Developing a New Chesapeake Bay Water Quality Indicator for Tracking Progress toward Bay Water Quality Standards Achievement

Management Board Meeting
February 27, 2013
Annapolis, MD

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Indicator Purpose

- To measure progress toward the achievement of water quality standards
- Development was initiated by the need to measure progress towards the Executive Order's Water Quality Outcome
- Fully consistent with state regulations and procedures

Chesapeake Bay Executive Order's Water Quality Outcome

- Meet water quality standards for dissolved oxygen, water clarity/underwater grasses and chlorophyll *a* in the Bay and tidal tributaries by implementing 100% of the pollution reduction actions for nitrogen, phosphorus and sediment no later than 2025
- 60% of tidal segments attaining water quality standards by 2025

Bay Health

- Individual dissolved oxygen, water clarity and chlorophyll *a* indicators currently reported by CBP Partnership (http://www.chesapeakebay.net/track/health/bayhealth)
- The WQGIT recommends the adoption of a combined indicator to measure progress towards the achievement of water quality standards

Collaborative Process

- EPA Regions 3's Water Protection Division and Office of Regional Counsel
- CBP's Scientific, Technical Assessment and Reporting Team's (STAR) Criteria Assessment Protocols (CAP) Workgroup
- CBP's Water Quality Goal Implementation Team (WQGIT)

Criteria Assessment

- The CBP Partnership has not fully developed, reached agreement on, published, nor adopted into the tidal water jurisdictions' water quality standards regulations a full set of criteria assessment procedures for all the applicable dissolved oxygen criteria

Criteria Assessment Protocols Workgroup Efforts

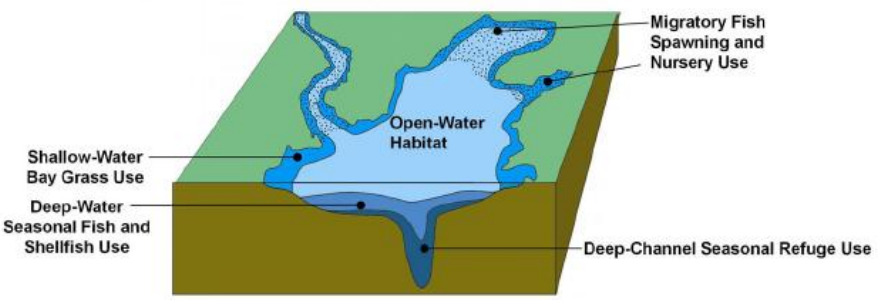
ELEMENT	SCHEDULING/ACTION
Provide a recommendation on assessing the 7-day mean open-water summer season DO criterion	In progress – TMAW
Present options for illustrating attainment uncertainty beyond our CFD methodology	In progress – TMAW
Develop and present the implications of separating shallow-water from offshore water for dissolved oxygen criteria assessment	April 2013 – TMAW
Assess alternative definitions of 'instantaneous minimum' and present options for a new definition in the context of our criteria assessments	Fall 2013 – TMAW
Assess whether dissolved oxygen event duration is inherently captured by the CFD assessment; suggest an alternative	TMAW – Date TBD
Provide recommendations for incorporating high frequency dissolved oxygen measurement results into the 30-day assessments	TMAW – Date TBD
Provide a recommendation on assessing the 1-day mean deep-water DO criterion	TMAW – Date TBD
Benthic Assessment Protocols questions	In progress
DO Assessment Protocols – segment classification and monitoring questions from MD	Additional communications with EPA Region 3 are needed to conclude these discussions
Protocols for incorporating nontraditional partner data	In progress – CBP Monitoring Team
Develop a water quality indicator for tracking progress toward the achievement of water quality standards	**In progress**

Recommendation

- Where a full suite of dissolved oxygen assessment procedures have not been agreed to by the Partnership, those respective designated use segments where these dissolved oxygen criteria apply will be considered to be in non-attainment

