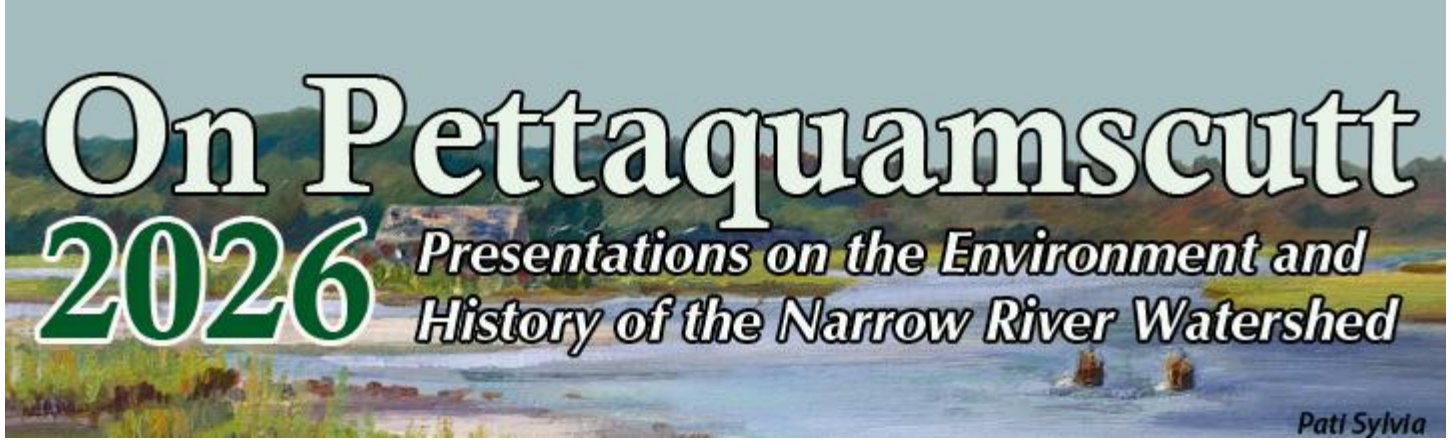


Dredging the Mouth of the Narrow River

History, Current Conditions and Future Plans

Narrow River Preservation Association

James Dean Vogel and Craig Wood

8 February 2026

NARROW RIVER PRESERVATION ASSOCIATION

Discussion-Details

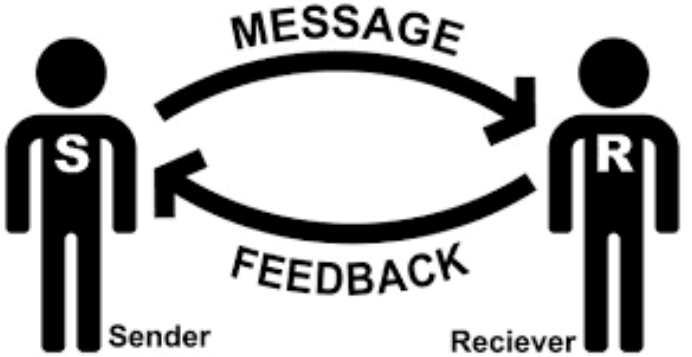
- The Narrow River Watershed Estuary is a Complex System!
  - Sand Migration
  - Climate Change and the Salt Marsh
  - 2016-2017 USFWS Dredging/Thin Layer Placement
  - Stakeholders
- How did we get here?
  - Timeline
  - Current situation
- Dredging in the Narrow River Estuary
  - Studies and Modeling
  - Special Area Management Plan (SAMP)
- Project Details
  - Goals
  - Design
- Discussion and Questions

Narrow River Dredging-February 2026

- The Narrow River Watershed Estuary is a Complex System!
- Salt Marsh habitats are fragile!
- The Coastal System Causes Sand to naturally accumulate in the Narrow River Mouth.
- The Town Plans to excavate the sand out of the mouth to improve Navigation and replenish the dunes. (A moderate (conservative) first step)
- The Design of the Dredging is to increase the flow in one channel.
- Monitoring will be established to ensure the
  - project goals were attained
  - Proper planning for Future Maintenance Dredging and Beneficial Reuse
- All efforts are in support of meeting the Long-term goals of
  - Narragansett Beach Replenishment
  - Healthy Narrow River Estuary
  - Safe Boating

Dredging the Narrow River Mouth

This is a Two-Way Discussion



- We want to address your questions and concerns:
  - Please ask Clarifying Questions as we go.
  - Detailed Questions at the end of the presentation.
  - If you want to follow-up with us, please email us at: NRPA@narrowriver.org

Narragansett Town Council Update 5 January 2026

- Project timeline
  - Ongoing: June-Dec-2025-Permit submission and review
    - CRMC, Army Corp of Engineers, RIDEM, USFWS, Save the Bay, and NRPA
  - Future:
    - Early 2026-Receive Permit from CRMC, RIDEM and Army Corps of Engineers
    - Request for Proposal-30 day
    - Funding: Town Budget, Congressional Spending Grant, Public/Private Partnership
    - Earliest Project Start 15 October 2026
    - Latest Project End 31 January 2027
    - Project Estimated Cost: $1.6-2.0 Million

The Narrow River Watershed Estuary is a Complex System!

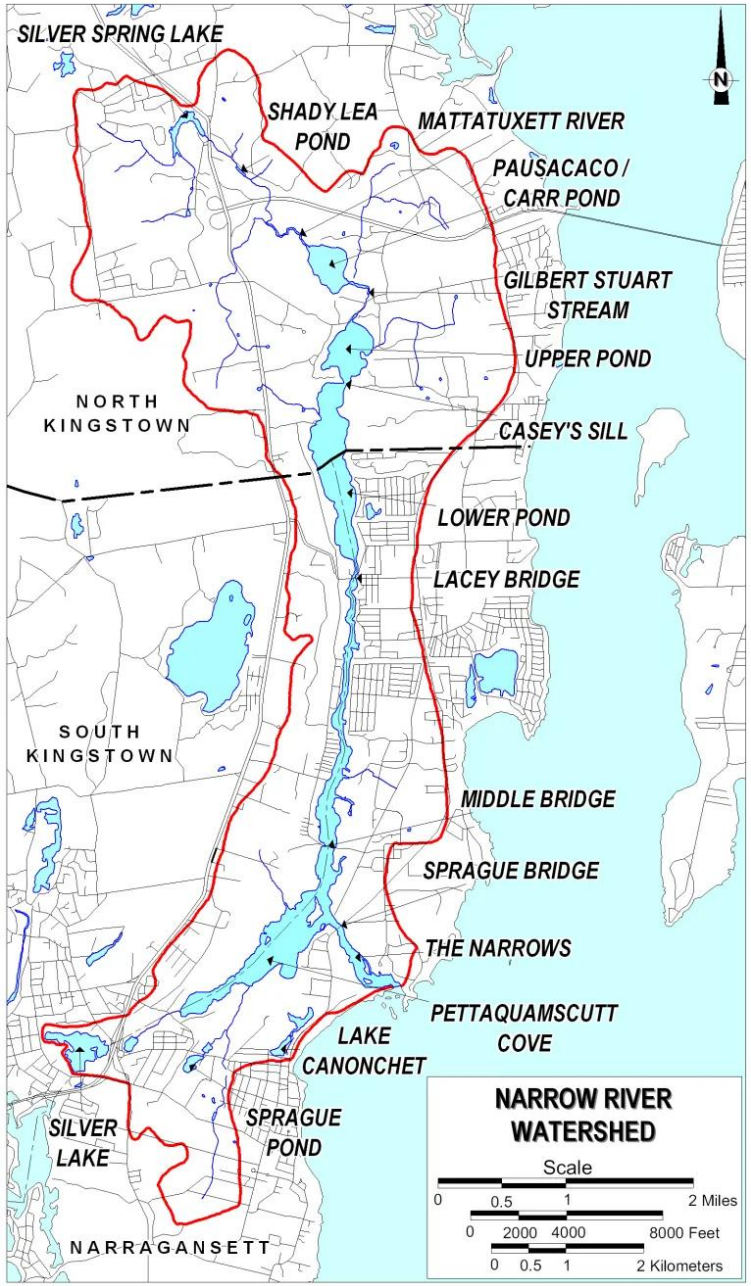
“Take me to the River” Pati Sylvia, https://www.patisylviafineart.com/

Narrow River/ Pettaquamscutt River

- Three towns of Narragansett, South Kingstown and North Kingstown
- A Tidal Inlet: Not truly a river
  - Flows in both directions
  - Brackish water
  - Approximately seven-mile-long tidal inlet connected by a narrow channel to a series of kettle basins fed by a small stream
- Mostly shallow, it does have two unusually steep-sided ponds, one of which plunges to a maximum depth of approximately 60 feet.

