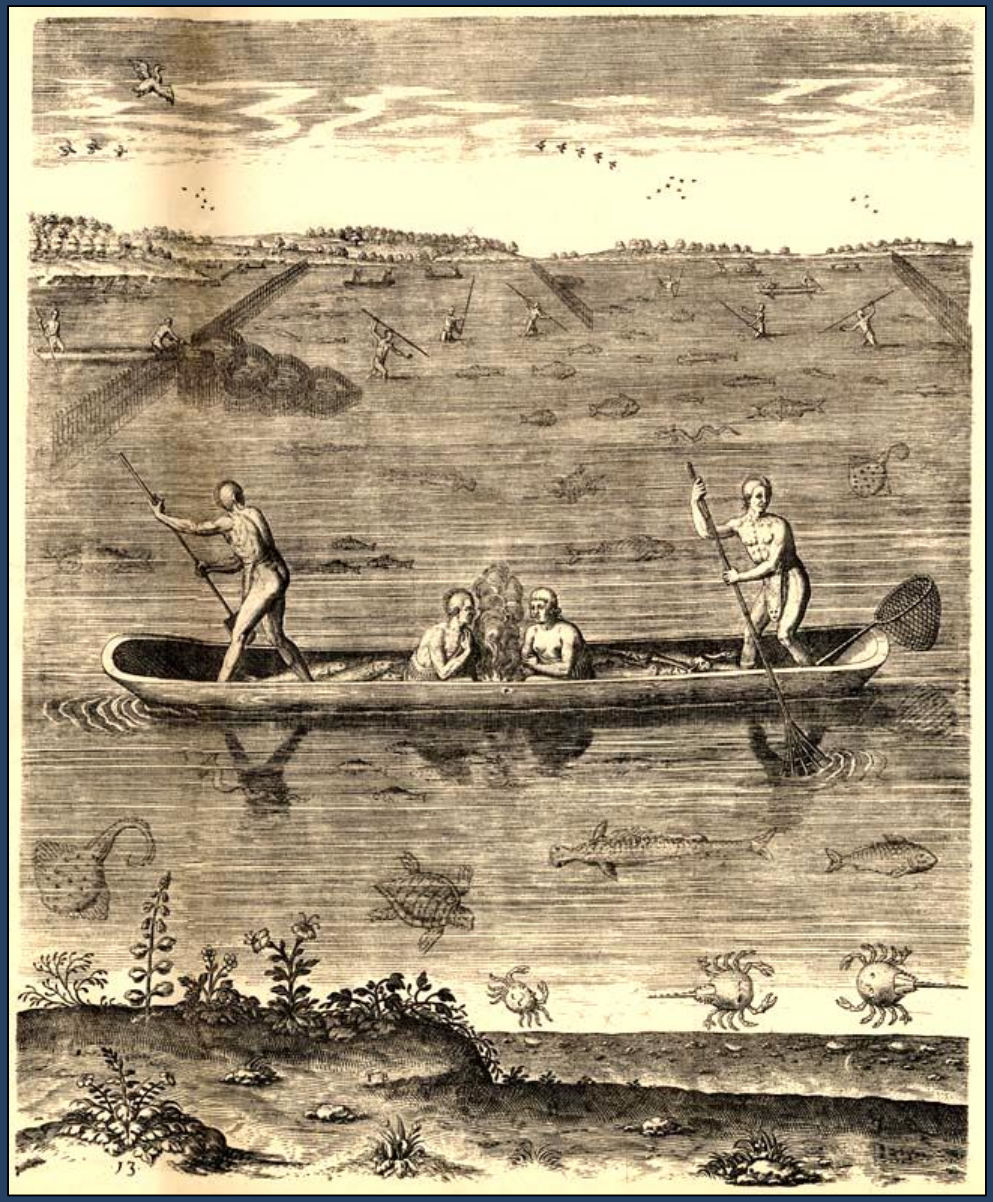
Restoration of Three-Dimensional Oyster Reefs in the St. Mary's River

