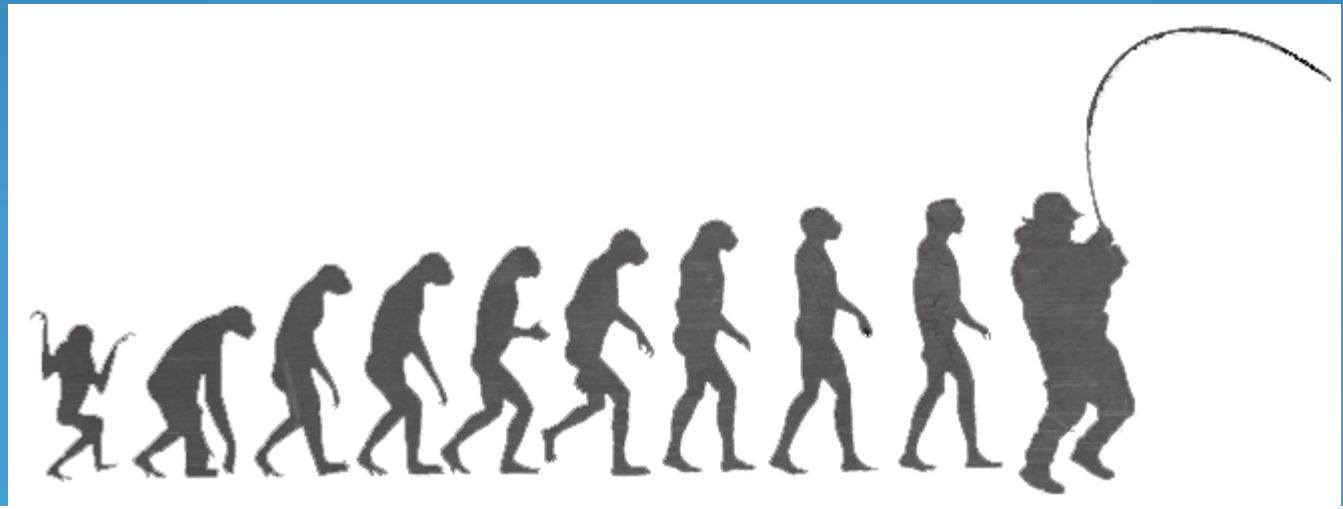
Enabling Effective Adaptive Management in the Chesapeake Bay Program

Sustainable Fisheries Goal Implementation Team

Executive Committee Meeting

March, 26th 2012



Why Adaptive Management?

- Adaptive management has long been discussed, advocated, and implemented (in limited fashion) within the Chesapeake Bay Program
  - Described in the CBP's internal governance document
  - Featured in Executive Order 13508 Strategy
- CBP Management Board decided to implement adaptive management in 2010
- Necessary for the CBP to "move forward in a more strategic and well-coordinated manner"

Adaptive Management Process

1. Articulate Program Goals
2. Describe Factors Influencing Goal Attainment
3. Assess Current Management Efforts (and gaps)
4. Develop Management Strategy
5. Develop Monitoring Program
6. Assess Performance
7. Manage Adaptively

" My ability to adapt is the key to my success. "

Why Oysters First?

- Most migratory species are managed by ASMFC
- Blue crab management successful through CBSAC
  - Adaptive management process already in place
- An oyster decision framework allows our GIT to:
  - Learn about management gaps in oyster restoration
  - Specifically describe what actions we are taking and why

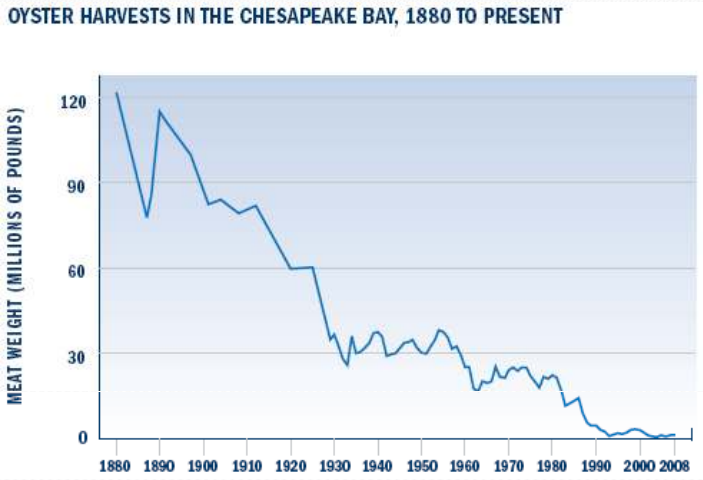
1. Articulate Program Goal

- Restore native oyster habitat and populations in 20 tributaries out of 35 to 40 candidate tributaries by 2025.