Narrow River/ Pettaquamscutt River Watershed

- **Watershed Area:** 8,650 acres
- Towns:
  - North Kingstown: 4,188 acres (48.4%)
  - Narragansett: 2,841 acres (32.8%)
  - South Kingstown: 1,621 acres (18.7%)



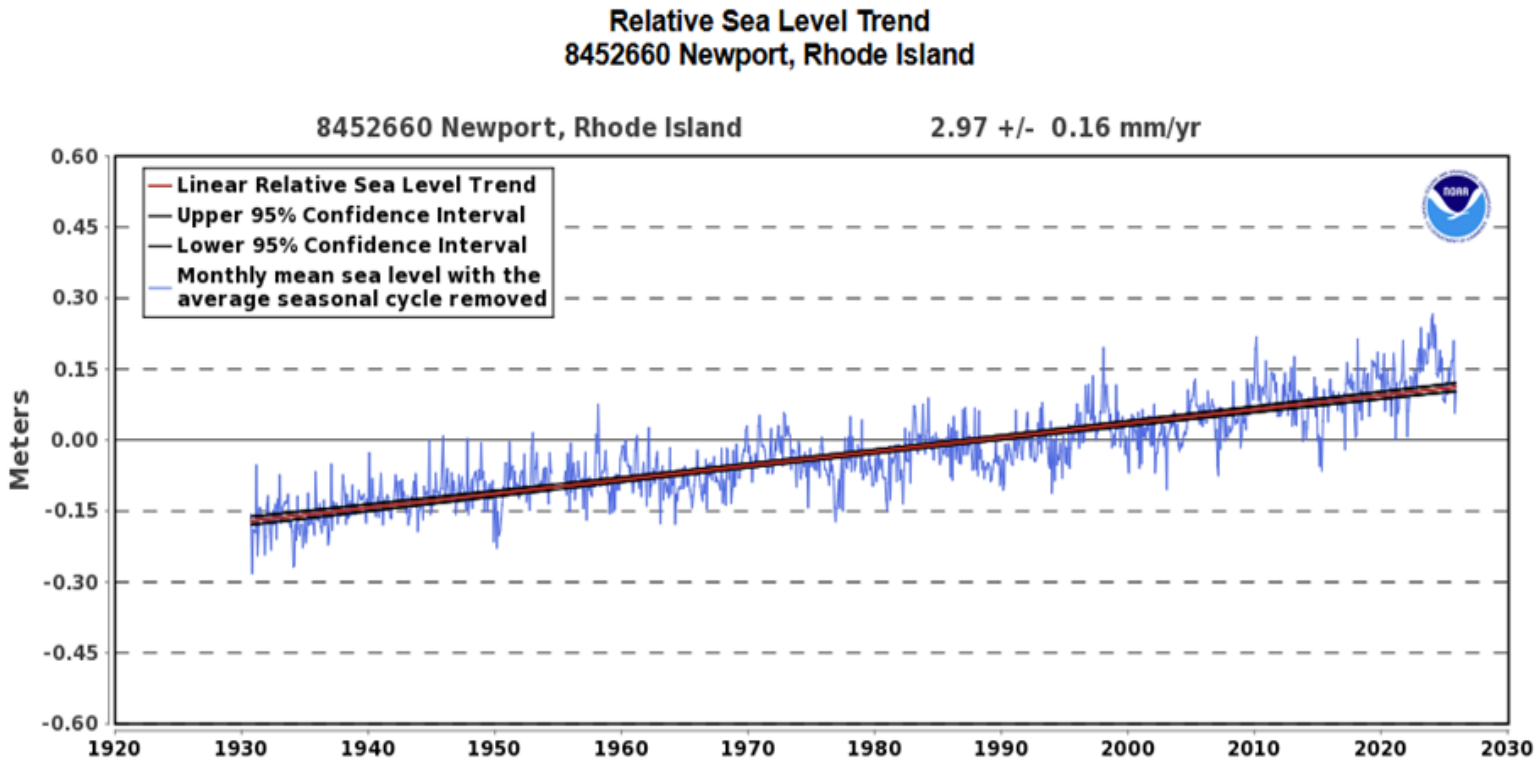
Narrow River/ Pettaquamscutt River Mouth

Narrow River Dredging is very Complex!

- **River Delta sand accumulation (shoaling) at the mouth and lower river reaches, particularly following storms over recent winters**
- Beach and Dune erosion (ongoing) with
- Sediment transport from the Narragansett Town Beach
- Storm overwash of sand from eroded beaches and dunes
- **Shoaling at the river mouth (formation of tidal deltas) is**
  - **Natural process that,**
  - **Will continue after the initial dredging concludes**

