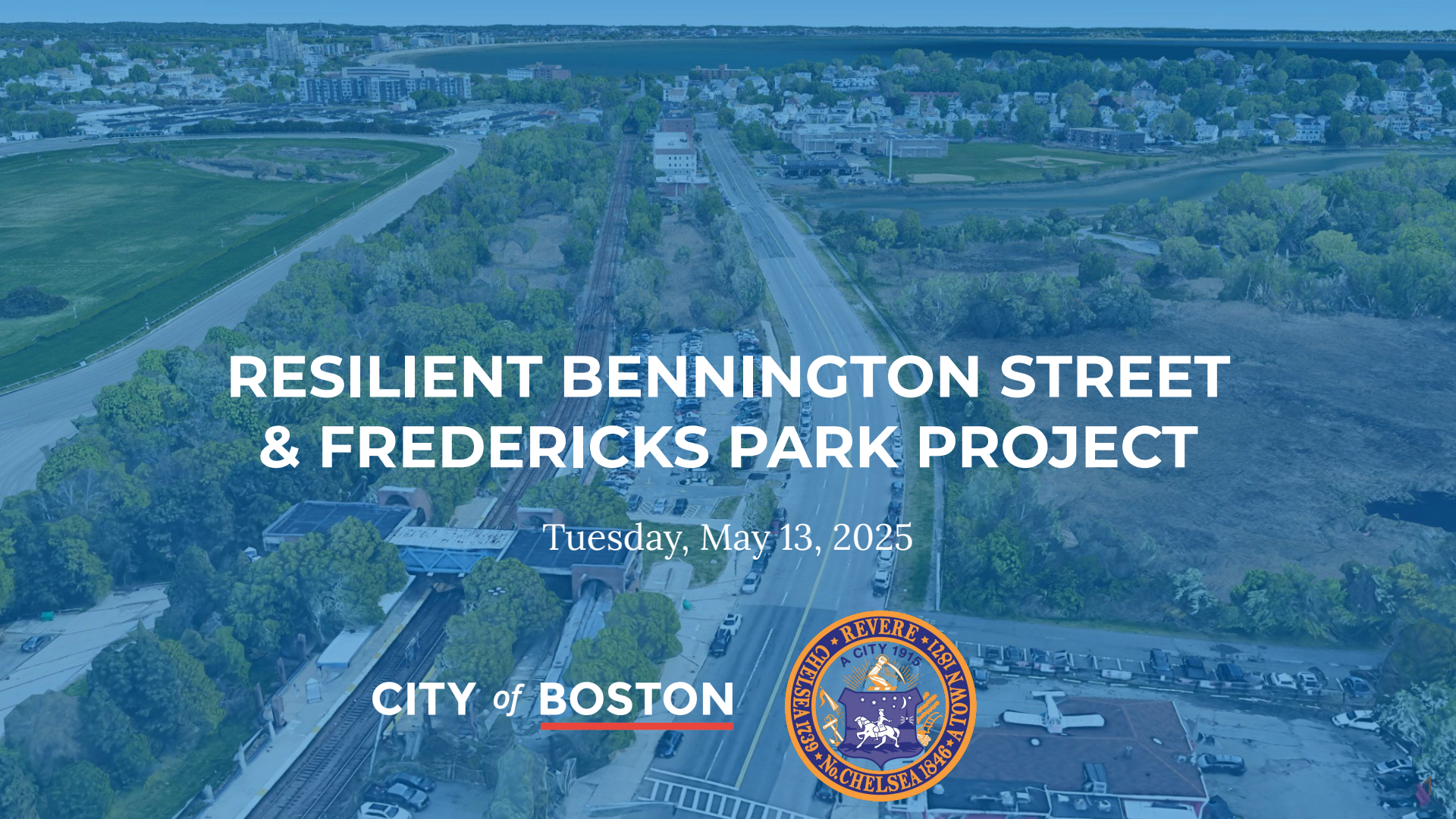


RESILIENT BENNINGTON STREET & FREDERICKS PARK PROJECT

Tuesday, May 13, 2025

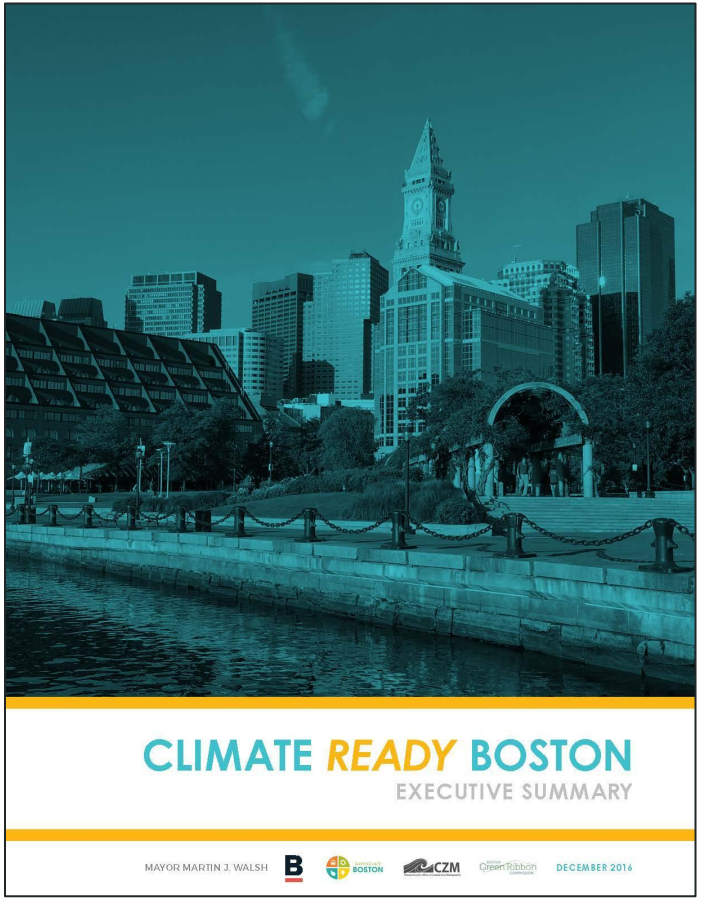
CITY of BOSTON

PRESENTATION OUTLINE

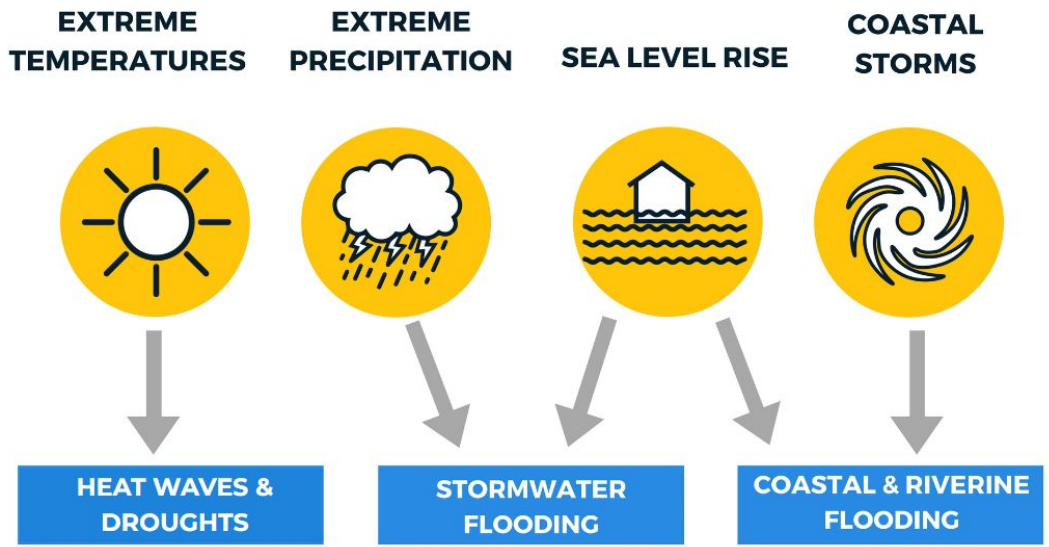
- City of Boston’s Coastal Resilience Planning and Implementation
- Case Study: Resilient Bennington Street Fredericks Park Project
- Q&A

CITY OF BOSTON'S COASTAL RESILIENCE PLANNING AND IMPLEMENTATION

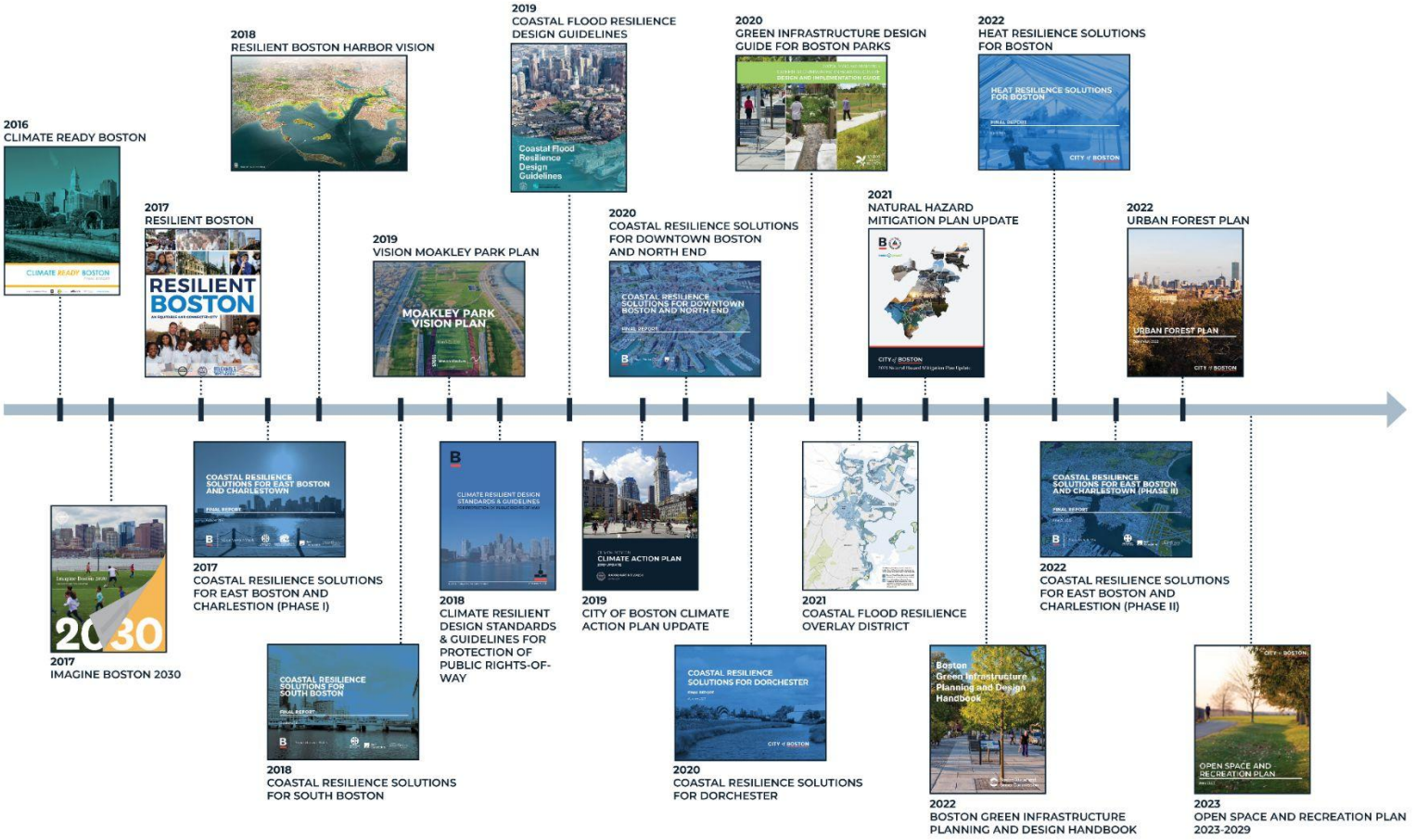
CLIMATE READY BOSTON



In 2016, the City of Boston released the *Climate Ready Boston* report, which included a comprehensive vulnerability assessment of current and projected risks associated with each of three climate hazards under a low, medium, and high greenhouse gas emissions scenario.

