

Reports

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Captain Sinclair's Recreational Area Living Shoreline and Oyster Restoration

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Captain Sinclair's Recreational Area Living Shoreline and Oyster Restoration

Donna Milligan & C. Scott Hardaway, Jr.

Shoreline Studies Program

Virginia Institute of Marine Science

William & Mary



Timeline

Marsh Sills

2014, December: Received design and construction funding for the living shoreline demonstration project from the National Fish & Wildlife Foundation (NFWF)

2015, November: Permits received

2015, December: Construction contract awarded

2016, January: Construction started – Finished in February

2016, May: Marsh grasses planted



Oyster Bay Sills

2016, October: Received design and construction funding for oyster bag sills from NFWF

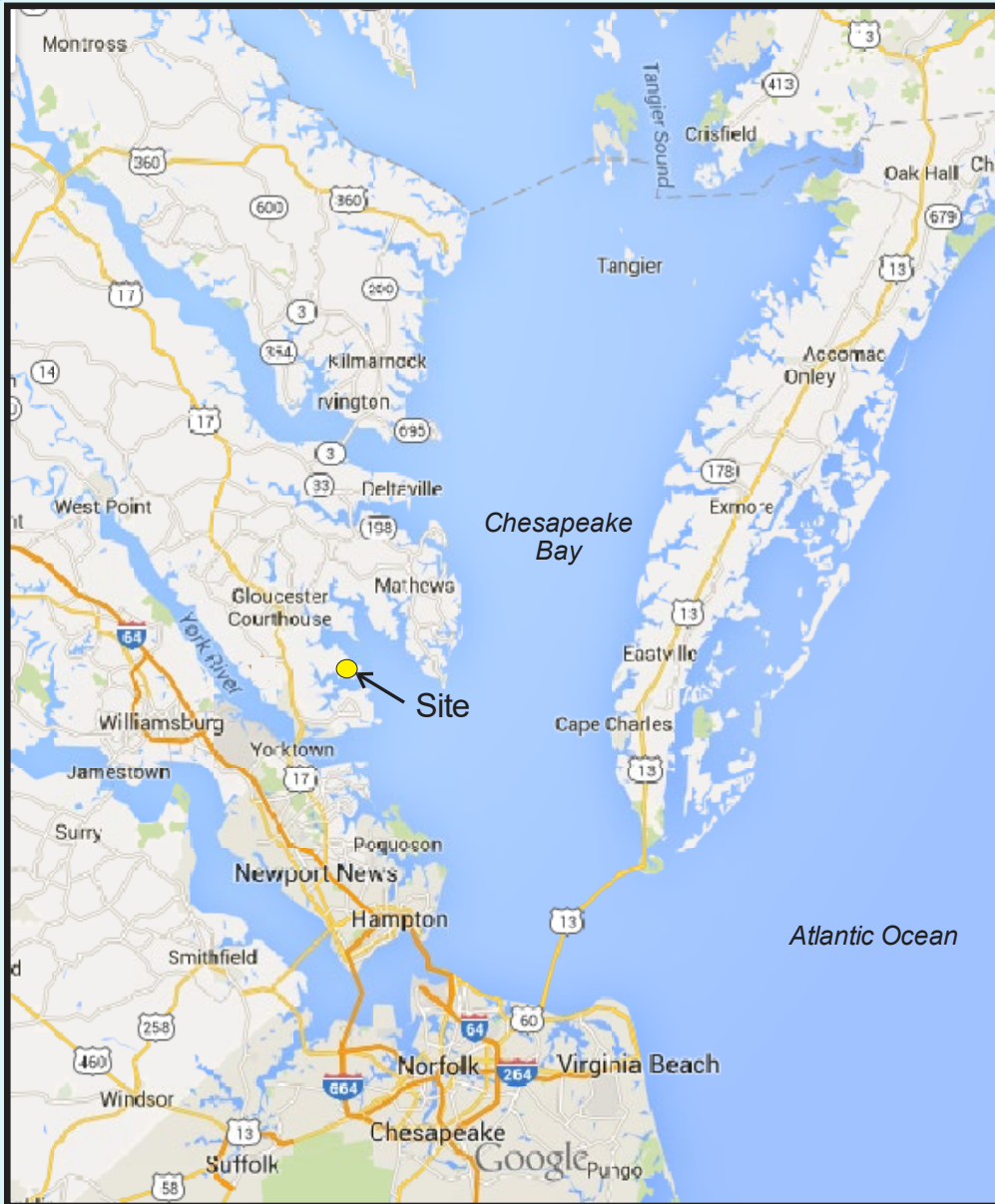
2017, August: Volunteers installed oyster bags

2023: ASBPA Best Restored Shore Award!