Designated Uses

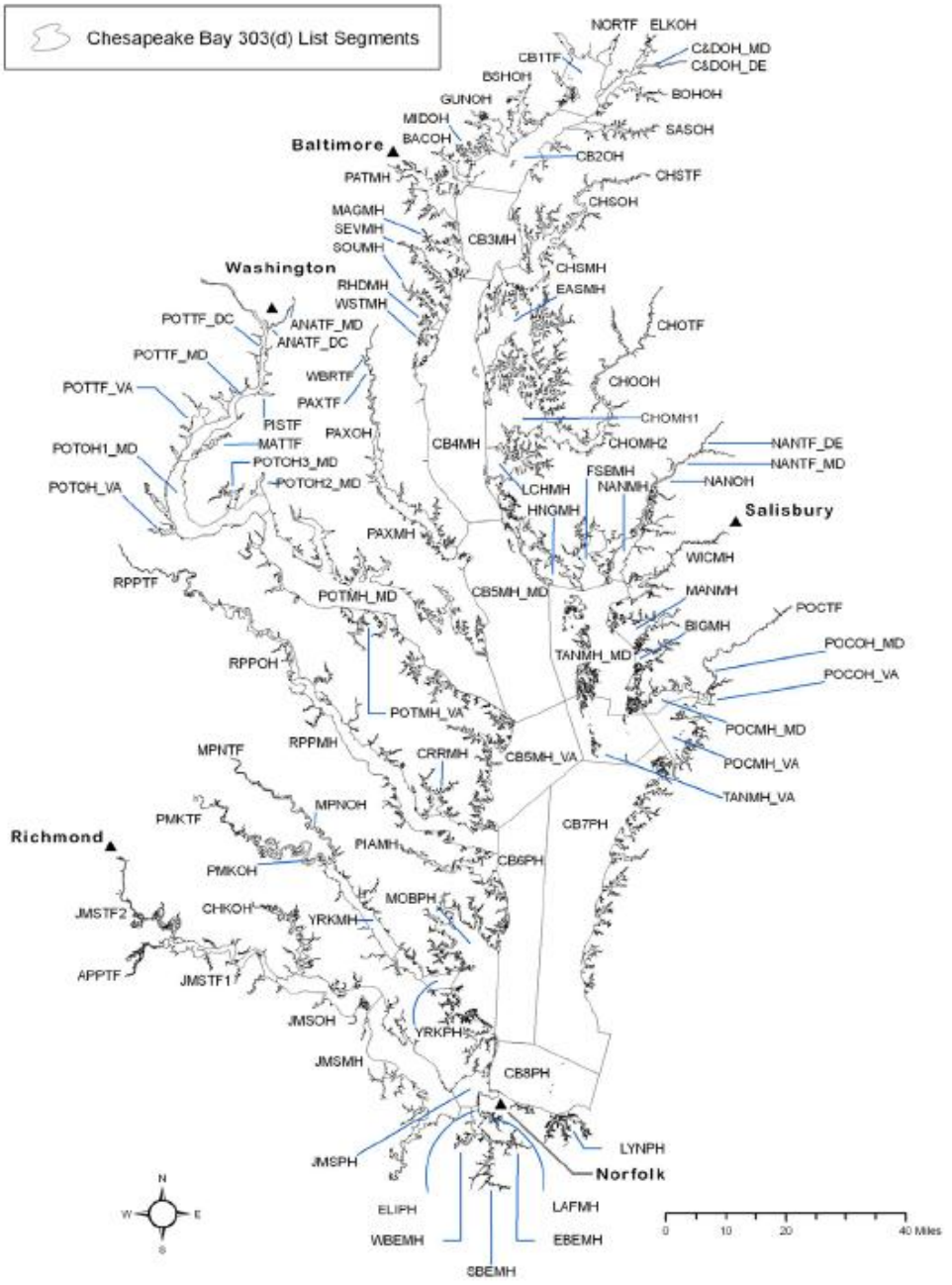
- Unique combinations of water quality criteria applied to each of the five tidal water designated uses within each of the 92 tidal segments
- 291 designated-use segments



