SMITH ISLAND:

MARTIN ISLAND AND RHODES POINT LIVING SHORELINE PROTECTION PROJECTS

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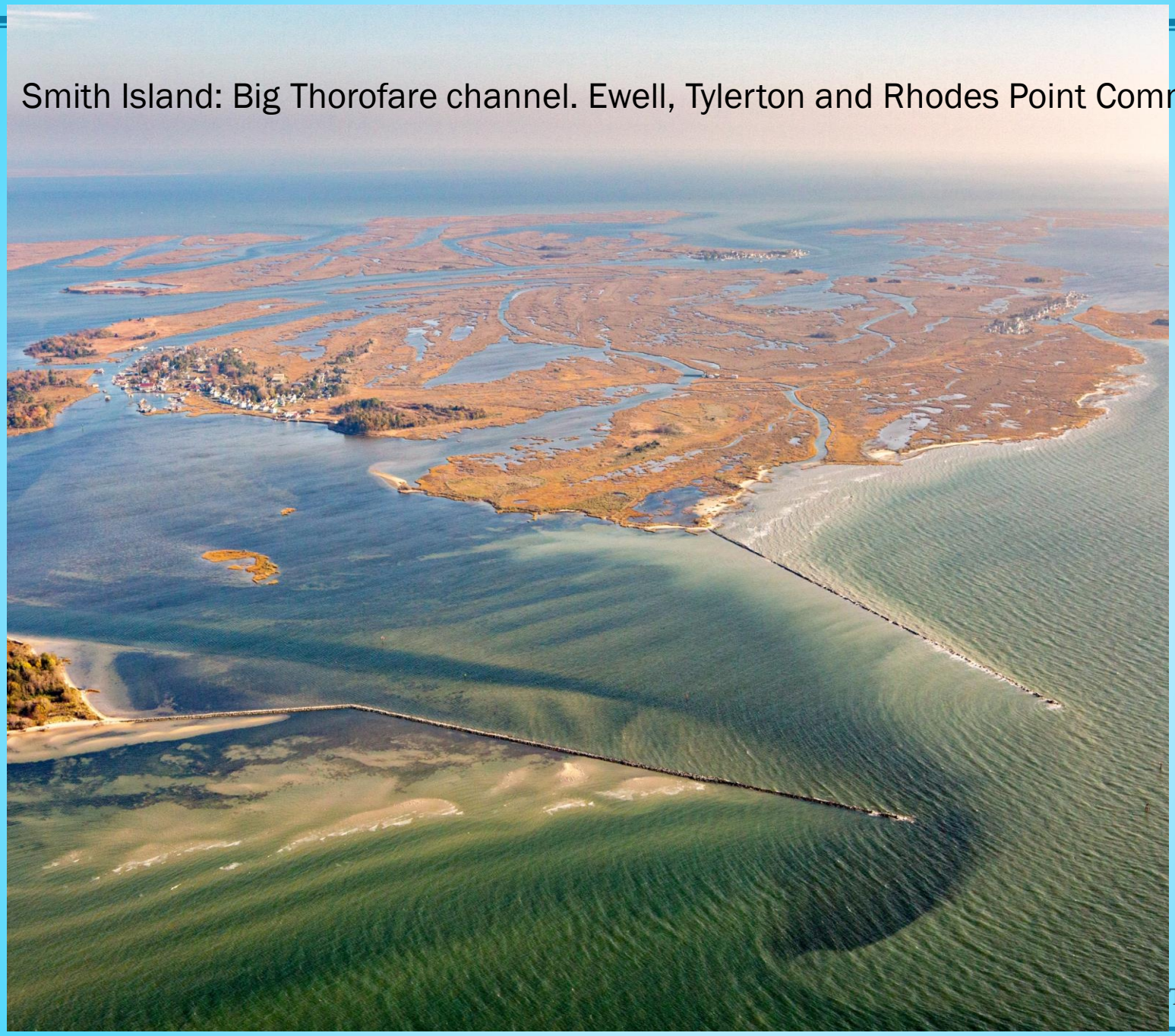
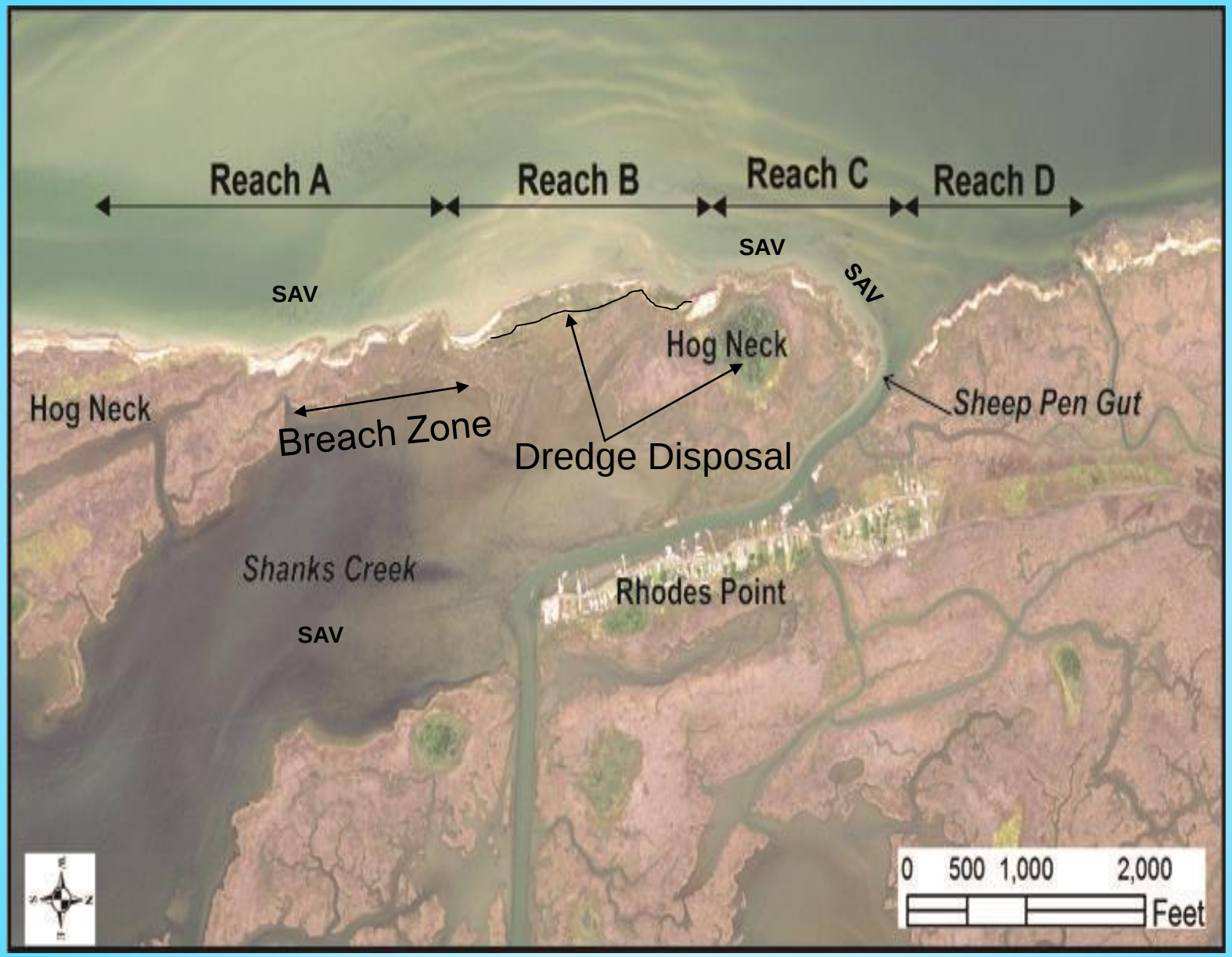
Dave Wilson, Delmarva RC&D
Gary Pusey, Somerset County.

