

# Town of Fairhaven Climate Vulnerability Assessment

FY23 MVP Action Grant  
Community Meeting #2  
May 31<sup>st</sup>, 2023

# Agenda

## 1. Overview of Sea Level Rise and Storm Model

5 min

## 2. Present and Future Flood Maps

10 min

## 3. Infrastructure Risk Assessment

10 min

## 4. Natural Resources Risk Assessment

5 min

## 5. Breakout Tables

25 min





# Project Team

- **Municipal Lead: Town of Fairhaven, Bruce Webb**
  - [conservation\\_agent@fairhaven-ma.org](mailto:conservation_agent@fairhaven-ma.org)
- **Steering Committee:**
  - Fairhaven Public Works Department
  - Fairhaven Highway Department
  - Fairhaven Conservation Commission
  - Fairhaven Emergency Services
  - Fairhaven Economic Development Committee
  - Fairhaven Planning Board
- **Technical Work: Woods Hole Group**
  - Contact: [cofsthun@woodsholegroup.com](mailto:cofsthun@woodsholegroup.com)
- **Community Engagement: Public Invitation**



# Project Objectives

- Provide data on likely future flooding scenarios
- Identify potential flooding impacts to public infrastructure
- Identify potential flooding impacts to natural resources
- Prioritize assets by level of risk
- Produce high-quality maps/graphics
- Public outreach and education






# Coastal Flood Hazards

- Hurricane of 1938
- Hurricane Carol (1954)
- Hurricane Bob (1991)
- Hurricane Sandy (2012)
- Winter Storm of Dec 23, 2022







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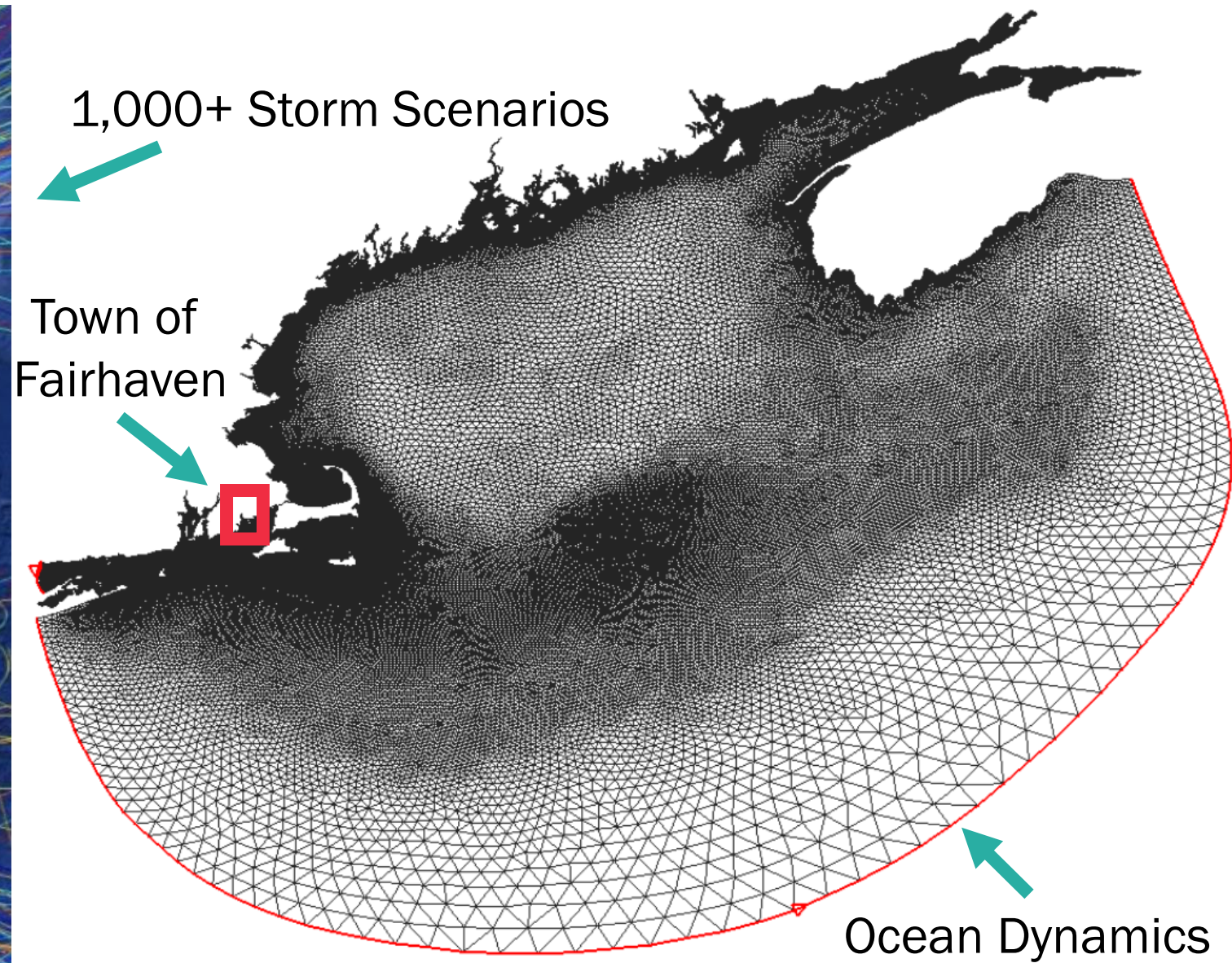
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# Massachusetts Flood Risk Model



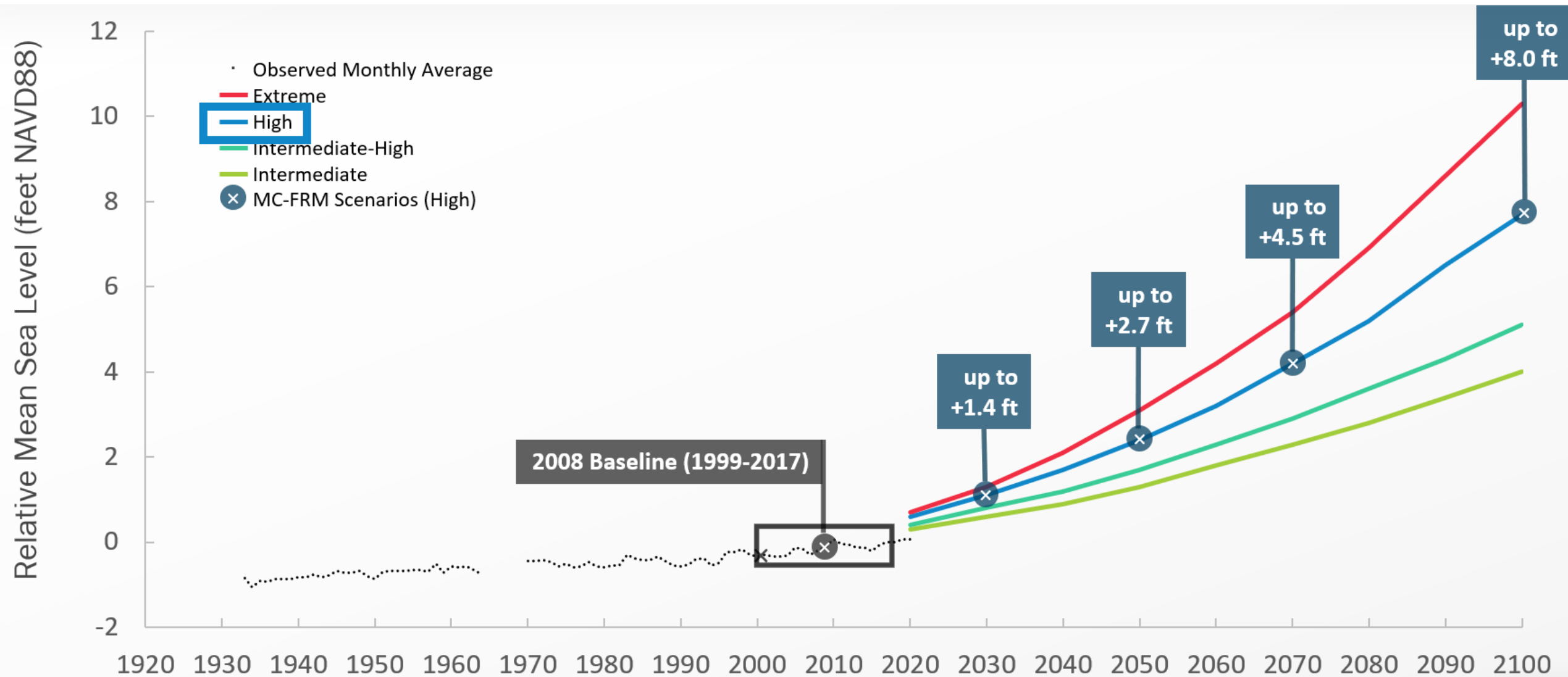
# Flood Probability Modeling – MC-FRM

*Massachusetts Coastal Flood Risk Model*





# Massachusetts Sea Level Rise Projections



- › Projections from Resilient MA (DeConto and Kopp, 2017)
- › Labels in flags are relative sea level rise from baseline year of 2008 (1999-2017) in MC-FRM
- › SLR Projections are regionally representative of Fall River to Truro MA



The background is a teal-colored map showing a dense street grid. Overlaid on this grid are several white symbols: a horizontal line at the top, a plus sign, a solid dot, and an open circle on the left side, and several small circles at street intersections throughout the map. 

