



Oyster Management Review: 2016-2020

**Presentation to the Oyster Advisory Commission
February 15, 2022
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Purpose of the Report

“The department has committed to reviewing the effectiveness of the locations of sanctuaries, public shellfish fishery areas, and aquaculture areas every 5 years and to propose changes where needed.”

Reports can be found at:

<https://dnr.maryland.gov/fisheries/Pages/oysters/5-Year-Oyster-Review-Report.aspx>



Three Management Areas

Sanctuaries – Areas permanently closed to oyster harvest. Some sanctuaries have been targeted for extensive oyster restoration projects to potentially accelerate the recovery of oyster populations within the sanctuary, increase their environmental benefits, and contribute to enhancement of populations outside the sanctuary.

Public Shellfish Fishery Areas (PSFA) – Areas where shellfish are harvested for commercial purposes. Oyster aquaculture leases are not allowed in these areas unless a petition to declassify is approved, which may occur if a biological survey indicates that the area does not have enough oysters to support commercial harvest by the public fishery.

Aquaculture – Areas where aquaculture leases are issued by the state to individuals or businesses for private aquaculture.

Management Area Objectives

Effectiveness is defined relative to the original management objectives in the 2010 proposal: to restore the ecological function of oysters and to enhance the commercial fishery for its economic and cultural benefits.

Sanctuary

- Protect half of the “best bars” and investigate why these areas remain productive;
- Facilitate development of natural disease resistance
- Provide essential ecological functions
- Serve as reservoirs of reproductive capacity
- Located in all salinity zones
- Increase ability to protect sanctuaries from illegal harvesting

PSFA

- Retain 168,000 acres of natural oyster bars including 76% remaining productive oyster habitat
- Protect half of the “best bars” as for the benefit of licensed oystermen
- Implement a more targeted and scientifically managed wild oyster fishery.

Aquaculture

- Streamline the regulatory process for aquaculture
- Open new areas to leasing to promote shellfish aquaculture industry growth
- Provide alternative economic opportunities for watermen

Sanctuary Objective Evaluation



Objective #1: Protect half of the Bay's most productive oyster grounds that remain and allow investigation of the reasons why these remain most productive. [Jones and Rothschild 2009 'Best Bars' Analysis]

- 2009 'best bars' analysis (same as last report)
 - Based on number of 'best bars', 59% in sanctuaries
- 2020 'best bars' analysis
 - Based on number of 'best bars', 50% in sanctuaries
- Recommend 'best bars' analysis should not remain static; instead update periodically

Sanctuary Objective Evaluation



Objective #2: Facilitate development of natural disease resistance.

- Objective remains under evaluation
- Recent disease levels over this time period have been below the long-term averages
- Continue to collect and analyze disease information



Objective #3: Provide essential natural ecological functions that cannot be obtained on a harvest bar.

- Objective is being met and will continue to be evaluated
- Research showed how a complex, three-dimensional structure created by large-scale restoration sanctuaries impacts the food web and nutrient cycling to benefit the oyster reef and the ecosystem as a whole



Objective #4: Serve as a reservoir of reproductive capacity.

- Objective remains under evaluation
- Reproductive potential has increased - increased number of larger, older oysters

Sanctuary Objective Evaluation



Objective #5: *Provide a broad geographic distribution across all salinity zones.*

- 30% acreage in low-salinity
- 56% acreage in medium-salinity
- 15% acreage in high-salinity



Objective #6: *Increase ability to protect sanctuaries from illegal harvesting.*

- Larger sanctuary areas including inter-connecting non-oyster bottom
- Implementation of MLEIN - radar monitoring & video surveillance
- Ability to suspend licenses administratively with the points system for multiple sanctuary violations
- Aviation unit

PSFA Objective Evaluation



Objective #1: Retain 168,000 acres of natural oyster bars including 76% (27,000 acres) of the remaining 36,000 acres of remaining productive oyster habitat identified in the Programmatic Environmental Impact Statement (PEIS).

- 179,836 acres are classified as PSFAs
- 27,000 (76%) acres of productive bottom in areas open to public fishery

PSFA Objective Evaluation



Objective #2: Include half of Maryland's consistently most productive oyster grounds (Jones and Rothschild 2009 'best bars') for the benefit of licensed oystermen.

