

# Regulatory Tools for Coastal Floodplain Resiliency

Martha's Vineyard Coastal Conference  
October 1, 2024



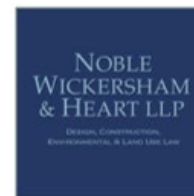
CAPE COD  
COMMISSION



Sea Grant  
WOODS HOLE OCEANOGRAPHIC INSTITUTION



URBAN HARBORS INSTITUTE



In Massachusetts, we expect the following sea level rise over 2018 levels:



**2100:** 5-8' (150– 240 cm)

**2070:** about 3.5' (105 cm)

**2050:** about 2' (60 cm)

# MASSACHUSETTS JURISDICTIONAL CONTEXT



## Wetlands Protection Act

MGL c. 131 § 40

Protects inland and coastal water-related lands (“resource areas”)

Work in these areas requires a permit



## Wetlands Protection Act Regulations

310 CMR 10.00

Issued by MassDEP

Set performance standards for work in regulated areas



## Local bylaws & regulations

Adopted by towns who administer permits through local conservation commission

Can be stricter than the Act

Bylaws approved at town meeting

Regulations are issued by the conservation commission



## MA State Building Code

Cannot regulate or restrict the use of materials or methods of construction of structures regulated under the MSBC

Wetlands Bylaws Can: protect wetlands resources from development impacts

Wetlands Bylaws Cannot: regulate building construction within wetland resource areas

# FLOOD PROTECTION IS A PROTECTED INTEREST

## MA WETLANDS PROTECTION ACT & REGULATIONS

### Land Subject to Coastal Storm Flowage (LSCSF) is a protected resource area.

- *“...land subject to any inundation caused by coastal storms up to and including that caused by the 100-year storm, surge of record or storm of record, whichever is greater.”*

### But . . .

- Few performance standards for flood protection under Wetlands Act and DEP regulations.
- Current flood protections rely on historic FEMA maps and do not consider future risks.

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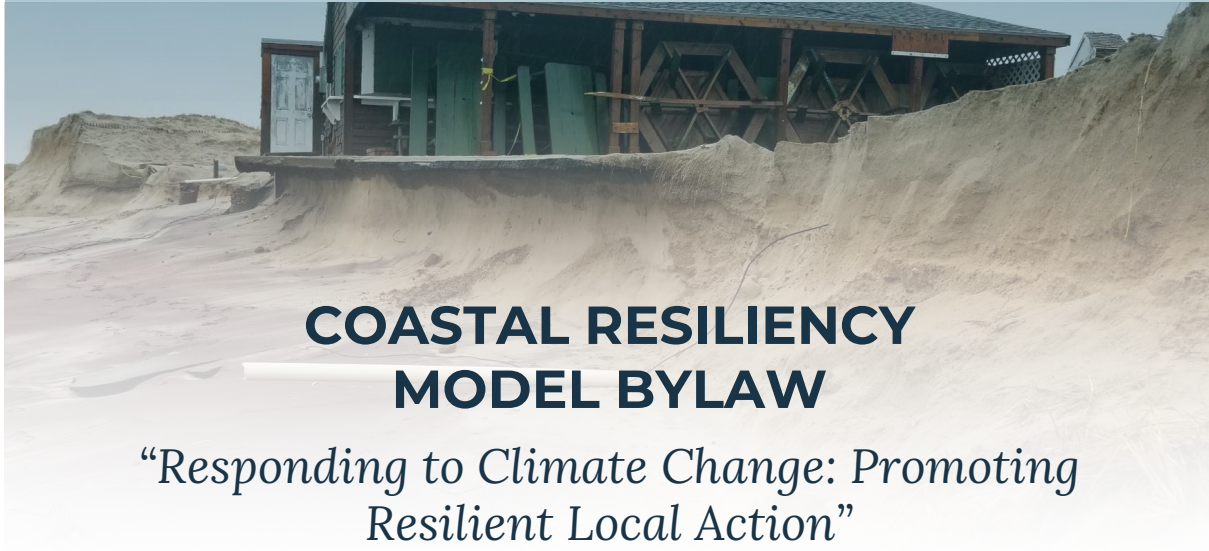
# NEED FOR FLOOD PROTECTION STANDARDS

