do the same. I have included a copy of that resolution for your reference. Boston is acting on concerns Malden residents have highlighted in recent months:

"The health threats of climate change include increased exposure to extreme heat ..." and
"Climate change exacerbates health disparities, disproportionately harming the most vulnerable among us - children and pregnant women, people with low income, the aged, and people with disabilities and chronic illnesses, and marginalized people of all races and ethnicities ..."

These issues have been raised in Malden's public meetings. They were discussed again at Malden's January 2020 Conservation Commission meeting. (I refer you to the record of that meeting for further information on the elevated heat impacts of artificial turf being proposed for Roosevelt Park.)

I attach a "heat map" of Malden showing growing heat islands hovering over the city. Climate change and human change (such as Malden's installation of artificial turf fields) raise the temperature.

Heat islands are a "red plague" over Malden. We have the obligation and ability to redress this. Please: 1) cap the limit on artificial turf square footage, and 2) establish a plan to reduce this total in the future.

Thank you for including my comments in your research and report.

Sincerely, Brian DeLacey / Malden, MA

REFERENCES

=====

“Our region will feel many impacts from climate change in the coming years, but the one we will all face—no matter how close we live to a flood zone, how much money we make, our access to health care, or our proximity to a highway—is heat. Since the 1980s, each successive decade has been warmer than any preceding decade since the 1850s. Worldwide (and in our region), July 2019 was the hottest month in recorded history.

This trend is not our friend. Somerville’s Climate Change Vulnerability Assessment says that in 10 years we will have 40 days each year over 90 degrees. Remember how hot it was last summer? We had only 10 days of 90 degrees or more. This will be an extraordinary increase in a very short time.”

<https://digboston.com/hot-topic-why-is-somerville-still-installing-turf-fields-in-increasingly-hot-climates/>

<https://www.greenribboncommission.org/2020/01/boston-city-council-passes-resolution-declaring-that-the-climate-crisis-is-a-health-emergency>

<https://www.cityofmalden.org/702/Municipal-Vulnerability-Preparedness>

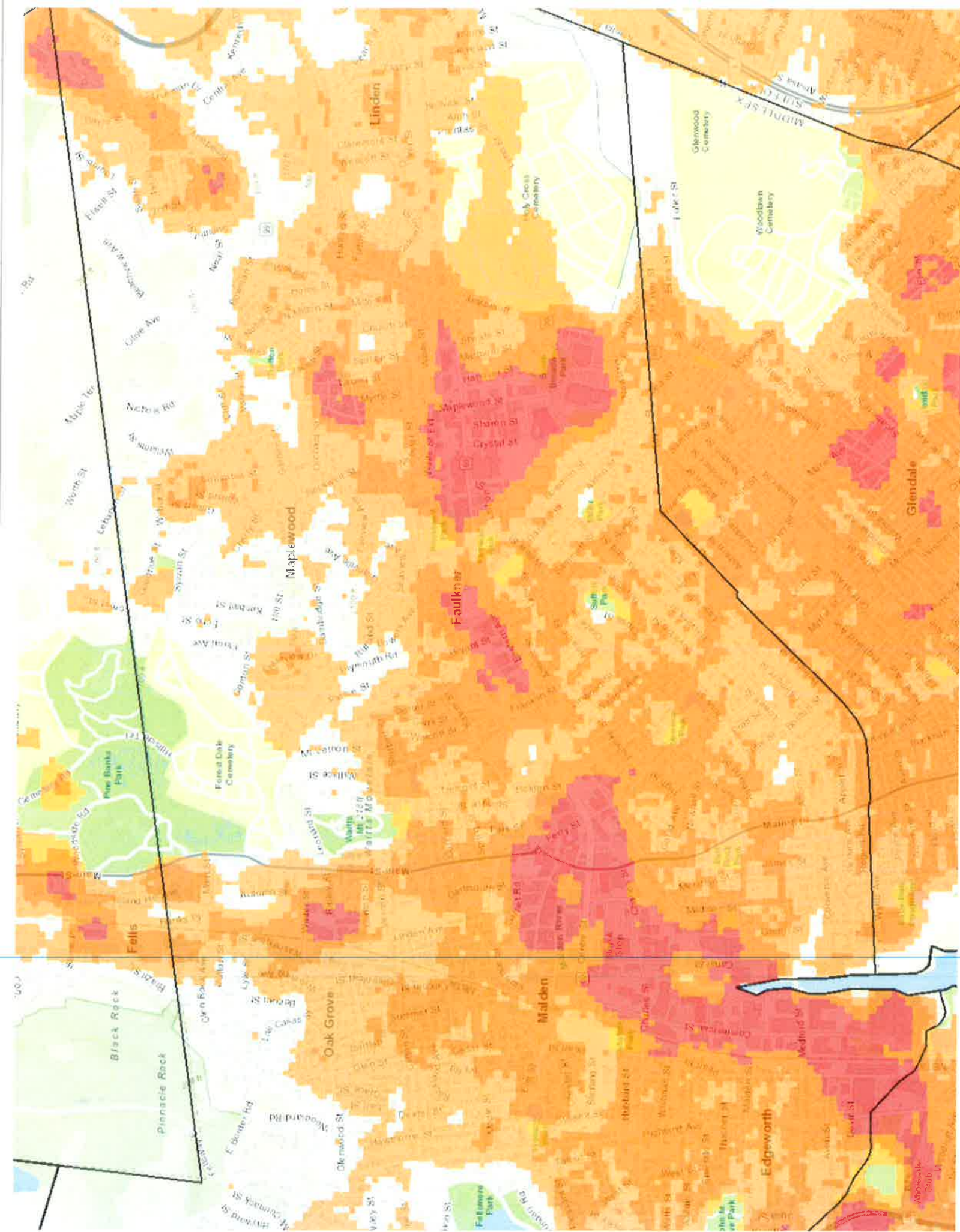
<https://www.mapc.org/planning101/mapping-the-heat-surface-temperatures-in-the-mapc-region/>