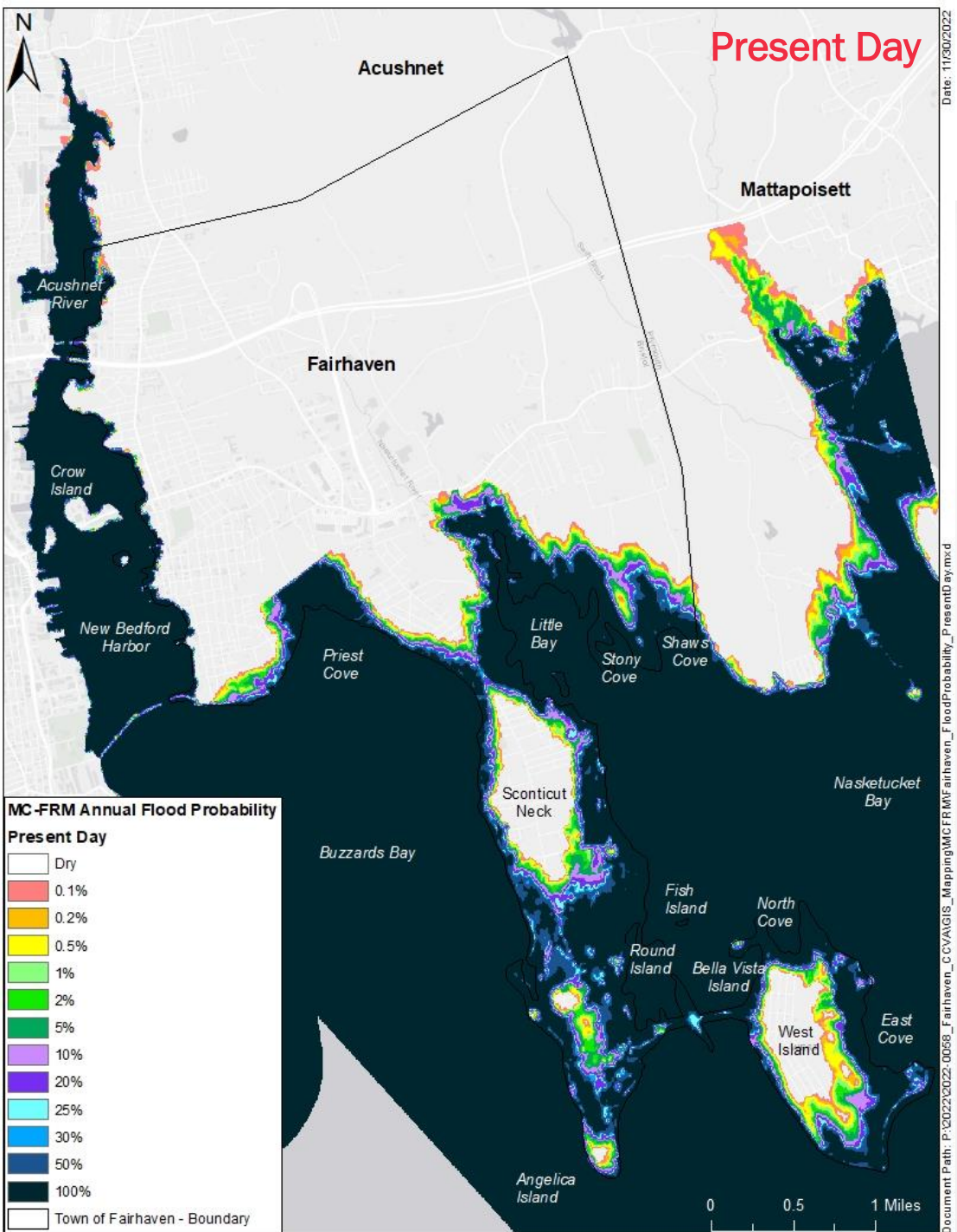
# Flood Probability Maps



# Annual Flood Probability Extent

Present Day

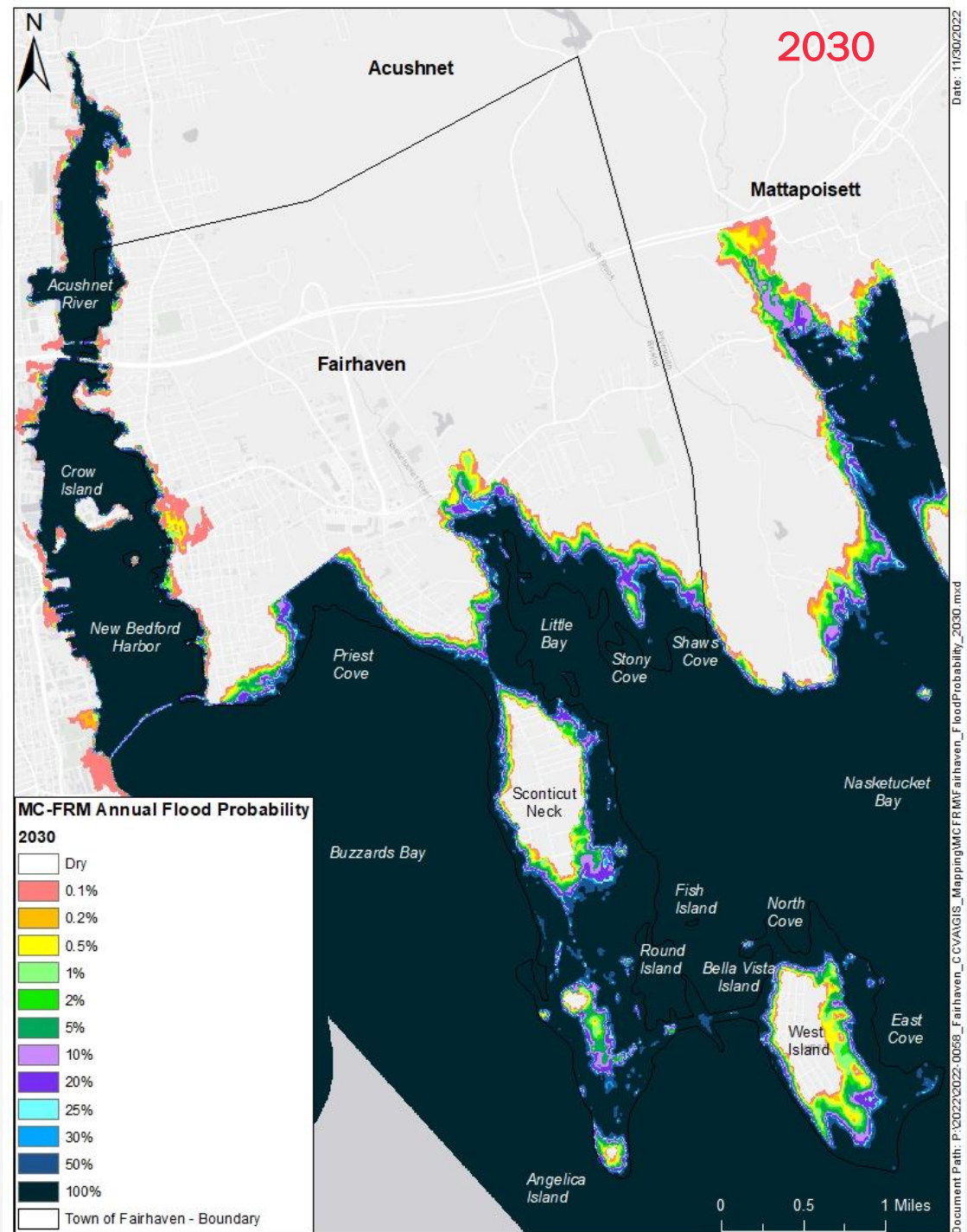
Assets	Present Day	
	1-Year Storm	100-Year Storm
Roadway	4.1 miles	18.5 miles
Trails	164 ft	0.4 miles
All Buildings	266	1,298
Schools	0	0
Nursing Home	0	0
Pump Stations	4	12
Historic Sites	3	3
Open Space (Beaches & Parks)	10	11
Water Access (Town Landings)	18	19
Sewer Manholes	37	239
Stormwater Manholes	10	76
Catch Basins	45	262
Stormwater Outfalls	67	99
DEP 21E, AUL, and UST Sites	2	3





