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

Water Quality Goal Implementation Team Conference Call
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Annapolis, MD

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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

Chesapeake Bay Executive Order's Water Quality Outcome

- CBP Partnership has developed a combined indicator to measure progress towards the water quality outcome

- It could supplement or replace the individual dissolved oxygen, water clarity and chlorophyll *a* indicators currently reported by CBP Partnership (http://www.chesapeakebay.net/track/health/bayhealth)

Collaborative Process

- This indicator was developed by the CBPO working with EPA Regions 3's Water Protection Division and Office of Regional Counsel as well as CBP's Scientific, Technical Assessment and Reporting Team's (STAR) Criteria Assessment Protocols (CAP) Workgroup
- First brought forth to the WQGIT November 2012

WQGIT Comments

Comment/Concern	Action (Page numbers refer to briefing document)
Reference for the EO Water Quality Outcome	Pg.1) Provided an excerpt from the EO document in form of a footnote; provided link to EO Strategy and directed readers to appropriate pages.
Some confusion related to the lack of criteria assessment procedures for short-term DO criteria as it relates to the indicator's calculations	Pg.6) Provided background information for clarity and context.
Can we measure Incremental Progress?	Pg.11) Initiated efforts to develop a means for tracking incremental progress toward the attainment of water quality standards; continuing efforts are included as part of the recommended next steps.

Decision…

1. How do we address the fact that 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?

CAP WG Efforts

CAP WG ELEMENT	SCHEDULING/ACTION
Provide a recommendation on assessing the 7-day mean open-water summer season DO criterion	TMAW 01/07/2013 Recommendation refinement in progress
Present options for illustrating attainment uncertainty beyond our CFD methodology	Part of TMAW 7-day mean discussions in progress
Develop and present the implications of separating shallow-water from offshore water for dissolved oxygen criteria assessment	TMAW April 2013 meeting
Assess alternative definitions of 'instantaneous minimum' and present options for a new definition in the context of our criteria assessments	Fall 2013 workshop
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
Benthic Assessment Protocols questions	CAP is working with the community on these
DO Assessment Protocols – segment classification and monitoring questions from MD	Additional communications with EPA Philadelphia are needed to conclude these discussions
Protocols for incorporating nontraditional partner data	CBP Monitoring Team currently working on this
Develop water quality indicator for tracking progress toward water quality standards achievement	**TODAY: WQGIT for final approval for presentation to MB February 2013**

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

Decision and Recommendation

2. Do we take an area-based (or volume-based) approach vs. a count approach as the basis to reporting the water quality indicator?

   RECOMMENDATION:

   We will use an area-based, weighted approach, which considers differences in segment size and number of applicable designated uses

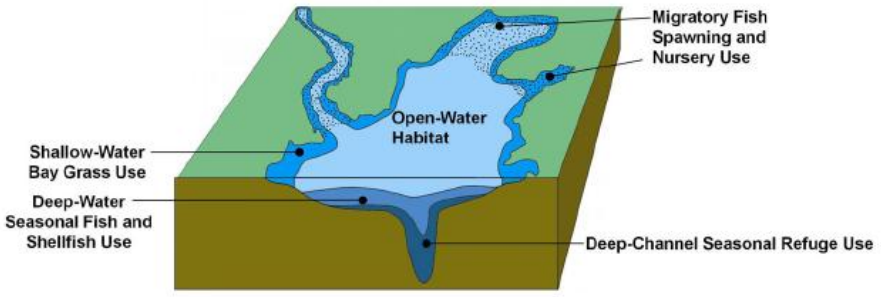
Calculating Segment Level Percent Attainment: (SA in attainment ÷ Total SA) * 100

CB4MH

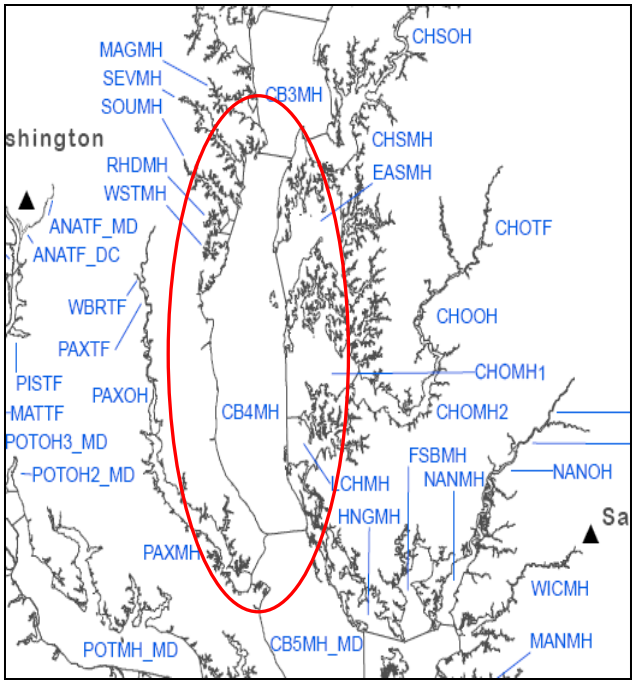
Segment surface area (SA) = 908,847,238.56 km²