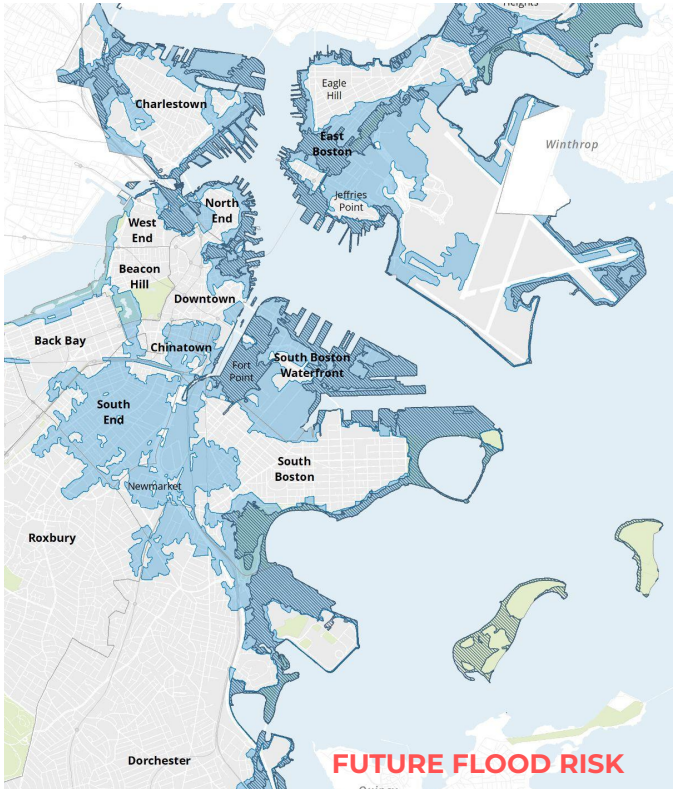


CITYWIDE CLIMATE RESILIENCE PLANNING & POLICY



BOSTON'S HISTORIC COASTLINE

The history of landmaking is part of what makes Boston so vulnerable to sea level rise and coastal flooding. **Today, about one-sixth of Boston sits on landfill.** Many areas that are vulnerable to flooding today are areas of land that were created using landfill.

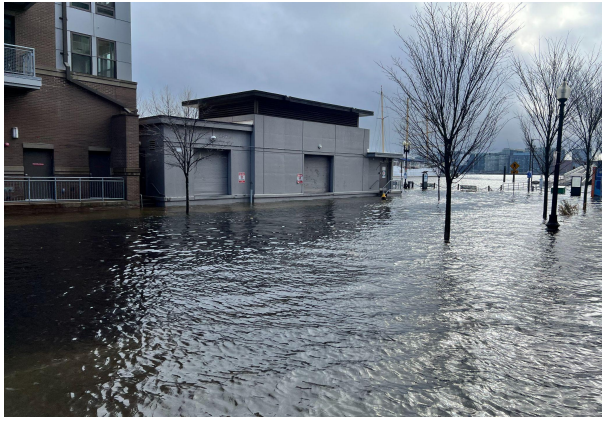


COASTAL FLOODING IN BOSTON (2018-2024)

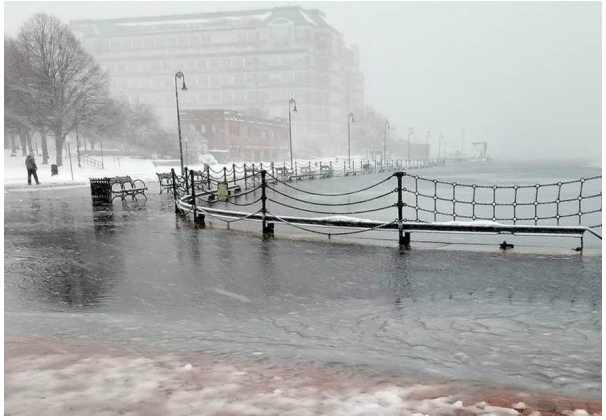
Flooding along Atlantic Avenue in Downtown Boston
(Source: Alison Brizius, January 2024)

Flooding along the Border Street waterfront in East Boston
(Source: Robin Seidel, January 2024)

Flooding beneath the Evelyn Moakley Bridge in South Boston's Fort Point Channel
(Source: Alison Brizius, December 2022)



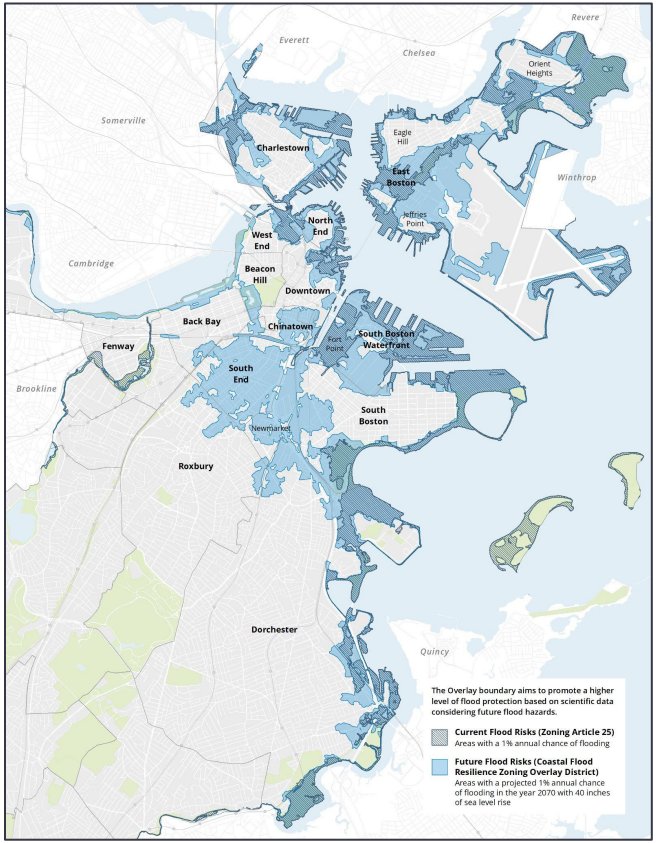
Flooding along Lewis Mall in East Boston
(Source: Robin Seidel, January 2024)



Flooding along the Harborwalk in the Charlestown Navy Yard
(Source: Gerry Angoff, Winter 2018)

Flooding along the Harborwalk in Downtown Boston
(Source: Alison Brizius, December 2022)

NEIGHBORHOOD-LEVEL COASTAL RESILIENCE PLANNING

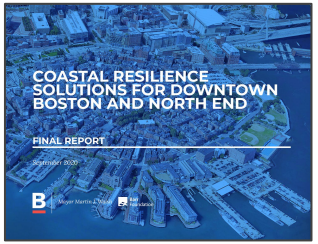


Projected coastal flooding from sea level rise + storm surge in 2030
Projected coastal flooding from sea level rise + storm surge in 2070

Between 2017-2022, the City completed neighborhood-level coastal resilience plans for all 47 miles of Boston's coastline.

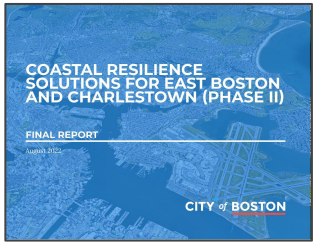
East Boston & Charlestown Phase 1 (2017)

South Boston (2018)



North End & Downtown (2020)

Dorchester (2020)



East Boston & Charlestown Phase 2 (2022)

GOALS AND OBJECTIVES OF COASTAL RESILIENCE PLANS

1. **Identified the location and timing of flood risk** across the given study area;

2. **Engaged stakeholders** to identify key priorities, opportunities, and constraints to inform coastal resilience strategies;

3. **Developed conceptual coastal resilience solutions** that provide multiple benefits for the community; and

4. **Created an implementation roadmap** that outlines the timing by which strategies need to be constructed and next steps for advancing each proposed project in each neighborhood

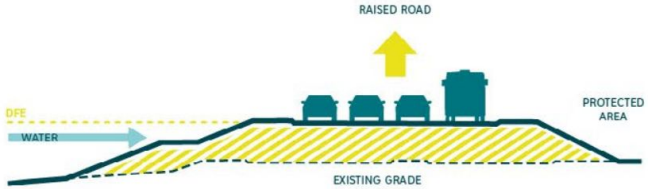
EXAMPLES OF COASTAL RESILIENCE STRATEGIES

RAISED HARBORWALK / RAISED PARK SPACE

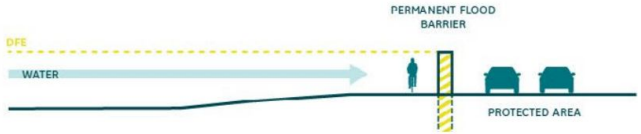
RAISED BERMS AND DUNES

NATURE-BASED SOLUTIONS

RAISED ROADWAYS / MEDIAN FLOODWALLS



VERTICAL FLOODWALLS



ADAPTED BUILDINGS AND STRUCTURES

PRIORITIZING PROJECT IMPLEMENTATION

Timing of Flood Risk (Sea Level Rise)

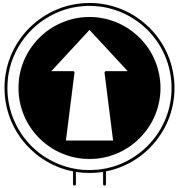
Fringe Flooding vs. Flood Pathway

Extreme Heat Exposure

Environmental Justice Criteria

Land Ownership

Protection of Affordable Housing



Protection of Evacuation Corridors

Protection of Critical Transportation Infrastructure

Protection of Critical Facilities

Protection of Water-Dependent Industrial Uses

FROM PLANNING TO IMPLEMENTATION

COASTAL RESILIENCE IMPLEMENTATION: THREE CONCURRENT STRATEGIES

TODAY'S STORMS

Key Goal:
Strengthen our response to today's flooding

How?

Educate residents about emergency preparedness, strengthen protocols for preparing for and responding to extreme weather, and operationalize deployable barriers

Key City Agencies:

Office of Emergency Management
Office of Climate Resilience

THIS DECADE'S STORMS

Key Goal:
Address 2030 flood pathways

How?

Advance near-term priority projects identified in coastal resilience plans from conceptual design to construction

Key City Agencies:

Office of Climate Resilience
Planning Department
Parks & Recreation Department

BEYOND 2030

Key Goal:
Transform our 47 miles of coastline

How?

Through an ongoing partnership with the U.S. Army Corps of Engineers, advance mid- and long-term priority projects from conceptual design to construction

Key City Agencies:

Office of Climate Resilience,
Planning Department,
Boston Water & Sewer Commission, and many more!

RESILIENT BOSTON HARBOR VISION

COASTAL RESILIENCE IMPLEMENTATION

CLIMATE RESILIENCE

Boston is taking action to adapt to and prepare for the impacts of climate change.