Offered by Councilor Matt O'Malley



RESOLUTION AFFIRMING THAT **THE CLIMATE CRISIS IS A** **HEALTH EMERGENCY**

- WHEREAS:** The United Nations' Intergovernmental Panel on Climate Change (IPCC) reported that only a decade remains for global warming to be kept to a maximum of 1.5 C, and even half a degree will significantly worsen the risks of drought, floods, extreme heat, and poverty for hundreds of millions of people; and
- WHEREAS:** The IPCC report concluded that global greenhouse gas (GHG) emissions would need to be reduced by 45% by 2030, and entirely by 2040 to avoid the most catastrophic effects of climate change, yet these emissions hit a record high in 2018; and
- WHEREAS:** 1,299 jurisdictions and local governments in 25 countries have declared a climate emergency, including the Worcester City Council and Amherst Town Council in the Commonwealth of Massachusetts, and 13,273 scientists from 156 countries named climate change an emergency; and
- WHEREAS:** More than 100 national public health groups, including the American Medical Association and the American Academy of Pediatrics; Center for Climate, Health, and the Global Environment; and Harvard T.H. Chan School of Public Health agree that the climate crisis is a health emergency; and
- WHEREAS:** Climate change affects the social and environmental determinants of health—clean air, safe drinking water, sufficient food and secure shelter; and
- WHEREAS:** The health threats of climate change include increased exposure to extreme heat, reduced air quality, more frequent and intense natural hazards, and increased exposure to infectious diseases and aeroallergens, nutritional security, effects on mental health, and increased risk of population displacement and conflict; and
- WHEREAS:** Climate change exacerbates health disparities, disproportionately harming the most vulnerable among us—children and pregnant women, people with low income, the aged, and people with disabilities and chronic illnesses, and marginalized people of all races and ethnicities; and
- WHEREAS:** Children's health is increasingly threatened from air pollution from fossil fuels, famine, heat, water shortages, and vector borne-diseases from every degree of warming; and
- WHEREAS:** The burning of fossil fuels like coal, oil, and gas for electricity, heat, and transportation is the primary source of human-generated emissions; and



[REDACTED]

From: Ron Cochran <rcochran@CITYOFMALDEN.ORG>
Sent: Thursday, January 30, 2020 3:51 PM
[REDACTED]
Subject: FW: Municipal Vulnerability Plan - Comments

Here is some feedback to be included. Also, on another note, can you change all references to the Leventhal project to "Malden River Works" instead of "Malden Works."