1) Migratory Fish Spawning and Nursery
2) Open Water
   a) Chlorophyll *a*
3) Deep Water
4) Deep Channel
5) Shallow Water Bay Grasses

Methods

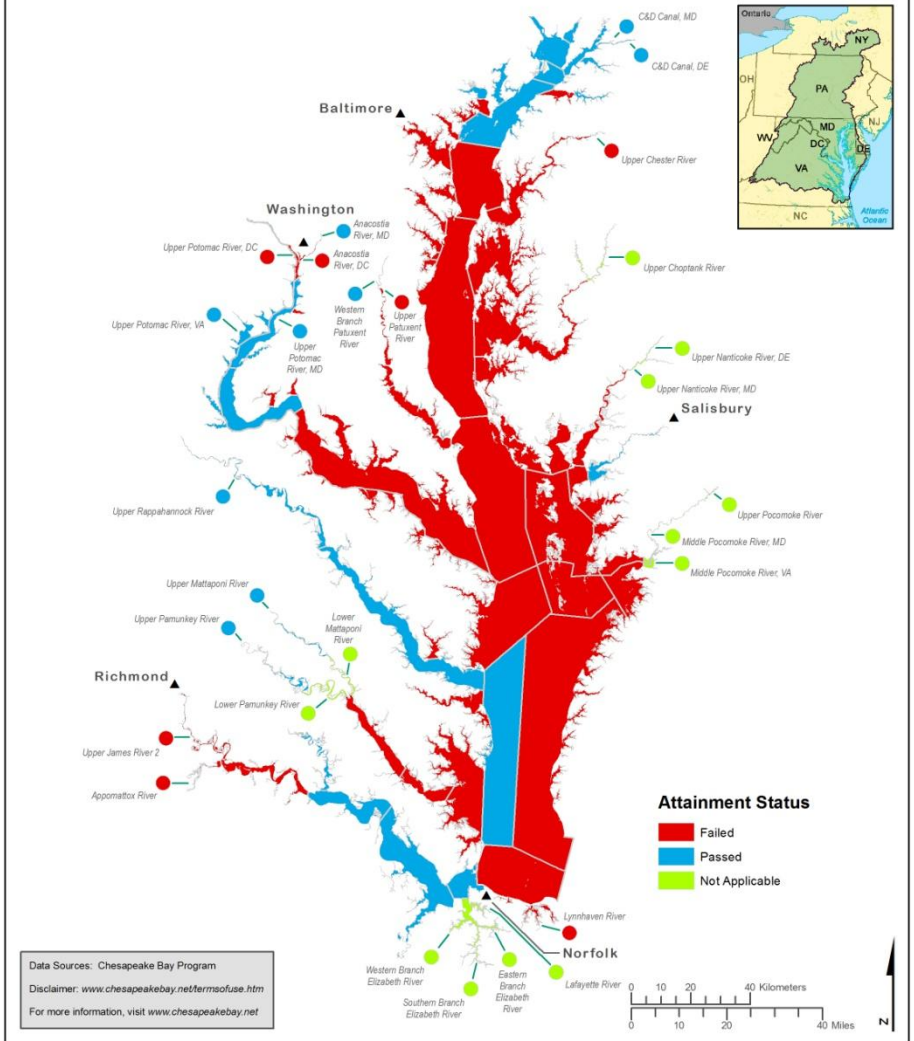
- Use a weighted, area-based and/or segment count approach, which accounts for the number of applicable designated uses per segment



Chesapeake Bay Waters Meeting Water Quality Goals for the Shallow Water Bay Grasses Use

2008-2010

Chesapeake Bay Program
A Watershed Partnership



Data Sources: Chesapeake Bay Program
Disclaimer: www.chesapeakebay.net/termsofuse.htm
For more information, visit www.chesapeakebay.net

