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Sustainable Fisheries GIT: Oyster Restoration Progress Update

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Overview of Oyster Restoration Framework

Through the Chesapeake Bay Watershed Agreement, the Chesapeake Bay Program has committed to...

Goal: *Sustainable Fisheries*

Outcome: *Oyster Restoration*

Continually increase finfish and shellfish habitat and water quality benefits from restored oyster populations.

Restore native oyster habitat and populations in 10 tributaries by 2025 and ensure their protection.



Chesapeake Bay Oyster Metrics



- *State and Federal agencies, plus consulting scientists, developed Bay-wide, consensus definition of a 'restored reef' and a 'restored tributary per the Chesapeake Bay Agreement Oyster Outcome.*
- *Called 'Oyster Metrics' or 'GIT Metrics'*
- *On-the-ground restoration is now planned & built to meet these Metrics; monitored relative to them.*

Key Steps for Tributary Restoration

- Develop GIS geodatabase of spatial data
- Survey and characterize the river bottom
- Survey and characterize existing oyster population
- Define 100% of 'currently restorable oyster habitat' ('CROH')
- Set a restoration target (50% to 100% of 'CROH')
- Draft a tributary restoration plan ('Blueprint')
- Identify funding
- Implement and track restoration work
- Monitor success

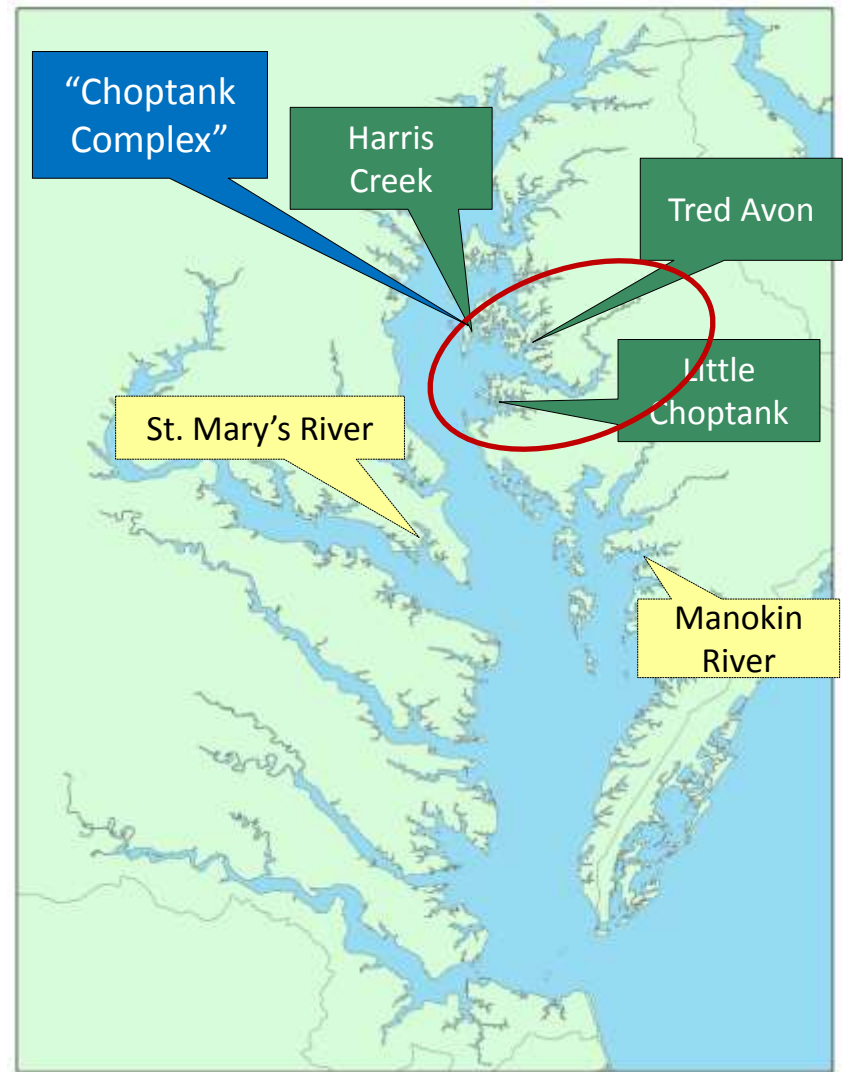
State-specific Updates

- All numbers are PRELIMINARY; end-of-year accounting underway

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Progress in Maryland

MD Target Tributaries for Large-Scale Oyster Restoration



MD Oyster Restoration Workgroups

Sustainable Fisheries Goal
Implementation Team



Community
Consultants



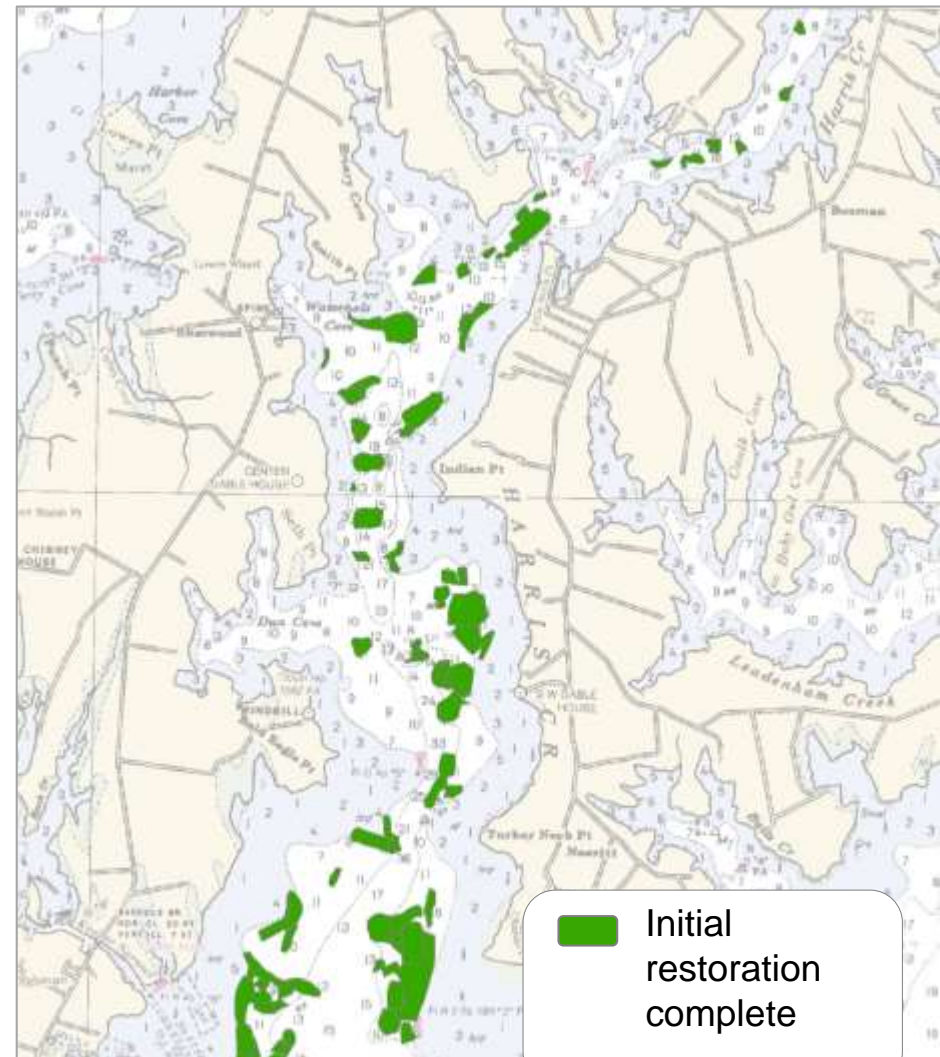
MD Interagency Oyster Restoration
Workgroup



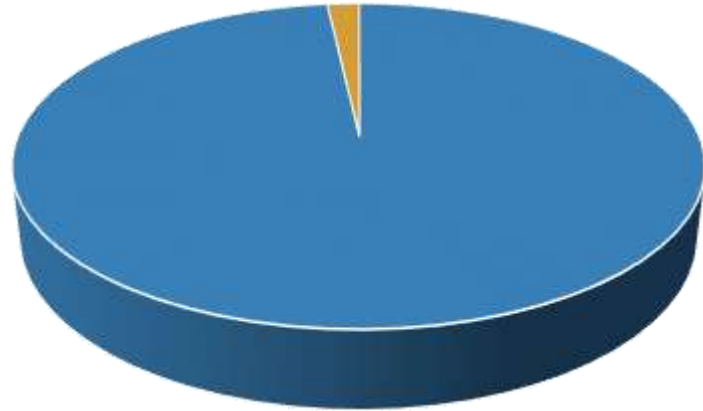
Scientific
Consultants

Harris Creek- Restoration Status

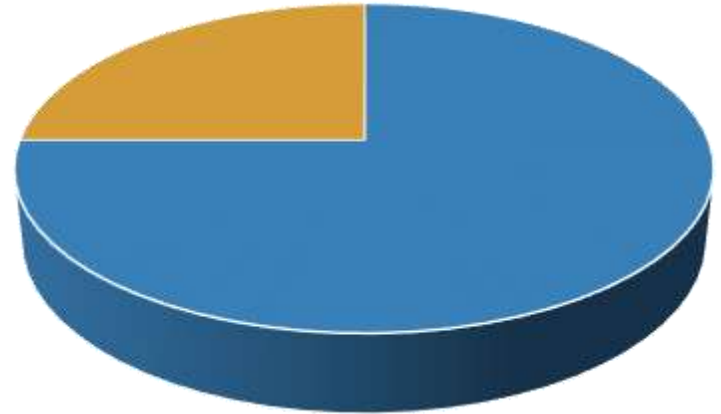
- Started in 2011
- 350 acres
- 2.49 billion spat-on-shell
(produced by U of MD &
Chesapeake Bay Foundation)
- \$28.56 million
- 3-year-old reefs monitored in
2015, 2016, 2017;
2018 underway



