

**Gulf Shore Association of Condominiums  
Fourth Annual Water Forum:**

**“Resiliency Planning and Investment in Naples:  
Where Do We Stand and How Do We Pay For it”**

**Brett D. Moore, P.E., BC.CE  
Humiston & Moore Engineers**

## Coastal Vulnerability Update

- Recent Awareness – Storms (2022 through 2025)
- Recovery Status – Post Milton (1/2024 to 1/2026)

## Building Coastal Resiliency – Onshore Protection

- Importance of Beach & Dune Program
- Plan Options & Guidance
- Plan Implementation

Clam Pass

Beach Fill Program

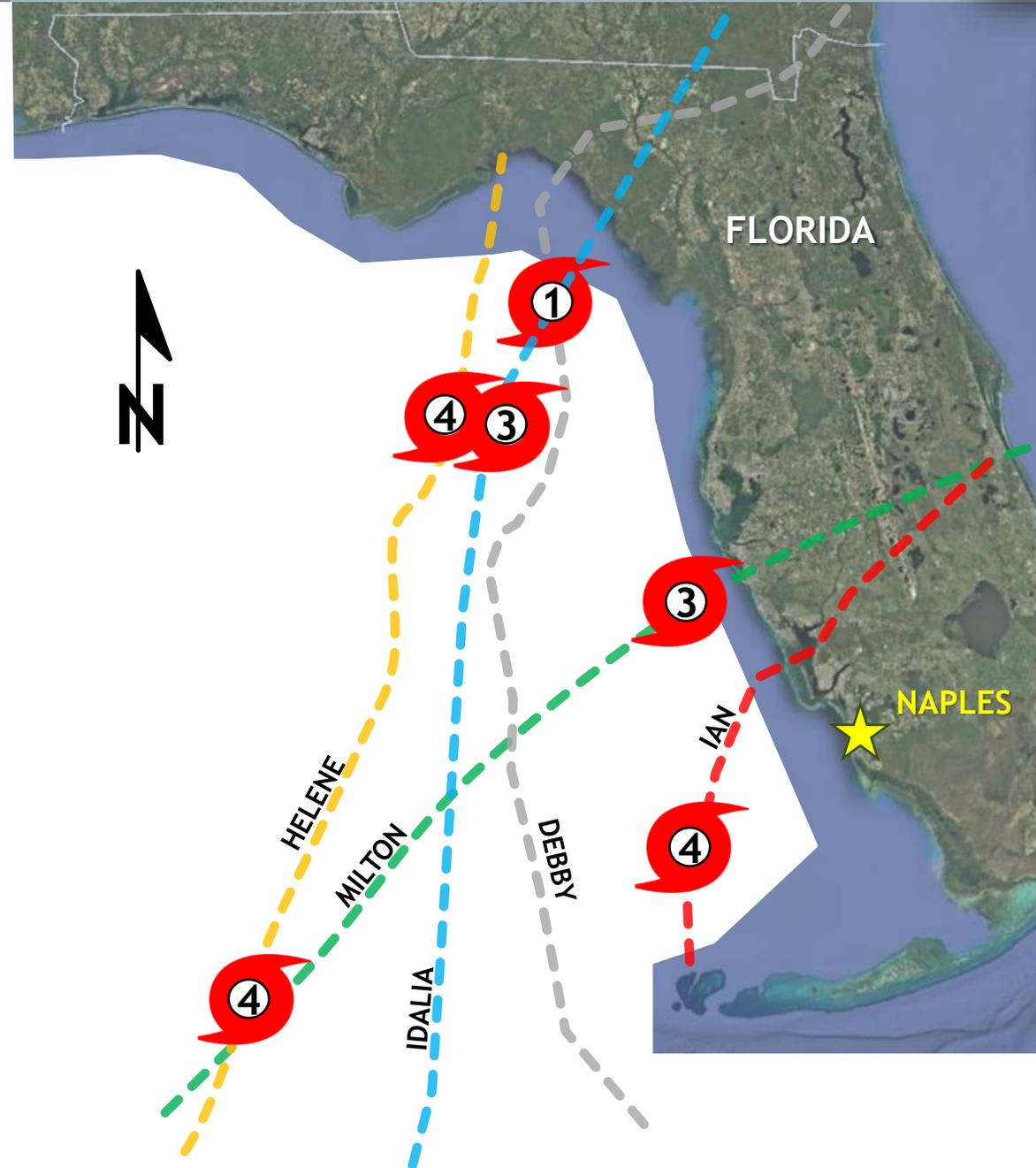
Doctors Pass



## 2022-2024 HURRICANE SEASONS

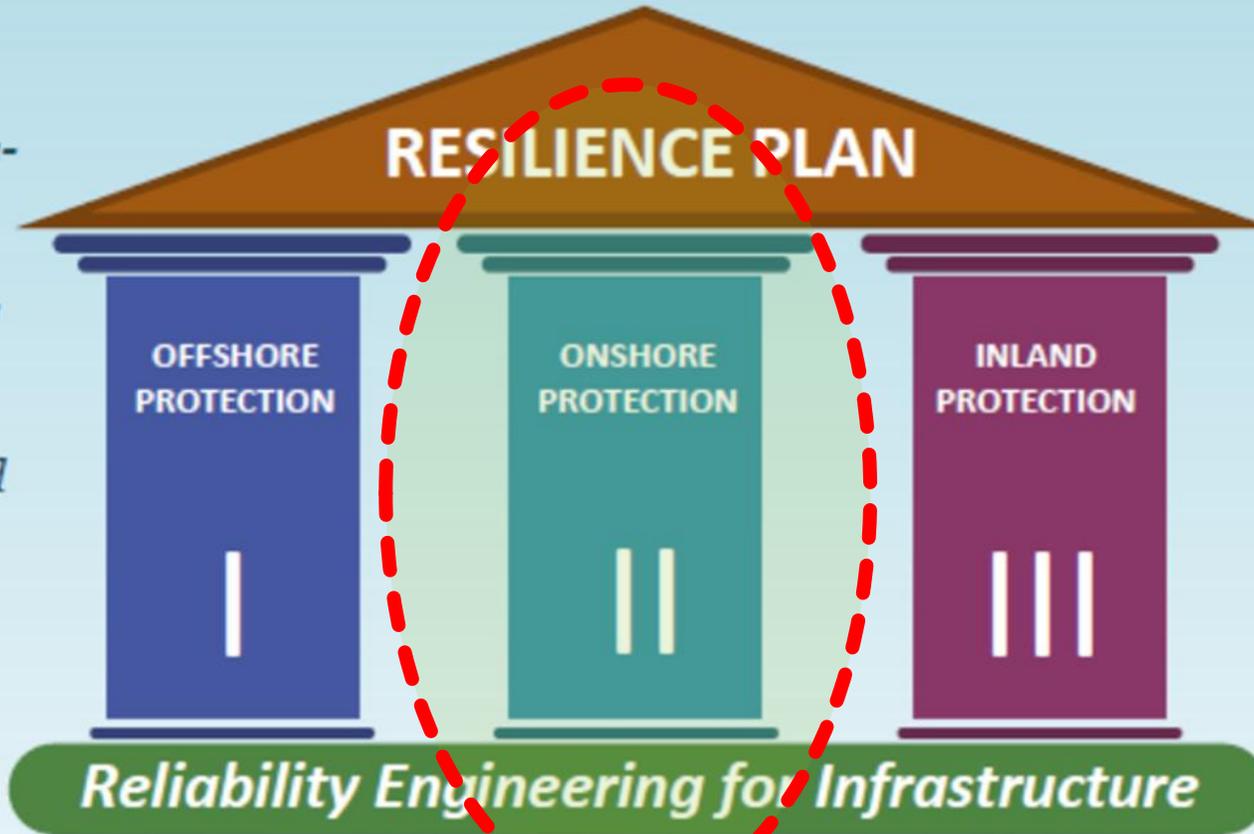
Naples Point of View

STORM	DATE	CATEGORY	SURGE (FT)
IAN	09/2022	4	8 to 12
IDALIA	08/2023	3	2.4
DEBBY	08/2024	TS	3.5
HELENE	09/2024	4	5 to 6
MILTON	10/2024	3	6 to 7



# “PILLARS” supporting the Plan

**Vision:**  
*Achieve a three-pillar approach to protect the City from tropical storms, hurricanes, and long-term sea-level rise.*



**Objective:**  
*Integrate offshore, onshore, and inland resilience into a layered and unified framework as pillars of one system.*