Sustainable Fisheries Goal Implementation Team Meeting

December 18, 2017

Bob Paul

St. Mary's College of Maryland

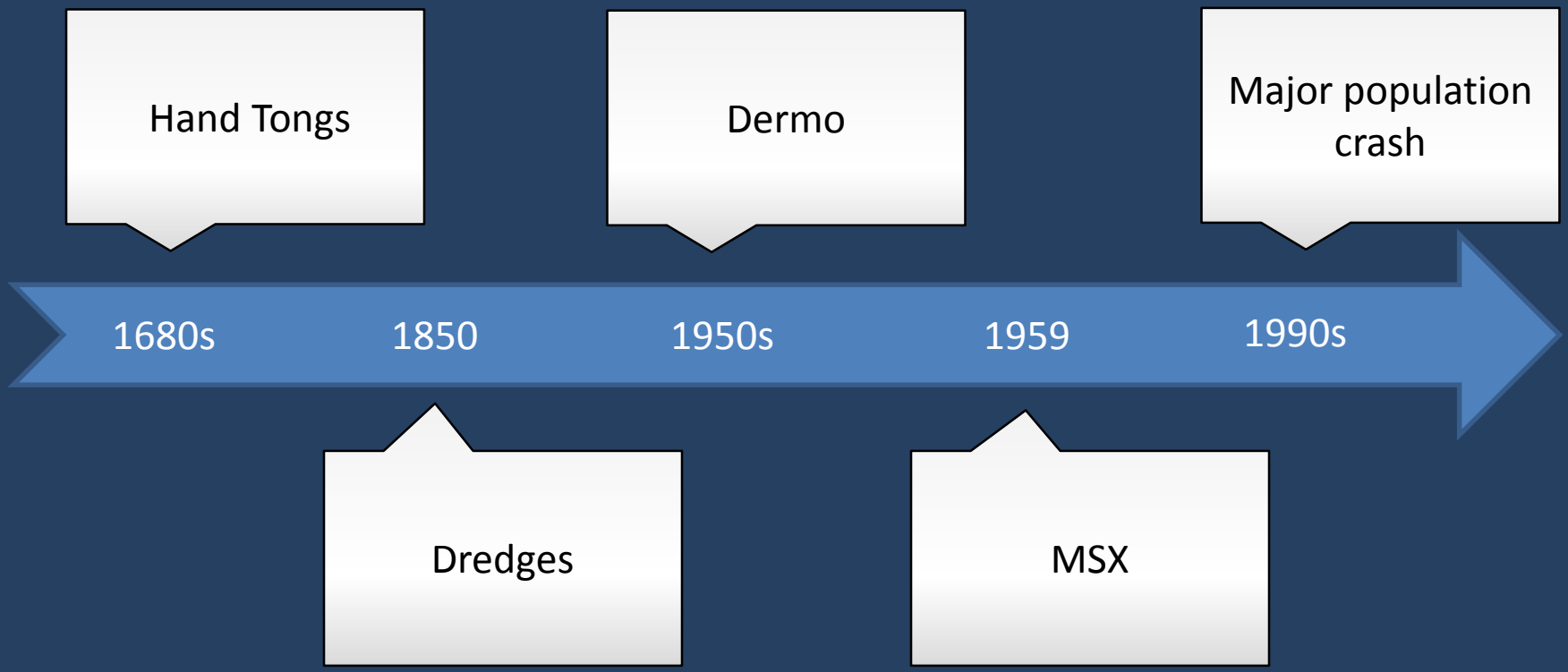


Native Americans Pre-Colonial Contact

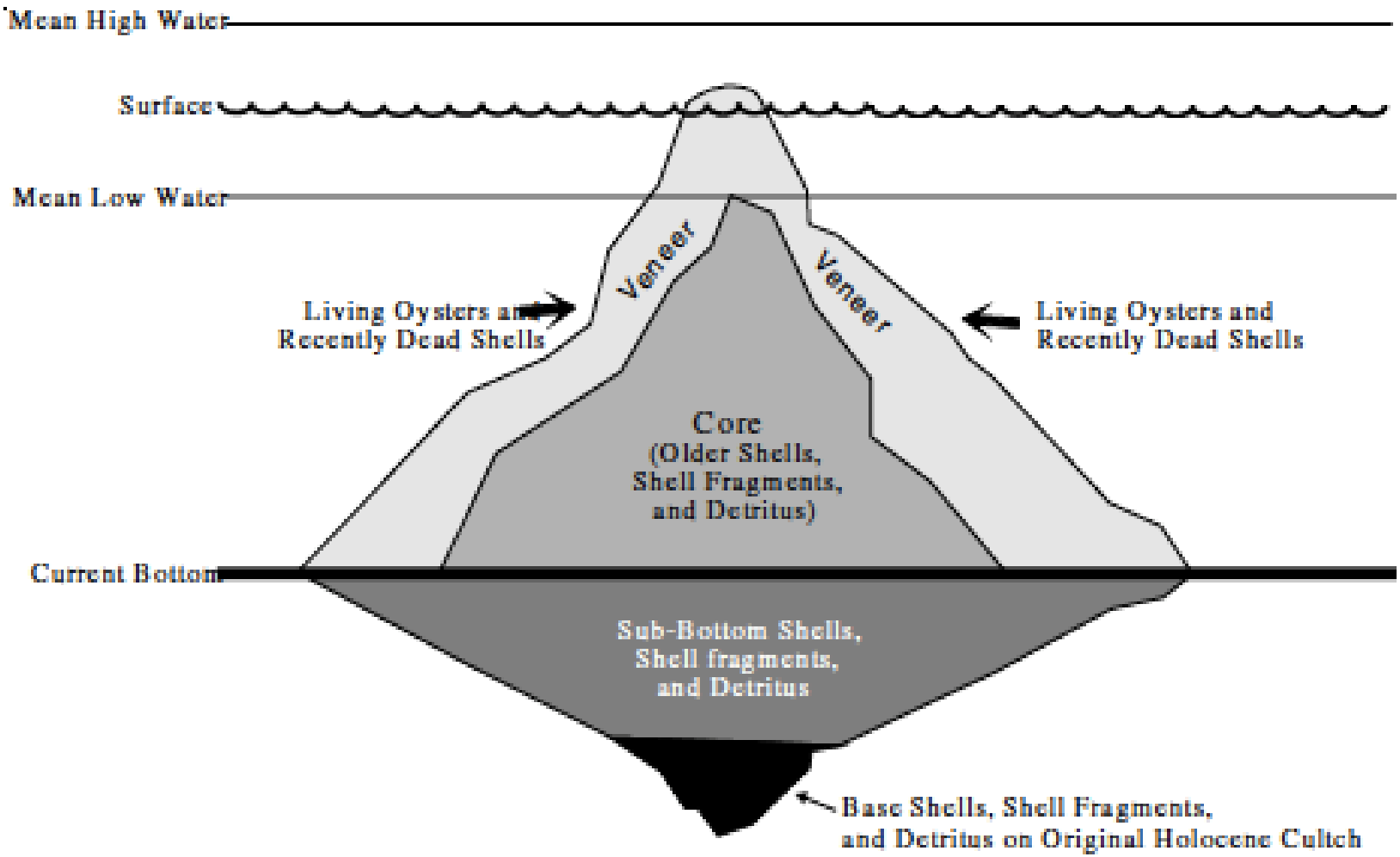
Middens

Colonial Contact
1639
In St. Mary's City

Harvest and Disease History



Historic Oyster Reef Structure



(From Hargis and Haven, 1999)

Shell Harvesting and Reef Destruction

St. Mary's River at St. Mary's City looking toward its confluence with the Potomac