# Annual Flood Probability Extent 2030

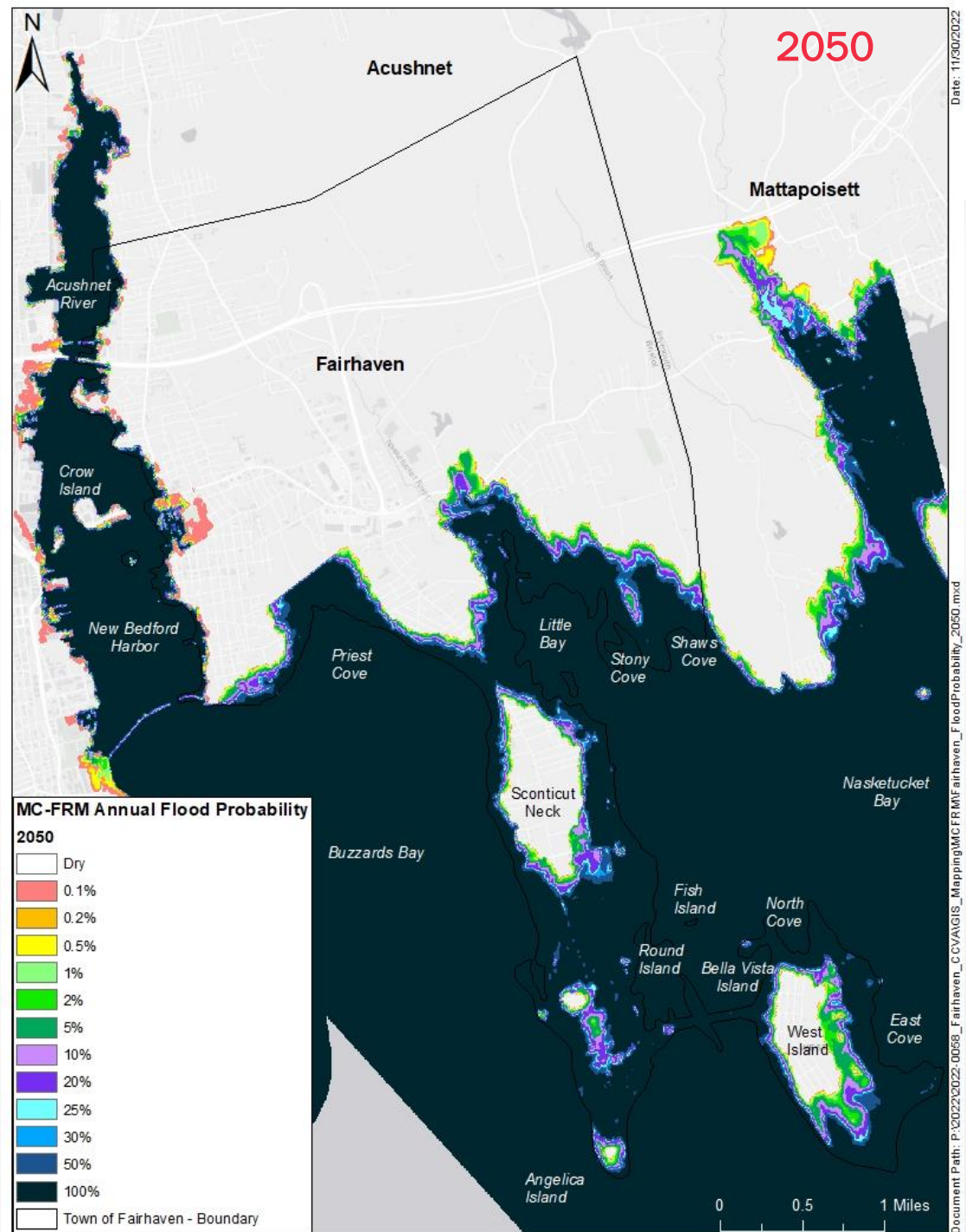
Assets	2030	
	1-Year Storm	100-Year Storm
Roadway	7.1 miles	20.4 miles
Trails	417 ft	0.4 miles
All Buildings	433	1,479
Schools	0	0
Nursing Home	0	0
Pump Stations	6	12
Historic Sites	3	3
Open Space (Beaches & Parks)	11	11
Water Access (Town Landings)	19	19
Sewer Manholes	76	267
Stormwater Manholes	20	93
Catch Basins	95	291
Stormwater Outfalls	81	109
DEP 21E, AUL, and UST Sites	2	4





# Annual Flood Probability Extent 2050

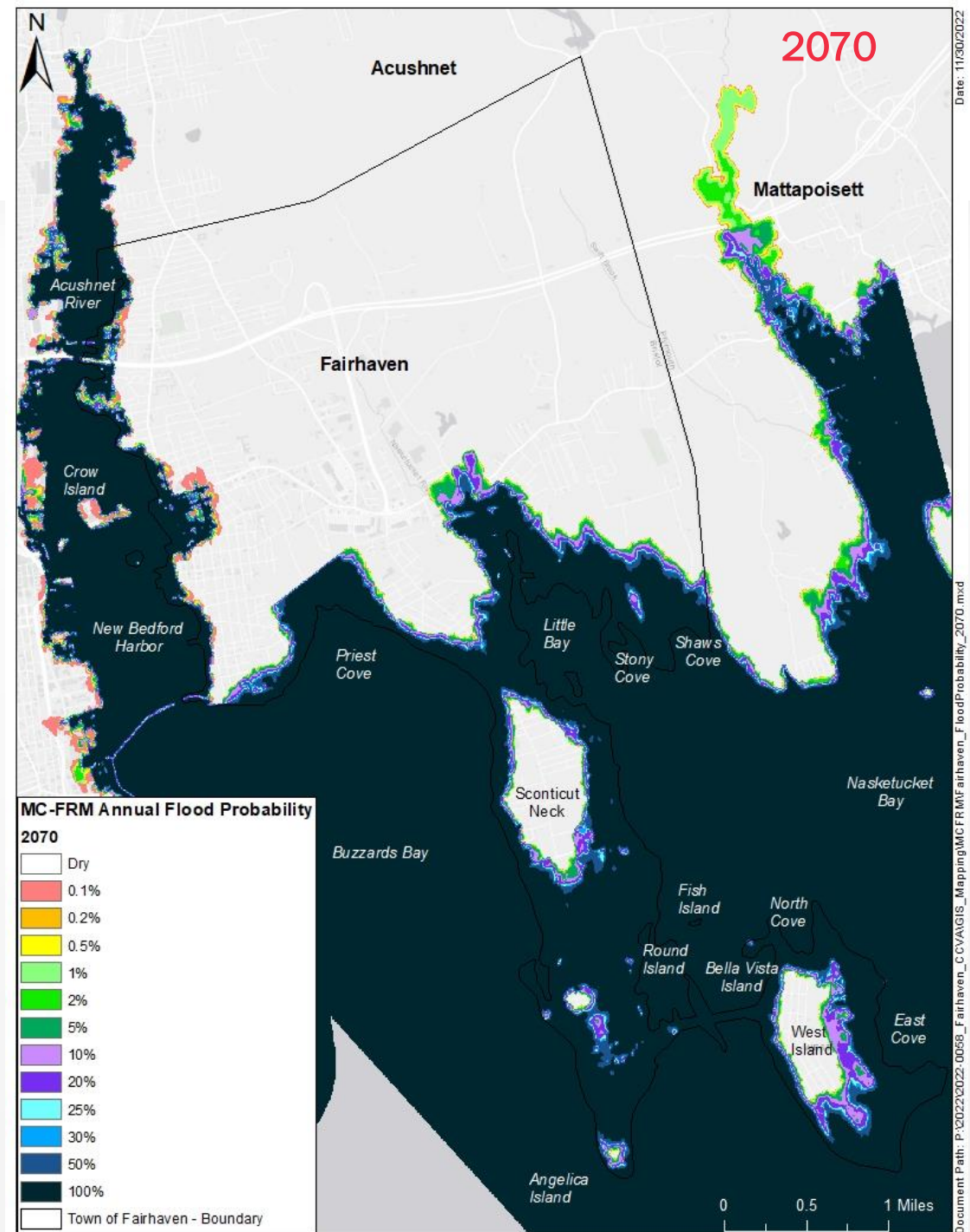
Assets	2050	
	1-Year Storm	100-Year Storm
Roadway	10.9 miles	23.7 miles
Trails	767 ft	0.5 miles
All Buildings	730	1,787
Schools	0	0
Nursing Home	0	0
Pump Stations	6	14
Historic Sites	3	3
Open Space (Beaches & Parks)	12	12
Water Access (Town Landings)	19	19
Sewer Manholes	137	335
Stormwater Manholes	60	154
Catch Basins	170	338
Stormwater Outfalls	90	113
DEP 21E, AUL, and UST Sites	4	7





# Annual Flood Probability Extent 2070

Assets	2070	
	1-Year Storm	100-Year Storm
Roadway	16.8 miles	28.4 miles
Trails	1,338 ft	0.6 miles
All Buildings	1,194	2,227
Schools	0	0
Nursing Home	0	0
Pump Stations	11	14
Historic Sites	3	3
Open Space (Beaches & Parks)	12	12
Water Access (Town Landings)	19	19
Sewer Manholes	248	420
Stormwater Manholes	146	215
Catch Basins	329	544
Stormwater Outfalls	96	121
DEP 21E, AUL, and UST Sites	7	8