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Chesapeake Bay Waters Meeting Chlorophyll a Criteria Water Quality Goals

2008-2010

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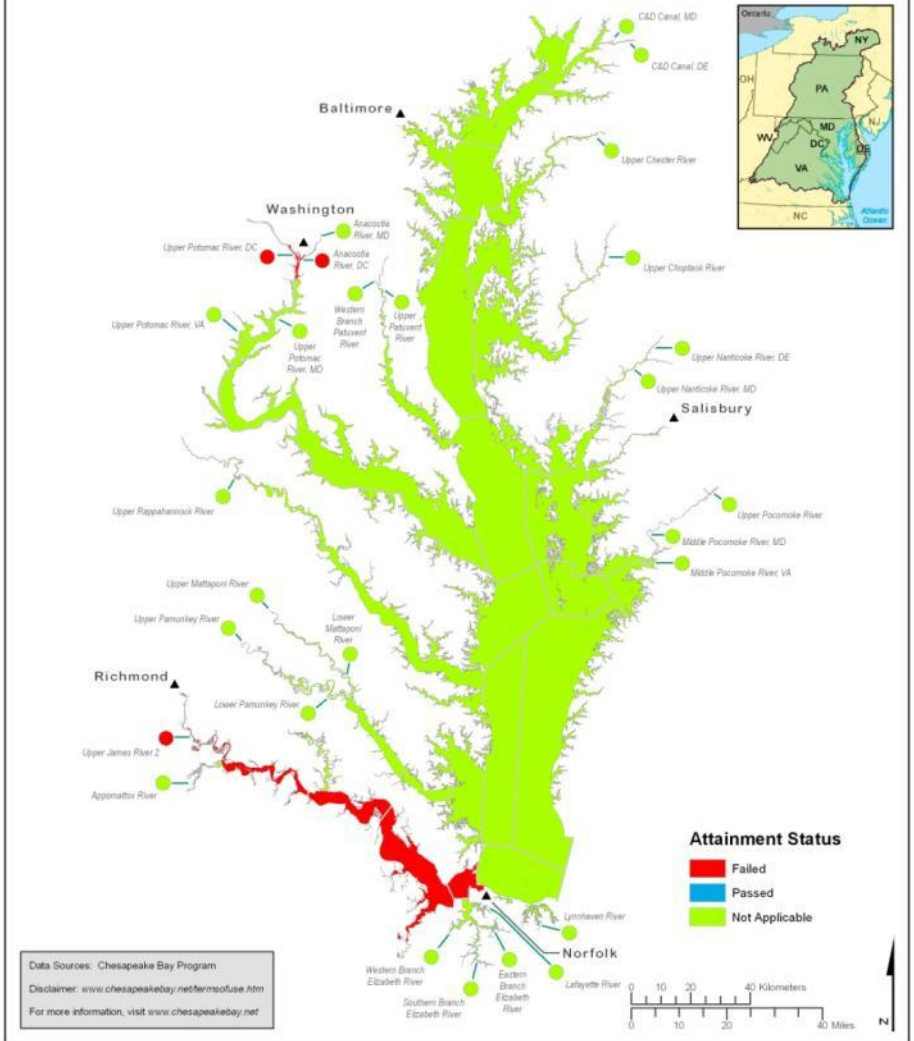

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Chesapeake Bay Waters Meeting Water Quality Goals for the Open Water, Deep Water, and Deep Channel Uses

