

Quonnie Pond and Breachway Site Vulnerability Assessment and Design for Coastal Resiliency

Public Information Meeting – Task 3

11/18/2021



GZA Scope of Work

- Existing Conditions Assessment
 - GZA Metocean Analysis
 - Review of StormTools Results
 - Bathymetric Survey
 - Numerical Modeling
- Proposed Resiliency Design

Site Location and Hydrologic Setting

Find a Street Address...



Stafford Springs

Tolland

TOLLAND

Storrs

Willimantic

Windham

GOLDEN HILL PAUGUSSETT (STATE) RESERVATION

Norwich

NEW LONDON

New London

Old Saybrook

Greenport

Old

WINDHAM

Danielson

Plainfield

Norwich

NEW LONDON

New London

Montauk

Putnam

Plainfield

Norwich

NEW LONDON

New London

Montauk



Tropical cyclones

Block Island Sound

Long Island Sound

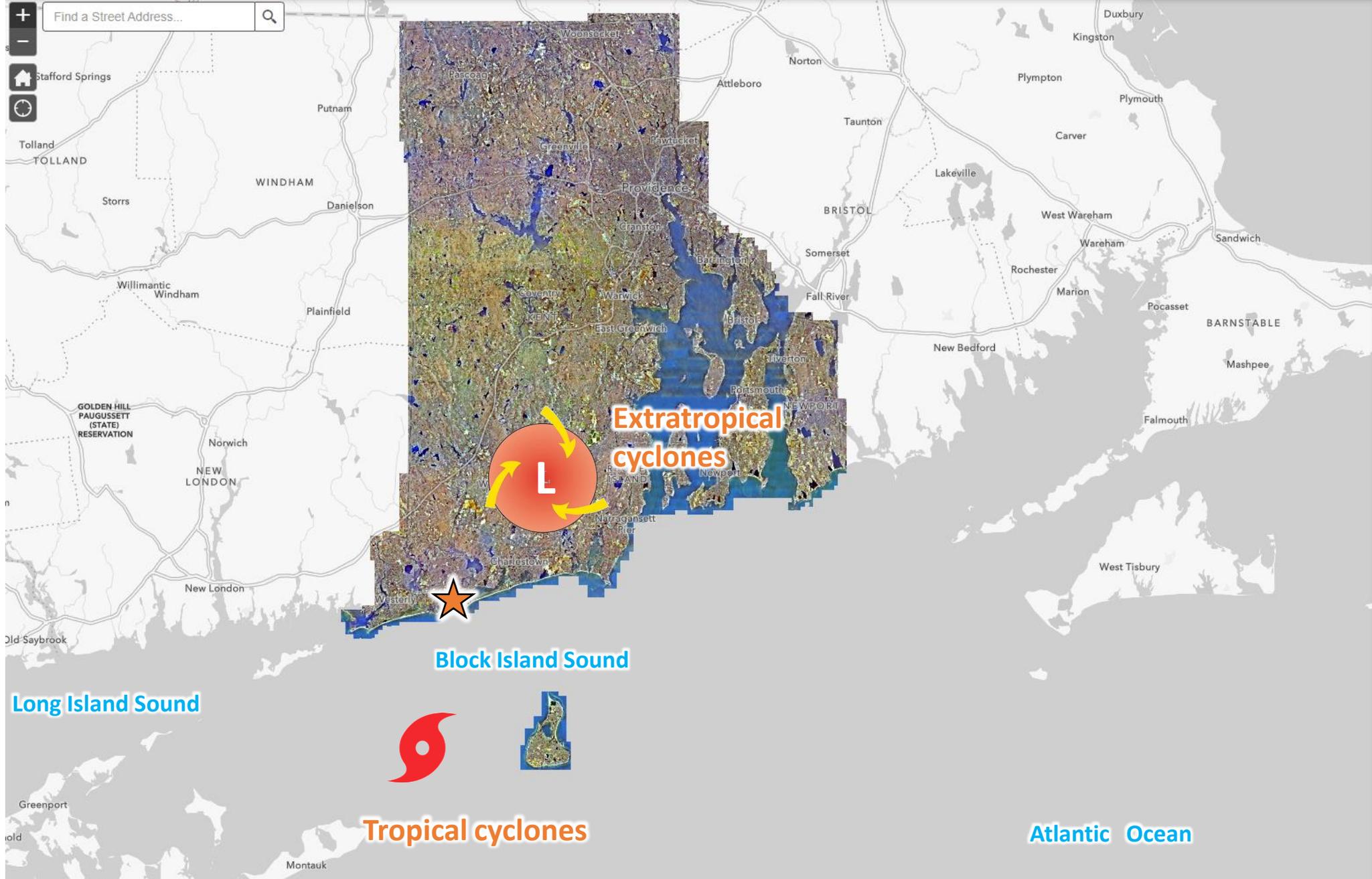


Extratropical cyclones



Block Island Sound

Atlantic Ocean



Site Vulnerability Assessment



Find a Street Address...

+ -

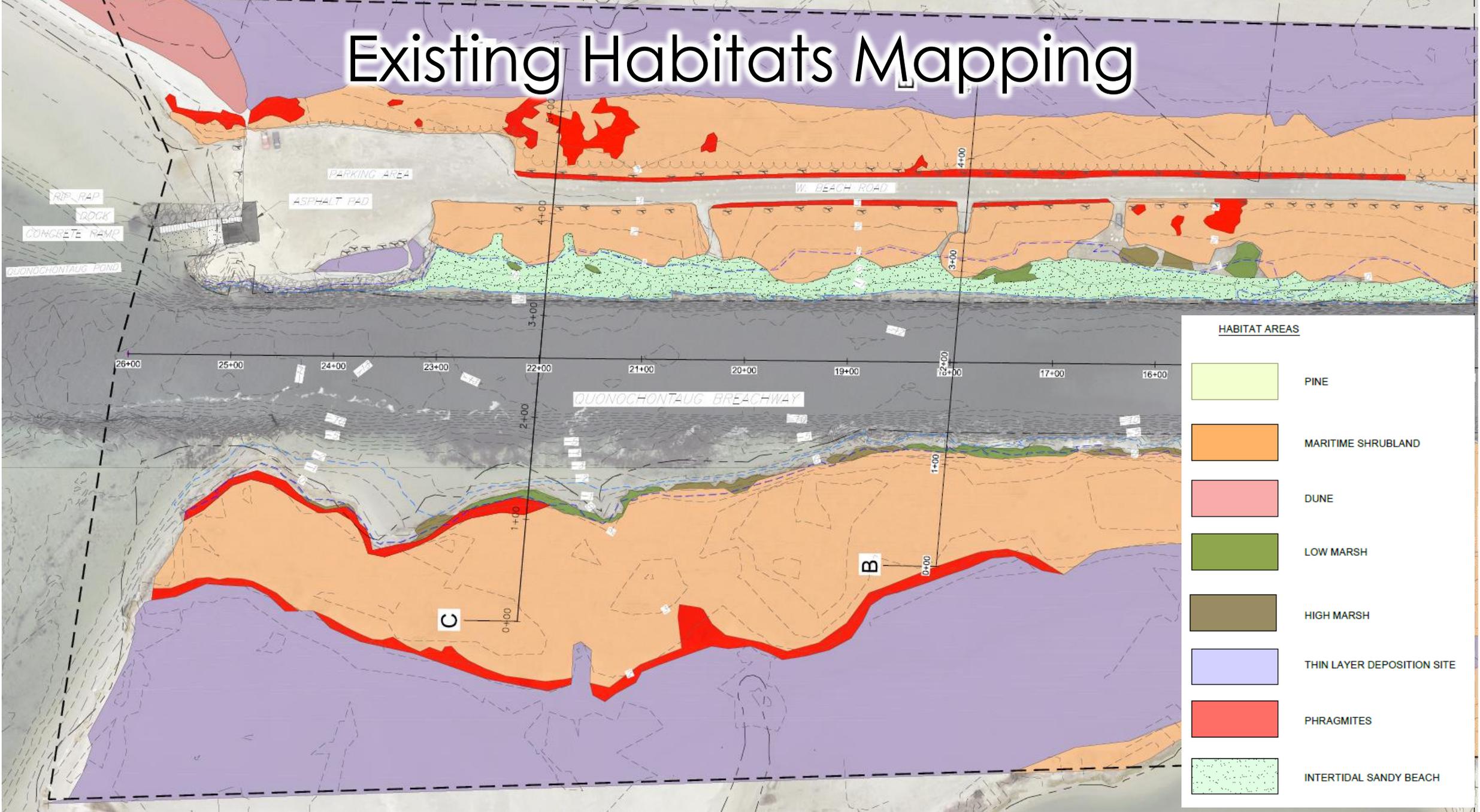
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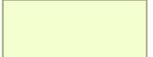
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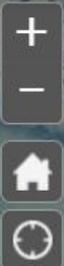


High-res Aerial Imagery Fall 2020

Existing Habitats Mapping



HABITAT AREAS	
	PINE
	MARITIME SHRUBLAND
	DUNE
	LOW MARSH
	HIGH MARSH
	THIN LAYER DEPOSITION SITE
	PHRAGMITES
	INTERTIDAL SANDY BEACH



Find a Street Address...