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 %**



Calculating Baywide Percent Attainment: (Σ SA in attainment ÷ Σ Total SA) * 100

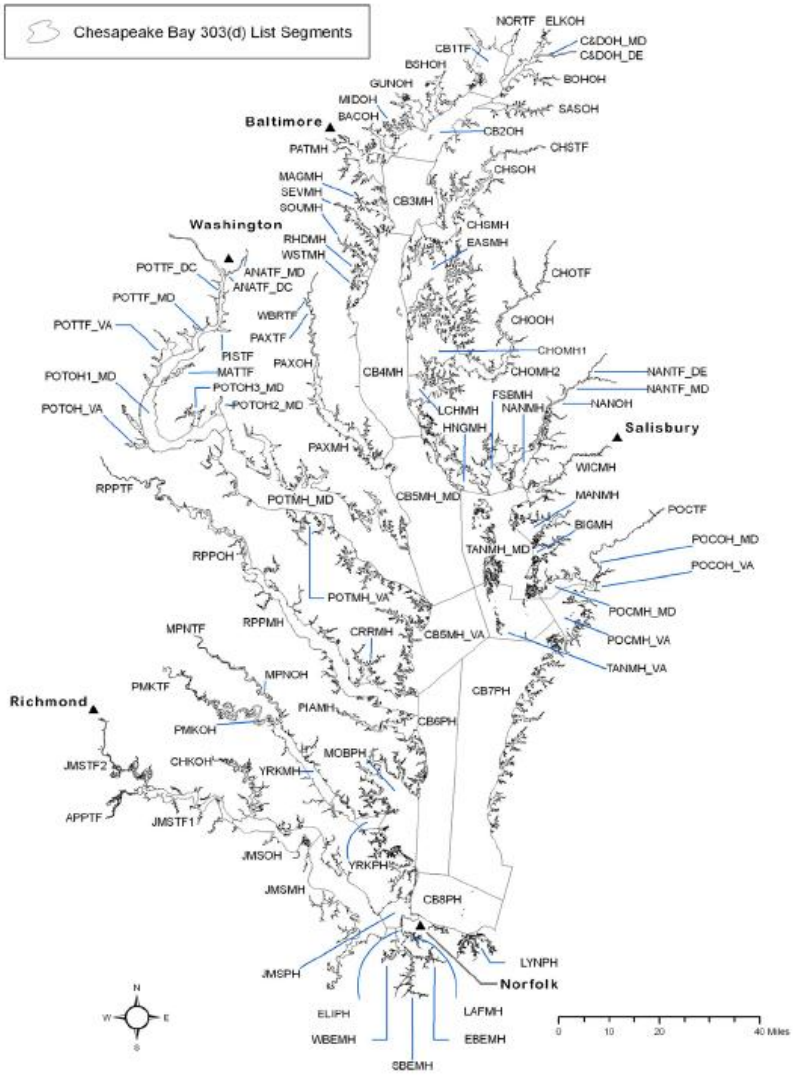
All Segments Combined

Σ surface area (SA) of each segment's applicable designated use and criteria = 40,740,997,335.07 km²

Designated Uses (DU) and Criteria:

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

DU	Σ SA of DU Segments & Criteria (km²)	Σ SA of DU Segments & Criteria in Attainment (km²)
MSN	5,565,101,169.36	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	11,558,645,485.84	2,616,220,341.04
Total	**40,740,997,335.07**	**2,699,881,036.04**
BAYWIDE Percent Attainment		**7%**



