

NH Shoreline Structure Inventory & Other Data





NH Shoreline Structure Inventory & Other Data

Chris Bucher, NHDES Coastal Program 2025 Intern



Estuary Management Plan Actions

1.1-9:

Review and optimize MS4 compliance for all towns (regardless of MS4 designation), including infrastructure mapping, erosion and sediment controls, illicit discharge programs, and good housekeeping practices. Sweep municipal paved roads and parking lots two times per year (spring and fall).

5.1-9:

Continue to identify vulnerable assets and infrastructure for implementation plans that better adapt to changing conditions (e.g., nature-based solutions).

2016 Shoreline Inventory: Review

- Created a baseline dataset (inventory) of engineered shoreline structures
- Inform integrated shoreline management decisions
- Shoreline habitat & vulnerability



New Hampshire Inventory of Tidal Shoreline Protection Structures



Windsor, N. (2015, October 28). [King tide winter crash against Hampton seawall]

March 2016 (Edited May 2017)

Engineered Shoreline Structures

- Berm
- Jetty/Groin
- Rip Rap/Revetment
- Seawall
- Living Shorelines



Reasons for an update

- 9 years ago
- New NHDES chapter 600 revisions as of 12-15-19
- Part 609: Tidal shoreline stabilization requirements
 1. Maintain or enhance natural processes
 2. Technique/s used are best available scientific & engineering practices
 3. The use of a Living shoreline technique unless deemed not practical

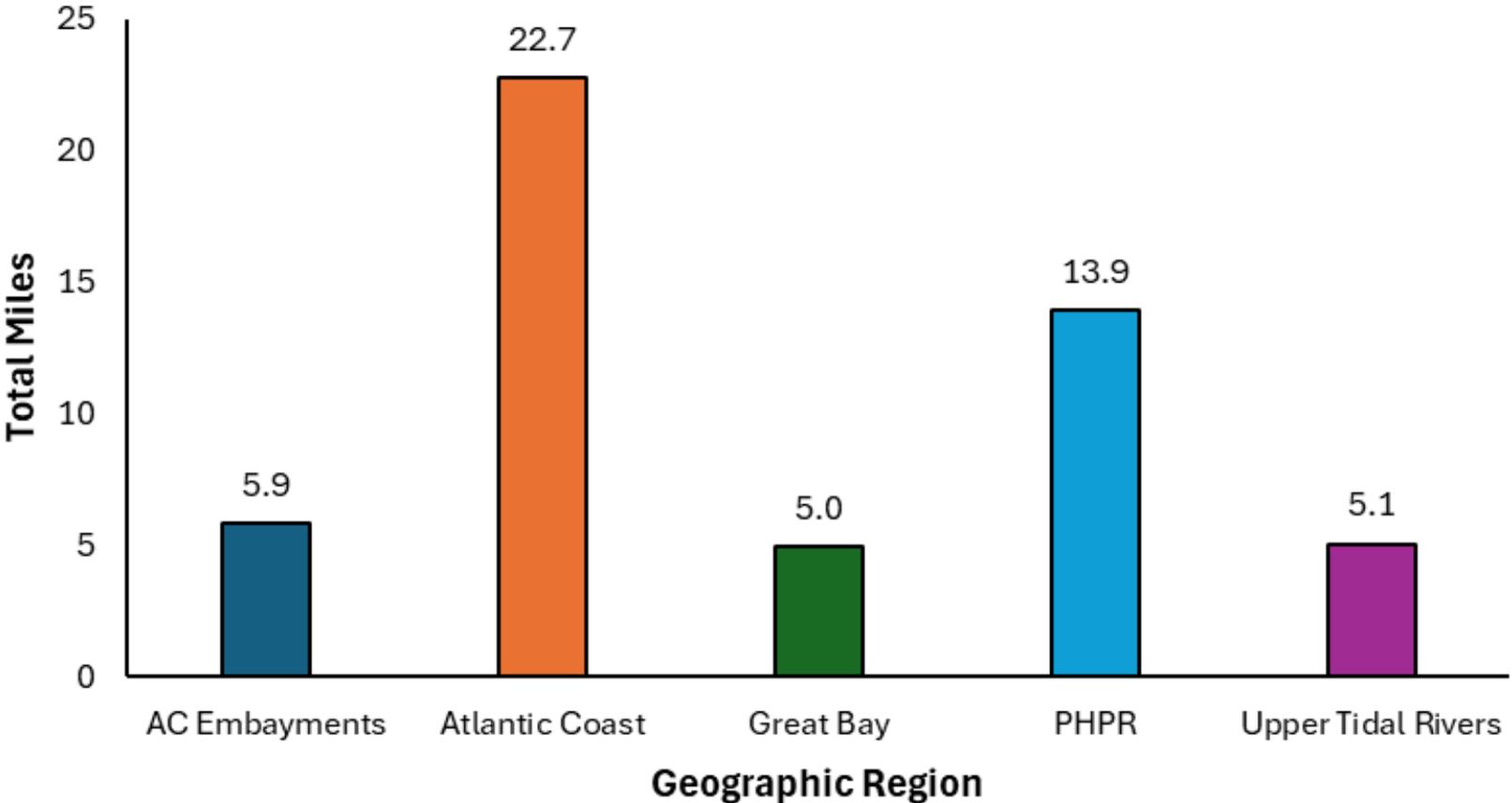
2025 Shoreline Structure Inventory

- Review & update 2016 spatial inventory
 - Modify existing structures
 - Update attributes
- Review wetland permits (2016-2025)
 - New structures
 - Field verifications
- Change analysis (2016-2025)
 - Total mileage of structures