Historically

- a highly productive oyster fishery

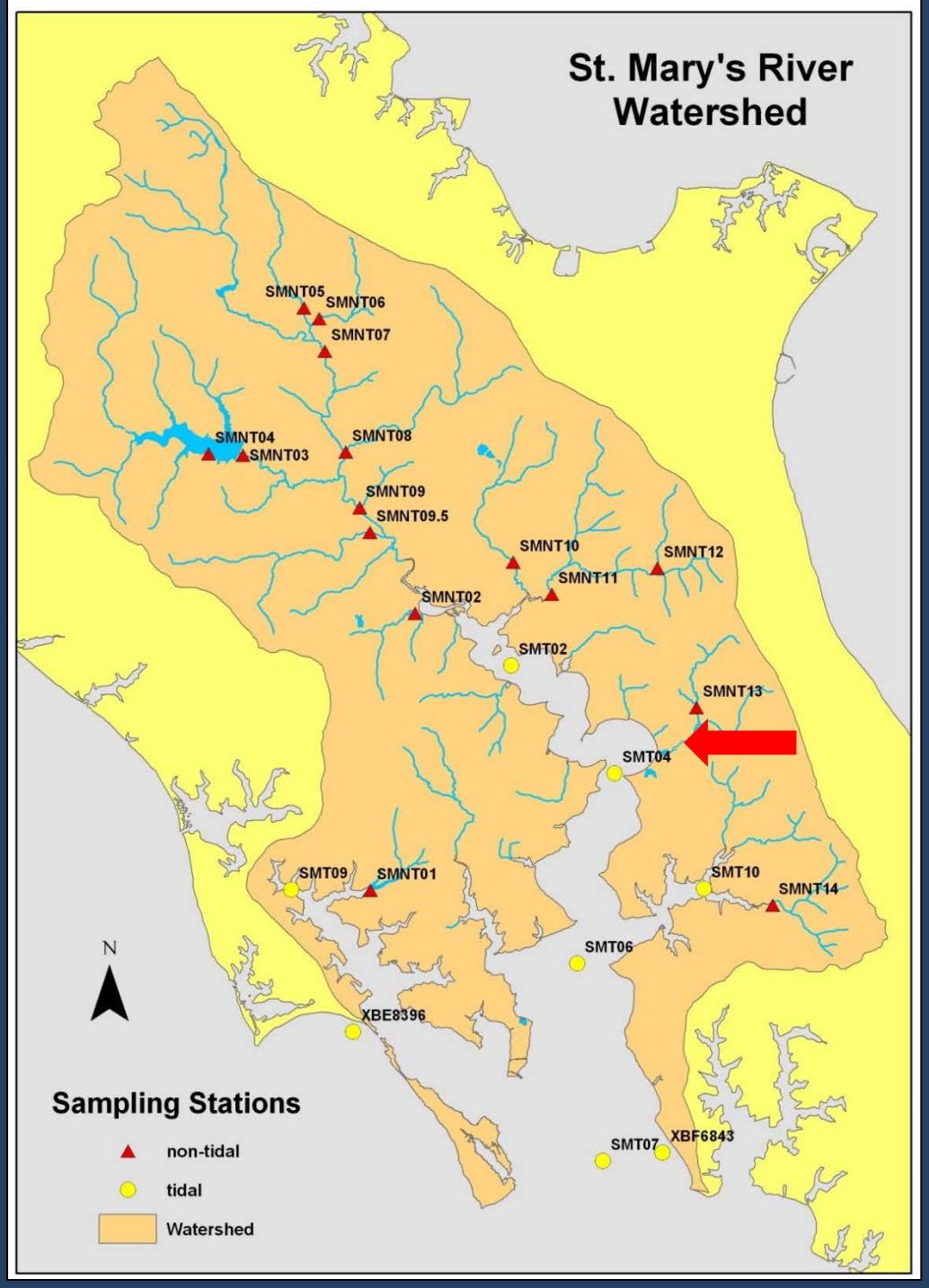
-somewhat resilient to harvesting pressure

2008 Partnership