- 2009 'best bars' analysis (same as last report)
 - Based on number of 'best bars', 71% in PSFA
- 2020 'best bars' analysis
 - Based on number of 'best bars', 58% in PSFA
- Recommend 'best bars' analysis should not remain static; instead update periodically

PSFA Objective Evaluation



Objective #3: Maintain a more targeted and scientifically managed public oyster fishery.

- Maryland oyster stock assessment
- Harvest rules for the oyster season are being developed annually based on the fishing levels and abundance relative to the biological reference points
- 2019 Oyster Management Plan (will be updated in 2022)
- 2021 Oyster Advisory Commission consensus process

Aquaculture Objective Evaluation



Objective #1: Streamline the regulatory process for aquaculture.

- Legislation passed in 2009 and 2011 removed many impediments to shellfish aquaculture in Maryland and streamlined the regulatory process
- Aquaculture Coordinating Council and Maryland General Assembly



Objective #2: Open new areas to leasing to promote shellfish aquaculture industry growth.

- 2009 Lease Law opened thousands of acres for shellfish aquaculture leasing
- Leaseholders required to actively plant and use leases
- 53% increase in leased acreage over past five years

Aquaculture Objective Evaluation



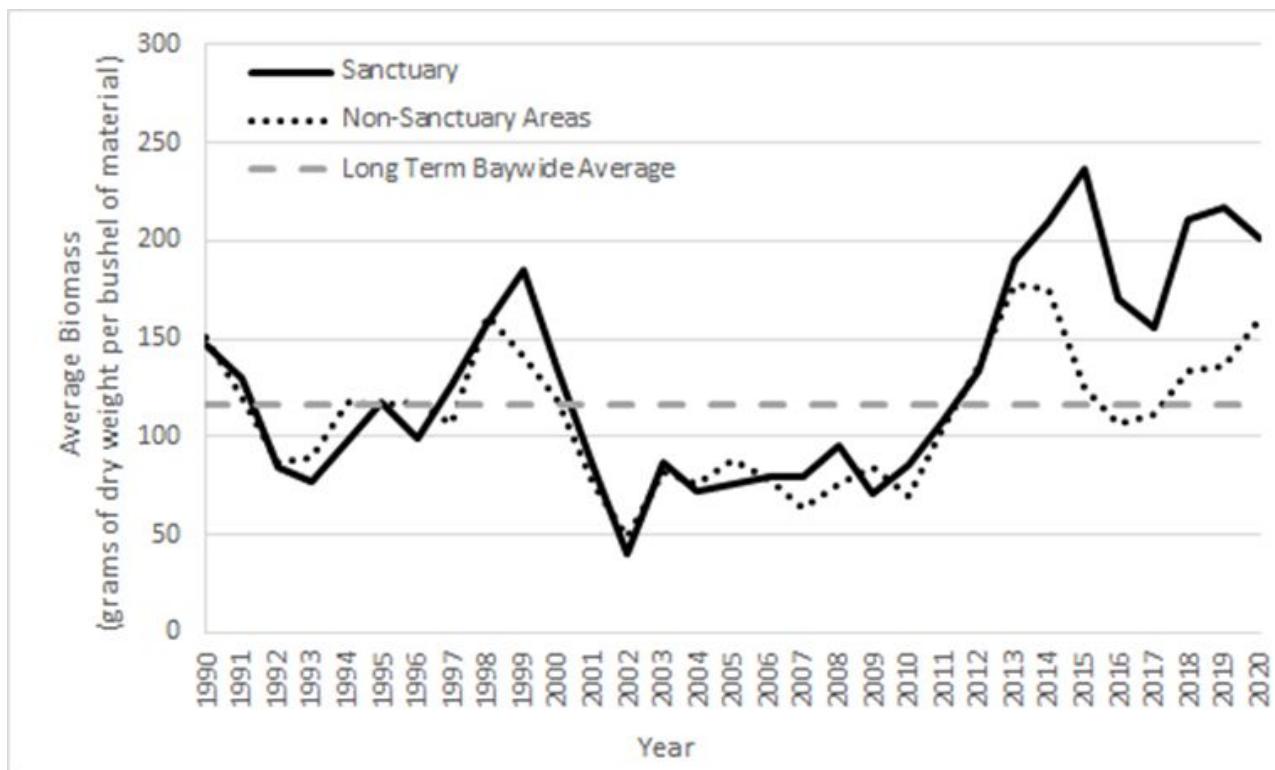
Objective #3: Provide alternative economic opportunities for watermen.