Harris Creek Monitoring Results 2015- 2017



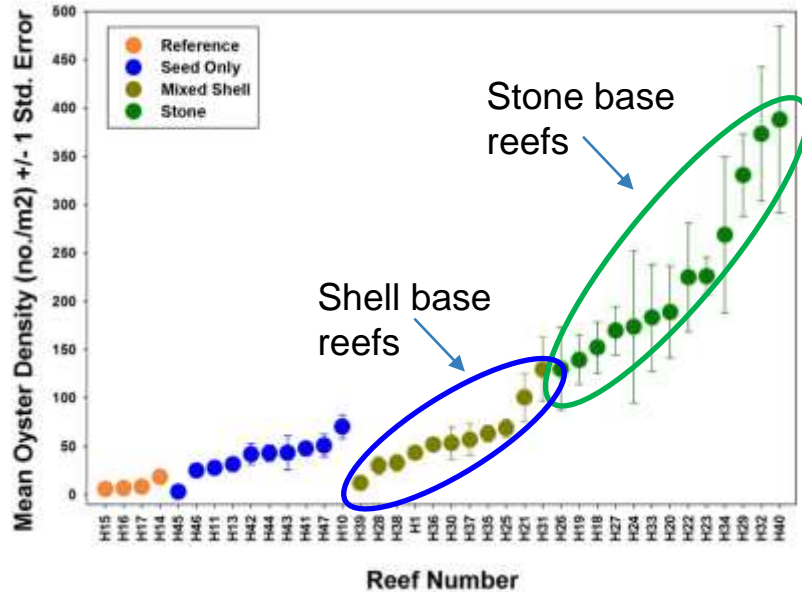
- 98% (55 of 56 restored reefs monitored) met minimum threshold oyster density & biomass



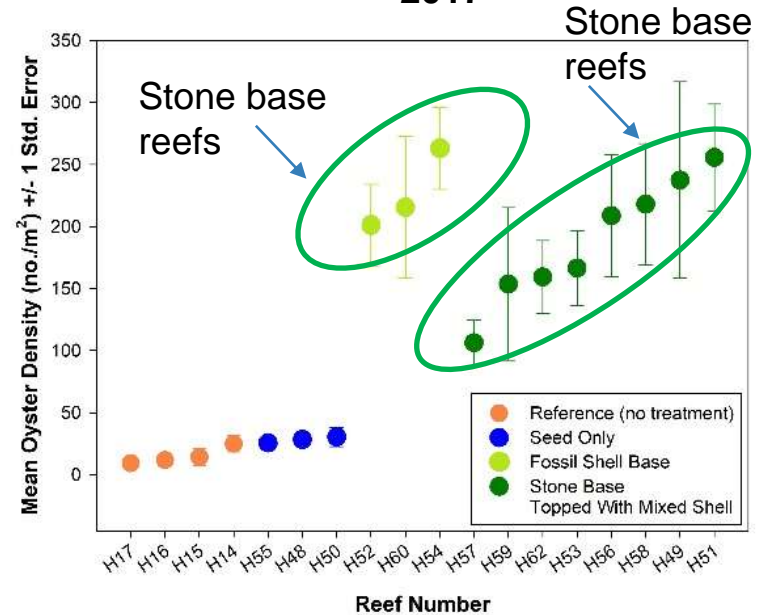
- 75% (42 of 56 restored reefs monitored) met higher, target oyster density & biomass

Harris Creek- Monitoring Results 2016- 2017

2016



2017



Harris Creek: Reference Reef (untreated)



Harris Creek: Seed-Only Reef



Harris Creek: Stone-Base Reef with Seed



Harris Creek

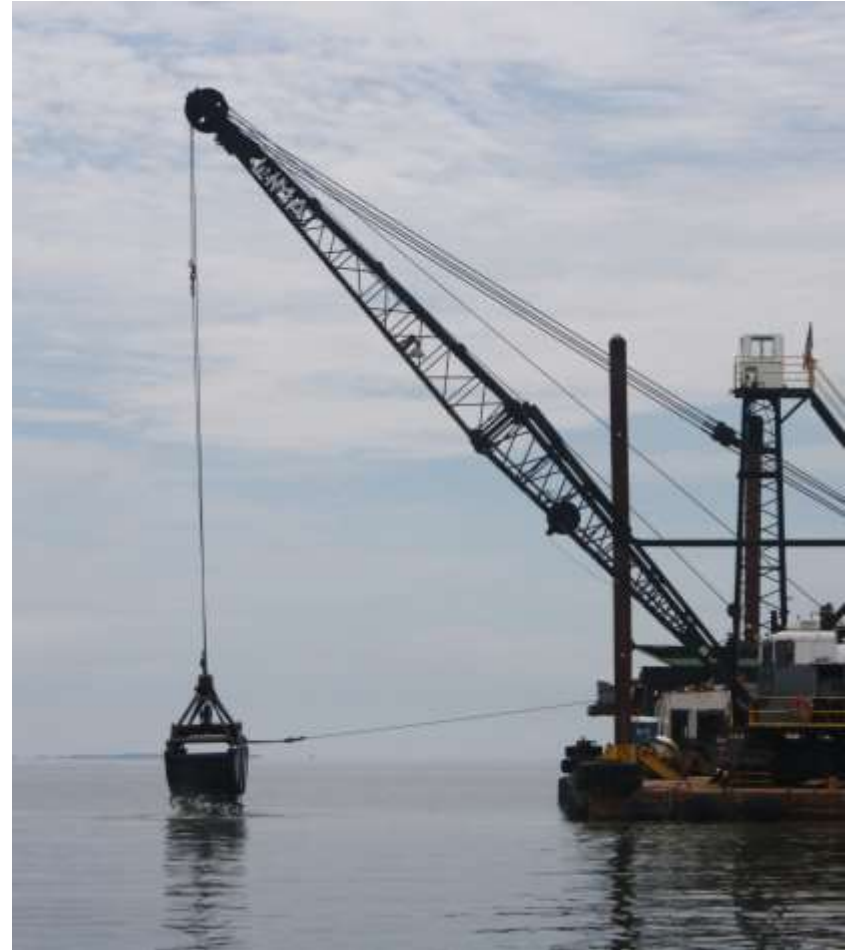
- Mature oysters are found in quantity on stone substrate in Harris Creek.
- Stone in other MD tributaries has not yet been monitored (not yet three years old).