2008-2010

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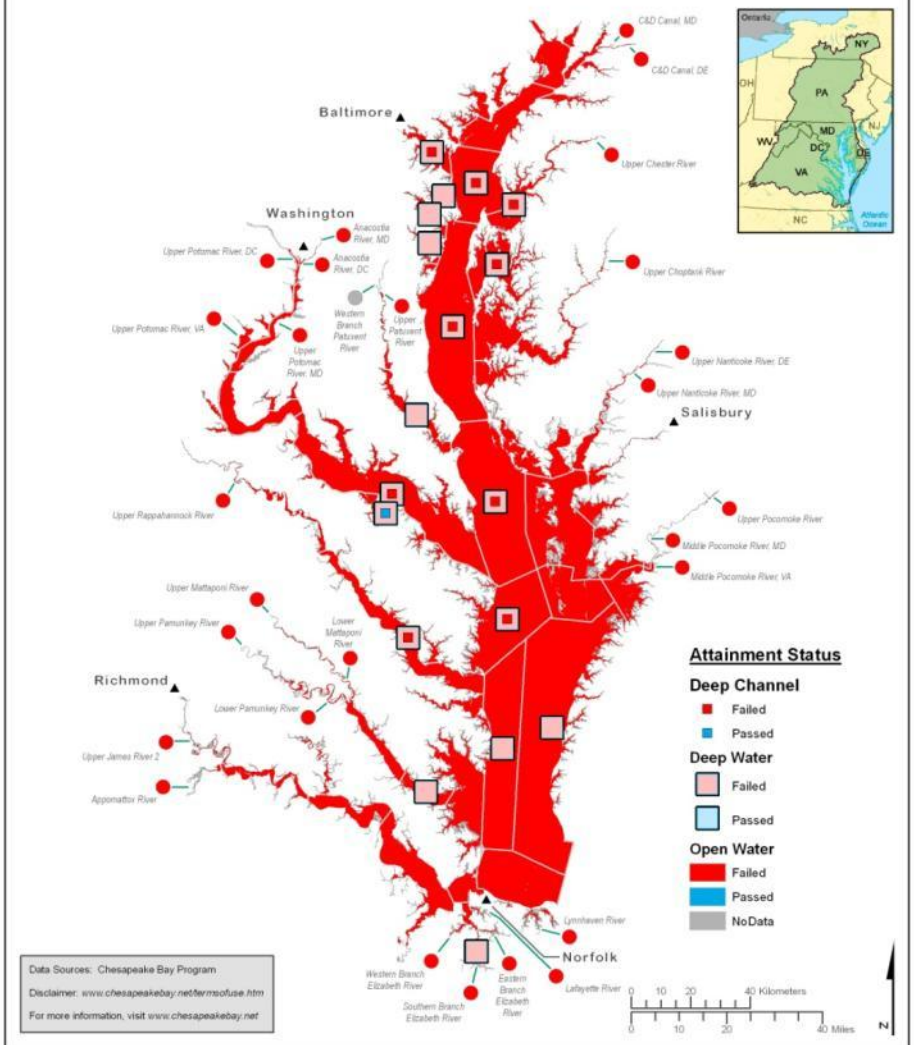

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Chesapeake Bay Waters Meeting Water Quality Goals for the Migratory, Spawning and Nursery Habitat Use