2025 Shoreline Inventory: Outputs

Armoring by Geographical Region



2025 Shoreline Inventory: Outputs

Community	Armored Miles
Rye	13.71
Hampton	10.16
Portsmouth	7.49
Dover	3.87
New Castle	3.80
Seabrook	2.74
North Hampton	2.65
Durham	2.24
Newington	1.73
Greenland	1.25
Newmarket	1.23
Exeter	0.94
Newfields	0.28
Stratham	0.24
Rollinsford	0.20
Hampton Falls	0.05
Madbury	0.01

52.59 total miles

2025 Shoreline Inventory: Outputs

Community	Armored Miles
Rye	13.71
Hampton	10.16
Portsmouth	7.49
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52.59 total miles

~25% of shoreline structures are within HSE communities

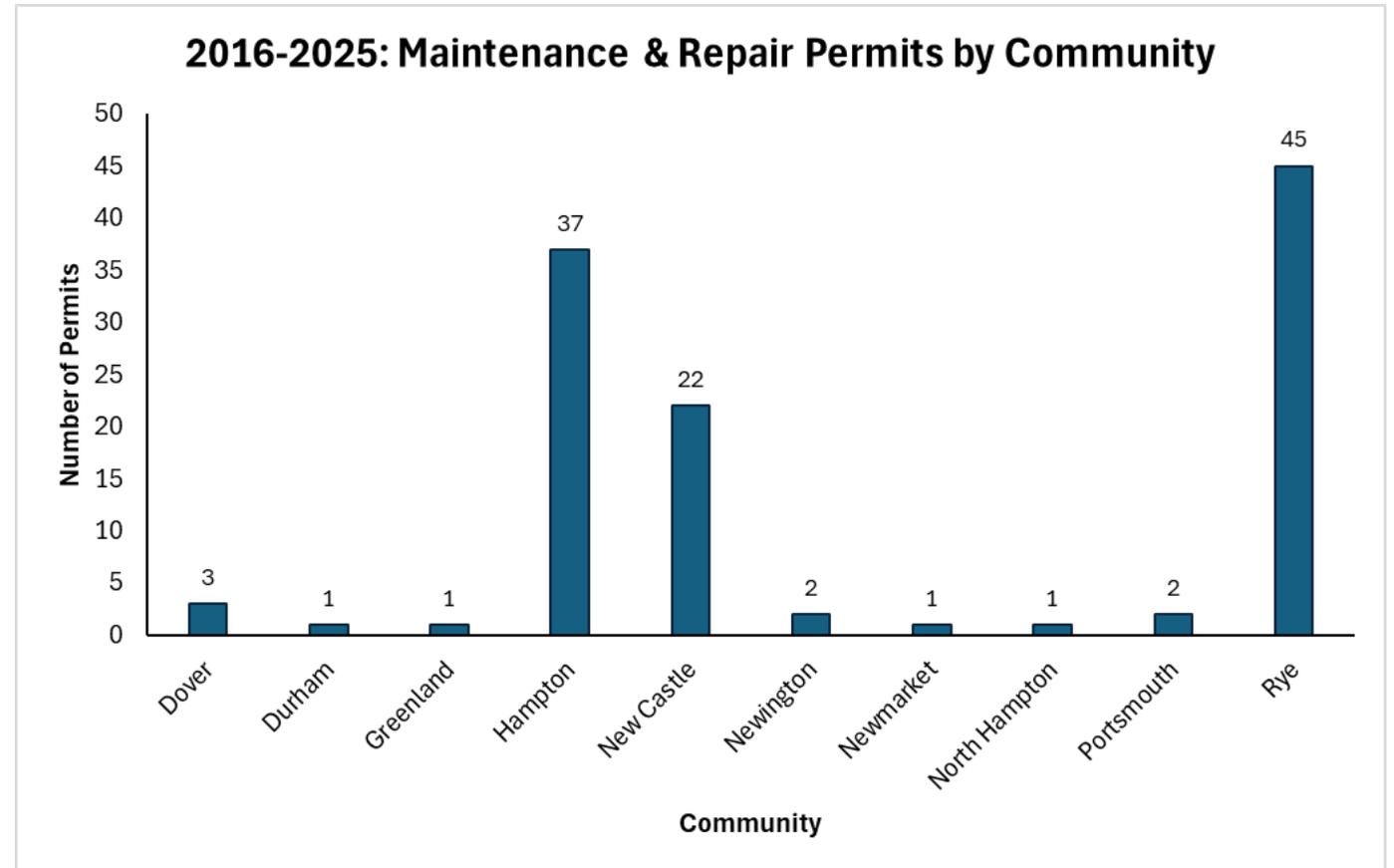
Community	Updated 2016 (armored miles)	2025 (armored miles)	Percent Change
New Castle	3.60	3.80	+5.52%
Dover	3.68	3.87	+5.18%
Durham	2.15	2.24	+4.12%
Newington	1.67	1.73	+3.56%
Newmarket	1.20	1.23	+2.65%
Hampton	10.09	10.16	+0.75%
Portsmouth	7.46	7.49	+0.41%
Exeter	0.94	0.94	0.00%
Greenland	1.25	1.25	0.00%
Hampton Falls	0.05	0.05	0.00%
Madbury	0.01	0.01	0.00%
Newfields	0.28	0.28	0.00%
North Hampton	2.65	2.65	0.00%
Rollinsford	0.20	0.20	0.00%
Rye	13.71	13.71	0.00%
Seabrook	2.74	2.74	0.00%
Stratham	0.24	0.24	0.00%