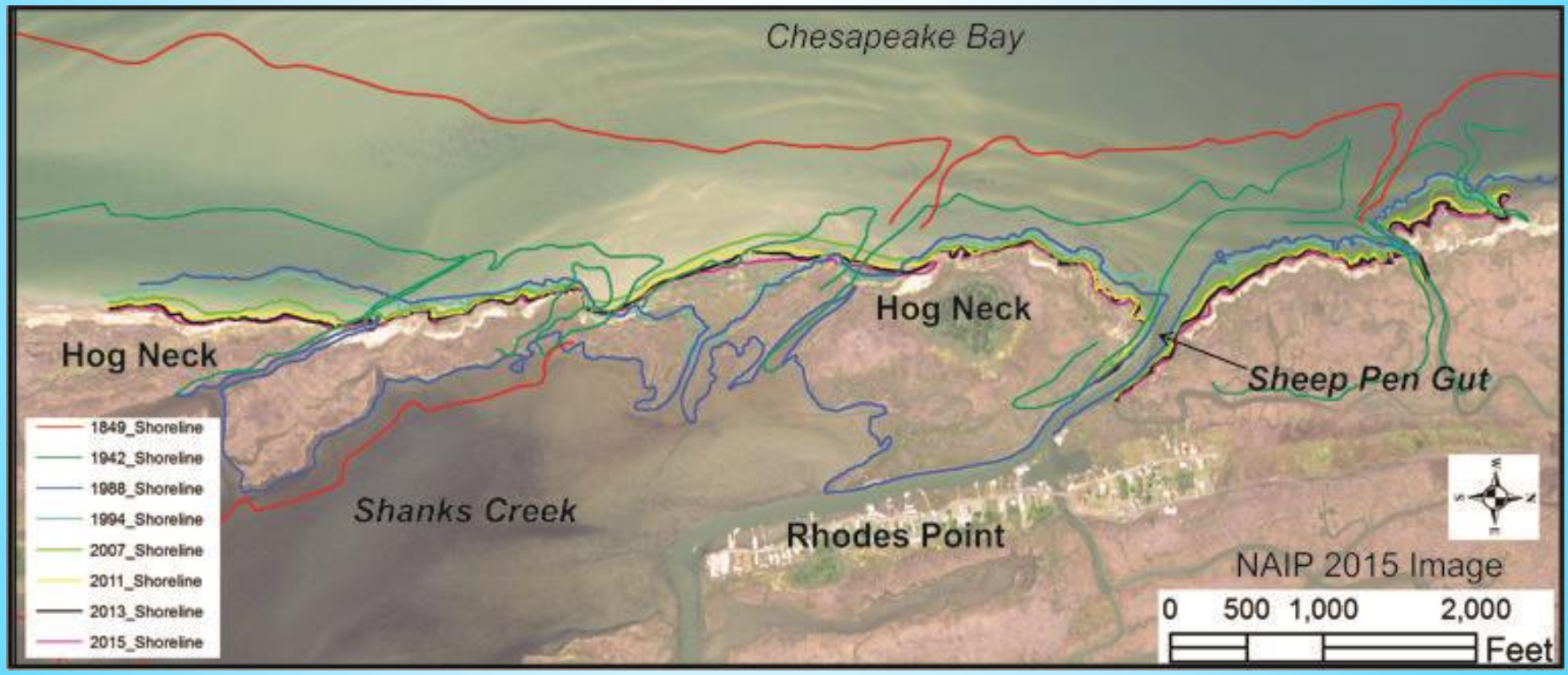
Boat trip – June 4, 2024

Smith Island: Big Thorofare channel. Ewell, Tylerton and Rhodes Point Communities