2008-2010

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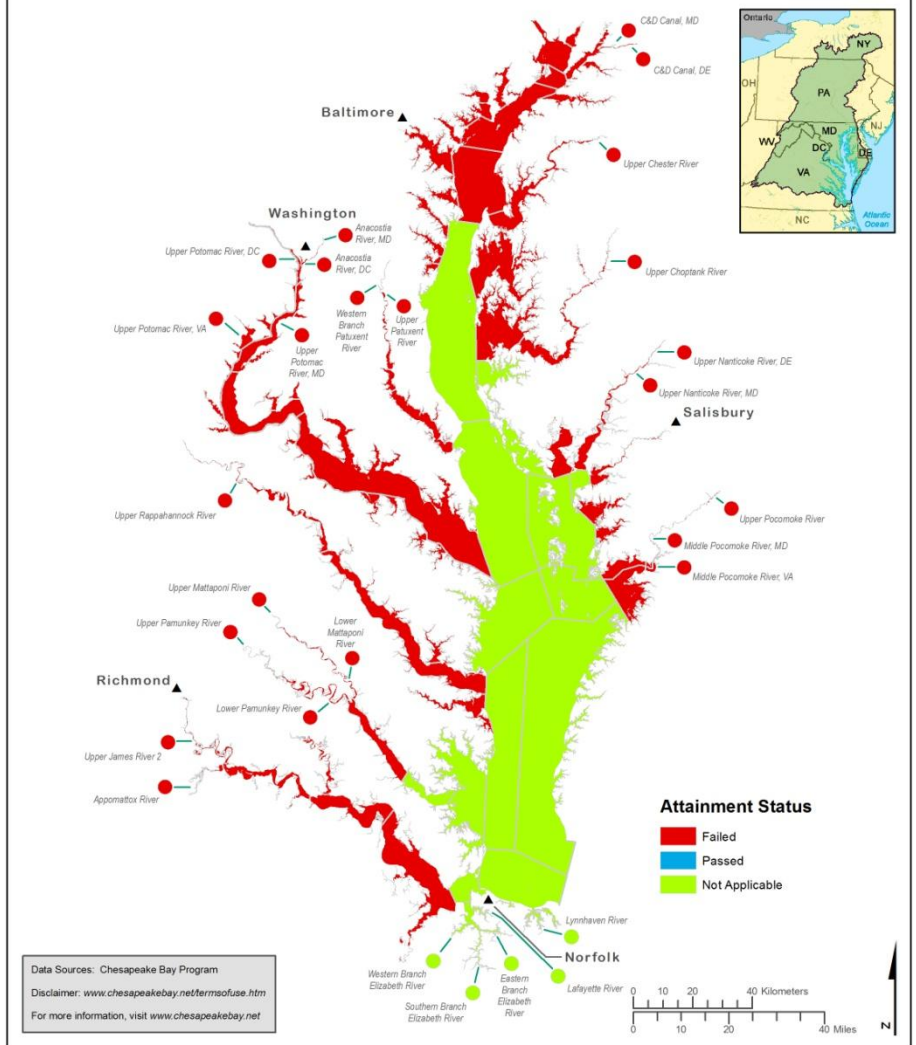

Data Sources: Chesapeake Bay Program

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Chesapeake Bay Waters Meeting Water Quality Goals

2008-2010

Chesapeake Bay Program
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Percent attainment reflects the percent of all the applicable designated uses and criteria for an individual segment in attainment with all water quality standards.

Data Sources: Chesapeake Bay Program

Disclaimer: *www.chesapeakebay.net/termsofuse.htm*

For more information about the methods and data for this map, please refer to "Developing a New Chesapeake Bay Water Quality Indicator for Tracking Progress towards Bay Water Quality Standards Achievement."

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Commitment by Partnership

- By 2015, EPA and its seven jurisdictional partners are committed to working collaboratively on developing, subjecting to independent scientific peer review, agreeing to, and then publishing criteria assessment procedures for the remaining dissolved oxygen criteria currently without Partnership approved assessment procedures.

Final Indicator Recommendations

- Based on an accounting of attainment of all Bay water quality criteria applicable to the 291 number of designated-use segments
- Reported annually based on a weighted and/or count approach
- Where a full suite of dissolved oxygen assessment procedures have not been agreed to by the Partnership, those respective designated-use segments where these dissolved oxygen criteria apply will be considered to be in non-attainment
- The indicator will be graphically illustrated

Decision Requested

Agreement to adopt the WQGIT's recommended new Chesapeake Bay water quality indicator for tracking progress towards Bay water quality standards achievement, recognizing that the following work is underway and will come back to the MB for further decisions:

Decision Requested

1. CBPO staff will work with the Communications Workgroup on finalizing the different ways in which the water quality indicator can be publically presented and displayed on the Partnership's web site; and
2. CBPO staff will work with STAR's Tidal Monitoring and Analysis Workgroup on how the partners can build off indicator information to display additional incremental progress using this indicator, then work back up through the WQGIT and MB on partnership adoption of a set of incremental progress Bay water quality indicators.