2025 Shoreline Inventory: Hot Spot Analysis

Using Wetlands Permit Data, we can track changes

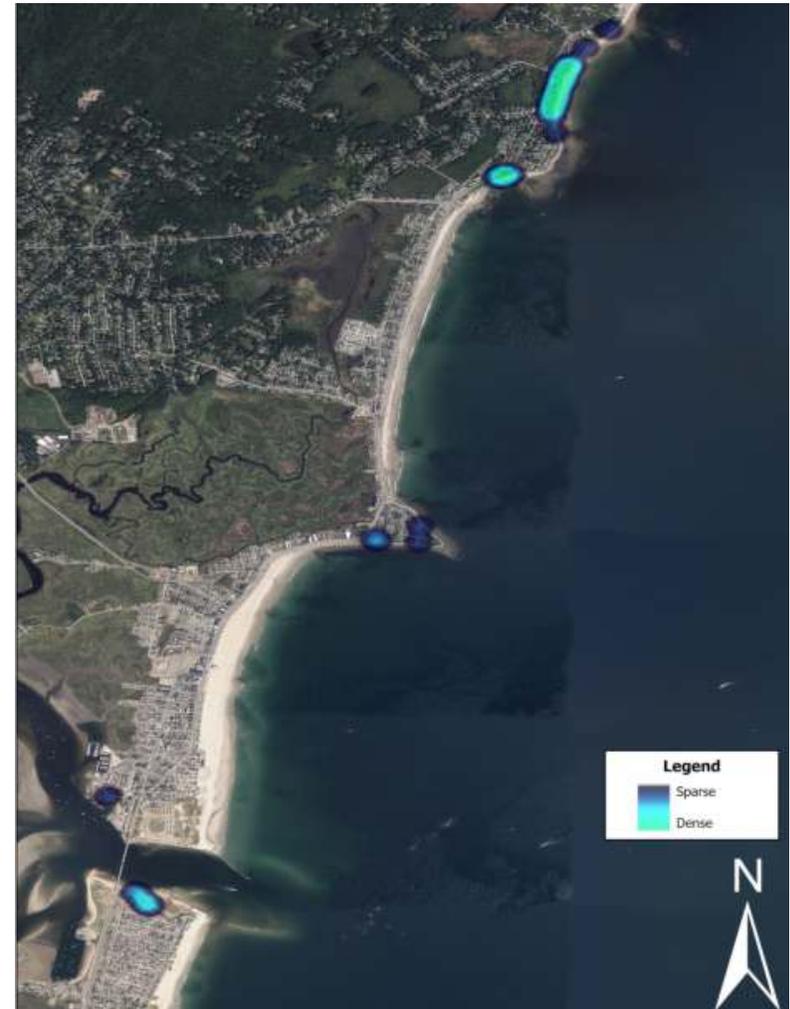
Are there regions of the Seacoast that have more frequent or higher density of repairs?

