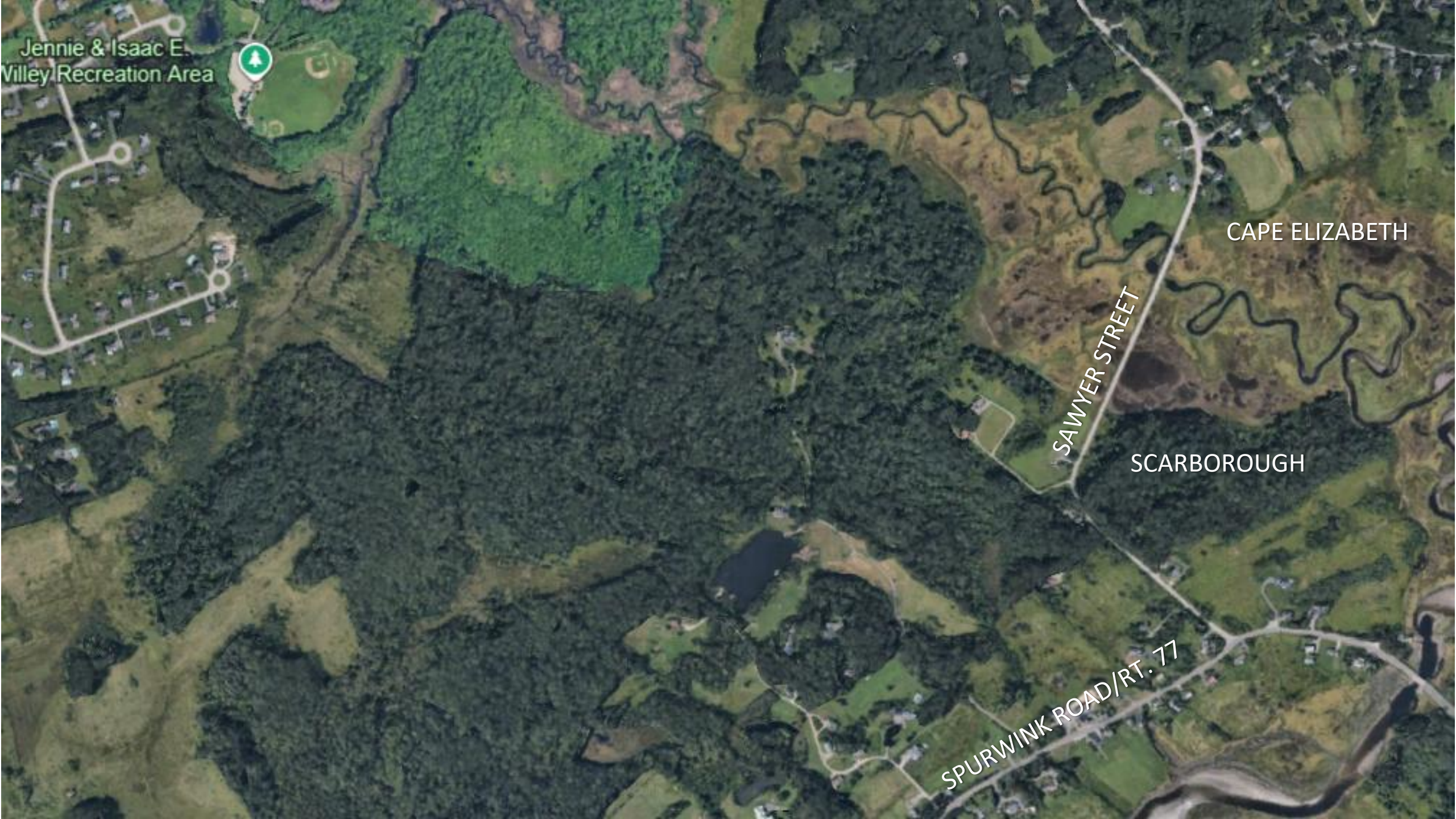
SPURWINK MARSH RESTORATION & SAWYER STREET REMOVAL PROJECT



Public Meeting
September 24, 2025

SCARBOROUGH MAINE

ENGINEERING & TECHNICAL SERVICES · TOWN OF SCARBOROUGH ·


Jennie & Isaac E.
Villey Recreation Area
CAPE ELIZABETH
SAWYER STREET
SCARBOROUGH
SPURWINK ROAD/RT. 77

PROJECT SUMMARY

- The Towns received $1.59M from the Maine Natural Resource Conservation Program (MNRCP) to remove 1,400 feet of road from Spurwink Marsh
- 62+ acres of salt marsh will be restored or enhanced (requires complete road removal)



SCARBOROUGH MAINE

HOW DID WE GET HERE?

- 2019 Cape Elizabeth Habitat and Culvert Assessment



Coastal Storm - January 10, 2024

SCARBOROUGH MAINE

HOW DID WE GET HERE?

- 2019 Cape Elizabeth Habitat and Culvert Assessment
- 2019 Sawyer Road Culvert Tidal Crossing Assessment

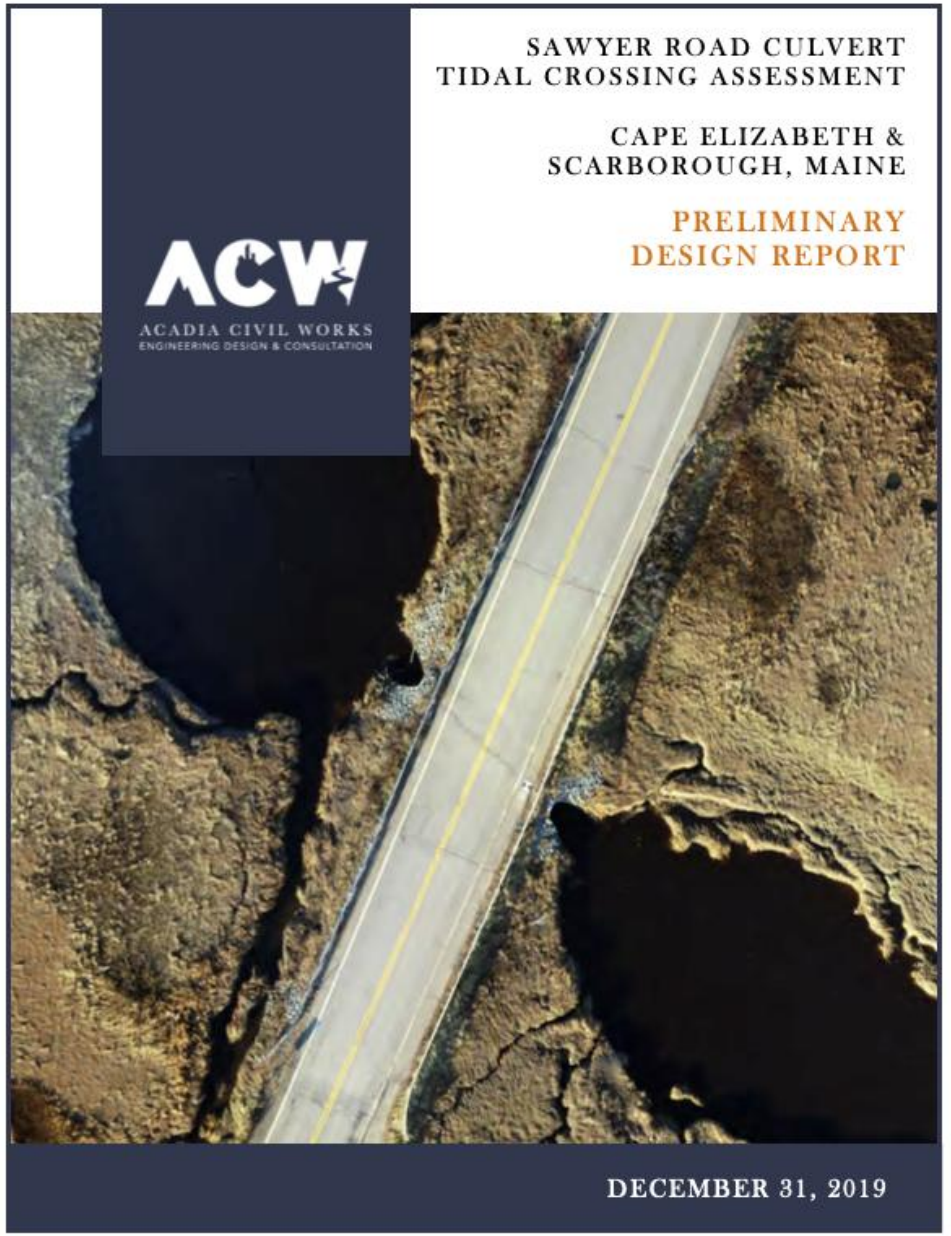


Coastal Storm - January 10, 2024

SCARBOROUGH MAINE

SAWYER ROAD TIDAL CROSSING ASSESSMENT

- Modeling study explored culvert sizing based on different sea level rise scenarios
- Study results:
  Culvert replacement = $2.5 – $5M
  Road will still flood
  Raising road or installing bridge = $10M+



SCARBOROUGH
MAINE

HOW DID WE GET HERE?

- 2019 Cape Elizabeth Habitat and Culvert Assessment
- 2019 Sawyer Road Culvert Tidal Crossing Assessment
- 2022 joint Town Council workshop



Coastal Storm - January 10, 2024

SCARBOROUGH MAINE

HOW DID WE GET HERE?

- 2019 Cape Elizabeth Habitat and Culvert Assessment
- 2019 Sawyer Road Culvert Tidal Crossing Assessment
- 2022 joint Town Council workshop
- 2023 MNRCP grant proposal



Coastal Storm - January 10, 2024

SCARBOROUGH MAINE

HOW DID WE GET HERE?

- 2019 Cape Elizabeth Habitat and Culvert Assessment
- 2019 Sawyer Road Culvert Tidal Crossing Assessment
- 2022 joint Town Council workshop
- 2023 MNRCP grant proposal
- 2024 Joint Town Council workshop



Coastal Storm - January 10, 2024

SCARBOROUGH MAINE

SAWYER STREET CLOSURES 2020 - TODAY

2020
- April 8, 2020
- April 9, 2020

2021
- January 16, 2021

2022
- January 2, 2022
- December 23, 2022

2023
- December 18, 2023

2024
- January 10, 2024
- January 11, 2024
- January 13, 2024
- January 14, 2024
- February 9, 2024
- February 12, 2024
- September 22, 2024

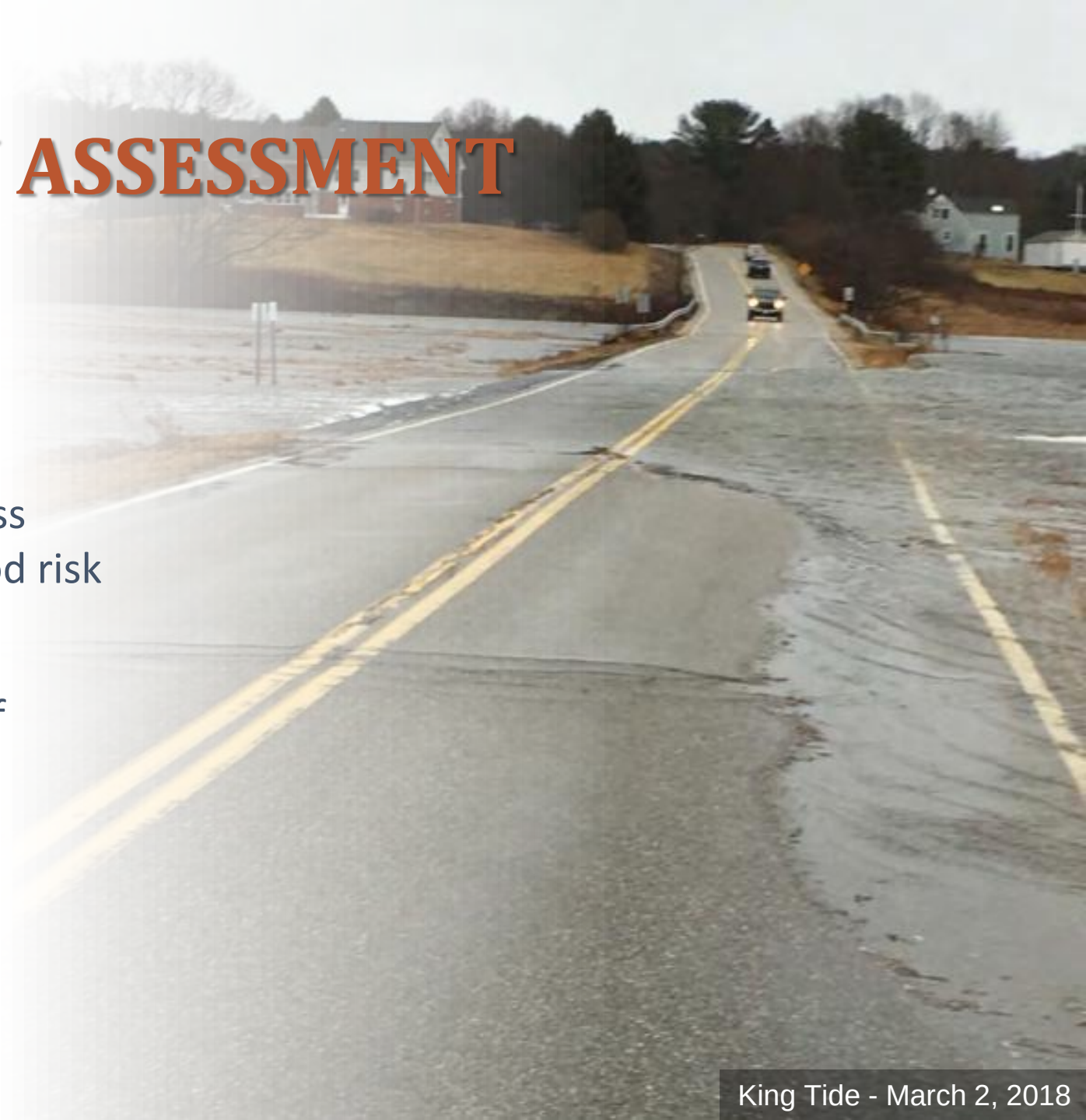


Coastal Storm - December 23, 2022

SCARBOROUGH MAINE

VULNERABILITY ASSESSMENT

- Evaluated coastal flood risk for Scarborough's areas and infrastructure
- Risk-based prioritization process ranked the roads based on flood risk and consequences
- Over 100 public roads at-risk of flooding by 2100:
  → 38 at-risk today
  → 62 at-risk by 2050