BOSTON'S CHANGING CLIMATE | COASTAL RESILIENCE | STORMWATER MANAGEMENT | HEAT RESILIENCE
OPEN SPACE AND CONSERVATION | ZONING AND DESIGN GUIDELINES | EMERGENCY RESPONSE AND PREPAREDNESS
CLIMATE READY BOSTON 2016 | ABOUT THE OFFICE | CLIMATE RESILIENCE TEAM | JOIN OUR TEAM
OUR CITY PARTNERS

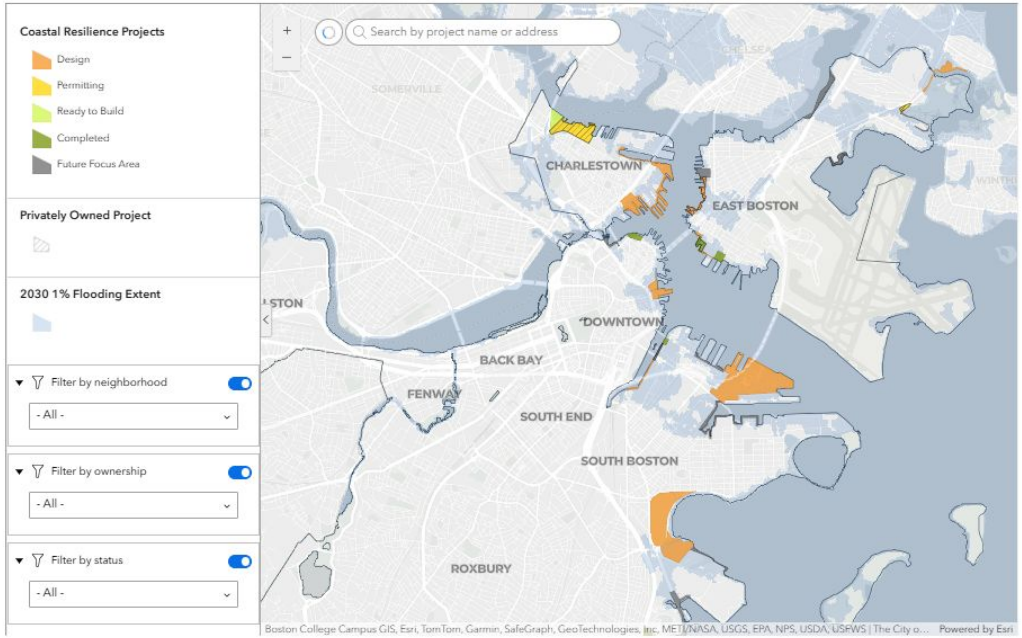
In Boston, we experience the effects of climate change on a daily basis. Rising sea levels, stronger storms, and hotter days pose a threat to our city. The City released the Climate Ready Boston report in 2016, which evolved into the Climate Ready Boston initiative. Since 2016, Climate Ready Boston has completed coastal resilience plans for our entire 47-mile coastline as well as a citywide heat resilience plan.

Today, the Office of Climate Resilience and our partners in other departments are implementing climate resilience projects across the city to address coastal flooding,

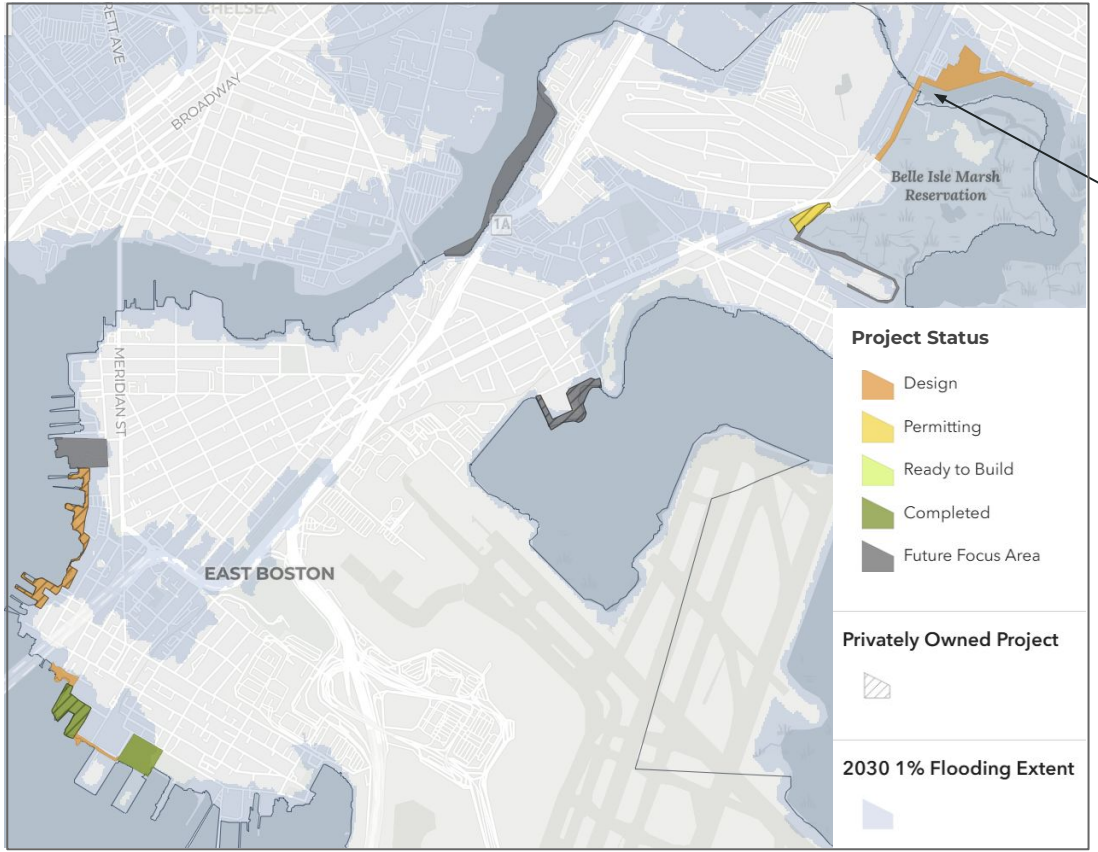
BOSTON.GOV/CLIMATE RESILIENCE

COASTAL RESILIENCE PROJECT TRACKER

The Coastal Resilience Project Tracker is designed to provide an interactive overview of the City's current efforts to mitigate and adapt to coastal flooding. The Coastal Resilience Project Tracker is more than just a tool for viewing active projects; it's a platform for engagement and education. We encourage viewers to explore the tracker, learn about the city's ongoing efforts, and find out how to get involved in making Boston a climate-resilient city. Together, we can ensure that Boston survives and thrives in the face of climate change.



CASE STUDY: RESILIENT BENNINGTON STREET & FREDERICKS PARK



The map displays extents of flooding produced from the Massachusetts Coast Flood Risk Model (MC-FRM), which is the Commonwealth of Massachusetts' adopted flood projection model. The flooding shown accounts a 1% annual chance storm with 2030 sea level rise projections.

Bennington Street and Fredericks Park
Design in progress

RESILIENT BENNINGTON STREET & FREDERICKS PARK PROJECT

PROJECT TEAM

City of Boston
Climate Resilience

REVERE 1871 A CITY 1915 CHELSEA 1739 No. CHELSEA 1846 A TOWN

vhb

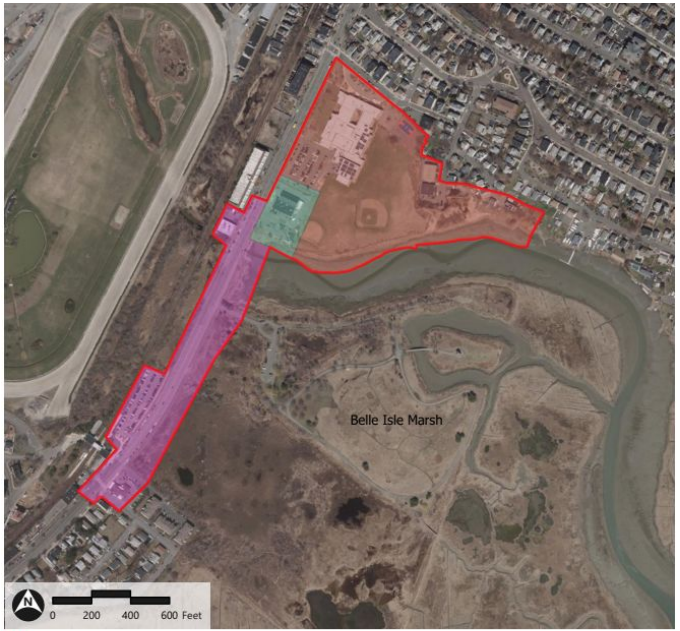
terraink
landscape architecture

dcr
Massachusetts

GRANT FUNDED BY:

MVP
Municipal Vulnerability
Preparedness

PROJECT AREA



PROJECT STAKEHOLDERS - LANDOWNERS & ABUTTERS

- **City of Boston:** owns Bennington Street in Boston
- **City of Revere:** owns Fredericks Park and Beachmont Memorial School
- **Massachusetts Department of Conservation and Recreation (DCR):** owns Belle Isle Marsh and Alfred H. Long pump station
- **Massachusetts Department of Transportation (MassDOT):** owns Bennington Street in Revere
- **Massachusetts Bay Transportation Authority (MBTA):** owns Blue Line train tracks, station, and parking lot
- **Beachmont Veterans of Foreign Wars (VFW):** private landowner
- **Beachmont Residential:** private landowners

EXISTING CONDITIONS - BENNINGTON STREET

Bennington Street adjacent to Belle Isle Marsh in East Boston (looking northeast)

Bennington Street adjacent to Belle Isle Marsh in East Boston (looking northeast)

Bennington Street adjacent to Belle Isle Marsh in East Boston (looking northeast)

Bennington Street in East Boston approaching Revere (looking northeast)

Belle Isle Inlet tide gate at the border between Boston and Revere (looking northeast)

Bennington Street facing Fredericks Park in Revere (looking east)

EXISTING CONDITIONS - FREDERICKS PARK

Fredericks Park (left) and wetlands (right) separate by a chain link fence (looking east)

Fredericks Park (right) and wetlands (left) separate by a chain link fence (looking west)

Existing wetlands condition between Fredericks Park and Montfern Avenue in Revere (looking east)

Aerial image of Fredericks Park in Revere

Aerial image of the waterfront between Fredericks Park and Montfern Avenue in Revere

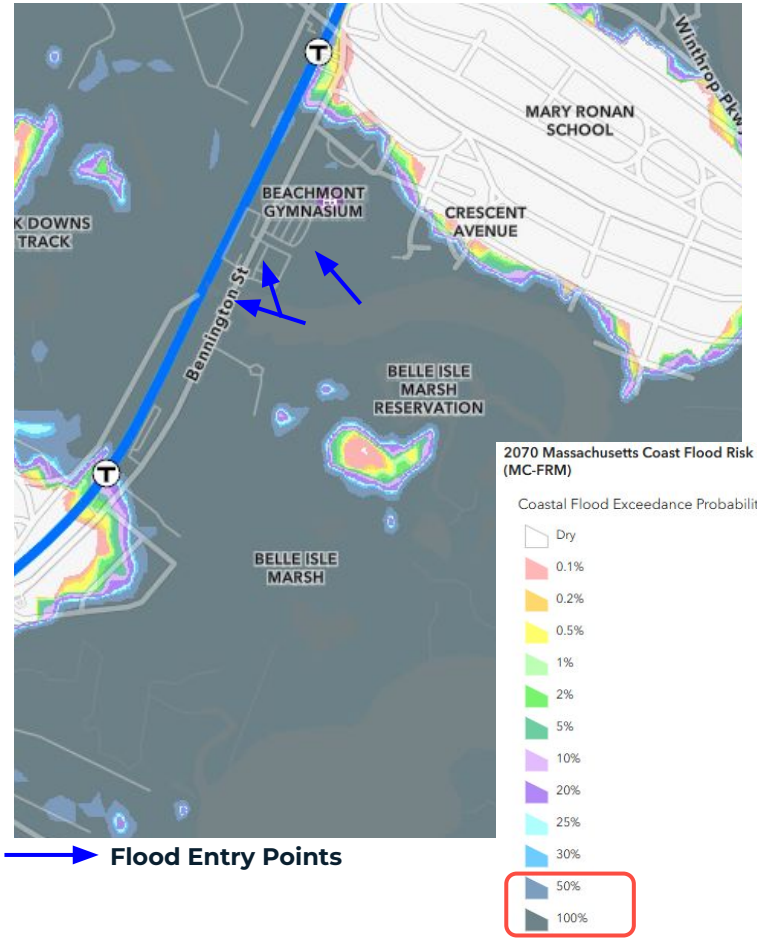
PROJECT NEED - CURRENT AND FUTURE FLOOD RISK

Flooding at the Beachmont School parking lot in Revere (December 2022)

Flooding in the Beachmont VFW parking lot looking towards Frederick's Park (December 2022)

Flooding overtopping Bennington Street looking northbound (December 2022)

Video taken from the border between Boston and Revere by the Belle Isle Inlet tide gate on January 13, 2024



PROJECT GOALS

- **Reduce coastal flood risk,** protecting East Boston and Revere from near- and long-term impacts of sea-level rise and coastal storms out to 2070;
- **Support the health and preservation of Belle Isle Marsh**;
- **Support co-benefits along Bennington Street**, including green stormwater infrastructure, tree canopy, and active transportation
- **Enhance Fredericks Park** to improve coastal resilience, stormwater management, recreational amenities, and ecological habitat along the marsh.