- Hampton
- New Castle
- Rye

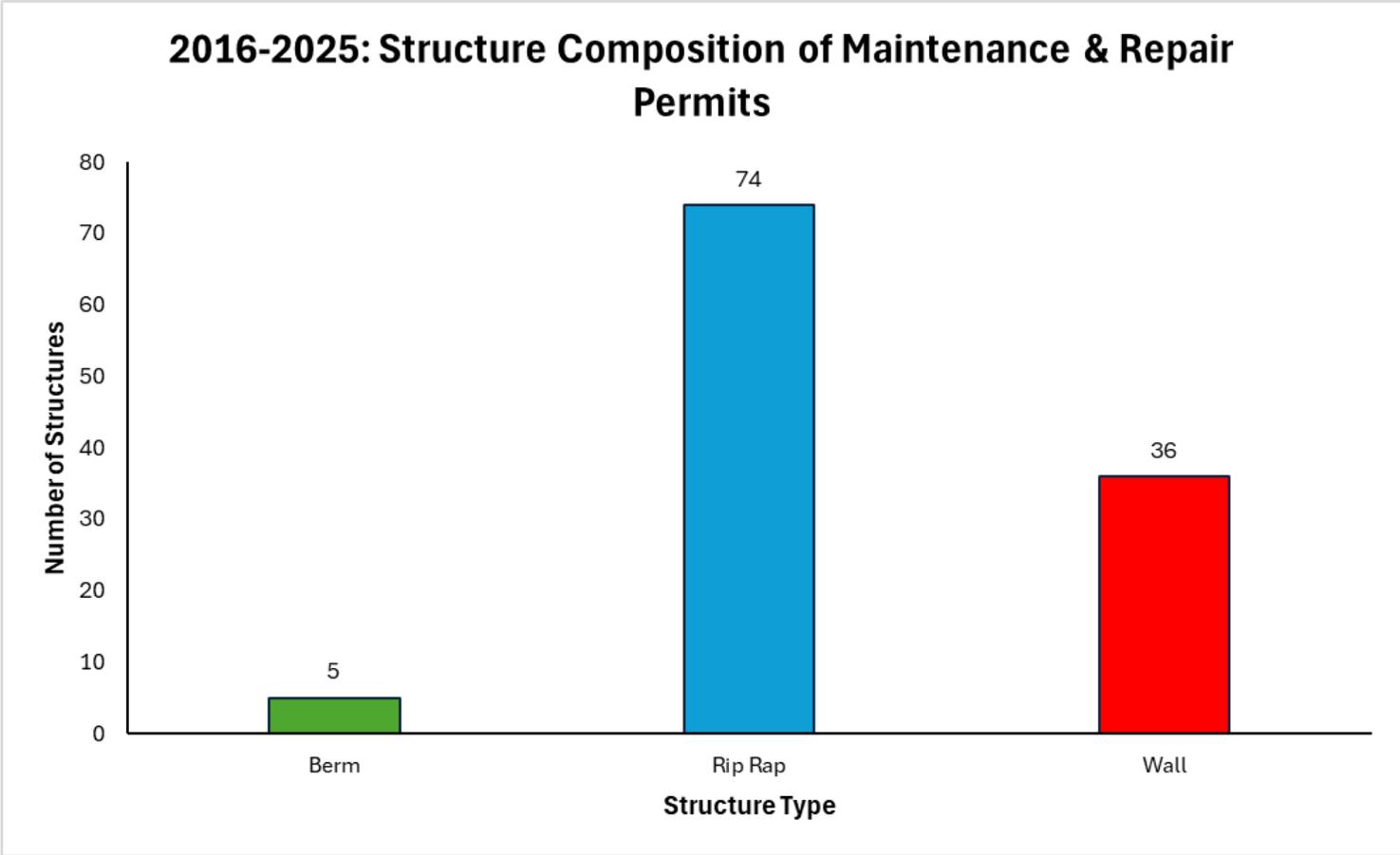


2025 Shoreline Inventory: Hot Spot Analysis

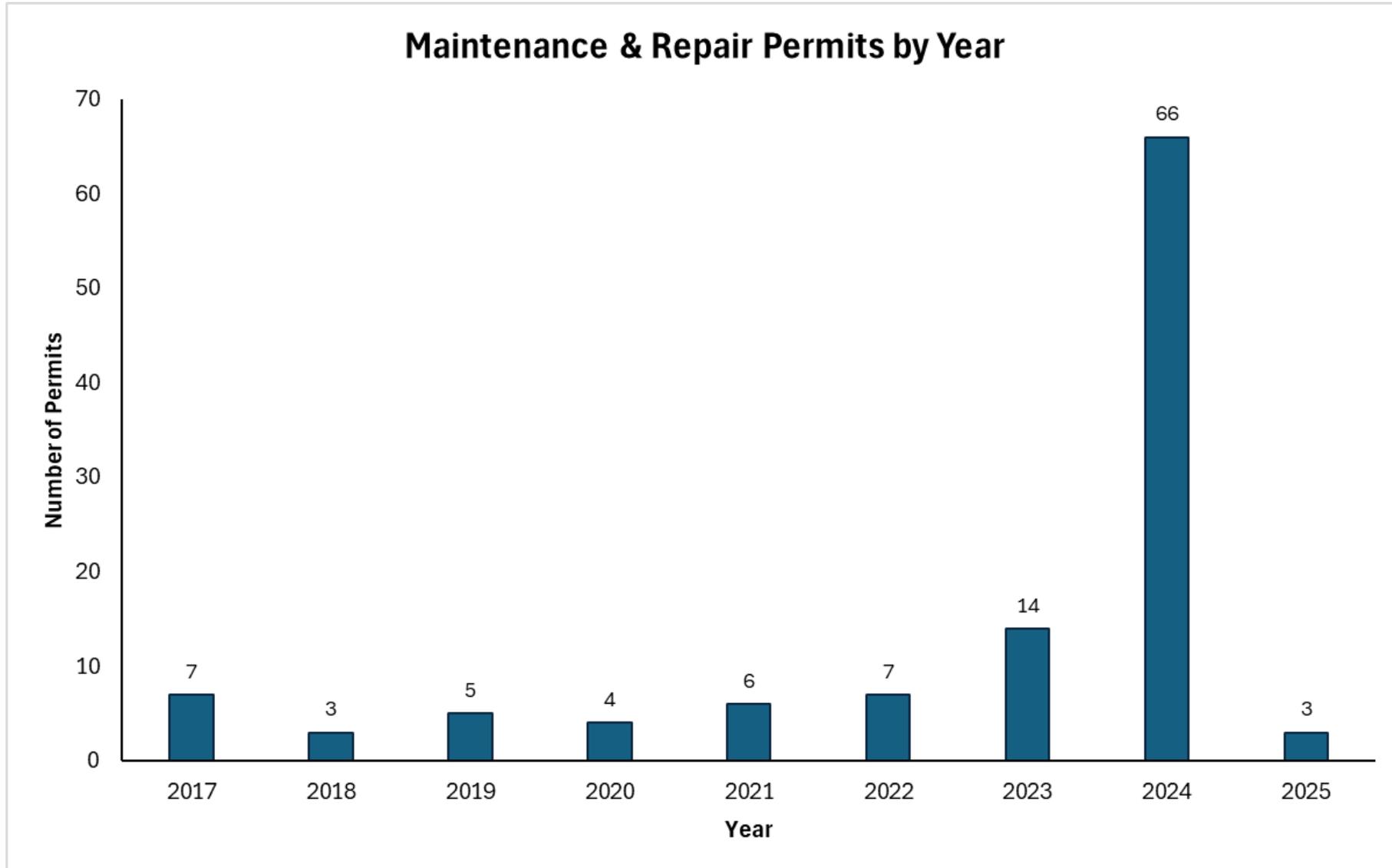
- Are there regions of Hampton that have more frequent or higher density of repairs?
 - Plaice Cove
 - Boar's Head
 - Hampton Harbor