King Tide - March 2, 2018

SCARBOROUGH MAINE

	Top 30 Roads	
Avenue 1	E Grand Ave	Pine Point Rd*
Avenue 2	Ferry Rd	Route 1
Avenue 5	Jones Creek Dr	Route 9*
Avenue 6	Kent St	Sawyer St
Avenue 7	King St	Shipwreck Rd
Bayview Ave	Milliken Rd	Snow Canning Rd
Black Point Rd	Morning St	Spurwink Rd
Champion St	Ocean Ave	Vesper St
Clay Pits Rd	Old Neck Rd	Winnocks Neck Rd
Driftwood Ln	Payne Rd	Winnocks Neck to Plummer Island

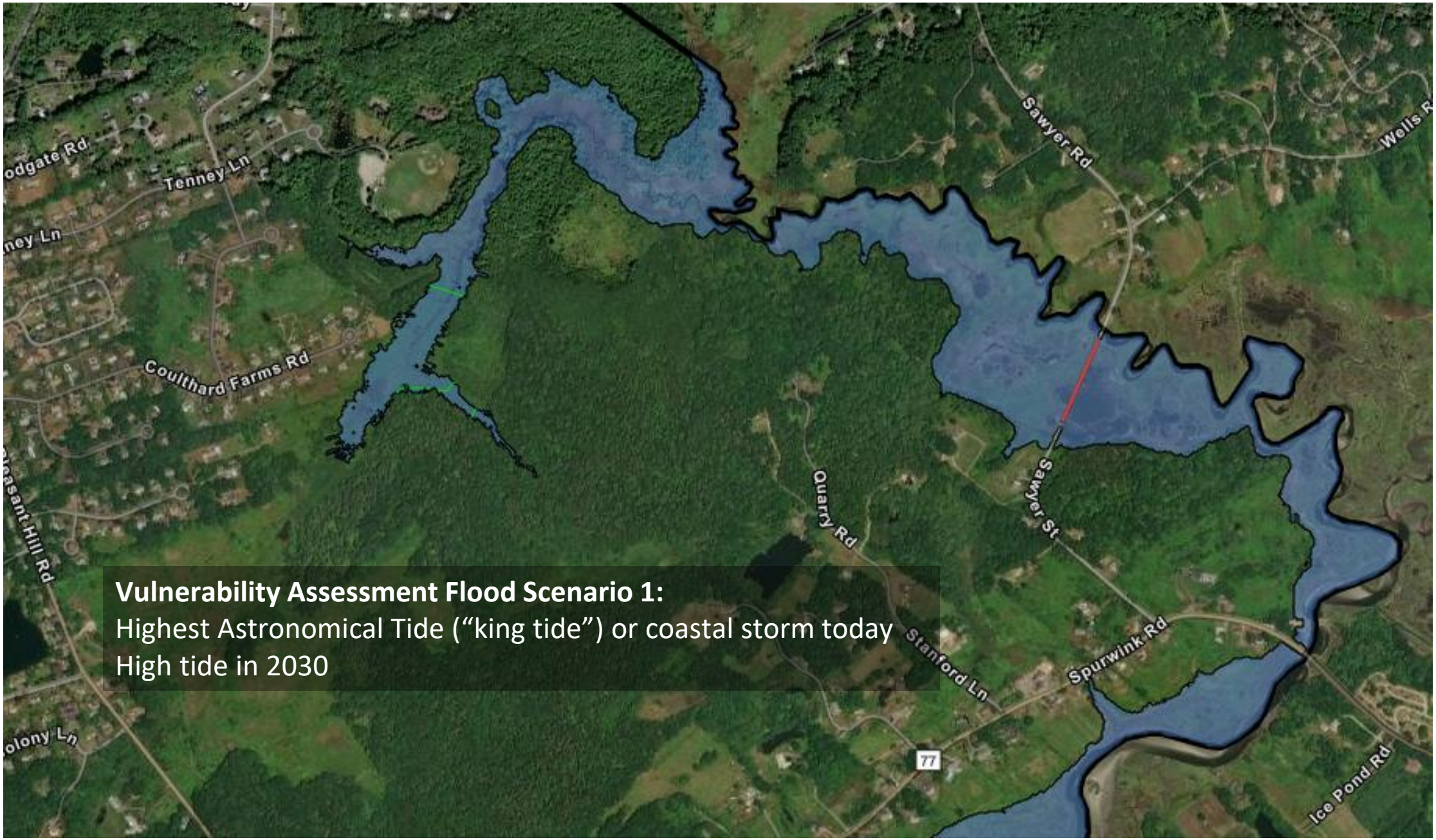
Top 30 Public Roads, Ranked Roads Based on Weighted Risk Score, Alphabetical Order.

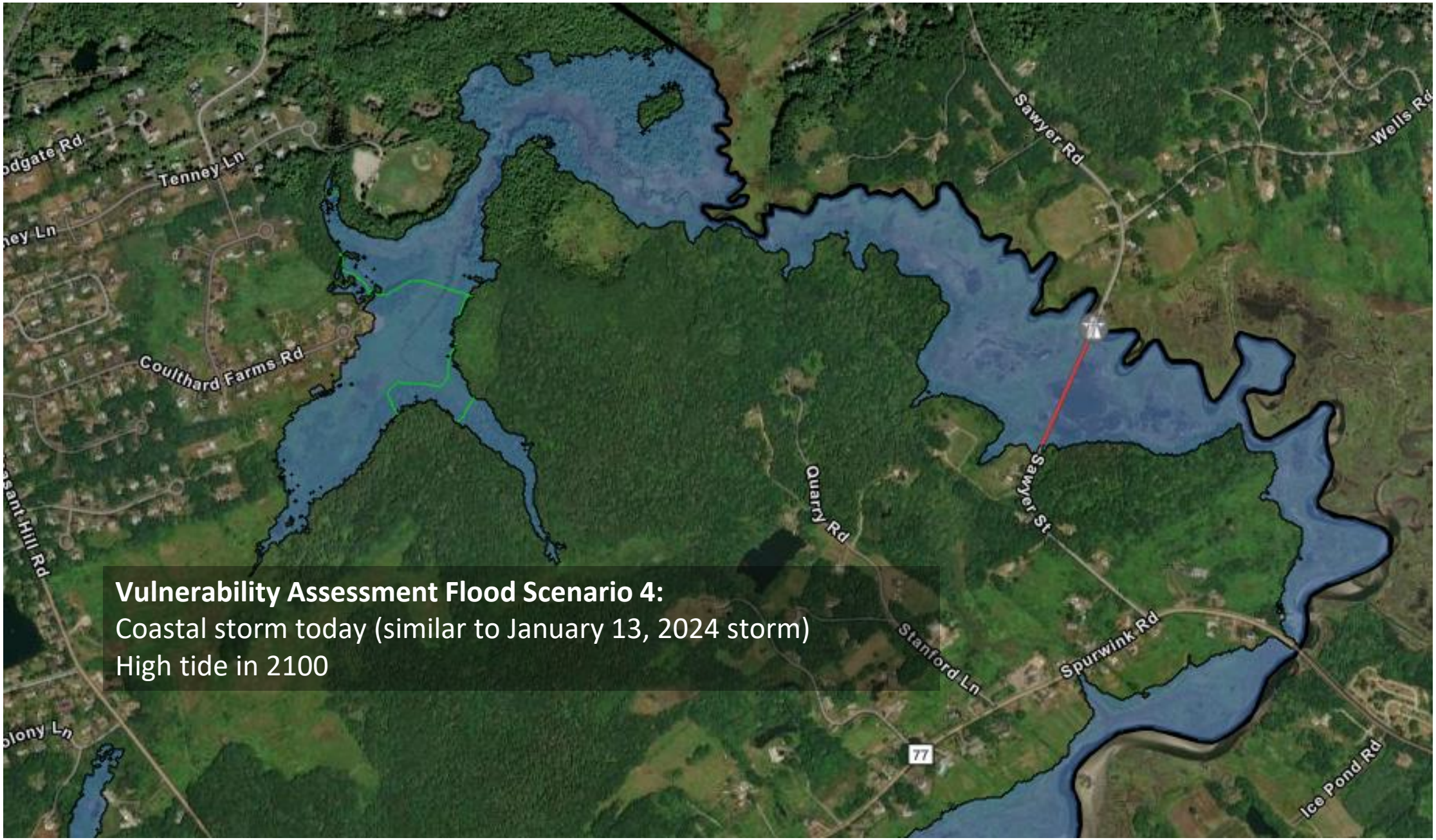
*Route 9 refers to the section of Route 9 near the Scarborough Marsh Audubon Center currently planned for adaptation as part of the Maine DOT Route 1 and Route 9 Adaptation Project. Pine Point Road refers to the section of Route 9 near Jones Creek.

	Top 30 Roads	
Avenue 1	E Grand Ave	Pine Point Rd*
Avenue 2	Ferry Rd	Route 1
Avenue 5	Jones Creek Dr	Route 9*
Avenue 6	Kent St	Sawyer St
Avenue 7	King St	Shipwreck Rd
Bayview Ave	Milliken Rd	Snow Canning Rd
Black Point Rd	Morning St	Spurwink Rd
Champion St	Ocean Ave	Vesper St
Clay Pits Rd	Old Neck Rd	Winnocks Neck Rd
Driftwood Ln	Payne Rd	Winnocks Neck to Plummer Island

Top 30 Public Roads, Ranked Roads Based on Weighted Risk Score, Alphabetical Order.

*Route 9 refers to the section of Route 9 near the Scarborough Marsh Audubon Center currently planned for adaptation as part of the Maine DOT Route 1 and Route 9 Adaptation Project. Pine Point Road refers to the section of Route 9 near Jones Creek.


