Science Guiding Large-Scale Oyster Restoration

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Policy Context

Plans Align:

- Chesapeake Bay Executive Order oyster goal & new Chesapeake Bay Agreement goal = Restore oyster populations in 10 tributaries by 2025;
- USACE Oyster Restoration Master Plan
- DNR Oyster Restoration & Aquaculture Development Plan
- NOAA selected the Choptank Complex as a Habitat Focus Area

Oyster Metrics:

- NOAA, USACE, DNR, VMRC, Army Corps, UMD, VIMS + 17 consulting scientists;
- Developed Bay-wide, consensus definition of 'restored reef' and 'restored tributary'
- On-the-ground restoration is now being planned and built to meet these metrics; monitored for success against them

Established:

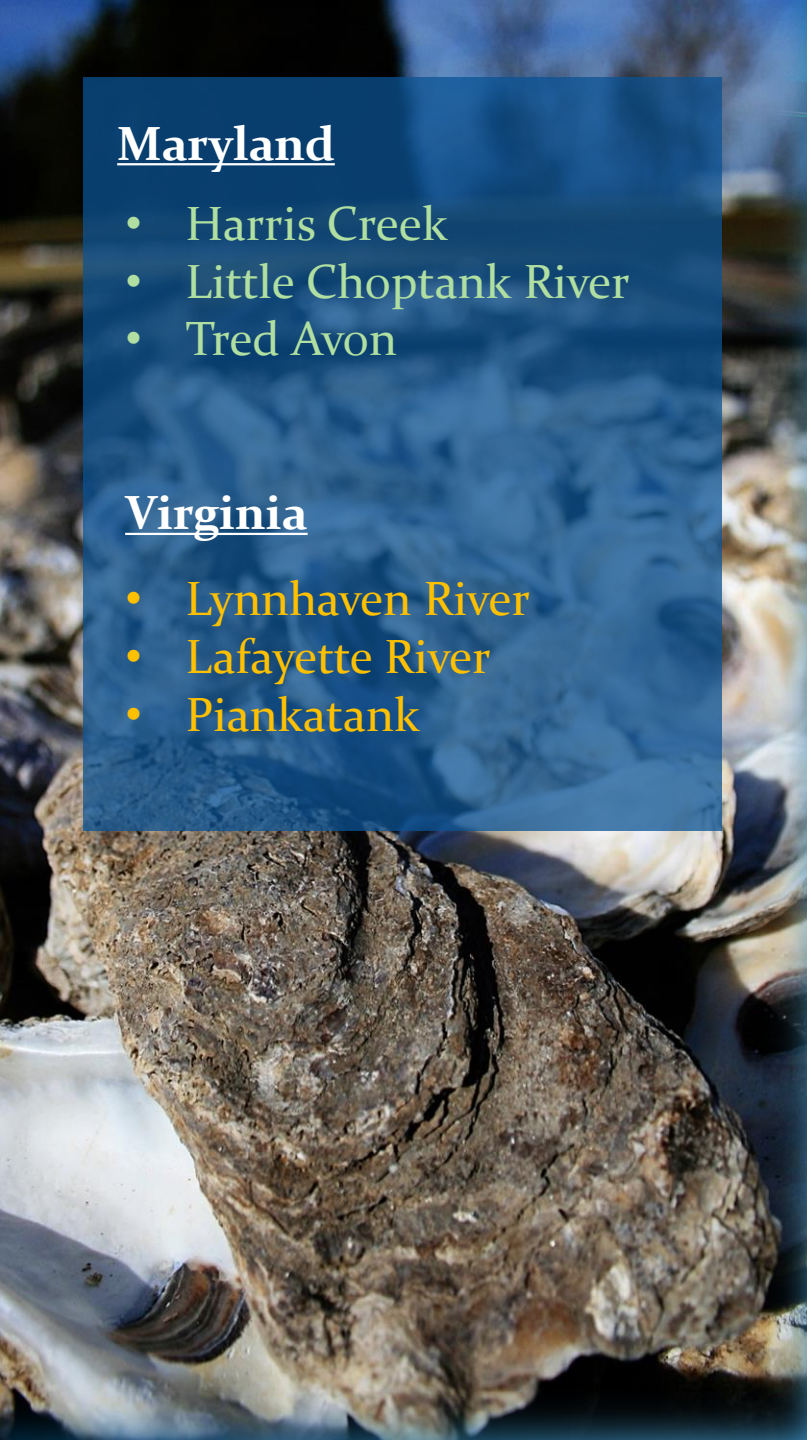
MD & VA Oyster Restoration Interagency Workgroups under the Sustainable Fisheries Goal Implementation Team.