Reach A
Reach B
Reach C
Reach D
SAV
SAV
SAV
Hog Neck
Hog Neck
Breach Zone
Dredge Disposal
Sheep Pen Gut
Shanks Creek
Rhodes Point
SAV
0 500 1,000 2,000
Feet

SHORELINE CHANGE



SHORE AREA CHANGE

Reach	Long-Term (1849-2015)	Short-Term (2007-2015)
A	9.4	8.7
B	5.4	10.5
C	4.8	5.5
D	5.9	7.4

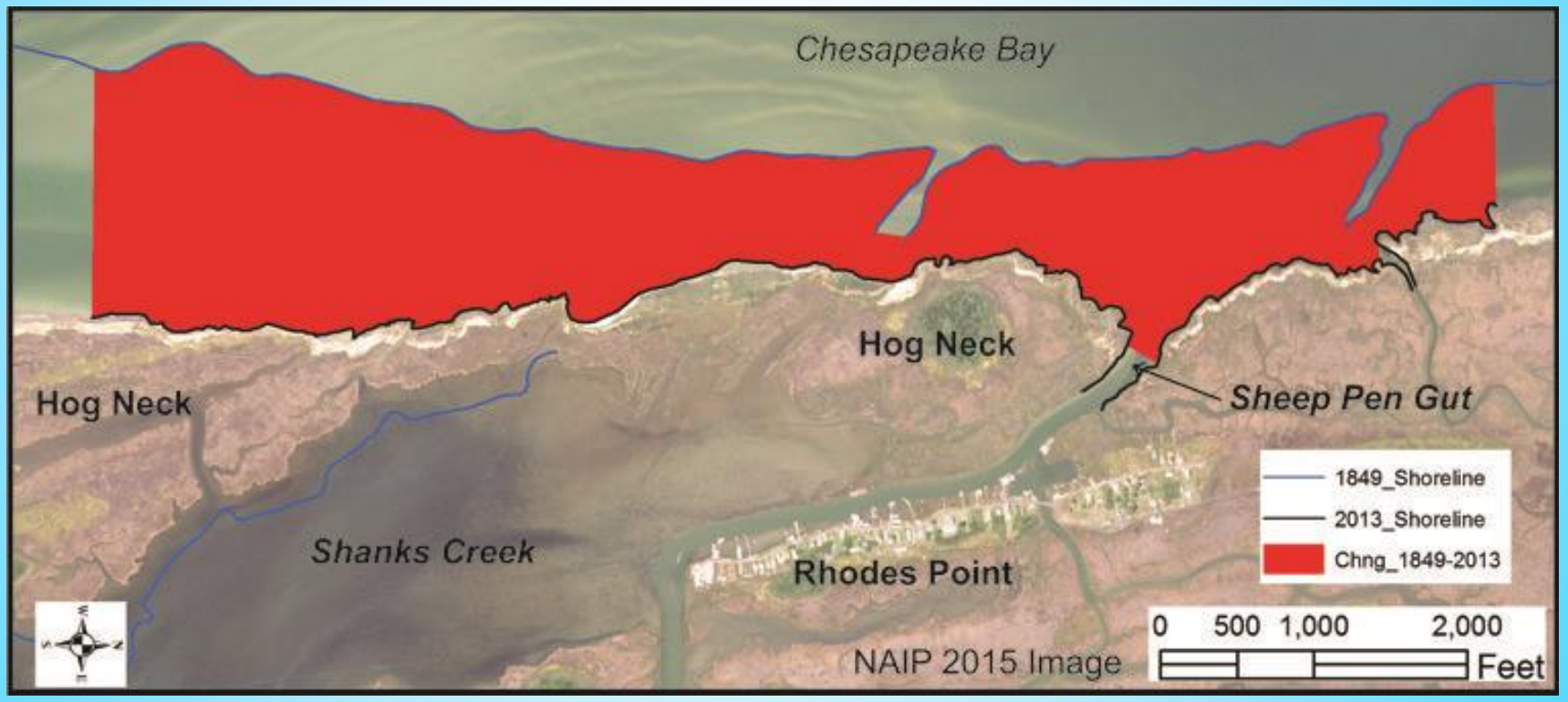
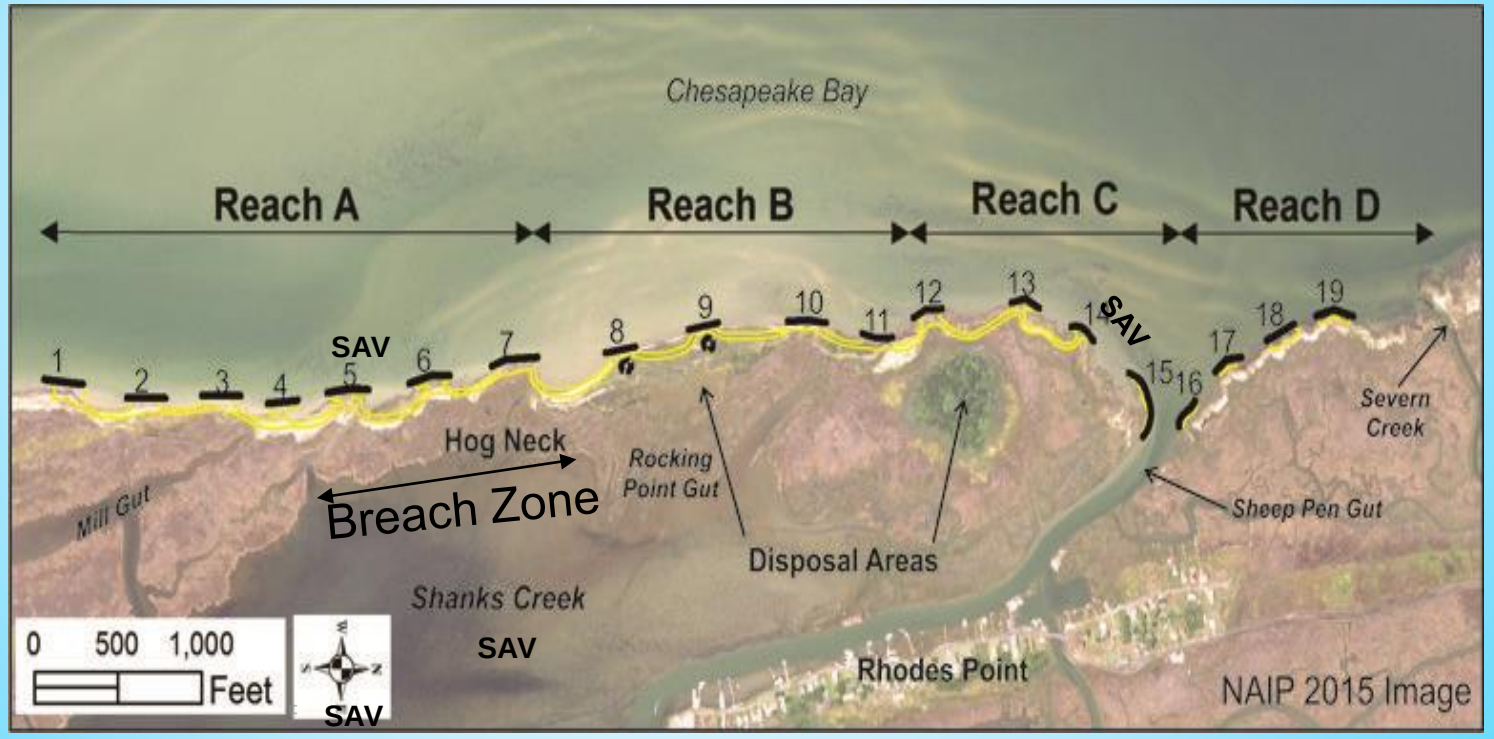