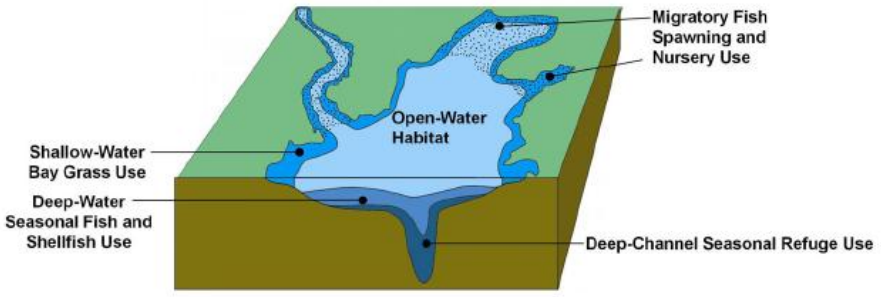
Calculating Segment Level Percent Attainment: (SA in attainment ÷ Total SA) * 100

CB4MH

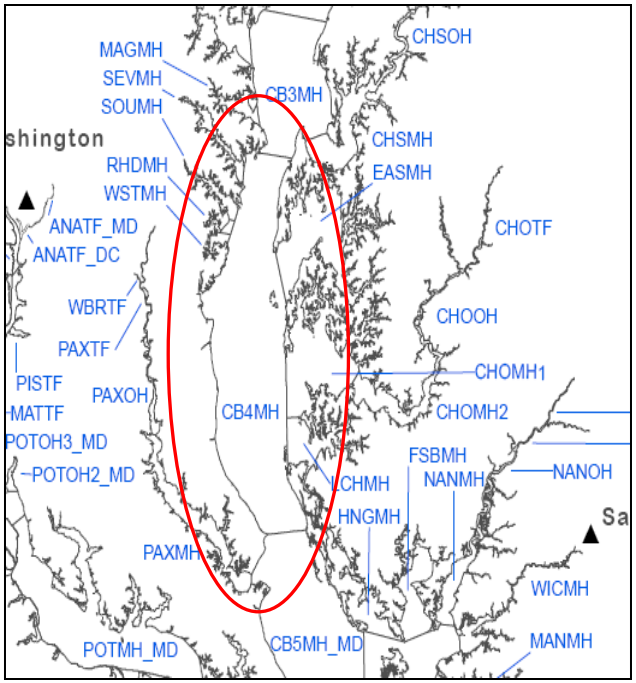
Segment surface area (SA) = 908,847,238.56 km²

Applicable Designated Uses (DU):

- ✓ Migratory Fish Spawning and Nursery
- ✓ Open Water
- ✓ Deep Water
- ✓ Deep Channel
- ✓ Shallow Water Bay Grasses



DU	Total SA (km²)	Attainment Status	SA in Attainment (km²)
MSN	908,847,238.56	No	0.00
OW	908,847,238.56	No	0.00
DW	908,847,238.56	No	0.00
DC	908,847,238.56	No	0.00
SW	908,847,238.56	No	0.00
Total	**4,544,236,193.00**	---	**0.00**
Percent Attainment for CB4MH			**0.00 %**