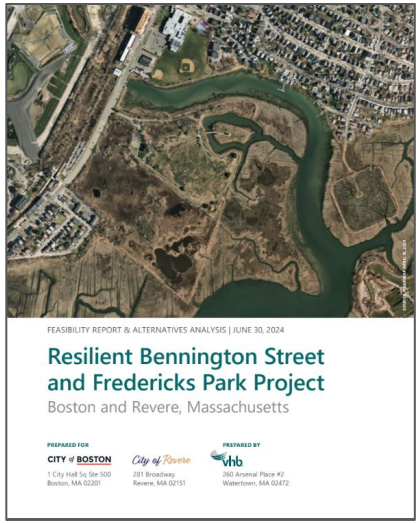
PHASE I

Phase I: Feasibility Report & Alternatives Analysis

September 2023
City of Boston and City of Revere received an FY24 Municipal Vulnerability Preparedness grant for $330,500 to further study coastal resilience strategies for Bennington Street and Fredericks Park.

November 2023
City of Boston launched the project with VHB. The project has included technical site investigations, stakeholder engagement, and an alternatives analysis.

June 2024
MVP grant period concluded and the team released a Feasibility Report and Alternatives Analysis with recommendations for the preferred alternative.



PHASES II & III

Phase I: Feasibility Report & Alternatives Analysis

September 2023
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City of Boston launched the project with VHB. The project has included technical site investigations, stakeholder engagement, and an alternatives analysis.

June 2024
MVP grant period concluded and the team released a Feasibility Report and Alternatives Analysis with recommendations for the preferred alternative.

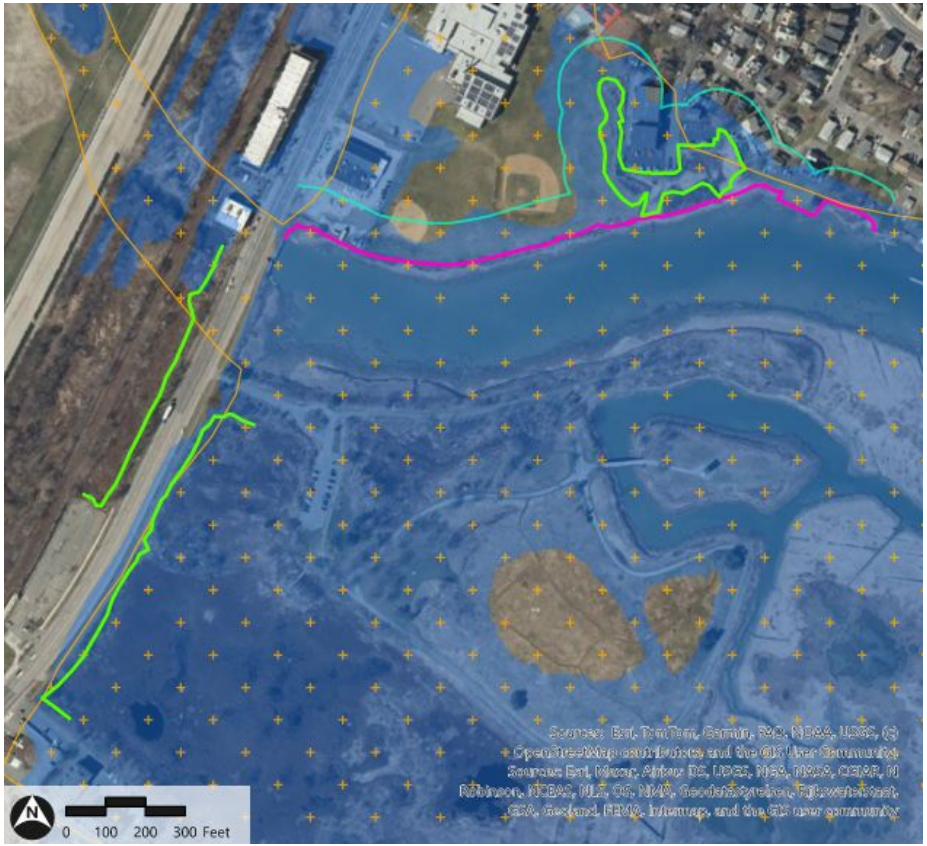
Phase II-III: Design & Permitting

July 2024
City of Boston and City of Revere are awarded an FY25 MVP grant of $456,500 to advance the project to schematic design (Phase II).

October 2024-June 2025
Phase II of the project launched to complete additional site investigations and move towards 50% schematic design.

June 2025 and beyond
City of Boston and City of Revere to advance the project beyond schematic design (Phase III)

SITE INVESTIGATIONS - WETLAND RESOURCE AREAS & ENVIRONMENTAL CONSTRAINTS



Wetland Resource Areas:

- Salt Marsh
- Bordering Vegetated Wetland
- Land Subject to Coastal Storm Flowage
- 100’ Buffer Zone

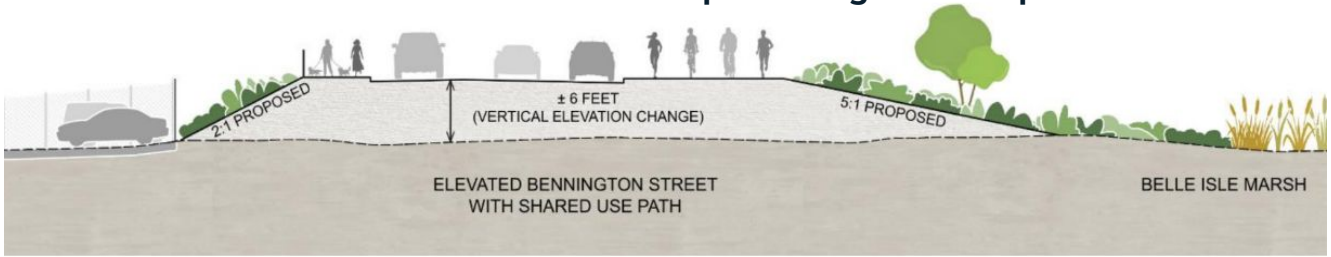
Additional Considerations:

- Area of Critical Environmental Concern (ACEC) boundary

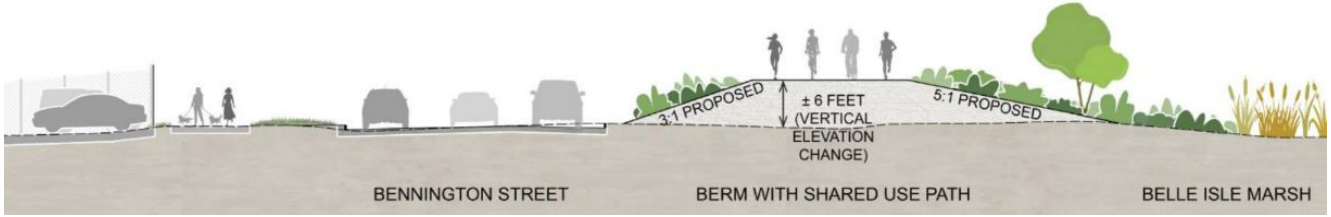
BVW
SaltMarsh
Areas of Critical Environmental Concern
100' Buffer Zone
FEMA 100-Year Flood Zone

BENNINGTON STREET ALTERNATIVES

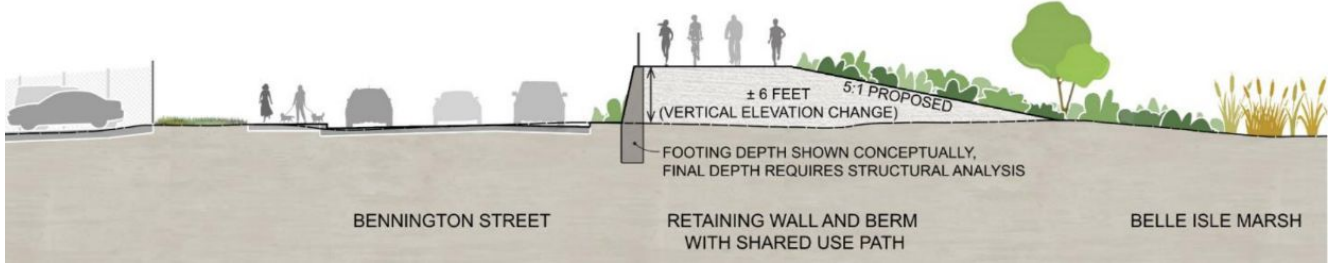
PREFERRED: Elevated Road with shared use path and gradual slope to the marsh



Berm with shared use path and gradual slope to the marsh

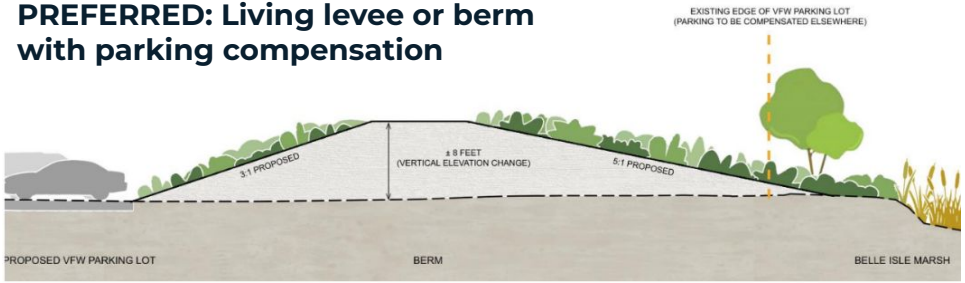


Berm with retaining wall and shared use path and gradual slope to the marsh

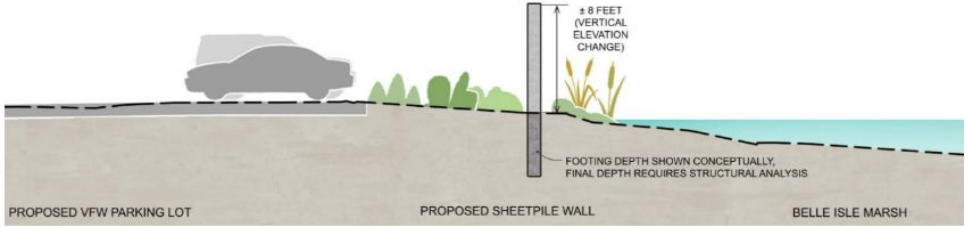


BEACHMONT VFW ALTERNATIVES

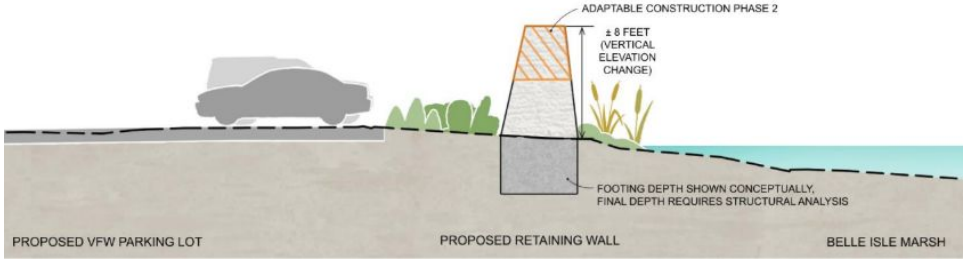
PREFERRED: Living levee or berm with parking compensation