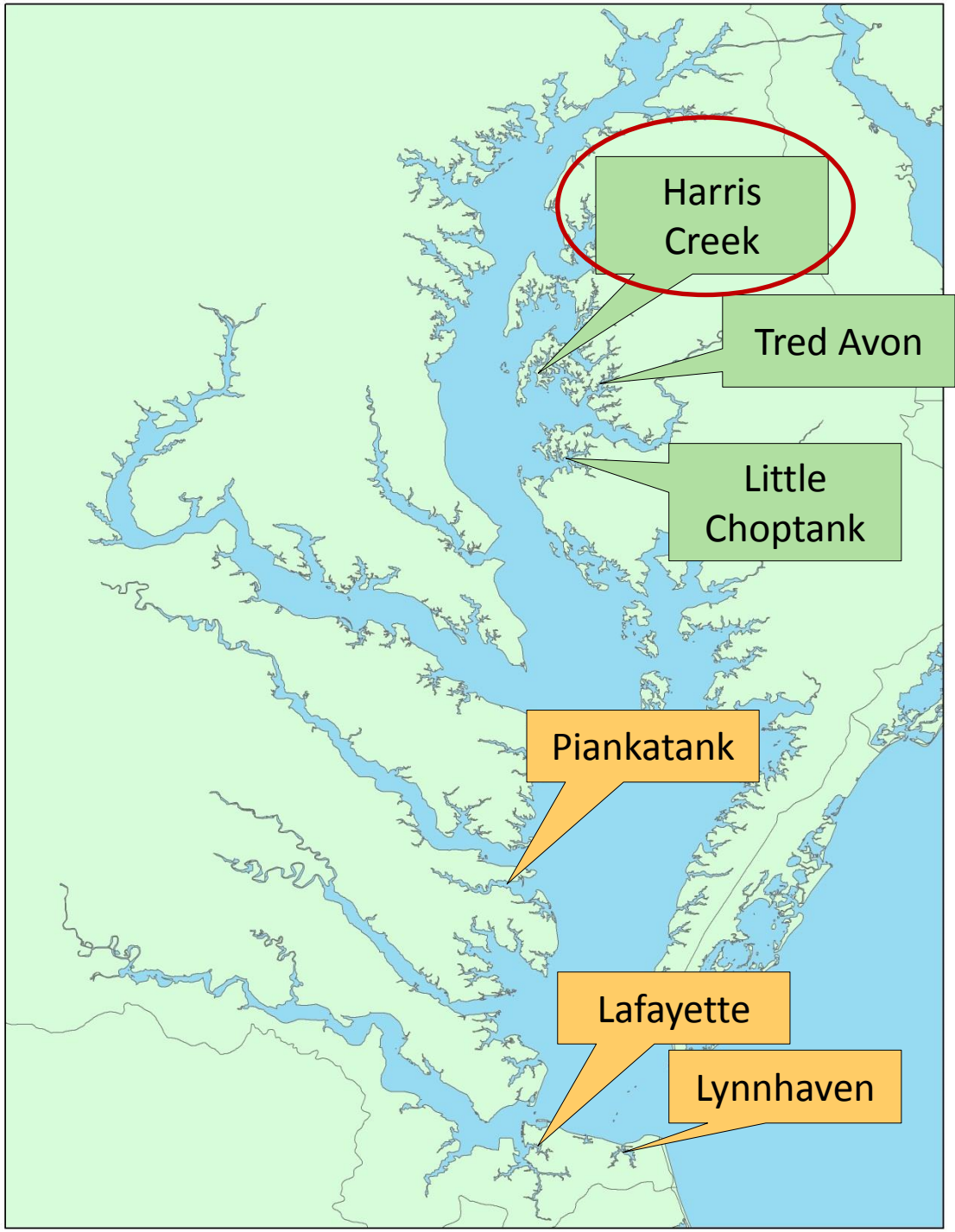
Maryland

- Harris Creek
- Little Choptank River
- Tred Avon

Virginia

- Lynnhaven River
- Lafayette River
- Piankatank



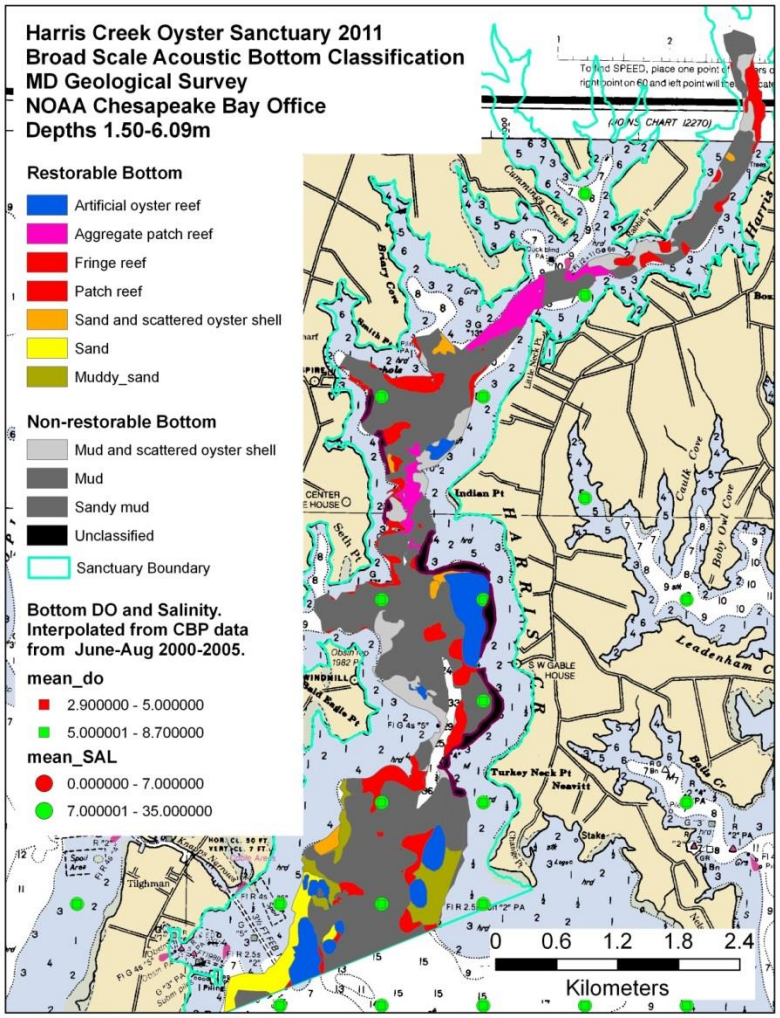


MD oyster restoration workgroup