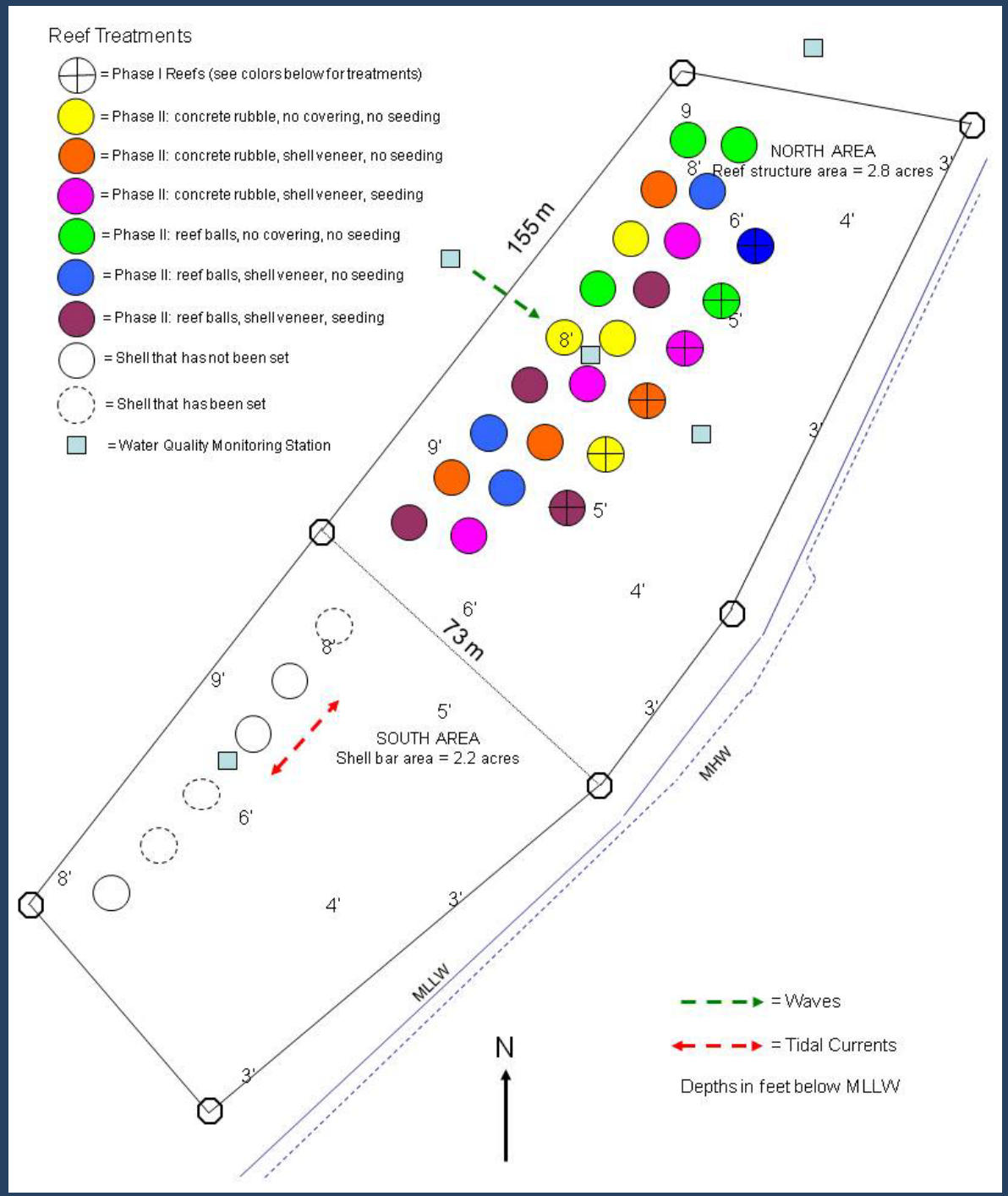
- St. Mary's River Watershed Association
- St. Mary's College of Maryland
- Rotary Club of Leonardtown