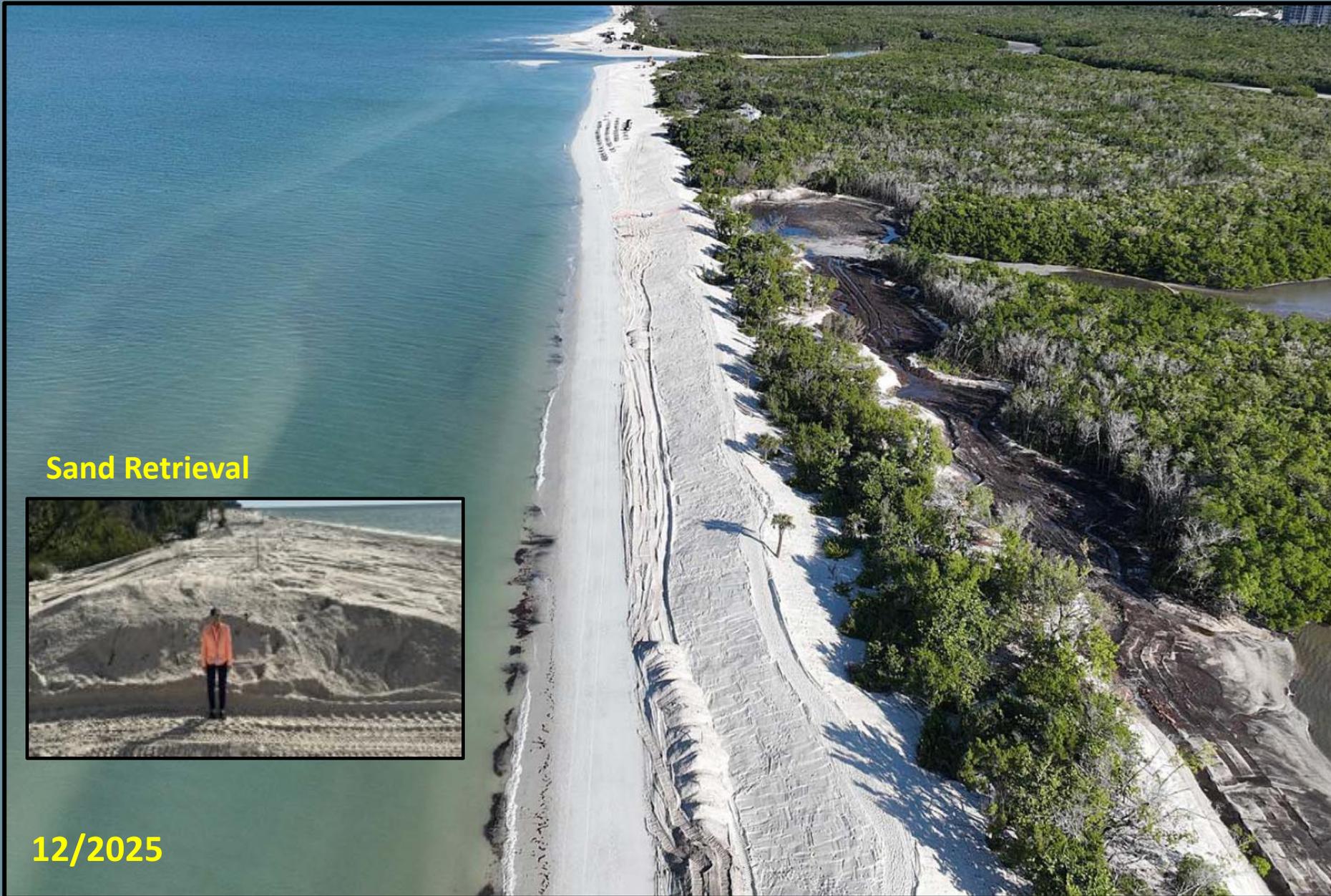
**Goals:** *Reduce flood risk, protect infrastructure, preserve beaches, and ensure continuity of essential services during and after storms.*

## Beach Segments: Clam Pass to Doctors Pass

- Area 1 Clam Pass Park to Naples Cay (R-44 to R-45)
- Area 2 North Park Shore (R-46 to R-49)
- Area 3 South Park Shore (R-50 to R-53)
- Area 4 Moorings (R-53 to R-57)