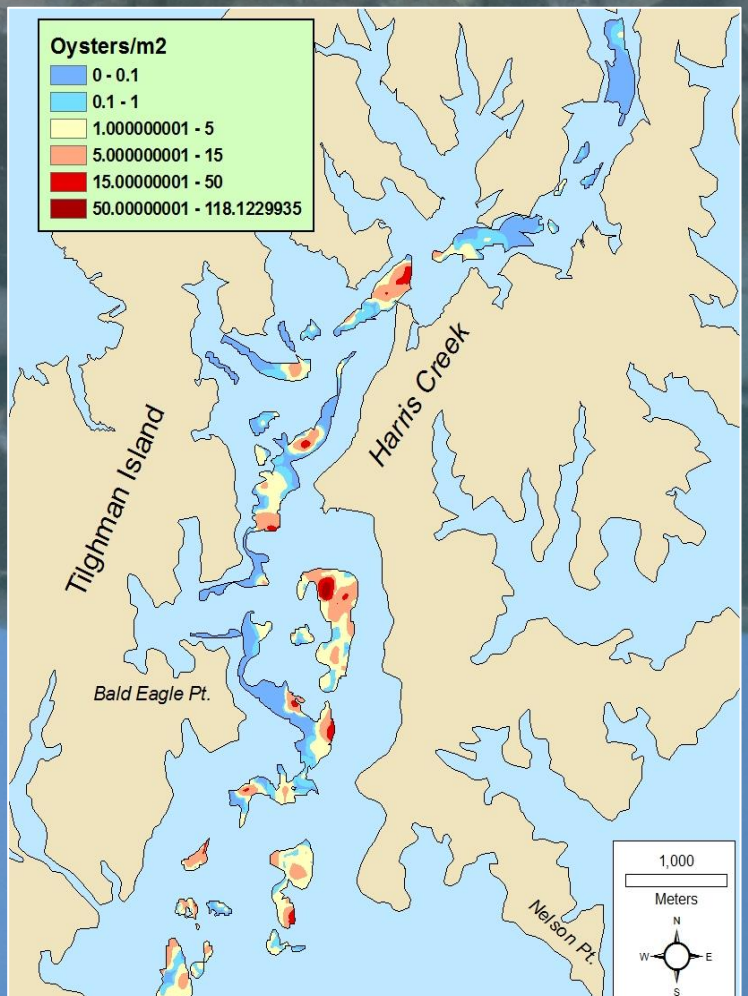
- NOAA; USACE Baltimore District; MD Dept Natural Resources; Oyster Recovery Partnership
- Created Oyster Restoration Tributary Plans, in consultation with partners and consulting scientists
  - Used science to target restoration areas; estimated seed needs, substrate needs, cost;
  - Workgroup coordinates implementation and tracks progress

Science guiding restoration site selection

Benthic habitat characterization + bathymetric data + water quality data = Restorable Bottom Analysis