Chesapeake Bay Waters Meeting Water Quality Goals

2008-2010

Chesapeake Bay Program
A Watershed Partnership

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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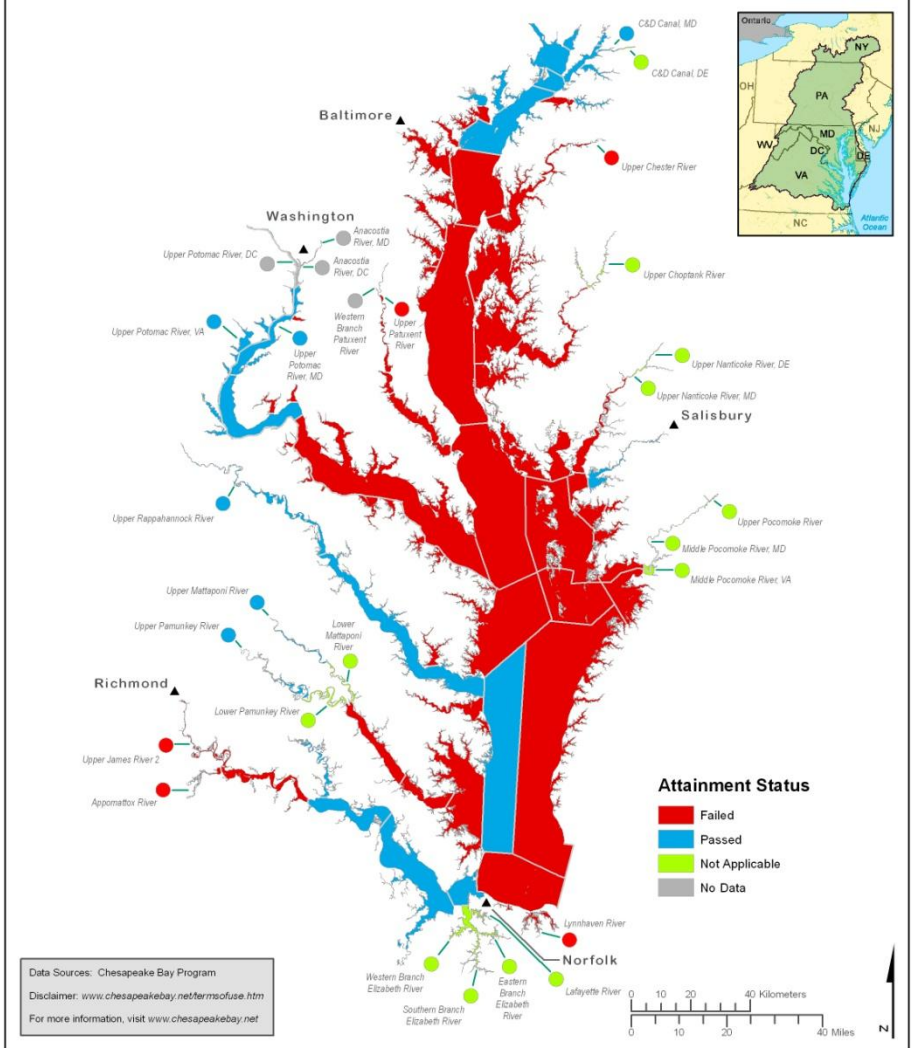
UTM Zone 18N, NAD 83

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

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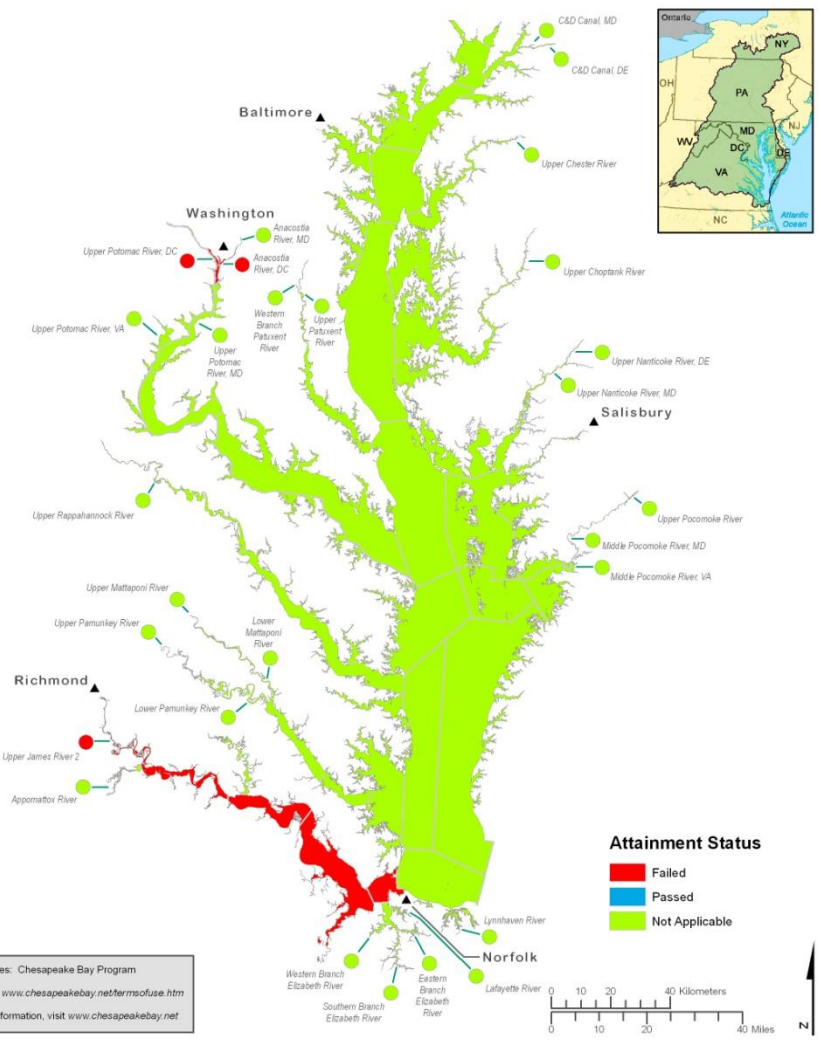
Chesapeake Bay Waters Meeting Chlorophyll a Criteria Water Quality Goals