Deteriorated Revetment

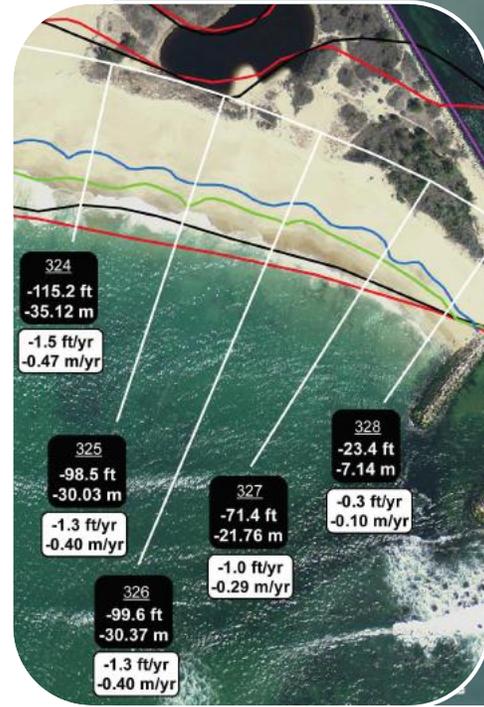
Remnant of Ex. Revetment Crest

Erosion and Loss of Habitat

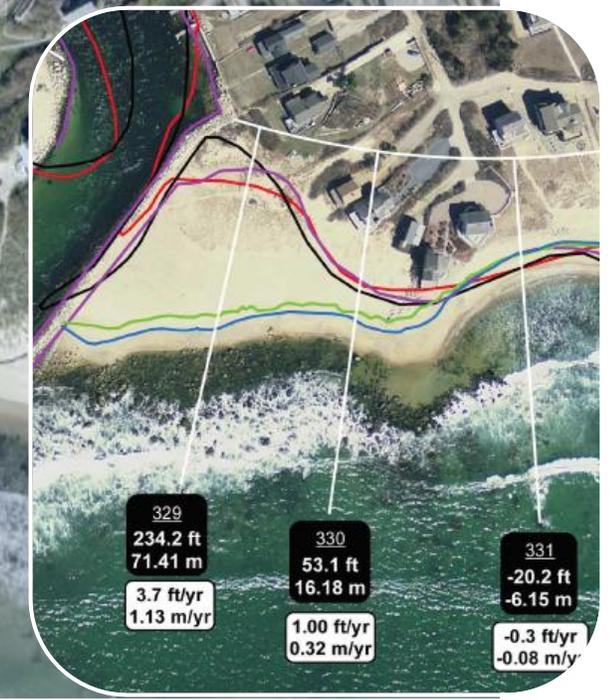
200ft

-71.724 41.334 Degrees





Shoreline Change (Erosion)



Shoreline Change (Accretion)

Site Photographs – March 2020



West Bank, looking north

Site Photographs – March 2020



East Bank, looking north



East Bank, looking south

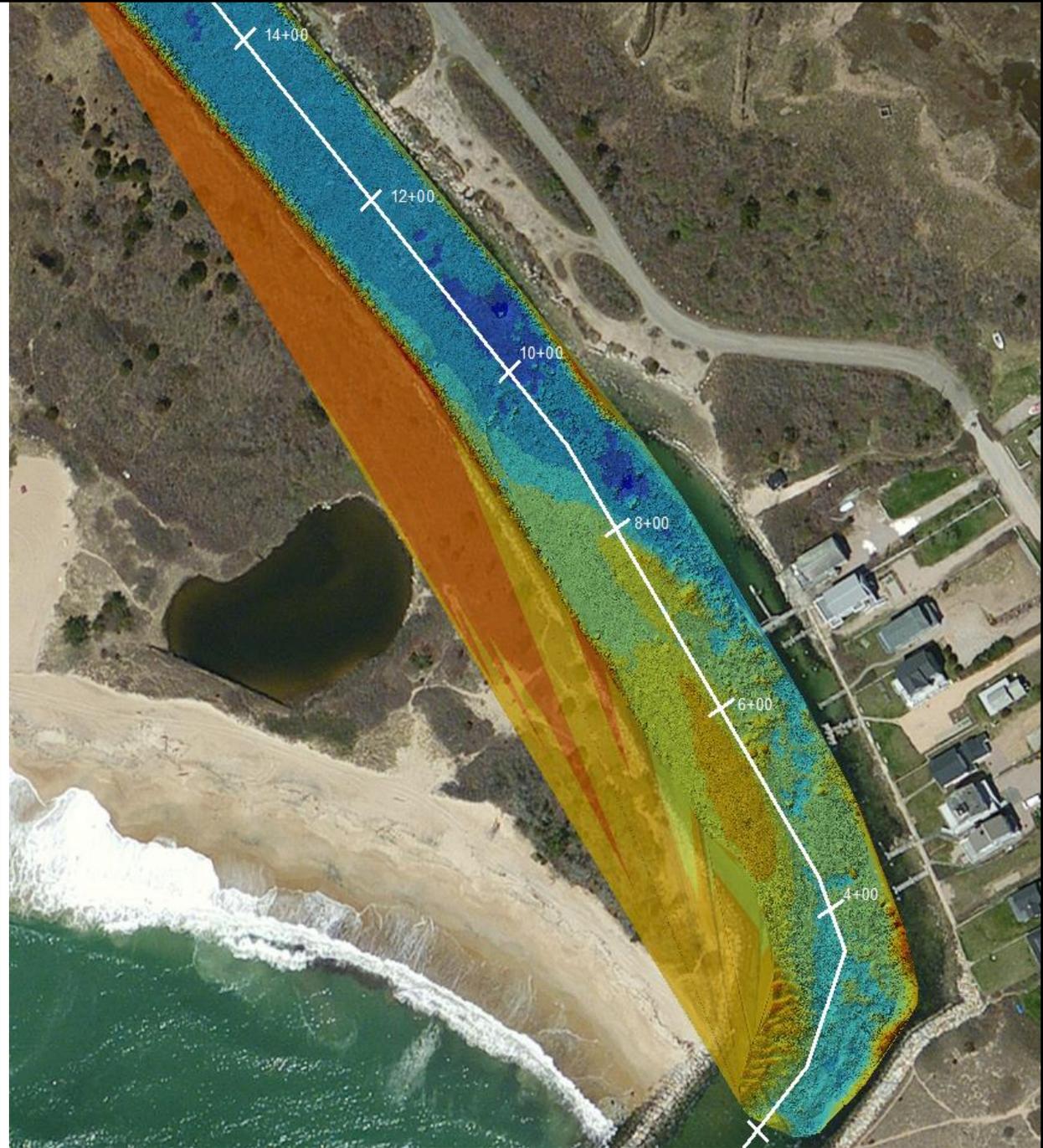
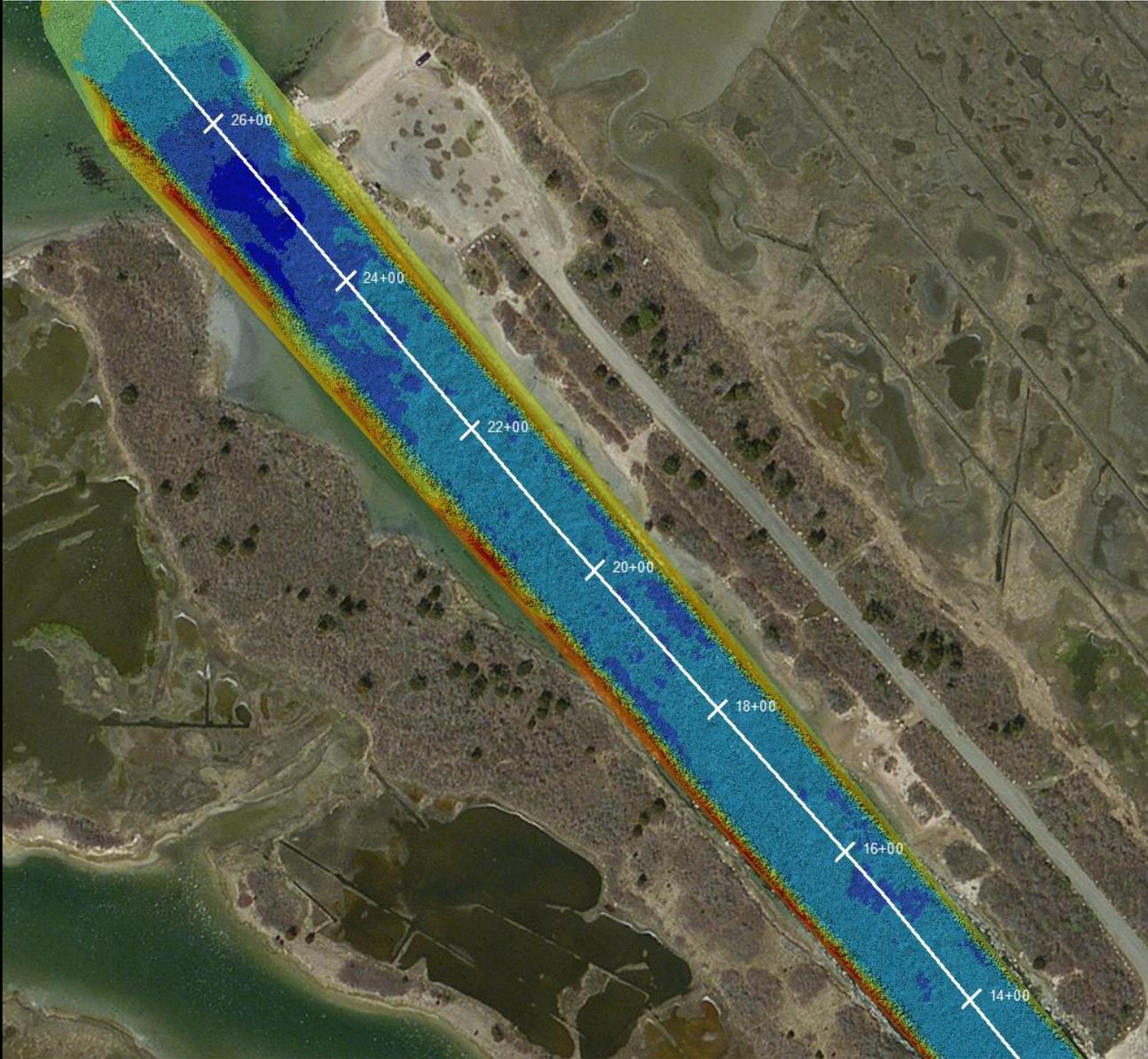