Location

37° 19'28.35"N

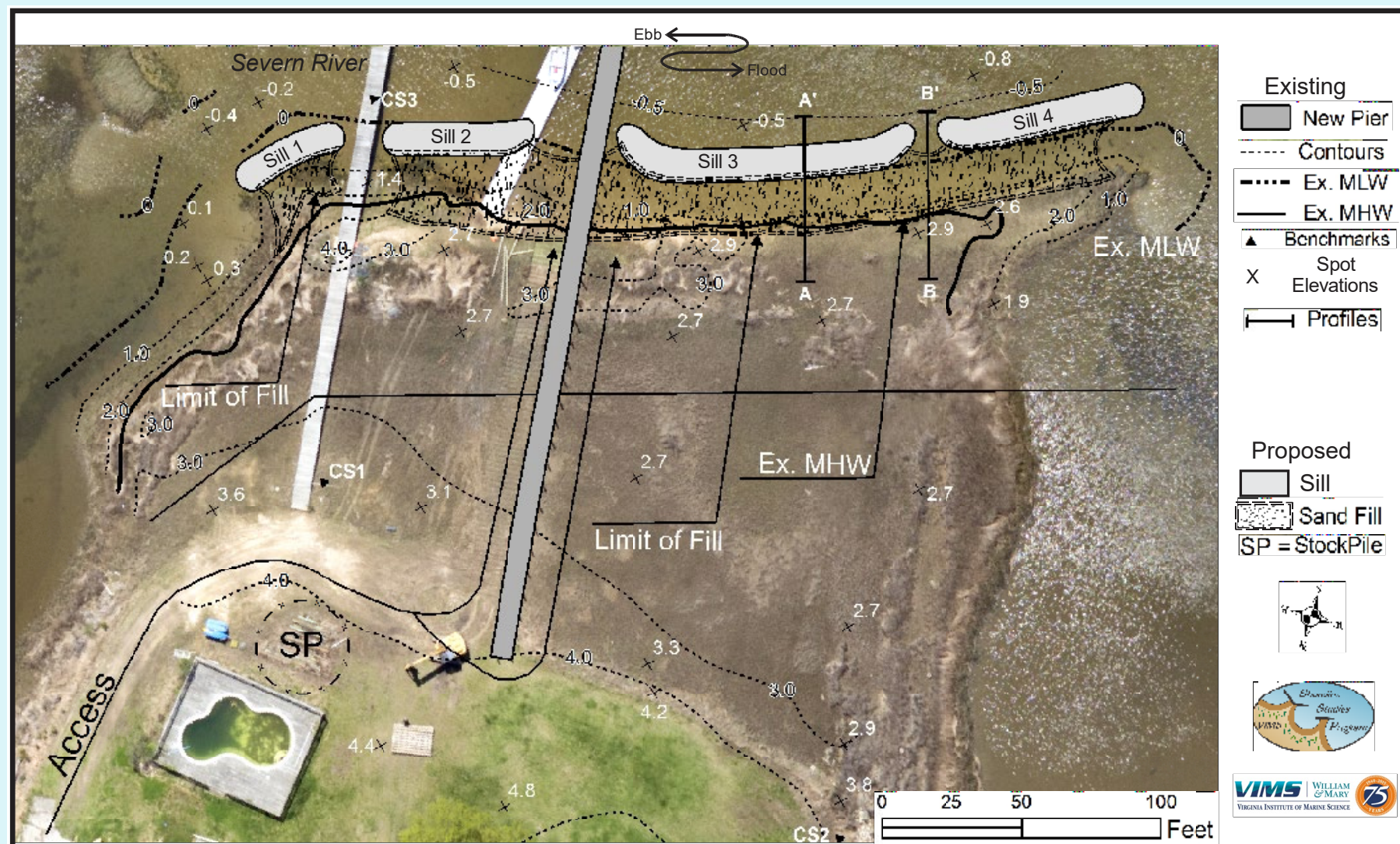
76° 25'40.67"W



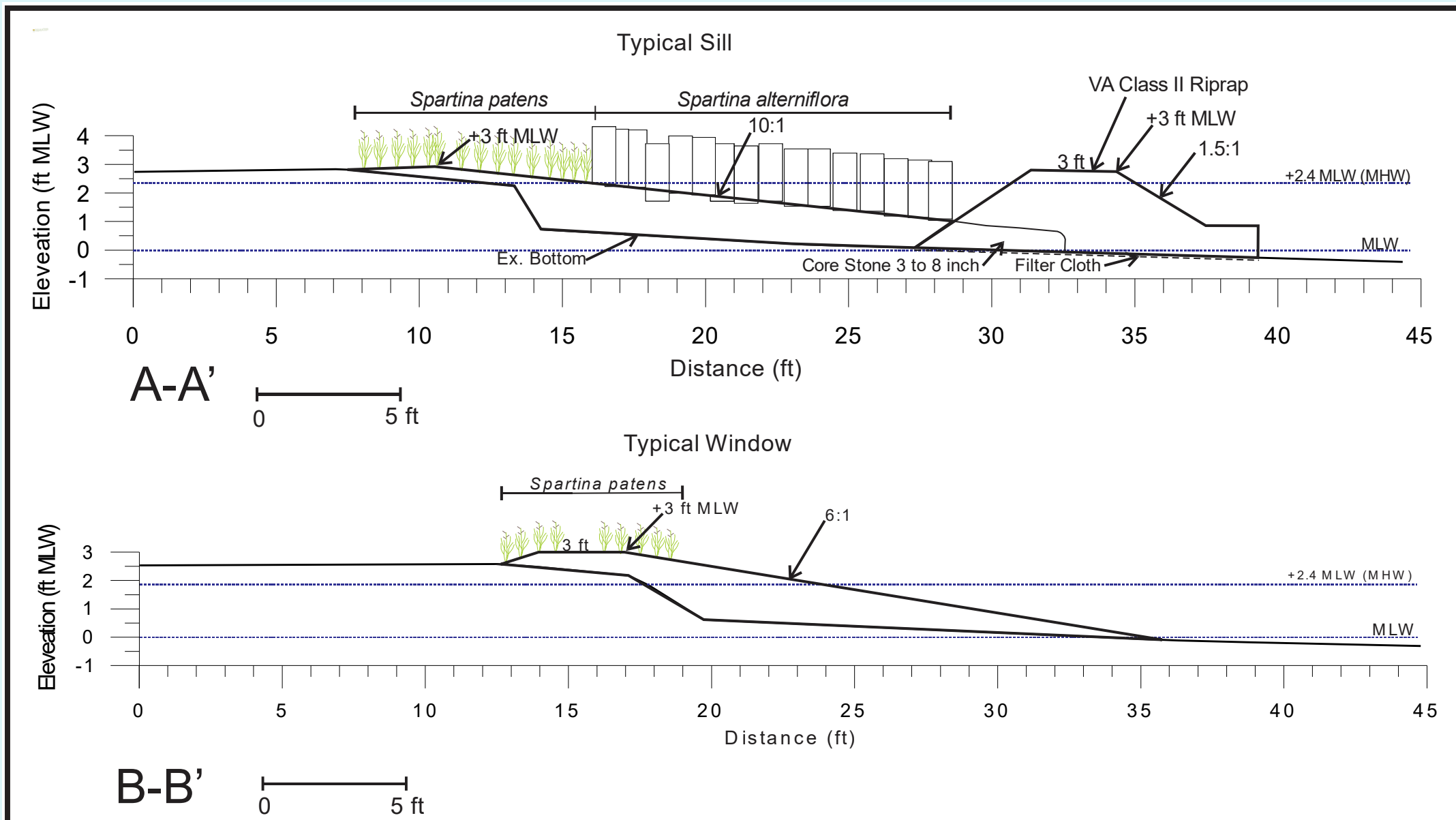
Plan

Four sills with three windows and sand fill which were built to protect the existing eroding marsh as well as provide recreational access.

The upper elevation of sand fill was set at +3.0 ft MLW and extends on a 10:1 slope to about mean tide level at the back of the proposed stone sills.