From: Steve Winslow <swinslow@CITYOFMALDEN.ORG>
Date: Thursday, January 30, 2020 at 3:37 PM
To: Ron Cochran <rcochran@CITYOFMALDEN.ORG>
Cc: Yem Lip <ylip@CITYOFMALDEN.ORG>, Daniel Grover <dgrover@CITYOFMALDEN.ORG>, John DeSantis <jdesantis@CITYOFMALDEN.ORG>, "Gary R. Stead" <gstead@CITYOFMALDEN.ORG>, Evan Spetrini <espetrini@maldenredevelopment.com>, "Amber Christoffersen (amber.christoffersen@mysticriver.org)" <amber.christoffersen@mysticriver.org>
Subject: Municipal Vulnerability Plan - Comments

Ron:

Thanks to you and the MVP for all the thought and hard work that went into the draft plan.. The draft plan and the proposed priorities are very well done. I provide the following comments both from my perspective as a long-term resident of Malden, Councillor at Large, as a former project manager at MRA focused on the Malden River area (as part of the then Telecom City Project now River's Edge) and my long-term work with the Mystic River and Saugus River Watershed Associations related to the development of the Northern Strand Trail.

1. East Side Partnership.. MyRWA is a very strong partner for the west side of the city that sits in the Malden / Mystic River watershed. As I commented at the January 7 meeting - there's a need to be sure that we also build partnerships with Revere and the Saugus River Watershed on the east side of the city, particularly since the coastal protections on the east side are much less robust at the current time that those on the west side. Certainly willing to reach out to contacts there. Serious consideration should be given to revisit and update to seek a more natural version of the regional "Saugus River Floodgate Project" that was first proposed to address the extreme flooding conditions of the Blizzard of 1978 but was dropped in 1993.
2. DPW Site Resiliency: that should be looked at in conjunction with the proposed design on new elements to the Malden Waterfront at that location. Some consideration should be given to working with the City of Melrose to potentially co-locate DPW facilities at a less vulnerable location on Broadway on the Melrose / Malden line.
3. High Priority Infrastructure: I wholeheartedly agree with these priorities especially as they relate to the ongoing planning along the Broadway corridor. I have been advocating that the study be broadened to include consideration of stormwater flooding issues including those noted on Bowman Street. A City-wide assessment of our stormwater system is urgently needed.
4. Societal Actions: the MHA evaluation could also include an evaluation of the use of roof-top solar as a means to help residents keep costs lower for air conditioning. The priorities related to Salemwood should incorporate information that has been developed in connection with the Roosevelt Park improvement project which includes a mix of both natural and aesthetic man-made solutions to increase flood storage while ensuring

recreational facilities can withstand both flooding and the rigors of a heavy recreational use by both the school and sports programs.

5. Town Line Brook properties and beyond: consideration should also be given to incentivize less development in flood plains and perhaps even strategic retreat of the most vulnerable homes by offering density credits in other parts of Malden in return for restricting development. Building codes should be reviewed to ensure that new construction and alterations in current and future flood zones will be able to withstand expected events (See Boston's building code). This should consider not only outside elevations but also basement elevations which are often lower.

Councillor Winslow

[REDACTED]

From: Ron Cochran <rcochran@CITYOFMALDEN.ORG>
Sent: Tuesday, February 4, 2020 10:53 AM
[REDACTED]
Subject: Fwd: MVP comments
Attachments: MVP notes to Ron_Jan30.doc; ATT00001.htm

Begin forwarded message:

From: Karen Buck <karen.buck.mt@gmail.com>
Date: January 31, 2020 at 4:38:39 PM EST
To: Ron Cochran <rcochran@CITYOFMALDEN.ORG>
Subject: MVP comments

Hi Ron,
Attached are comments regarding the MVP draft plan for the City of Malden. Even though these comments represent common feelings among Friends of the Malden River, these comments are from myself as a resident and community activist of Malden.
Thanks for the opportunity to comment.