Site Photograph – March 2021

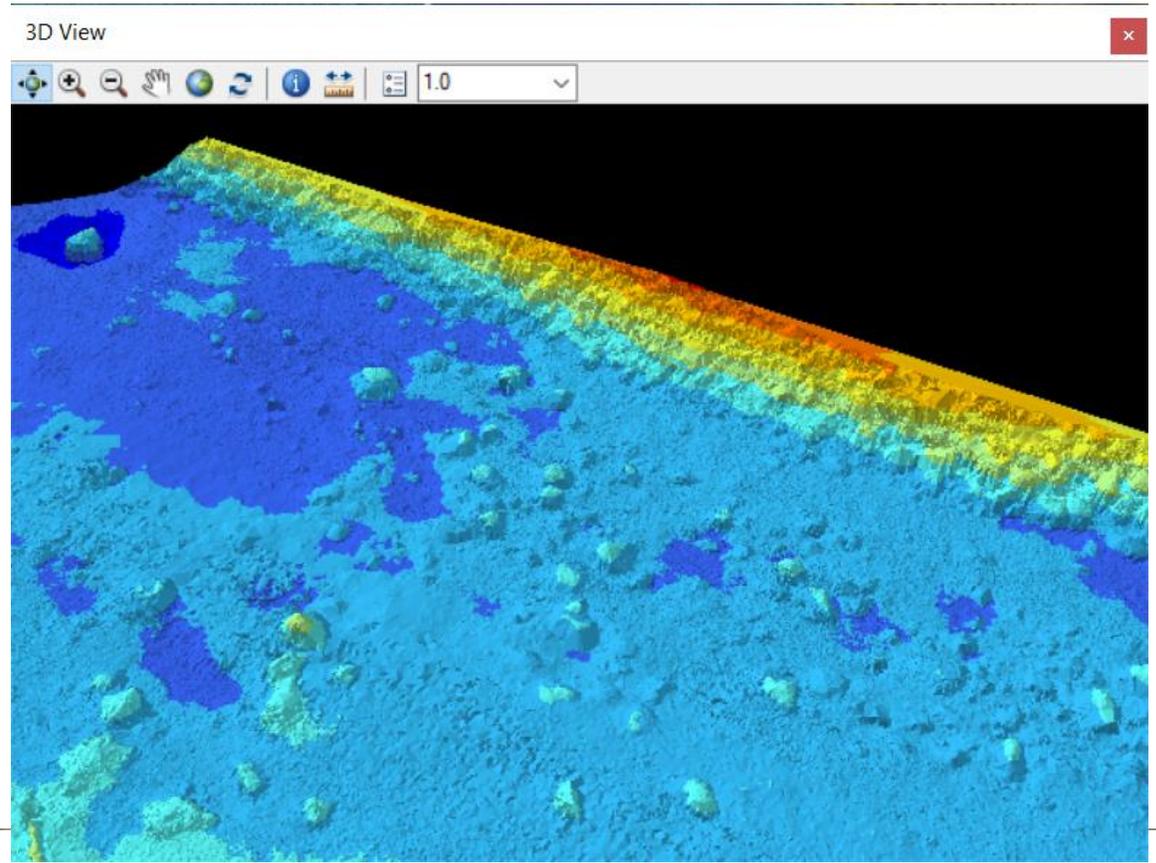
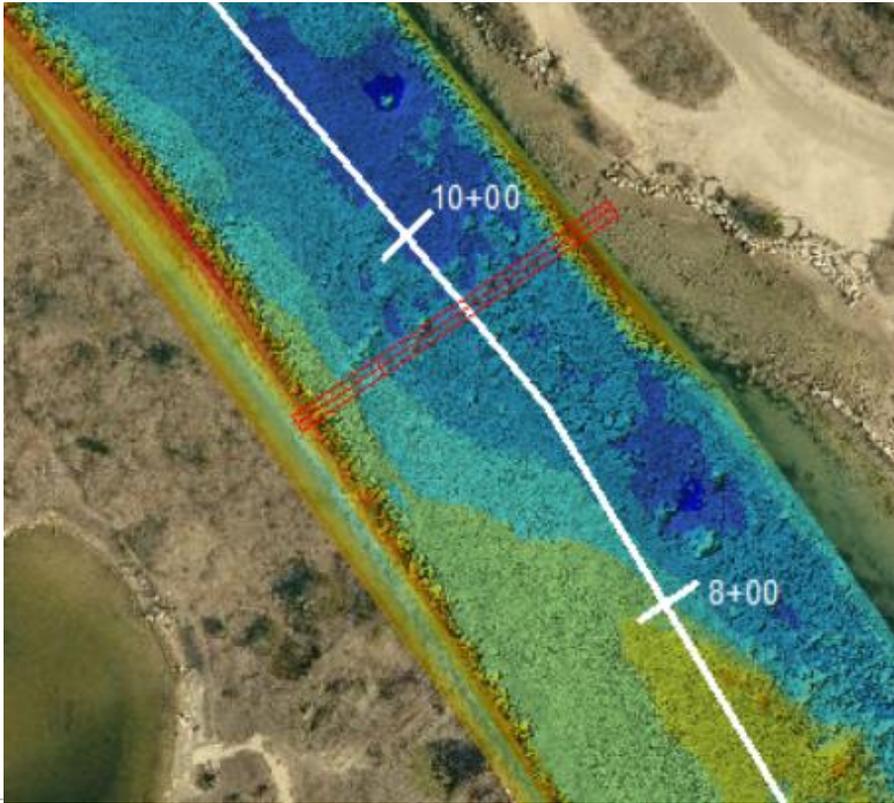