Figure 1

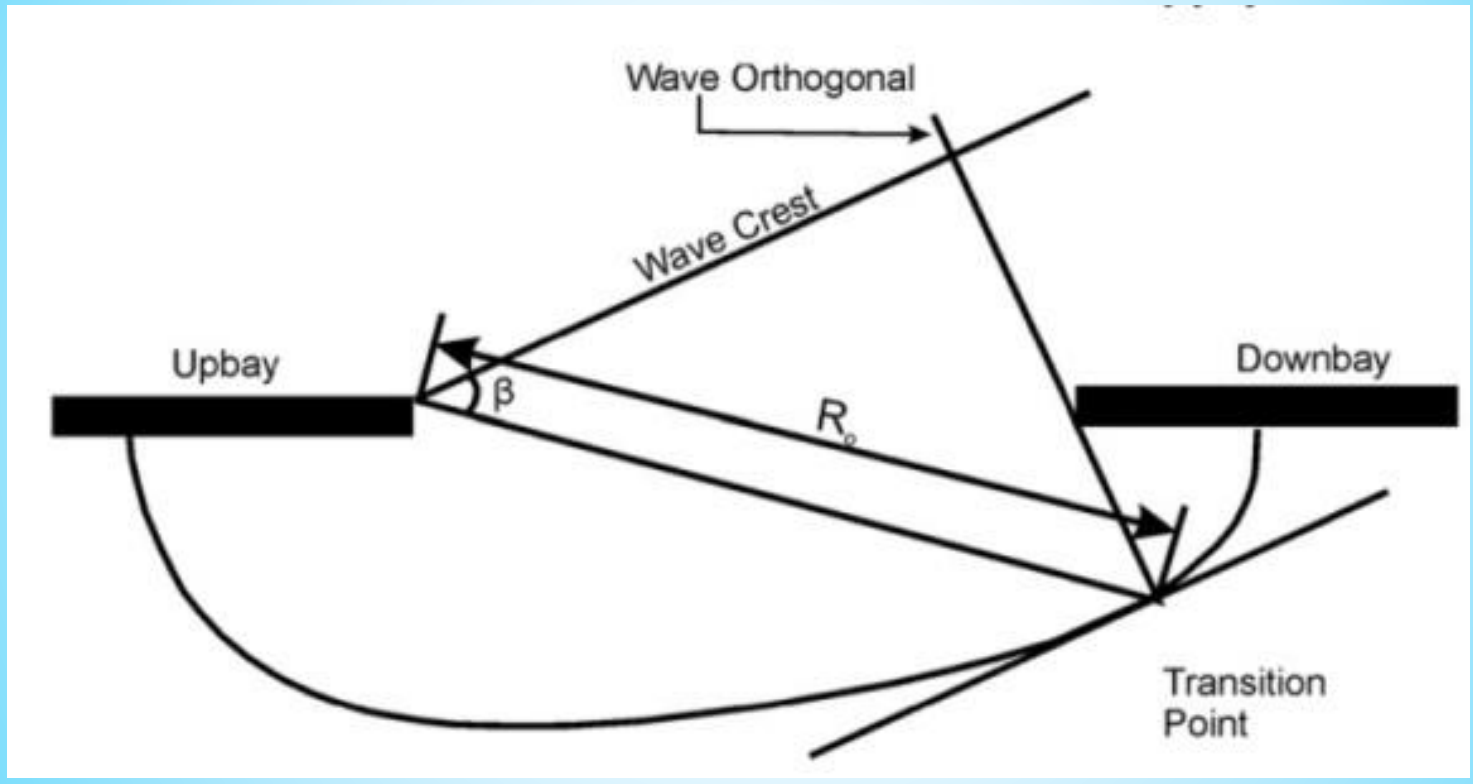
DESIGN

The proposed plan extends along about 8,000 feet of Bay coast. It includes 18 headland breakwaters 180 to 300 feet in length and a 400 foot structure at the southern