- 45% of leaseholders are commercial licensed watermen in Maryland in 2019
- During the 2019 calendar year, aquaculture production accounted for 20% of the total oyster harvest
- Price per bushel in 2019
 - Aquaculture average price per bushel = \$55
 - Public fishery average price per bushel = \$44
- Leaseholders selling oysters in months outside of the public fishery season (Oct. to March)

Overall Trends

Oyster populations baywide:

- Benefited from low mortality
- Three good years of reproduction (spatfall) in 2010, 2012, and 2020
- Biomass generally increased



Classifying Areas

- Determining performance of individual areas allows for the relative comparison of which areas are performing better than others
- Each sanctuary and PSFA (combined into NOAA Code harvest area) was ranked according to their productivity
- Productive area = high density of oysters, good habitat, and good survival
- Ranking analysis conducted
 - Used metrics from Fall Survey data collected within the last 10 years (2011 to 2020): density of market oysters, small oysters, and spat; the amount of cultch (substrate); and total estimated mortality

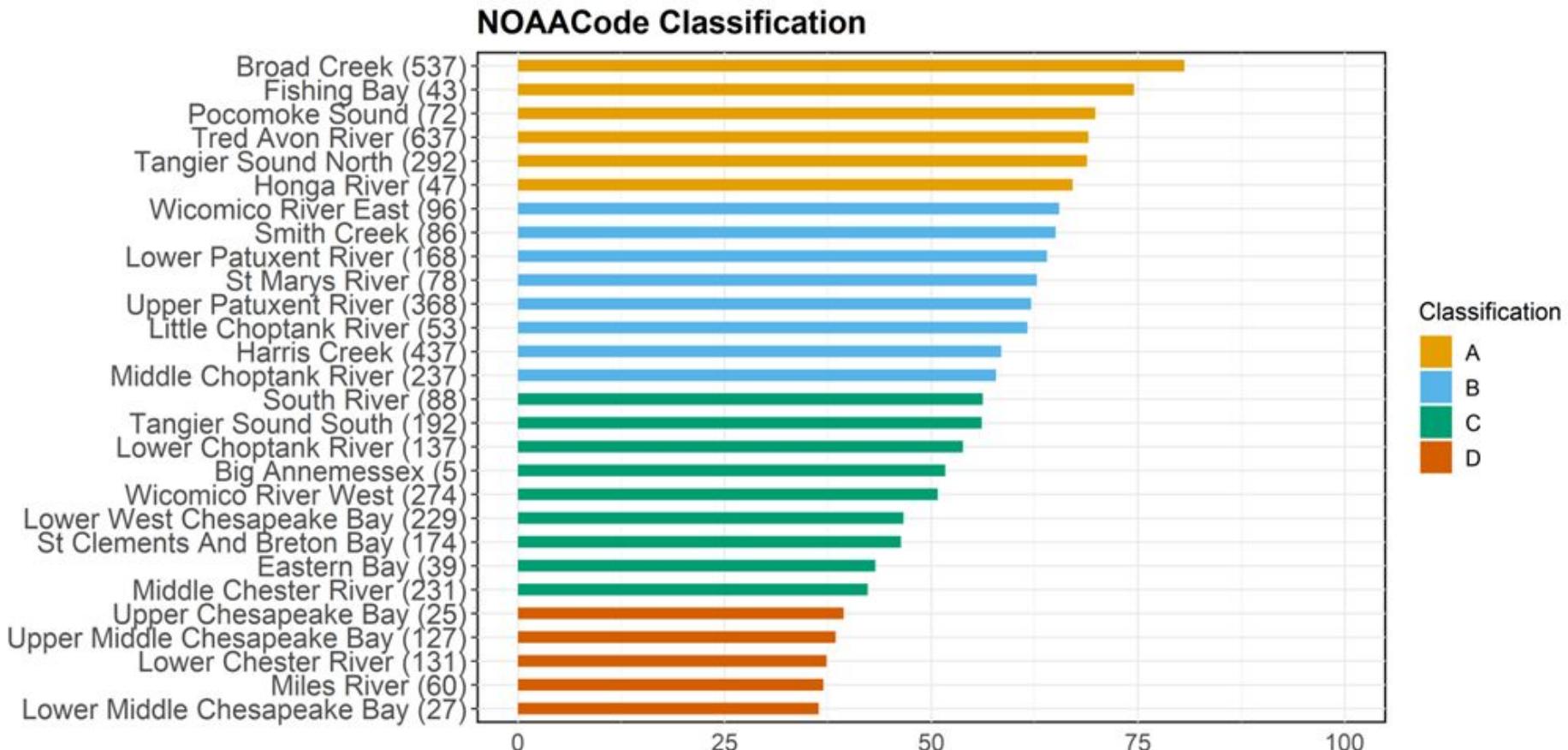


Classifying Areas

Each sanctuary and NOAA Code was classified into a level:

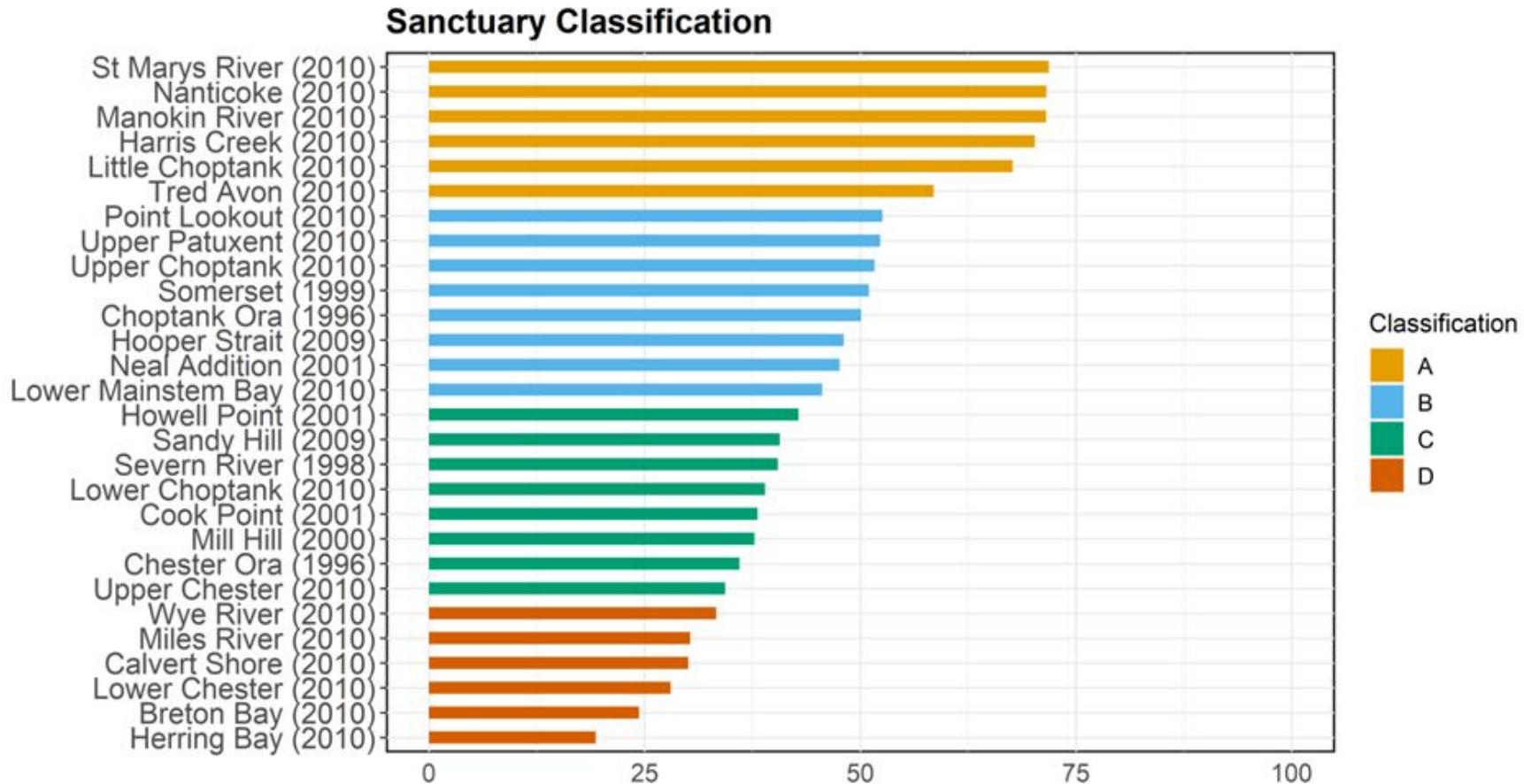
- Level A: considered very productive with high oyster densities, good habitat, and low mortality
- Level B: considered above average
- Level C: considered below average
- Level D: considered not productive often having low densities of oysters or poor habitat, though may have low mortality
- Level E: insufficient data to determine classification