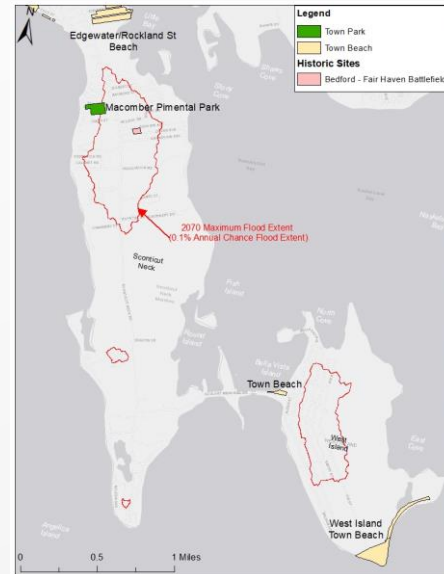
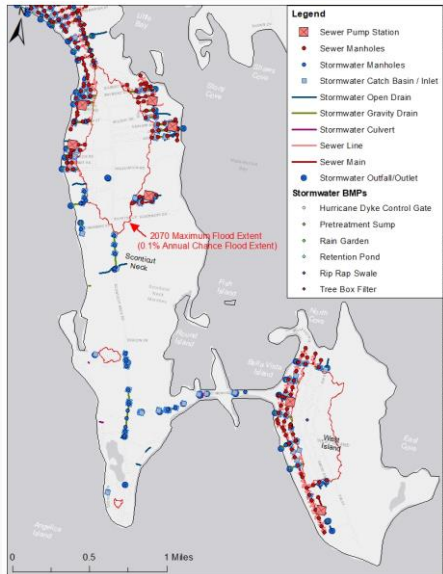
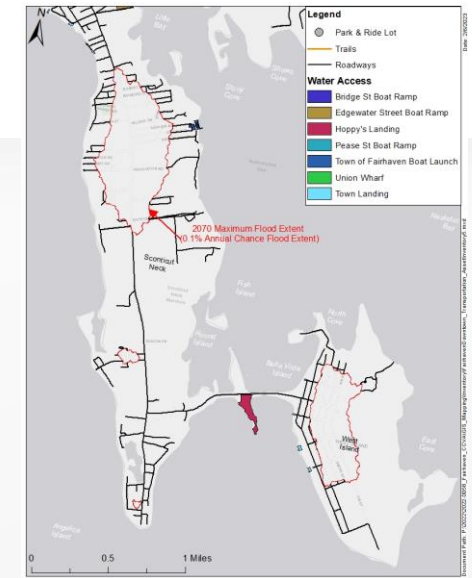
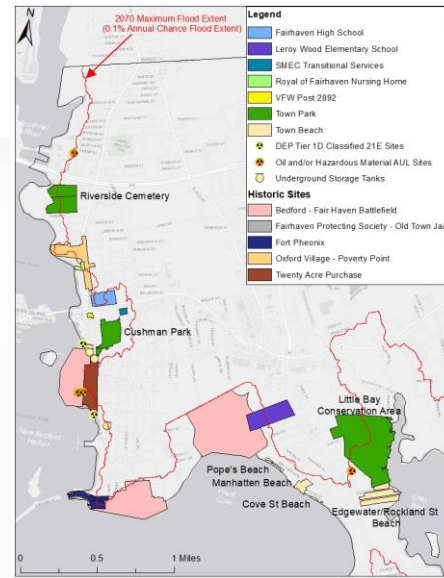
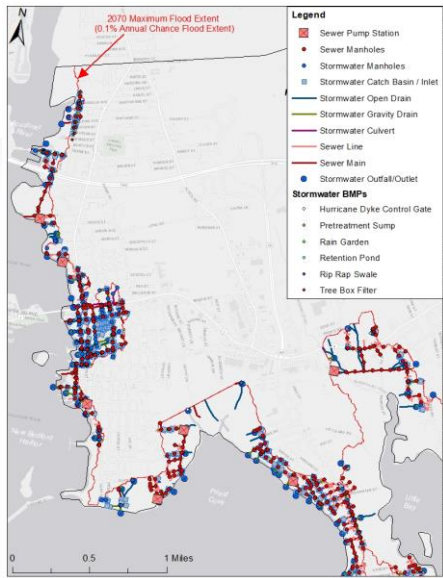






# Risk Assessment





# Critical Infrastructure

- Public Infrastructure
- Open Space
- Historical Sites
- Utility Infrastructure
- Transportation Infrastructure



# Consequence of Flooding

Example:

Rating	Direct Impacts			Indirect Impacts		
	Service Loss Extent	Service Loss Duration	Cost of Damage	Public Safety & Emergency Services	Economic Activity	Public Health & Environment
4	Town	>30 d	>\$10M	Very High	Very High	Very High
3	Neighborhoods	15-30 d	\$1M-\$10M	High	High	High
2	Neighborhood	8-14 d	\$100K-\$1M	Moderate	Moderate	Moderate
1	Locality	1-7 d	\$10K-\$100K	Low	Low	Low
0	Property	<1 d	<\$10K	None	None	None



# Risk Scoring

## Critical Infrastructure

Name	Type	Critical Elevation (ft NAVD88)	Critical Elevation Description	Consequence Score	Annual Flood Probability			Risk Score (0 – 5)			1% Storm Flood Depth		
					2030	2050	2070	2030	2050	2070	2030	2050	2070
Abbey Street Pump Station	Pump Station	5.03	Minimum ground surface elevation.	42%	5	5	5	2.08	2.08	2.08	7.07	9.57	11.77
Boulder Park Pump Station	Pump Station	4.90	Minimum ground surface elevation.	42%	5	5	5	2.08	2.08	2.08	7.10	9.50	11.70
Shore Drive Pump Station	Pump Station	5.65	Wet well elevation.	42%	5	5	5	2.08	2.08	2.08	6.35	8.65	10.85
Weybridge Road Pump Station	Pump Station	6.01	Wet well elevation.	42%	5	5	5	2.08	2.08	2.08	5.89	8.29	10.49
Town of Fairhaven Boat Launch	Water Access	7.15	Average ground surface elevation.	42%	5	5	5	2.08	2.08	2.08	4.85	7.15	9.35
Bernese Street Pump Station	Pump Station	8.50	Minimum ground surface elevation.	42%	5	5	5	2.08	2.08	2.08	3.40	5.80	8.00
Sunrise Court Pump Station	Pump Station	9.21	Wet well elevation.	42%	5	5	5	2.08	2.08	2.08	2.89	5.19	7.49
Manhattan Avenue Pump Station	Pump Station	9.32	Minimum ground surface elevation.	42%	5	5	5	2.08	2.08	2.08	2.88	5.28	7.48
Camel Street Pump Station	Pump Station	9.38	Minimum ground surface elevation.	42%	5	5	5	2.08	2.08	2.08	2.52	4.72	6.92
Rocky Point Road Pump Station	Pump Station	8.96	Minimum ground surface elevation.	42%	5	5	5	2.08	2.08	2.08	2.54	4.44	6.64
Causeway Road Pump Station	Pump Station	13.45	Minimum ground surface elevation.	42%	0.2	1	5	0.08	0.42	2.08	0.00	0.35	2.55
Pilgrim Avenue Pump Station	Pump Station	5.02	Wet well elevation.	42%	0	5	5	0.00	2.08	2.08	0.00	0.38	2.48
Taber Street Pump Station	Pump Station	6.73	Wet well elevation.	42%	0	0	5	0.00	0.00	2.08	0.00	0.00	0.77
Union Wharf	Water Access	3.86	Wharf ground surface elevation.	38%	5	5	5	1.88	1.88	1.88	0.84	1.74	3.64
Hoppy's Landing	Water Access	5.02	Average ground surface elevation.	29%	5	5	5	1.46	1.46	1.46	6.68	8.68	10.88
Cushman Park	Open Space	6.32	Average ground surface elevation.	29%	0	0	5	0.00	0.00	1.46	0.00	0.00	1.08
Fort Phoenix	Open Space	2.81	Average ground surface elevation.	25%	5	5	5	1.25	1.25	1.25	9.19	11.49	13.79
Riverside Cemetery	Open Space	3.54	Minimum elevation of most seaward access road.	25%	5	5	5	1.25	1.25	1.25	1.06	1.96	3.96
Macomber Pimental Park	Open Space	12.84	Average ground surface elevation.	21%	0.2	5	5	0.04	1.04	1.04	0.00	1.46	3.76
Railroad Ave Pump Station	Pump Station	13.57	Minimum ground surface elevation.	42%	0	1	2	0.00	0.42	0.83	0.00	1.13	3.23
Edgewater/Rockland Street Beach	Open Space	2.16	Average ground surface elevation.	13%	5	5	5	0.63	0.63	0.63	10.04	12.54	14.74
Edgewater Street Boat Ramp	Water Access	2.41	Average ground surface elevation.	13%	5	5	5	0.63	0.63	0.63	9.79	12.39	14.59
Raymond Street Landing/Austria Ave Landing	Water Access	2.51	Average ground surface elevation.	13%	5	5	5	0.63	0.63	0.63	9.49	11.89	14.19
Winsegansett Street Landing	Water Access	1.93	Average ground surface elevation.	13%	5	5	5	0.63	0.63	0.63	9.67	11.67	13.87
Town Beach	Open Space	2.51	Average ground surface elevation.	13%	5	5	5	0.63	0.63	0.63	9.29	11.39	13.59
Calumet Street Landing	Water Access	3.04	Average ground surface elevation.	13%	0.2	5	5	0.03	0.63	0.63	8.86	11.16	13.46
Gull Island Road Landing	Water Access	2.16	Average ground surface elevation.	13%	5	5	5	0.63	0.63	0.63	9.14	11.14	13.44
Bonney Street Landing	Water Access	3.27	Average ground surface elevation.	13%	5	5	5	0.63	0.63	0.63	8.83	11.23	13.43
Blue Point Road Landing	Water Access	3.49	Average ground surface elevation.	13%	0.2	5	5	0.03	0.63	0.63	8.41	10.51	12.71
West Island Town Beach	Open Space	3.46	Average ground surface elevation.	13%	5	5	5	0.63	0.63	0.63	8.14	10.14	12.44
Jerusalem Road Landing	Water Access	4.33	Average ground surface elevation.	13%	2	5	5	0.25	0.63	0.63	7.57	9.87	12.17
Sedgewick Street Landing	Water Access	4.68	Average ground surface elevation.	13%	0.1	5	5	0.01	0.63	0.63	7.22	9.52	11.82
Bernese Street Landing	Water Access	5.19	Average ground surface elevation.	13%	5	5	5	0.63	0.63	0.63	6.71	9.11	11.41
Fishermans Road Landing	Water Access	4.94	Average ground surface elevation.	13%	0	5	5	0.00	0.63	0.63	6.36	8.46	10.66
Little Neck Road Landing	Water Access	5.45	Average ground surface elevation.	13%	0	5	5	0.00	0.63	0.63	6.15	8.25	10.45
Hathaway Street Landing	Water Access	6.28	Average ground surface elevation.	13%	5	5	5	0.63	0.63	0.63	5.82	8.22	10.42
Briercliff Road Landing	Water Access	7.31	Average ground surface elevation.	13%	5	5	5	0.63	0.63	0.63	4.59	6.89	9.19
Bridge St Boat Ramp	Water Access	2.47	Average ground surface elevation.	13%	5	5	5	0.63	0.63	0.63	2.03	3.03	5.03
Little Bay Conservation Area	Open Space	12.92	Average ground surface elevation.	13%	0.5	5	5	0.06	0.63	0.63	0.00	2.08	4.18
Pease St Boat Ramp	Water Access	3.80	Average ground surface elevation.	13%	5	5	5	0.63	0.63	0.63	0.90	1.80	3.70
Cove St Beach	Open Space	1.93	Average ground surface elevation.	8%	5	5	5	0.42	0.42	0.42	10.07	12.57	14.77
Pope's Beach	Open Space	2.37	Average ground surface elevation.	8%	5	5	5	0.42	0.42	0.42	9.63	12.23	14.33
Bedford - Fairhaven Battlefield	Historic Site	2.81	Average ground surface elevation.	8%	5	5	5	0.42	0.42	0.42	9.59	11.99	14.09
Knollmere Beach	Open Space	3.27	Average ground surface elevation.	8%	5	5	5	0.42	0.42	0.42	8.83	11.33	13.53
Manhattan Beach	Open Space	6.57	Average ground surface elevation.	8%	5	5	5	0.42	0.42	0.42	5.73	8.03	10.23
Oxford Village - Poverty Point	Historic Site	14.08	Average ground surface elevation.	8%	0.1	5	5	0.01	0.42	0.42	0.00	0.00	0.00
Twenty Acre Purchase	Historic Site	9.05	Average ground surface elevation.	8%	0.1	5	5	0.01	0.42	0.42	0.00	0.00	0.00
Fairhaven Protecting Society - Old Town Jail	Historic Site	7.35	Lowest building elevation.	21%	0	0	0.5	0.00	0.00	0.10	0.00	0.00	0.00
Middle Street Pump Station	Pump Station	8.38	Elevation of building threshold.	42%	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
SMEC Transitional Services	School	9.19	Lowest entrance elevation.	38%	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
VFW Post 2892	Club/Lodge	8.40	Loading dock elevation.	17%	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Fairhaven High School	School	6.83	Basement entrance elevation.	58%	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Royal of Fairhaven Nursing Home	Nursing Home	14.04	Elevation of AC Pad	50%	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
South Street Pump Station	Pump Station	10.23	Wet well elevation.	42%	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Park & Ride	Transportation	7.75	Average ground surface elevation.	13%	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00