Thanks,
Karen Buck
323 Forest St, Malden, MA 02148

This email has been scanned for spam and viruses by Proofpoint Essentials. Click [here](#) to report this email as spam.

Dear MVP Task Team,

We may have talked briefly about some of the items below. But, I want to either bring these items to the forefront for consideration due to their eligibility for action grants.

2. Community Outreach and Education – Eligible projects include those that increase public understanding of climate change impacts within and beyond the community and foster effective partnerships, especially with Environmental Justice communities.

Community Outreach and Education is a challenge in Malden due to multi-lingual population, poverty of time and bandwidth, lack of diversity in time offerings and lack of child-care. If funded and matched with grassroots groups and volunteers with proper planning and community outreach, there would be greater results in education and attendance.

Malden River Works has been very successful in community outreach with 497 survey responses and large attendance in two public meetings. It has been work, but well worth the effort. A combination of stipends, staff hours, and volunteer work was part of the success.

3. Local Bylaws, Ordinances, Plans, and Other Management Measures – Projects to develop, amend, and implement local ordinances, bylaws, standards, plans, and other management measures to reduce risk and damages from extreme weather, heat, flooding and other climate change impacts are eligible.

There needs to be rezoning in our Commercial Street corridor to protect the Malden River and its coastline. A mandated green space along the Malden River would provide the public with open space, tree plantings, preservation of wetlands (no artificial turf) would act as a sponge both for air and water quality and flood resilience.

4. Redesigns and Retrofits – Engineering and construction projects to plan, redesign, or retrofit vulnerable community facilities and infrastructure (e.g., wastewater treatment plants, culverts, and critical municipal roadways/evacuation routes) to function over the life of the infrastructure given projected climate change impacts, including more intense precipitation, extreme heat, and flooding are eligible.

Malden needs to establish an enterprise fund to improve its storm water system. A feasibility study is the first step. The City of Malden needs more financial stability and revenue to take care of its essential storm water system. Following the feasibility study, would be effective community outreach and education to increase awareness among all of Malden residents.

Nature-Based, Infrastructure and Technology Solutions to Reduce Vulnerability to Extreme Heat and Poor Air Quality – Green infrastructure projects that utilize natural resources, vegetation, and pervious surface to reduce ambient temperatures, provide shade, increase evapotranspiration, improve local air quality, and otherwise provide cooling services within the municipality are encouraged.

The Forest Dale Cemetery and other cemeteries need to replace the trees that have come down in the past five + years. The trees need to be of native origin (not the Asian Pears that are populating our streets). Native plantings should replace the trees that have been removed from our streets. The park maintenance department of the DPW needs more information and education as to how to manage our green spaces effectively and with nature based solutions (e.g. Howard Park: gardens were razed by the DPW in late August destroying natural solutions of native plantings due to complaints of people hanging out on the park benches.) Malden DPW has to find a suitable native tree for planting. The Asian Pear that populates our city is not a substantial replacement.

. Nature-Based Flood Protection, Drought Mitigation, Water Quality, and Water Infiltration Techniques – Projects that utilize natural resources and pervious surfaces to manage flooding, erosion, and other storm damage, such as stormwater wetlands (i.e., constructed wetlands for pollutant removal) and bio-retention systems. Feasibility, design, permit, construct, and/or monitor non-structural approaches that enhance or create natural systems to provide increased riverine shoreline stabilization and flood control approaches are favored. Projects that replace impervious surfaces such as unused parking lots and abandoned developed areas with parks, including new trees, native groundcovers and plantings, community gardens, and greenspace to reduce flooding and heat island impacts are encouraged.

Creating a climate resilient waterfront public open spaces along the Malden River will ensure that the river can absorb the waters from the rainfall and the storm water system. To create a resilient open space is critical to protect the DPW and the Malden River. This project would utilize and enhance natural resources to manage flooding and to keep the DPW operating in an efficient manner.

I know that synthetic turf fields are heat islands from experience and common knowledge. I encourage the City of Malden to investigate proper drainage and construction of a grass field at Roosevelt Park. I also encourage the City of Malden to reject any proposals for other synthetic turf fields.