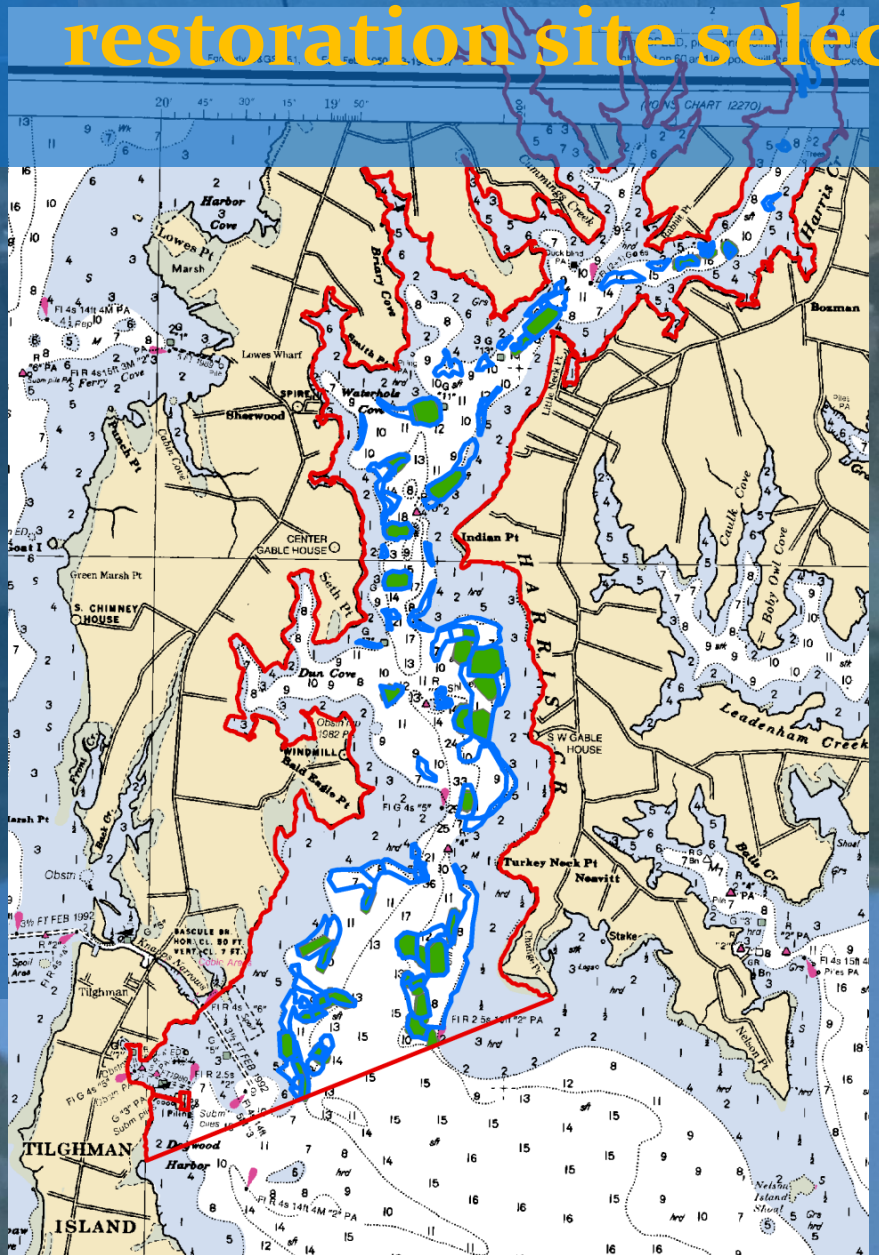
Oyster Population Survey



Science guiding restoration site selection

Harris Creek

- Proposed restoration (377 acres)
- Has received restoration treatment (188 acres, as of end 2013)
- Oyster sanctuary boundary



Science guiding restoration site selection

Science guiding monitoring & analysis

Oyster Metrics success criteria

(measured 3 years and 6 years post restoration)

- Oyster population (density, biomass)
- Presence/ absence of multiple year classes;
- Reef height;
- Reef area;
- Reef patchiness;
- Anoxic vs. oxic shell volume

Diagnostic parameters

(most measured continuously, or at fall survey and 3 and 6 year check in points)

- Dissolved oxygen,
- Temperature;
- salinity;
- pH;
- chlorophyll a;
- Alkalinity;
- oyster disease;
- predation;
- signs of poaching.

Science guiding monitoring & analysis

Soooooooo… how are they doing??