Sawyer Rd
Wells R
Tenney Ln
Coulthard Farms Rd
Quarry Rd
Sawyer St
Stanford Ln
Spurwink Rd
Ice Pond Rd
77
Vulnerability Assessment Flood Scenario 1:
Highest Astronomical Tide ("king tide") or coastal storm today
High tide in 2030

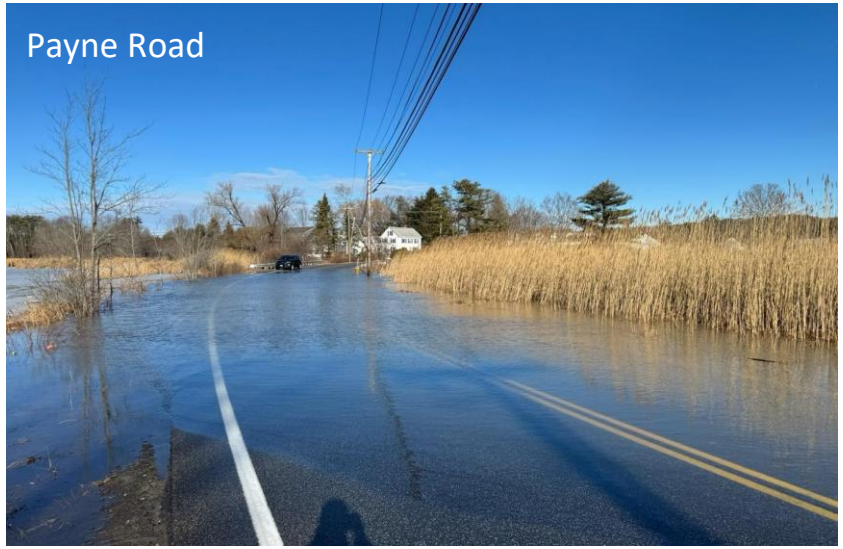


Vulnerability Assessment Flood Scenario 4:
Coastal storm today (similar to January 13, 2024 storm)
High tide in 2100

ROAD INFRASTRUCTURE PRIORITIES







Plus:

- Scottow Hill Road
- Black Point Road
- Pine Point area
- Higgins Beach area

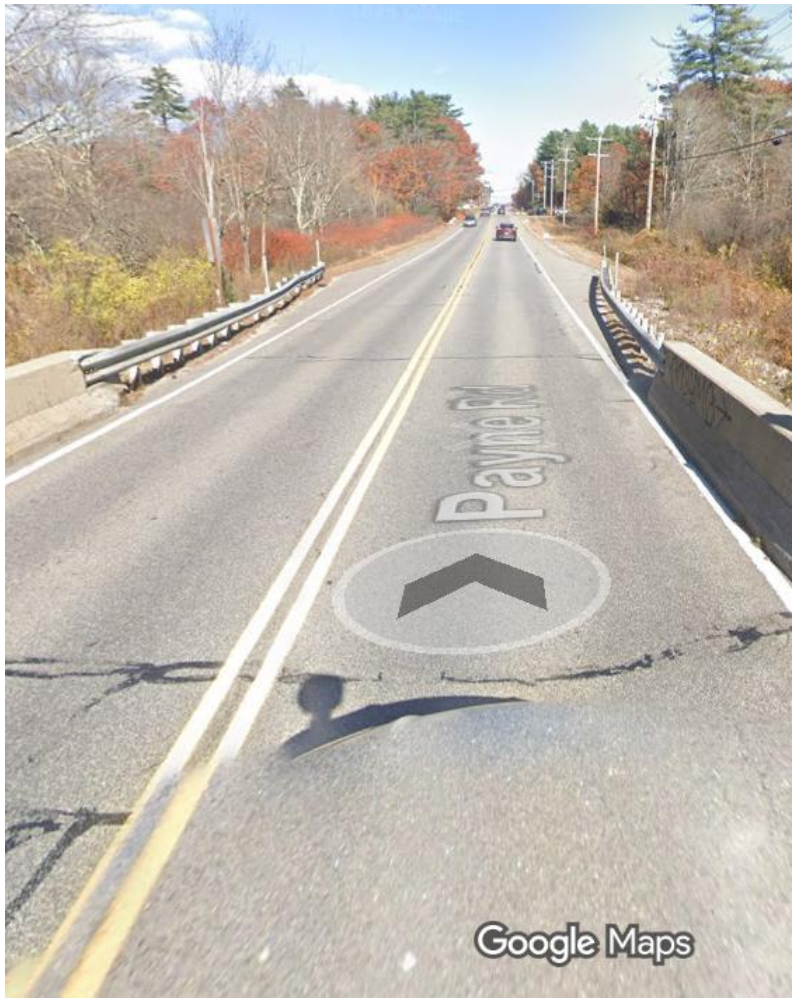
SCARBOROUGH
MAINE

ROAD INFRASTRUCTURE PRIORITIES

Payne Rd @ Nonesuch River

- Bottleneck at river crossing
- Road can't be widened unless culvert is replaced





SCARBOROUGH MAINE

ROAD INFRASTRUCTURE PRIORITIES

Gorham Rd @ Nonesuch River

- Bottleneck at river crossing
- Unsafe pedestrian access at the crossing
- Road can't be widened unless culvert is replaced





SCARBOROUGH MAINE

FINANCIAL IMPLICATIONS

Marsh Restoration & Road Removal
MNRCP grant = $1,590,000
Towns' contribution = $185,000 (each)
TOTAL = $1,960,000

Culvert Replacement
$2,500,000 - $5,000,000

Culvert Replacement & Elevate Road
$10,000,000+

Given the Town's infrastructure needs and limited funding, should Scarborough invest in Sawyer Street, or remove it?



Coastal Storm – January 10, 2024

SCARBOROUGH MAINE

Spurwink Marsh Restoration

September 24, 2025

Jacob Aman

Wells National Estuarine Research Reserve

jaman@wellsnerr.org

wellsreserve
at laudholm

Beginning with HABITAT

Focus Areas of Statewide Ecological Significance

Scarborough Marsh













WHY IS THIS AREA SIGNIFICANT?

Covering more than 3,000 acres, Scarborough Marsh is the largest contiguous salt marsh system in Maine. Salt marshes filter pollution from the water and provide food and shelter for numerous species of birds, fish, mammals, and shellfish. Given the wildlife productivity and habitat diversity in this area, Scarborough Marsh is arguably the most significant of Maine's coastal Focus Areas. The Focus Area also includes Scarborough Beach and its dunes, which are Essential Habitat for piping plovers and least terns.

OPPORTUNITIES FOR CONSERVATION

- Work with willing landowners to permanently protect remaining undeveloped areas.
- Encourage town planners to improve approaches to development that may impact Focus Area functions.
- Encourage homeowners to maintain adequate riparian buffers.
- Monitor and remove invasive plant populations.
- Identify and restore tidal restrictions and undersized culverts.
- Educate recreational users about the ecological and economic benefits provided by the Focus Area.

For more conservation opportunities, visit the Beginning with Habitat Online Toolbox: www.beginningwithhabitat.org/toolbox/about_toolbox.html.

Rare Animals
Saltmarsh Sharp-tailed Sparrow
Common Moorhen
Harlequin Duck
Least Bittern
Arctic Tern
New England Cottontail

Rare Plants
Saltmarsh False-foxglove
Smooth Winterberry Holly
Beach Plum
Dwarf Glasswort

Rare and Exemplary Natural Communities
Coastal Dune-marsh Ecosystem
Dune Grassland
Pitch Pine Bog
Pitch Pine Dune Woodland
Salt-hay Saltmarsh

Essential Wildlife Habitats
Piping Plover/Least Tern
Roseate Tern

Significant Wildlife Habitats
Tidal Wading Bird and Waterfowl Habitat
Inland Wading Bird and Waterfowl Habitat
Deer Wintering Area

Scarborough Marsh photographs by Jennifer Soule

RARE SPECIES AND EXEMPLARY NATURAL COMMUNITIES OF THE FOCUS AREA

	Common Name	Scientific Name	State Status*	State Rarity Rank	Global Rarity Rank
Animals	Saltmarsh Sharp-tailed Sparrow	*Ammodramus caudacutus*	SC	S3	G4
	Common Moorhen	*Gallinula chloropus*	T	S2	G5
	Harlequin Duck	*Histrionicus histrionicus*	T	S2S3	G4
	Least Bittern	*Ixobrychus exilis*	E	S2	G5
	Arctic Tern	*Sterna paradisaea*	T	S2	G5
	New England Cottontail	*Sylvilagus transitionalis*	E	S2	G3
Plants	Saltmarsh False-foxglove	*Agalinis maritima*	SC	S3	G5
	Smooth Winterberry Holly	*Ilex laevigata*	SC	S3	G5
	Beach Plum	*Prunus maritima*	E	S1	G4
	Dwarf Glasswort	*Salicornia bigelovii*	SC	S1	G5
Natural Communities	Coastal Dune-marsh	Coastal Dune-marsh		S3	n/a
	Dune Grassland	Dune Grassland		S2	G4
	Pitch Pine Bog	Pitch Pine Bog		S2	G3G5
	Pitch Pine Dune Woodland	Pitch Pine Dune Woodland		S1	G2
	Salt-hay Saltmarsh	*Spartina* Saltmarsh		S3	G5

Ecological Services of the Focus Area

- Nutrient export to marine food webs
- Major migratory stopover for myriad bird species
- Cleans water running off land prior to discharge into ocean
- Nursery for juvenile fish and shellfish
- Contributes to regional biodiversity by providing habitat for rare species and habitats.

Economic Contributions of the Focus Area

- Attracts tourism for wildlife observation, paddling, hunting, and angling
- Acts as protective buffer for storm surge
- Supports local marine resource industries
- Provides scenic vistas that raise property values
- Valuable open space for local residents

Spurwink Marsh 1930

Portland Water District





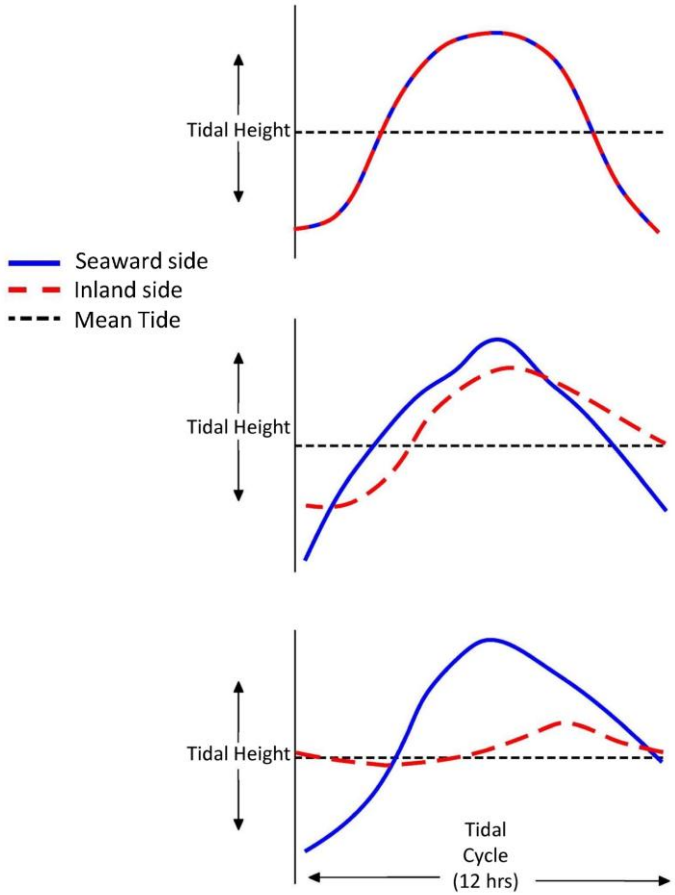


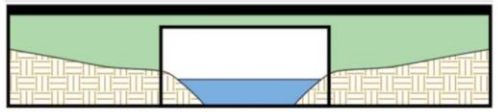
Roads in Tidal Marshes

- Roads built across tidal marshes cause severe, long-term damage by altering hydrology and fragmenting habitats.
- Restricting the natural tidal flow disrupts the natural functioning of the marsh, leading to changes in vegetation, water chemistry, and wildlife communities.
- The primary effect of roads on tidal marshes is the disruption of natural tidal flooding caused by structures like undersized culverts and causeways.
- By restricting the flow of saltwater, roads cause reduced tidal range and flushing to upstream areas.

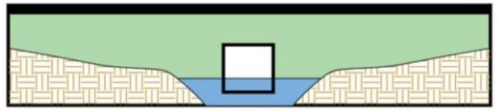
Roads in Tidal Marshes

CoastWise

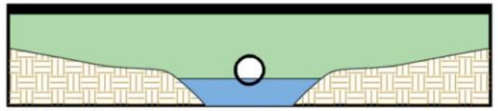




UNRESTRICTIVE CROSSING
This crossing features a bridge span that exceeds the wetland width. As a result, the graph indicates little to no difference between the magnitude and timing of seaward and inland tidal water levels. It's unlikely to restrict flow except during the highest tides of the year, and then only marginally.