Photo by Oyster Recovery Partnership, 2017

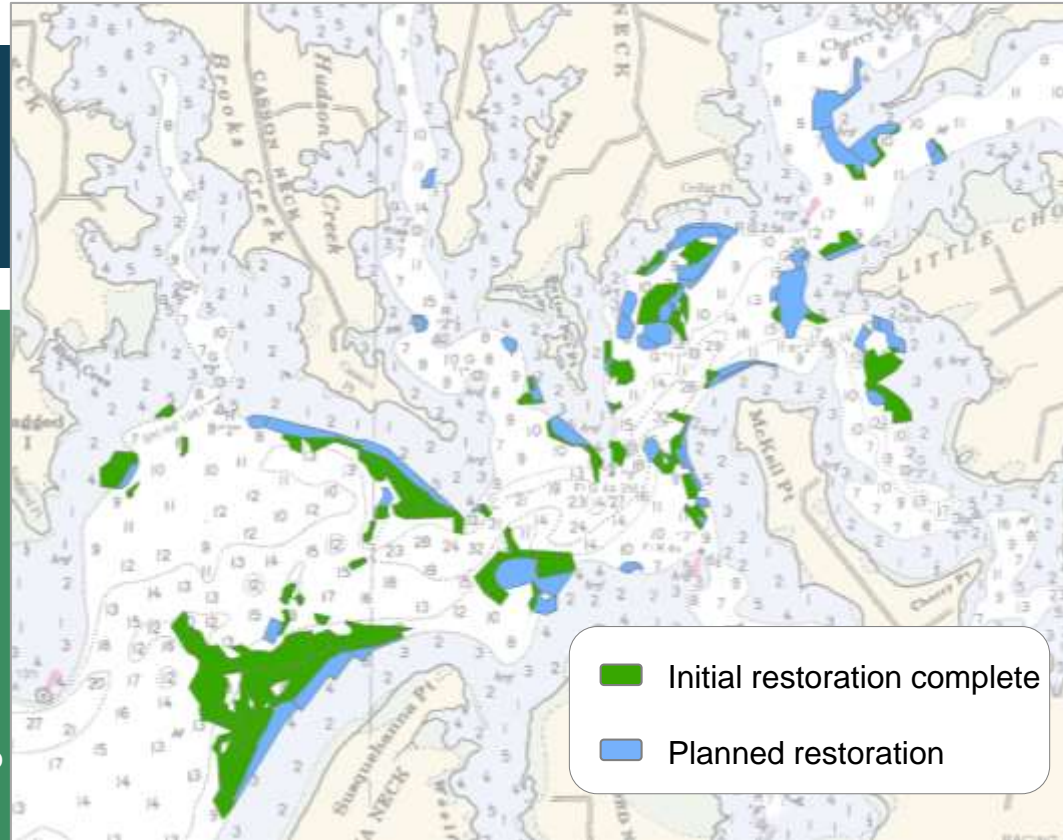
Harris Creek

- Harris Creek alone is the largest sanctuary oyster restoration project in the United States; likely the world.
- Scientists/ resource managers have visited from:
 - China
 - New Zealand
 - Australia
 - Germany
 - Denmark
 - The Netherlands
 - The United Kingdom



Little Choptank River

- Original goal in plan = 440 acres (65% of 'CROH')
- 338.83 acres restored to date (1.64 billion seed; \$21.44 million)
- In 2019, we can reach 50- 51% 'CROH' (343+ acres) by using seed only technique, without constructing remaining planned substrate acres.