### Clam Pass Park Park Shore & Moorings





Sand Retrieval



12/2025



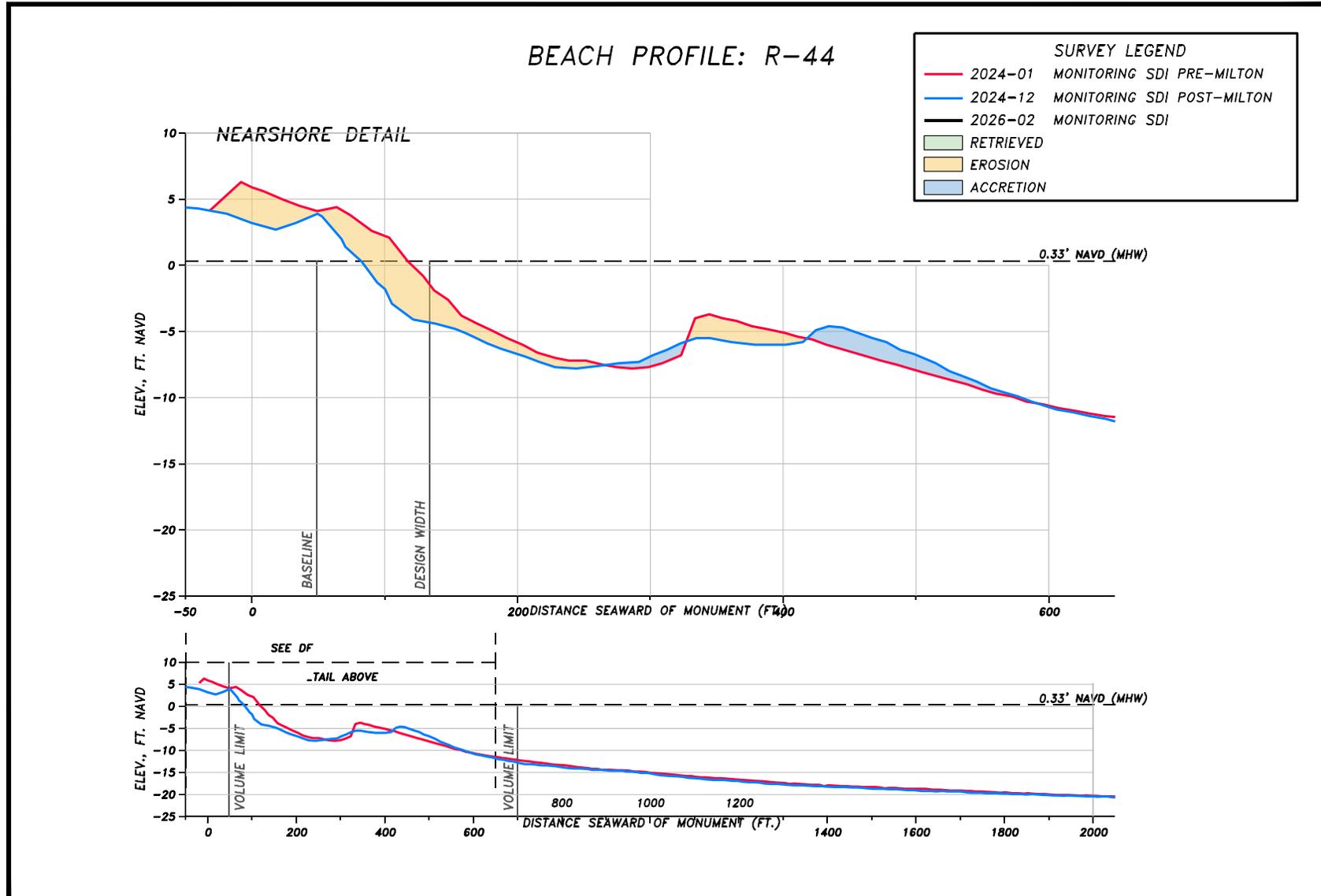
R-44

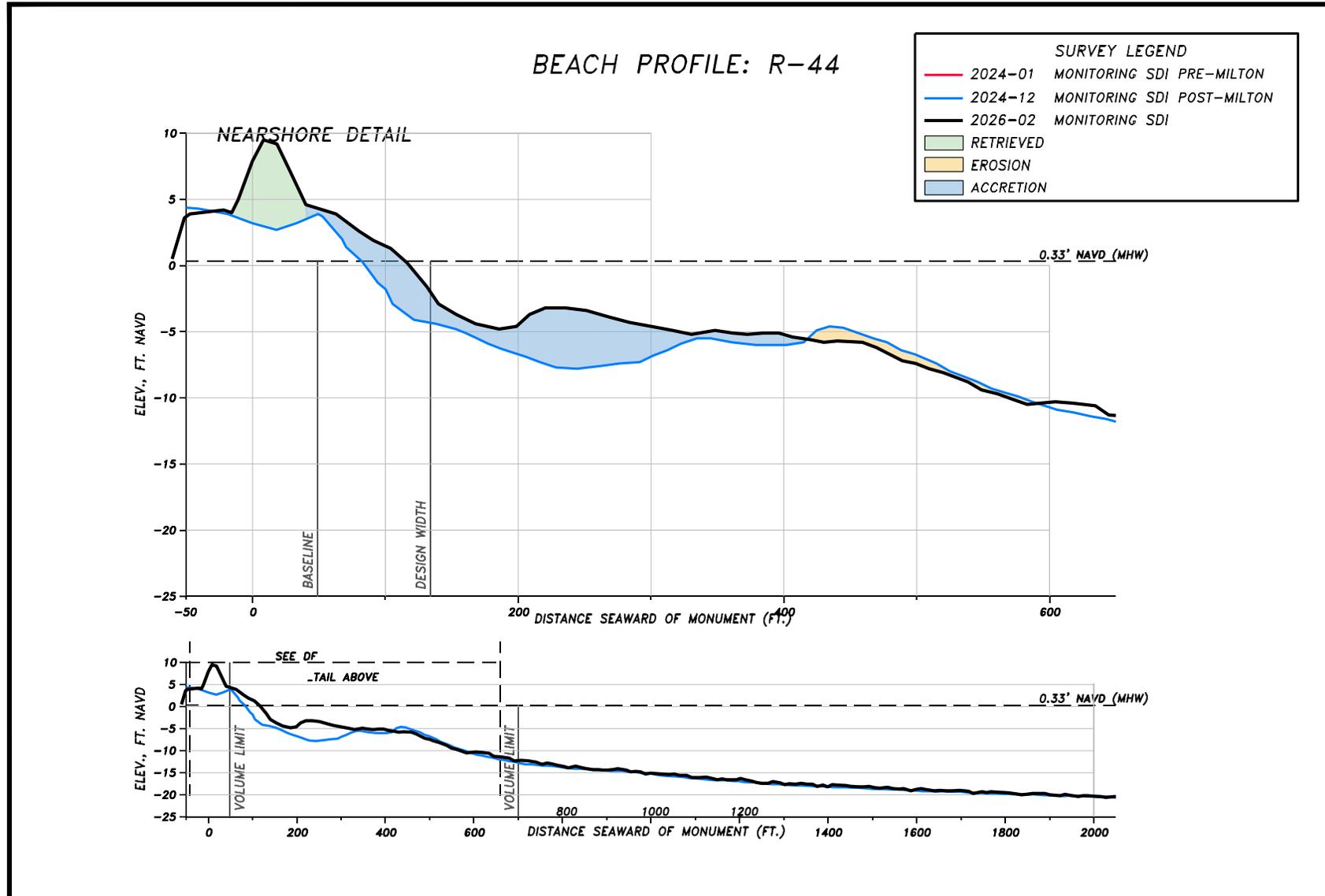
R043

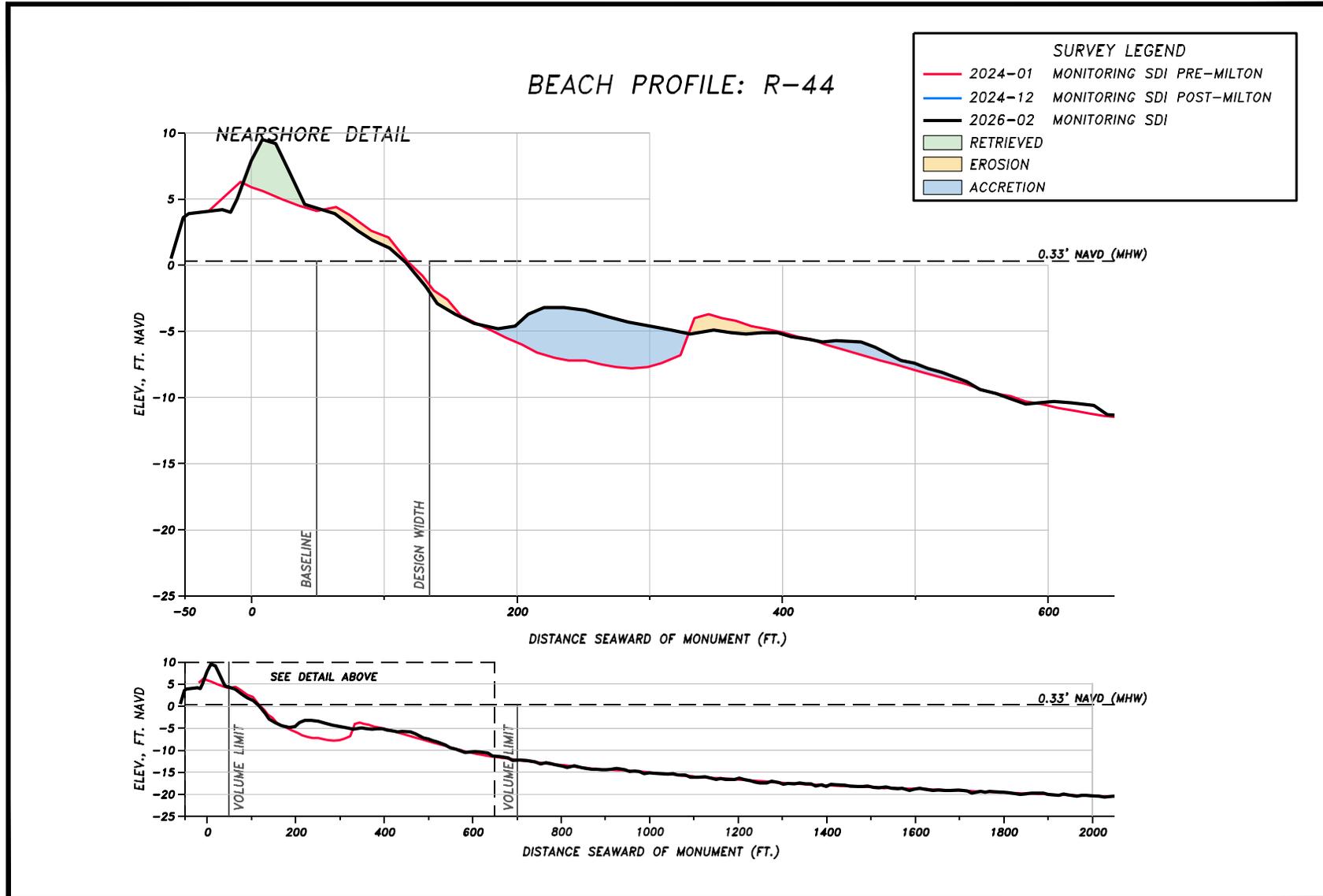
R044

R045











**Sand Retrieval**

**10/23/24**



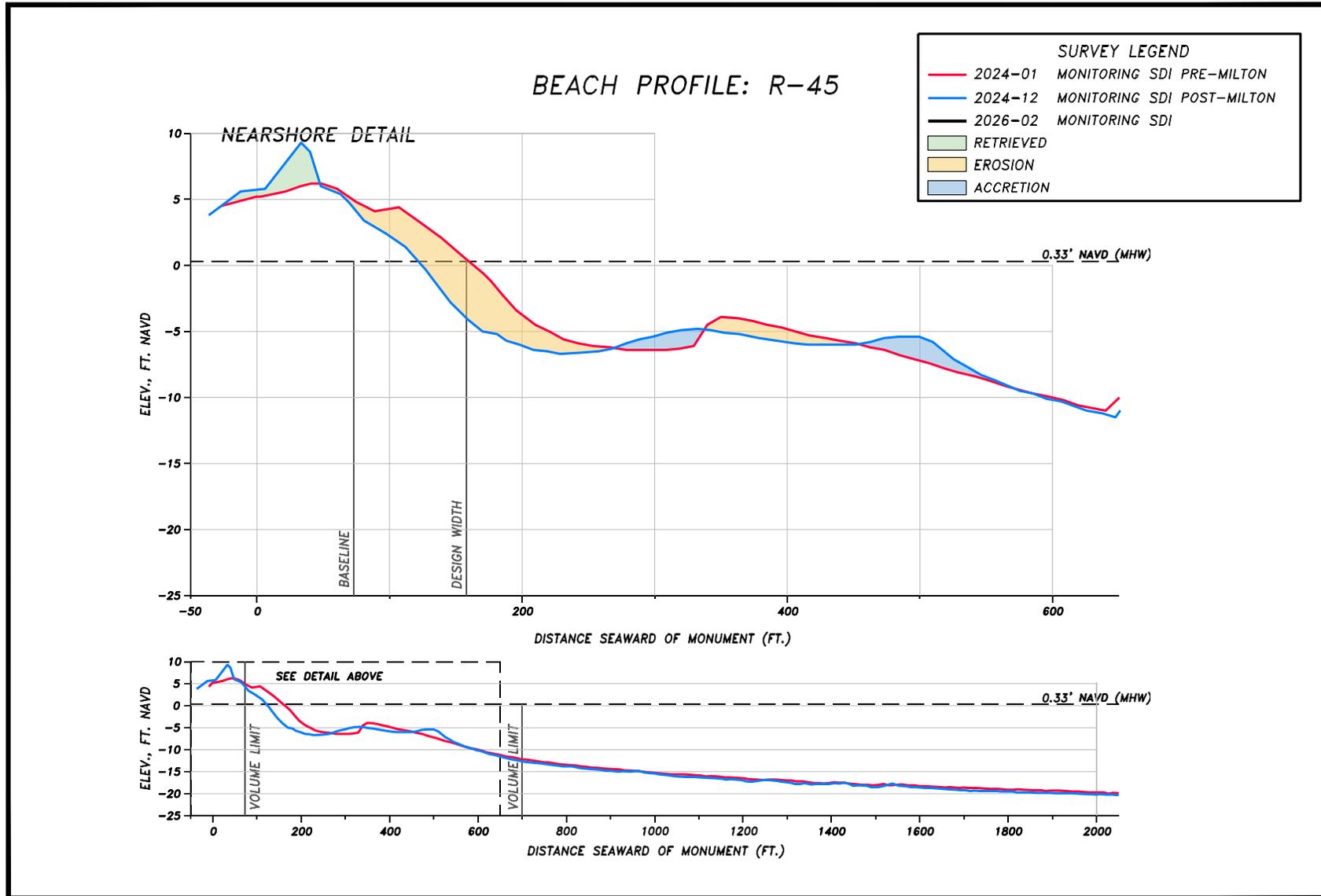
**Dune Planting**

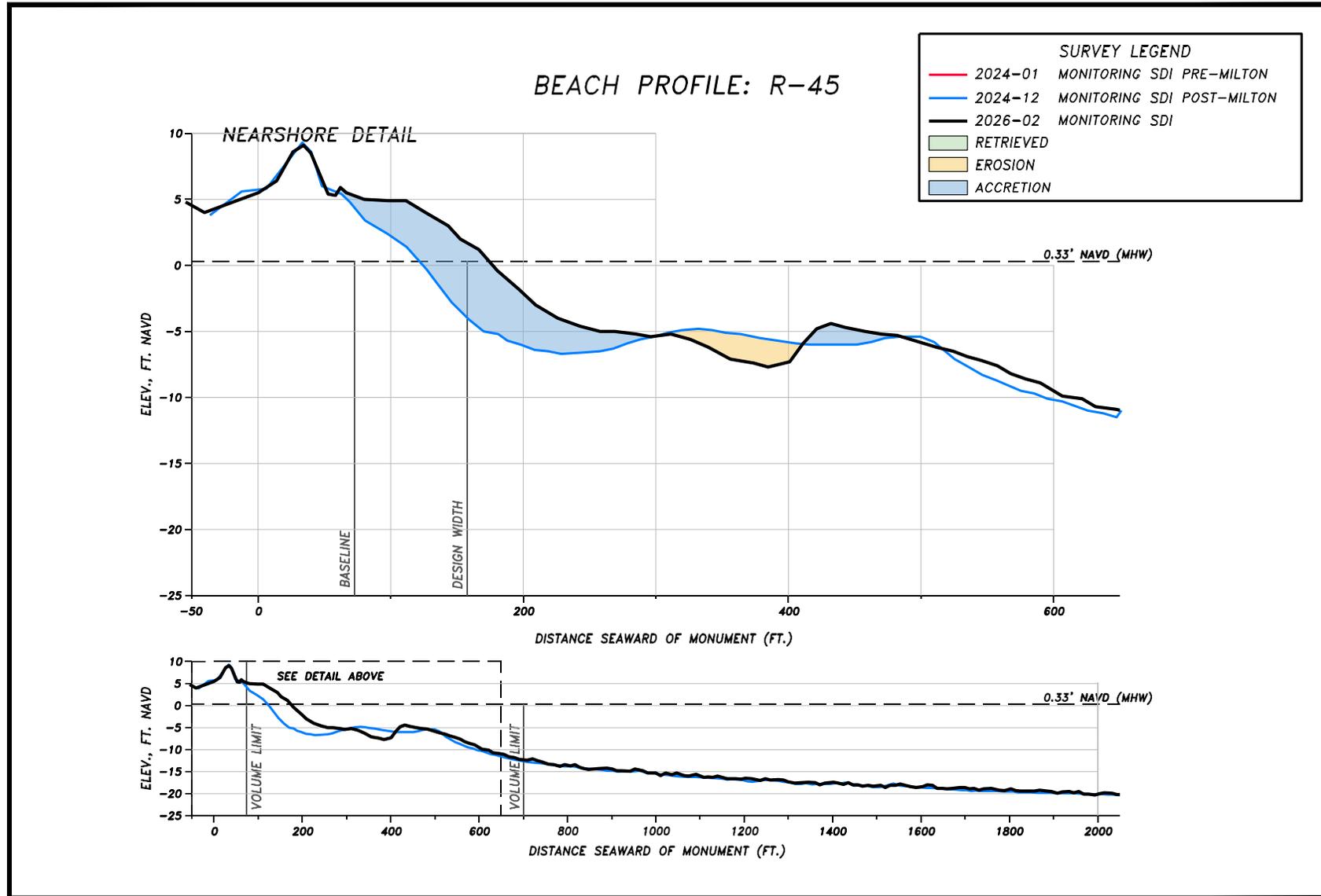
**1/23/26**

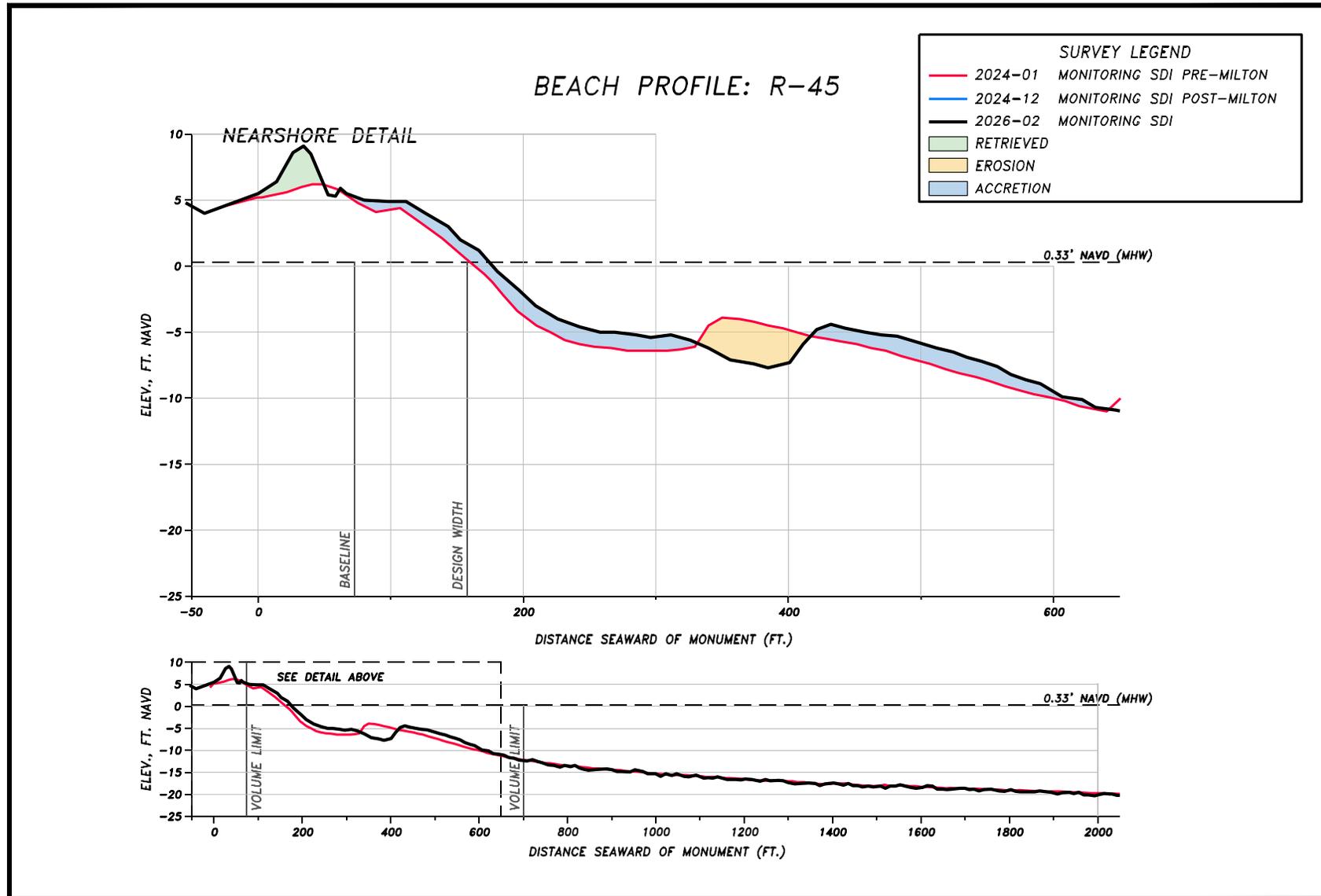


**12/2025**









Post Milton

10/30/24