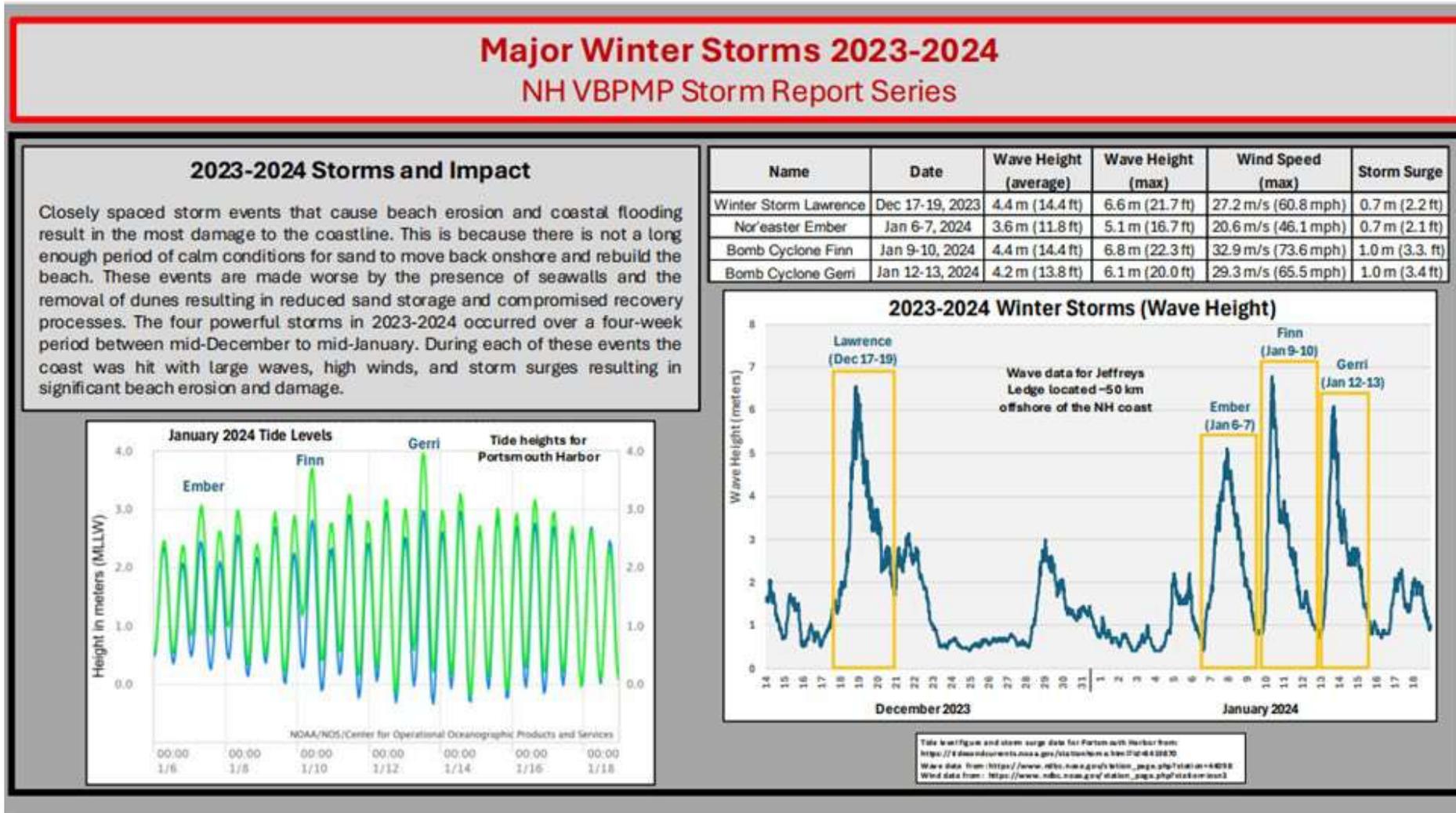
2025 Shoreline Inventory: Hot Spot Analysis