Topographic and Bathymetric Survey

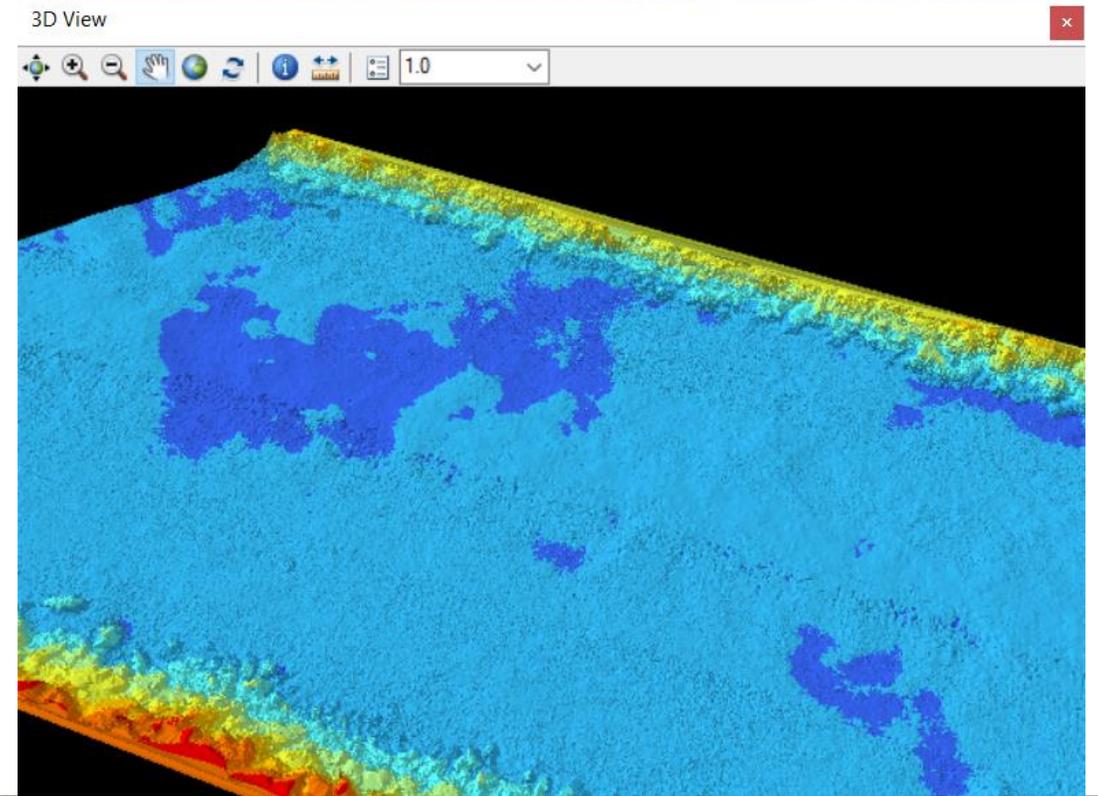
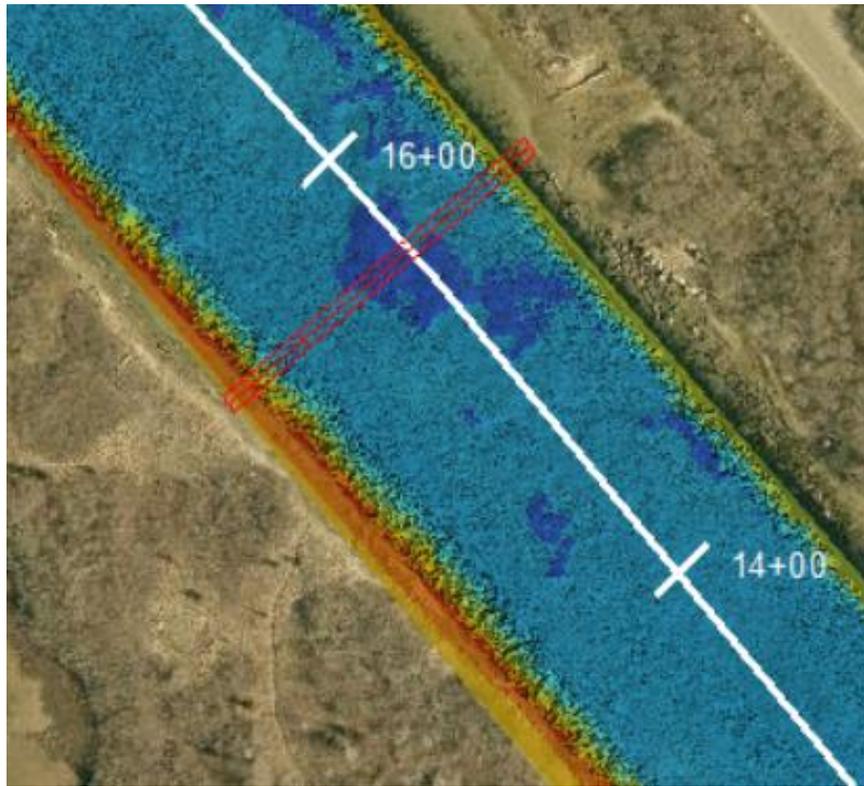
Bathymetric Survey Results



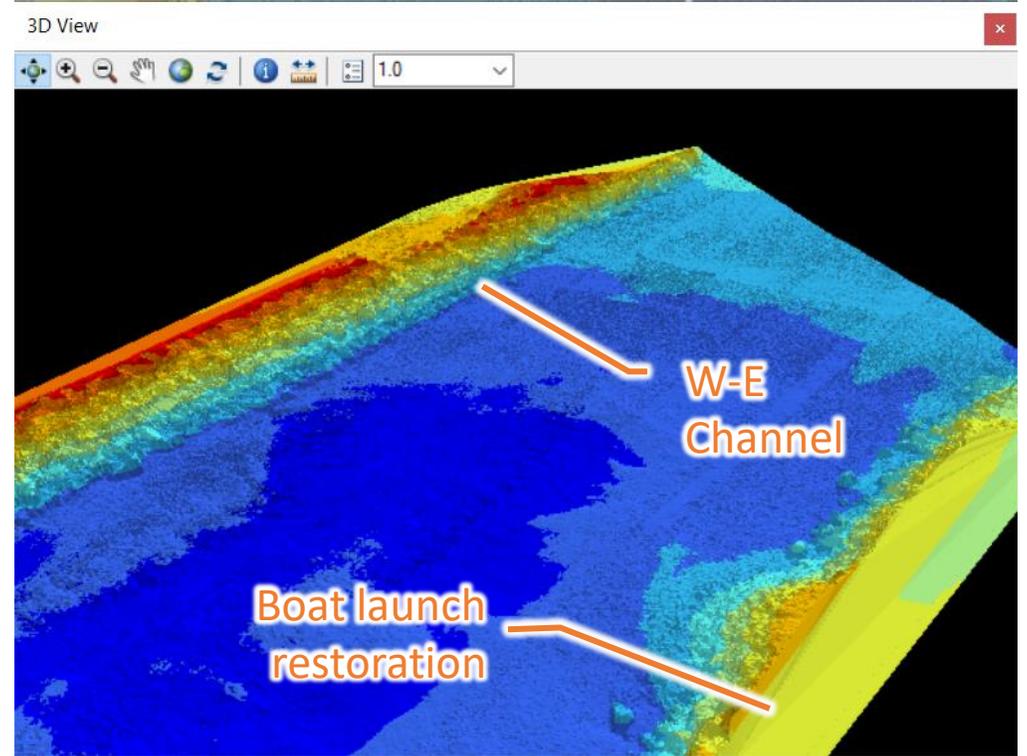
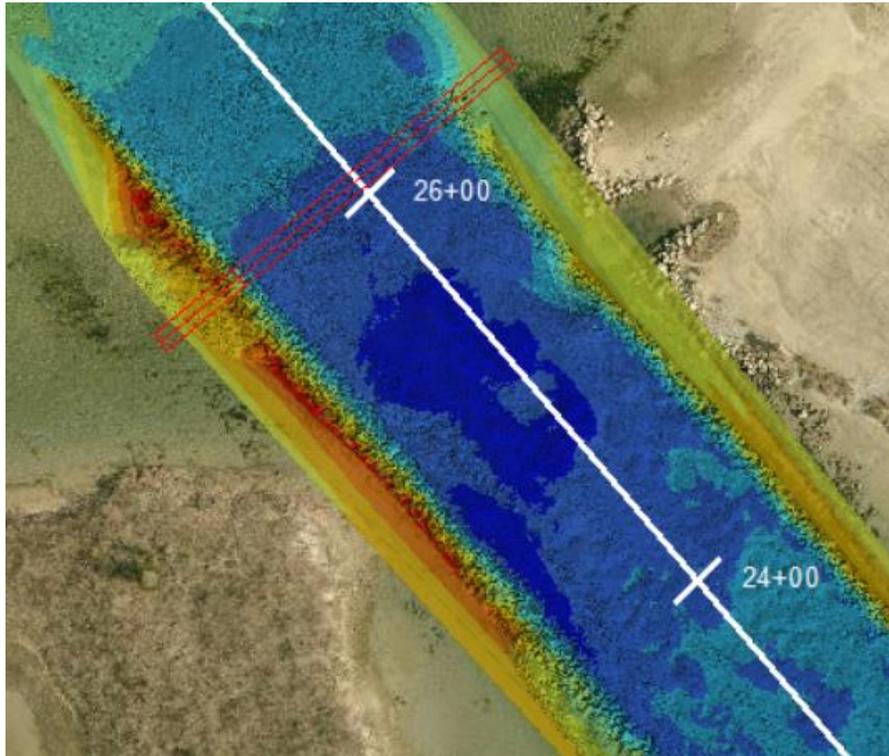
Bathymetric Survey Results – Station 9+60