Effects of Climate Change

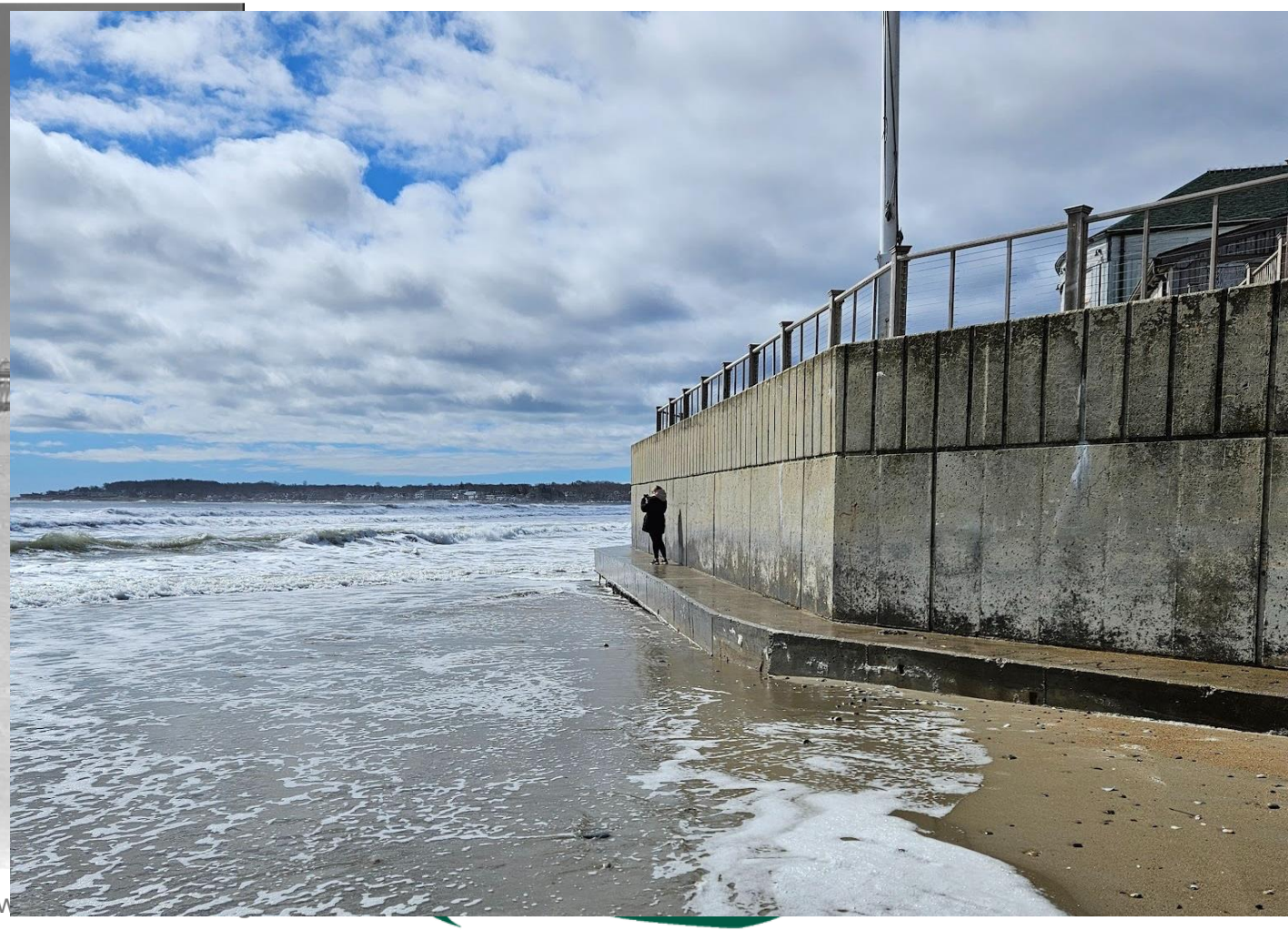
- Coastal storms are increasing in both frequency and intensity
- Recorded sea levels in Newport have risen one foot since 1930
- Sea level rise is accelerating with current rates nearly twice the long-term average
- Beach erosion rates are increasing
- Salt marshes are struggling to keep pace



Consequences of Beach and Dune Erosion

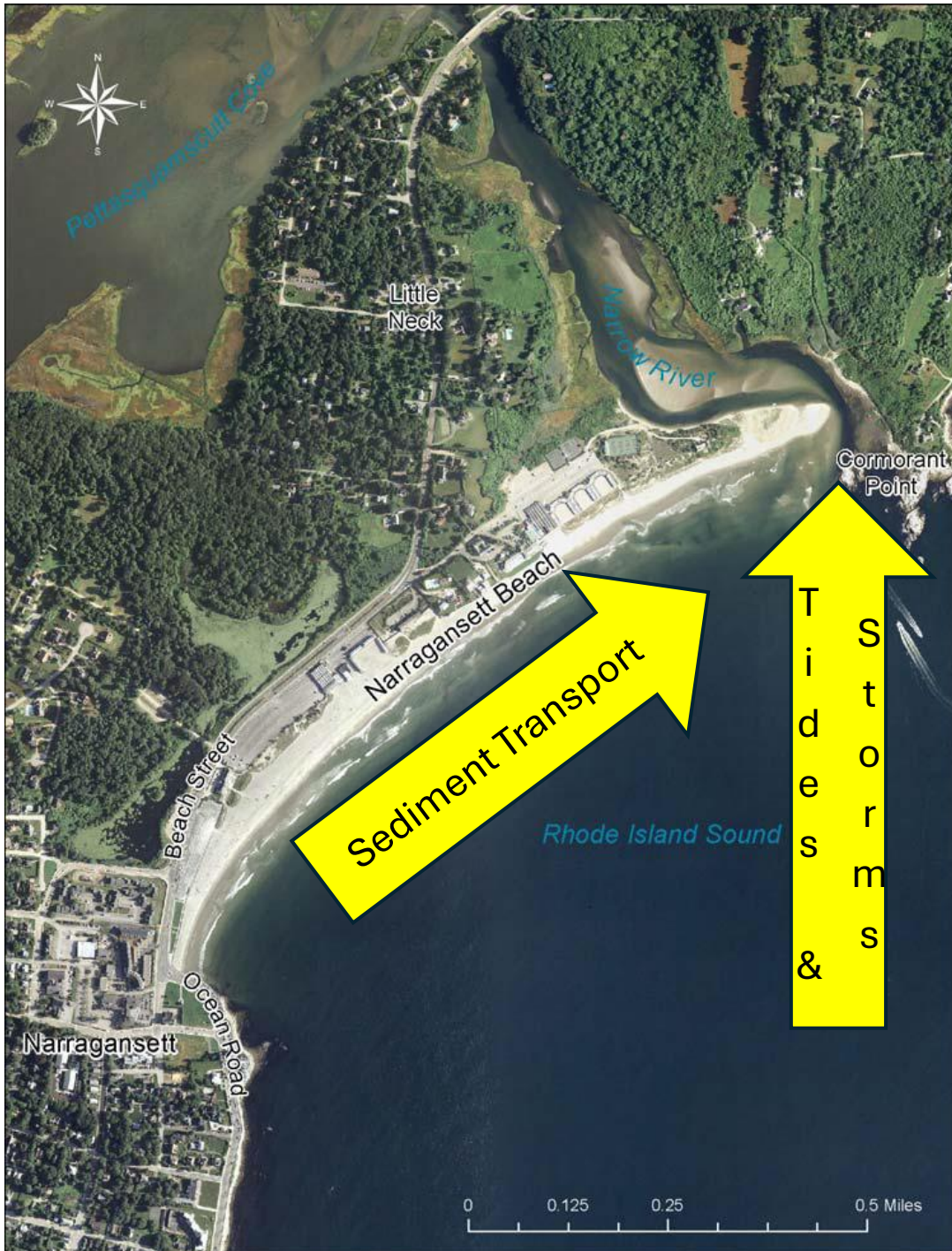
Dunes Club and adjacent houses

Dunes Club 1939 and Today



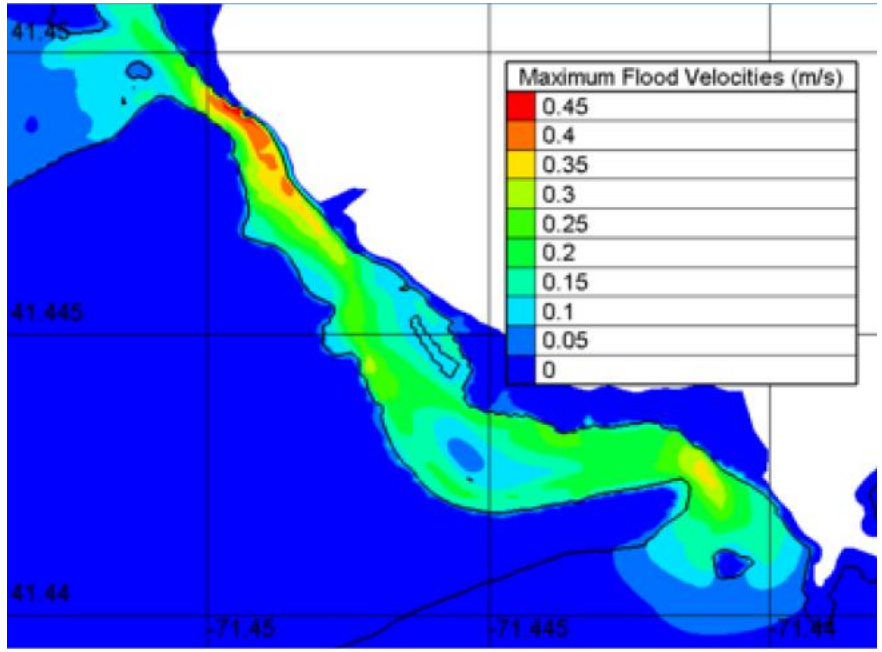
Sand Migration (Transport) and Accumulation