2025 Shoreline Inventory: Hot Spot Analysis



2025 Shoreline Inventory: Hot Spot Analysis



- [NH_Beaches_Storm_Impacts_Series_2023-2024.pdf](#)

Welcome

Layers List

Legend

Home

Add Data

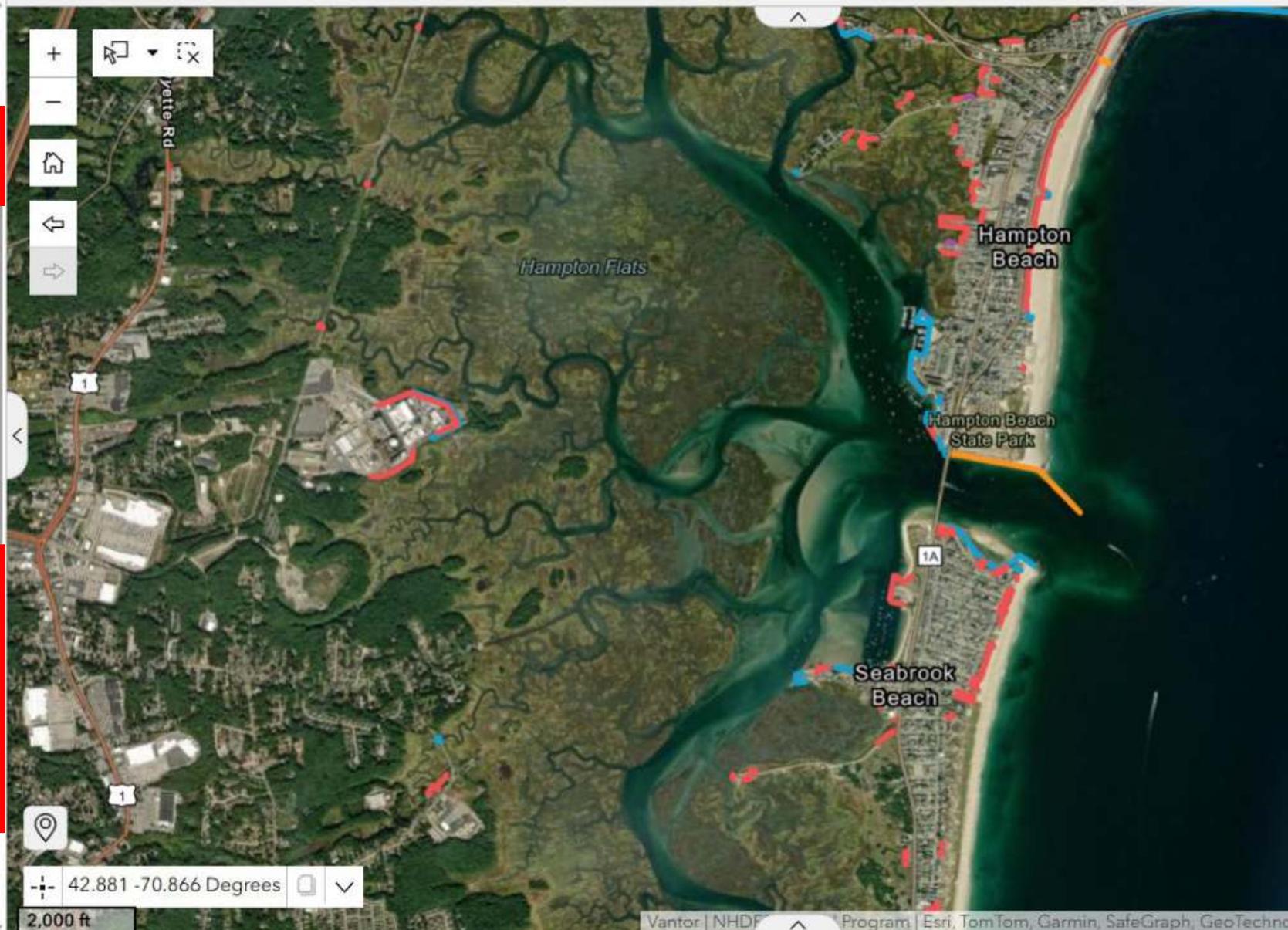
Themes

Draw and Measure

Attributes

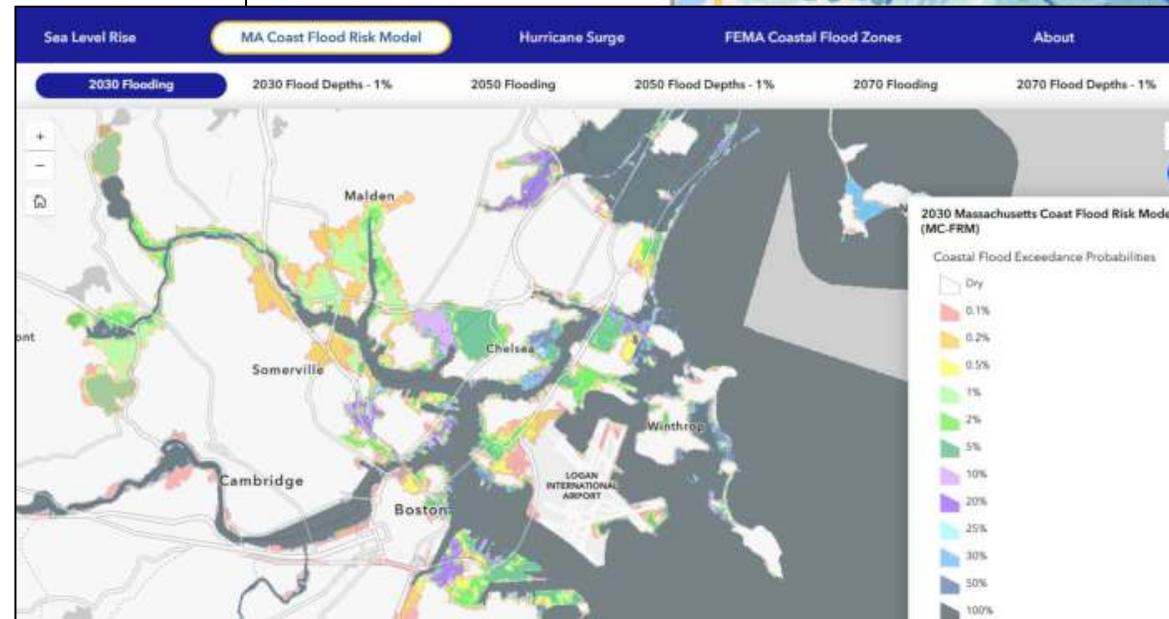
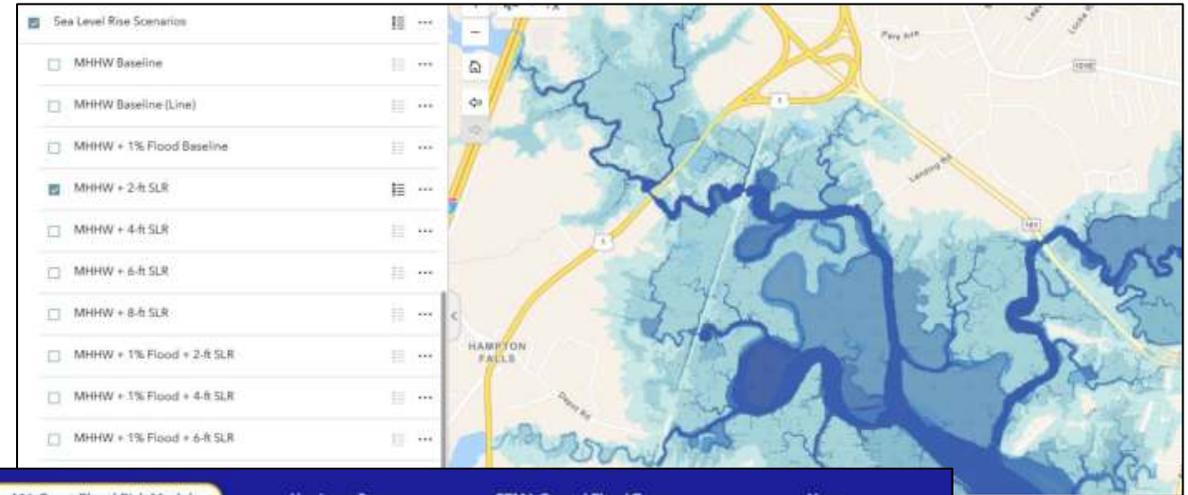
Share

- Inland Water Resources
- Location and Geodetic Network
- Oceans and Coasts
- Coastal Erosion Hazard Layers
- CBRA Otherwise Protected Areas
- Coastal Beaches
- Dunes
- Coastal Restoration Database
- 2025 Shoreline Structure Inventory
 - Wall
 - Rip Rap/Revetment
 - Berm
 - Living Shoreline
 - Jetty/Groin
- Salt Marsh Ditches NH 2021



NH Coastal Flood Risk Model

- Replace existing bathtub models
- Dynamic Model includes critical processes
 - Waves
 - Storm Surge
 - Calibrated with historic storms



Model Outputs

	Climate Scenarios/ SLR Scenarios					total data files
	Present Day	2040 (+0.8)'	2056 (+1.3)'	2083 (+2.4)'	2100 (+3.4)'	
Annual exceedance probabilities	x	x	x	x	x	5

Viewable on the Coastal Viewer

Model Outputs

	Climate Scenarios/ SLR Scenarios					total data files
	Present Day	2040 (+0.8)'	2056 (+1.3)'	2083 (+2.4)'	2100 (+3.4)'	
Annual exceedance probabilities	x	x	x	x	x	5
Tidal benchmarks		x	x	x	x	4
Water surface elevations*	xxx	xxx	xxx	xxx	xxx	15
Wave heights*		xxx	xxx	xxx	xxx	12
						36

