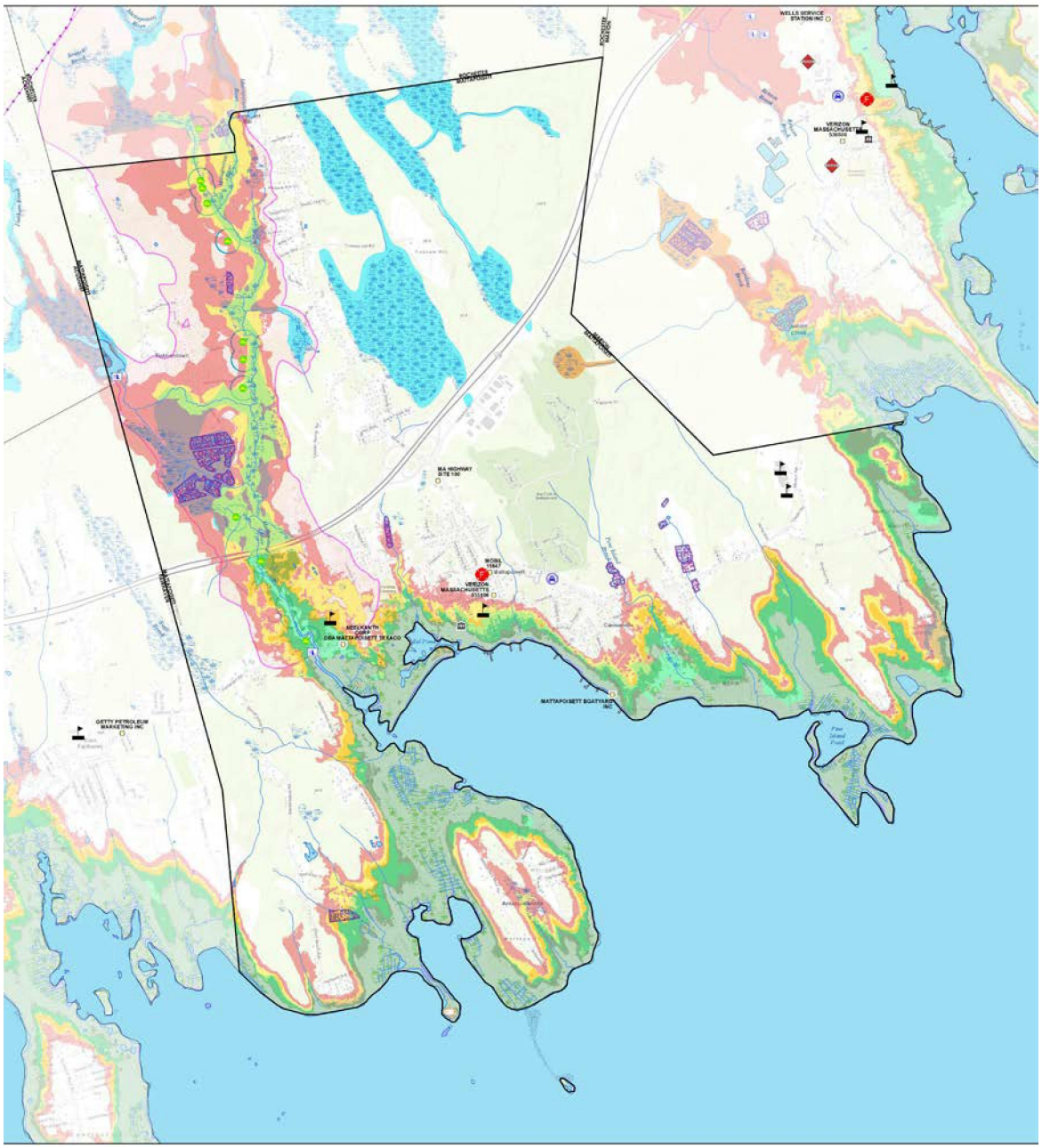
Town of Mattapoisett



Community Resilience Building Workshop

Summary of Findings

May, 2018

FUSS & O'NEILL

Project No. 20170390.D10

Town of Mattapoisett

Community Resilience Building Workshop

Summary of Findings

Overview

Extreme weather and natural and climate-related hazards are an increasing concern for the communities of Massachusetts, and there is a clear need to involve municipalities, corporations, organizations, and the State in increasing resilience at all levels. Recent storm events affecting the region have highlighted many of the vulnerabilities that towns and cities face. Hurricane Irene and Superstorm Sandy brought intense flooding to many municipalities and threatened (or destroyed) infrastructure across the state. Extreme temperatures at both ends of the spectrum have pushed the limits of communities' preparedness to protect both infrastructure and people. In coastal communities, the impacts of sea level rise are felt daily and further exacerbate the impacts of other extreme events. Current climate modeling indicates that all of these hazards are expected to increase in frequency and scale over the coming decades. The Municipal Vulnerability Preparedness (MVP) program provides support and a prescribed process for cities and towns in Massachusetts to plan proactively for resiliency and implement key climate change adaptation actions.

In 2017, the Town of Mattapoisett was awarded a $16,000 MVP grant to fund the planning stage of this process. The Town partnered with Fuss & O'Neill, a state certified MVP Provider, to complete a comprehensive, baseline climate change and natural hazard vulnerability assessment and develop a list of priority actions for the Town. This process involved the development of an MVP Core Team, which met on February 22, 2018 and again on March 28, 2018 to determine initial concerns and worked to identify stakeholders within the municipality and set goals for the process as well as plan for the workshop.

Those stakeholders were then invited to participate in a Community Resilience Building (CRB) workshop on April 10, 2018, engaging in a day-long, tried and tested process developed by The Nature Conservancy. The CRB methodology is an "anywhere at any scale" format that draws on stakeholders' wealth of information and experiences to foster dialogue about the strengths and vulnerabilities within the Town. Workshop participants interacted at both large and small group levels, using an iterative process to gather input, synthesize ideas across groups, and ultimately develop a set of priority resilience and adaptation actions.

The CRB workshop's central objectives were to:

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

Top Hazards and Vulnerable Areas

During the Community Resilience Building workshop, participants were asked to identify the top four natural hazards of concern for the Town of Mattapoisett. Discussion of the top hazards built on earlier conversations that took place at the MVP Core Team Meetings, as well as ongoing Town conversations that have formed the basis for the Town's Hazard Mitigation Planning.

The impacts of storm surge were identified as one of the Town's top hazards. Other storms (Hurricanes and Nor'easters) resulting in flooding was identified as a second, distinct threat, as this in conjunction with the recent storms bring different and potentially extreme impacts. Also, as a coastal community, sea level rise was identified as a third major hazard. Finally, drought and heat were identified as a potential hazard. These hazards have already demonstrated impacts on the Town, and as climate change progresses, these hazards are expected to have ever greater consequences for infrastructure and environment, as well as for various societal elements. Specific areas of concern are identified below.

Top Hazards

- Coastal Storms
- Other Storms (Hurricanes and Nor'easters) with Flooding
- Sea Level Rise
- Heat and Drought

Areas of Concern

While many impacts are expected to be felt Town-wide, certain elements, locations, or community groups present particular concerns.

Neighborhoods/Communities
Densely populated coastal neighborhoods along the southwestern end of Town, area around Holly Woods Road and Angelica Avenue on the Eastern edge of Town, , the Mattapoisett Neck Road Area, Brant Island area, Acout Road

Ecosystems
The Breakwaters around the Harbor, the shellfish beds, the loss of plant diversity in the wetland areas, loss of wetlands due to heat and flooding, the waterfront is a focal point of Town

Infrastructure
Water supply wells, Loss of sewer transmission main to Fairhaven WWTP, Town Hall, Library and Schools and Fire Threats to the Village Area, designated shelters in town are not sufficient, impacted roads affect evacuations of critical areas.