- Net Sediment Transport to north
- Breaking Waves – 3 to 10 feet at shoreline
- Tides
- Storm-Surge Overwash – 1 to 10 feet water depth across shore zone



Sand Migration into the Narrow River

- Town beach is eroding
- Beach nourishment to date is not a significant factor
- Movement down the coast into river
- The Narrow River is Flood Tide Dominant the incoming tidal currents are stronger and faster on average than the outgoing (ebb) currents
- All the sand that comes in does not come out
- **Net: Accumulation over time!**



Impact of Dredging the Lower Narrow River on Circulation and Flushing in the Narrow River (Swanson C., M. Spaulding and A. Shaw. August 2016)

Salt Marsh Ecology

- Critical to health of the estuary (water quality, storm protection, nursery for fish, important wildlife habitat, carbon storage)
- Marsh elevation range in Narrow River < 1 feet (High Marsh range only 2.5 inches)
- Typical marsh elevation gains (accretion rates) are half current rise in sea level – marshes are drowning in place
- High marsh is only nesting habitat for imperiled Saltmarsh Sparrow

Courtesy of US Fish and Wildlife Service

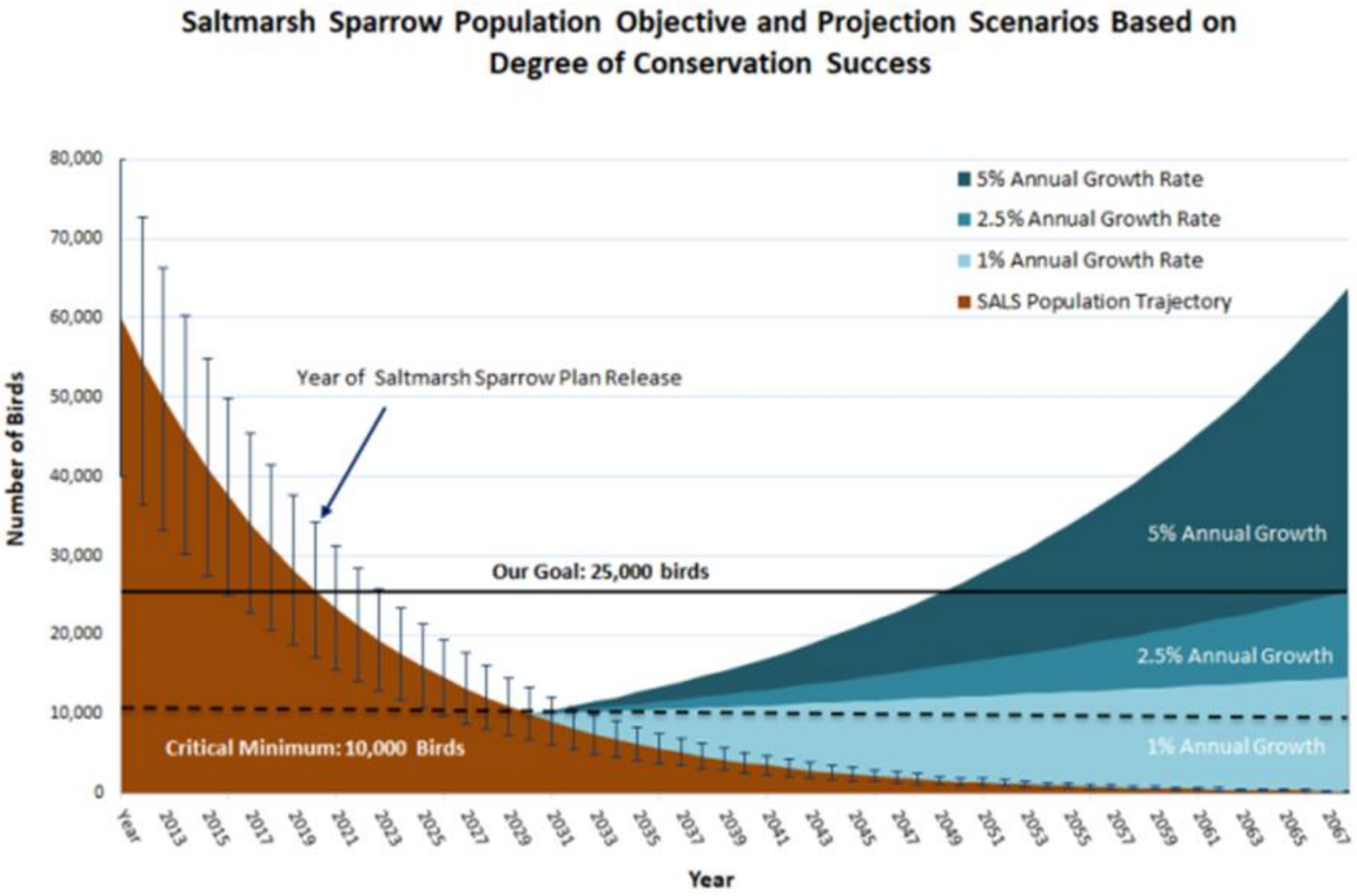
High Marsh zones on Narrow River

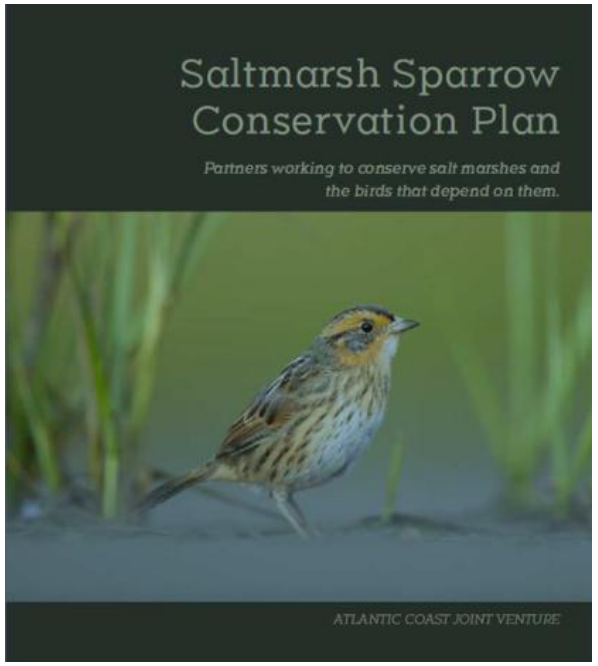
Healthy High Marsh with dense stands of *Spartina patens* (salt marsh hay) keeping pace with sea level rise

Former High Marsh sparsely vegetated with short-form *Spartina alterniflora* (cordgrass), degraded from prolonged saturation of peat

Courtesy of US Fish and Wildlife Service

Saltmarsh Sparrow Population Trend





Without significant intervention the species is anticipated to go extinct in 30 years

Salt Marsh Restoration on Narrow River

2016-2017-USFWS Dredging and Thin Layer Placement

Courtesy of US Fish and Wildlife Service

2016-2018 & 2026? Save the Bay/USFWS/Narrow River Land Trust - Drainage Restoration (Runnels) Projects (multiple locations)

Salt Marsh Restoration on Narrow River

2016-2017 USFWS Dredging and Thin Layer Placement

On Left: Pre-restoration dredge locations to create eelgrass habitat and source sediment for marsh building

On Right: Post-restoration placement over approximately 14 acres of existing marsh (raised 1-6 inches)

Courtesy of US Fish and Wildlife Service

Narrow River Wildlife
Endangered/Threatened Birds in Rhode Island

- **Saltmarsh Sparrow (Extinction Risk):** Considered the most specialized of tidal-marsh birds, these sparrows are experiencing a 9% annual population decline due to flooding of their nests.
- **Roseate Tern (Endangered):** Coastal birds with very limited breeding sites, primarily found on islands in Buzzards Bay and off Long Island, NY, threatened by rising sea levels.
- **Piping Plover (Threatened):** Small shorebirds that nest on sandy beaches, threatened by human development and predators.
- **Red Knot (Threatened):** Migratory shorebirds that rely on coastal habitats.