Project Goals

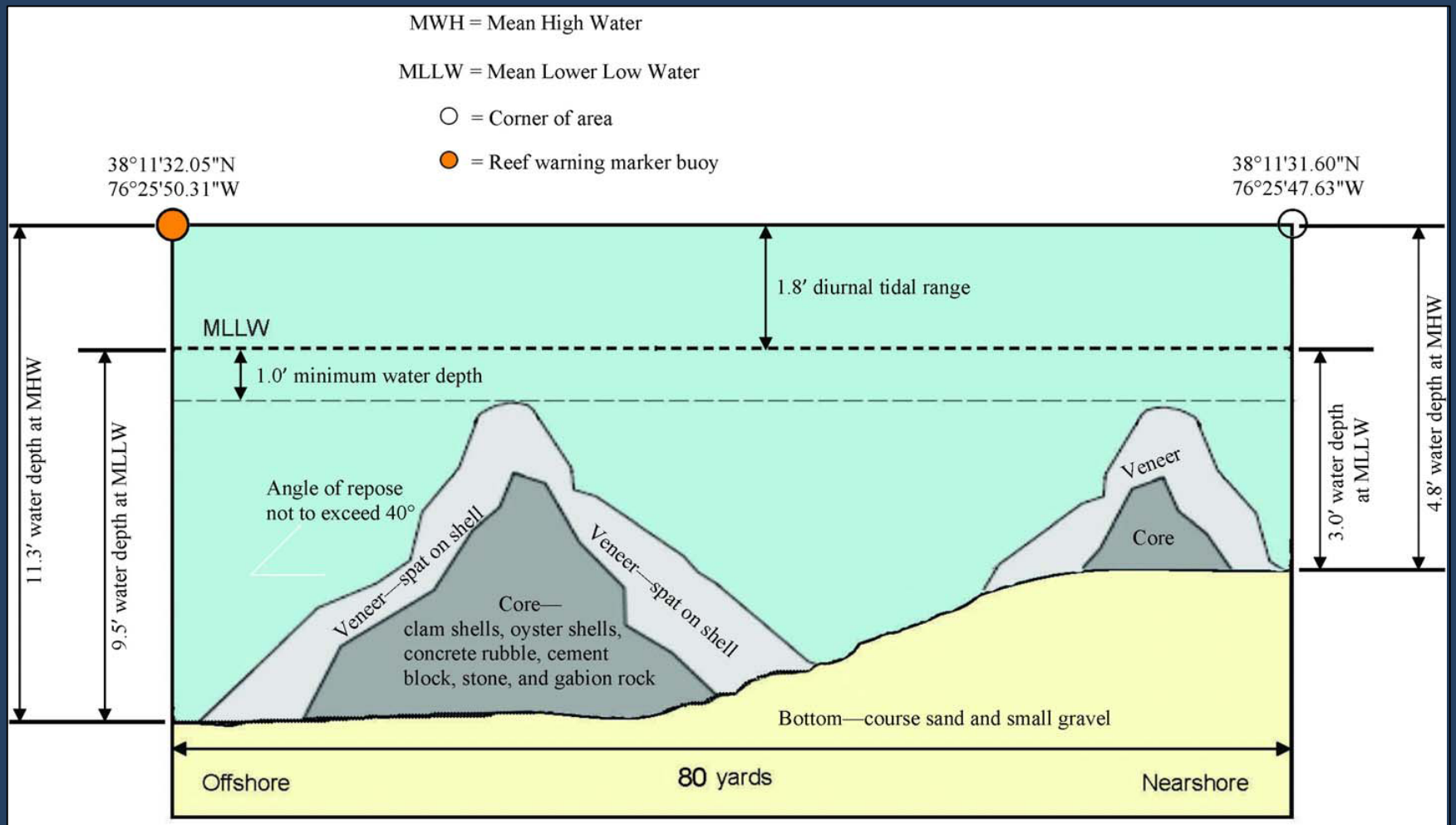
- Construct artificial oyster reefs in the St. Mary's River Oyster Sanctuary that sustainably restore native oyster habitat and ecosystem services
- Conduct monitoring and scientific research to demonstrate the benefits and sustainability of 3-dimensional reefs as a restoration technique
- Provide educational outreach opportunities by involving students and members of the local community