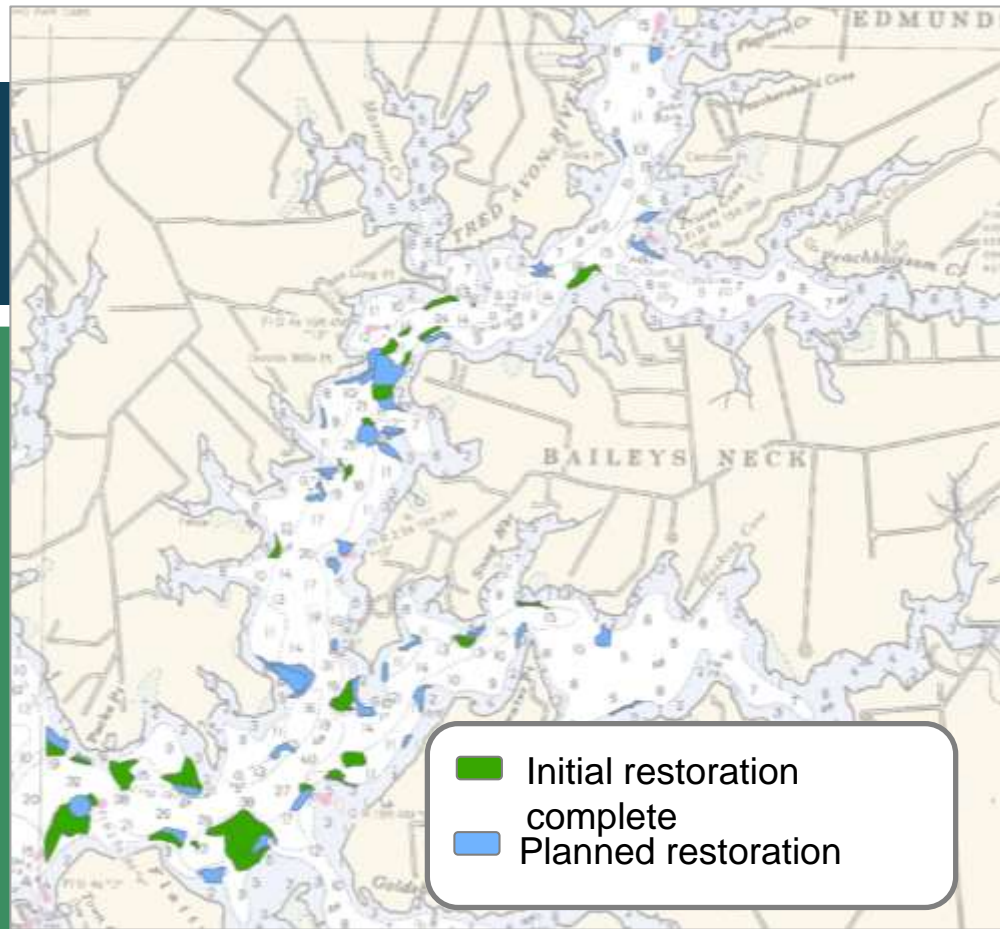


Little Choptank River



Tred Avon River

- 2018: USACE- Baltimore built 4.25 acres from mixed shell (scallop, conch, clam shell)
- 83 acres now complete (416 million seed; \$5.26 million). Goal = 147 acres (59% CROH)
- 2019: will seed <5 remaining unseeded acres. No funding currently available for additional reef construction.



St. Marys River (*recommended tributary*)

- GIS geodatabase established
- Oyster population survey currently wrapping up
- Workgroup has drafted a plan (numbers may change slightly pending final survey results)
- Oyster plantings to start summer 2019



Manokin River (*recommended tributary*)

- GIS geodatabase established
- Oyster population survey winter-spring 2019
- Oyster plantings may start as early as summer 2019