Narrow River Stakeholders

- Town of Narragansett
  - Foth Engineering
- Towns of South Kingstown and North Kingstown
- State of Rhode Island
  - Residents
  - Tourism Industry
  - Visitors
- Private
  - Dunes Club
  - Mettatuxet Improvement Association
- Narrow River Kayaks
- Regulatory
  - Rhode Island
    - Costal Resources Management Council (CRMC)
    - Department of Environmental Management (DEM)
  - United States
    - Army Corps of Engineers
    - US Fish and Wildlife
    - National Marine Fisheries Service
- Narrow River Preservation Association (NRPA)
- Narrow River Land Trust
- Save the Bay

Narrow River Dredging is very Complex!

- The decision to dredge the river mouth should therefore be made with a proper understanding of its potential impacts

How did we get here?

Current Conditions – November 2025

Recent Timeline

- ***2003-Middlebridge Bridge Replacement***
- *2009 Draft Army Corp Study of Dredging the Mouth of Narrow River*
- *September 2011-Woods Hole Narragansett Town Beach Replenishment Feasibility Project*
- October 2012-Hurricane (Superstorm Sandy)
- February 2013-18” Snow
- January 2015-19” Snow
- *August 2016-URI Impact of Dredging the Lower Narrow River on Circulation and Flushing in the Narrow River*
- ***Winter 2016-2017-USFWS Dredging and Thin Layer Replacement***
- March 2018-Winter Storm
- February 2020-Winter Storm
- August 2020-Hurricane Isaias
- July 2021-Tropical Storm Elsa
- August 2021-Huricane Henri
- 2023-2024 Winter Storms
- **2026-2027 Mouth Dredging**

NARROW RIVER PRESERVATION ASSOCIATION

PROTECTING THE PETTAQUAMSCUTT ESTUARY SINCE 1970

This is the timeline of the mouth of the Narrow River from 1951 to Present.

The red circle on each photo represents the location of the historic flagpole on Dog Island that existed until Winter 2024/25.


Apr 2003


Apr 2014


March 2018-
Winter Storm
Apr 2018

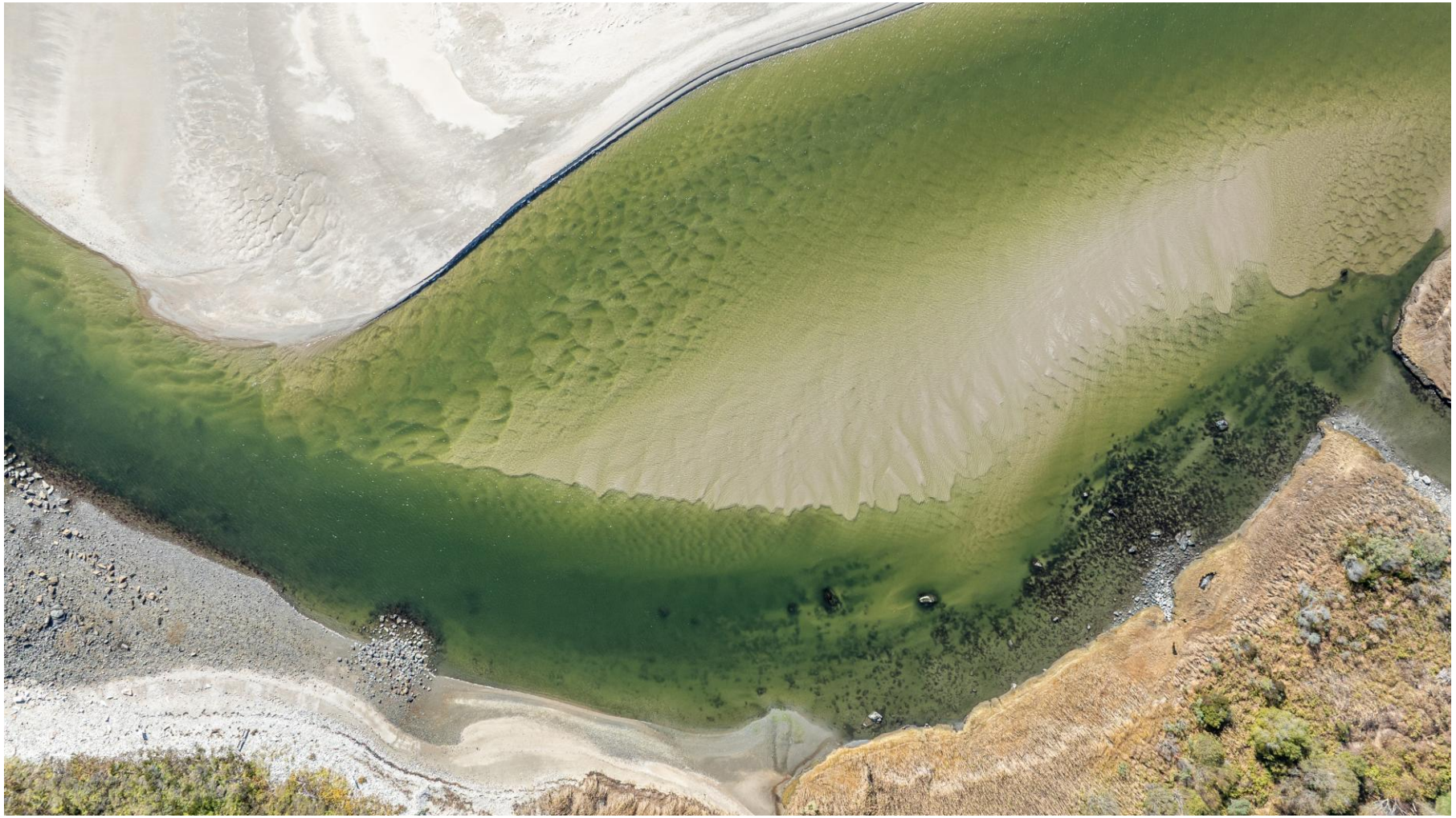

Nov 2019


July 2021-Tropical Storm Elsa
August 2021-Huricane Henri
Apr 2022

November 2025-Mouth of Narrow River

November 2025-Mouth of River / Lagoon

November 2025-Mouth of Narrow River Navigation Limited (very shallow at the beach)