Seawall Option 1 - Sheetpile Wall



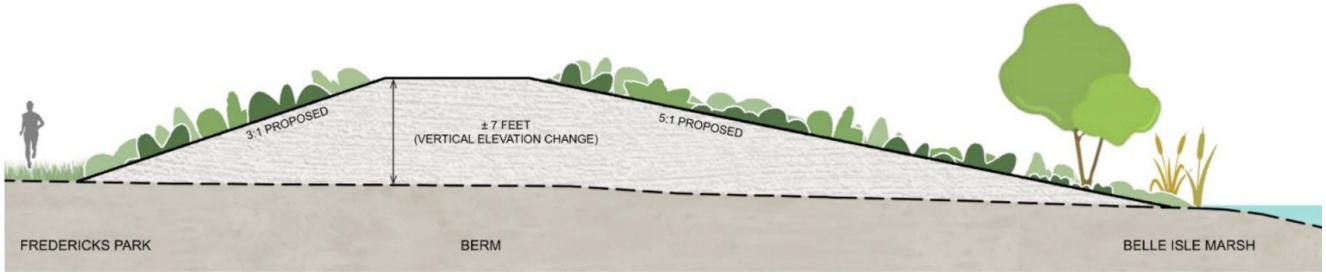
Seawall Option 2 - Retaining Wall with adaptable construction phasing



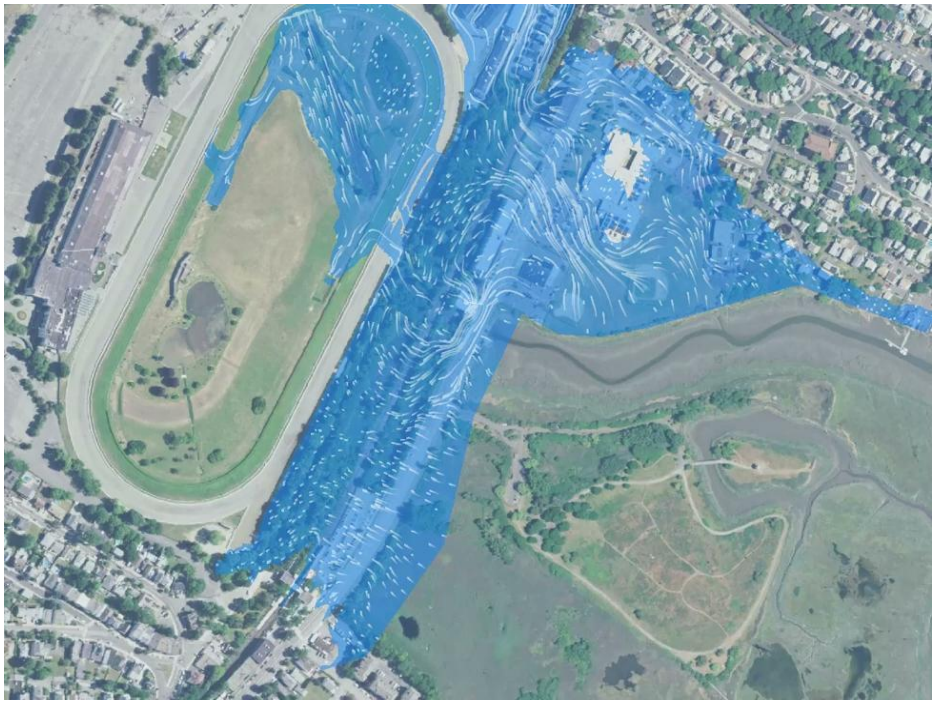
FREDERICKS PARK ALTERNATIVES

PREFERRED: Elevated Park with gradual slope to the marsh

Living levee or berm



DYNAMIC FLOOD MODEL

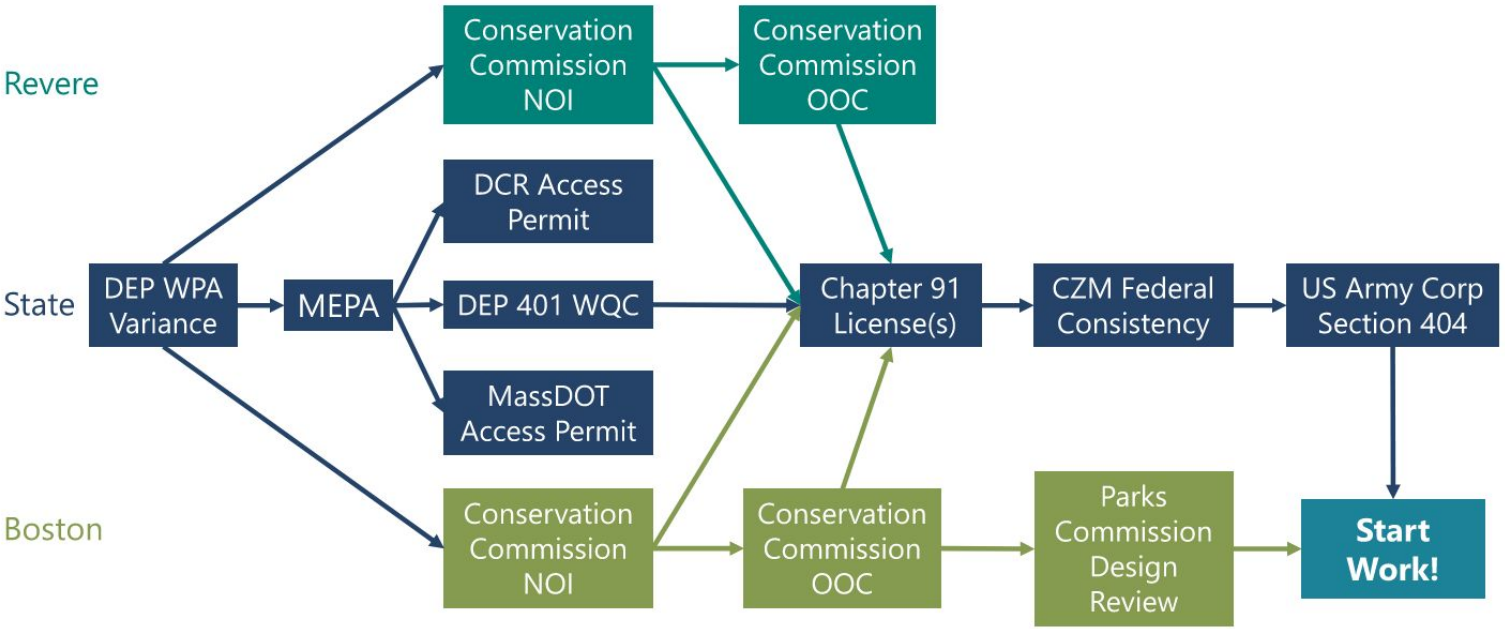


Pre-Project Flood Risk

Post-Project Flood Risk

Future Flood Scenario under predicted conditions of 1.5' of SLR, 100-yr Rainfall, 100-year storm

NEXT STEPS - ANTICIPATED PERMITTING



THANK YOU!

Catherine McCandless – Office of Climate Resilience
catherine.mccandless2@boston.gov

2.7. Coastal Resilience

Goal 1: Minimize and prepare for the impacts of climate change, specifically sea level rise and coastal flooding, within the harbor planning area.

Objective 1: Support the Coastal Resilience Advisory Committee in the implementation of the Coastal Resilience Plan.

Recommendation 1: Convene regular inter-committee/department meetings to coordinate coastal resilience efforts, and share objectives, challenges, and project prioritizations.

Responsible Parties

- Coastal Resilience Advisory Committee
- Town Administration Department
- Natural Resources Department
- Land and Water Council
- Department of Public Works
- Sewer Department
- Information Technology Department
- Planning and Land Use Services
- Planning Board
- Select Board
- Board of Health
- Harbor and Shellfish Advisory Board
- Water Department
- Police Department
- Fire Department

Recommendation 2: Implement the Town's Coastal Resilience Plan (CRP) and future CRP updates. Follow the prioritization timeline of the Town's Coastal Resilience Plan (CRP) and future CRP updates, while acknowledging the CRP is a "living document", adapting to accommodate future changing climate conditions and increasing/reducing risk. Ensure that the goals of the CRP and future updates are aligned with/inform other planning efforts. Additionally, consider shellfish components when implementing coastal resilience projects.

Responsible Parties

- Coastal Resilience Advisory Committee
- Town Administration Department
- Natural Resources Department
- Planning Board and Select Board
- Land and Water Council
- Department of Public Works

- Sewer Department
- Marine Department
- Planning and Land Use Services
- Water Department
- Nantucket Land Bank

Recommendation 3: Address known data and planning gaps including, but not limited to: a groundwater and sea level rise monitoring study, a Stormwater Management Plan, a numerical modeling study of Coatue breaching, a future wetlands migration study, an updated analysis of vulnerable public access sites, and a survey of Harbor coastlines for existing and future erosion and flood protections.

Responsible Parties

- Natural Resources Department
- Land and Water Council
- Coastal Resilience Advisory Committee
- Department of Public Works
- Planning and Land Use Services
- Marine Department
- Water Department
- Sewer Department
- MA Department of Environmental Protection
- Nantucket Land Bank

Recommendation 4: Work with environmental justice communities and other underrepresented communities to address their needs and interests related to coastal resilience, ecological restoration, relocation, and climate disruptions. Communicate information in multiple adaptive formats (*e.g.* video, audio) for non-English readers and speakers. Ensure that an environmental justice community representative is on the Harbor Plan Implementation Committee, and that harbor-related decisions and forums are communicated to the environmental justice communities.

Responsible Parties:

- Harbor Plan Implementation Committee
- Coastal Resilience Advisory Committee
- Natural Resources Department
- Department of Culture and Tourism

Recommendation 5: The Harbor Plan Implementation committee should include a member of the Coastal Resilience Advisory Committee.

Responsible Parties:

- Coastal Resilience Advisory Committee

Objective 2: Continue to increase collaboration, education, and outreach with on-island groups involved in coastal resilience and adaptation.

Recommendation 1: Work with local partners to develop, implement, and improve coastal resilience strategies, prioritizing nature-based solutions where possible. Examples include working with the Nantucket Conservation Commission to develop compensatory flood storage in the Harbor, the Nantucket Conservation Foundation on nature-based methods of erosion control, and local landscapers to introduce more salt-tolerant native vegetation.

Responsible Parties:

- Natural Resources Department
- Land and Water Council
- Coastal Resilience Advisory Committee
- Nantucket Conservation Foundation
- Conservation Commission
- Nantucket Land Bank

Recommendation 2: Incorporate community-based science (*i.e.,* opportunities for community members to help gather scientific data) into the Town's monitoring initiatives and engage the public, non-profit, and volunteer organizations in Town monitoring programs, for example erosion and flood monitoring.

Responsible Parties:

- Coastal Resilience Advisory Committee
- Natural Resources Department
- Land and Water Council
- Nantucket Shellfish Association
- Nantucket Conservation Foundation
- Mass Audubon
- Biodiversity Initiative (through its Grant Program)
- Nantucket Land Bank

Recommendation 3: Conduct education and outreach to encourage public awareness of coastal resilience and adaptation best practices. Examples include the Resilient Nantucket Toolkit and the Coastal Resilience Flyer for Homebuyers and Real Estate Agencies. Ensure that informational presentations and best practice brochures are accessible in adaptive formats (*e.g.* video, audio) for non-English readers and speakers.

Responsible Parties:

- Coastal Resilience Advisory Committee
- Natural Resources Department
- Department of Culture & Tourism
- Land and Water Council
- Nantucket Conservation Foundation
- Nantucket Biodiversity Initiative (through its Grant Program)

- Realtors Association

Recommendation 4: Hire a dedicated coastal resilience and natural resource education coordinator and a dedicated coastal resilience and adaptation grant writer. [[Can we provide more details on how this would be funded and what gaps it would fill?]]

Responsible Parties:

- Planning Board
- Select Board
- Natural Resources Department

Objective 3: Continue to build coastal resilience within Nantucket and Madaket Harbors by improving infrastructure which reduces the risk of coastal hazards prioritizing nature-based approaches to the extent possible.