Facilities
Town Hall, Center School, Mattapoisett Boatyard and Water front Parks

Current Concerns and Challenges Presented by Hazards

Major storm events and related flooding have been a recurring threat to Mattapoisett throughout its history. Notable historic events include impacts from the Great Hurricane of 1938, the 1954 hurricane, Hurricane Bob in August of 1991 and some more recent events in the early to mid-2000's. During these events there was significant flooding and many homes were flooded in some of the low lying neighborhoods.

In much more recent memory, the Town experienced extensive rain and flooding impacts during a severe weather event in June of 2013. During this event some critical infrastructure including a water main that connects Pease's Point and Point Connett was exposed and had to be isolated from the system. This led to low pressures throughout this part of the distribution system and many water quality complaints.

Exposure of Water Main at Pease's Point and Point Connett during June 2013 storm

Other events from the past also resulted in significant damage. Hurricane Bob damaged the shoreline with many boats being cast ashore. This resulted in significant damage to many homes and buildings in the shoreline area.

Since Hurricane Bob, there has continued to be an uptick in major wind, rain, and wet weather events. There were severe weather events from this past winter alone that caused damage and flooding.

The evidence of sea level rise is clear in Mattapoisett as well. The Town coastline and some low lying areas in Town regularly see significant water during high tide events due to "normal" tide fluctuations. This "sunny day flooding" driven by tides is an increasing concern at a number of sites in Mattapoisett.

While excess water is an obvious problem in Mattapoisett, too little water is equally concerning. Some areas of town do not have a municipal water supply and during high heat and drought conditions, wells can run dry. Since this is a real possibility in the southwestern part of Town, the Water and Sewer Department is looking to extend city water to these areas.

Other current concerns identified include the effluent force main from the Eel Pond Pump Station. This crosses the beach and the Phoenix Rail trail on its way to discharging into sewers that go into Fairhaven where the wastewater treatment plant (WWTP) is located. The force main carries a significant amount of the wastewater flows from the Town to the WWTP and, if damaged or lost, could have significant impacts to the quality of water along the shoreline and not allow wastewater to be treated in the community. The Town has evaluated alternatives to relocate and re-route this critical force main. The Town is now looking at the best way to fund and complete the project to mitigate this issue.

The Town Hall and the Center School are located in the Village area and both of these structures would be affected by severe weather events. The Town Hall and its computer servers would be affected by a Category 2 Hurricane and if there was Sea Level Rise this area could be inundated with water and this would shut down this building.

The Center School is also in this area and could be affected and flooded during a Hurricane. The Town feels another Shelter or Emergency Meeting Area should be designated and more efforts are needed to prepare the community in this area for future weather events.

Specific Categories of Concerns and Challenges

Infrastructural

The three groups within the workshop came up with the following infrastructural concerns:

- Loss of Water Supply and wells in key locations
- Damage or Loss of the Eel Pond Force Main Crossing the Barrier Beach and the Phoenix Rail Trail
- Damage or Loss of Key Tow Buildings including the Town Hall, the Library and Schools
- Brant's Island and Mattapoisett Neck Road Areas – Fire Protection
- Roads would be flooded/impacted leaving residents stranded
- Wellhouse No. 3 Transmission Main crossing the Mattapoisett River
- Pease's Point/Point connect Water Main Crossing
- Town Wharf would be damaged during storm surge
- The Village Center would be susceptible to Fires

Societal

The following Societal challenges or concerns were raised during the workshop

- There are many areas within Town where folks would be stranded or in danger of loss of life or property during a severe storm event. Also, there would be no way for emergency personnel to be able to assist.
- There needs to be a more Comprehensive Plan for Shelter Operations that include better details for evacuation, communicating with residents and providing the necessary amenities for the Shelter
- Protecting the existing water supplies by cutting off water for residents in affected areas.
- Loss of Property Value and revenue and being unable to recoup or capture this moving forward if there is significant damage.
- Drought Condition is area where there is not public water supply.
- Potential loss of Community Events which would adversely affect lifestyle and local businesses
- Potential damage or loss to historical landmarks including the Lighthouse and some of the coastal parks.

Environmental concerns or challenges that were discussed during the workshop included:

- Loss of Forest and Plant Species in the Town , specifically Trees in Parks
- Loss of Plant Diversity
- Review and Update Local Regulations for Design to account for increased Flooding
- Adverse effects on Shellfish beds along the coastline
- Effects on the Harbor due to the breakwaters and increased Sea Level
- Failure of Septic Systems due to flooding affecting the water quality
- Increase of disease due to invasive species and bugs.

Current Strengths and Assets

While the Town recognized a number of vulnerabilities, workshop participants also identified key strengths as well. Mattapoisett updated its Hazard Mitigation Plan in 2016 and has a new Police and Fire Facility planned for the coming years. The Town has also made some key evaluations and assessments in the Town already as evidenced by Coastal Zone Management Grants received for resilience analysis for critical water and wastewater infrastructure.

- The Town updated its **hazard mitigation plan** in 2016.
- The Town has completed Coastal Zone Management Grants for critical water and wastewater infrastructure throughout Town to identify the most critical infrastructure and provide preliminary adaption measures.
- The Town benefits from **strong support from Public Safety.** This includes participation and efforts by the Fire Chief and personnel during Core Team and workshop activities.
- The Town's **main Water Treatment Plant**, while vulnerable, is a regional facility that serves the surrounding towns and is an important strength for the water supply system.
- The Town has **specialized vehicles and equipment** for use in flood conditions or other situations where standard equipment is insufficient to provide emergency services.

Top Recommendations to Improve Resilience in Mattapoisett

Participants at the CRB workshop identified a number of recommendations to address vulnerabilities and increase resiliency in three main topic areas: infrastructure, environment, and society. Management of critical infrastructure, primarily dealing with mains that service areas of the community that could receive

flooding was paramount. A second theme centered on providing emergency services to the Town's residents during hazard events, with particular attention to vulnerable neighborhoods that might be cut off or experience catastrophic flooding. In conjunction with this, there was a lot of discussion about a comprehensive plan for shelters in Town in terms of how they would be operated, what amenities and materials they would have available and how communications to the Town for these shelters would be accomplished.

Highest Priority

- **Eel Pond Force Main Rerouting and/or Relocation.** This critical force main carries most all of the wastewater from the Town through two crossings that could be adversely affected by storm surge, flooding and Seal Level Rise. The town has completed preliminary evaluations and alternative analysis regarding relocating and re-routing this force main. The Town has also completed detailed design drawings regarding the proposed relocation. They are now looking for funding and assistance for getting this critical infrastructure relocated

- **Construction of the Relocation of the Water Main Crossing between Pease's Point and Point Connett.** This critical water main was exposed during a June 2013 storm event. After being exposed, the Town had to isolate the water main while the beach and the cover for the water main were restored. During the time the water main was isolated, the Town had numerous water quality issues in the tow area and there were many low pressure complaints. Two CZM grants were obtained to evaluate options for relocating the water main. The first recommended horizontal directional drilling of a portion of the water main and open cut replacement at a deeper depth for two other portions of the pipe between Avenue A and Beach/Bay Road. The second CZM grant provided funding for the design permitting and bidding of the proposed improvements. The Town is currently seeking funding from CZM to complete the construction of this critical crossing.