State has issued draft performance standards for LSCSF, but not yet promulgated

Increasing interest to protect this area more thoroughly, now and into the future



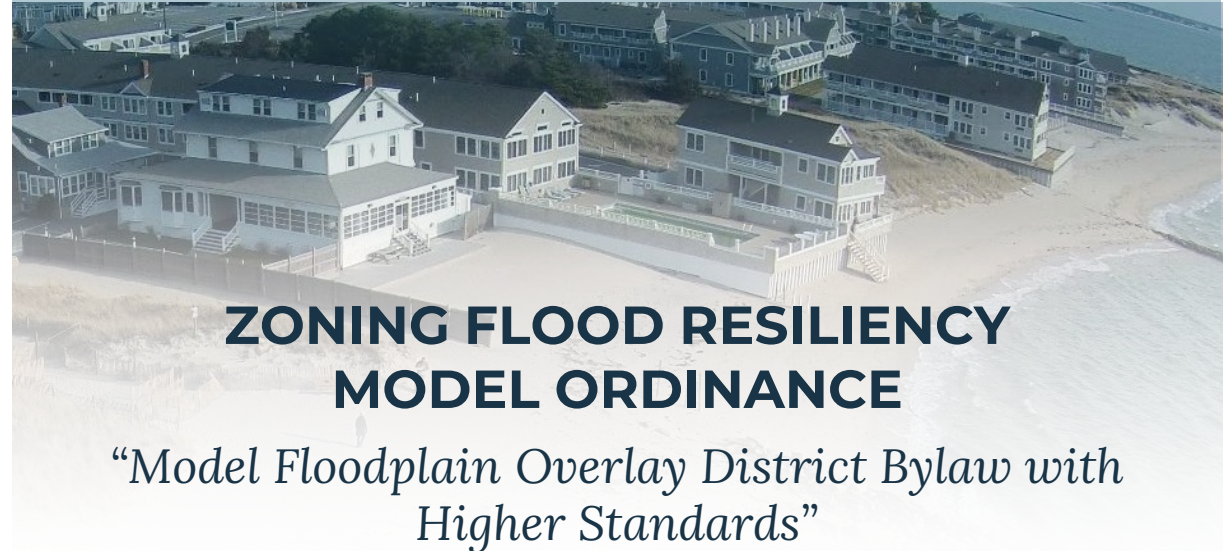
Image: Sandwich, MA Source: Cape Cod Times



## COASTAL RESILIENCY MODEL BYLAW

*“Responding to Climate Change: Promoting Resilient Local Action”*

- EEA Planning Assistance Grant (2019-2021)
- Develop natural resource protection, flood protection, and land use strategies to reduce development risk in the floodplain and promote natural resource migration



## ZONING FLOOD RESILIENCY MODEL ORDINANCE

*“Model Floodplain Overlay District Bylaw with Higher Standards”*

- NOAA grant to Woods Hole Sea Grant / Cape Cod Cooperative Extension (2021-2022)
- Combination of required floodplain bylaw language as well as higher standards relative to zoning to protect from the effects of coastal flooding and promote flood resiliency

## EEA Planning Assistance Grant (2022-2024)

Develop complementary wetlands regulations and zoning bylaw models for coastal floodplain development to:



Increase protection of our coastal resources and environment



Allow for natural resource migration



Reduce environmental harm and damage



Plan for future changes to the extents of coastal resource areas



Give towns some consistency between regulations administered by different boards

## PROJECT OVERVIEW

# Regulatory Tools For Coastal Floodplain Resiliency



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## 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





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## 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



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## MODEL WETLANDS REGULATIONS

### Other Performance Standards

Provisions that Apply to Entire District

Coastal A and V Zones

A Zones

Coastal Resilience 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*
- Repetitive Loss (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.



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# 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.