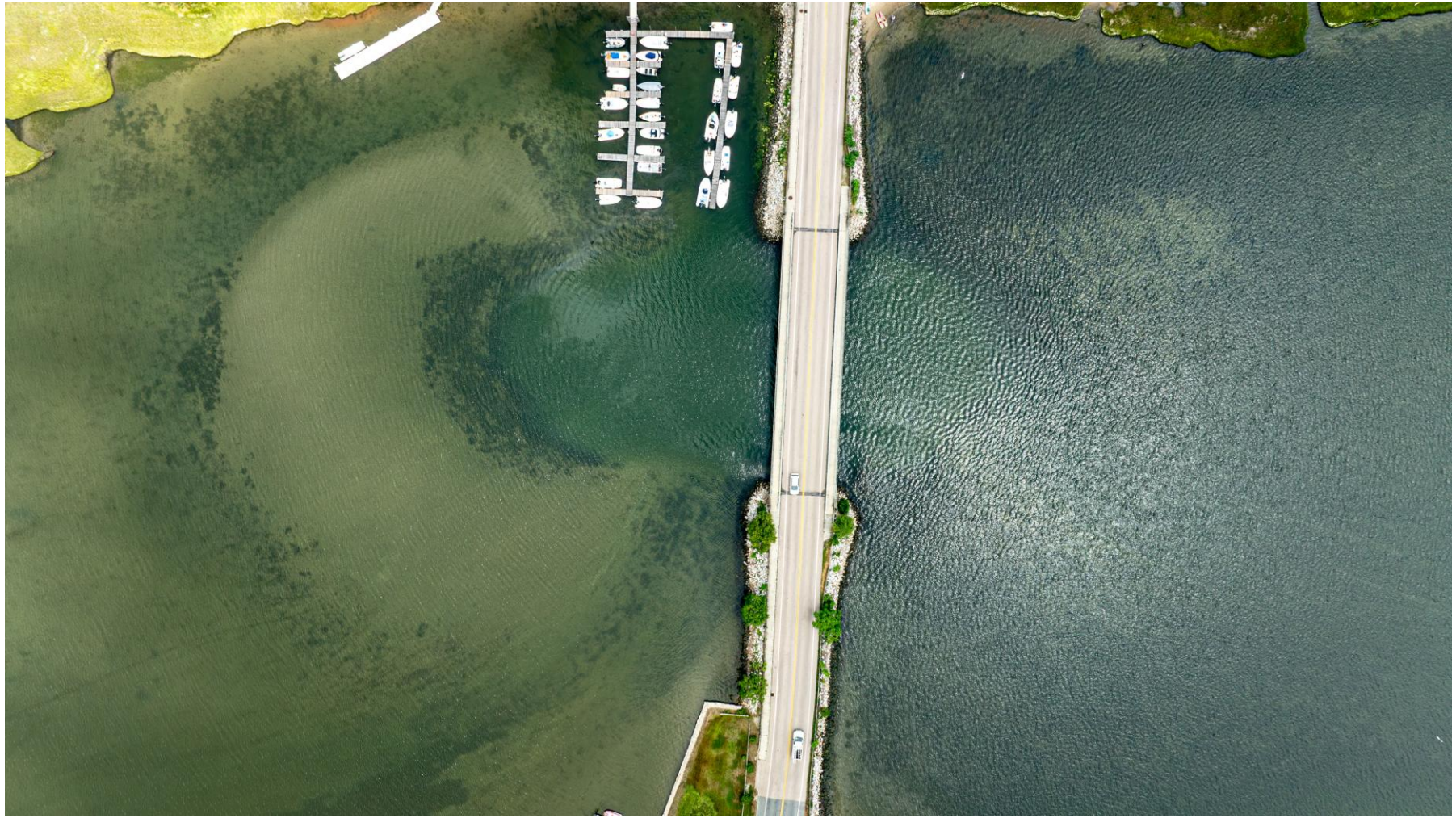


November 2025-Mouth of Narrow River Navigation Limited (pinch points)

November 2025-Sprague Bridge Navigation Limited (pinch points)

November 2025-Middlebridge-Navigation Limited

July 2025-Middlebridge Navigation Limited



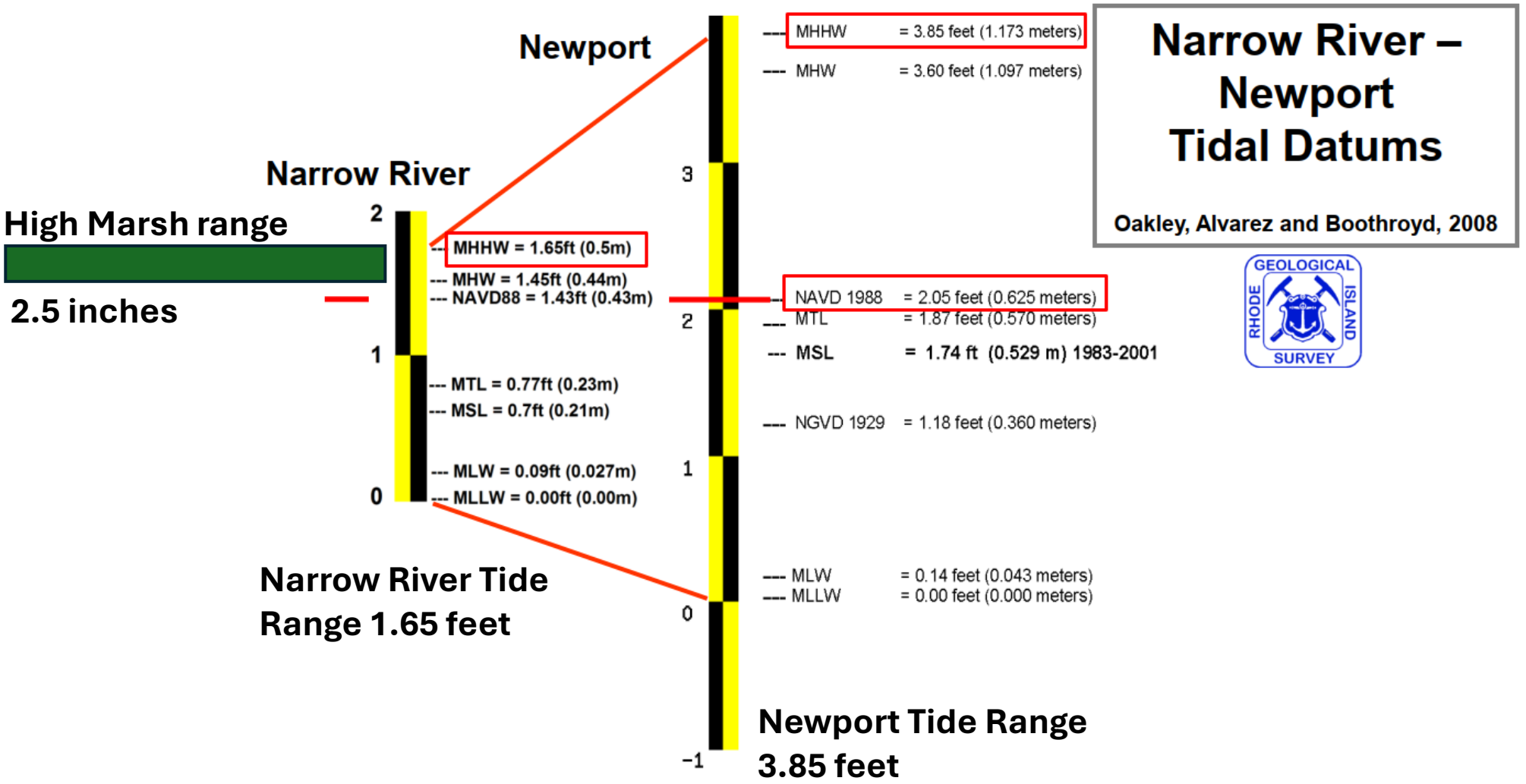
Narrow River-Its Current *Complex* Condition

- More Sand at the Mouth and upstream
- Dunes eroded
- Larger River Delta
- One Channel
- Lagoon at the Beach
- Navigation difficult at multiple locations
- More Plover and Tern offspring in 2025
- The River is not closing up

Narrow River
Special Area Management Plan (SAMP)

- First SAMP in State (originally prepared in 1999)
- It would not harm the River if its flood-tidal delta was dredged periodically and the sand replaced on the Narragansett Beach
- Boat navigation in the lower Narrows would be enhanced and no habitat changes would occur north of the Sprague Bridge, as bridge previously thought to be major choke point for tides upstream
- Narragansett Town Beach would be the logical site for beach replacement using flood-tidal delta sand
- Requirement to prepare a Management Plan as a condition of the permit