# Risk Scoring

Critical Infrastructure

Name	Type	Critical Elevation (ft NAVD88)	Critical Elevation Description	Consequence Score	Annual Flood Probability			Risk Score (0 – 5)			1% Storm Flood Depth		
					2030	2050	2070	2030	2050	2070	2030	2050	2070
Abbey Street Pump Station	Pump Station	5.03	Minimum ground surface elevation.	42%	5	5	5	2.08	2.08	2.08	7.07	9.57	11.77
Boulder Park Pump Station	Pump Station	4.90	Minimum ground surface elevation.	42%	5	5	5	2.08	2.08	2.08	7.10	9.50	11.70
Shore Drive Pump Station	Pump Station	5.65	Wet well elevation.	42%	5	5	5	2.08	2.08	2.08	6.35	8.65	10.85
Weybridge Road Pump Station	Pump Station	6.01	Wet well elevation.	42%	5	5	5	2.08	2.08	2.08	5.89	8.29	10.49
Town of Fairhaven Boat Launch	Water Access	7.15	Average ground surface elevation.	42%	5	5	5	2.08	2.08	2.08	4.85	7.15	9.35
Bernese Street Pump Station	Pump Station	8.50	Minimum ground surface elevation.	42%	5	5	5	2.08	2.08	2.08	3.40	5.80	8.00
Sunrise Court Pump Station	Pump Station	9.21	Wet well elevation.	42%	5	5	5	2.08	2.08	2.08	2.89	5.19	7.49
Manhattan Avenue Pump Station	Pump Station	9.32	Minimum ground surface elevation.	42%	5	5	5	2.08	2.08	2.08	2.88	5.28	7.48
Camel Street Pump Station	Pump Station	9.38	Minimum ground surface elevation.	42%	5	5	5	2.08	2.08	2.08	2.52	4.72	6.92
Rocky Point Road Pump Station	Pump Station	8.96	Minimum ground surface elevation.	42%	5	5	5	2.08	2.08	2.08	2.54	4.44	6.64
Causeway Road Pump Station	Pump Station	13.45	Minimum ground surface elevation.	42%	0.2	1	5	0.08	0.42	2.08	0.00	0.35	2.55
Pilgrim Avenue Pump Station	Pump Station	5.02	Wet well elevation.	42%	0	5	5	0.00	2.08	2.08	0.00	0.38	2.48
Taber Street Pump Station	Pump Station	6.73	Wet well elevation.	42%	0	0	5	0.00	0.00	2.08	0.00	0.00	0.77
Union Wharf	Water Access	2.86	Wet well surface elevation.	28%	5	5	5	1.08	1.08	1.88	0.84	1.74	3.64
Hoppy's Landing									1.46		6.68	8.68	10.88
Cushman Park									1.46		0.00	0.00	1.08
Fort Phoenix									1.25	9.19	11.49	13.79	
Riverside Cemetery									1.25		1.06	1.96	3.96
Macomber Pimental Park									1.04		0.00	1.46	3.76
Railroad Ave Pump Station									0.83		0.00	1.13	3.23
Edgewater/Rockland Street Beach									0.63	10.04	12.54	14.74	
Edgewater Street Boat Ramp									0.63	9.79	12.39	14.59	
Raymond Street Landing/Austria /									0.63	9.49	11.89	14.19	
Winsegansett Street Landing									0.63	9.67	11.67	13.87	
Town Beach									0.63	9.29	11.39	13.59	
Calumet Street Landing									0.63	8.86	11.16	13.46	
Gull Island Road Landing									0.63	9.14	11.14	13.44	
Bonney Street Landing									0.63	8.83	11.23	13.43	
Blue Point Road Landing									0.63	8.41	10.51	12.71	
West Island Town Beach									0.63	8.14	10.14	12.44	
Jerusalem Road Landing									0.63	7.57	9.87	12.17	
Sedgewick Street Landing									0.63	7.22	9.52	11.82	
Bernese Street Landing									0.63	6.71	9.11	11.41	
Fishermans Road Landing									0.63	6.36	8.46	10.66	
Little Neck Road Landing									0.63	6.15	8.25	10.45	
Hathaway Street Landing									0.63	5.82	8.22	10.42	
Briercliff Road Landing									0.63	4.59	6.89	9.19	
Bridge St Boat Ramp									0.63	2.03	3.03	5.03	
Little Bay Conservation Area									0.63	0.00	2.08	4.18	
Pease St Boat Ramp	Water Access	3.80	Average ground surface elevation.	13%	5	5	5	0.63	0.63	0.63	0.90	1.80	3.70
Cove St Beach	Open Space	1.93	Average ground surface elevation.	8%	5	5	5	0.42	0.42	0.42	10.07	12.57	14.77
Pope's Beach	Open Space	2.37	Average ground surface elevation.	8%	5	5	5	0.42	0.42	0.42	9.63	12.23	14.33
Bedford - Fairhaven Battlefield	Historic Site	2.81	Average ground surface elevation.	8%	5	5	5	0.42	0.42	0.42	9.59	11.99	14.09
Knollmere Beach	Open Space	3.27	Average ground surface elevation.	8%	5	5	5	0.42	0.42	0.42	8.83	11.33	13.53
Manhattan Beach	Open Space	6.57	Average ground surface elevation.	8%	5	5	5	0.42	0.42	0.42	5.73	8.03	10.23
Oxford Village - Poverty Point	Historic Site	14.08	Average ground surface elevation.	8%	0.1	5	5	0.01	0.42	0.42	0.00	0.00	0.00
Twenty Acre Purchase	Historic Site	9.05	Average ground surface elevation.	8%	0.1	5	5	0.01	0.42	0.42	0.00	0.00	0.00
Fairhaven Protecting Society - Old Town Jail	Historic Site	7.35	Lowest building elevation.	21%	0	0	0.5	0.00	0.00	0.10	0.00	0.00	0.00
Middle Street Pump Station	Pump Station	8.38	Elevation of building threshold.	42%	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
SMEC Transitional Services	School	9.19	Lowest entrance elevation.	38%	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
VFW Post 2892	Club/Lodge	8.40	Loading dock elevation.	17%	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Fairhaven High School	School	6.83	Basement entrance elevation.	58%	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Royal of Fairhaven Nursing Home	Nursing Home	14.04	Elevation of AC Pad	50%	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
South Street Pump Station	Pump Station	10.23	Wet well elevation.	42%	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Park & Ride	Transportation	7.75	Average ground surface elevation.	13%	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00