Typical Cross-Sections



As-Built, Pre-Planting

February 2016



Planting

Gloucester High School Crew Team volunteered to plant grasses under the direction of Walter Priest, Wetland Design, LLC. May 2016



Goose Fencing



Pre-Installation (April 2015)



8 years post-installation (August 2023)



2 Months Post Planting (July 2016)



Pre-Installation (April 2015)



2 Months Post Planting (July 2016)



7 years post-installation (August 2022)



Marsh Sills after Nearly 8 Years

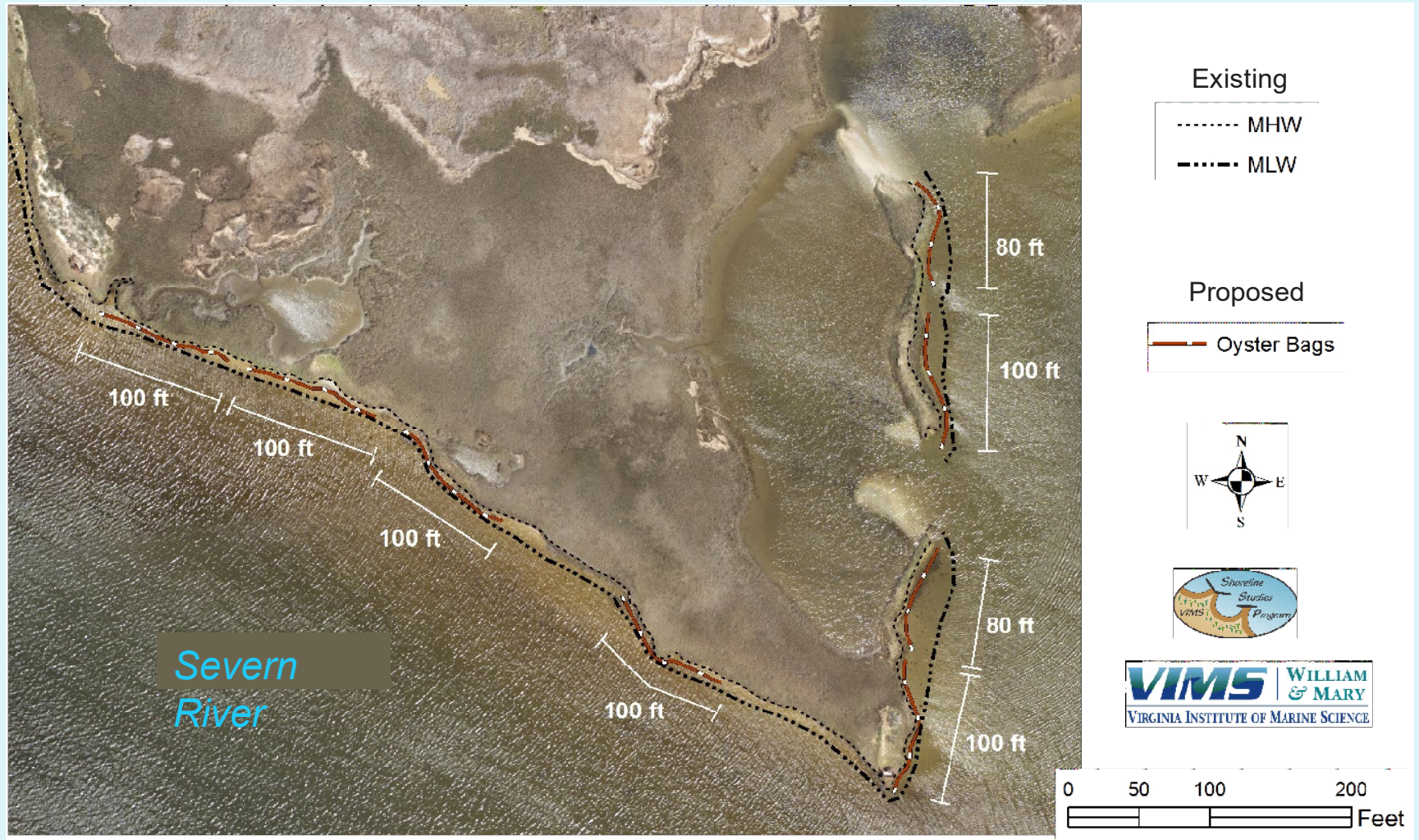


Oyster Bag Sill Permitted Plan

4 intertidal oyster bag sills were planned along the east-facing shoreline. These were the 6-bag design.