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## 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



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# MODEL ZONING REGULATIONS

## Outline

Provisions that Apply to Entire District

Coastal A and V Zones

A Zones

Coastal Resilience Zones



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## MODEL ZONING REGULATIONS

# Development Regulations

- Limitations on development in A, Coastal A, and V zones
- Limits on redevelopment
- Limits on expansion of structural footprint
- Lot coverage limits
- Limitations on reconstruction after Substantial Damage
- Considerations for historic structures
- Prohibition/limits on fill
- Prohibition on storage of hazardous materials



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# MODEL ZONING REGULATIONS

## Other Provisions

### 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





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## 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



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# 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



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## MODEL ZONING REGULATIONS

# Coastal Resilience Zones

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



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# Communications Framework

## Overview



Key Term Definitions

Communication Best Practices

Town-specific data and information

Talking Points

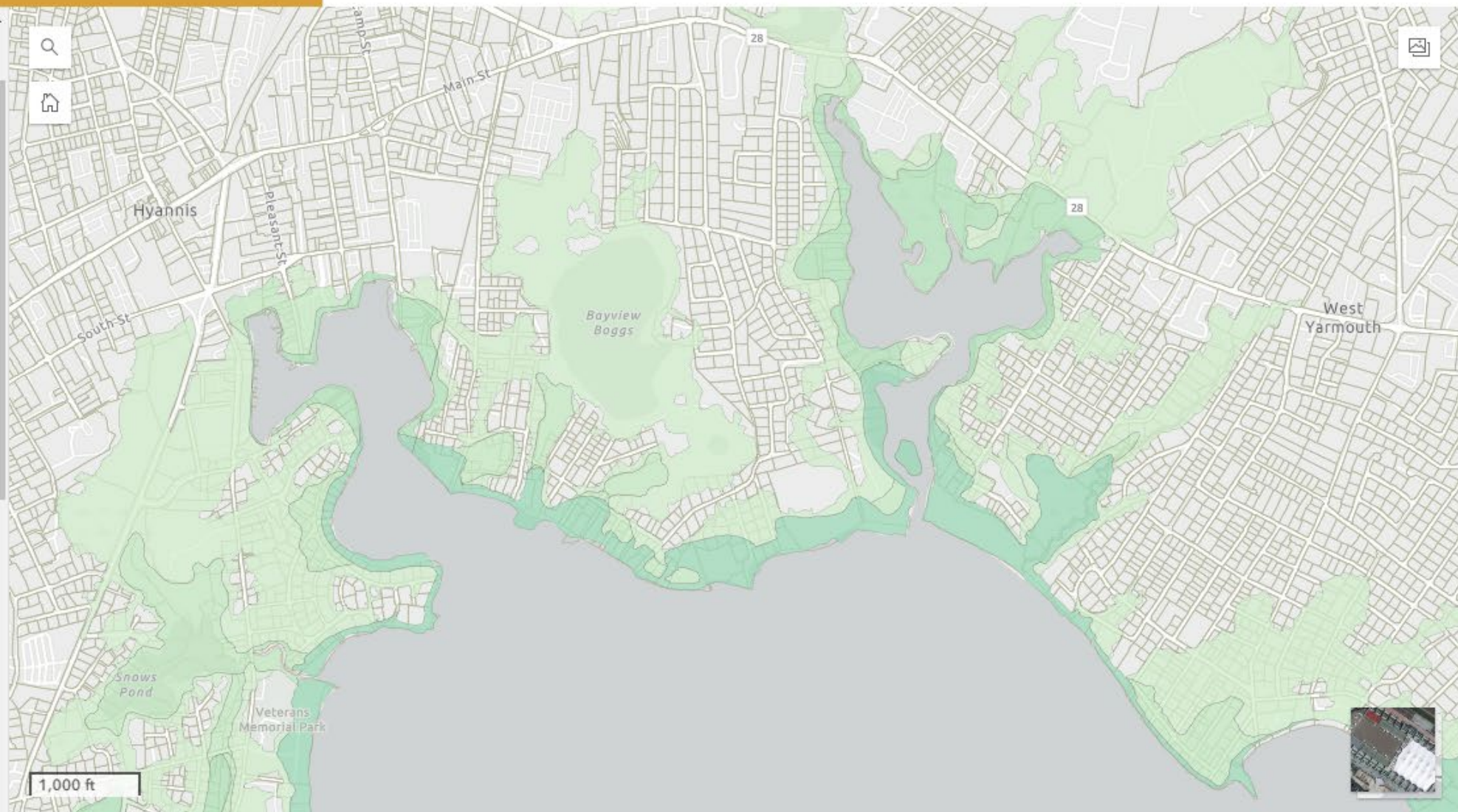
View One: Property flood risk

View Two: Design flood...