Bathymetric Survey Results – Station 15+50



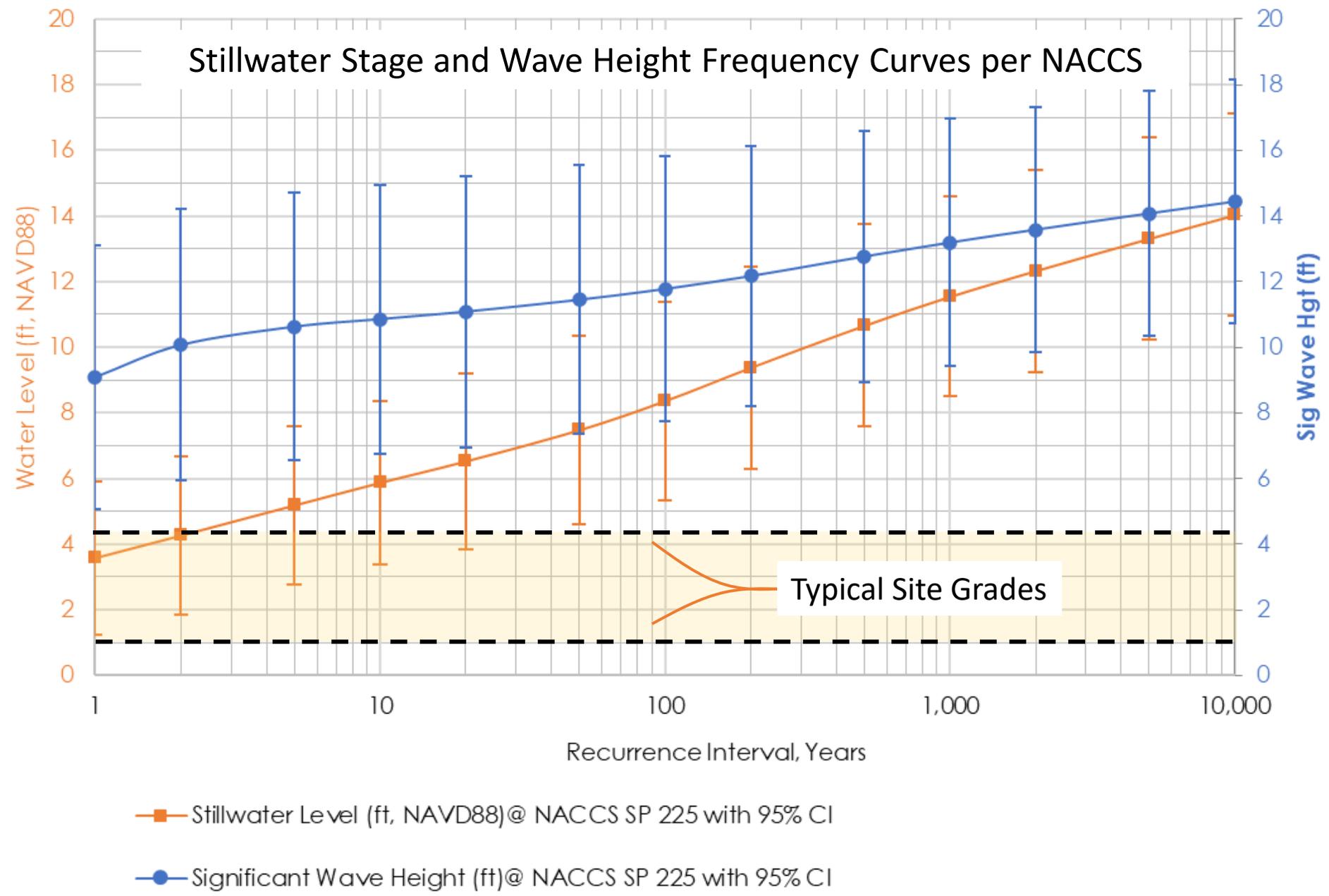
Bathymetric Survey Results – Station 26+00



Flood Vulnerability Assessment



Stillwater Stage and Wave Height Frequency Curves per NACCS



RI STORMTOOLS

“STORMTOOLS is a method to illustrate and display storm inundation, with and without sea level rise, for different types of storms that could occur along Rhode Island's coast line.”

<https://stormtools-mainpage-crc-uri.hub.arcgis.com/>

Estimated Relative Sea Level Change Projections From 2010 To 2100 -
Gauge: 8452660, Newport, RI (2.58 mm/yr)

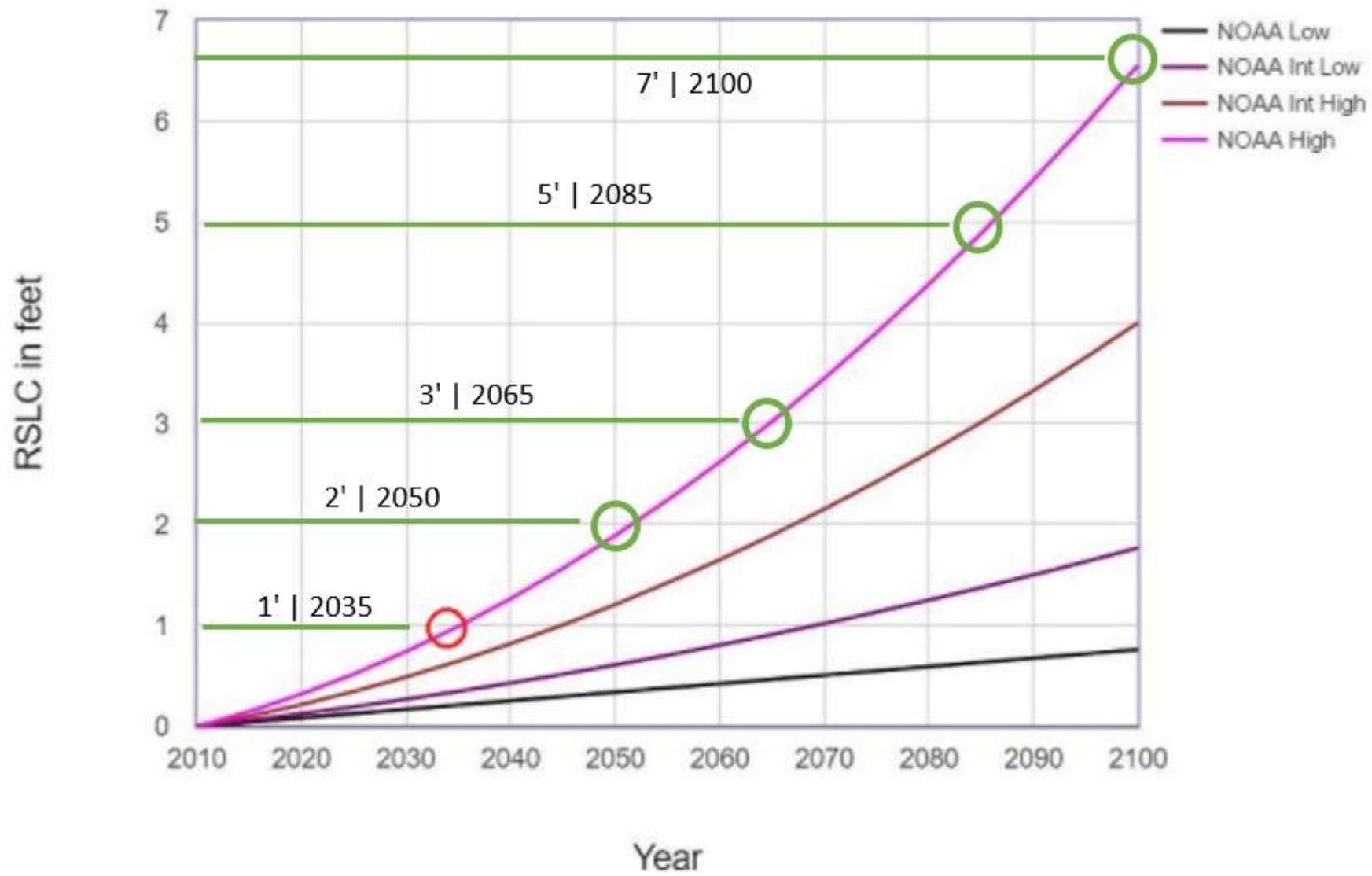


Table B-2: Summary of Tidal Flood Inundation Depths with Selected SLR Scenarios

Note: MHHW stands for Mean Higher High Water. Tropical and extratropical storm-induced flood conditions not included in this table. Assumes typical ground surface elevation along the inlet banks (low and high marsh habitat) of 1 to 2 feet NAVD88 and shrubland at 2 to 3 feet NAVD88 and the road at 3 feet NAVD88.