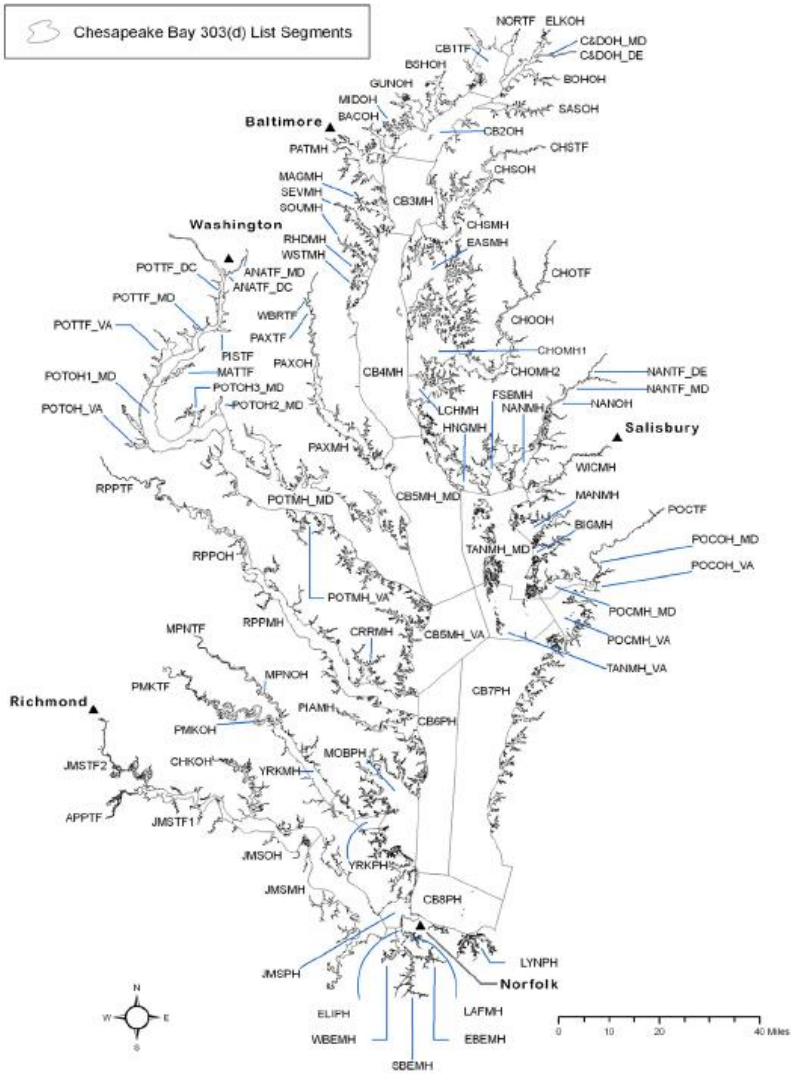


Apply Approach Baywide

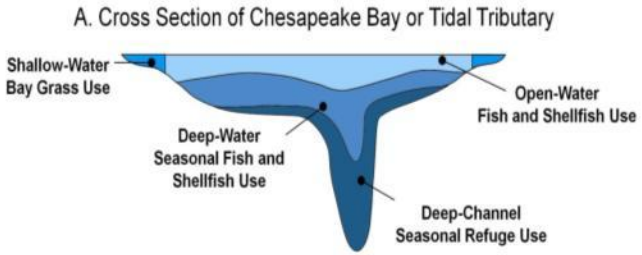
Baseline:

7% of the Bay is attaining water quality standards

DU	Σ SA of DU Segments & Criteria (km²)	Σ SA of DU Segments & Criteria in Attainment (km²)
MSN	4,960,572,203.76	0.00
OW	11,660,174,083.95	0.00
Chl-a	620,327,627.29	0.00
DW	6,932,558,324.18	0.00
DC	4,404,190,644.45	83,660,695.00
SW	11,559,715,304.09	2,620,581,205.04
Total	**40,137,538,187.72**	**2,704,241,900.04**
BAYWIDE Percent Attainment		**7%**



Graphical Illustration



CB4MH

Designated Use (DU)

Percent Attainment for each DU

Designated Use (DU)	Percent Attainment for each DU
N/A	---
SW Bay Grasses	0%
MSN	0%
Open Water	0%
Deep Water	0%
Deep Channel	0%

Percent Attainment for CB4MH

0%

WBEMH

Designated Use (DU)

Percent Attainment for each DU

Designated Use (DU)	Percent Attainment for each DU
CHLA	---
SW Bay Grasses	---
MSN	---
Open Water	0%
N/A	---
N/A	---

Percent Attainment for CB4MH

0%