- **Wellhouse No. 3 Water Transmission Main.** The piping crosses the Mattapoisett River to the east of Wellhouse No. 3 and has been exposed by the widely changing flows in the River during various times of the year. This main has been evaluated by others and the recommendation is for this main to be relocated. The relocation will use horizontal direction drilling to install the water main below the river bottom to eliminate its exposure to river conditions. This directional drilling will also minimize wetlands buffer zone disturbance.

- **Investigate the long Term effects of invasive species, indigenous species and their habitats due to the increasing changes in wetland areas along the coastline.** The Town is worried about shellfish habitats as well as the areas where flooding could occur due to the increased prevalence of invasive species of plants and bugs. Further flooding in these areas, may forever alter or eliminate some of the species from this area.

- **Impacted Roads** The Town is worried there are many roads that could be impacted in low lying areas and along the coastline. They include Route 6 (Main Street), Brant Island Road, Angelika Avenue, Acout road, Holly woods Road, Mattapoisett Neck Road. These thoroughfares are the only real way out from certain neighborhoods and if the residents do not evacuate in a timely fashion, Emergency Personnel may not be able assist or rescue these resident.

Moderate Priority

- **Comprehensive Plan for Shelter Operations** - The Town has identified the need for a comprehensive plan to communicate to the Residents where the shelters are, what amenities/materials there are available at the shelter and how they would be maintained and operated during emergency situations. Another aspect of this is there are other shelters potentially in other Towns or regionally that are available for residents and what they provide and offer that may be different from those in Town.

- **Fiscal Effects on Town due to Loss/Damages -** The Town is worried that many areas that are damaged, flooded or destroyed during a severe weather event could result in the permanent loss of revenue and population in town This could adversely affect the economy and also affect the time it takes to recover from this event. There was mention of how the population reduced drastically during the Great Hurricane in the late 1930's due to the significant damage and loss of property in certain areas of Town. This could happen again especially if insurance and people are not willing to re-build in certain areas.

- **Town Hall** – The Town is looking into property that can house the new police department and if possible also allow for the construction of a new Town Hall that would be out of the potential flooding areas.

Lower Priority

- **Study the possibility of expanding the public water supply** to establish a back-up in case the residential wells in the low lying areas are inundated and no other supply is available**.**

- **Historical Landmarks** – Some are located in vulnerable areas and the town feels an assessment and discussion of what can be done to protect these should be completed. The Town will look into other avenues for funding to get this work completed.

- **Breakwaters in the Harbor area** – There is an investigation of the state of the piers in town to determine whether improvements or enhancements are needed to combat wave action in the area.

- **Planning and Permitting to Address Changes in Climate** – The Town would be looking into its planning documents and reviewing its permitting policies to take into account climate change, seal level rise and potential for flooding.

CRB Workshop Participants

All workshop invitees are listed below; attendees are indicated with an asterisk.

Name	Position/Organization
Jackie Coucci	Council on Aging Director
Andrew Murray	Fire Chief
Justin Dubois	Mattapoisett Fire Department
Amanda Stone	Community Nurse
Michael Gagne	Town Administrator
Melody Pacheco	Assistant to Town Administrator
Kathleen Costello	Administrator of Assessing
Barry Denham	Highway Surveyor
Nick Nicholson	Water/Sewer Department
Jill Simmons	Harbormaster
Kathy Massey	Shellfish Agent
Henri Renauld	Water/Sewer Department
Elizabeth Liedhold	Conservation Agent
Catherine Heuberger	Town Clerk
Gary Johnson	Mattapoisett Land Trust
Kurt Mailman	Facilitator - Fuss & O'Neill, Inc.
Kevin Flood	Lead Facilitator - Fuss & O'Neill, Inc.

Those that were invited but were unable to attend included Dale Barrow, Health Agent, Andrew Bobola, Building Commissioner, Anthony Days, Police Department and Mary Lyons Emergency Planning.

Citation

Fuss & O'Neill (2018). Community Resilience Building Workshop Summary of Findings. Town of Mattapoisett, Fuss & O'Neill ,Inc., Mattapoisett, Massachusetts.

CRB Workshop Project Team: Organization, Name, Role

Name	Organization	Role
Henri Renauld	Water & Sewer Dept. Superintendent	Project Coordinator/Core Team Member
Michael Gagne	Town Administrator	Core Team Member
Barry Denham	Highway Superintendent	Core Team Member
Andrew Murray	Fire Chief	Core Team Member
Nick Nicholson	Water & Sewer Dept.	Core Team Member
Elizabeth Leidhold	Conservation Agent	Core Team Member
Mary Monahan	Fuss & O'Neill	MVP Lead Coordinator
Kevin M. Flood	Fuss & O'Neill	Lead Facilitator/Presenter
Kurt A. Mailman	Fuss & O'Neill	Facilitator/Scribe