Year	# of Years from Now	Projected SLR (ft)	MHHW (ft NAVD88)	MSL (ft NAVD88)	Typical Inundation Water Depth (ft)		
					East and West Bank Marsh	East and West Bank Shrub	Road (south to north)
2020	Present	--	1.1	-0.4	Tidal (where eroded)	No flood	No flood
2035	15	1	2.1	0.6	Tidal	Irregularly Flooded	No Flood
2050	30	2	3.1	1.6	Tidal-Submerged	Tidal	Tidal
2065	45	3	4.1	2.6	Submerged	Tidal-Submerged	Tidal-Submerged
2100	80	7	8.1	6.6	Submerged	submerged	submerged

Details Basemap

Share Print Measure Find address or place

About Content Legend

Legend

1 foot Sea Level Rise (High Tide) (feet above grade)

- Inundated Area



STORMTOOLS
Nuisance Storm
with 1-Foot Sea
Level Rise in Year
2035

(High Tide with 1-foot SLR)

Legend

1 Year Coastal Storm with 1 foot Sea Level Rise (feet above grade)

- <= 2
- 4
- 6
- 8
- 10
- > 10
- Lowlying



STORMTOOLS
Nuisance Storm with
1-Foot Sea Level Rise
in Year 2035

1-year Recurrence Interval Flood with 1-foot SLR

About Content Legend

Legend

3 feet Sea Level Rise (High Tide) (feet above grade)

- Inundated Area



STORMTOOLS
Nuisance Storm with
3-Foot Sea Level Rise
in Year 2065

High Tide with 3-foot SLR

Legend

1 Year Coastal Storm with 3 feet Sea Level Rise (feet above grade)

- <= 2
- 4
- 6
- 8
- 10
- > 10
- Lowlying

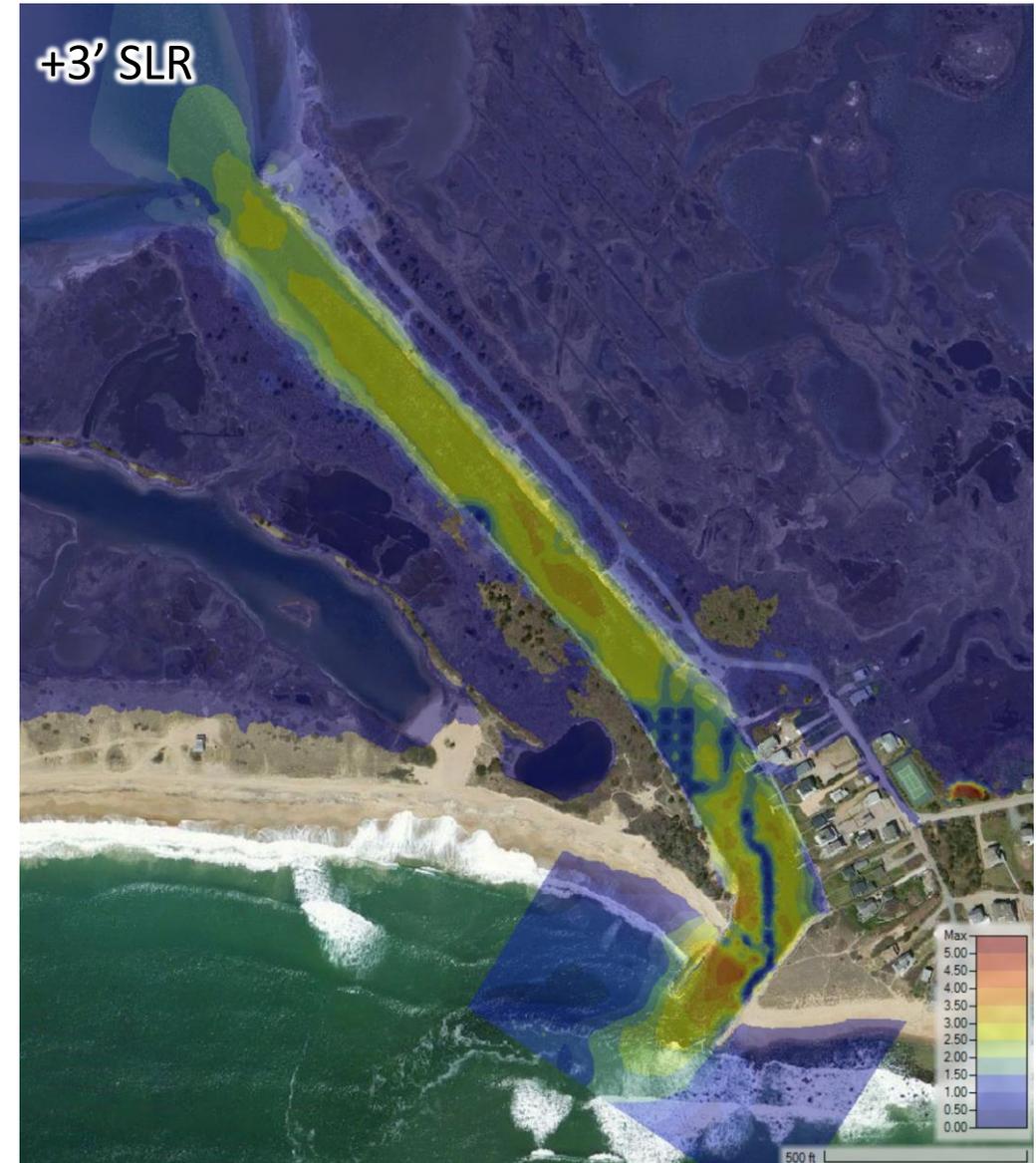
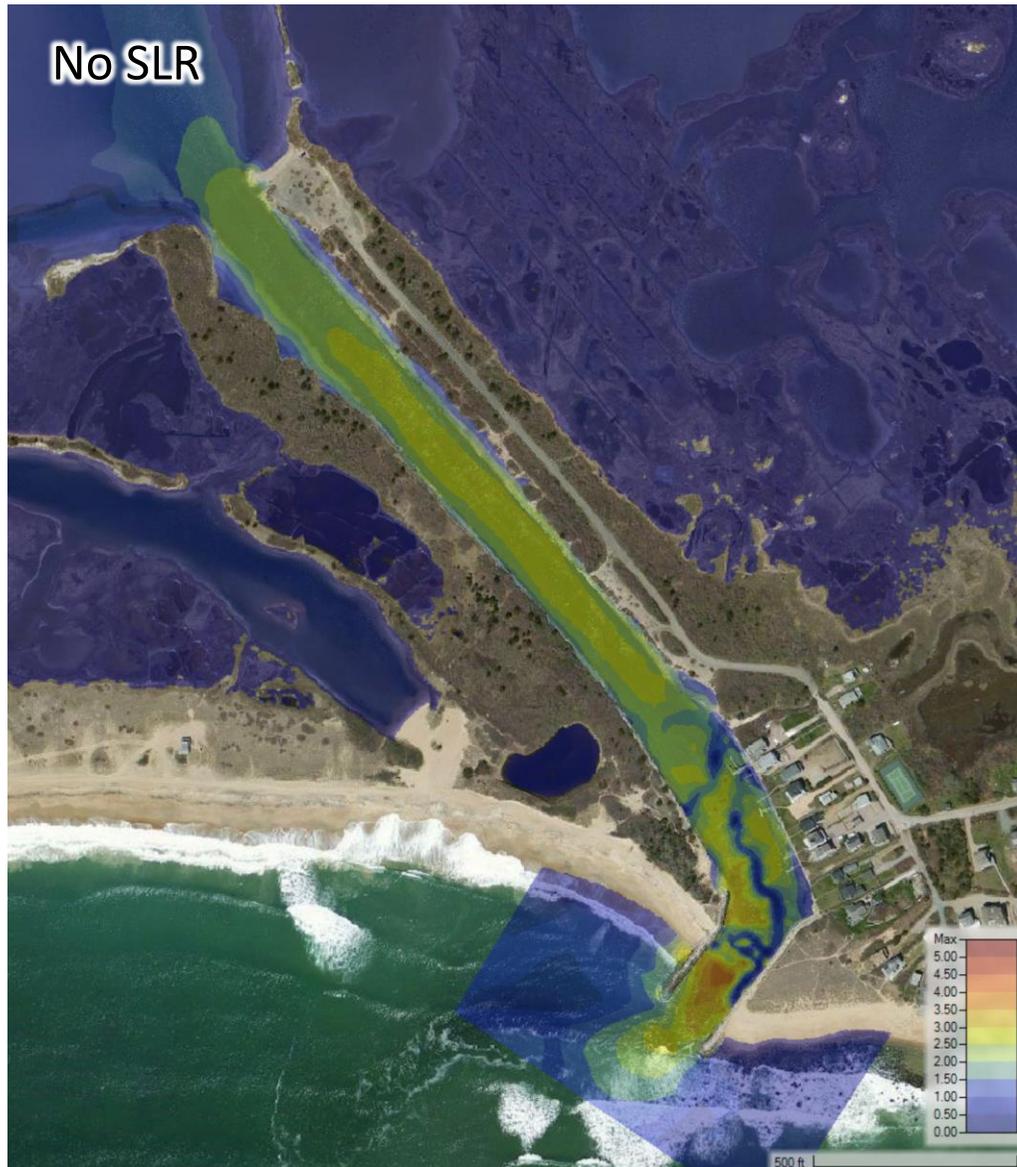
STORMTOOLS
Nuisance Storm with
3-Foot Sea Level Rise
in Year 2065