Recommendation 1: Improve and expand the resilience of the Town's docks and piers through best available methods, incorporating public access, and prioritizing nature-based solutions where possible. It is especially important to focus on where harbor infrastructure can contribute to regional resilience (e.g., where harbor facilities intersect with flood pathways for landward areas). Sites to consider include:

- Elevating Steamboat Wharf
- Raising Town dock or converting to floating dock
- Elevating the ramp at Children's Beach
- Elevating F Street boat ramp

Responsible Parties

- Natural Resources Department
- Harbormaster
- Planning Board
- Select Board
- Coastal Resilience Advisory Committee
- Department of Public Works
- Nantucket Land Bank
- Steamship Authority

Recommendation 2: Improve and expand the coastal resilience of road infrastructure within the Harbor Planning Area through best available methods, incorporating public access and prioritizing nature-based solutions where possible. Sites to consider include:

- Raising Easton Street, Hulbert Avenue, Washington Street Extension, Consue Springs, and Polpis Road
- Raising Madaket Road and the Ames Avenue Bridge

- Improving the resilience of Millie's Bridge and the Madaket Road/Ames Avenue intersection through erosion management

Responsible Parties

- Natural Resources Department
- Harbormaster
- Nantucket Land Bank
- Planning Board
- Select Board
- Coastal Resilience Advisory Committee
- Department of Public Works

Objective 4: Continue to improve and diversify the Town's ability to fund coastal resilience and adaptation projects.

Recommendation 1: Join the Community Rating System of the National Flood Insurance Program. This program provides discounts for flood insurance policy holders and floodplain expertise for municipalities based on efforts taken by the Town for flood prevention measures beyond federal minimums, improving coastal resilience, and improving public awareness of flood risks. An additional funding source specific to harbors and infrastructure is the MA Seaport Economic Council Grants. Additional funding sources specific to habitat and natural resources include the NFWF National Coastal Resilience Fund and the MA CZM Coastal Resilience Grants.

Responsible Parties:

- Natural Resources Department
- Planning Board and Select Board
- Coastal Resilience Advisory Committee
- Conservation Commission

Recommendation 2: Incorporate recommendations from the Coastal Resilience Plan into the Town's capital funding process as a strategic goal.

Responsible Parties:

- Natural Resources Department
- Planning Board
- Select Board
- Coastal Resilience Advisory Committee

Recommendation 3: Continue to pursue funding such as increased embarkation fees, Ch91 non-compliance penalties [[should this be included as one of these funding opportunities?]], state and federal grants, public-private partnerships, coastal resilience districts, and betterments within coastal resilience districts to secure funding for resilience and adaptation projects. [note: to be discussed - there may be some conflicting opinions on whether increased embarkation fees are a good idea]

Responsible Parties

- Natural Resources Department
- Planning Board
- Select Board
- Coastal Resilience Advisory Committee
- Town Administration
- Town Finance Department

Recommendation 4: Work with homeowners to increase their awareness and improve their responses to climate risks. Examples include offering tax subsidies to homeowners for taking proactive coastal resilience measures such as moving vulnerable infrastructure, engaging the real estate agents to educate buyers about risks through use of the real estate flyer and other options, and developing programs and policies through which homeowners assume risk due to erosion-caused loss of utilities or services.

Responsible Parties

- Natural Resources Department
- Planning Board
- Select Board
- Coastal Resilience Advisory Committee
- Real Estate Agents and Brokers

Objective 5: Continue to integrate climate resilience and adaptation measures into municipal regulations and bylaws.

Recommendation 1: Update municipal bylaws and regulations to address current and anticipated climate concerns, with an emphasis on nature-based approaches. Examples include (1) integrating the best available flood projections into Town regulations to regulate activities in future flood-prone areas. Model language for zoning and wetlands is available through the Cape Cod Commission, (2) Implementing Coastal Resilience Districts to enhance planning, funding, and maintenance, and (3) promoting coordination across projects to ensure that they work together to provide regional benefits (*e.g.*, align the heights of adjacent bulkheads). Other potential areas to explore include strategic retreat, moratoriums on development (including pools, homes, accessory dwelling units, decks) and redevelopment in flood-prone areas, and strategies that have multiple benefits such as resilience and public access.

Responsible Parties:

- Natural Resources Department
- Planning Board
- Select Board
- Coastal Resilience Advisory Committee
- Conservation Commission
- Historic District Commission
- Zoning Board of Appeals

Recommendation 2: Identify types of regulatory relief that may be necessary to facilitate adaptation and resilience projects.

Responsible Parties:

- Natural Resources Department
- Planning Board and Select Board
- Coastal Resilience Advisory Committee
- Conservation Committee
- Historic District Commission
- Board of Health
- Harbor and Shellfish Advisory Board

Recommendation 3: Develop and implement educational activities to encourage awareness of and compliance with bylaws and regulations.

Responsible Parties

- Natural Resources Department
- Planning Board and Select Board
- Coastal Resilience Advisory Committee
- Conservation Committee
- Department of Culture & Tourism

Nantucket Coastal Resilience Advisory Committee: Floodplain Discussion

April 14, 2025

Shannon Hulst, CFM
Cape Cod Cooperative Extension
Woods Hole Oceanographic Institution Sea Grant

ACK
CRAC

Mandatory Floodplain Updates

2020 State Model Floodplain Bylaw

- Why
- When
- What
- 2025 pending update

Sea Grant
WOODS HOLE OCEANOGRAPHIC INSTITUTION

COUNTY OF BARNSTABLE MASSACHUSETTS

Discussion of mandatory additions to current bylaw

- Certain protective legal language
- Designation of Floodplain Administrator
- Submit new technical data
- Variances to the National Flood Insurance Program
- Floodplain permits
- Unnumbered A Zones
- AO and AH drainage requirements
- Recreational Vehicles
- Enforcement
- Definitions

Optional Floodplain Updates: Cape Cod Model Resiliency Bylaws

Cape Cod Model Resiliency Bylaws

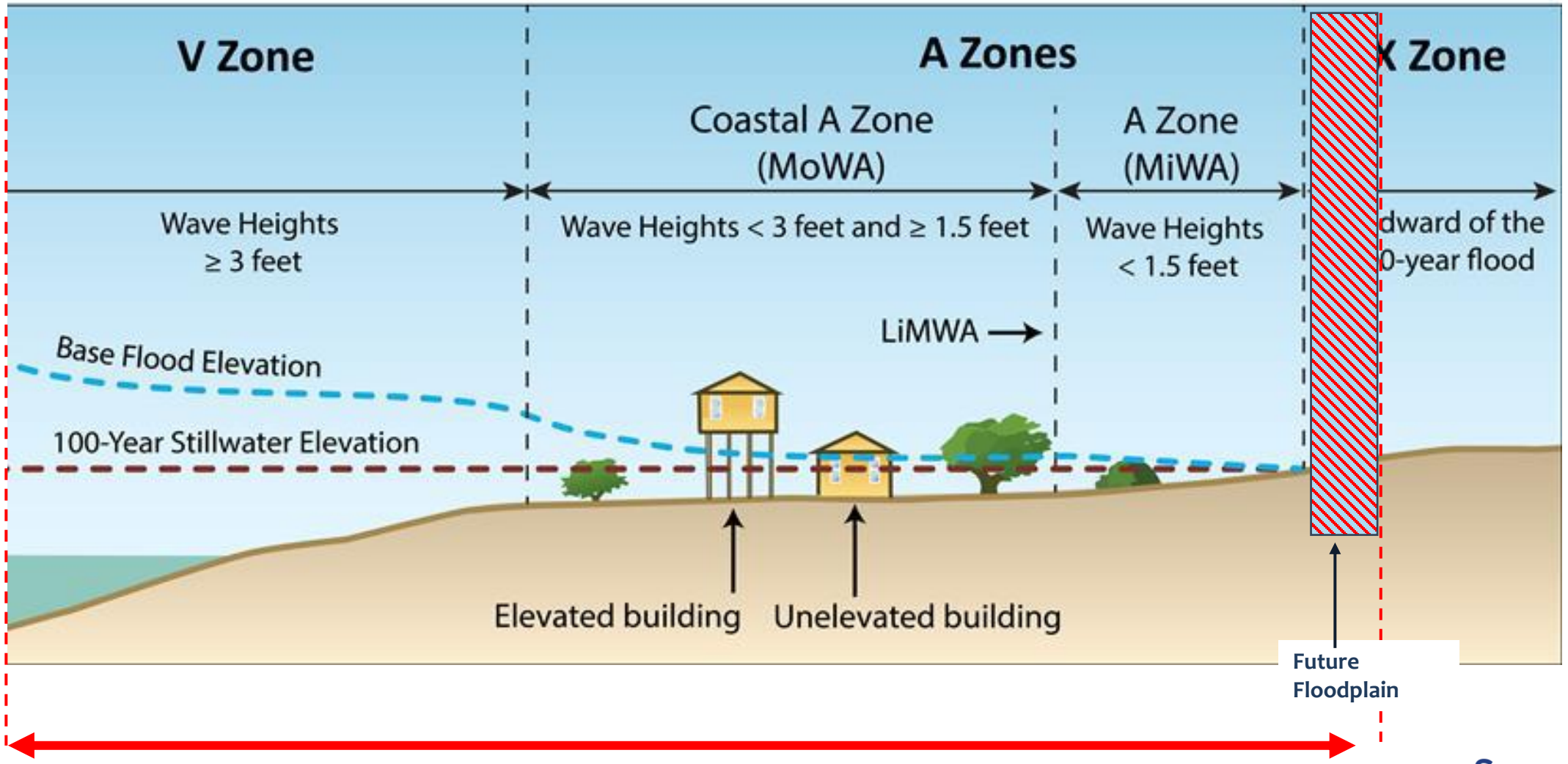
- Cape Cod Commission, Cape Cod Cooperative Extension and partners
- LSCSF + Zoning/General
- Coastal Resilience Zone
- Historic Structures