mouth of Sheep Pen Gut. Breakwaters # 16-19 will control the coast north of Sheep Pen Gut.

Creates about 2.2 acres of low marsh and 3.6 acres of high marsh.

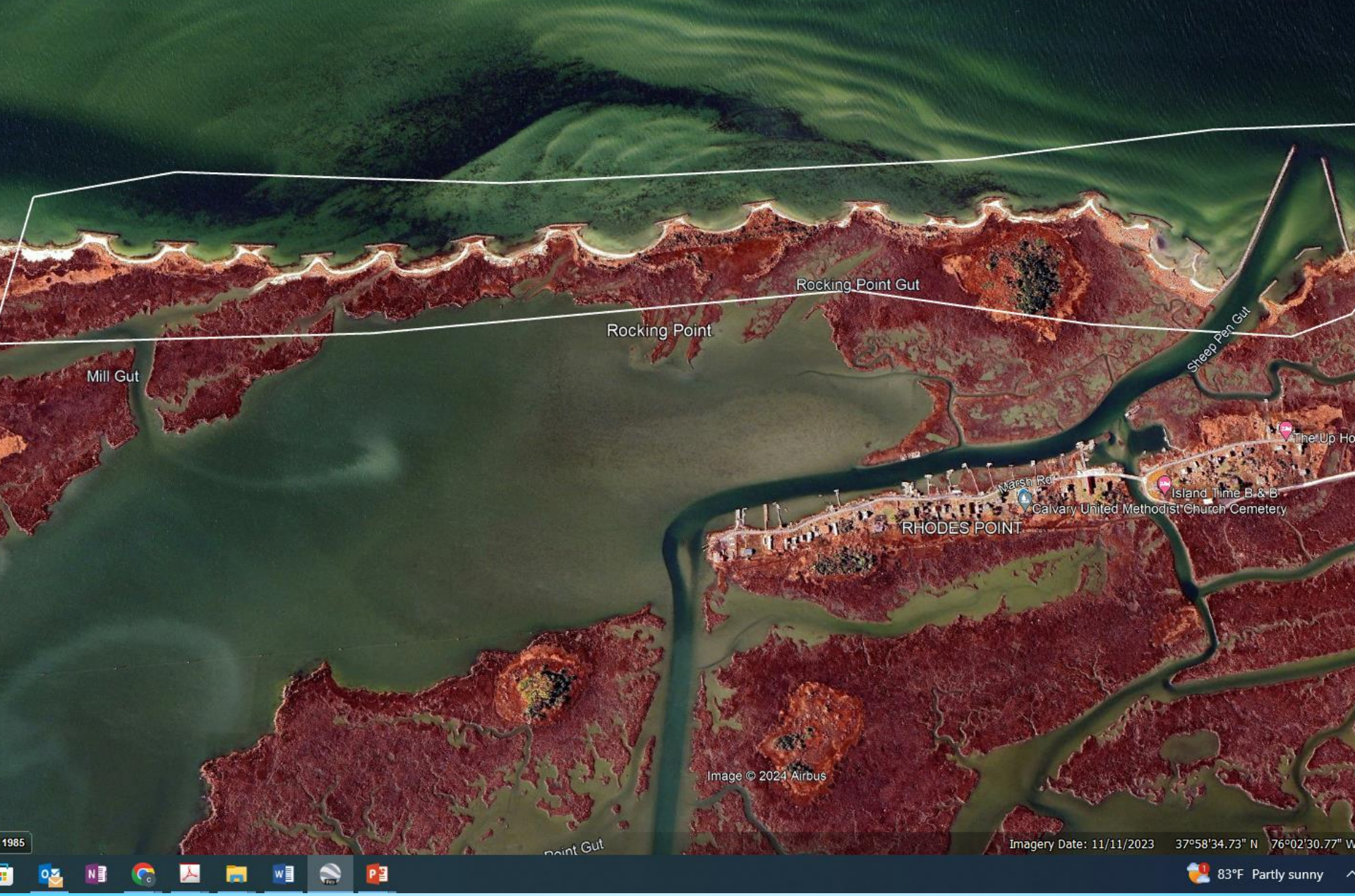


COASTLINE DESIGN, P.C.