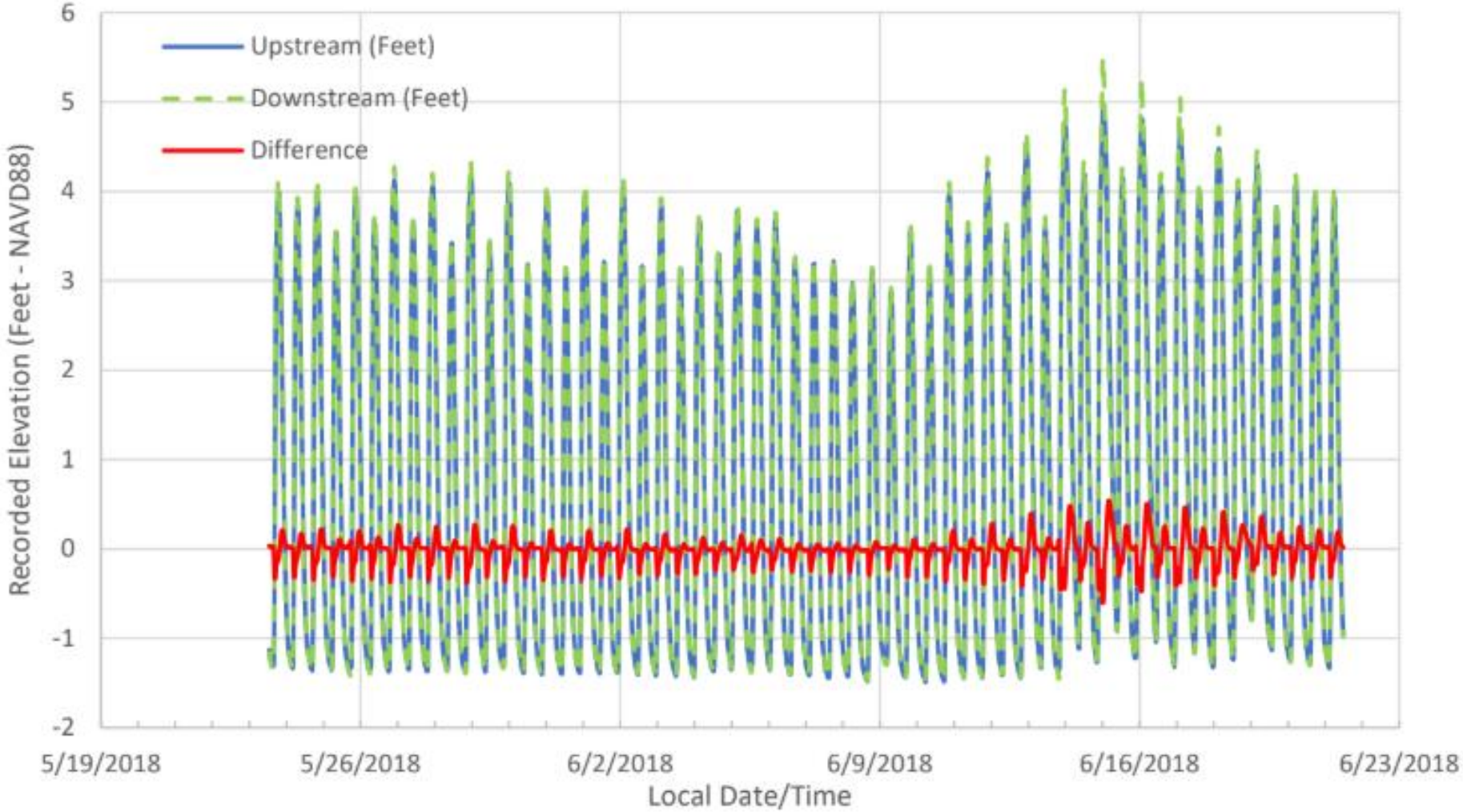
RESTRICTIVE CROSSING
At this site, the incoming tide must attain the perched crossing's outlet height before flowing upstream. Inland water levels drain slower than the seaward side because the culvert is undersized and the perch prevents full drainage. The differences between seaward and inland conditions are likely to increase during spring tides.



SEVERELY RESTRICTIVE CROSSING
This culvert is even smaller and perched higher than the example above. That causes a major lag in the timing of high and low tide and greatly suppressed upstream tide heights. It also allows less drainage of the inland side. These differences would be even more pronounced during spring tides and major precipitation events.



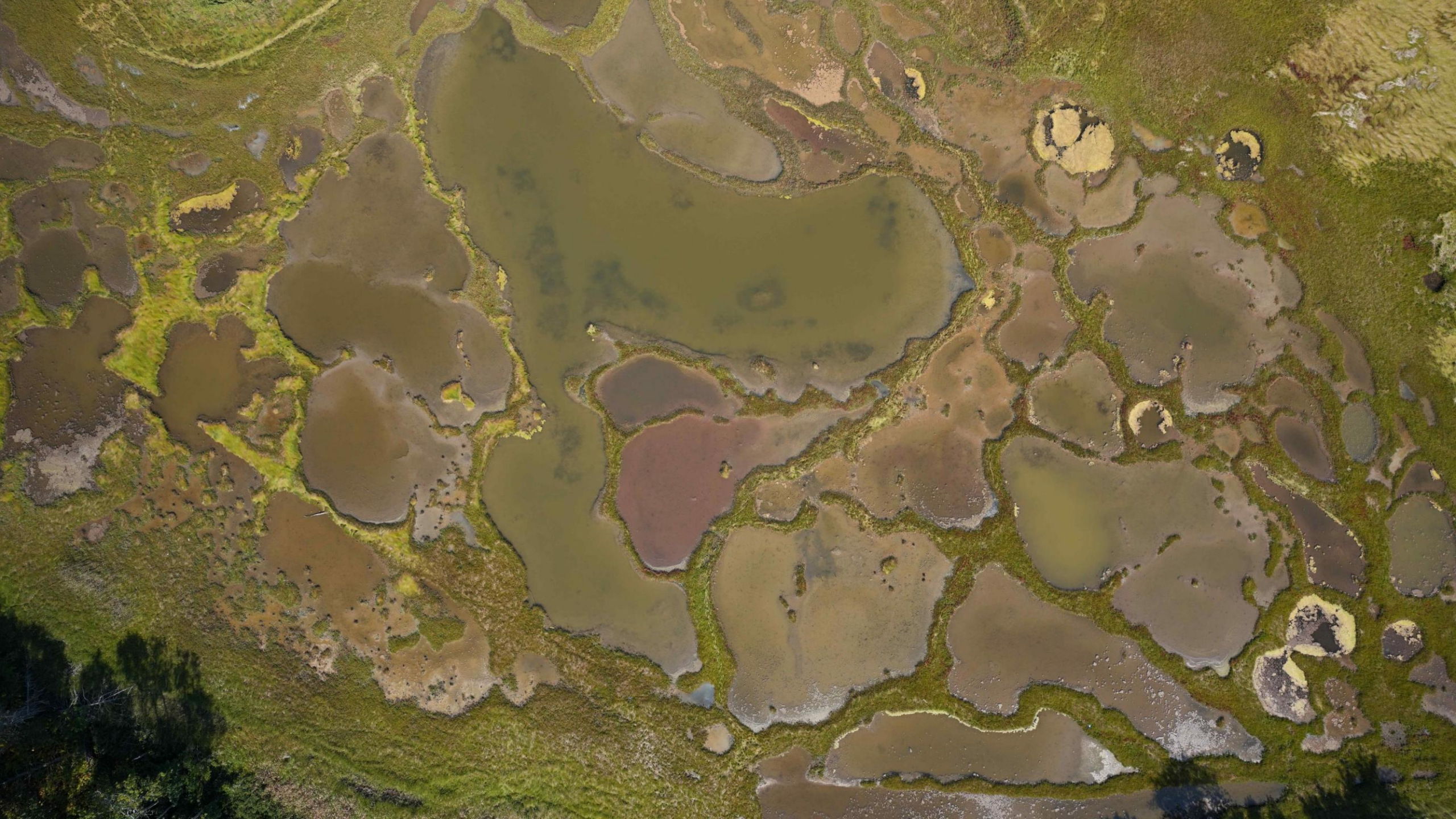
Figure 11 – Recorded Water Surface Elevations at Sawyer Road

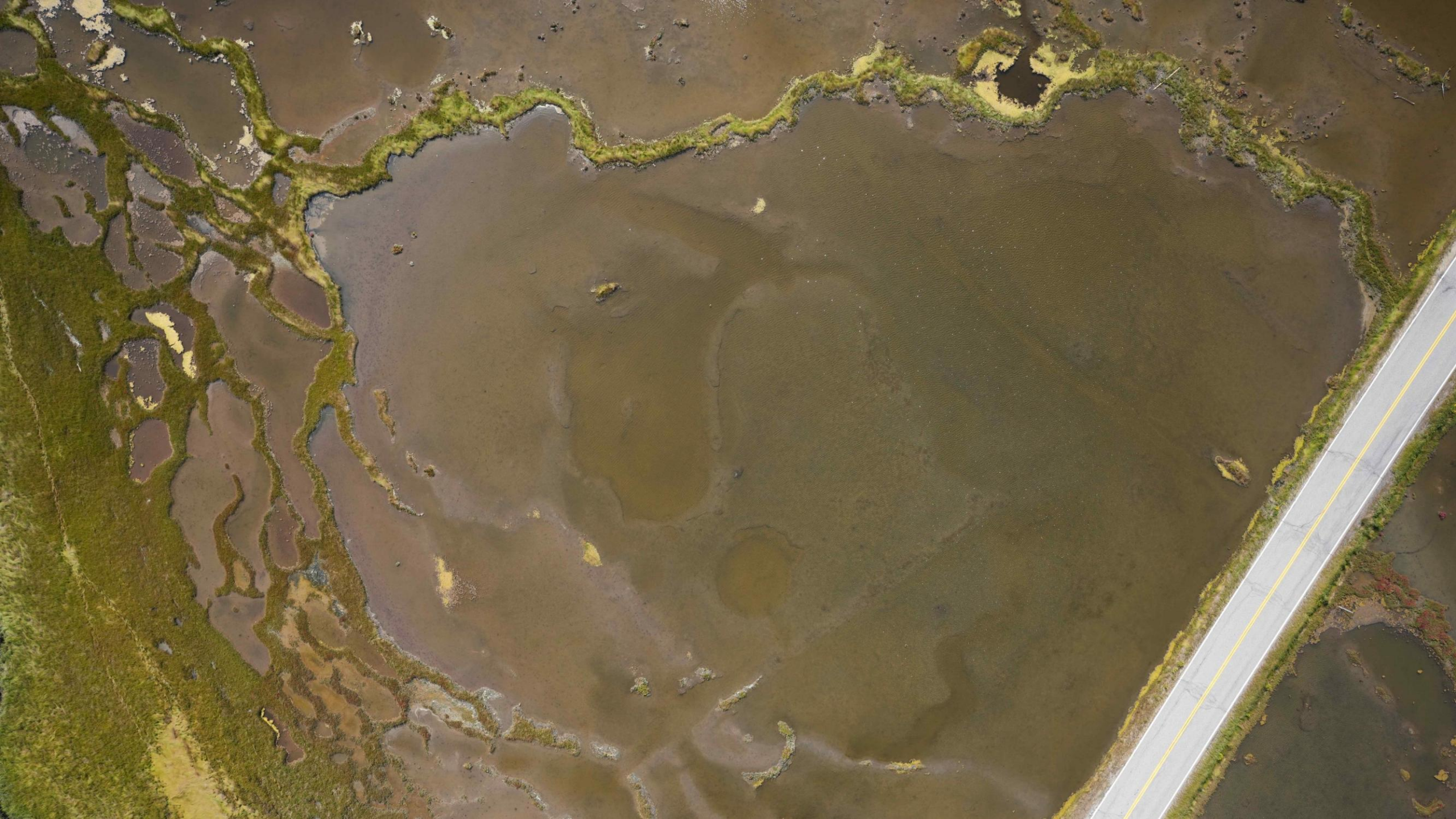




Roads in Tidal Marshes

- Marshes maintain their elevation in part by trapping sediment delivered by tidal water. Restrictions limit sediment supply and marshes can’t keep pace with sea level rise, resulting in open water expansion and conversion to mud flats.
- Roads can also cause increased flooding on the upstream side by blocking drainage during high rainfall events.