Tides in Narrow River compared with Narragansett Bay



Predicted Model Results from Dredging the Narrow River Mouth

Scenario	Dredging Volume (m^3) *(yds^3)*	Sprague Bridge Tide Range (m) *(ft)*	Sprague Bridge Attenuation	Upper Pond Tide Range (m) *(ft)*	Upper Pond Attenuation	Tidal Prism (m^3) *(ac-ft)*	High Tide Volume (m^3) *(ac-ft)*	Tidal Flushing (days)
Present	n/a	0.38 *1.24*	0.41	0.17 *0.57*	0.17	675,100 *550*	4,928,000 *4,000*	3.8
Dredging to -1 m MSL	21,500 *28,100*	0.41 *1.35*	0.42	0.18 *0.59*	0.18	731,670 *590*	4,971,800 *4,030*	3.5
Dredging to -1.4 m MSL (USACE)	43,000 *56,200*	0.44 *1.44*	0.48	0.19 *0.61*	0.19	771,630 *630*	5,010,800 *4,060*	3.4
Dredging to -2 m MSL	80,500 *105,000*	0.54 *1.78*	0.60	0.21 *0.68*	0.21	912,580 *740*	5,098,600 *4,130*	2.9
Dredging to -3 m MSL	184,000 *241,000*	0.77 *2.51*	0.84	0.24 *0.80*	0.25	1,185,400 *960*	5,357,000 *4,340*	2.3

Tidal flushing was calculated as (high tide volume)/(tidal prism)*(12.42 hr)/(24 hr/day).

Impact of Dredging the Lower Narrow River on Circulation and Flushing in the Narrow River (Swanson C., M. Spaulding and A. Shaw. August 2016)

Outcomes of Dredging the Narrow River Mouth

Positive

- Navigation safety
- Improved water quality from increased flushing (nutrients/bacteria/temperature)
- Resilience against future overwash events
- Increased nesting habitat for shorebirds

Negative

- Potential increased flooding on Salt Marshes
- Lose of intertidal/subtidal habitat
- Construction-related impacts to fish/shellfish

Narragansett Town Dredging Project Goals

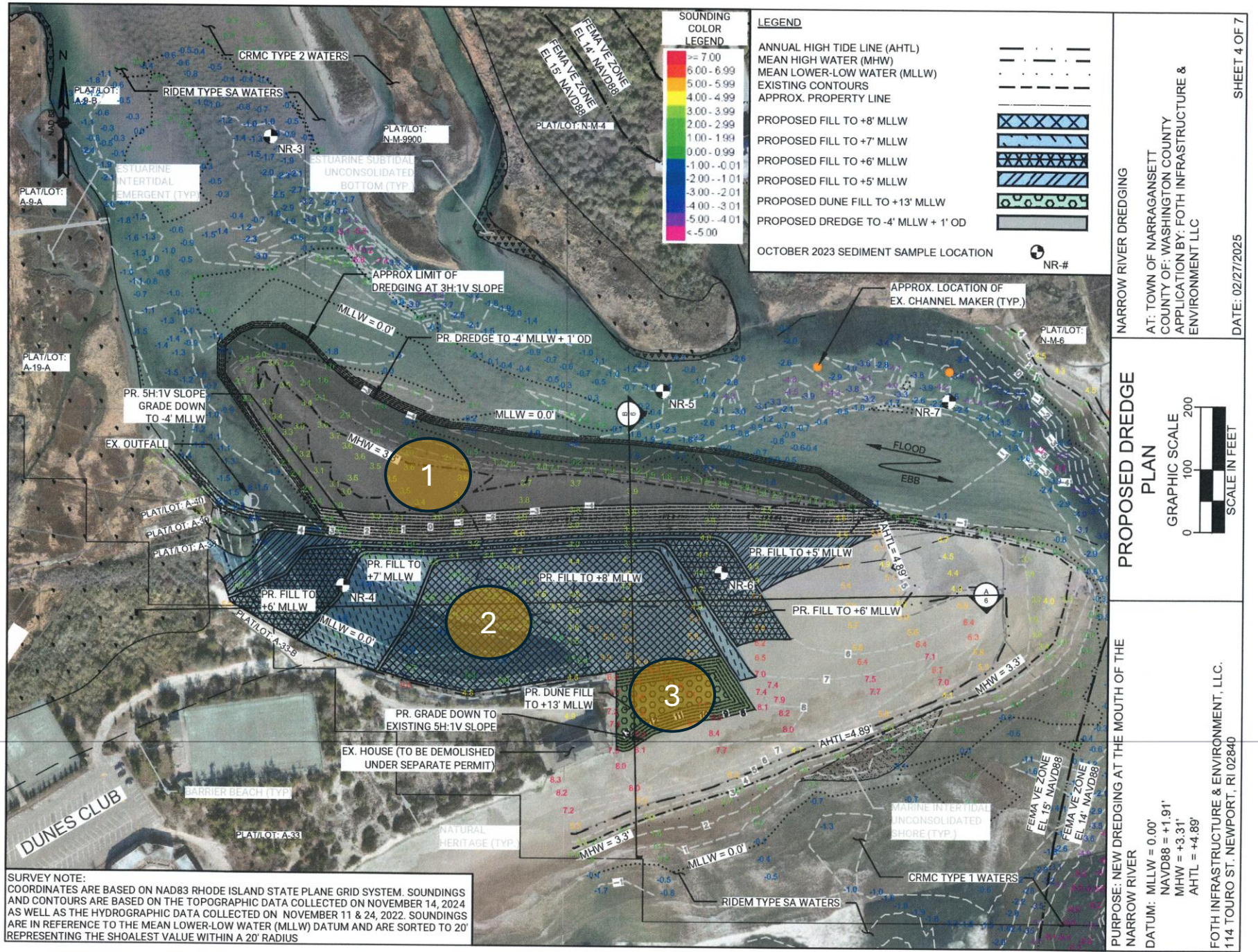
- Maintain recreational vessel usage of the spit
- To preserve tidal action in the critical resource areas of the Narrow River Estuary

Narragansett Town Dredging Project

- Early 2026-Receive Permits from CRMC, RIDEM and Army Corps of Engineers
- Request for Proposal-30 day
- Earliest Project Start 15 October 2026
- Latest Project End 31 January 2027
- Project Estimated Cost: $1.6-2.0 Million
  - Funding: Town Budget, Congressional Spending Grant, Public/Private Partnership