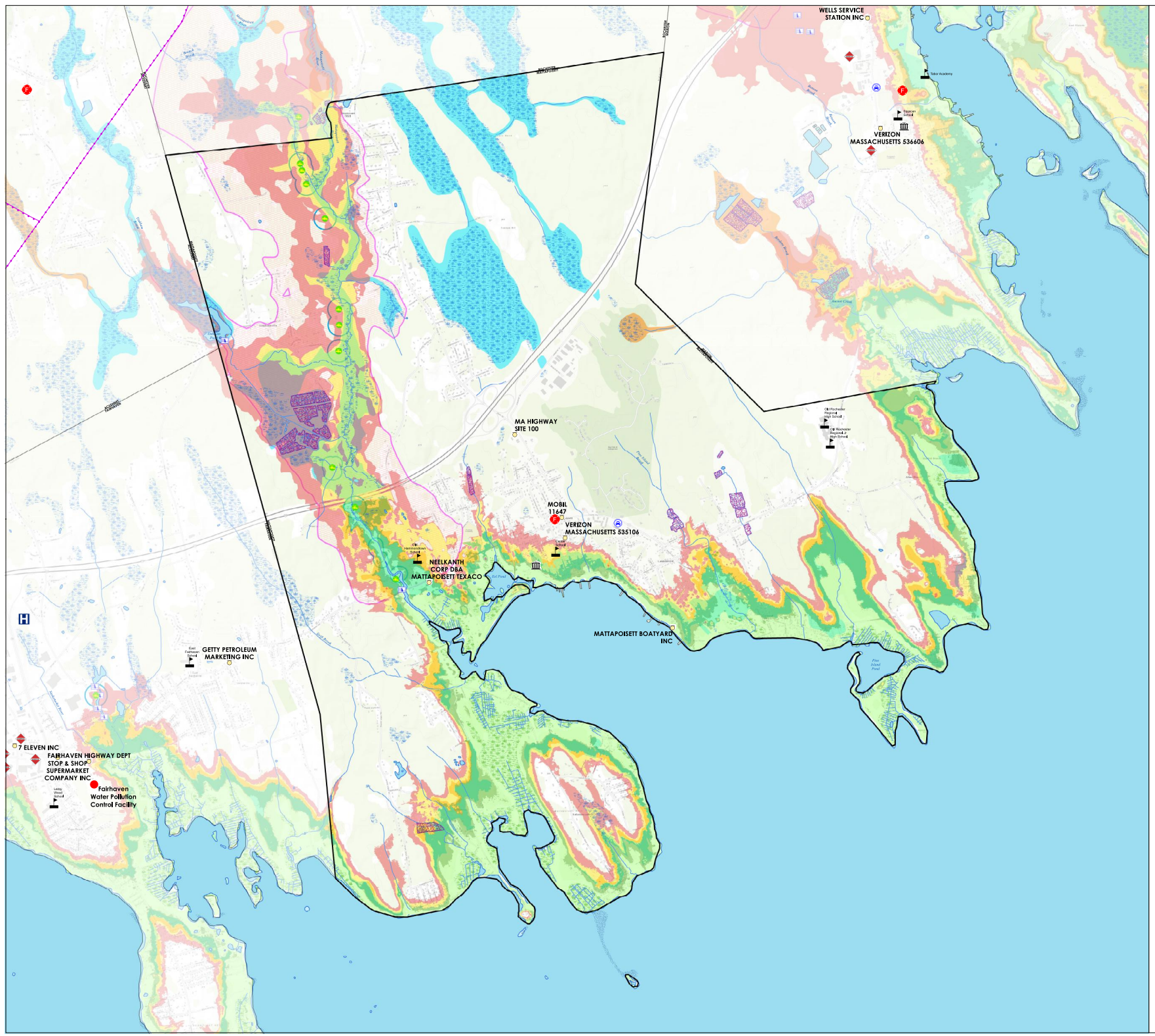
Acknowledgements

Many thanks to the MVP Core Team members, CRB workshop participants, and to Henri Renauld who acted as the local Project Coordinator. Thanks to the Town of Mattapoisett and the Town Library for providing a meeting space for the CRB Workshop and for the snacks and lunch provided for the day.

Funding for the CRB Workshop was provided through a Massachusetts MVP grant.

Appendix A

CRB Workshop Base Map



MATTAPOISETT, MA

MUNICIPAL VULNERABILITY PREPAREDNESS PROGRAM

- Town Hall
- School
- Police Station
- Fire Station
- Hospital
- Community Groundwater Source
- Dams
- MassDEP Major Facilities
- Underground Storage Tanks
- Powerline
- Perennial Stream
- Intermittent Stream
- Shoreline
- Manmade Shoreline
- Ditch/Canal
- Pond, Lake, Ocean
- Wetland
- Salt Wetland
- Cranberry Bog
- Tidal Flat
- Wellhead Protection Zone I
- Wellhead Protection Zone II

Flood Zone Designations

- 1% Annual Chance of Flooding
- Regulatory Floodway
- 0.2% Annual Chance of Flooding
- Reduced Flood Risk due to Levee
- Area Not Included

Worst-case Hurricane Surge Inundation Zones

Hurricane Category

- Category 1
- Category 2
- Category 3
- Category 4

N W E S

0 0.25 0.5 1
Miles

Data sources:
MassGIS - Infrastructure, Hydrology, and Administrative Data
ESRI - World Topographic Map - Base Map

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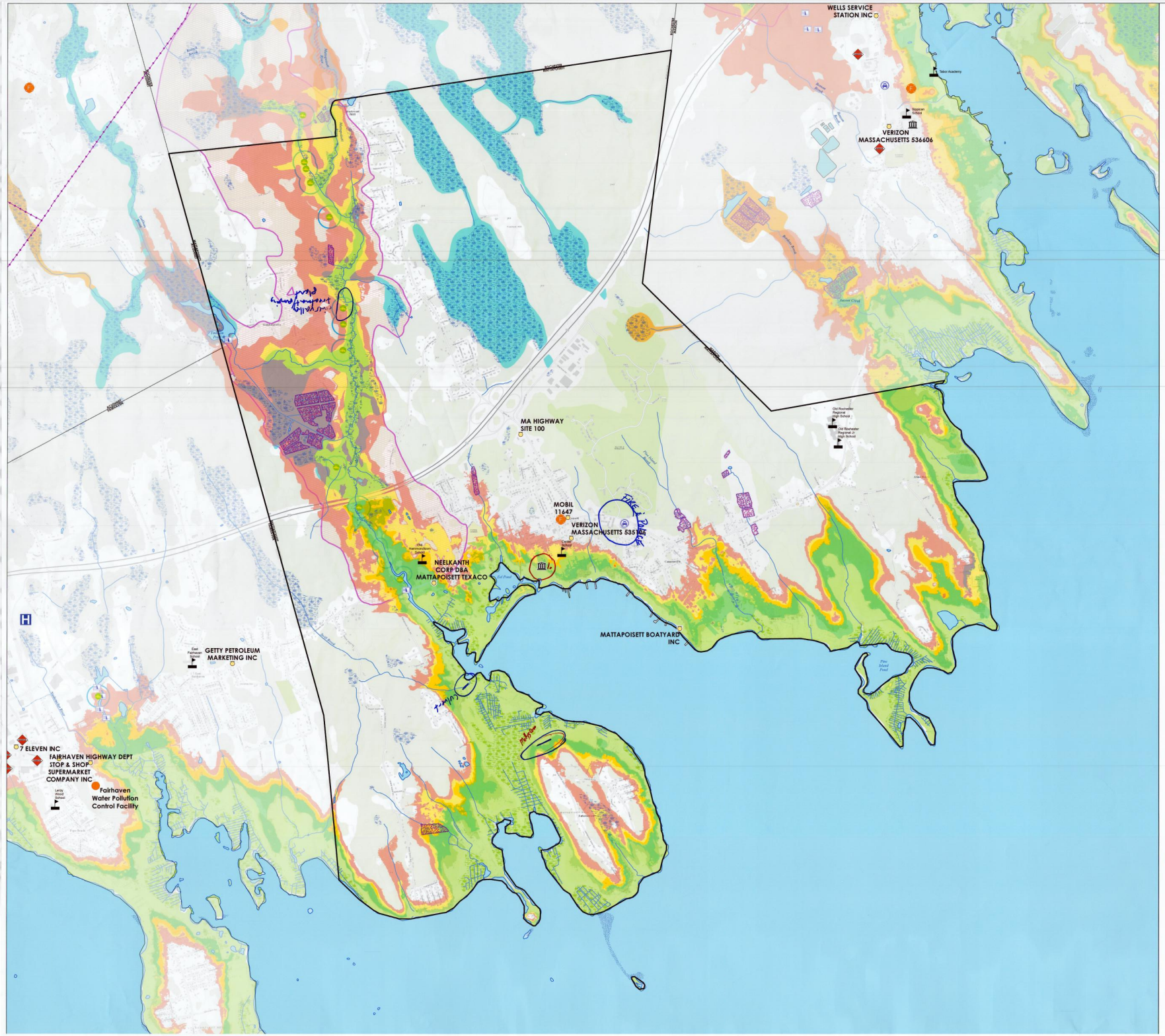
Appendix B