Roads in Tidal Marshes

- Restricted tidal flow can lead to the spread of invasive plants such as *Phragmites australis*.
- When tidal restrictions cause sufficient declines in water salinity or cause marsh peat to deteriorate, stored carbon and other greenhouse gases are released into the atmosphere





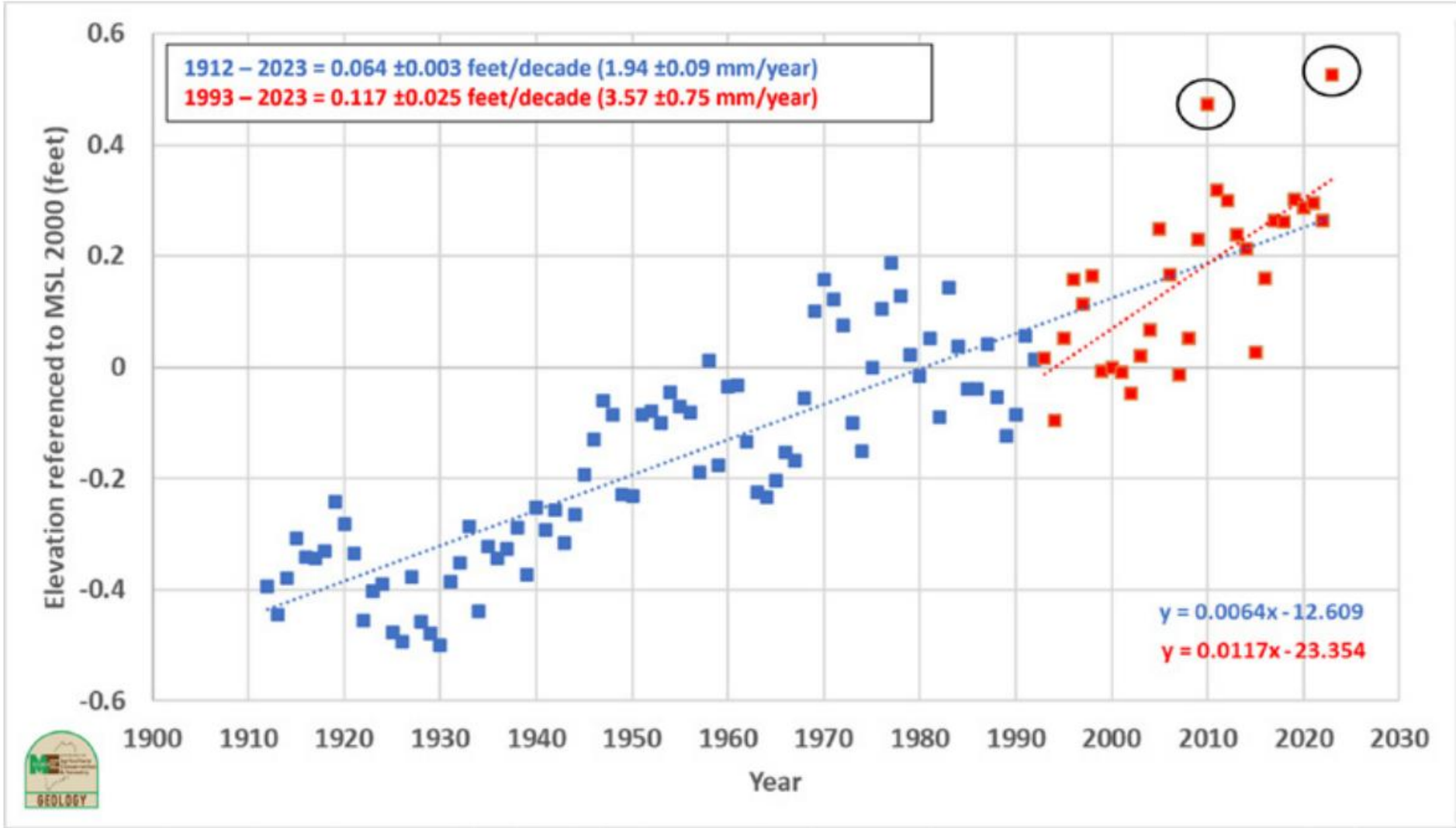
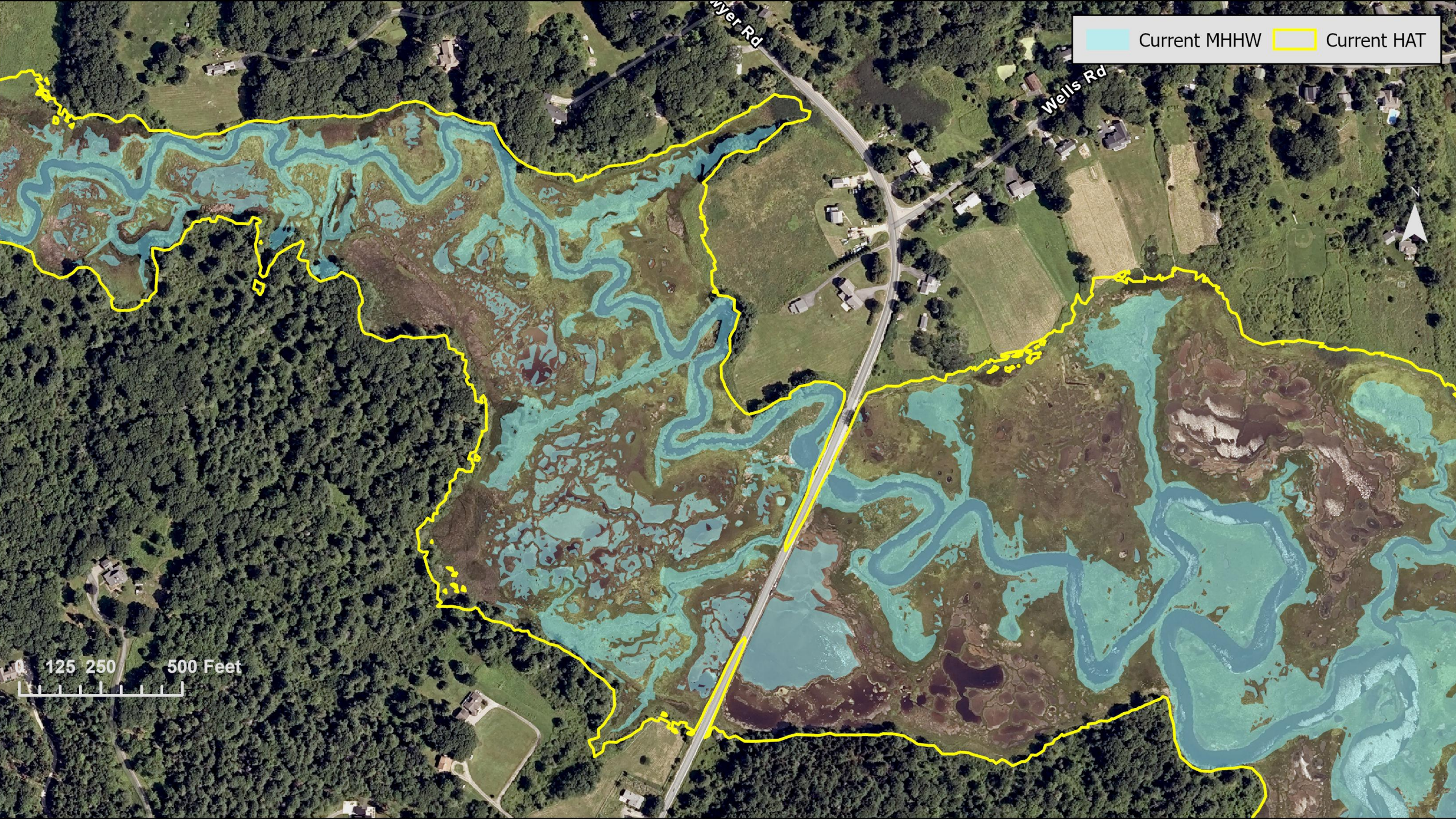


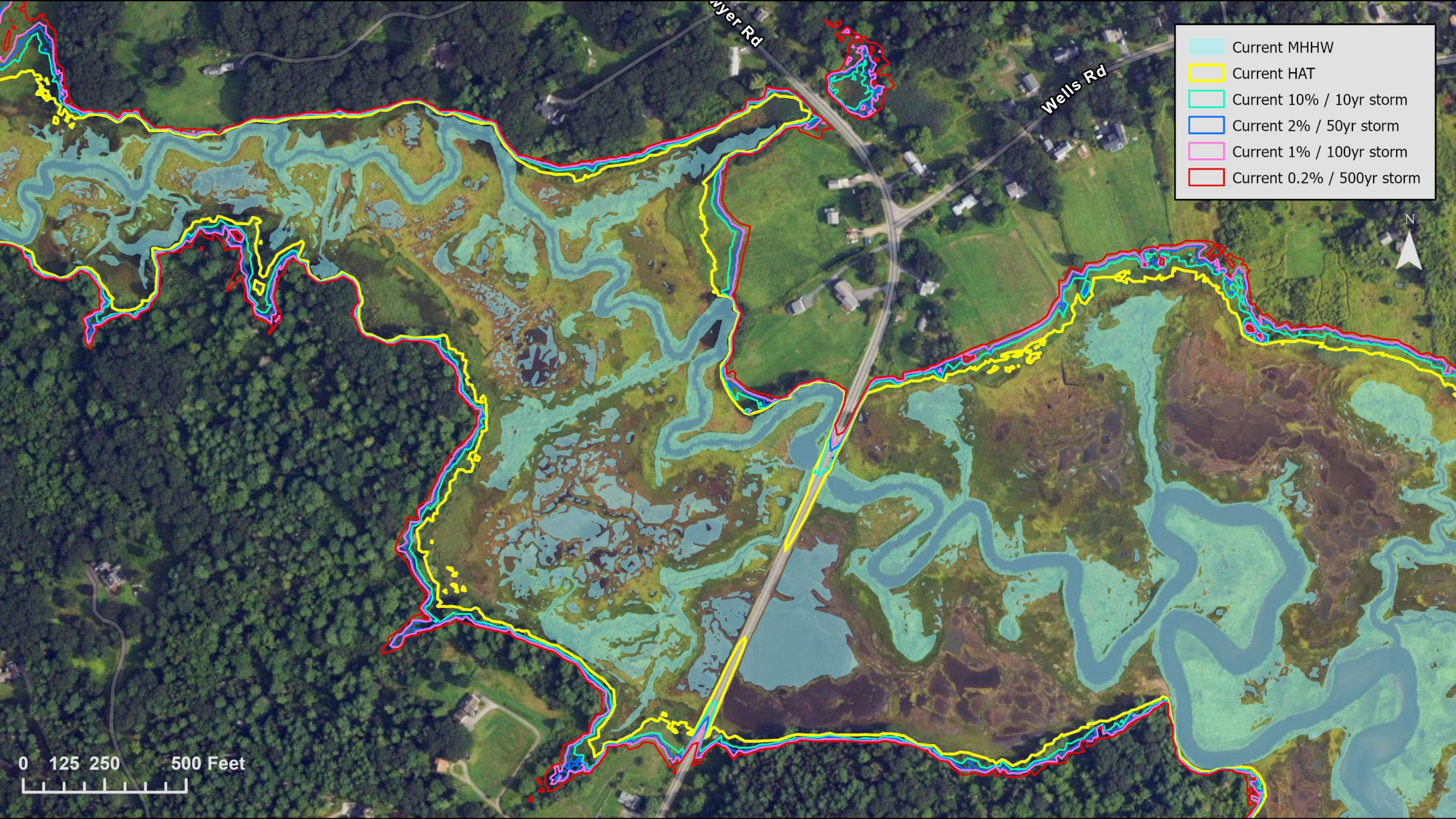
Figure 1. Observed annual mean sea level (blue and red dots), with long-term (1912-2023; blue line) and short-term (1993-2023; red line) sea level rise trends at the Portland, Maine, NOAA tide gauge. Measurements are relative to 2000 mean sea level, and anomalous high sea level years of 2010 and 2023 are circled (see **Figure D1** in Appendix D for Bar Harbor and Eastport). For more information on 2000 mean sea level and other vertical datums used in this text, see callout box "Water level datums and baselines."