I have worked with grass fields as an athletic director. With proper drainage and care (no synthetic fertilizers or pesticides in a wetland area), these fields can be managed.

Ecological Restoration and Habitat Management to Increase Resiliency – Projects that repair or improve natural systems for community and ecosystem adaptation, such as right-sizing culverts, dam removal, controlled burns, soil stabilization, invasive species removal and native revegetation, prevention and recovery from forest pest invasions in urban and rural forests, restoration of floodplain functions, and other natural resource management projects.

The Malden River needs to be reestablished with native plants. Phragmites need to be removed and controlled. The Oxbow Islands need to be protected from storm water trash flow and pollutants that flow through the storm drains. The Army Corps of Engineers has a plan of action that needs to be implemented on the Malden River in the Oxbow Islands section. This section of the Malden River will be the most helpful during flood events.

[REDACTED]

From: K Sull <kms818@aol.com>
Sent: Friday, January 31, 2020 3:13 PM
To: mayor@cityofmalden.org; mluse@cityofmalden.org; [REDACTED]
Subject: Fwd: MVP comments

Sent from my iPhone

Begin forwarded message:

rcochran@cityofmalden.org

[REDACTED]
Subject: MVP comments

Dear Mayor Christenson, Mr. Cochran, [REDACTED]

I would like to submit the following comments to the draft of the MVP (Malden Vulnerability Report)

After attending the meeting, I believe the City of Malden needs to plan for the future by revisiting current projects that will impact stormwater runoff and heat island effects, especially in areas of the City that are already effected by heat islands and flooding.

One such project is the Roosevelt Park Improvement Plan. This project will be adding an additional heat island in a congested area that already houses 4 artificial turf fields which are serving as heat islands. Weather data has already demonstrated there are more more days with temperatures at or above 90 degrees. In addition, data has shown that storms with more precipitation are going to continue and escalate. The low lying areas in flood zones will be subjected to more intense and more frequent floods.

The Salemwood School and Roosevelt Park have already been highlighted in the vulnerability report as high impact/action items. (See below for those highlighted comments)

The consultant from GZA was asked about the effects of articulations turf by transforming Roosevelt Park, a 3 acre grass park, which abuts a culverted brook and wetland area in a very low lying area which also serves as a collection and storage area from the highlands across Salem Street. His response was, "You answered your own question." It would be detrimental.

In a neighborhood that already experiences significant flooding in their basements, considering adding to this flooding by not mitigating the current flooding conditions is dangerous to those residents. The MVP calls for an H and H (Hydraulic and Hydrology) study of the stormwater system for Salemwood and Roosevelt Park. This has not been

done for this project or for the betterment of the entire community to ensure our stormwater drainage system is sufficient.

For these reasons, Malden must be committed to a vulnerability plan that addresses heat island mitigation and potential flooding in all neighborhoods to protect our City as a whole and the residents in these targeted areas.

We must adhere to our commitment as a community to mitigate climate change by preparing for what science is telling us. When we received the grant to create a vulnerability plan it was a beginning. Now we have to remember, this challenge is real. Immediate gratification for an artificial turf field may produce damaging effects for our City in the near future.

Sincerely yours,
Kathleen M. Sullivan
27 Oliver Street
Malden, MA 02148

City of Malden Vulnerability Draft

Report <https://www.cityofmalden.org/DocumentCenter/View/2293/DRAFT---Malden-Summary-of-Findings-Report-PDF>

4.2 SOCIETAL • Stakeholders identified the need to determine back-up power capabilities at the City's Senior and Public Housing Facilities with respect to the top hazards. • Stakeholders raised concerns over the lack of public shelter space in the event of a large-scale hazard event especially in consideration of emergency and homeless sheltering capacities. • Stakeholders expressed the need to communicate across multiple languages to reduce the potential for language isolation during hazard events in the City. • Stakeholders noted that the Salemwood School and Roosevelt Park are vulnerable to impacts from flooding.

4.3 ENVIRONMENTAL • Stakeholders noted that several parks and cemeteries in Malden that are at risk to flooding are also near public housing, schools and residential neighborhoods. The ones identified by several stakeholder groups included Linden, Coytemore Lea and Roosevelt Parks and Forest Dale and Holy Park Cemeteries.