CRB Workshop Outputs:
Participatory Mapping Exercise & Risk Matrices



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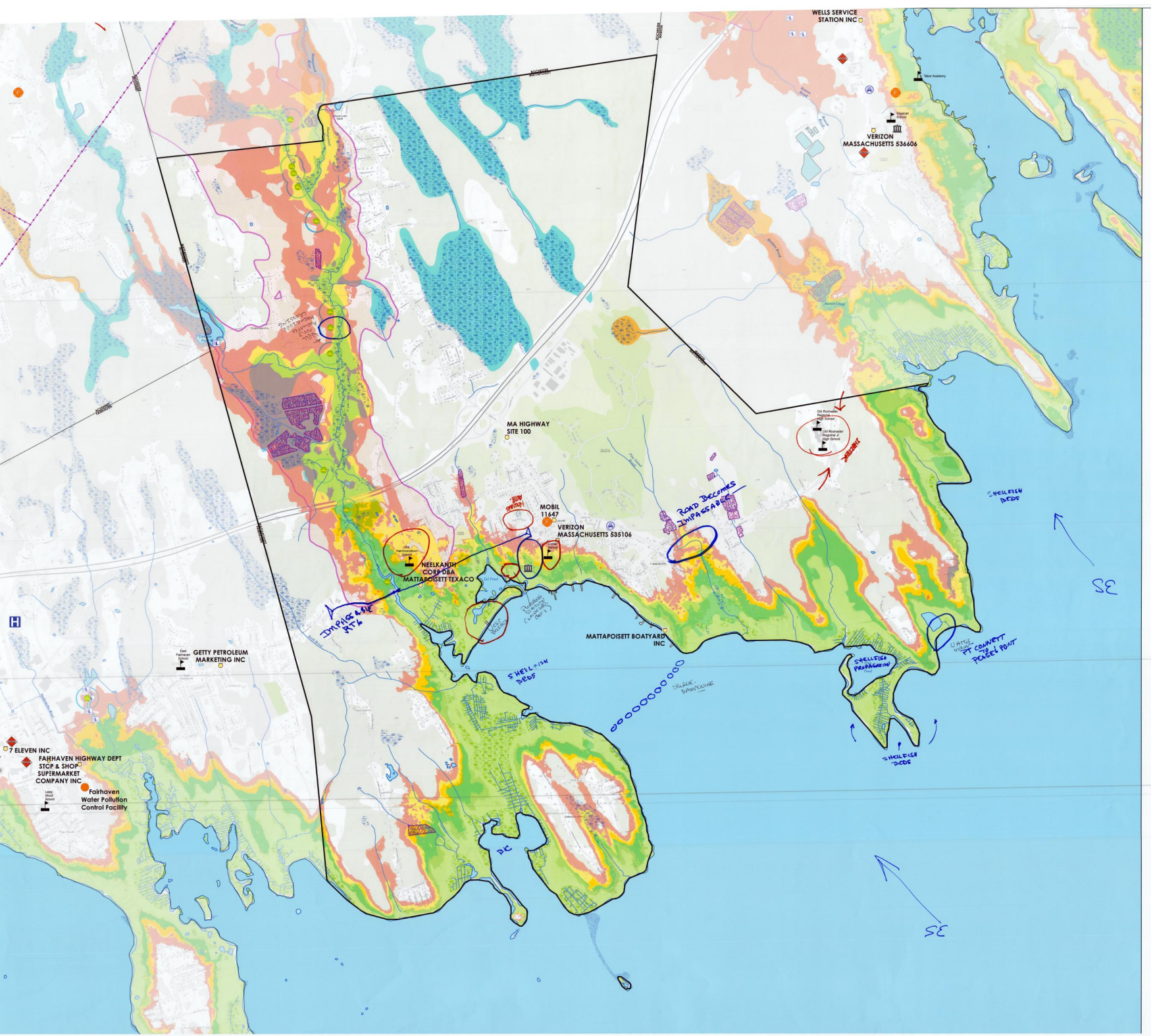

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Miles

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FINAL CONSENSUS RISK MATRIX FOR MATTAPOISETT

Redundant facility? or shelter

other regional shelters - Marion - Rochester - Mattapoisett - Plymouth

food, water, medical etc - need to be forecasted

DPH - Emergency Dispensing Site
Shelter? - not a plan for this?
- Vulnerability - NO MOU
- Run shuttle by the Hep "

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.com

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

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

Features	Location	Ownership	V or S	Flooding	Hurricanes	SLR	Storm Surge	Climate change issues	Drought	Priority H-M-L	Time Short Long Ongoing
Infrastructural											
Town Hall		Town	✓	✓	✓	✓	✓	✓			
Drinking Water Wells/Infrastructure		Town	✓	✓	✓	✓	✓	✓	✓		
Impacted Roads, - RT 6 - Island areas		Town	✓	✓	✓	✓	✓	✓			
Shelters, Schools, (center)	Emergency Plans not sufficient		✓	✓	✓	✓	✓	✓			
Eel Pond Force Main				✓	✓	✓	✓	✓			
Fire Event - Village Center	—	- closer look at Regulations, Zoning, Etc					- WM sizing, evaluation for protection				
Societal											
Shelters - Comp Plan for Comm/Education				✓	✓		✓				
Shut off WM's - Peases / Crescent / Harbor Beach - Out of water - Protect Supply - Volume of Folks							✓	✓			
Fiscal Impacts → - Values, Property Taxes - loss of homes											
Potential Loss of Events, Lifestyle - Businesses			✓	✓	✓	✓		✓			
- Historical Landmark Impacts		- Assessment of Critical Historical Landmarks - See what measures can be taken									
Environmental											
WM - Pease's RT / Point Connett			✓	✓	✓	✓		✓			
Well No. 3 WM Crossing			✓	✓	✓	✓		✓			
Review Local Regulations - Flooding - For Design											
- Invasive Species, Loss of Indigenous Species / Without significant effect on shellfish?											
Eel Pond Force main & WM Relocation			✓	✓	✓	✓	✓	✓	✓		
Water front (Piers, Shellfish) Focal Point											

- RT 6
- RT 195 (5)
- Brant Island
- Angelika
- Acoast
- Mattapoisett Neck Rd.

Emergency Personnel do not go out after certain point

Lack of WM's
- in areas - droughts result in no available supply

- High School - Big Facility - Food Prep

- State of Structures Pets, in Town want to do some improvements. enhancements to control wave action

2
3
4
1

- Impacts of Evacuation cash flow Financial Implications as well as long term recovery

Grant Writer in Town to assist Rule of Mickey

- All Agencies to list grants we have worked with

Sewer in area where there's septic

Water Recharge Study - Estuary Program

- Buzzard's Bay Program

smaller env. agencies may help with grants for this

Rare Endangered Species

Study - Climatic Changes on Animal / Plant Species
- provide buffer from Coastal Events
- Quality of life - WQ grant received - need to evaluate in more detail

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.com

H-M-L priority for action over the Short or Long term (and Ongoing)
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Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

	Features	Location	Ownership	V or S					Priority H-M-L	Time Short Long Ongoing
	Infrastructural									
1)	Town Hall	T	T	V	Floods	Hurricanes	SLR		H	
2)	Mattapoisett Neck Fire Protection (Brandt Isld &	T	T	V	"	"	"	Drought	M	
3)	Wharves	T	T	V	"	"	"		L	
4)	Molly's Cove Culvert	T	T	V	"	"	"		H	Emergency Access
5)	Drinking Water Wells	T	T	V&S	Cat 3 - Floods	"	"	Drought	M	
6)	IMPACTED ROADS	T	T	V	Floods	"	"	Drought & Heat wave	H	
	Societal									
1)	#3 River Crossing Water Main (possible contamination)	T	T	V	Floods	Hurricanes		Drought	H	
2)	Drought - Wells Brandt Isld & Neck Rds. (water main)	T	Private	V	Floods	Hurricanes		Drought	H	Fire Access
3)	MRV Straight	T	T	V&S	Cat 4 - Floods	Hurricanes	SLR		M	
4)	Pease's Pt Water main	T	T	V	Floods	Hurricanes	SLR		H	
	Environmental									
1)	Eel Pond Force @ outlet & Foot Bridge	T	T	V	Floods	Hurricanes	SLR	~~Fire~~	H	
2)	Tree Program	T	T&P	V	*	"		Drought	H	
3)	Coastal Impacts on homes & Boat Yards	T	T&P	V	Floods	"	SLR		H	