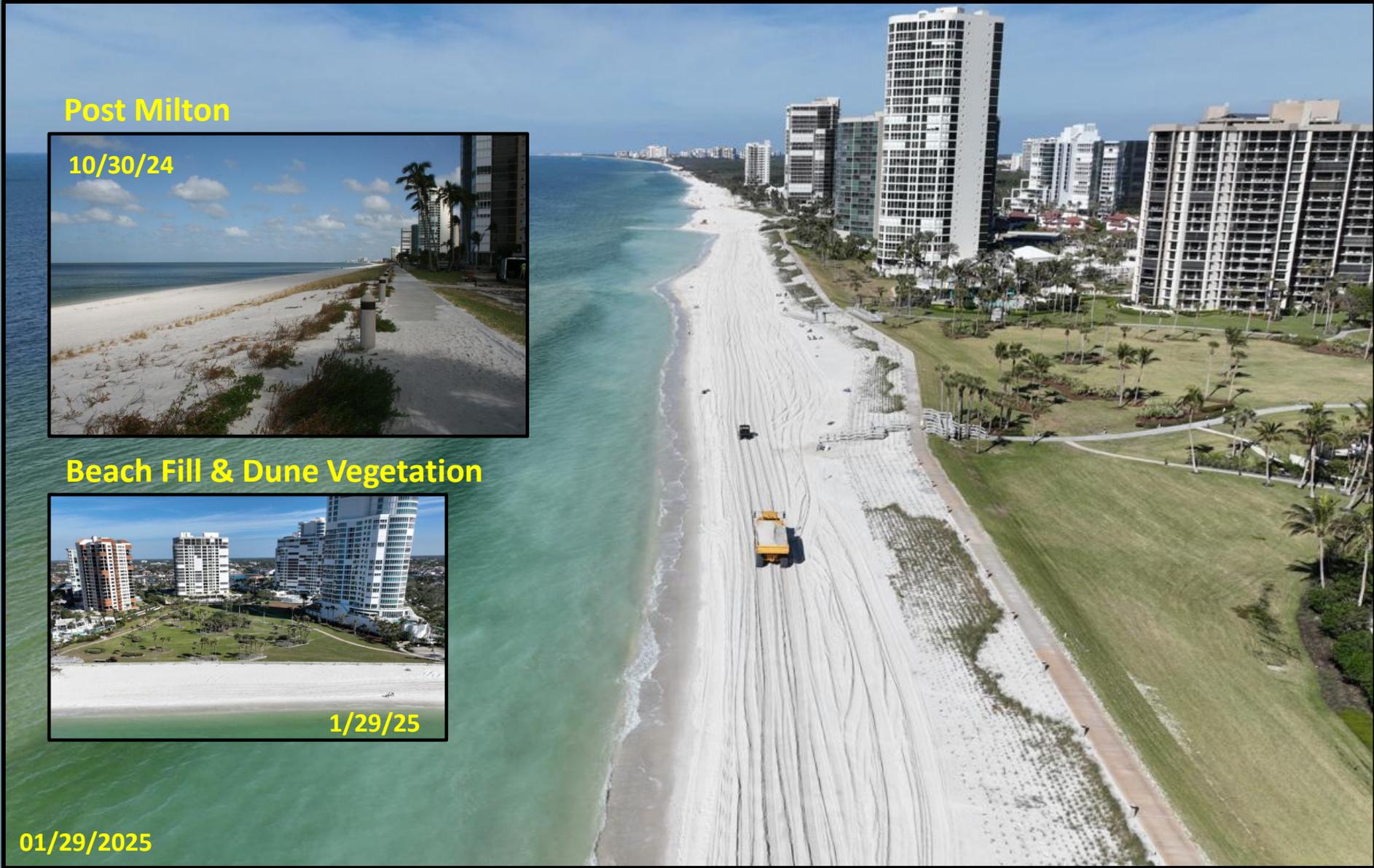


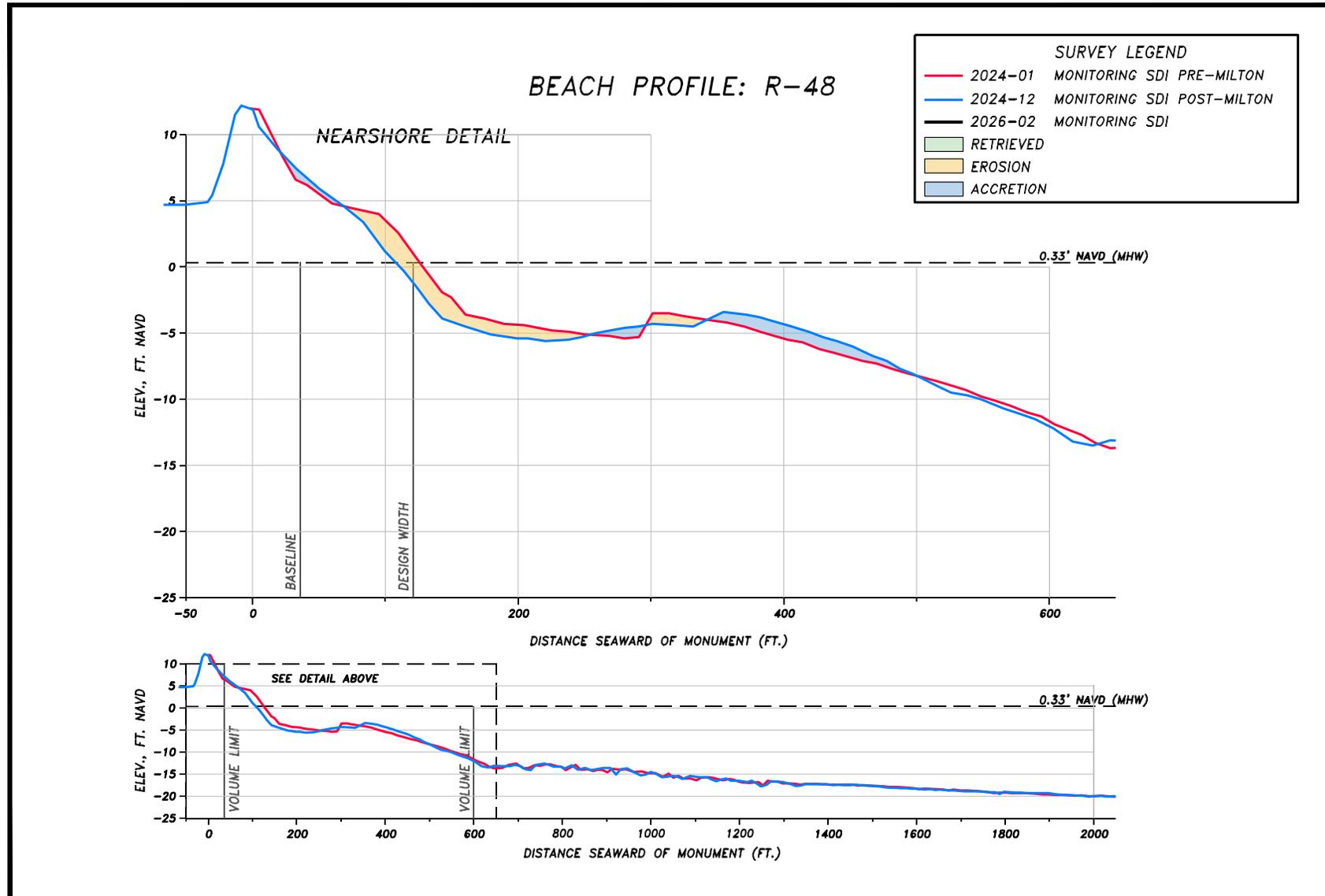
Beach Fill & Dune Vegetation

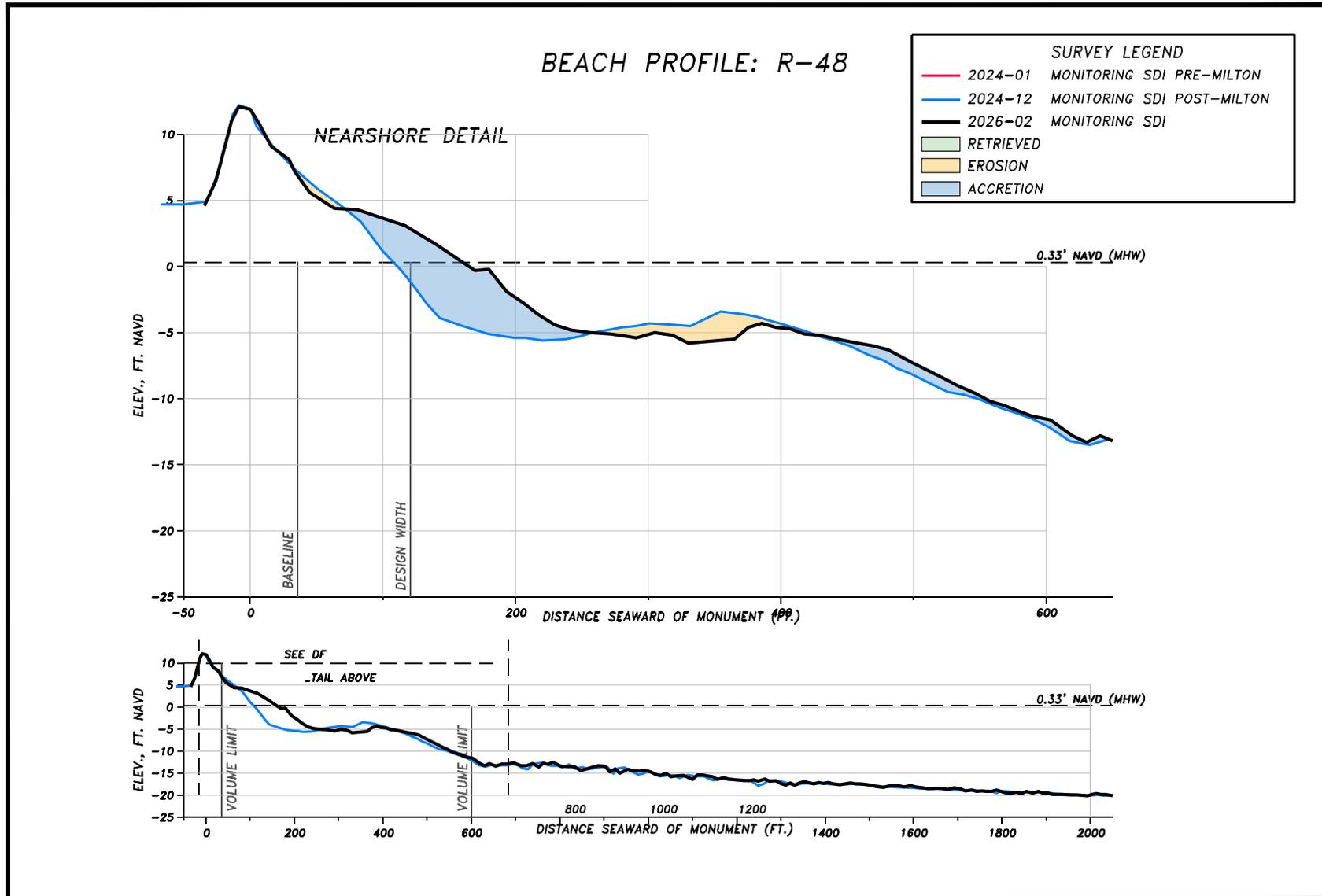


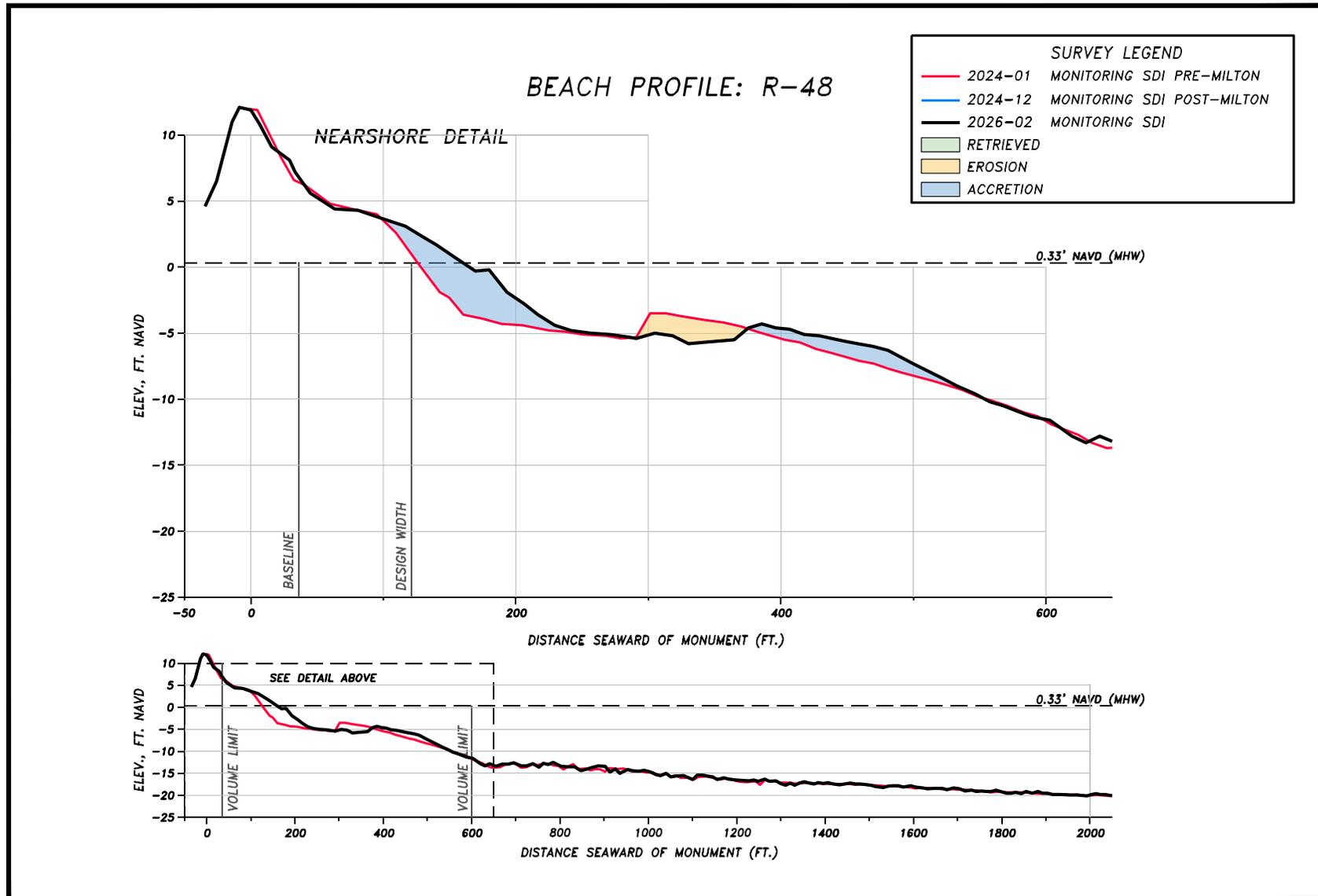
1/29/25

01/29/2025











## Sand Retrieval

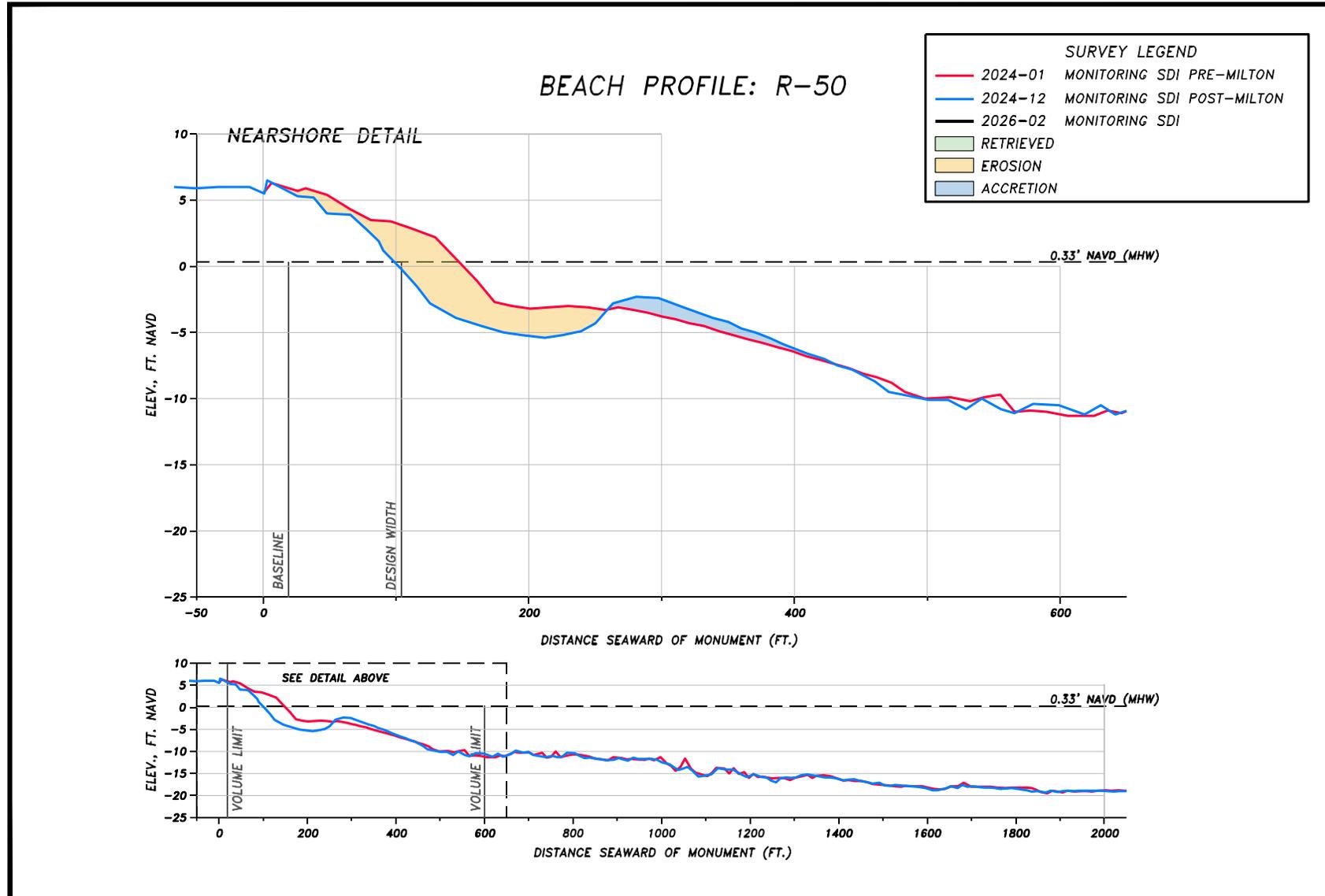


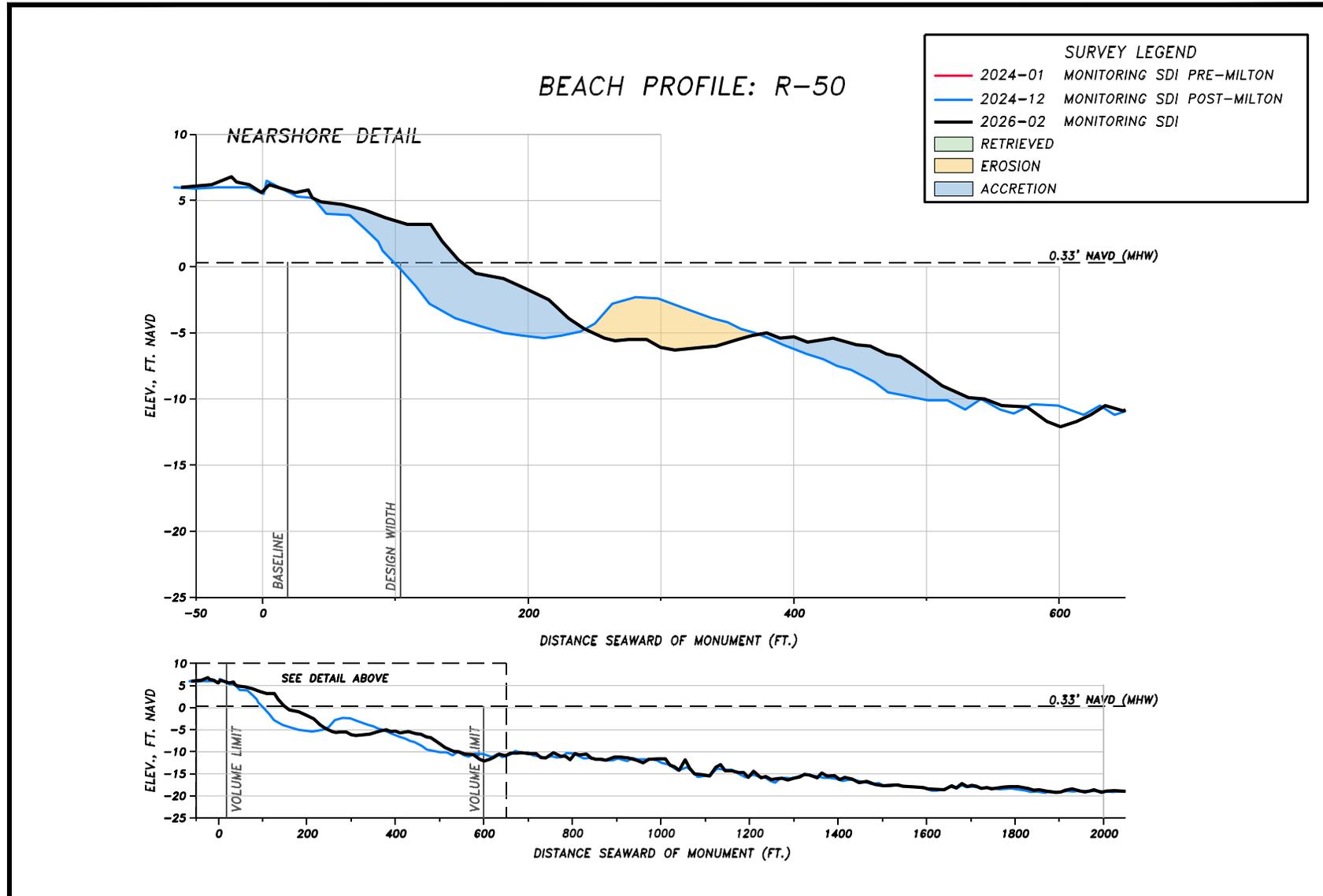
## Beach Fill

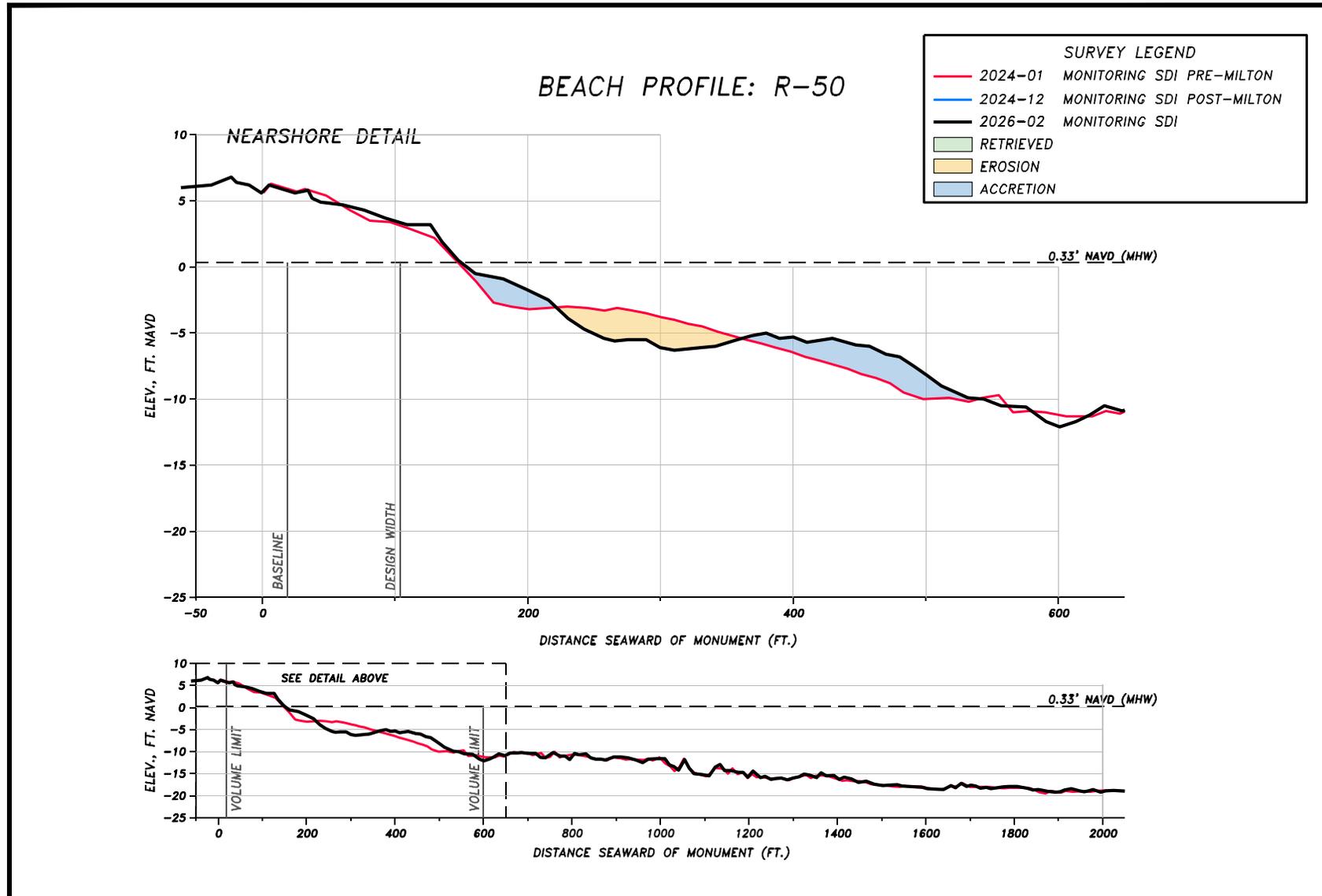


01/29/2025











**Beach Accretion**



05/29/25

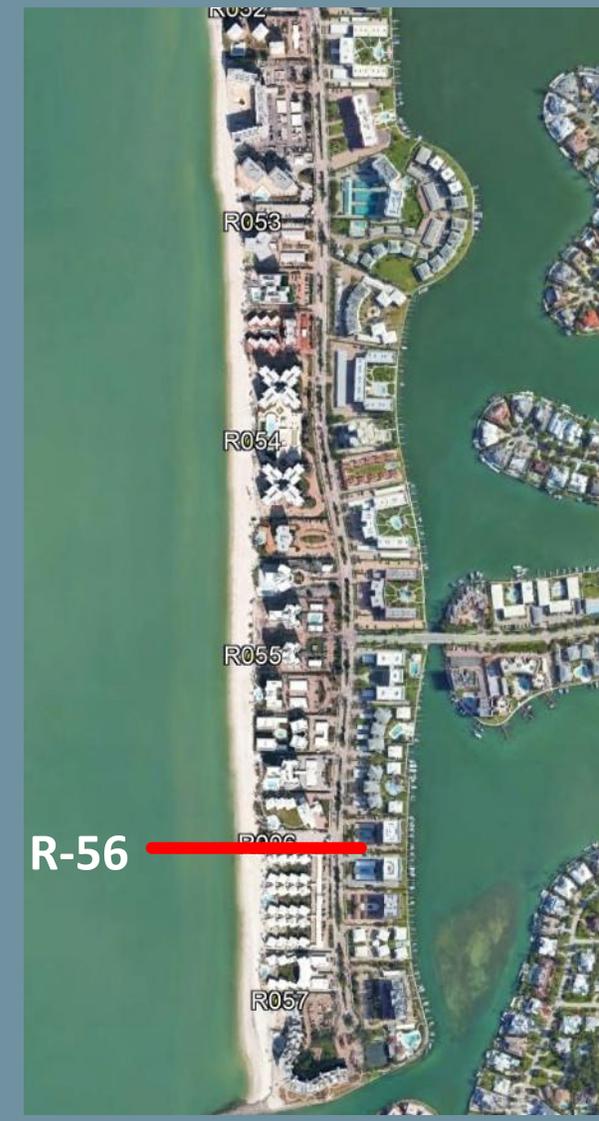