1. 14 Sewer Pump Stations
2. Fairhaven Boat Launch
3. Union Wharf
4. Open Space Parks
  - Hoppy's Landing
  - Cushman Park
  - Riverside Cemetery
  - Fort Pheonix
  - Macomber Pimental Park



# Risk Scoring

## Transportation Infrastructure

Name	Type	Critical Elevation (ft NAVD88)	Critical Elevation Description	Consequence Score	Annual Flood Probability			Risk Score (0 – 5)			1% Storm Flood Depth		
					2030	2050	2070	2030	2050	2070	2030	2050	2070
HUTTLESTON AVENUE / ROUTE 6 (East)	Roadway	9.42	Lowest surface elevation along centerline.	58.33%	5	5	5	2.92	2.92	2.92	2.68	5.58	7.48
HUTTLESTON AVENUE / ROUTE 6 (West)	Roadway	5.52	Lowest surface elevation along centerline.	58.33%	0	1	5	0.00	0.58	2.92	0.00	0.08	1.98
SCONTICUT NECK ROAD	Roadway	4.59	Lowest surface elevation along centerline.	50.00%	5	5	5	2.50	2.50	2.50	7.61	10.01	12.21
MAIN STREET	Roadway	3.56	Lowest surface elevation along centerline.	50.00%	5	5	5	2.50	2.50	2.50	1.04	2.04	4.14
GREEN STREET	Roadway	3.43	Lowest surface elevation along centerline.	50.00%	0	0.1	5	0.00	0.05	2.50	0.00	0.00	3.97
GREEN STREET / BEACON STREET	Roadway	12.71	Lowest surface elevation along centerline.	50.00%	0.5	2	5	0.25	1.00	2.50	0.00	1.89	3.89
HOWLAND ROAD	Roadway	4.60	Lowest surface elevation along centerline.	50.00%	0.5	5	5	0.25	2.50	2.50	0.00	0.90	2.80
INTERSTATE 195	Roadway	5.18	Lowest surface elevation along centerline.	50.00%	0	5	5	0.00	2.50	2.50	0.00	0.32	2.32
WASHINGTON STREET	Roadway	6.42	Lowest surface elevation along centerline.	50.00%	0	0	5	0.00	0.00	2.50	0.00	0.00	0.98
EDGEWATER STREET	Roadway	1.56	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	10.64	13.24	15.44
SCOTT STREET	Roadway	2.15	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	9.95	12.55	14.65
SHAWMUT STREET	Roadway	3.05	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	9.15	11.85	14.05
BLUEPOINT ROAD	Roadway	2.18	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	9.72	11.82	14.02
STETSON AVENUE	Roadway	2.71	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	9.29	11.69	13.99
ALCOBIA DRIVE	Roadway	2.34	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	9.46	11.46	13.76
SHORE DRIVE	Roadway	2.76	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	9.24	11.54	13.74
SHAW COVE	Roadway	3.09	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	9.21	11.51	13.71
CALUMET ROAD	Roadway	2.85	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	9.15	11.35	13.65
WAPATMA LANE	Roadway	2.84	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	9.16	11.26	13.46
WIDEMARSH-BEACH WAY	Roadway	2.94	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	9.06	11.26	13.46
FREDERICK AVENUE	Roadway	3.36	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.64	11.04	13.44
LAWRENCE STREET	Roadway	3.49	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.61	11.21	13.31
BUIST AVENUE	Roadway	3.57	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.53	11.03	13.23
SCALLOP ROAD / BALSAM STREET	Roadway	3.09	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.71	10.91	13.11
OCEAN AVENUE	Roadway	3.40	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.60	10.90	13.10
AUSTRIA AVENUE	Roadway	3.77	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.23	10.73	13.03
MORAVIA AVENUE	Roadway	3.69	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.31	10.81	13.01
GRANDVIEW AVENUE	Roadway	3.56	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.44	10.74	12.94
EGYPT LANE / HYLAND STREET	Roadway	3.88	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.32	10.82	12.92
HATHAWAY STREET	Roadway	4.08	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.22	10.72	12.92
WINDSWEPT DRIVE	Roadway	3.39	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.61	10.71	12.91
KENNEDY COURT	Roadway	3.99	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.21	10.71	12.91
BELLA VIST ISL	Roadway	3.43	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.47	10.67	12.87
NONQUITT AVENUE	Roadway	3.93	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.17	10.77	12.87
SHORE DRIVE / GRANDVIEW AVENUE	Roadway	3.64	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.36	10.66	12.86
BAYSIDE STREET	Roadway	3.07	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.43	10.53	12.73
POINT STREET	Roadway	4.11	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.19	10.49	12.69
COTTONWOOD STREET	Roadway	3.61	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	8.29	10.39	12.69
EMERSON AVENUE	Roadway	4.04	Lowest surface elevation along centerline.	41.67%	5	5	5	2.08	2.08	2.08	7.96	10.36	12.66

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# Risk Scoring

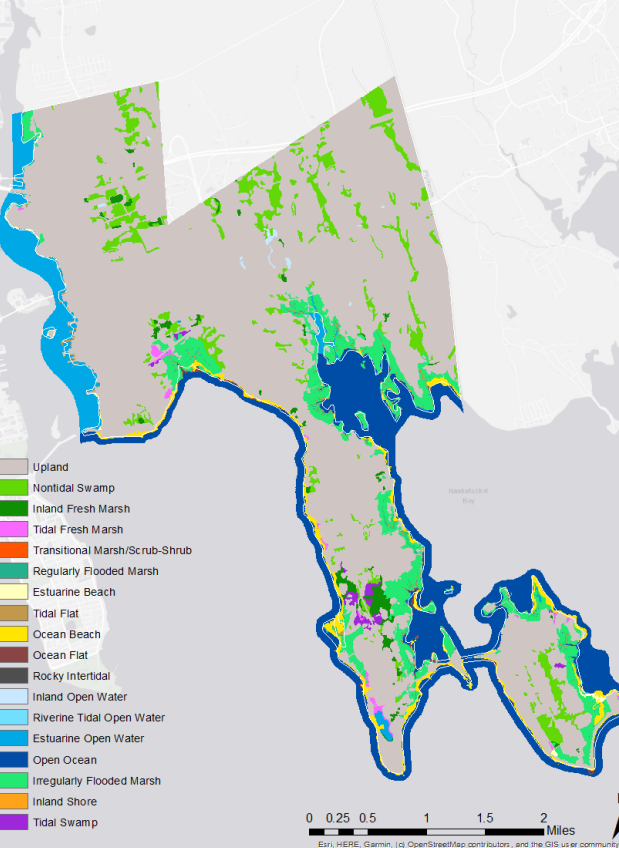
## Transportation Infrastructure

Name	Type	Critical Elevation (ft NAVD88)	Critical Elevation Description	Consequence Score	Annual Flood Probability		
					2030	2050	2070
HUTTLESTON AVENUE / ROUTE 6 (East)	Roadway	9.42	Lowest surface elevation along centerline.	58.33%	5	5	5
HUTTLESTON AVENUE / ROUTE 6 (West)	Roadway	5.52	Lowest surface elevation along centerline.	58.33%	0	1	5
SCONTICUT NECK ROAD	Roadway	4.59	Lowest surface elevation along centerline.	50.00%	5	5	5
MAIN STREET	Roadway	3.56	Lowest surface elevation along centerline.	50.00%	5	5	5
GREEN STREET	Roadway	3.43	Lowest surface elevation along centerline.	50.00%	0	0.1	5
GREEN STREET / BEACON STREET	Roadway						
HOWLAND ROAD	Roadway						
INTERSTATE 195	Roadway						
WASHINGTON STREET	Roadway						
EDGEWATER STREET	Roadway						
SCOTT STREET	Roadway						
SHAWMUT STREET	Roadway						
BLUEPOINT ROAD	Roadway						
STETSON AVENUE	Roadway						
ALCOBIA DRIVE	Roadway						
SHORE DRIVE	Roadway						
SHAW COVE	Roadway						
CALUMET ROAD	Roadway						
WAPATMA LANE	Roadway						
WIDEMARSH-BEACH WAY	Roadway						
FREDERICK AVENUE	Roadway						
LAWRENCE STREET	Roadway						
BUIST AVENUE	Roadway						
SCALLOP ROAD / BALSAM STREET	Roadway						
OCEAN AVENUE	Roadway						
AUSTRIA AVENUE	Roadway						
MORAVIA AVENUE	Roadway						
GRANDVIEW AVENUE	Roadway						
EGYPT LANE / HYLAND STREET	Roadway						
HATHAWAY STREET	Roadway						
WINDSWEPT DRIVE	Roadway						
KENNEDY COURT	Roadway						
BELLA VIST ISL	Roadway	3.43	Lowest surface elevation along centerline.	41.67%	5	5	5
NONQUITT AVENUE	Roadway	3.93	Lowest surface elevation along centerline.	41.67%	5	5	5
SHORE DRIVE / GRANDVIEW AVENUE	Roadway	3.64	Lowest surface elevation along centerline.	41.67%	5	5	5
BAYSIDE STREET	Roadway	3.07	Lowest surface elevation along centerline.	41.67%	5	5	5
POINT STREET	Roadway	4.11	Lowest surface elevation along centerline.	41.67%	5	5	5
COTTONWOOD STREET	Roadway	3.61	Lowest surface elevation along centerline.	41.67%	5	5	5
EMERSON AVENUE	Roadway	4.04	Lowest surface elevation along centerline.	41.67%	5	5	5