St. Mary's River Watershed
SMNT05
SMNT06
SMNT07
SMNT04
SMNT03
SMNT08
SMNT09
SMNT09.5
SMNT10
SMNT12
SMNT11
SMNT02
SMT02
SMNT13
SMT04
SMT09
SMNT01
SMT10
SMNT14
SMT06
XBE8396
SMT07
XBF6843
N
Sampling Stations
non-tidal
tidal
Watershed


Reef Restoration Area
Pagan Point (reference reef)
St Marys City
St Marys City
© 2012 Google
Image U.S. Geological Survey
596 m
Imagery Date: 3/29/2007
38° 11.443' N 76° 26.115' W elev 0 m


Reef Treatments
= Phase I Reefs (see colors below for treatments)
= Phase II: concrete rubble, no covering, no seeding
= Phase II: concrete rubble, shell veneer, no seeding
= Phase II: concrete rubble, shell veneer, seeding
= Phase II: reef balls, no covering, no seeding
= Phase II: reef balls, shell veneer, no seeding
= Phase II: reef balls, shell veneer, seeding
= Shell that has not been set
= Shell that has been set
= Water Quality Monitoring Station
NORTH AREA
Reef structure area = 2.8 acres
155 m
73 m
SOUTH AREA
Shell bar area = 2.2 acres
MHW
MLLW
= Waves
= Tidal Currents
Depths in feet below MLLW
N

Cross-Sections of our Three- Dimensional Reefs



Linear reef structures:

- vary in height from 2.0′ to 8.5′
- never exceed a height of 1.0′ below MLLW
- vary in length from 15.0′ to 175.0′
- vary in width dependent on height—approx. 2-1 ratio (width -height)
- angle of repose from 25 to 40 degrees

TREATMENTS:

- Reef balls alone
- Reef balls with shell veneer
- Reef balls with spat on shell veneer

- Concrete rubble alone
- Concrete rubble with shell veneer
- Concrete rubble with spat on shell veneer


CCSDA
CHAMPIONSHIPS
2002

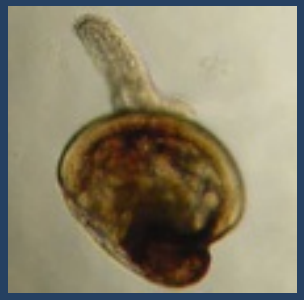

8090X
NY2368PM

Boeing's Oscar Ocasio and SMRWA's Bob Lewis

On December 15th, the Maryland Department of Natural Resources announced a comprehensive plan on oyster restoration, including its intention to recommend Breton Bay and the upper St. Mary's River as the fourth and fifth tributaries to satisfy the state's commitment to the Chesapeake Bay Watershed Agreement goal of restoring native oyster habitat and populations in five tributaries by 2025.

Building Reef Balls

Project by Liz Lee on spat settlement on different substrates



Oyster Shell

Concrete Rubble

PVC

Spat Abundance