NOAA Code Harvest Areas



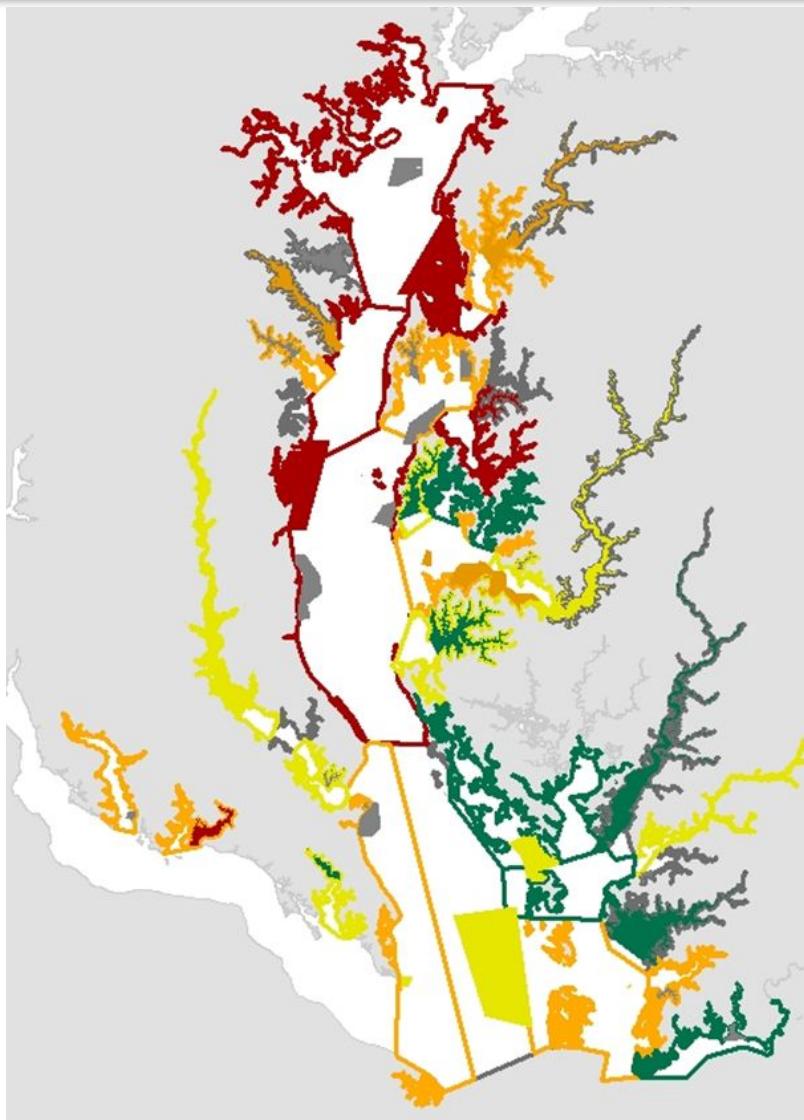
Note: Only used data from non-sanctuary bottom. For example, The "A" classification of Tred Avon River only applies to the 36% of the bottom that is not in a sanctuary.

Sanctuaries



Note: Only used data from sanctuary bottom. For example, The "A" classification of Tred Avon only applies to the Tred Avon Sanctuary and not the remaining 36% of the Tred Avon River not in a sanctuary. 17

Classifying Areas



Oyster Sanctuary Level A	NOAA Code Level A
Oyster Sanctuary Level B	NOAA Code Level B
Oyster Sanctuary Level C	NOAA Code Level C
Oyster Sanctuary Level D	NOAA Code Level D
Oyster Sanctuary Level E	NOAA Code Level E



Report Recommendations

- OAC to use information in report when examining recommendations regarding management actions and changes to areas based on performance
- Use 2020 'best bars' analysis instead of 2009 analysis. Periodically update 'best bars' analysis.
- Low and/or insufficient data for classification of individual areas
 - Oyster population patent tong surveys
 - Alter/increase Fall Survey sites
- Continue examining and researching sanctuaries
 - 10 years may not be enough time to fully understand the ecological impacts
- To assist towards meeting the second objective for aquaculture areas
 - Periodically evaluate PSFAs
 - PSFA sites that are both unproductive and not being used by the public fishery *could be* reclassified for leasing



???? Questions ?????