Wave Orthogonal
Wave Crest
Upbay
β
R_o
Downbay
Transition
Point

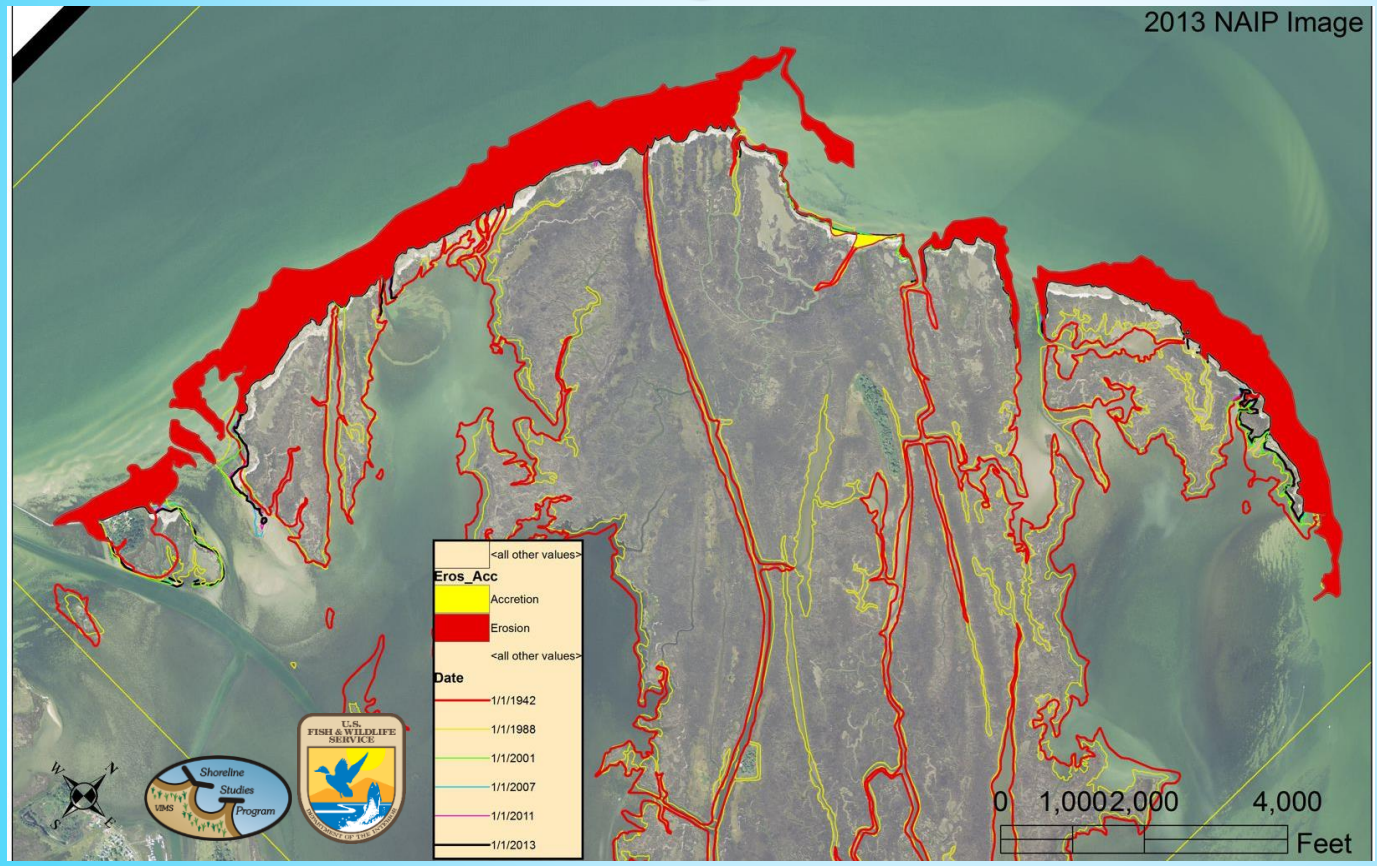

1
7
13
17


13
7
1



COASTLINE DESIGN, P.C.