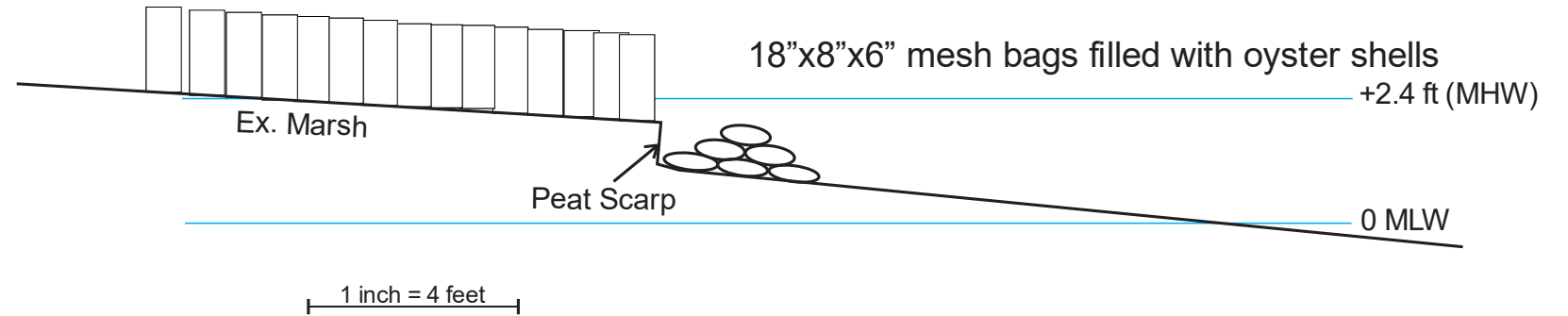
4 additional intertidal sills were planned along the southwest-facing shoreline. These were the 3-bag design.

Goal: Determine effectiveness of intertidal reefs for shore protection

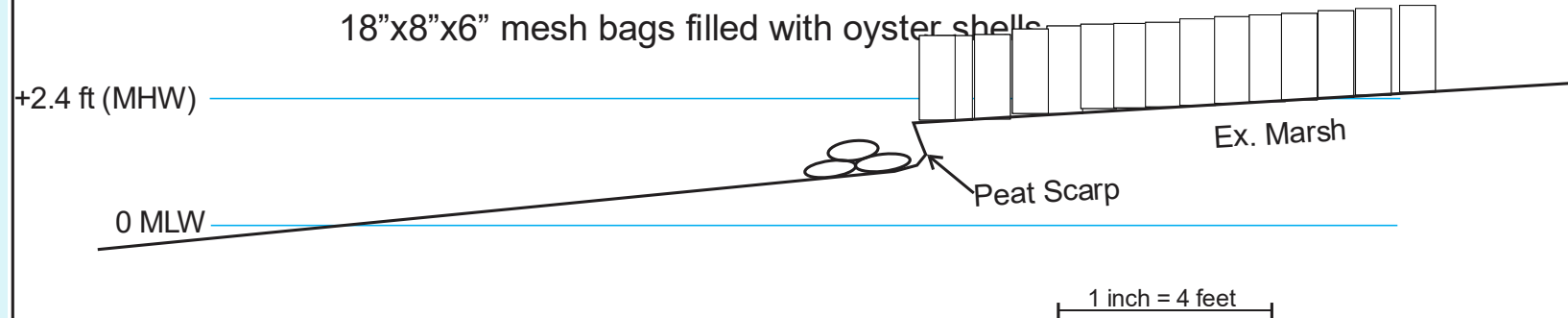


Typical Cross-Sections

Typical 6 Oyster Bag Sill



Typical 3 Oyster Bag Sill



Installation

6,000 oyster bags delivered on pallets



Wooden slide constructed to load boat



Bags were stacked along the shoreline



Two boats ran concurrently



Volunteers handed the bags to the stackers.



Placement became harder as tide rose.



Installation

Volunteers: VIMS, DCR, & high schoolers



3 bag sill



6 bag sills



6 bag sill

As-Built Survey

8 sills were constructed, however their layout was slightly different. One sill on the eastern side was omitted and the longer sill on the end of southwest side was split into 2 sections. In addition, sill 3 was made to wrap around the point to provide it protection.



Oyster Growth

AFTER 1.5 years (March 2019)

After 5 years (Aug 2022)



Shore Protection

In 2020, the marsh has eroded behind the sills, but sediment has filled in behind the sills.

That process has continued into 2022.

The gap in the marsh is wider than in 2020, but the whole section of marsh still remains intact.



AFTER 1.5 years (March 2019)



After 5 years (Aug 2022)



AFTER 1 year (July 2018)

The 3-bag sill did not hold up as well as the 6-bag sill. The marsh has continued to erode, but the sediment is flattening the coastal profile and grasses are starting to expand channelward.