Narraganset Town Dredging Project

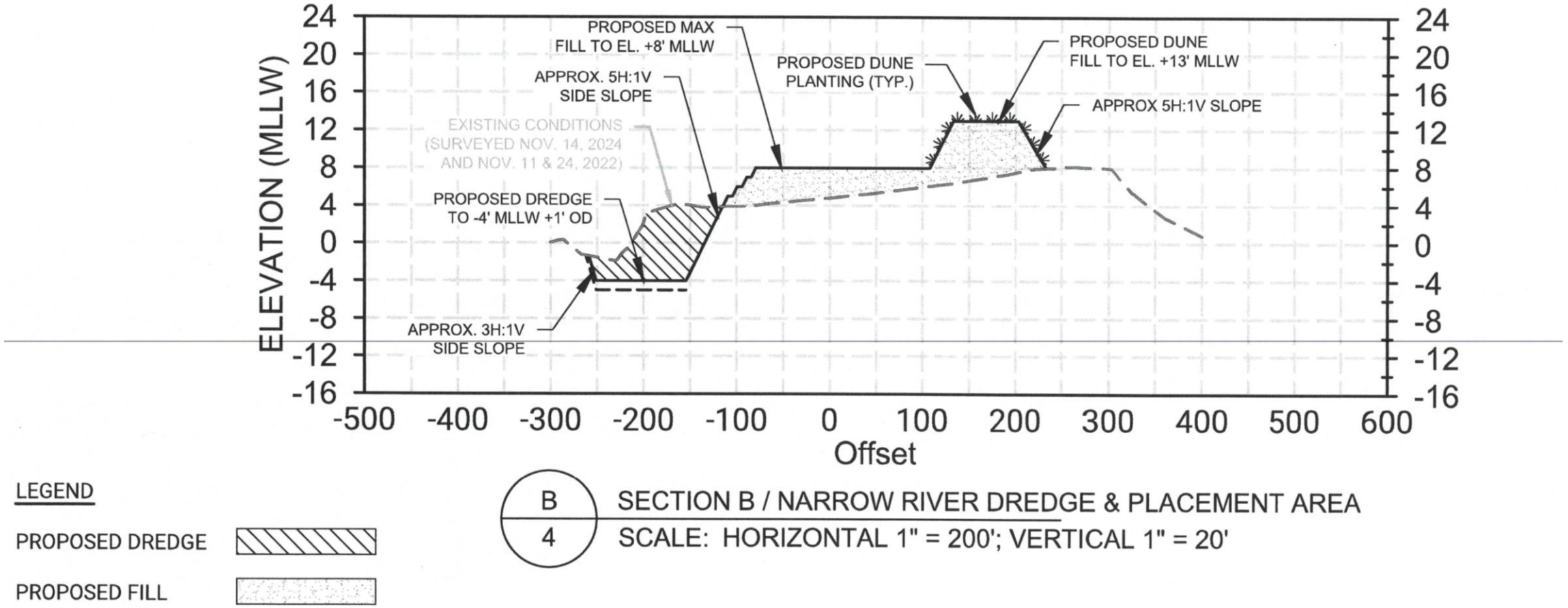
1. Sand Removed
2. Sand Deposited
3. Dune Extended




1. Sand Removed
2. Sand Deposited
3. Dune Extended
1
2
3


1. Sand Removed
2. Sand Deposited
3. Dune Extended
1
Future water
2
3

Dredge Project Elevations



Dredge Project Details

- Channel Depth: -4 feet Mean Lower Low Water (MLLW) + 1 foot Overdredge (OD)
- Fill (Coastal Beach): up to +8 feet MLLW (+4.7 feet MHW)
- Dune Restoration: up to +13 feet MLLW (+ 9.7 feet MHW)

- Amount of Sand to be Dredged: 41,551 cubic yards
  - Beach Replenishment by Town – typically 300-400 cubic yards annually
  - Typical dump truck capacity: 10-16 cubic yards
  - Dredge volumes accessed on modeling ranged from 28,000 to 241,000 cubic yards

Narrow River Dredging Project

What it does

- Creates deeper channel at mouth
- One channel for both flood and ebb tides
- Restores former dunes on split
- Closes portion of Lagoon
- Monitors upstream water levels for 2 months before and after
- Annual channel and beach surveys for 5 years following dredging project
- Requirement for management plan to guide maintenance work
- First step towards Dredge/Beach Replenishment

What it does not do

- Does not address other choke points away from the zone of work
- No town beach replenishment
- No long-term management plan to guide maintenance work-yet (to be required with 12 months of project completion)
- Does not create new private property – filled lands shall remain titled to the State of Rhode Island for the public trust

Narrow River Dredging-February 2026

- The Narrow River Watershed Estuary is a Complex System!
- Salt Marsh habitats are fragile!
- The Coastal System causes sand to naturally accumulate in the Narrow River Mouth.
- The Town plans to excavate the sand out of the mouth to improve Navigation and replenish the dunes. (A moderate (conservative) first step)
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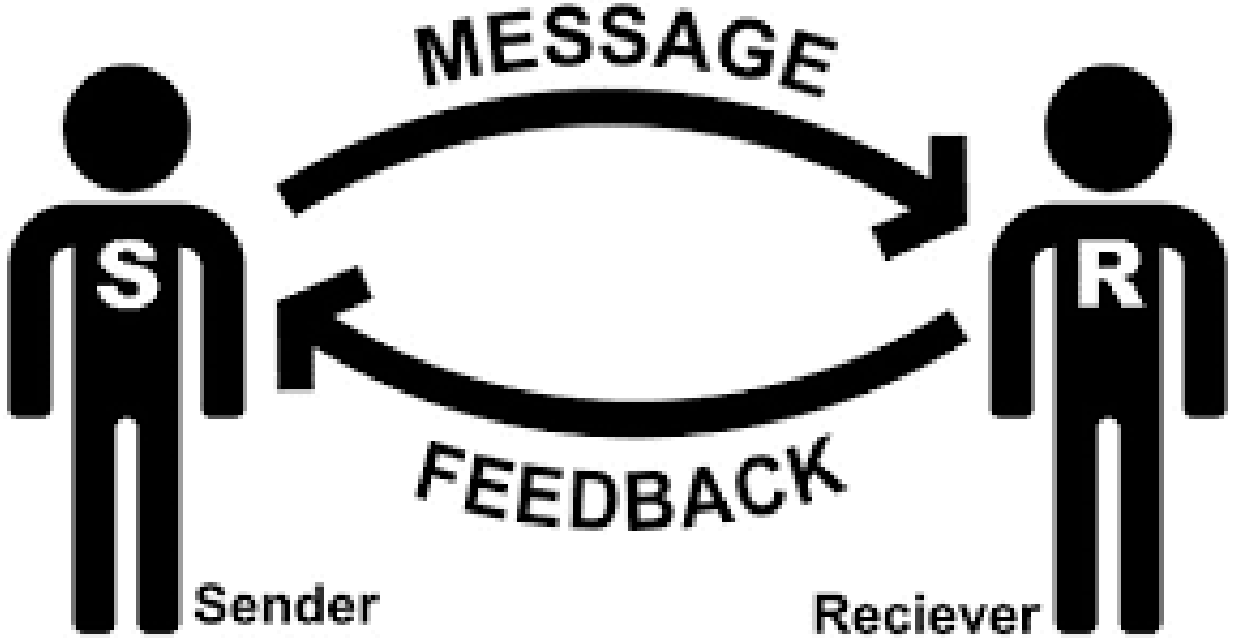
Discussion?



Our Mission:

The Narrow River Preservation Association (NRPA) engages people to preserve and protect the Narrow River (Pettaquamscutt Estuary) and its watershed.

Osprey Webcam

- If you want to follow-up with us, please email us at: NRPA@narrowriver.org
  - Questions on the Presentation
  - NRPA Membership
  - Volunteering

References

- NRPA Dredging Webpage (Contains most reports) https://narrowriver.org/dredging/
- On Pettasquamscutt, past presentations https://onpettaquamscutt.org/history.html
- RI CRMC File Number 2025-06-017 http://www.crmcpermitdatabase.org/PADS/CrmcApp/DetailsApp/135301712
- The Narrow River Special Area Management Plan, CRMC, 1999.
- NARROW RIVER, NARRAGANSETT, RHODE ISLAND, Hydrodynamic Numerical Modeling and Data Collection Report,Army Corp of Engineers, April 2009.
- Narragansett Town Beach Replenishment Feasibility Project, woods Hole Group, September 2011
- Impact of Dredging the Lower Narrow River on Circulation and Flushing in the Narrow River (Swanson C., M. Spaulding and A. Shaw. August 2016)
- Dunes Club Sea Wall Preservation Presentation, CRMC File Number 2025-01-022, October 2025
- High Quality Photography and Videography: Damian Marc Photography, https://damianmarcphotography.com/