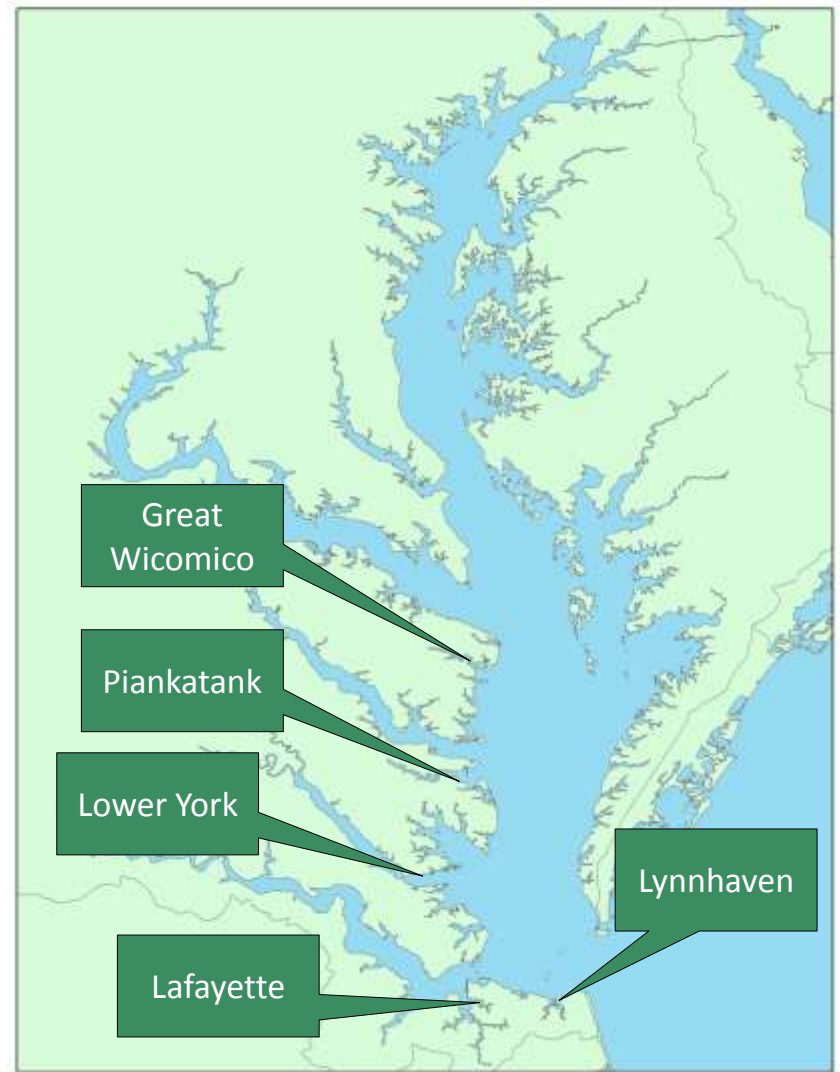


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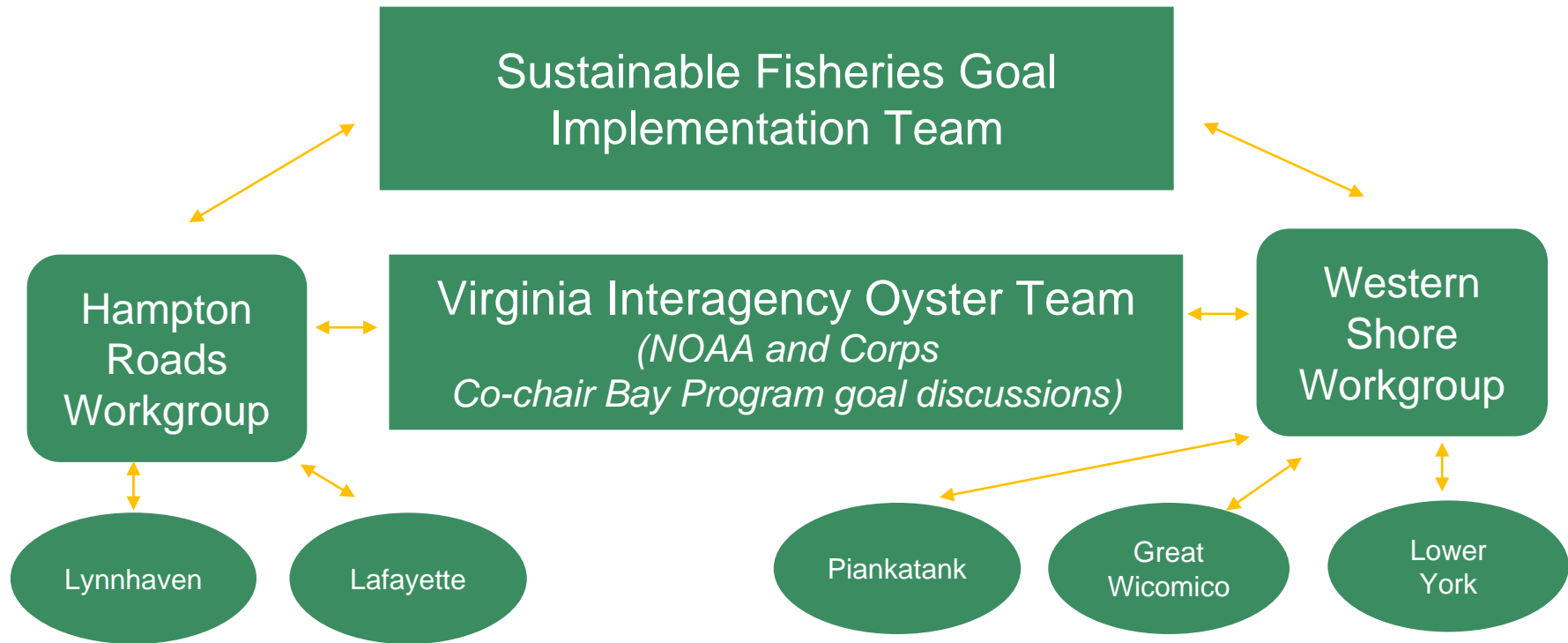
Progress in Virginia



Virginia Target Tributaries for Large-Scale Oyster Restoration



Virginia Oyster Restoration Workgroups



Virginia Oyster Restoration Workgroups

Members include:



Lafayette River

- Plan developed in 2017
- Restoration work completed in 2018!
- Goal: 80 acres
- Actual: 81.1 acres
(48 acres relict reefs; 22.5 acres older restoration projects;
10.6 acres in 2017 & 2018)



Lafayette River



- 2018 reef construction:
 - 6.1 acres
 - Substrate placed in stripes across reef area; then seeded
 - Crushed concrete, shell, stone; 12" high
 - Elizabeth River Project reef construction funded by EPA & NOAA;
 - Chesapeake Bay Foundation seeding funded by EPA & NFWF
- Workgroup now developing coordinated monitoring.