1-year Recurrence Interval Flood with 3-foot SLR

Numerical Hydraulic Modeling

GZA RAS Model – Calculated Maximum Velocity (existing conditions)

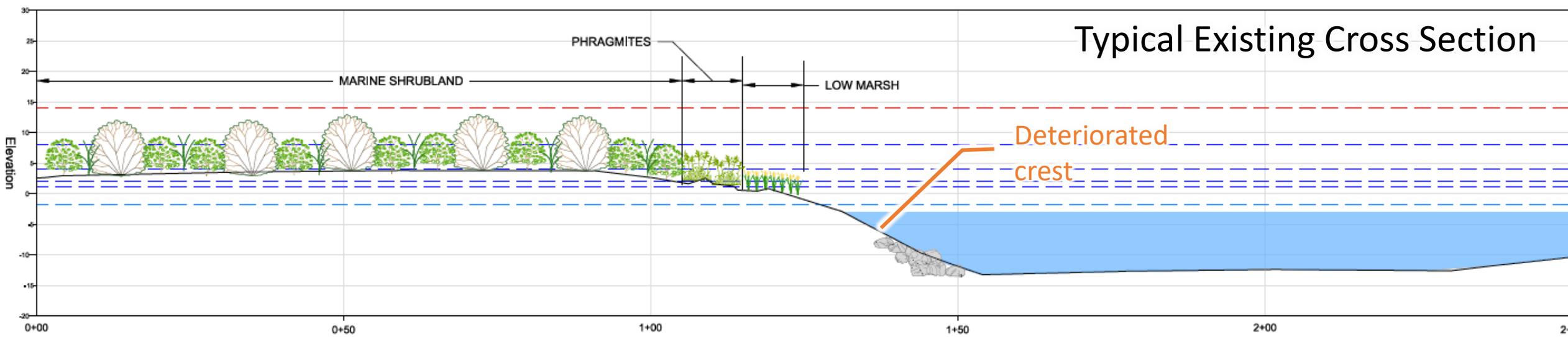


GZA RAS Model – Calculated Maximum Velocity (existing conditions)

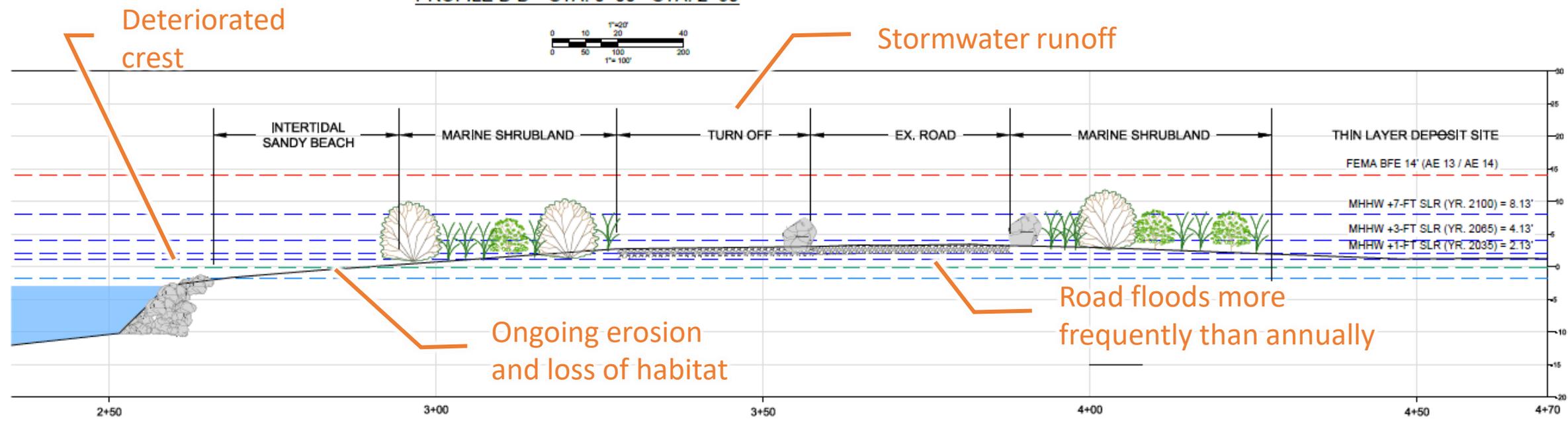
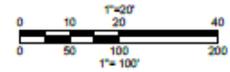


Proposed Concept Design

Typical Existing Cross Section



PROFILE B-B' - STA. 0+00 - STA. 2+50



PROFILE B-B' - STA. 2+50 - STA. 4+70

Find a Street Address...

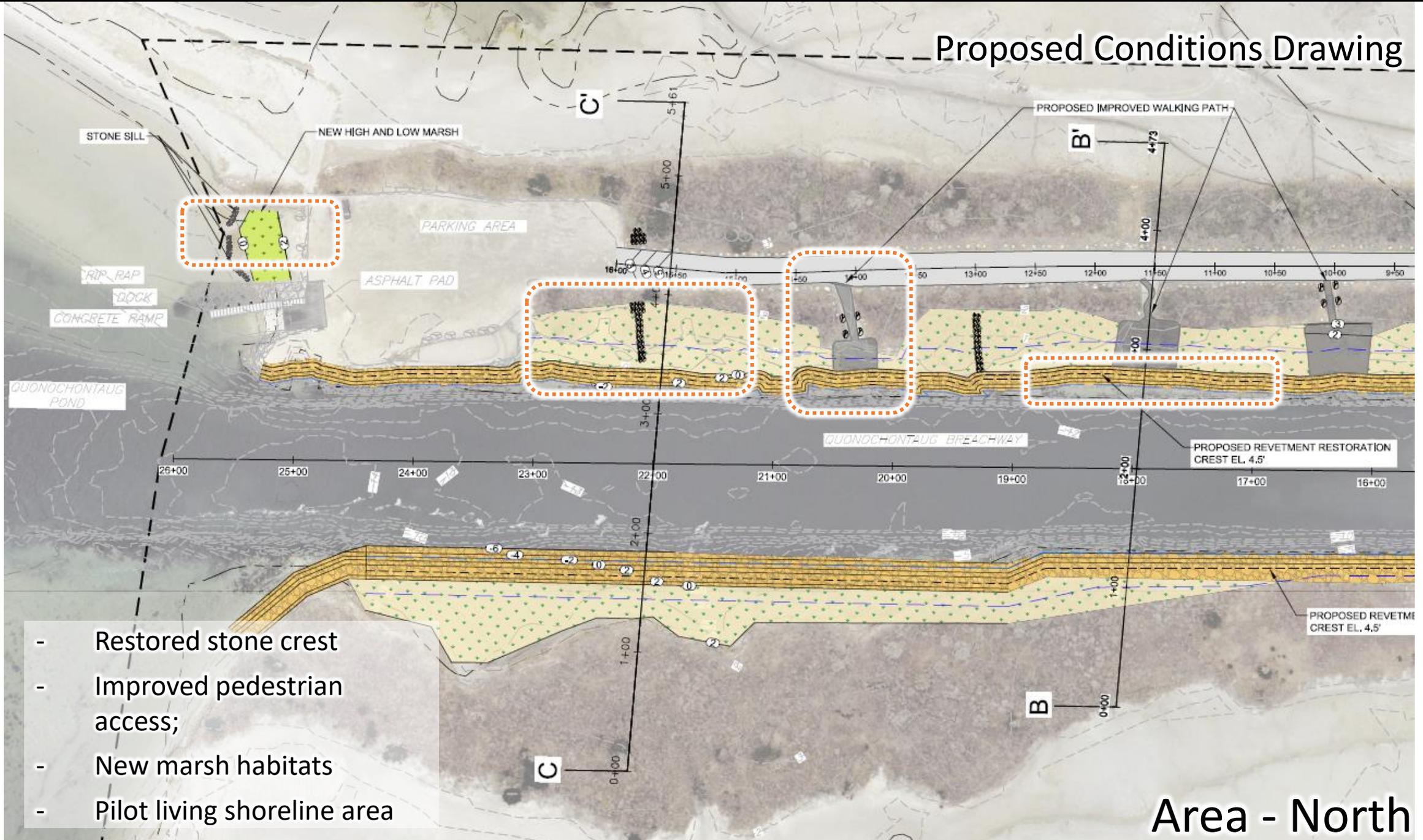
+
-
Home
Refresh



Key Design Considerations

- Restore stone revetment to Elev. +4.5' (> MHHW + 3' SLR)
- Restore low and high marsh (with reduced overbank currents)
- Re-align and elevate Access Road to Elev. +5.0'
- Improve parking and stormwater runoff
- Improve pedestrian access to waterfront
- Pilot living shore areas