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.com

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

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

Features	Location	Ownership	V or S	Hurricanes	Sea Level Rise	Flood	Wind + Wildfires	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Loss of Drinking WATER WELLS	NORTH RTE 6		V	✓	✓	✓		H	
Loss of Sewer Main to Fairhaven	Eel Pond		V	✓	✓	✓		H	
Town ① Hall, Library ② Schools ③	Village		V	✓	✓	✓		H	
STORM damage by flood waters									
Village Fire Threat	Village		V				✓	M	
Societal									
CONCERN THAT residents									
IN CERTAIN AREAS ARE endanger								H	
of loss of life + Property.	Along COAST		V	✓	✓	✓		H	
Pre-NOTICE before events	Town Wide							H	
Loss IN TOTAL TOWN PROPERTY VALUE	Town Wide							M	
Environmental									
Loss LONG TERM ENVIRONMENTAL									
PLANNING + PERMITTING for Changes	Town Wide							H	
loss of Forest + plant species	Town Wide								
Loss of PLANT diversity								M	
Increased incidence of disease due	Multi to invasives sp.							H	
Loss of wetlands due to heat	Multi							H	

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.com

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

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

Features	Location	Ownership	V or S	STORM SURGE	SEA Level Rise	Hurricane	Heat/Drought	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Pease's Point Water Main	SE	Town	✓	Storm Surge	sea level rise			H	
Eel Pond Force Main	SE	Town	✓	↓	↓			H	
#3 Water Main Crossing	North	Town	✓	↓	Erosion	✓		H	
1 Acushnet Rd. (Housing)	Center	State	✓	lack of Power ✓ → Home O²	✓	✓		H	
Town Hall	Center	Town	✓	✓	✓	✓		H	
Town Wharf	Center	Town	✓	✓	✓	✓		M	
Societal									
Shelter Operations includes	overall	everyone	✓	High		✓		High	Ongoing
Evacuation/Transportation/Communication (incl. to residents so they know the plan)									
food + water security + sanitation									
residents w/ complex medical conditions + needs)									
Shelter Access -> Flooding			✓						
Environmental									
Break Water	Harbor	town				✓			
Shellfish beds	everywhere		S	✓	✓	✓			

Appendix C

CRB Workshop Presentation Materials

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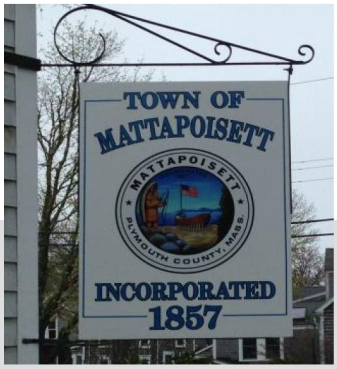

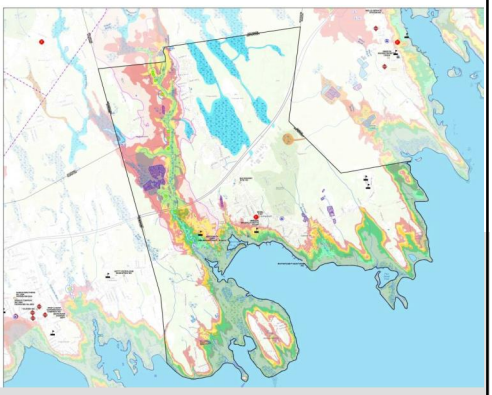

Community Resilience Building Workshop

presented at

The Town of Mattapoisett, Massachusetts

April 10, 2018 – 10:00 am

MVP Project Team

Kevin M. Flood

Kevin is the Water Practice Leader in Fuss & O'Neill's Water Environment and Natural Resources Practice Team that includes water, wastewater, and water resources. He has almost 30 years of water, wastewater and water resources experience that includes numerous studies, designs and construction projects. He has worked in Mattapoisett on Climate change Studies, Critical Infrastructure and Design of WM Relocation at Pease's Point.

Kurt A. Mailman

Kurt is a Vice President. He manages diverse wastewater and stormwater management projects from evaluation of pumping systems to capital improvement plans, funding, assessment, and design of challenging hydraulic conveyance systems and training of operations staff. He is the Client Manager for the Town of Mattapoisett and has also been involved in all projects completed.

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Fuss & O'Neill Overview

At Fuss & O'Neill, we place great emphasis on collaboration; both within the company and with our clients. We are guided by what is best for the client and the project – in identifying client champions, naming project leaders, building project teams, and providing responsive service and quality deliverables.

We strive to partner with our clients to understand their businesses and to be stewards of their resources as if they were our own, and aim to develop services and solutions that anticipate evolution of their unique business needs.

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Workshop Overview

Introductions

Brief Overview of MVP Program

Location Details

Definitions / Terminology

- Recent Climate Predictions - Commonwealth of MA

Recent Studies Completed

Introduction of Core Team

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Core Team Introductions

Mike Gagne' - Town Administrator

Henri Renauld - Water Superintendent

Barry Denham - Highway Surveyor

Andrew Murray - Fire Chief

William Nicholson - Business Advisor - Water Dept..

Elizabeth Leidhold - Conservation Agent

Mary Lyons - Emergency Planning

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Municipal Vulnerability Preparedness (MVP)

Climate MVP Communities: local impacts, local action

1. Engage Community
2. Identify CC impacts and targets
3. Complete Vulnerability Assessment
4. Prioritize Vulnerability
5. Take Action

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Mattapoisett MVP Program - $16,000

- Grant Supports Climate Change Vulnerability Assessments and Resiliency Planning
  - Comprehensive Approach
    - Infrastructure - Critical Facilities
    - Societal - Elderly, Faith Based Org., Neighborhoods, Shelters,
    - Environmental - Beaches, Dunes, State Parks, Open Space, Trees
  - Scope and Process Use the Guidance in the Community Resilience Building Workshop Guide
  - Municipalities That Complete This Process Will Be Designated Municipal Vulnerability Preparedness (MVP) Municipalities

MVP Designation May Lead to Enhanced Standing in Future Funding Opportunities

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MVP Program

- Community Resilience Building
  - Hold Workshop to Engage Stakeholders in the Community
  - Identify Impacts Using Available Data, Including New Climate Projections Developed by the Commonwealth
  - Identify Community Strengths and Vulnerabilities from Data and Community Input
  - Prioritize Actions - Conclude Workshop
  - Prepare and Review Report and Priorities
  - Move Forward
    - Identify and Monitor Funding Opportunities for Recommendations
    - Incorporate Plan into Other Local Planning Efforts

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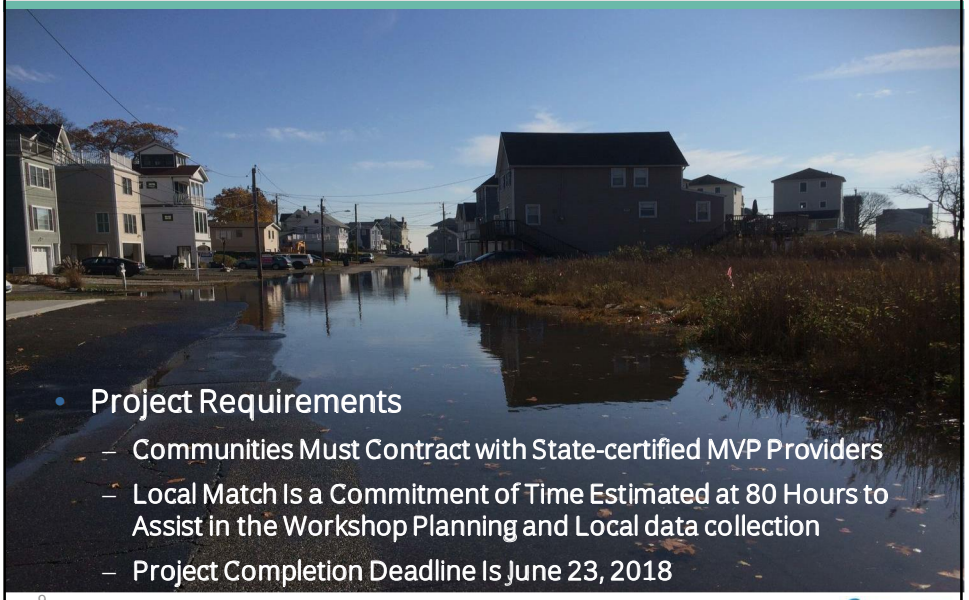
MVP Program