Viewable on the Coastal Viewer

3 AEPs: 10%, 1% & 0.2%

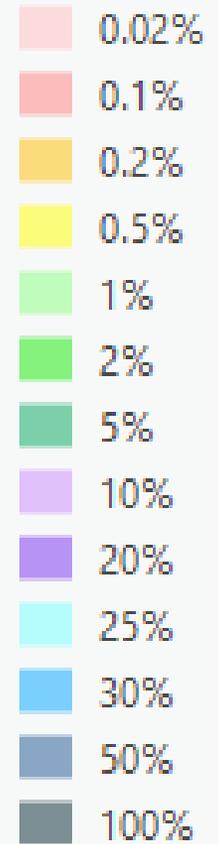
3 AEPs: 10%, 1% & 0.2%

Present
Day
(2015)

PRELIMINARY



Annual
Exceedance
Probability



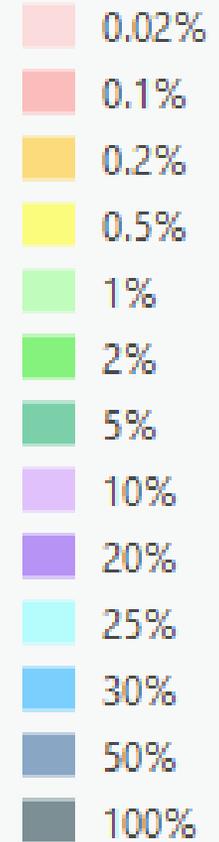
Present
Day
(2015)

PRELIMINARY



$$\frac{1}{aep} = \text{X year storm}$$

Annual
Exceedance
Probability



Present
Day
(2015)

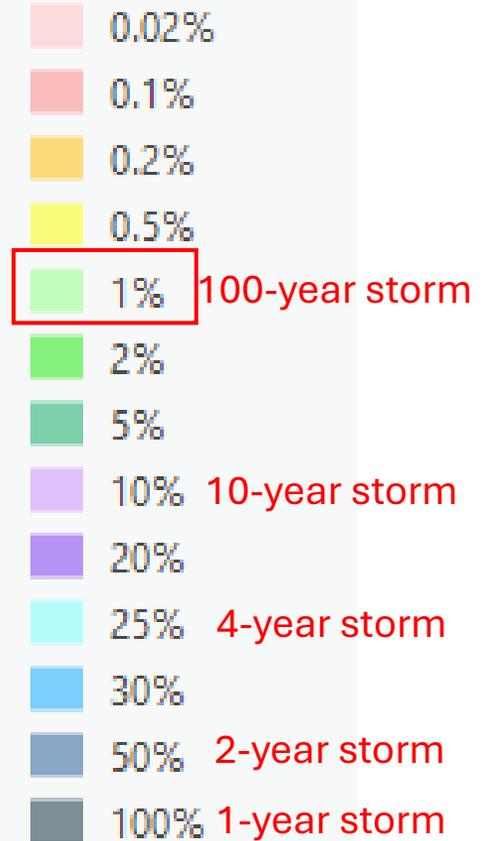
PRELIMINARY



$$\frac{1}{aep} = X \text{ year storm}$$

$$\frac{1}{0.01} = 100\text{-year storm}$$

Annual
Exceedance
Probability

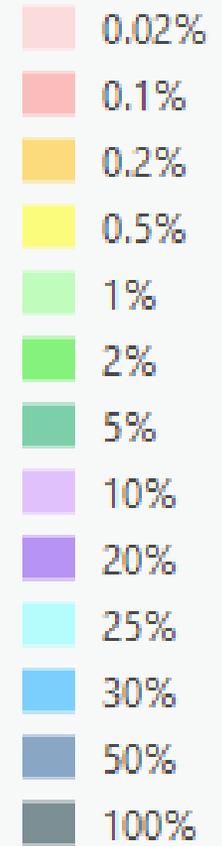


+ 0.8'

PRELIMINARY



Annual
Exceedance
Probability

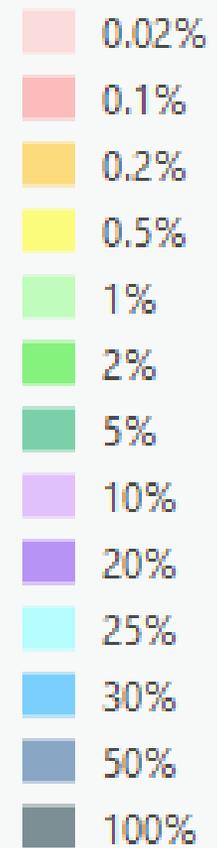


+ 1.3'

PRELIMINARY



Annual
Exceedance
Probability



Upcoming



AEPs & Water Depth on Coastal Viewer Any Day Now

Remaining data available to download on Woods Hole Group webpage

Wave Heights, Water Surface Elevations, Tidal Benchmarks



Preparing Fact Sheet & Frequently Ask Questions Documents



Technical Report



Phase II

Vulnerability Assessments

Alternative Analysis

Present Case Studies and 3 Training Modules

A winter landscape with snow-covered trees and a frozen body of water. The scene is serene and cold, with a mix of evergreen and deciduous trees, some heavily laden with snow. The water in the background is partially frozen, reflecting the overcast sky.

Thank You!

Perennial Pepperweed

Shoreline Structure Inventory

NH Coastal Flood Risk Model

aidan.t.barry@des.nh.gov