Current State  
Building Code design  
flood elevations

Elevation (ft NAVD 88)

- 10 or lower
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 25 and over



View One: Property flood risk

View Two: Design flood...

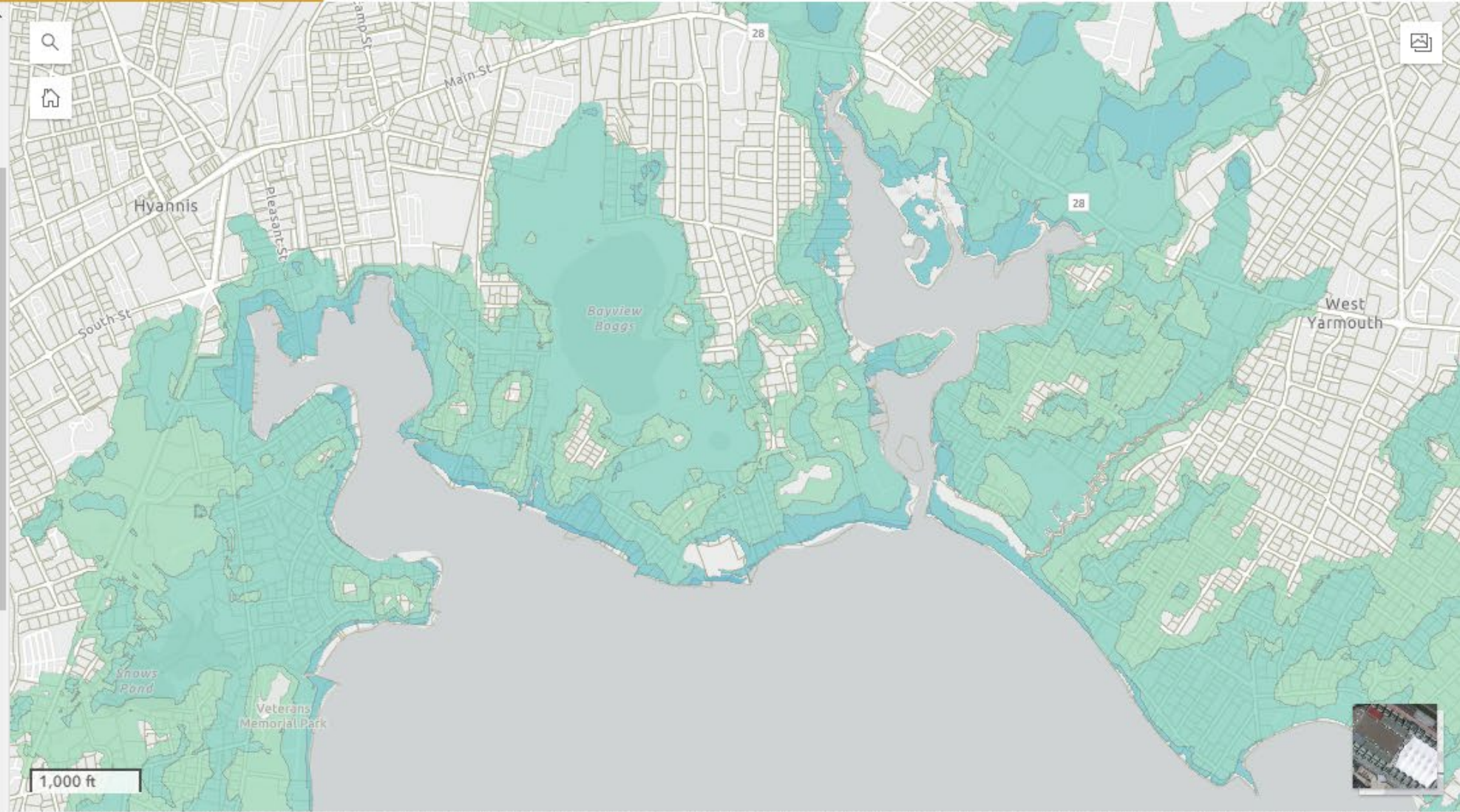


2050 MCFRM design flood elevations

Elevation (ft NAVD 88)



2070 MCFRM vs current building code elevations



The background of the slide is a light blue-tinted photograph of a house built on stilts over a body of water. The house has a gabled roof and a balcony. The water is visible in the foreground and middle ground.

# Thank you!

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