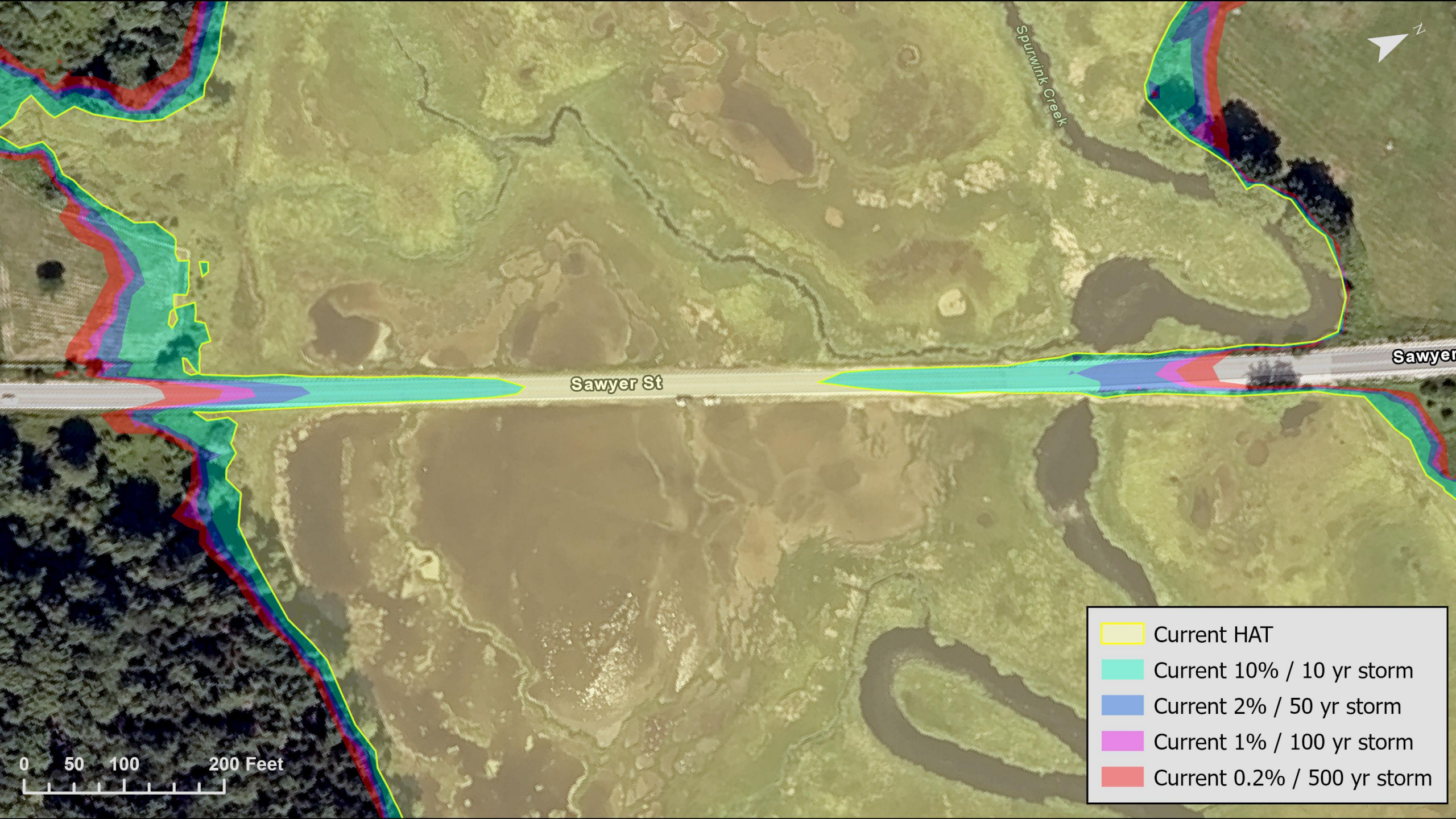
Spurwink Marsh Tidal Datum Values						
IN FEET						
	MHHW	HAT	10 yr	50 yr	100 yr	500 yr
Current	4.66	6.5	7.9	8.5	8.8	9.5
SLR 2030	5.4	7.3	8.7	9.3	9.6	10.3
SLR 2050	6.1	8	9.4	10	10.3	11
SLR 2100	8.6	10.5	11.9	12.5	12.8	13.5

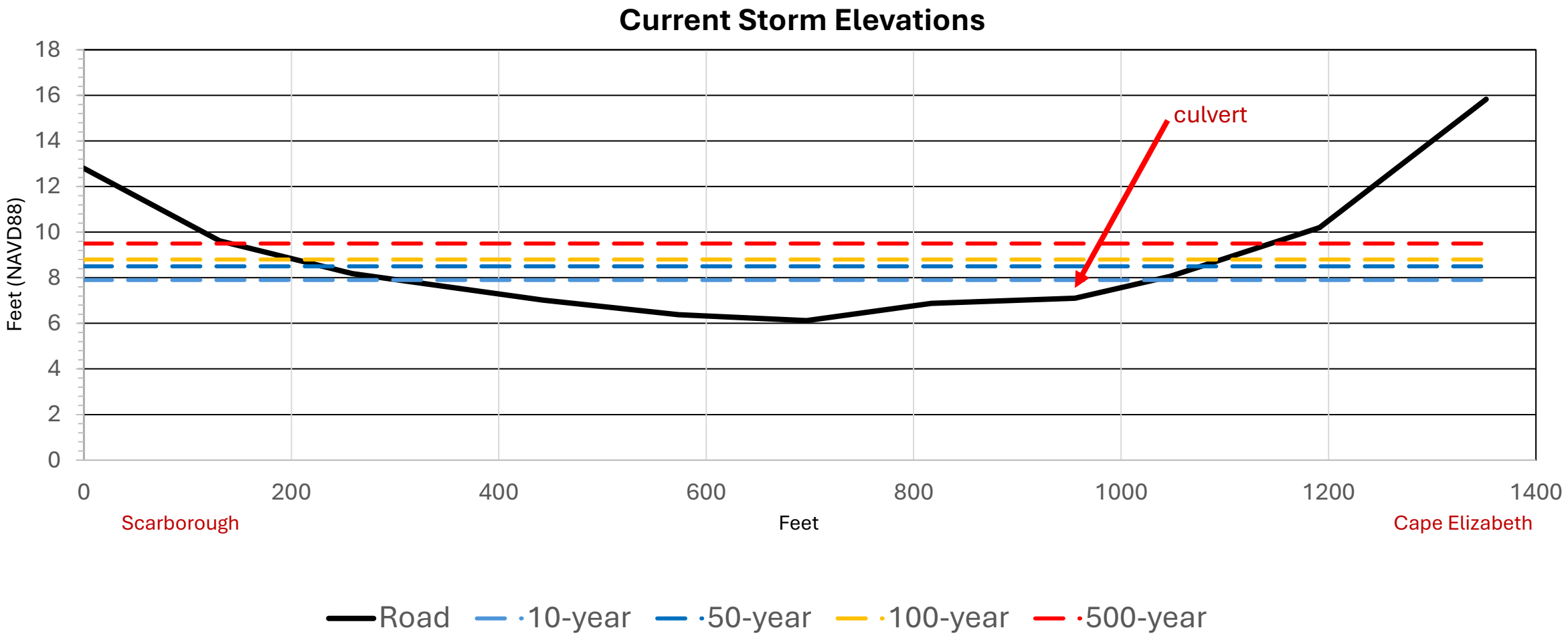
Future tidal levels incorporate intermediate sea level rise projections, using data from the National Oceanic and Atmospheric Administration (2017) and guidance from the Maine Climate Council (2020). These values also reflect what was reported in the 2024 Scarborough Flood Vulnerability Study by GEI consultants.

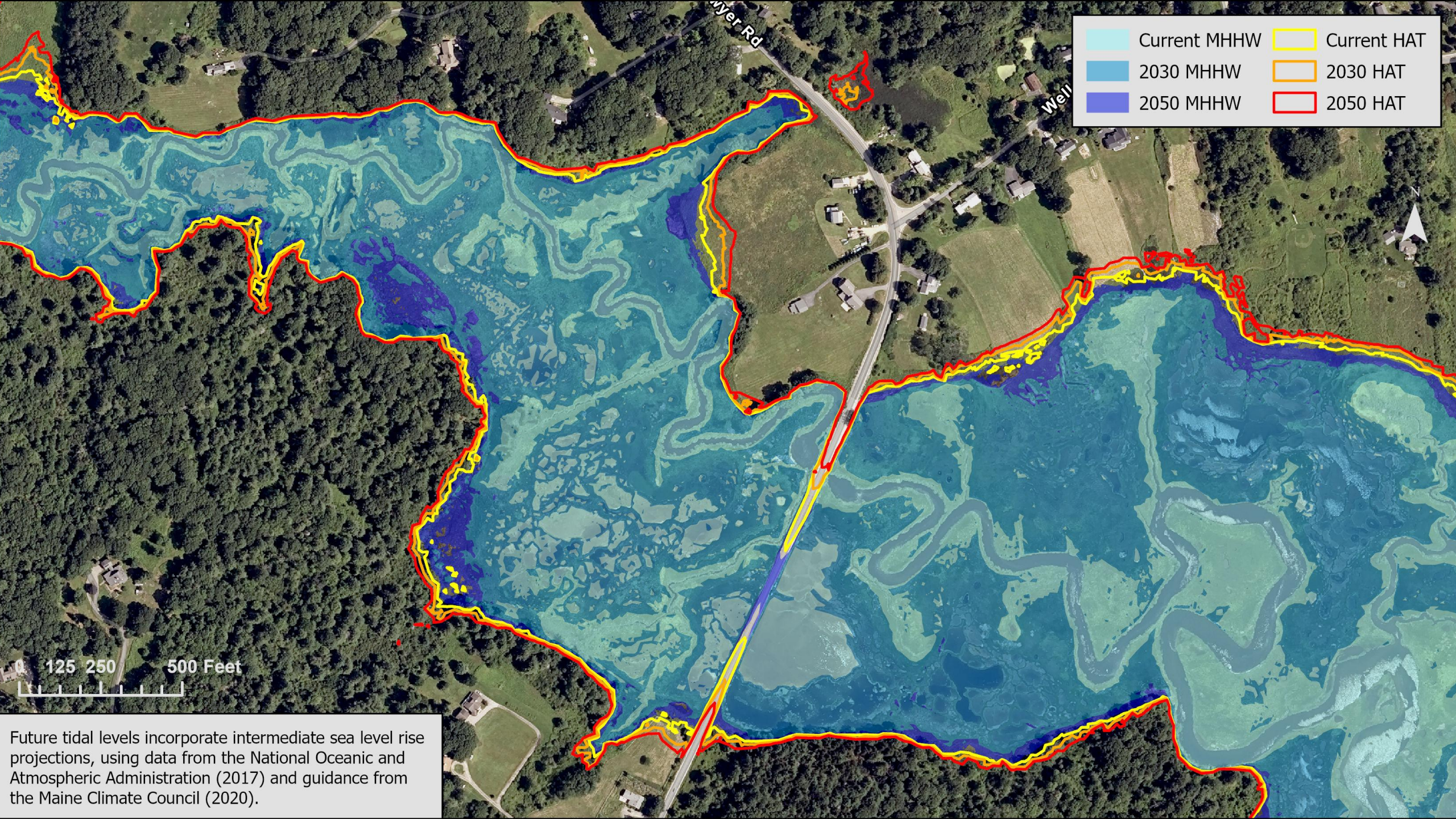
https://arcg.is/mLLqH


Current MHHW
Current HAT
Wells Rd
N
0 125 250 500 Feet

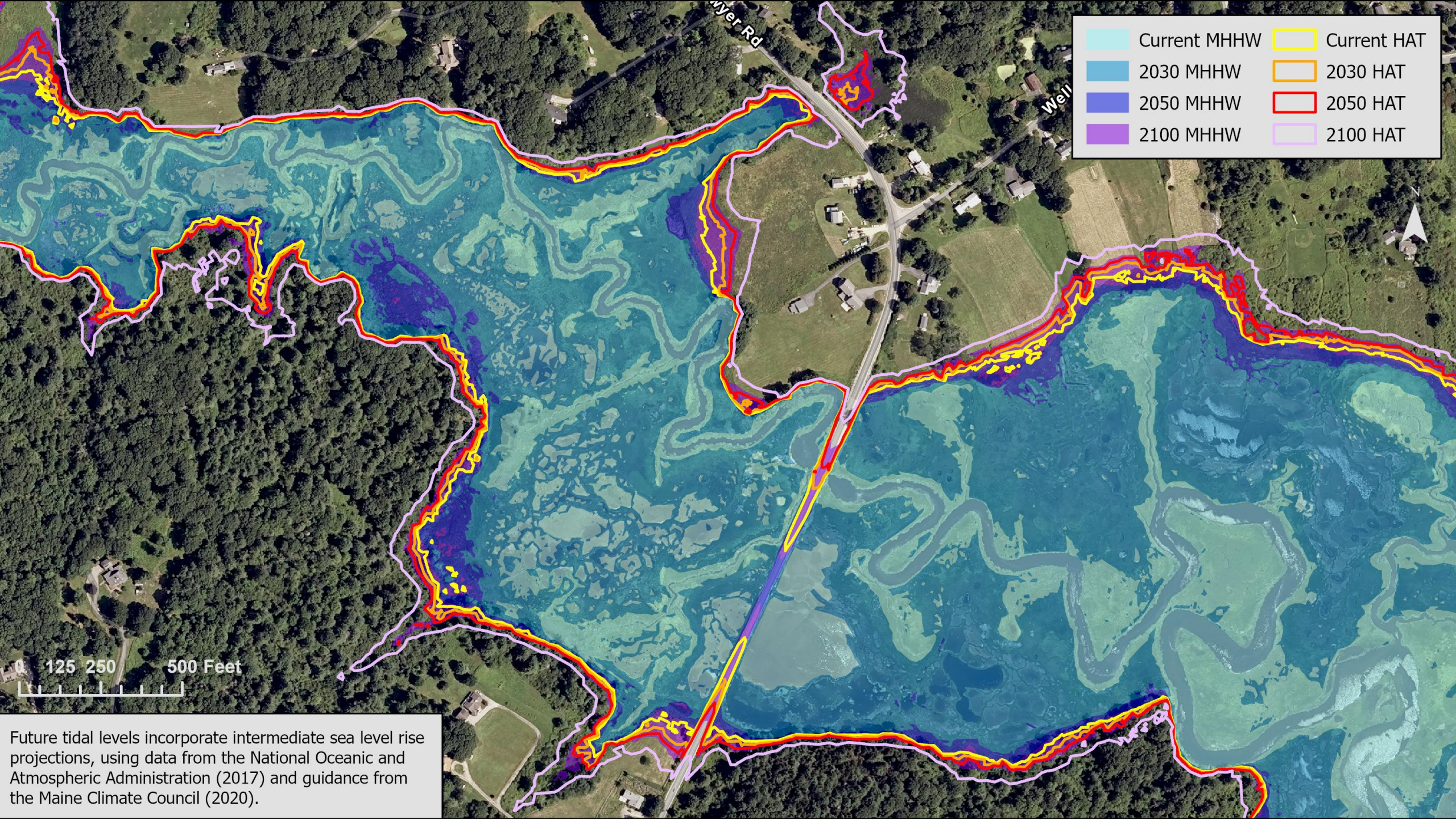

Current MHHW
Current HAT
Current 10% / 10yr storm
Current 2% / 50yr storm
Current 1% / 100yr storm
Current 0.2% / 500yr storm
Wells Rd
N
0 125 250 500 Feet