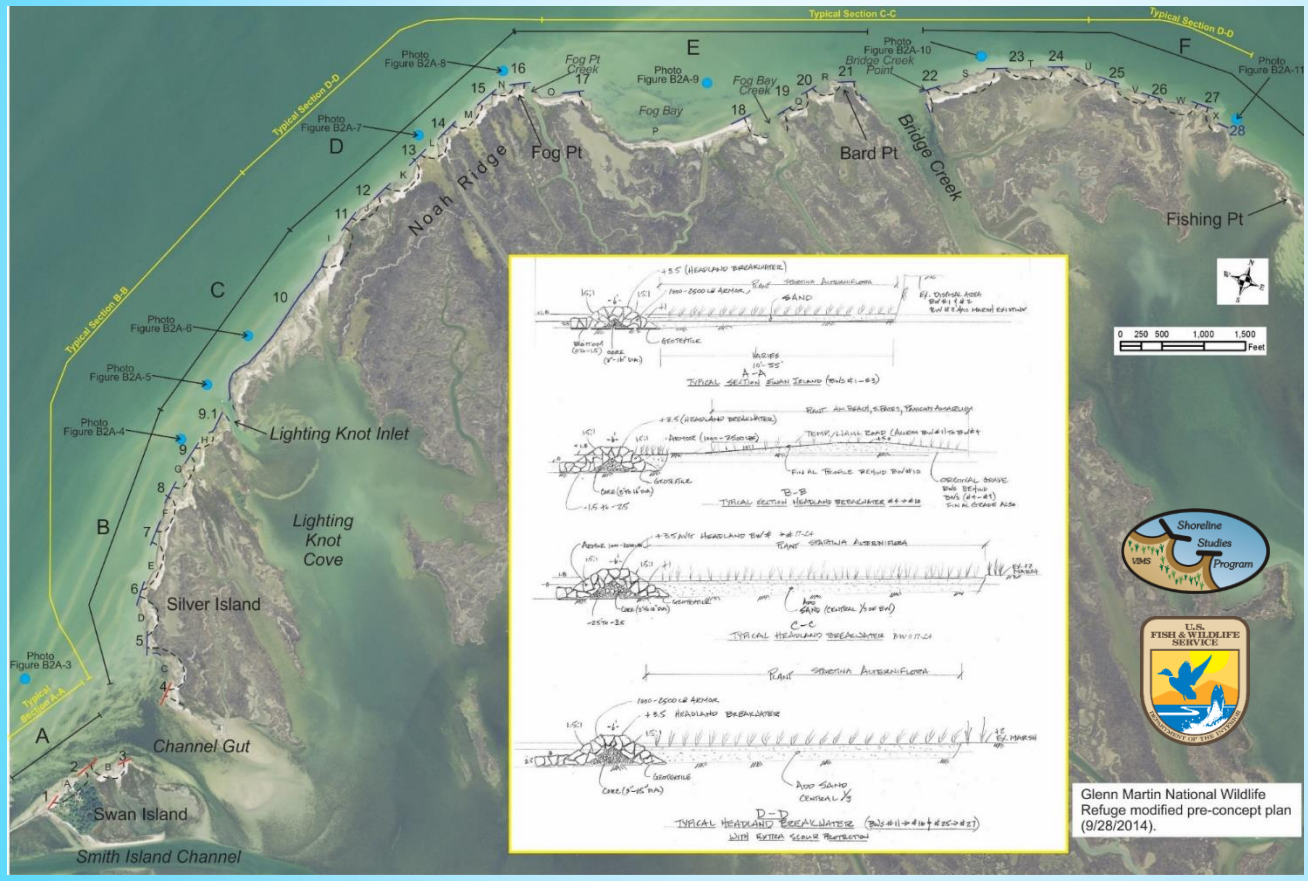
Smith Island – Martin NWR
Net Area Change 1942 to 2013



- Erosion rates vary from -2 ft to -18 ft/yr
- Between 1942 & 2013, 238 acres were lost at 3.3 acres/yr.
- With average eroding bank heights (under peat) of 4 ft, sediment volume eroded between 1942 & 2013 = 1,535,893 cy or about 21,632 cy/yr.
- Recent research indicates that these marshes may grow vertically with sea level rise.

COASTLINE DESIGN, P.C.

Smith Island – Martin NWR
Pre-Study Plan



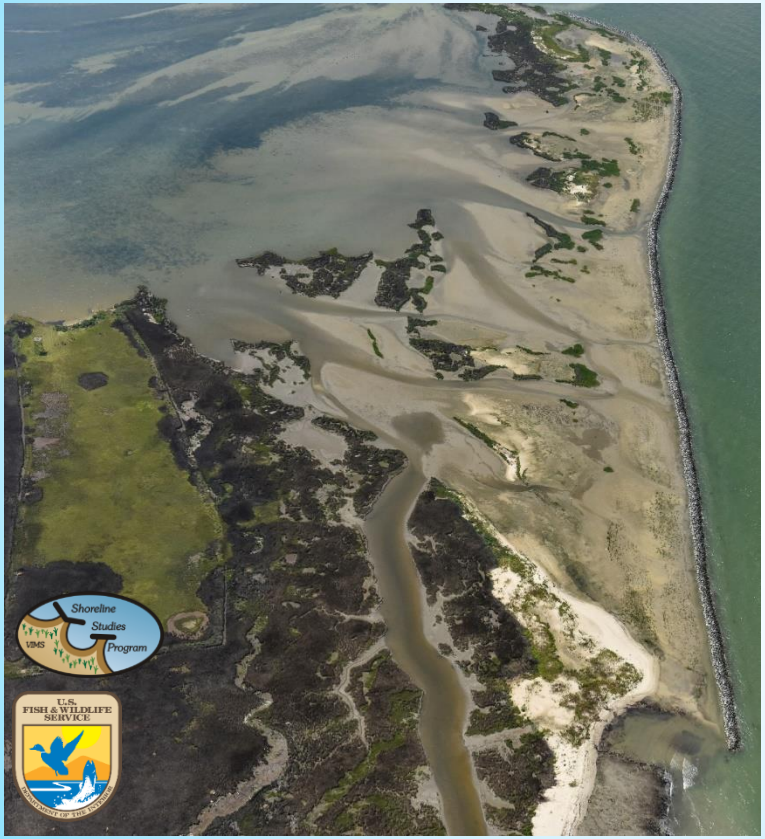
Constructed in 2015
Planted May 2016

COASTLINE DESIGN, P.C.