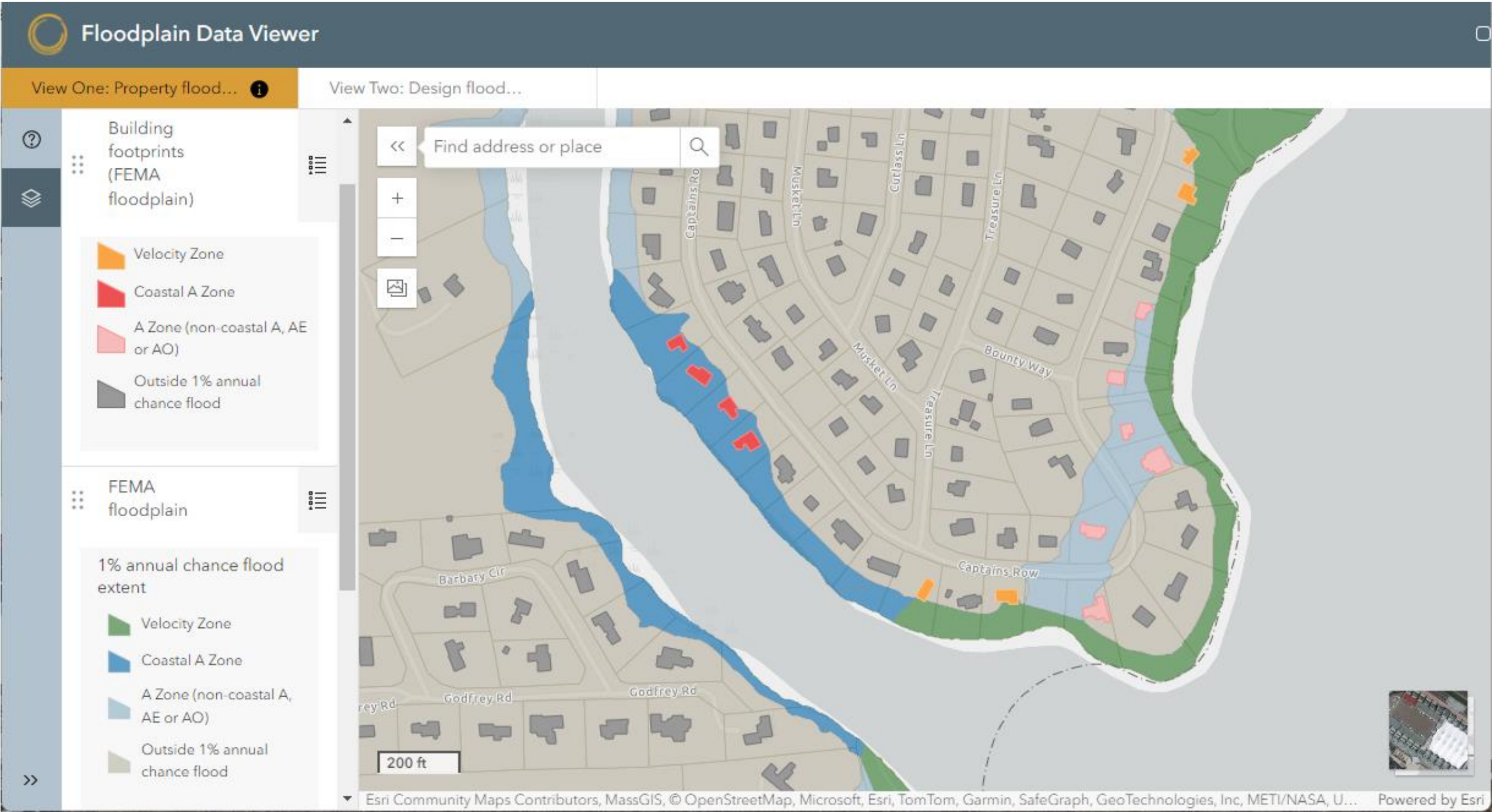
MODEL REGULATIONS

Key Regulatory Tools

- Includes performance standards for work within LSCSF
- Expands regulatory jurisdiction beyond LSCSF (horizontally and vertically) by creating Coastal Resilience Zone (CRZ)
  - Potential to regulate new area anticipated to be vulnerable in the future
  - *Land subject to 1% annual storm per Best Available Coastal Flooding Model [model adopted by Town, such as MC-FRM] for Target Year [e.g. 2050, 2070]* and Special Transition Areas
  - *Design Flood Elevation (DFE):* The predicted elevation of water resulting from sea level rise and coastal storms caused by the 1% annual storm for the Target Year.
- Intended to be added to existing bylaws but allows for adapting the new standards to local needs

Coastal Resiliency Zone




Floodplain Data Viewer
View One: Property flood...
View Two: Design flood...
Building footprints (FEMA floodplain)
Velocity Zone
Coastal A Zone
A Zone (non-coastal A, AE or AO)
Outside 1% annual chance flood
FEMA floodplain
1% annual chance flood extent
Velocity Zone
Coastal A Zone
A Zone (non-coastal A, AE or AO)
Outside 1% annual chance flood
Find address or place
Captains Rd
Musket Ln
Cutlass Ln
Treasure Ln
Bounty Way
Captains Row
Barbary Cir
Godfrey Rd
200 ft
Esri Community Maps Contributors, MassGIS, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, U...
Powered by Esri

Floodplain Data Viewer

View One: Property flood... | View Two: Design flood...

Building footprints (MCFRM floodplain)

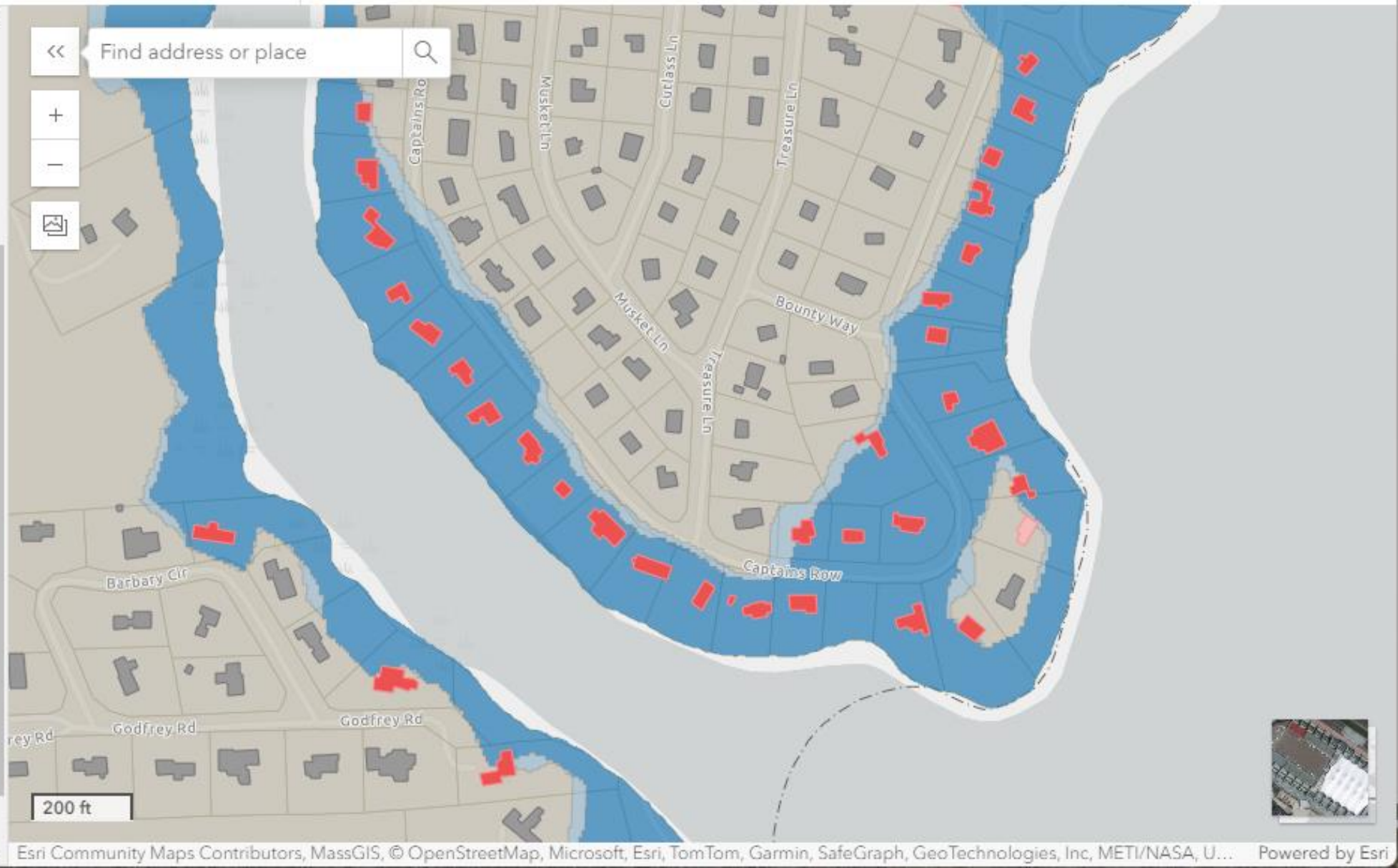
- 2050
- 2070
- Outside 1% annual coastal flood

MCFRM floodplain

1% annual coastal flood extent

- 2050
- 2070
- Outside 1% annual coastal flood

Parcels



Floodplain Data Viewer

View One: Property flood risk | View Two: Design flood...

2070 MCFRM design flood elevations

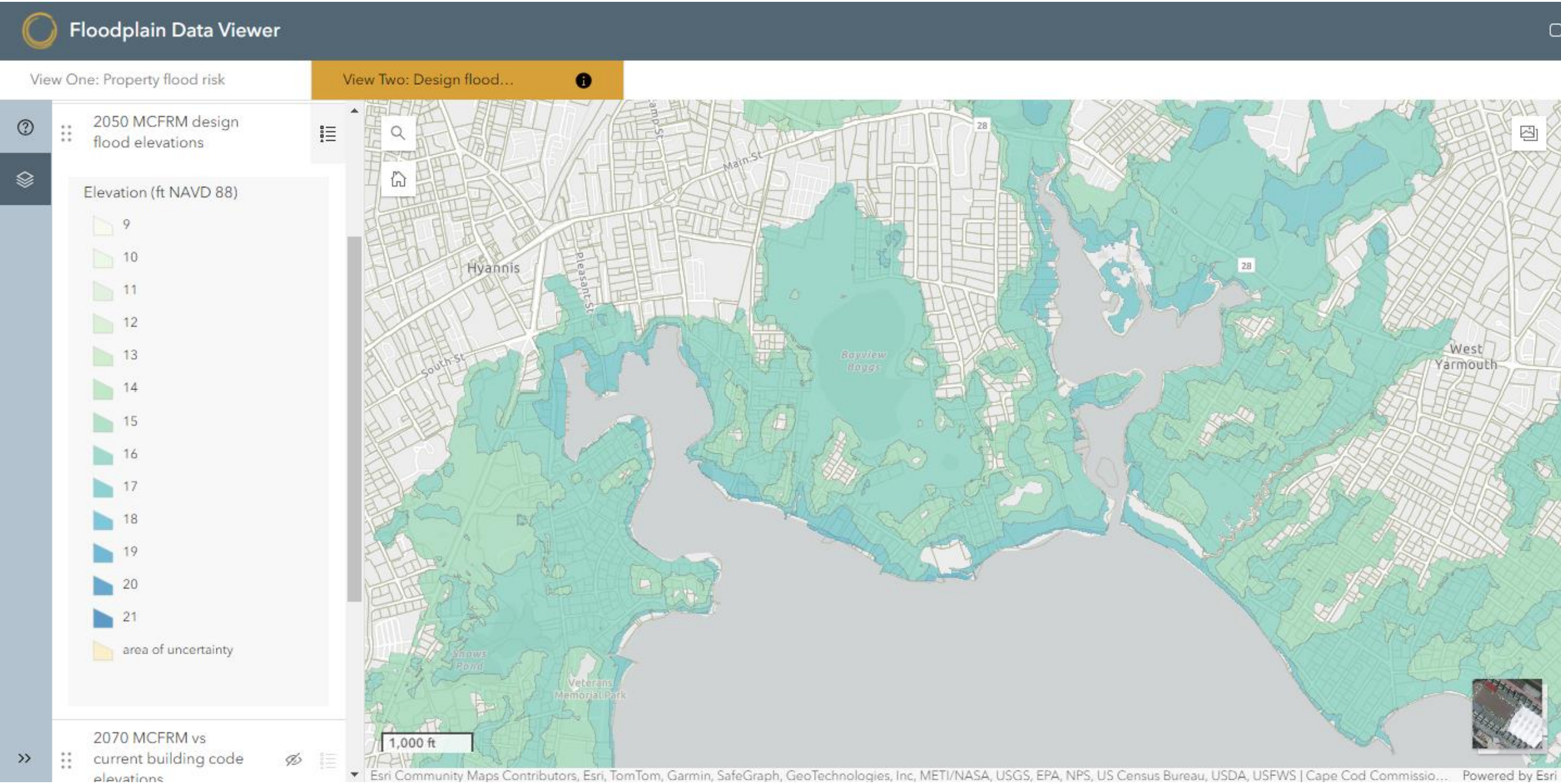
2050 MCFRM design flood elevations

Elevation (ft NAVD 88)

- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21

Find address or place

Captains Rd
Musket Ln
Cutlass Ln
Treasure Ln
Bounty Way
Captains Row
Barbary Cir
Godfrey Rd
Godfrey Rd
200 ft