Spurwink Creek
Sawyer St
Sawyer
N
Current HAT
Current 10% / 10 yr storm
Current 2% / 50 yr storm
Current 1% / 100 yr storm
Current 0.2% / 500 yr storm
0
50
100
200 Feet

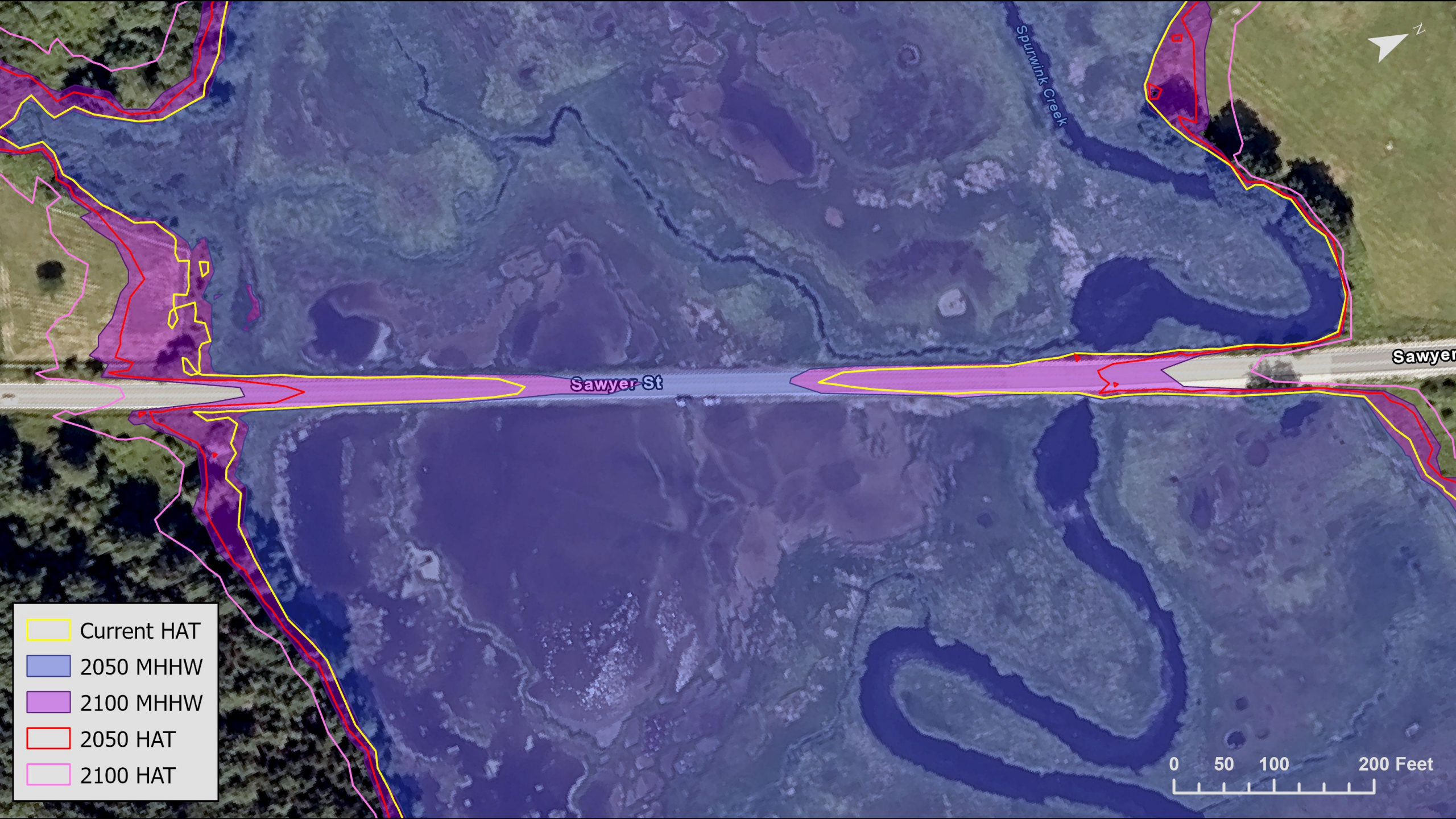

Current Storm Elevations
18
16
14
12
10
8
6
4
2
0
Feet (NAVD88)
culvert
0
200
400
600
800
1000
1200
1400
Scarborough
Feet
Cape Elizabeth
Road
10-year
50-year
100-year
500-year

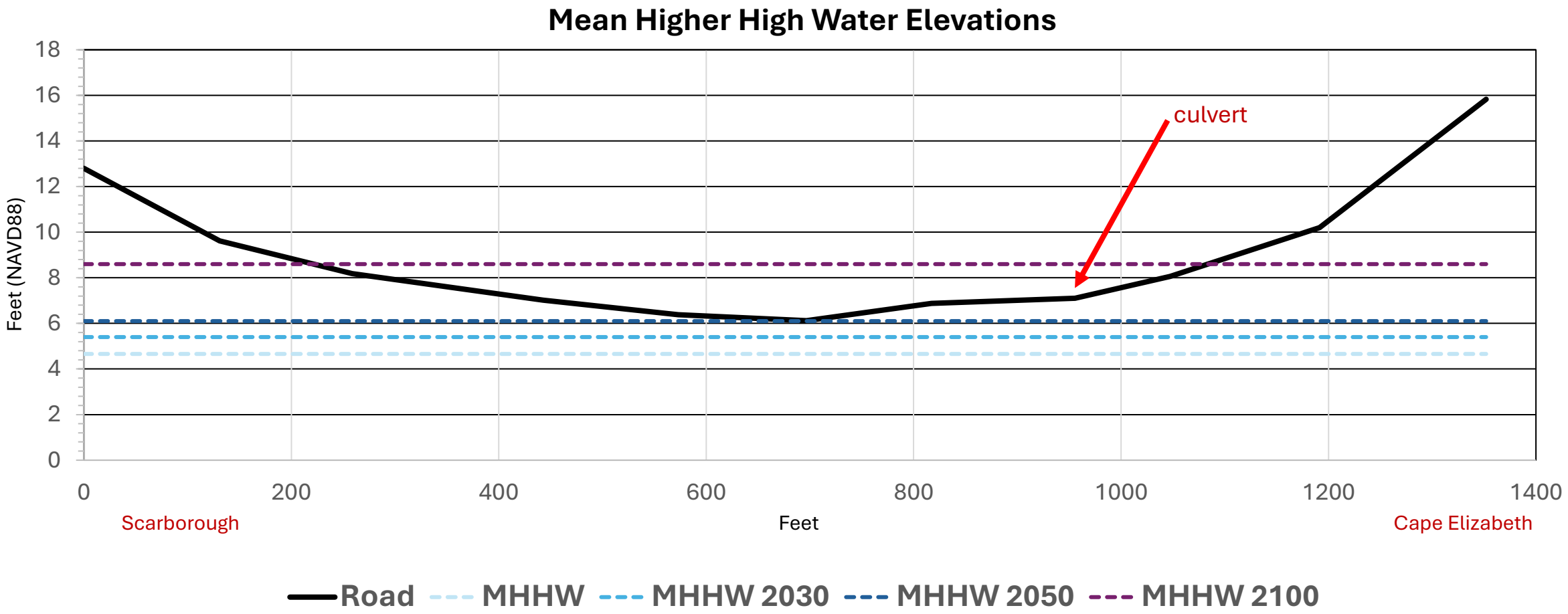


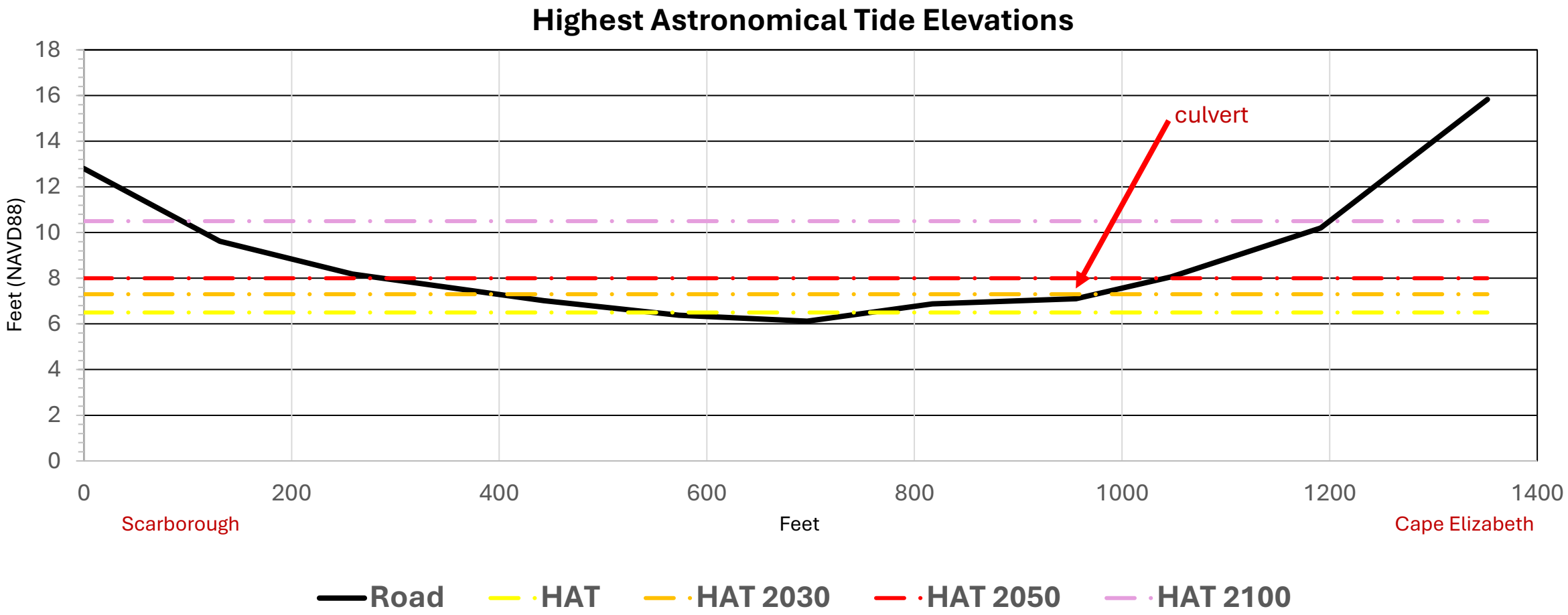
Future tidal levels incorporate intermediate sea level rise projections, using data from the National Oceanic and Atmospheric Administration (2017) and guidance from the Maine Climate Council (2020).