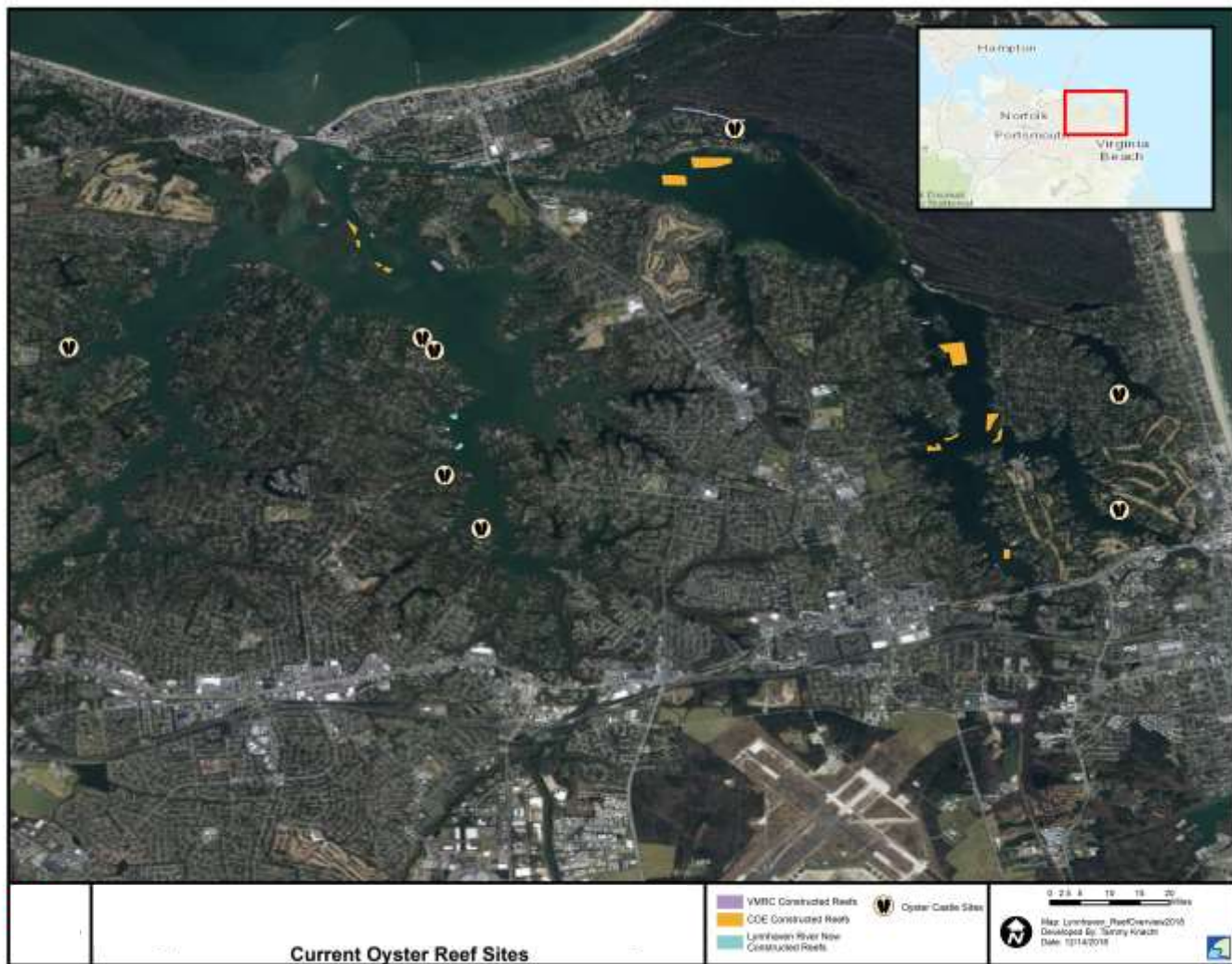
Lynnhaven River



In 2018, the Workgroup finalized the Lynnhaven Oyster Restoration Tributary Plan (Blueprint):

- Restoration Goal: 152 acres
- 54.6 acres of restoration reefs already constructed; 36 acres of natural, intertidal reefs
- Restoration remaining: 61.4 acres





Lynnhaven River – Restoration Planned for 2019



Planned 2019 Restoration Efforts:

- Chesapeake Bay Foundation and Lynnhaven River Now just received \$400,000 NFWF grant to build 5.25 acres of substrate reefs (likely crushed concrete) by 2020.
- VMRC plans to construct 10 acres of substrate reefs with NOAA funding.
- Corps and the City of Virginia Beach plan to construct up to 8 acres of reef habitat, as Phase 1 of the Lynnhaven River Basin Ecosystem Restoration Project.