After 5 years (Aug 2022)



AFTER 1.5 years (March 2019)



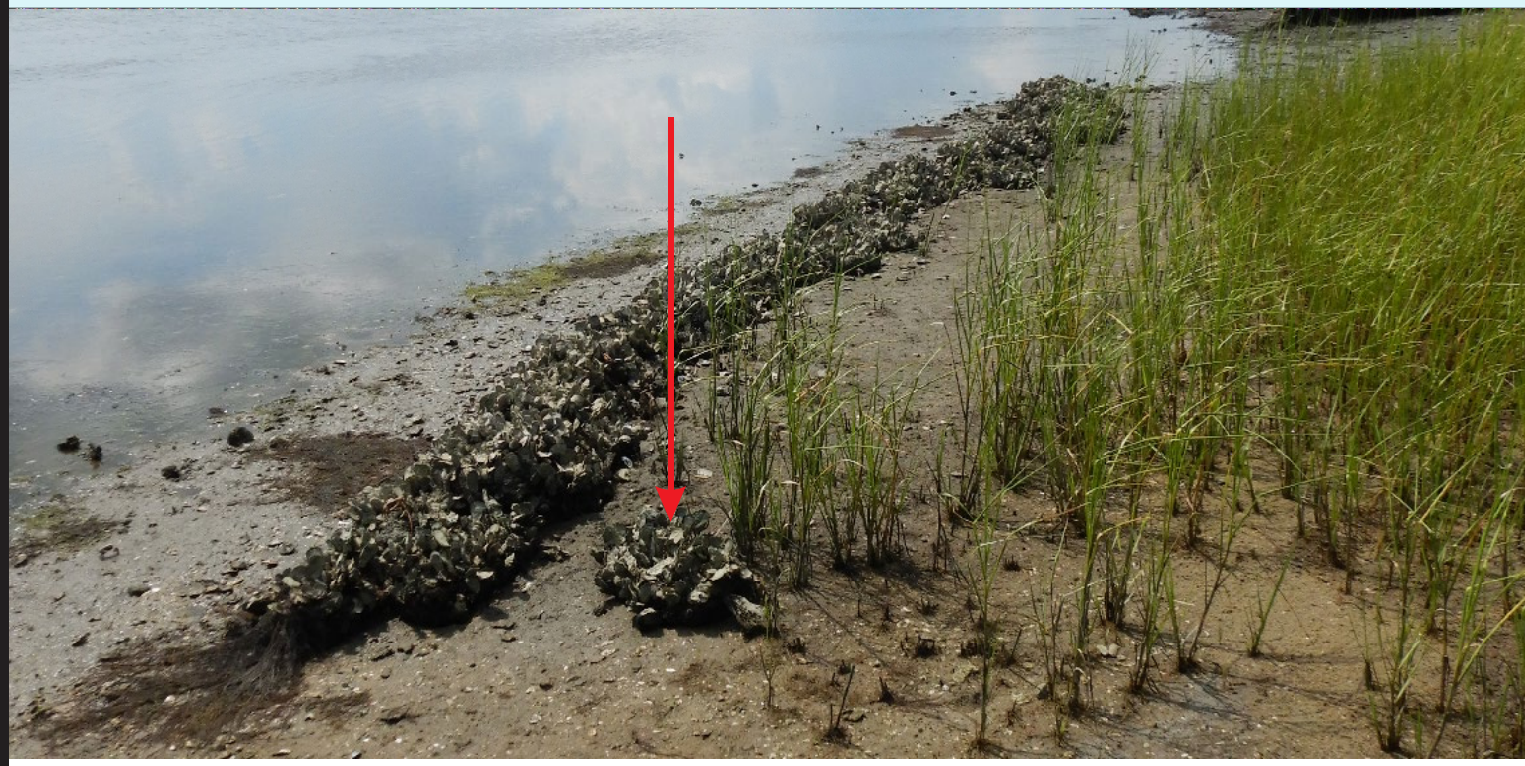
After 5 years (Aug 2022)



AFTER 1.5 years (March 2019)



After 5 years (Aug 2022)



Acknowledgements

VIMS

Lewis Lawrence, Executive Director, Middle Peninsula Planning District Commission
Walter Priest, President of Wetland Design, LLC
National Fish and Wildlife Foundation
Coastal Design and Construction