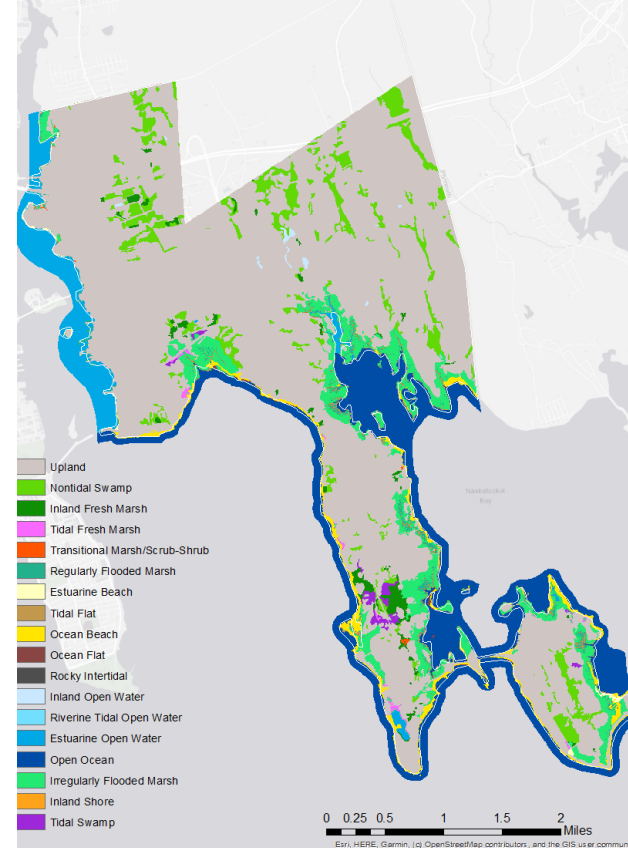
1. Huttleston Ave / Route 6
2. Sconticut Neck Rd
3. Main St
4. Green St
5. Howland Rd
6. Interstate-195
7. Washington St
8. Goulart Memorial Dr
9. Local Roadways



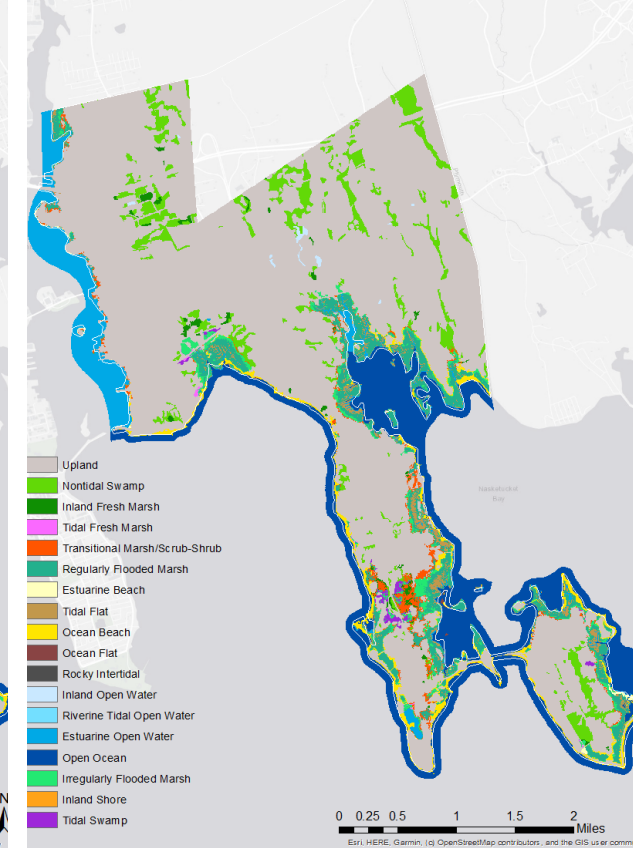
SLAMM Model Fairhaven - Baseline



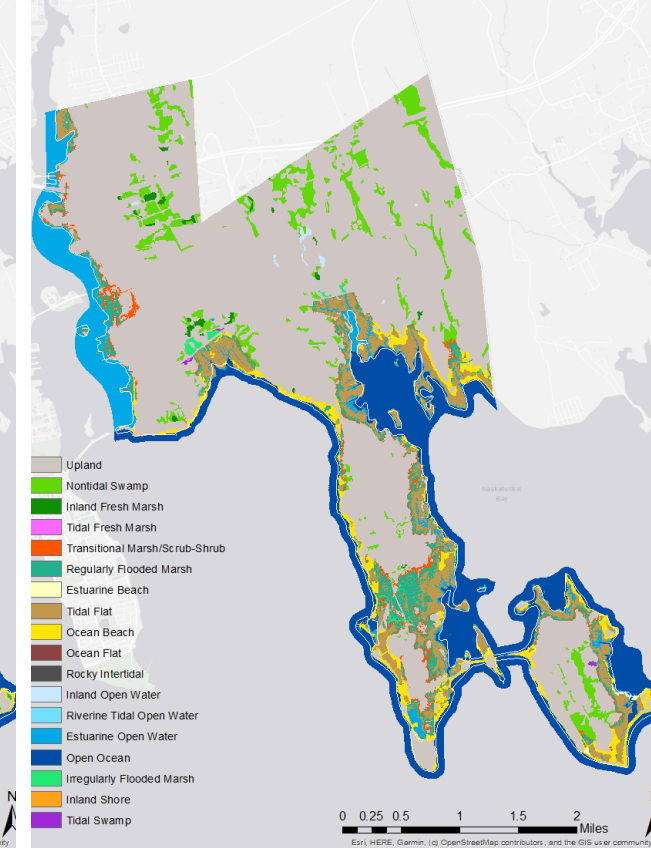
SLAMM Model Fairhaven - 2030



SLAMM Model Fairhaven - 2050

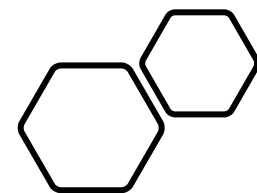


SLAMM Model Fairhaven - 2070



# Marsh Migration with Sea Level Rise (SLAMM Model)

- Encroachment of wetlands on upland (471 acres want to convert by 2070)
- Transitional marsh habitat expands (+114 acres by 2070)
- High marsh habitat progressively reduces (-515 acres by 2070)
- Low marsh habitat expands up to year 2050, then begins to convert to tidal flats
- Tidal flats expand (+501 acres by 2070)





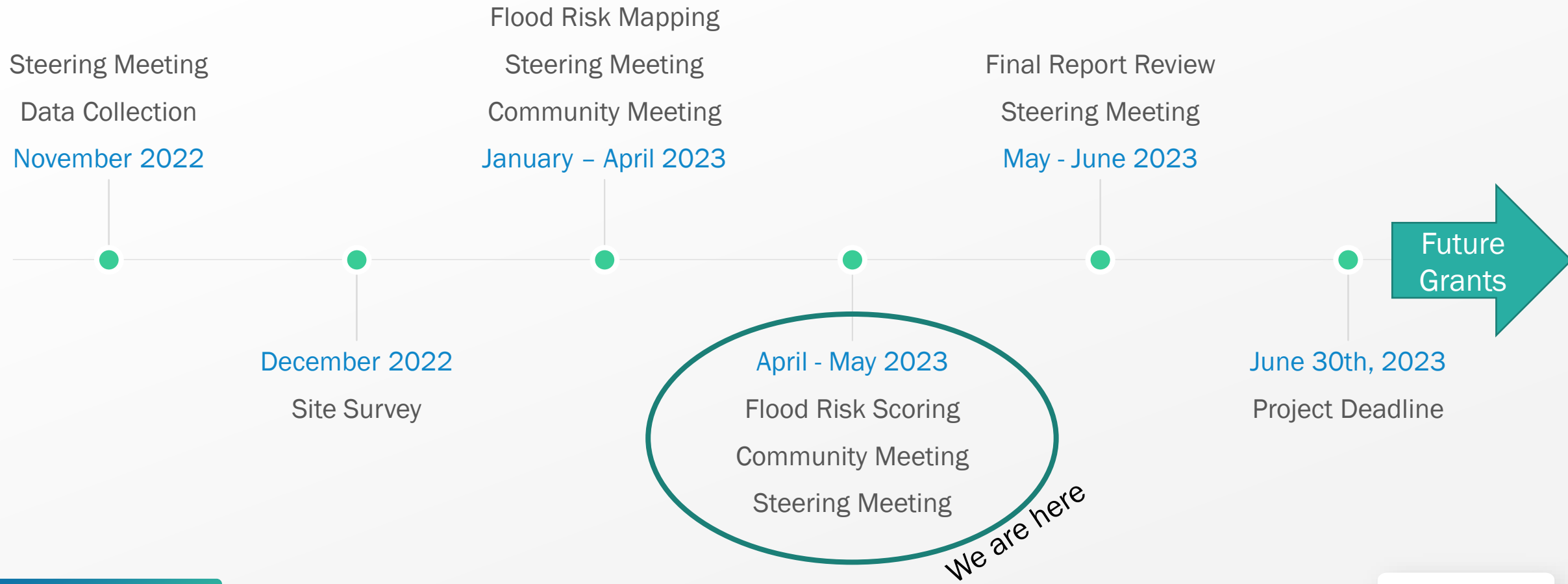


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## Breakout Discussion:

Critical Infrastructure  
Interact with Flood Maps  
Flood pathways

# Project Schedule



2022-2023





Thank you

Questions, discussion...