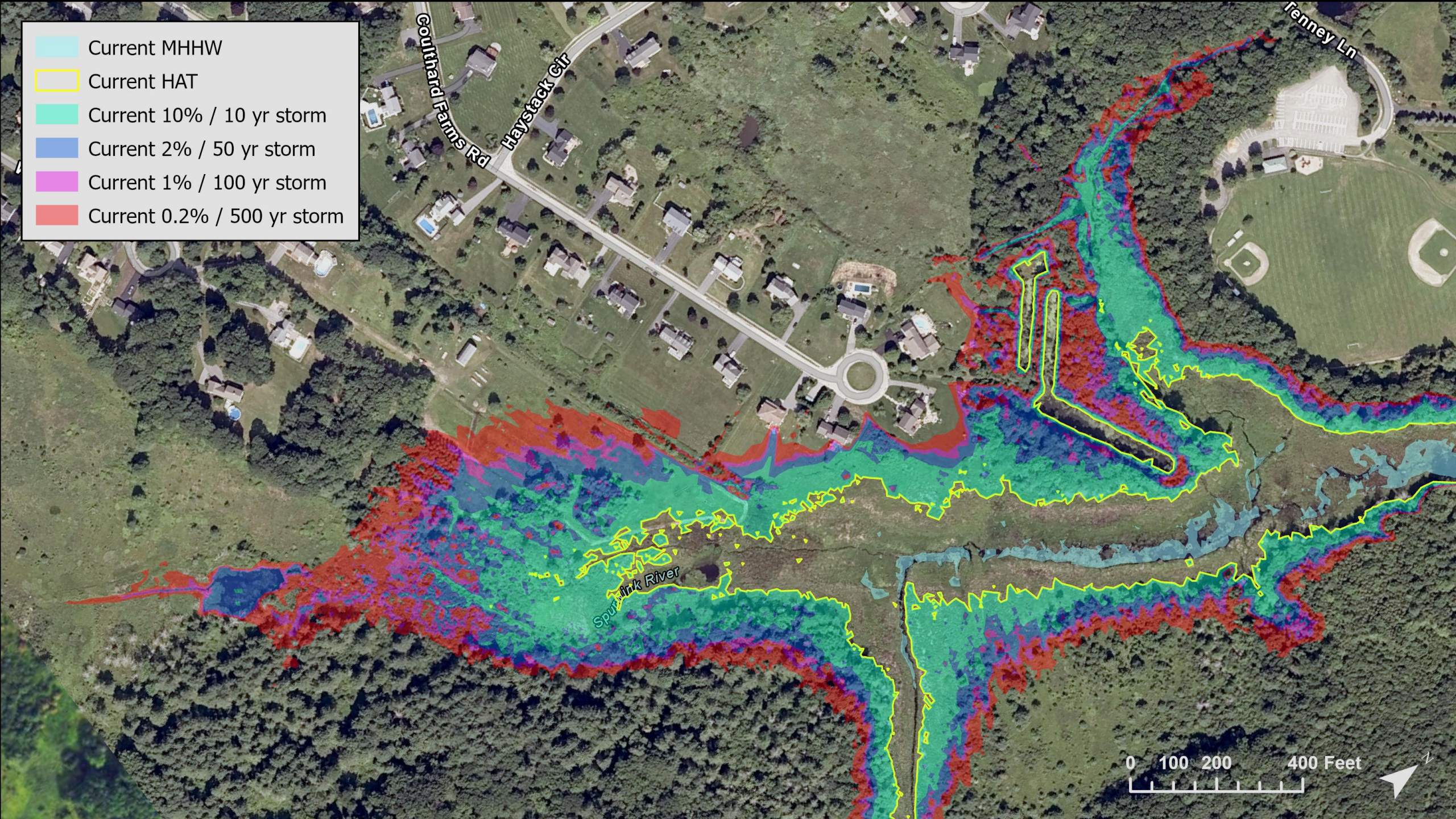


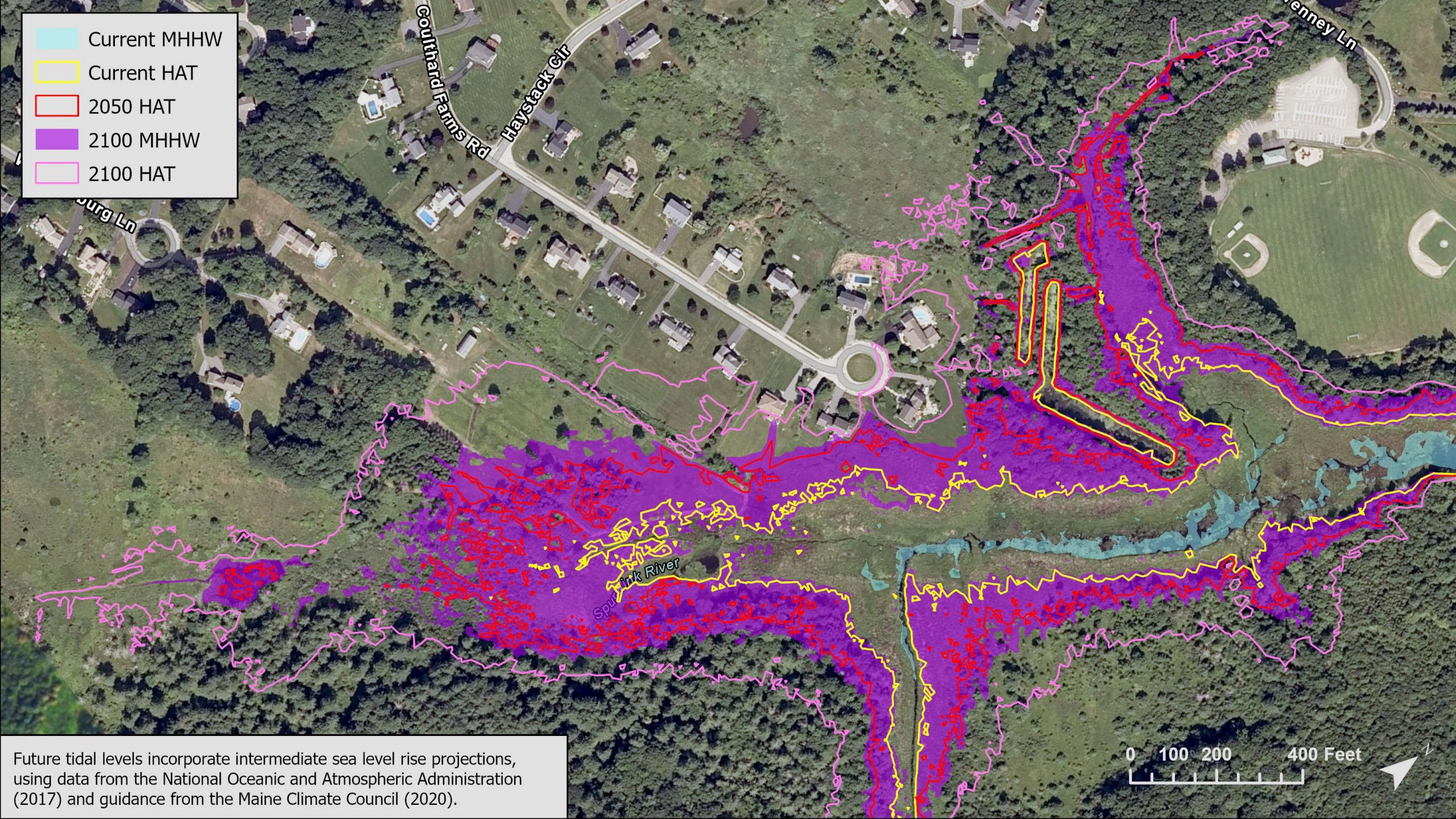
Future tidal levels incorporate intermediate sea level rise projections, using data from the National Oceanic and Atmospheric Administration (2017) and guidance from the Maine Climate Council (2020).


Spurwink Creek
Sawyer St
Sawyer
Current HAT
2050 MHHW
2100 MHHW
2050 HAT
2100 HAT
0
50
100
200 Feet


Mean Higher High Water Elevations
Feet (NAVD88)
18
16
14
12
10
8
6
4
2
0
culvert
0
200
400
600
800
1000
1200
1400
Scarborough
Feet
Cape Elizabeth
Road
MHHW
MHHW 2030
MHHW 2050
MHHW 2100


Highest Astronomical Tide Elevations
Feet (NAVD88)
18
16
14
12
10
8
6
4
2
0
culvert
0
200
400
600
800
1000
1200
1400
Scarborough
Feet
Cape Elizabeth
Road
HAT
HAT 2030
HAT 2050
HAT 2100


Current MHHW
Current HAT
Current 10% / 10 yr storm
Current 2% / 50 yr storm
Current 1% / 100 yr storm
Current 0.2% / 500 yr storm
Coulthard Farms Rd
Haystack Cir
Tenney Ln
Spurwink River
0 100 200 400 Feet



Future tidal levels incorporate intermediate sea level rise projections, using data from the National Oceanic and Atmospheric Administration (2017) and guidance from the Maine Climate Council (2020).

Thank You!

Jacob Aman

Wells National Estuarine Research Reserve

jaman@wellsnerr.org

wellsreserve
at laudholm

NEXT STEPS

Fall 2025

- Official Town Council process to discontinue Sawyer Street (public hearing and vote)

2026 and Beyond

- Project permitting
- Marsh enhancement design and implementation
- Road removal (fall 2026 at the earliest)
- Marsh restoration
- Post-construction monitoring



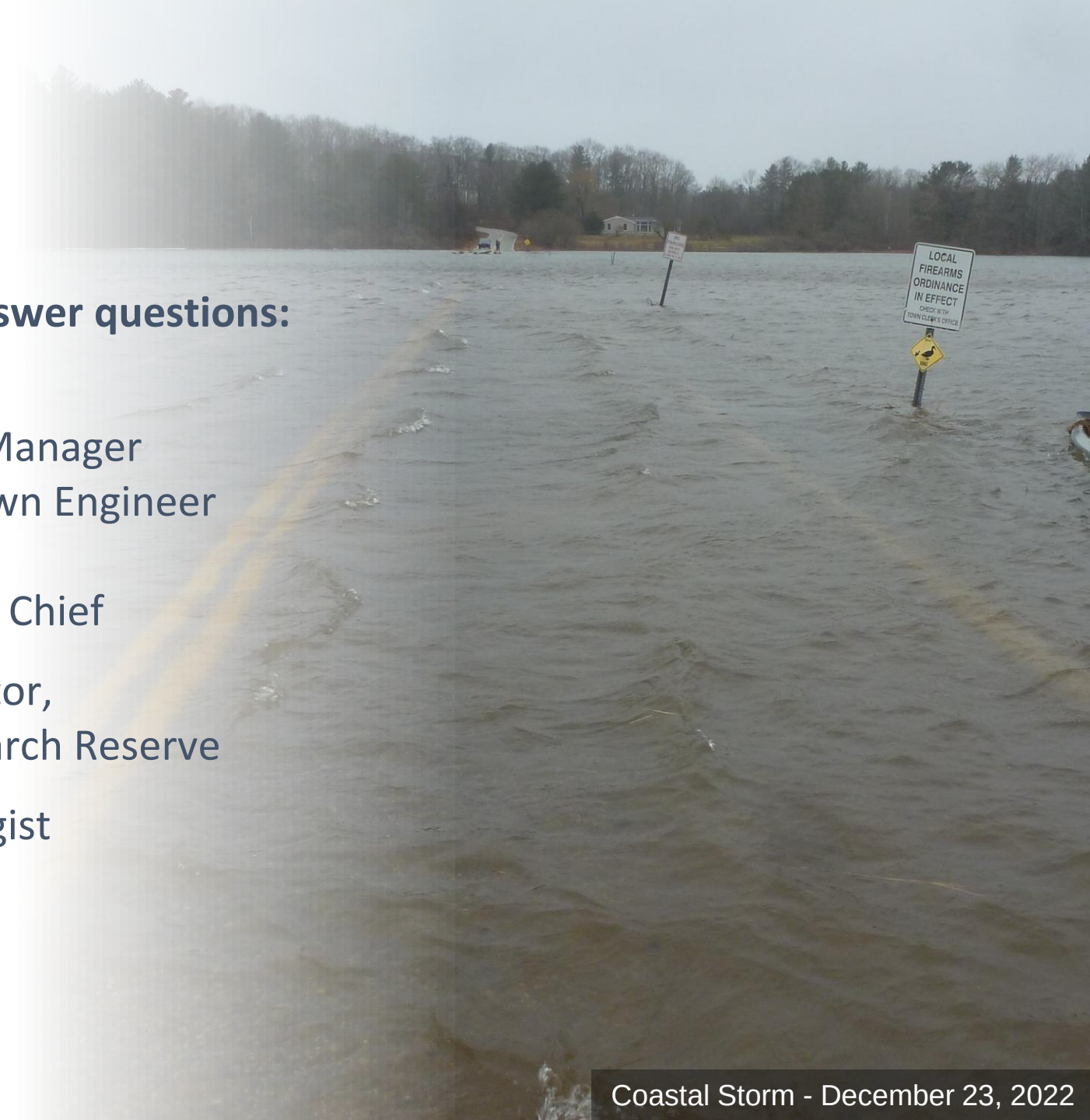
Coastal Storm - January 10, 2024

SCARBOROUGH MAINE

QUESTIONS?

The following are available to answer questions:

- Town Staff:
  - Jami Fitch, Sustainability Manager
  - Angela Blanchette, PE, Town Engineer
  - Rich Kindelan, Fire Chief
  - Gary Sandler, Fire Division Chief
- Jake Aman, Stewardship Director,
  Wells National Estuarine Research Reserve
- Peter Slovinsky, Marine Geologist
  Maine Geological Survey



Coastal Storm - December 23, 2022

SCARBOROUGH
MAINE