Lynnhaven River Basin Ecosystem Restoration:
Phase 1 Sites
Virginia Beach, VA



0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6 6.5 7 7.5 8 8.5 9 9.5 10



Piankatank River

- 2018 Workgroup developed draft plan
 - Restoration goal = 437 acres
 - Completed: 278 acres (75 restoration projects + 203 acres 'premet' reefs)
 - Restoration remaining: 160 acres
- 2018 construction:
 - VMRC/ TNC constructed 15+ acres at three reef sites
 - Crushed stone 2" in diameter; 3" high
 - \$200,000 project
 - VCU planted with approximately 7 million spat-on-shell



Piankatank River

- Map showing constructed, planned, and potential reefs.
- 2019: VMRC plans to build reefs- acreage depends on funding.
- USACE/VMRC plans to build 165 acres, pending funding.



Piankatank River Monitoring Update

- Substantive amount of previously constructed reefs that already meet GIT metrics – verified through VMRC monitoring program
- ROV footage of 2017 constructed 25-acre Burton's Point Reef in the Piankatank River

<https://wm1693.box.com/s/otmy3nb1mhx0q6ujthbdexxa9c45vi9o>

Great Wicomico

- In 2018, NOAA, with Workgroup info, developed a geodatabase of available spatial information for the River. This will serve as the basis for planning efforts.
- Previous restoration projects: in 2003 and 2004, the Corps/VMRC used shell to create 85 acres of reef habitat. Reef rehabilitation and adaptive management has occurred over time.
- In 2018, USACE funded VIMS/CNU to assess the previously constructed USACE restoration reefs relative to Oyster Metrics success criteria. Results will inform restoration planning.



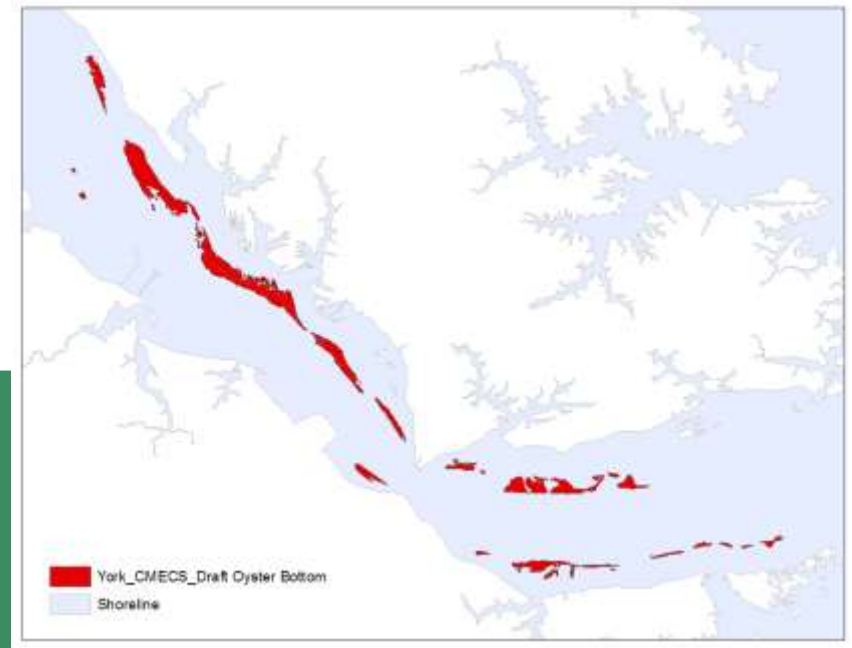


Great Wicomico Preliminary Monitoring 2018 Update

- VIMS has completed the patent tong sampling – some of reefs are now over 14 years old.
- Overall general status of previously constructed restoration reefs is promising
- On first look, we anticipate reefs 1-4, 8, 9, and 16 to meet or exceed GIT metrics
- Reefs 10-11 appear to have lost acreage – potentially due to anoxic conditions
- Reefs repaired in 2015 appear to be in good condition and anticipated to meet or exceed GIT metrics
- Evidence of reef impacts/potential poaching at edges of Reefs 10-11 and 13

Lower York

- 2018: NOAA, with Workgroup data, developed geodatabase of available spatial information for the River. This will serve as the basis for planning efforts.
- 2018: NOAA conducted sonar survey and developed a habitat assessment. Workgroup will use to determine currently restorable oyster habitat and set a restoration goal for the River.
- 2019: Workgroup to determine upstream and downstream river extent; begin planning.



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Summary of Progress Bay- Wide Progress



What is our Bay-wide progress?

Maryland

Selected Tributaries:

- Harris Creek
- Little Choptank
- Tred Avon
- St Mary's (*recommended*)
- Manokin (*recommended*)

Virginia

Selected Tributaries:

- Lafayette
- Lynnhaven
- Piankatank
- Great Wicomico
- Lower York





What is our Bay-wide progress?

- Ten tributaries selected/ recommended Bay-wide.
- Workgroups completed five restoration blueprints (Harris, Tred Avon, Little Choptank, Lafayette, Lynnhaven); two more in draft form (St Marys, Piankatank).
- Initial restoration complete in two tributaries.
- Since 2011: Approx: 863 acres of restoration projects Bay wide (770 acres MD; 92 acres in VA)
- Monitoring phase started in three tributaries (Harris; Little Choptank; Tred Avon); coordination work for starting in Lafayette.
- 98% of MD monitored reefs meet Oyster Metrics minimum threshold success criteria three years post restoration.



Discussion