[cofsthun@woodsholegroup.com](mailto:cofsthun@woodsholegroup.com)

# Consequence Scoring

## Critical Infrastructure

Name	Type	Address	Service_Loss		Damage_		Economic		Health_and_		Consequence
			Area	_Duration	Cost	Public_Safety	_Impact	Environment			
Fairhaven High School	School	12 Huttleston Avenue	4	3	4	2	1	0		58%	
Royal of Fairhaven Nursing Home	Nursing Home	184 Main Street	2	3	2	4	1	0		50%	
Abbey Street Pump Station	Pump Station	Abbey Street	2	3	2	1	0	2		42%	
Boulder Park Pump Station	Pump Station	James Street	2	3	2	1	0	2		42%	
Shore Drive Pump Station	Pump Station	Shore Drive	2	3	2	1	0	2		42%	
Weybridge Road Pump Station	Pump Station	Weybridge Road	2	3	2	1	0	2		42%	
Town of Fairhaven Boat Launch	Water Access	Shore Dr/ Seaview Ave	3	1	1	2	2	1		42%	
Bernese Street Pump Station	Pump Station	Bernese Street	2	3	2	1	0	2		42%	
Sunrise Court Pump Station	Pump Station	Sunrise Court	2	3	2	1	0	2		42%	
Manhattan Avenue Pump Station	Pump Station	Manhattan Avenue	2	3	2	1	0	2		42%	
Camel Street Pump Station	Pump Station	Camel Street	2	3	2	1	0	2		42%	
Rocky Point Road Pump Station	Pump Station	Rocky Point Road	2	3	2	1	0	2		42%	
Railroad Ave Pump Station	Pump Station	Fairhaven WWTP	2	3	2	1	0	2		42%	
Causeway Road Pump Station	Pump Station	Causway Road	2	3	2	1	0	2		42%	
Pilgrim Avenue Pump Station	Pump Station	Pilgrim Avenue	2	3	2	1	0	2		42%	
Taber Street Pump Station	Pump Station	Taber Street	2	3	2	1	0	2		42%	
Middle Street Pump Station	Pump Station	Middle Street	2	3	2	1	0	2		42%	
South Street Pump Station	Pump Station	South Street	2	3	2	1	0	2		42%	
Union Wharf	Water Access	UNION WHARF	2	2	2	1	2	0		38%	
SMEC Transitional Services	School	56 Bridge Street	3	3	1	1	1	0		38%	
Hoppy's Landing	Water Access	55 GOULART MEMORIAL DR	1	2	3	1	0	0		29%	
Cushman Park	Open Space	87 Main Street	3	2	1	0	1	0		29%	
Riverside Cemetery	Open Space	Main Street	2	1	1	0	1	1		25%	
Fort Pheonix	Open Space	FT PHOENIX PARK	3	1	1	0	1	0		25%	
Macomber Pimental Park	Open Space	Bernese Street	2	1	1	0	1	0		21%	
Fairhaven Protecting Society - Old Town	Historic Site	9 WASHINGTON ST	1	2	1	0	1	0		21%	
VFW Post 2892	Club/Lodge	109 Middle Street	1	2	1	0	0	0		17%	
Edgewater/Rockland Street Beach	Open Space	Edgewater Street	2	0	1	0	0	0		13%	
Edgewater Street Boat Ramp	Water Access	EDGEWATER ST	1	0	1	1	0	0		13%	
Winsegansett Street Landing	Water Access	Winsegansett Street	1	0	1	1	0	0		13%	
Town Beach	Open Space	Goulart Memorial Drive	2	0	1	0	0	0		13%	
Gull Island Road Landing	Water Access	Gull Island Road	1	0	1	1	0	0		13%	
Bonney Street Landing	Water Access	Bonney Street	1	0	1	1	0	0		13%	
West Island Town Beach	Open Space	Fir Street	2	0	1	0	0	0		13%	
Bernese Street Landing	Water Access	Bernese Street	1	0	1	1	0	0		13%	
Briercliff Road Landing	Water Access	Briercliff Road	1	0	1	1	0	0		13%	
Hathaway Street Landing	Water Access	Hathaway Street	1	0	1	1	0	0		13%	
Jerusalem Road Landing	Water Access	Jerusalem Road	1	0	1	1	0	0		13%	
Bridge St Boat Ramp	Water Access	BRIDGE ST	1	0	1	1	0	0		13%	
Little Bay Conservation Area	Open Space	Peirces Point	2	0	1	0	0	0		13%	
Pease St Boat Ramp	Water Access	PEASE PARK	1	0	1	1	0	0		13%	
Calumet Street Landing	Water Access	Calumet Street	1	0	1	1	0	0		13%	
Blue Point Road Landing	Water Access	Blue Point Road	1	0	1	1	0	0		13%	
Sedgewick Street Landing	Water Access	Sedgewick Street	1	0	1	1	0	0		13%	
Fishermans Road Landing	Water Access	Fishermans Road	1	0	1	1	0	0		13%	
Little Neck Road Landing	Water Access	Little Neck Road	1	0	1	1	0	0		13%	
Raymond Street Landing/Austria Ave Lar	Water Access	Raymond Street	1	0	1	1	0	0		13%	
Park & Ride	Transportation	I-195, 72 Sycamore St.	2	0	1	0	0	0		13%	
Cove St Beach	Open Space	Beach Cove St	2	0	0	0	0	0		8%	
Pope's Beach	Open Space	Bayview Avenue	2	0	0	0	0	0		8%	
Bedford - Fairhaven Battlefield	Historic Site	Town of Fairhaven	1	0	1	0	0	0		8%	
Knollmere Beach	Open Space	Nonquitt Avenue	2	0	0	0	0	0		8%	
Manhattan Beach	Open Space	Manhattan Avenue	2	0	0	0	0	0		8%	
Oxford Village - Poverty Point	Historic Site	Main Street	1	0	1	0	0	0		8%	
Twenty Acre Purchase	Historic Site	Water Street	1	0	1	0	0	0		8%	



# Consequence Scoring

## Transportation Infrastructure

Name	Subtype	Service_Loss_ Area	Service_Loss_ Duration	Damage_Cost	Public_Safety	Economic _Impact	Health_and_ Environment	Consequence _Score
HUTTLESTON AVENUE / ROUTE 6 (East)	Multi-lane Highway, not lir	4	3	1	4	2	0	58.33%
HUTTLESTON AVENUE / ROUTE 6 (West)	Multi-lane Highway, not lir	4	3	1	4	2	0	58.33%
SCONTICUT NECK ROAD	Major Road	3	3	1	3	2	0	50.00%
MAIN STREET	Major Road	3	3	1	3	2	0	50.00%
GREEN STREET	Major Road	3	3	1	3	2	0	50.00%
GREEN STREET / BEACON STREET	Major Road	3	3	1	3	2	0	50.00%
HOWLAND ROAD	Major Road	3	3	1	3	2	0	50.00%
INTERSTATE 195	Limited Access Highway	4	3	1	4	0	0	50.00%
WASHINGTON STREET	Major Road	3	3	1	3	2	0	50.00%
EDGEWATER STREET	Minor Street or Road	2	3	1	2	2	0	41.67%
SCOTT STREET	Minor Street or Road	2	3	1	2	2	0	41.67%
SHAWMUT STREET	Minor Street or Road	2	3	1	2	2	0	41.67%
BLUEPOINT ROAD	Minor Street or Road	2	3	1	2	2	0	41.67%
STETSON AVENUE	Minor Street or Road	2	3	1	2	2	0	41.67%
ALCOBIA DRIVE	Minor Street or Road	2	3	1	2	2	0	41.67%
SHORE DRIVE	Minor Street or Road	2	3	1	2	2	0	41.67%
SHAW COVE	Minor Street or Road	2	3	1	2	2	0	41.67%
CALUMET ROAD	Minor Street or Road	2	3	1	2	2	0	41.67%
WAPATMA LANE	Minor Street or Road	2	3	1	2	2	0	41.67%
WIDEMARSH-BEACH WAY	Minor Street or Road	2	3	1	2	2	0	41.67%
FREDERICK AVENUE	Minor Street or Road	2	3	1	2	2	0	41.67%
LAWRENCE STREET	Minor Street or Road	2	3	1	2	2	0	41.67%
BUIST AVENUE	Minor Street or Road	2	3	1	2	2	0	41.67%
SCALLOP ROAD / BALSAM STREET	Minor Street or Road	2	3	1	2	2	0	41.67%
OCEAN AVENUE	Minor Street or Road	2	3	1	2	2	0	41.67%
AUSTRIA AVENUE	Minor Street or Road	2	3	1	2	2	0	41.67%
MORAVIA AVENUE	Minor Street or Road	2	3	1	2	2	0	41.67%
GRANDVIEW AVENUE	Minor Street or Road	2	3	1	2	2	0	41.67%
EGYPT LANE / HYLAND STREET	Minor Street or Road	2	3	1	2	2	0	41.67%
HATHAWAY STREET	Minor Street or Road	2	3	1	2	2	0	41.67%
WINDSWEPT DRIVE	Minor Street or Road	2	3	1	2	2	0	41.67%
KENNEDY COURT	Minor Street or Road	2	3	1	2	2	0	41.67%
BELLA VIST ISL	Minor Street or Road	2	3	1	2	2	0	41.67%
NONQUITT AVENUE	Minor Street or Road	2	3	1	2	2	0	41.67%
SHORE DRIVE / GRANDVIEW AVENUE	Minor Street or Road	2	3	1	2	2	0	41.67%