- Project Requirements
  - Communities Must Contract with State-certified MVP Providers
  - Local Match Is a Commitment of Time Estimated at 80 Hours to Assist in the Workshop Planning and Local data collection
  - Project Completion Deadline Is June 23, 2018

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MVP Action Grant "NEW"

- Grant supports priority actions identified at Community Resilience Building Workshop
- $10,000 - $400,000 available
- Local match of 25% - can be in-kind
- Request for Responses anticipated in a few weeks
- Application deadline projected for mid-May
- Project award early June
- Next funding round anticipated Fall 2018

Only those communities which have completed the CRB workshop are eligible to apply

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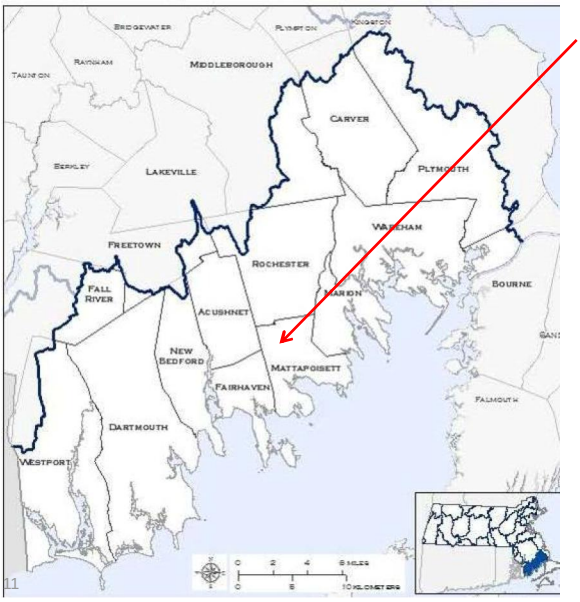
Location and Data for Region



Mattapoisett is in the Buzzards Bay Basin

2,500 homes

App. 6,100 people

24.2 Square Miles

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Terminology

Climate Change

The Change in Usual Climate Conditions

- Rising Temperature
- Changing Precipitation/ Rainfall Amount and Intensity
- Sea Level Rise

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Town of Mattapoisett - Buzzards Bay Basin - Temperatures

Buzzards Bay Region	Observed Baseline 1971-2000	Projected Change in 2030s	Projected Change in 2050s	Projected Change in 2070s	Projected Change in 2090s
Average Annual Temperature (°F)	50.67	+1.93 to +3.63	+2.56 to +5.85	+2.96 to +8.49	+3.28 to +10.34
Annual Days with Maximum Temperature over 90°F (Days)	4.41	+3.20 to +9.23	+4.20 to +20.84	+5.88 to +39.91	+8.16 to +55.00
Annual Days with Minimum Temperature below 0°F (Days)	1.7	-0.32 to -0.75	--0.4 to --0.9	-0.48 to --0.89	-0.45 to --0.94

- The Buzzards Bay basin is expected to experience increased average temperatures throughout the 21st century. Maximum and minimum temperatures are also expected to increase throughout the end of the century. These increased temperature trends are expected for annual and seasonal projections.
- The Buzzards Bay basin is also expected to experience an increase in days with daily maximum temperatures over 90 °F, 95 °F, and 100 °F.
  - Annually, the Buzzards Bay basin is expected to see days with daily maximum temperatures over 90 °F increase by 4 to 21 more days by mid-century, and 8 to 55 more days by the end of the century.
- Seasonally, winter, spring and fall are expected to see the largest decreases in days with daily minimum temperatures below 32 °F

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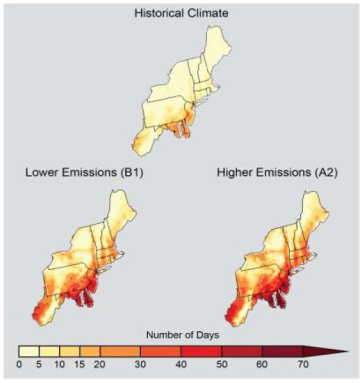
Impacts of Rising Temperature

Impacts from Increasing Temperature

- Impacts on Health including Plants, Animals and Ecosystems (forests and wetlands)
- Increased Weed and Pest Pressures - longer growing seasons and warmer winters
- Fish species and shell fish migration northward to cooler water temperatures
- Increasing number of days of Extreme Heat (>90° F)
  - Greater chance for heat related illness
  - Drought conditions affect crop production, harvest and livestock



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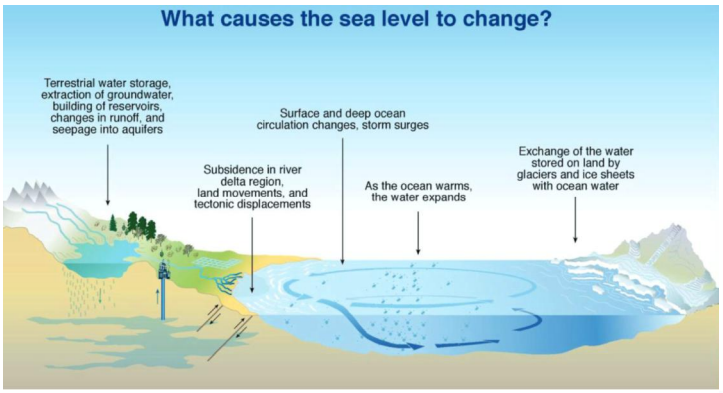
Town of Mattapoisett - Buzzards Bay Basin – Sea Level Rise

Sea level rise is caused by

- Loss of land based ice
- Thermal expansion of oceans (with increased temperature)
- Land subsidence



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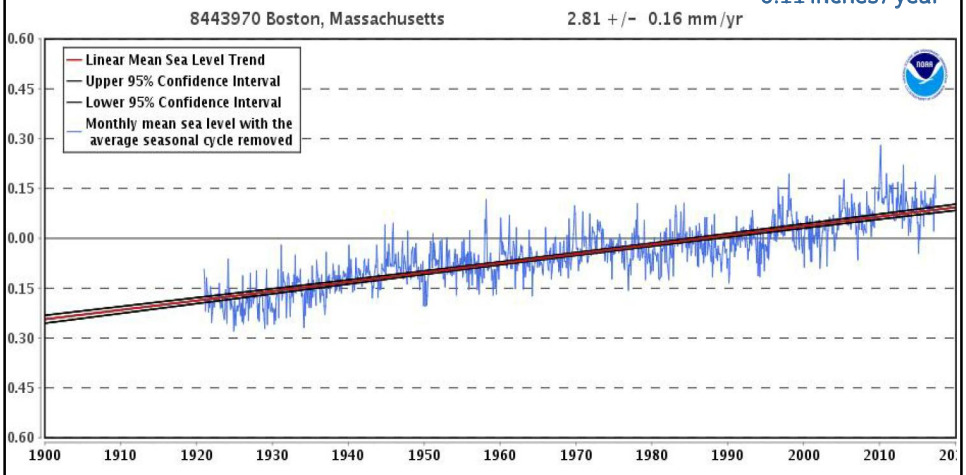
Sea Level Rise - Historical Data