Floodplain Data Viewer
View One: Property flood risk
View Two: Design flood...
2050 MCFRM design flood elevations
Elevation (ft NAVD 88)
9
10
11
12
13
14
15
16
17
18
19
20
21
area of uncertainty
2070 MCFRM vs current building code elevations
Hyannis
Main St
Pleasant St
South St
Bayview
Boggs
West Yarmouth
Snows Pond
Veterans Memorial Park
28
1,000 ft
Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS | Cape Cod Commissio...
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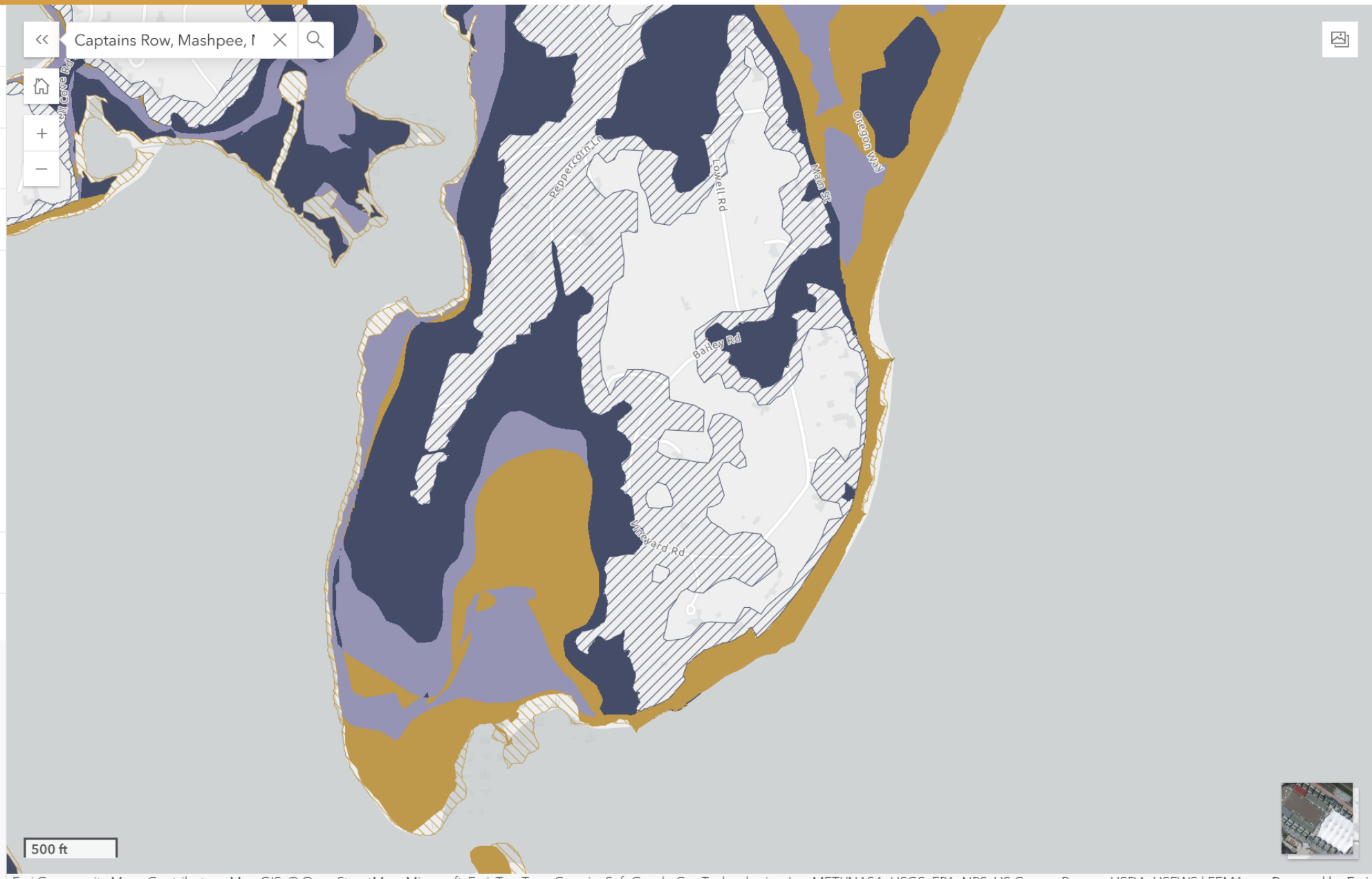
Floodplain Data Viewer

View One: Property flood risk | View Two: Design flood elevations

- New State Building Code design flood elevations
- Current State Building Code design flood elevations
- 2070 MCFRM design flood elevations
- 2050 MCFRM design flood elevations
- 2070 MCFRM vs new building code elevations
  - building code elevation is higher
  - elevations are equal
  - MCFRM elevation is higher
  - building code elevation only
  - MCFRM elevation only
- 2050 MCFRM vs new building code elevations
- Parcels



MODEL WETLANDS REGULATIONS

General Performance Standards

- Shall not increase flood elevation or velocity
- Shall not increase flows or cause channelization
- Shall avoid or mitigate adverse flooding effects on nearby properties ensuring return flow will not be prevented (i.e. ponding)
- Shall preserve existing soils, vegetation, and other natural conditions that serve as buffers to coastal flooding and storm surges

MODEL WETLANDS REGULATIONS

Other Performance Standards

Provisions that Apply to Entire District

Coastal A and V Zones

A Zones

Future Flood Zones

MODEL WETLANDS REGULATIONS

V Zone

- Prohibits new construction and expansion of buildings, sheds, garages, pools, septic systems or other structures

  Exceptions: relocation of utilities, roads, and Redevelopment Sites

- Repeated Flooding (Substantial Damage twice): Structure must be moved landward beyond V zone or demolished. Vacated site returned to vegetated state; cannot rebuild.

- Substantial Repair or Improvement: Must elevate building to Design Flood Elevation (DFE).

  Exceptions: historic buildings

- Stairs, boardwalks, docks, etc: Remove before storms or anchor, spacing for water to pass through. Components marked with contact information of owner.

MODEL WETLANDS REGULATIONS

A Zone

Special Transition Areas

A Zone (MoWA and MiWA)

- New construction / expansion of buildings allowed: Must elevate to DFE.

  Exception: historic buildings

- Substantial Repair similar to V zone
- Stairs, boardwalks, docks, etc: Similar to V zone

Special Transition Areas

- Cannot impede Predicted Path of Wetland Migration, new structures or expansions must be elevated to DFE

  Exception: historic buildings

- Fences, gates, sheds installed with opening to allow water to pass under and through. Cannot be rebuilt if damaged by migration of wetland resource area.

MODEL WETLANDS REGULATIONS

Redevelopment Sites

Enforcement

Redevelopment Sites

- No expansion of existing structures
- New construction/reconstruction limited to existing footprint. Must be elevated per underlying zone requirements
- Must reduce impervious surfaces and/or create compensable flood storage or wetlands resources
- Elevation of existing seawalls or placement of fill for flood control allowed with conditions

Enforcement

- Segmenting a project
- Rebuilding after required demolition
- Restoring ground level in elevated building
- Allowing dislodged stairs, decks, etc. to damage wetland resources

MODEL ZONING REGULATIONS

Outline

NOTE: This is different than the mandatory statewide model bylaw for National Flood Insurance Program compliance but will be incorporated into the same Floodplain Overlay District.

Provisions that Apply to Entire District

Coastal A and V Zones

A Zones

Future Flood Zones

MODEL ZONING REGULATIONS

Provisions Applicable to Entire District

Provisions Applicable to the Entire District

- No retaining walls, fences, or other structures that might redirect floodwaters without a Special Permit
- Building height measured from DFE
- Use assessed value and cumulative data for Substantial Improvement/Damage designations
- Historic Structures must attempt full compliance; only when historic designation is precluded may exemption be pursued
- Reconstruction may be pursued after Substantial Damage no more than two (2) times
- Non-Conversion Agreement
- Limitations on storage of hazardous materials

MODEL ZONING REGULATIONS

Coastal A and V Zones

- No new structures or expansions (except for utility elevation bumpouts and building access)
- No new pools or other hardscape; modifications to existing need a Special Permit
- Secure items stored underneath a structure
- For all Substantial Improvements, the lowest horizontal structural member must be elevated to the design flood elevation from either the building code or the best available flood model data, whichever is higher
- Repair or replacement of pre-existing accessory structures cannot exceed 120 sq ft and must be anchored and elevated

MODEL ZONING REGULATIONS

A Zones

- Option for no new structures
- Option for no expansions except for utility elevation bumpouts or relocation of structures from Coastal A or V Zones
- Special Permit for specific actions that a town might want to allow, such as outdoor landscape features
- For all Substantial Improvements, the first floor must be elevated to the design flood elevation from either the building code or the best available flood model data, whichever is higher
- Any land removed from a floodplain using a LOMR-F must adhere to underlying building regs (e.g. no basement)
- Accessory structures must be anchored and wet-floodproofed or meet building code standards

MODEL ZONING REGULATIONS

Future Flood Zones

- Mimic Wetlands bylaw: use best available data for the 1% chance floodplain for the Target Year
- Elevate structures based on Wetlands Bylaw/regs
- No restrictions on new development or expansions

Communications Framework

Overview

https://capecodcommission.org/our-work/regulatory-tools-for-coastal-floodplain-resiliency

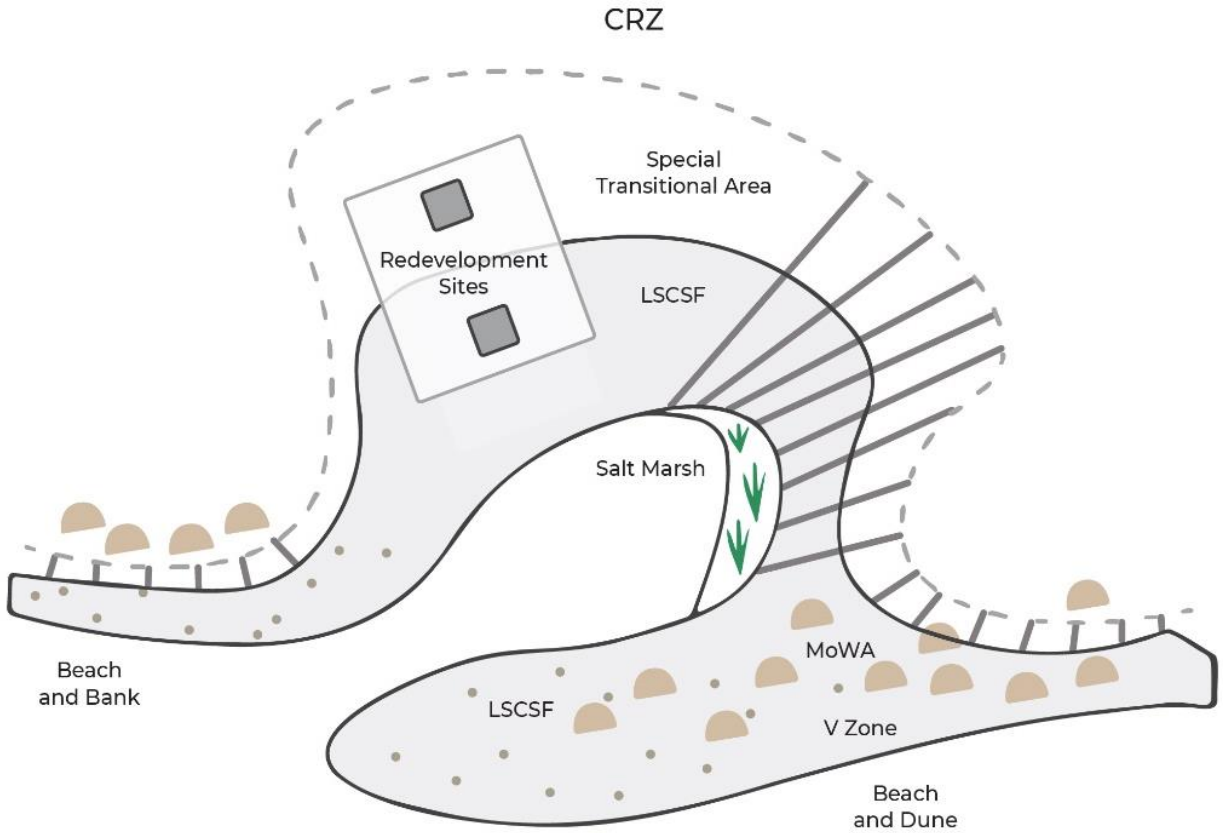
Thank You!

shannon.hulst@capecod.gov
(508) 375-6952

MODEL WETLANDS REGULATIONS

Definitions

Figure 1: Map of subareas within Coastal Resilience Zone (CRZ)



LSCSF - Land Subject to Coastal Storm Flowage; includes 1% annual flood risk per FEMA map, plus surge / storm of record

V Zone - Velocity Zone

MoWA - Moderate Wave Action Area

Adapted from figure created by Woods Hole Group