**Post Milton**



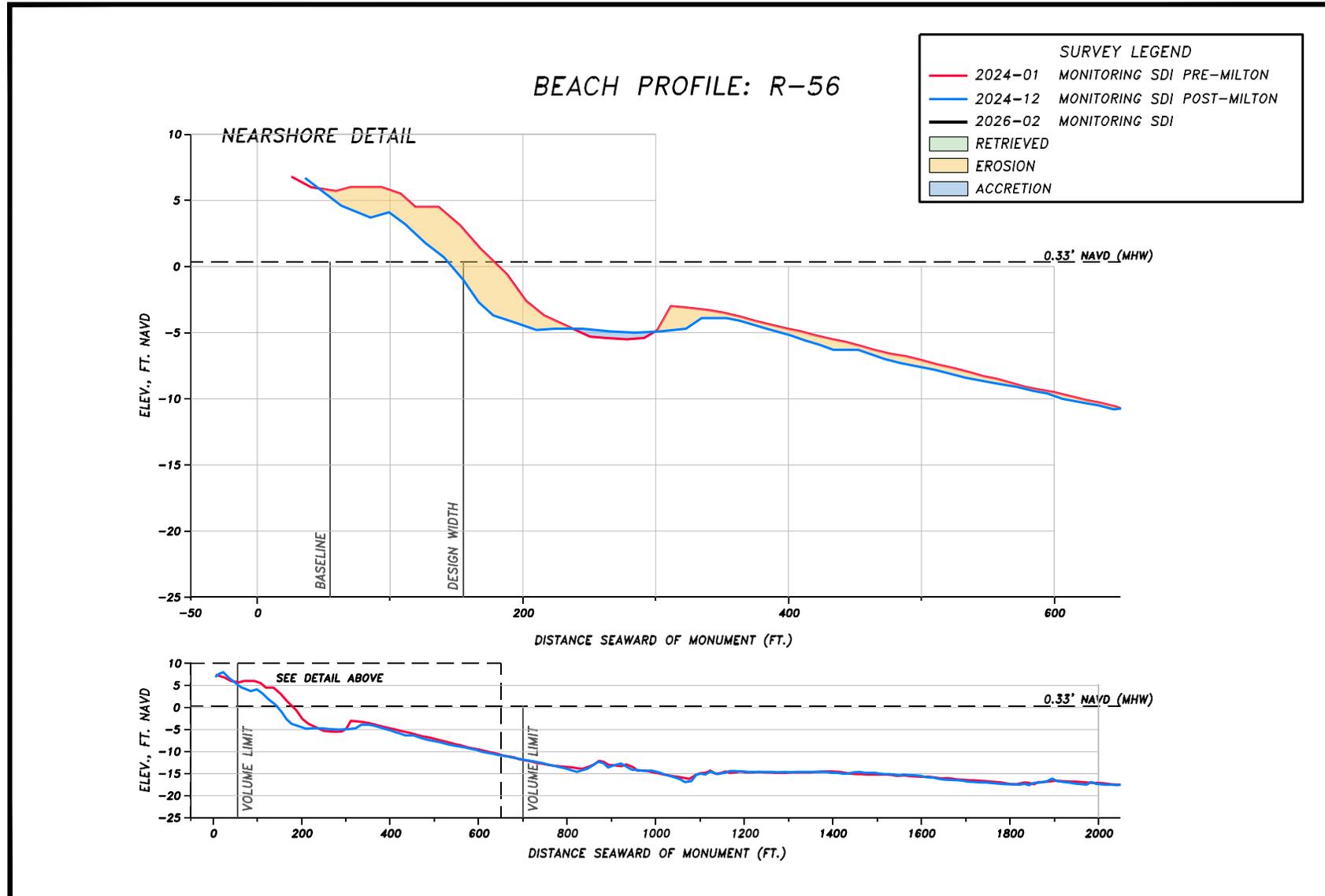
11/27/24

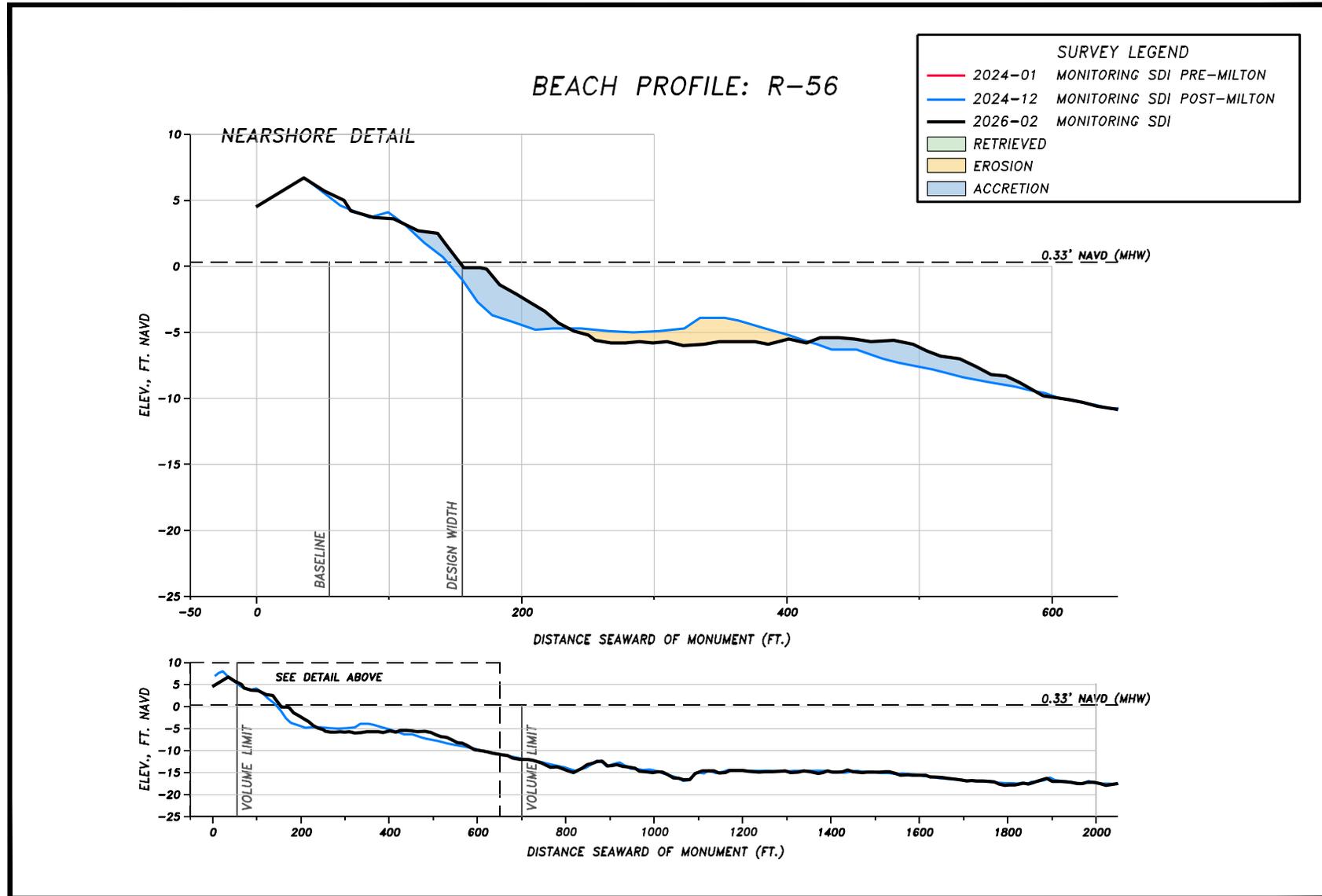
02/26/2025

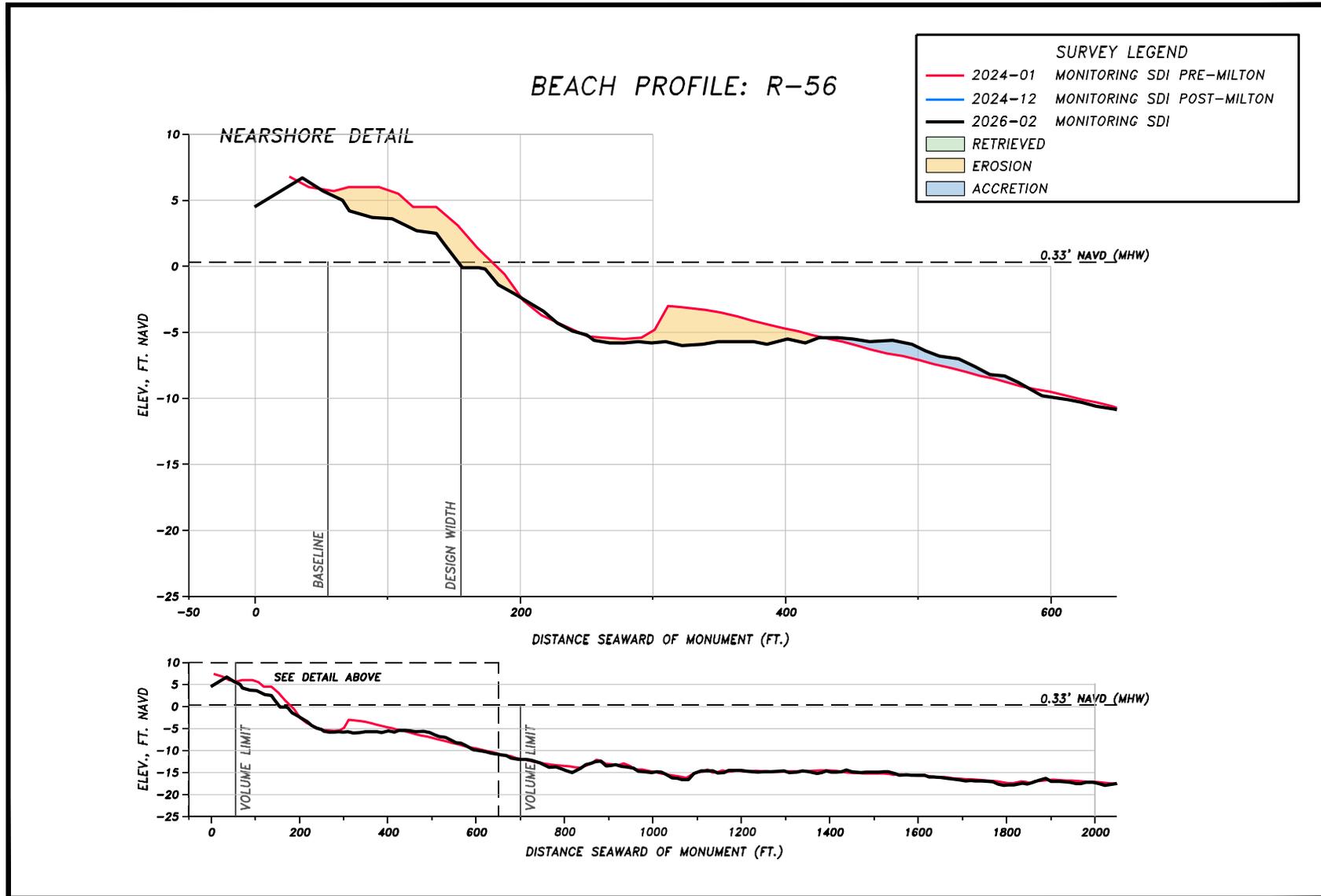
## Mooringings



R-56







## Segment Summary pre 2024 to 2026

### Volumetric Changes (x1000 cy)

<u>Beach Segment</u>	<u>1/24 - 12/24</u>	<u>12/24 - 2/26</u>	<u>1/24 - 2/26</u>
Area 1	-30.2	+57.4	+27.2
Area 2	-12.6	+58.5	+45.9
Area 3	-38.6	+71.2	+32.6
Area 4	<u>-78.2</u>	<u>+84.7</u>	<u>+6.5</u>