5.3 ENVIRONMENTAL • The City's parks and open space including cemeteries serve as key assets for reducing the heat island effect in some areas of the City and serve as flood storage areas to assist in reducing the impacts from future flooding. The stakeholders specifically identified Pine Banks Park, Linden Park, Fellsmere Park & Pond, Forestdale Park, and Roosevelt Park as key assets.

6.0 PRIORITY ACTIONS TO IMPROVE RESILIENCE During the final small group exercise the stakeholders developed actions to bolster the existing strengths and to improve/mitigate the vulnerabilities outlined in Sections 5 and 6. At the conclusion of the workshop stakeholders from each of the small groups presented a brief summary of their recommended priority actions as a large group and identified the following actions as the five top priorities to improve the City's resilience to natural and climate-related hazards that included:

1. Prepare a Department of Public Works (DPW) Site Resiliency Prototype Project that will support and building from the Malden Works resiliency work underway to include flood protection, stormwater improvement and energy resiliency at the DPW site.
2. Identify and implement resiliency improvements to Public Housing.
3. **Develop a City-wide Heat Mitigation/Tree Plantings Resilience Program.**
4. **Identify and Implement resiliency improvements to the City-wide Stormwater Infrastructure including preparation of comprehensive vulnerability assessment and action plan**
5. Conduct a Resiliency in Zoning Assessment to evaluate how existing zoning requirements support or hinder climate resiliency and identify how the zoning regulations could be amended to further bolster climate resiliency for the City

ACTION

Conduct Salemwood Runoff (H&H) Analysis, Vulnerability Assessment and Feasibility Study to include consideration of nature-based infiltration technologies and other nature-based systems. Utility Infrastructure Malden Schools, Parks and Recreation Public Works,

Conduct tree canopy feasibility study for improvements to Roosevelt Park at Salemwood School. Energy Resiliency Park and Recreation Public Works

[REDACTED]

From: Ron Cochran <rcochran@CITYOFMALDEN.ORG>
Sent: Tuesday, February 4, 2020 10:57 AM
To: [REDACTED]
Subject: Fwd: MVP Draft Report'Ublic Comment
[REDACTED]

Begin forwarded message:

From: Dcampitup <Dcampitup@comcast.net>
Date: January 31, 2020 at 1:15:19 PM EST
To: Ron Cochran <rcochran@CITYOFMALDEN.ORG>
Subject: MVP Draft Report'Ublic Comment

Dear Mr. Cochran,

Please accept these comments in response to the Municipal Vulnerability Preparedness DRAFT Report:

As a lifelong Maldonian, residing on Chester Street (Ward 2) , these comments are informed, not only by my life experience, but also my professional experience in the field of Nursing and Public Health.

While the Report is very thorough, I think it is well within its scope to document all of the potential effects related to public health and hygiene. I suggest this Report be amended to include all aspects of the overwhelming effects of climate change on Malden, as well as the entire Mystic Watershed area.

The Infrastructure Vulnerabilities of Heat/Temperature Rise, Flooding, High Wind/Air Quality, Fire and Drought each have tremendous implications specific to the health status on individuals of all ages, as well as the epidemiology of the Malden population.

The include such problems secondary to water/vector borne illnesses, sanitation issues, respiratory conditions such as asthma, mobility/access to resources and the already existing problems of poverty and food insecurity, to name a few.

Recommendations should outline the many initiatives and action steps, such as

- 1 expansion of Malden's Board of Health Department,
2. availability of temporary housing, home care, emergency, acute, urgent and long term care services, and
3. ongoing consultation with the many infectious disease and public health experts we are fortunate to have access to in the Boston area.

If you and/or the authors of the MVP Report have questions and/or wish to discuss my comments, do not hesitate to contact me via email or cell # 781-518-4120.

Sincerely,

Dee Campbell-Tompkins, BSN, MPH

Sent from my Samsung Galaxy smartphone.

This email has been scanned for spam and viruses by Proofpoint Essentials. Click [here](#) to report this email as spam.



GZA GeoEnvironmental, Inc.