Smith Island – Martin NWR
Reach B

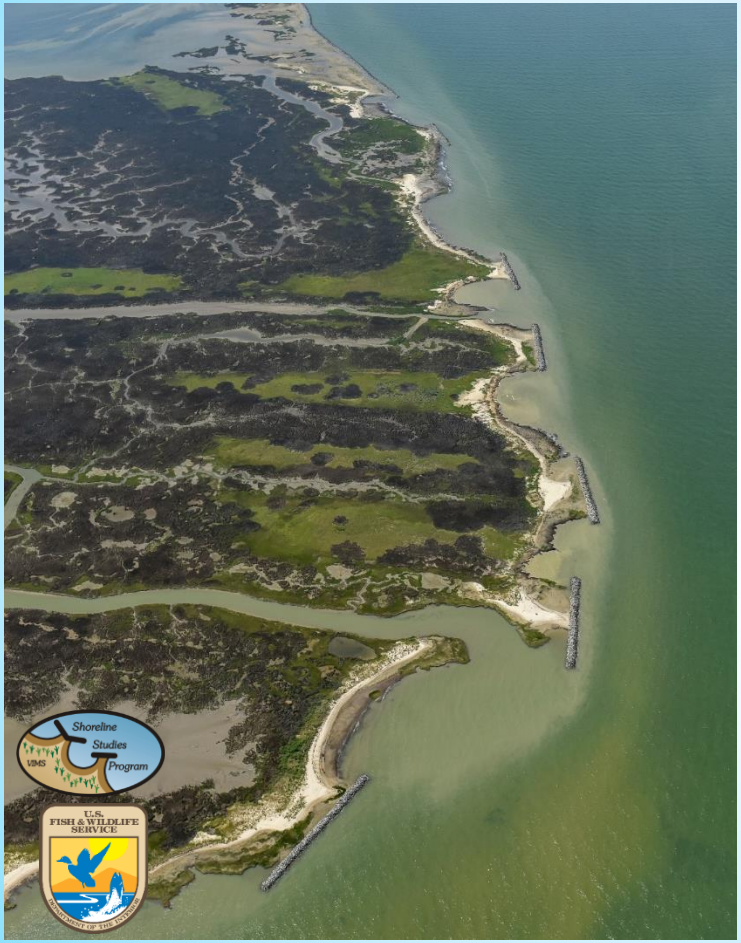
COASTLINE DESIGN, P.C.

Smith Island – Martin NWR
Reach C



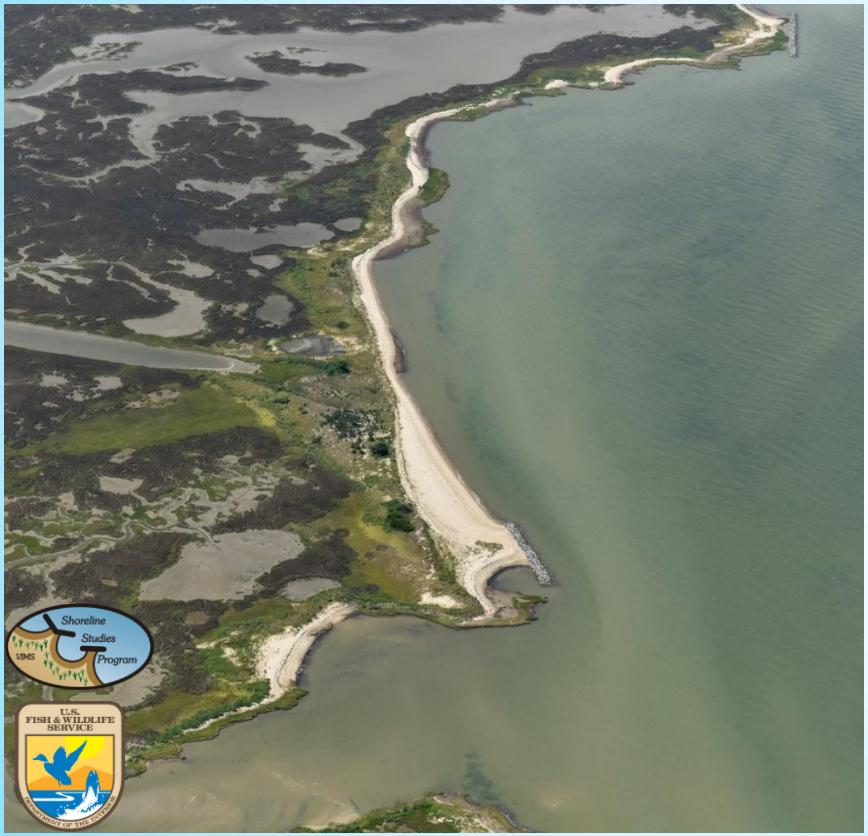
COASTLINE DESIGN, P.C.

Smith Island – Martin NWR
Reach D



COASTLINE DESIGN, P.C.

Smith Island – Martin NWR
Reach E



COASTLINE DESIGN, P.C.

Smith Island – Martin NWR
Reaches B through F

COASTLINE DESIGN, P.C.

Martin NWR

Post Construction 6 Nov 2015

7 years post-construction
14 Nov 2022

MARTIN NWR

Post Construction 6 Nov 2015

COASTLINE DESIGN, P.C.

SMITH ISLAND – MARTIN NWR
SHORELINE MANAGEMENT SUMMARY

- Primary goal is to provide site specific information on shoreline strategies.
- Shoreline Management should be done on reach basis in order to optimize cost effective methodology including breakwaters and headland control.
- Medium to Very High wave energy coasts are most appropriate for this approach.
- Understanding the processes of shore erosion puts the problem into context for waterfront property owners.
- Recommended strategies focus on marsh and beach creation to create a stable coastal profile and an protective environmental edge critical to long term performance and coastal resiliency


CAUTION
STAY
OFF
ROCKS