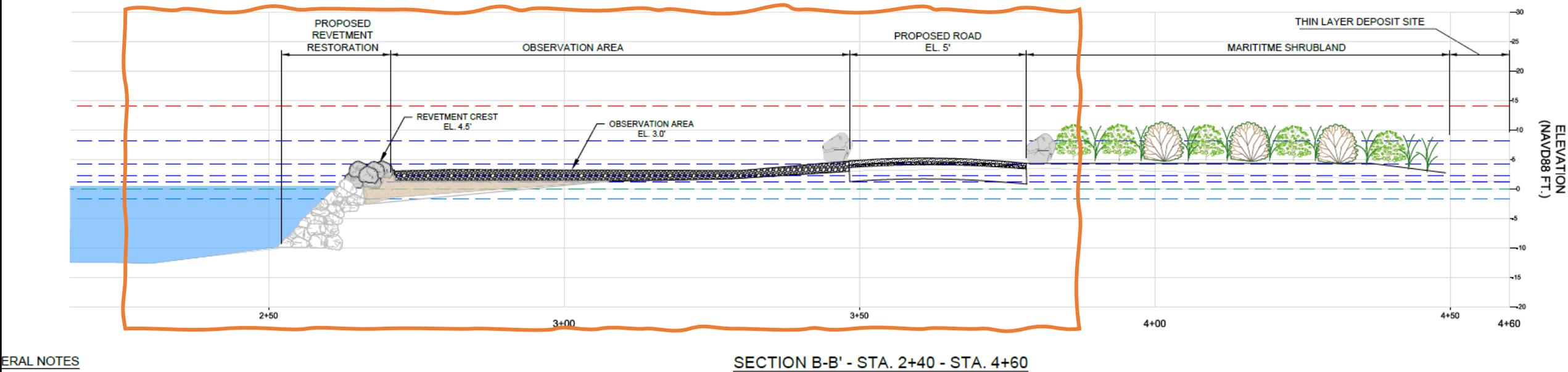
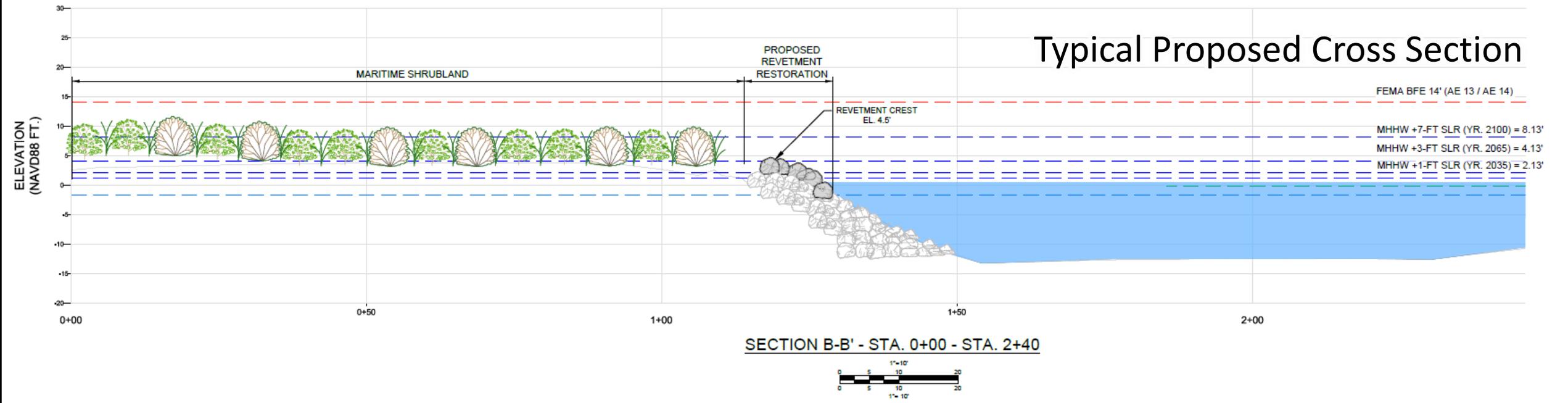
Proposed Conditions Drawing



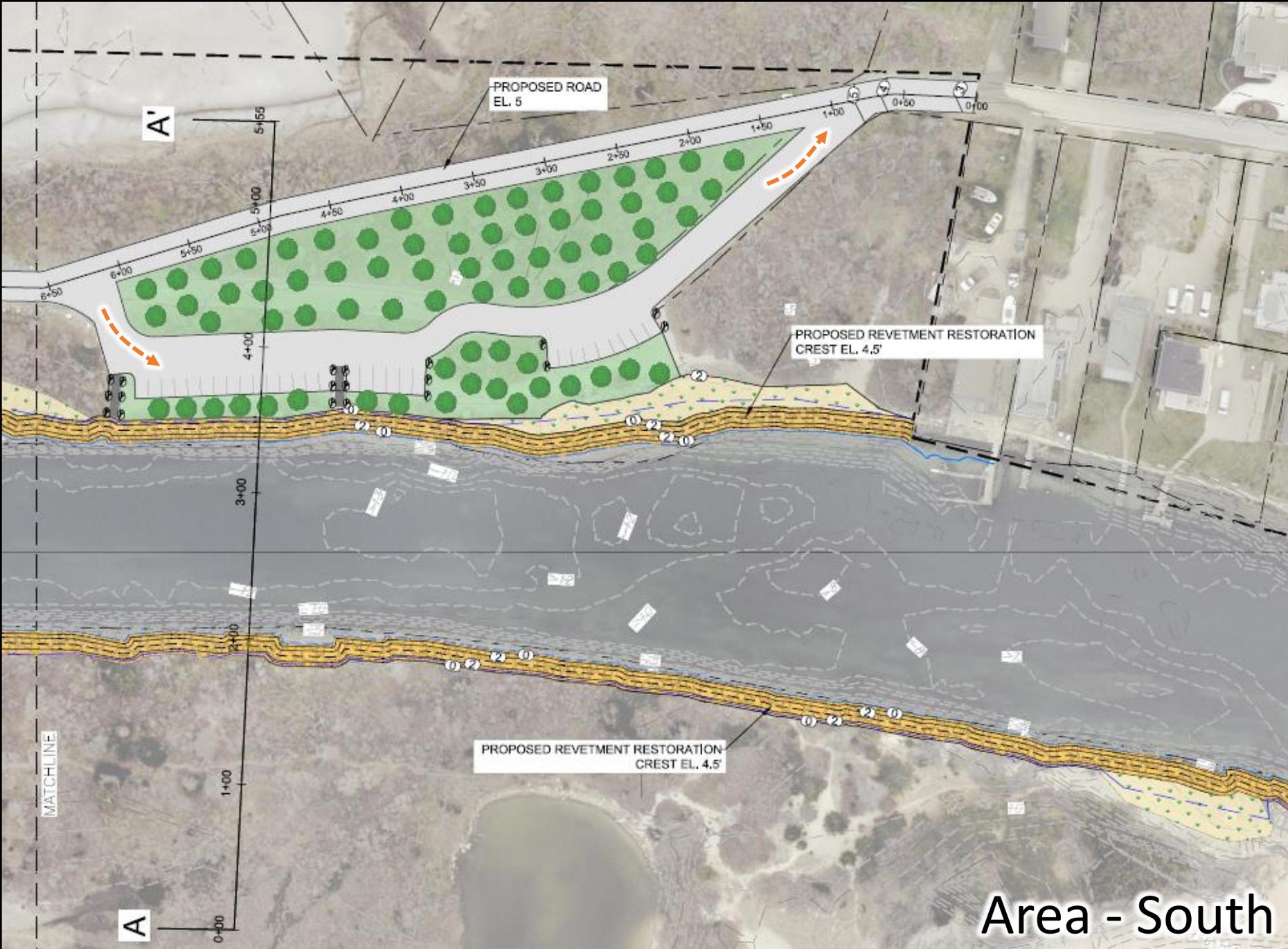
- Restored stone crest
- Improved pedestrian access;
- New marsh habitats
- Pilot living shoreline area

Area - North

Typical Proposed Cross Section



GENERAL NOTES



- Re-aligned road;
- Improved parking lot;
- Enhanced vegetated area

Existing (July 2021) vs Proposed (Rendering)



A person wearing an orange safety vest with the GZA logo and blue jeans stands on a rocky shore, looking out over a body of water. The vest has the GZA logo on the back. The person is holding a clipboard. The background shows a rocky coastline with some vegetation and a clear blue sky.

Questions & Discussions

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