Historical Sea Level Rise

0.11 inches / year



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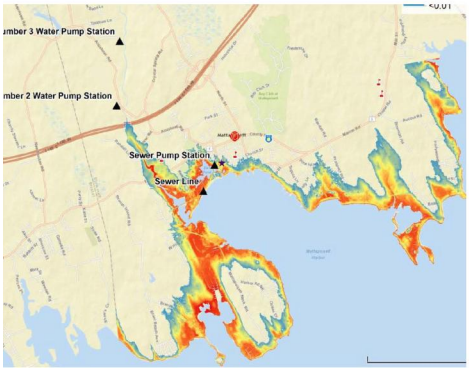
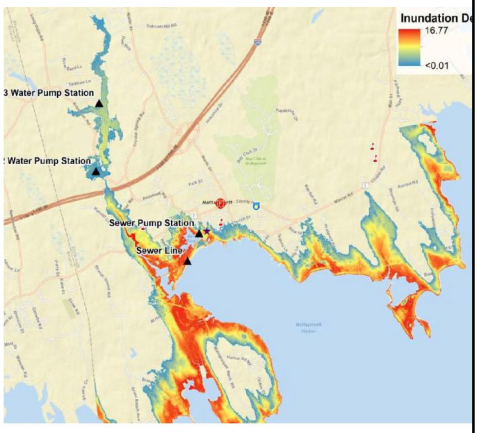
Impacts of Sea Level Rise

Inundation for Category 2 Storm with No Sea Level Rise





Inundation for Category 2 Storm with 2 Ft. of Sea Level Rise

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Town of Mattapoisett - Buzzards Bay Basin - Precipitation

Buzzards Bay Basin	Observed Baseline 1971-2000	Projected Change in 2030s	Projected Change in 2050s	Projected Change in 2070s	Projected Change in 2090s
Total Annual Precipitation (Inches)	47.76	-0.68 to +3.67	+0.33 to +5.43	+0.70 to +6.13	+0.28 to +6.76
Annual Consecutive Dry Days (Days)	17.49	-0.43 to +1.86	-0.28 to 2.26	-0.65 to +3.31	-0.21 to +4.08

- Seasonal projections for total precipitation are variable for the Buzzards Bay basin.
  - The winter season is expected to experience the greatest change with an increase of 0-15% by mid-century, and 1-31% by end of century.
  - Projections for the summer and fall seasons are more variable
- The Buzzards Bay basin is expected to see a slight decrease to an increase in consecutive dry days throughout this century.
  - The fall and summer seasons are expected to continue to experience the highest number of consecutive dry days.

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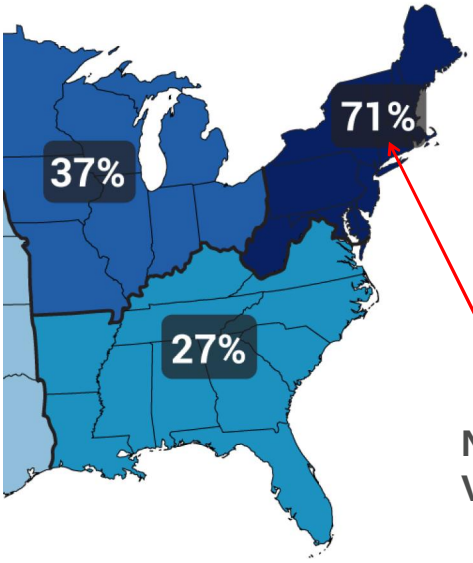
Impacts of Precipitation



Percent increase in the amount of precipitation falling in very heavy events (defined as the heaviest 1% of all daily events) from 1958 to 2012.

Northeast has the highest Variation in the Country

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Recent Studies Completed

- CZM Grant - Evaluation of Critical Infrastructure
  - Critical Water and Sewer Facilities
    - *Eel Pond Wastewater Pump Station, Eel Pond Sewer Force Main , Well No. 2 Facility, Well No. 3 Facility, Well No. 4 Facility, Water Main Crossing on Route 6 , Regional Water Treatment Facility , Sewer Crossing – Phoenix Rail Trail*
    - Identified Vulnerabilities at various locations which have resulted in other work being completed - Well No. 2 Facility, Eel Pond Force Main and Pump Station
  - Critical Water Crossing - Pease's Point and Point Connett
    - *Evaluated Options and Recommended Horizontal Directional Drilling of New Water Main , New Sewer Force Main to protect against storms and exposure of piping*
    - Identified Vulnerabilities which have resulted in Water Main Design for Relocation
- Hazard Mitigation Plan - Developed by the Town - Maps

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Today's Workshop Action Items

- Develop List of Overall Priorities
- Break out Groups and Evaluations using Risk Matrix , Available Mapping and past Experience /Knowledge
- Summarize Conclusions

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Risk Matrix

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.com

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

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

Features	Location	Ownership	V or S					Priority H - M - L	Time Short Long Ongoing
Infrastructural									
Societal									
Environmental									

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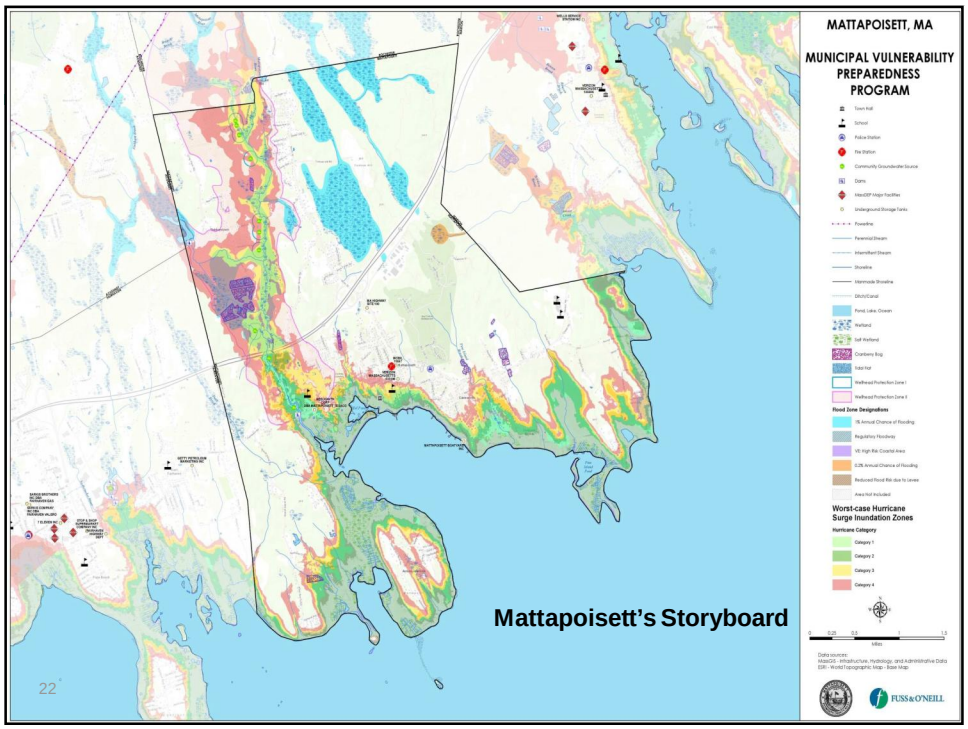

CRB Workshop - Details

- Assignment of Table Teams
- Using Maps as a Storyboard and Reference
- Development of Risk Matrix - Infrastructure, Environmental and Societal - See Handout provided
- Lunch
- Table Team Reporting List Priorities for 3 Areas
- Final Risk Matrix and Prioritization – Consensus among the Groups
- Conclusion

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