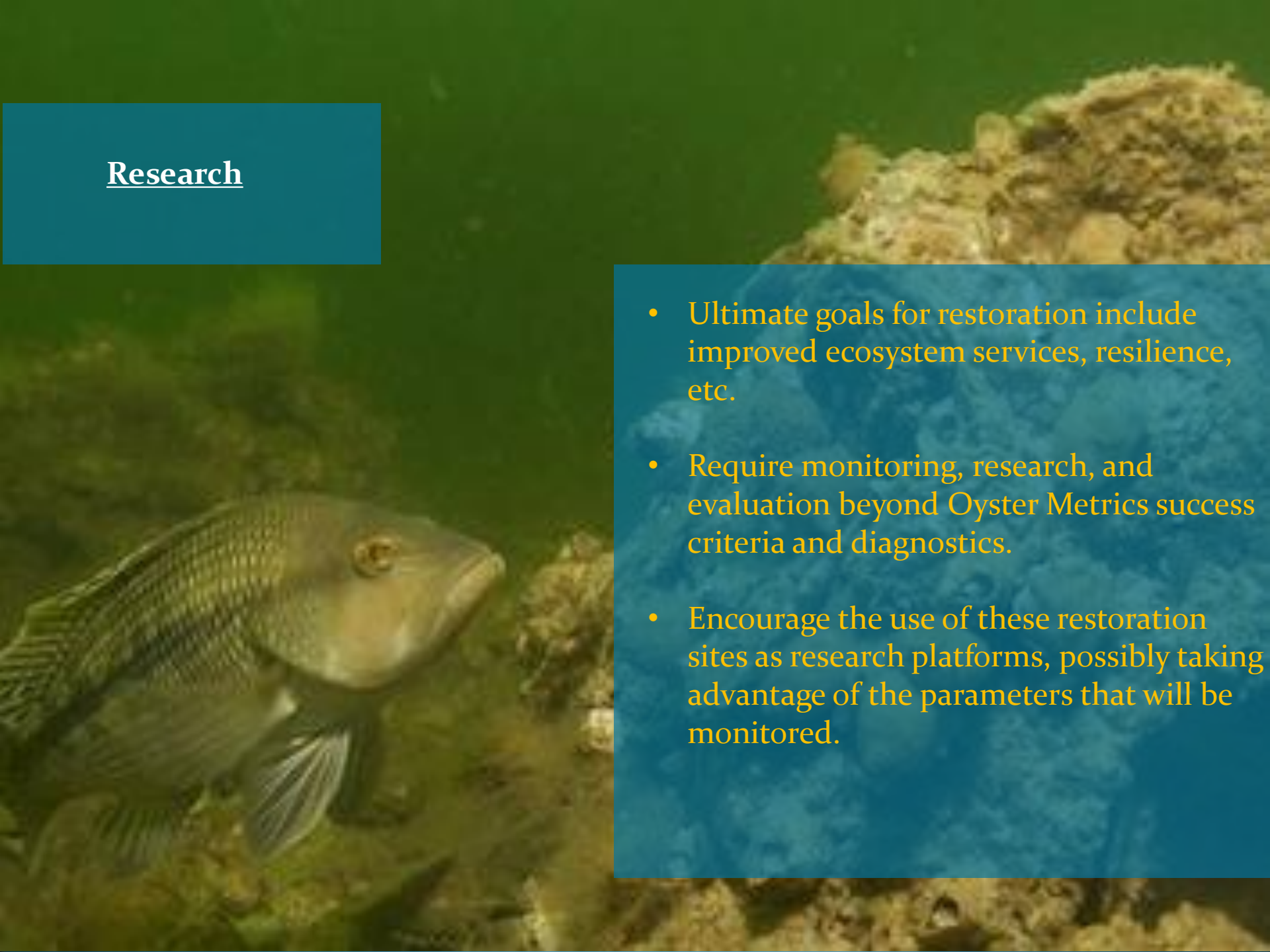
First 97 acre planted are due for "3 year check in" in fall 2014

Meanwhile… annual monitoring on a sub-set of sites shows promising results:

- Planted oyster survival is double what was anticipated in the Harris Creek Tributary Plan;
- Dermo disease: prevalence varies, but intensity is at sub-lethal levels
- Water quality conditions generally favorable

Potential threats:

- Poaching
- Disease outbreak
- Continued funding always an issue



Research

- Ultimate goals for restoration include improved ecosystem services, resilience, etc.
- Require monitoring, research, and evaluation beyond Oyster Metrics success criteria and diagnostics.
- Encourage the use of these restoration sites as research platforms, possibly taking advantage of the parameters that will be monitored.