<b>Total:</b>	<b>-159.6</b>	<b>+271.8</b>	<b>+112.2</b>



# PILLAR - II

## RESILIENCE PLAN

- Dunes (Collier County Effort)
  - *Beach/Dune Renourishment*
  - *Reinforced with native plants*
- Reenforced dunes (RD)
  - *Reinforced with buried structures*
- Walkable beach paths
  - *Elevated boardwalks/embedded(RD)*
  - *Preserve public access while protecting dunes*

ONSHORE  
PROTECTION



- Supported by sediment transported modeling to enable self-renourishment and reduce future maintenance cost
- Purpose – absorb wave energy that reached shore **AFTER** offshore dissipation/Pillar I

**Reliability Engineering for Infrastructure**

## Current Onshore Protection Action Plan Consistency with Pillar II (City, Dr. George)

1. Area 1 Beach Fill 2025 + Added Dune (Retrieval)
2. Area 2 Beach Fill + Dune Vegetation Maintenance
3. Area 3 Beach Fill and Sand Retrieval + Planning Dune + Seawall Improvements
4. Area 4 Beach Accretion + Seawall Improvements

## Segment Summary pre 2024 to 2026



## Beach Segments: Current Plan Forward and Options for Onshore Protection

1. Areas 1 & 2 Continue Beach Fill Program, Plant and Maintain Dune
2. Area 3 Continue Beach Fill Program, add resiliency through added dune, seawall improvements & vegetation
3. Area 4 Continue Beach Fill/Accretion Program and seawall improvements

## Beach Segments





**12-20-2024**  
**2 months Post Milton**



**03-03-2026**  
**16-months Post Milton**