Target Date	Programmatic Milestone
	OYSTER
December 2012	The Fisheries GIT will continue to adopt and apply oyster restoration performance metrics to existing projects in the Great Wicomico and Lynnhaven rivers. These metrics will be used to guide new tributary restoration planning and monitoring. (NOAA/USACE)
December 2012	Complete native oyster protection and restoration strategy, including a collaborative and agreed-upon federal-state list of priority tributaries targeting four to six tributaries for restoration and lay out steps for expanding aquaculture and evaluating sustainability of wild fishery. The collaborative strategy will document a phased approach for developing tributary scale restoration plans, reef construction, monitoring and performance evaluation. (NOAA)
December 2012	Complete USACE Native Oyster Restoration Master Plan. (USACE)
December 2012	Complete bay-wide Oyster Stock Assessment. (NOAA)

2. Factors Influencing Goal Attainment

- Low Population
- Reduced Habitat Area
- Poor Water Quality
- Varying Restoration Approaches between MD and VA
- Shell Availability
- Budget Limitations



3. Assess Current Management Efforts (and gaps)

- Previous efforts relatively small scale
- Oyster Restoration Metrics Report (December, 2011)
  - Establishes a set of peer reviewed scientifically agreed upon targets, metrics, and monitoring protocols for *sanctuary* reefs
- USACE Chesapeake Bay Native Oyster Restoration Master Plan (near completion)
  - Outlines long-term plan for large-scale native oyster restoration
  - Identifies target tributaries based on environmental criteria

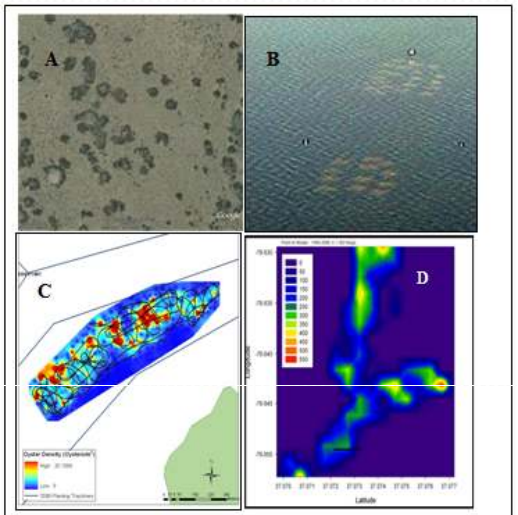


Figure 2. Shell and oyster coverage on natural and restored reefs: (**A**) Intertidal patch reefs in the VA coastal bays; (**B**) Shell plants in mounds in the Rappahannock River; (**C**) Track lines from seed planting and oyster densities on a restored reef in the Chester River; (**D**) Map of oyster density on Point of Shoals reef in the James River. (Figure credits: A. Image from VA Base Map Program via Google Maps; B. photo by P.G. Ross; C. figure from Ken Paynter; D. figure from Roger Mann.)

Norfolk District Chesapeake Bay Native Oyster Master Plan

4. Develop Management Strategy

- 2012 - Federal and state partners are working toward a list of priority tributaries
  - Targeting 4-6 tributaries for restoration
- Fisheries GIT establishing MD and VA Interagency Workgroups
  - Lead and monitor the restoration of priority tributaries
  - Utilize latest habitat mapping tools and spatial analyses to assess the restorable bottom in development of 'restoration blueprints'
  - MD → Harris Creek
  - VA
    - Great Wicomico and Lynnhaven will be evaluated based on the metrics report
    - Lafayette and Piankatank rivers → Tributary scale efforts being considered

5. Develop Monitoring Program

- The Oyster Metrics Report outlines a monitoring protocol to measure progress towards the established targets and thresholds
  - 1. Structure of the restored reef (reef spatial extent, reef height, and shell budget)
  - 2. Population density (as individual abundance and biomass)
  - 3. A total reef population estimate (biomass)

6. Assess Performance

- Evaluation of success in oyster restoration efforts:
  - Several levels over varying spatial and temporal scales
  - Targets and metrics of operational success required to guide restoration
- Individual Reef Monitoring
  - Required to determine success at various stages by evaluating:
    - Recruitment success
    - Post-settlement/planting survival
    - Natural mortality
    - Disease status
    - Growth
    - Reproduction and shell accumulation
- Tributary Level Evaluation
  - Operational definitions about the area within a tributary needing rehabilitation
  - Functional measures of the status of those areas several years after the restoration activity

7. Manage Adaptively

- Based on the monitoring assessment, system models are amended, and monitoring strategies are revised to improve program performance.
- After restoration efforts are undertaken and monitored for their success, we can loop back and assess our strategy