2008-2010

Chesapeake Bay Program
A Watershed Partnership



Data Sources: Chesapeake Bay Program

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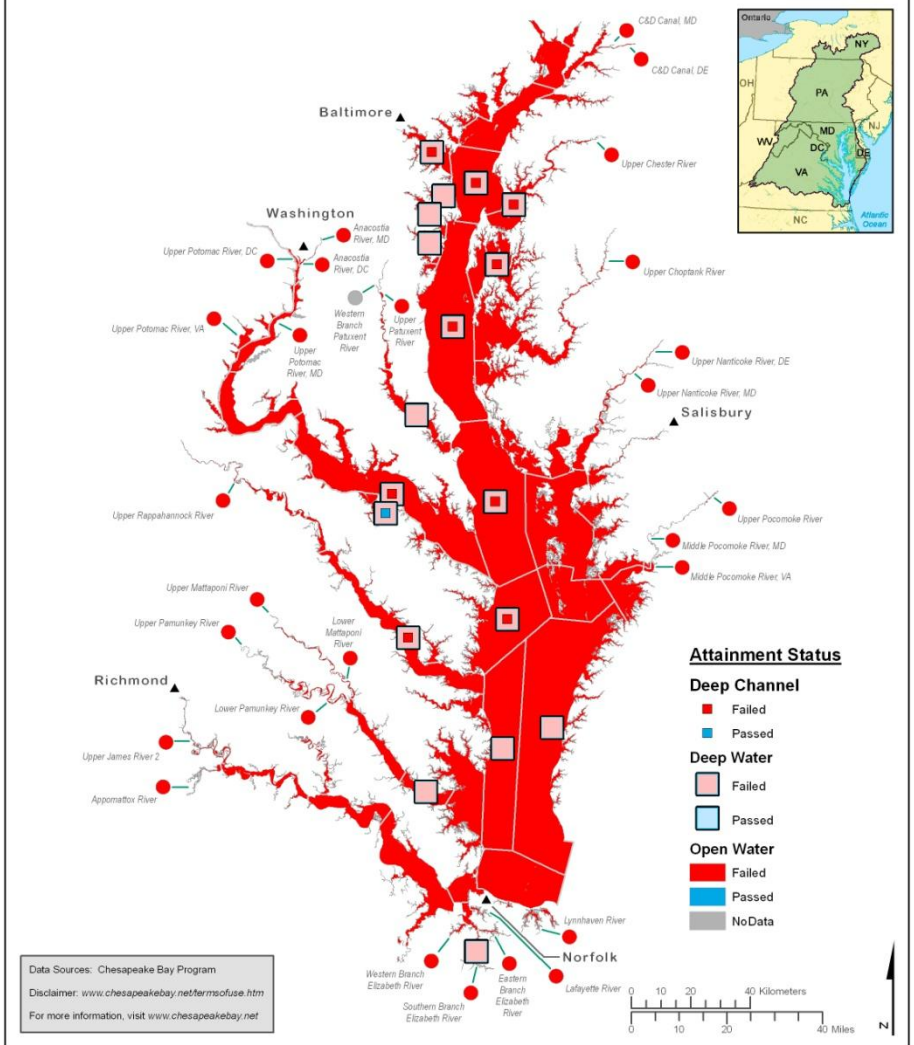
Chesapeake Bay Waters Meeting Water Quality Goals for the Open Water, Deep Water, and Deep Channel Uses

2008-2010

Chesapeake Bay Program
A Watershed Partnership



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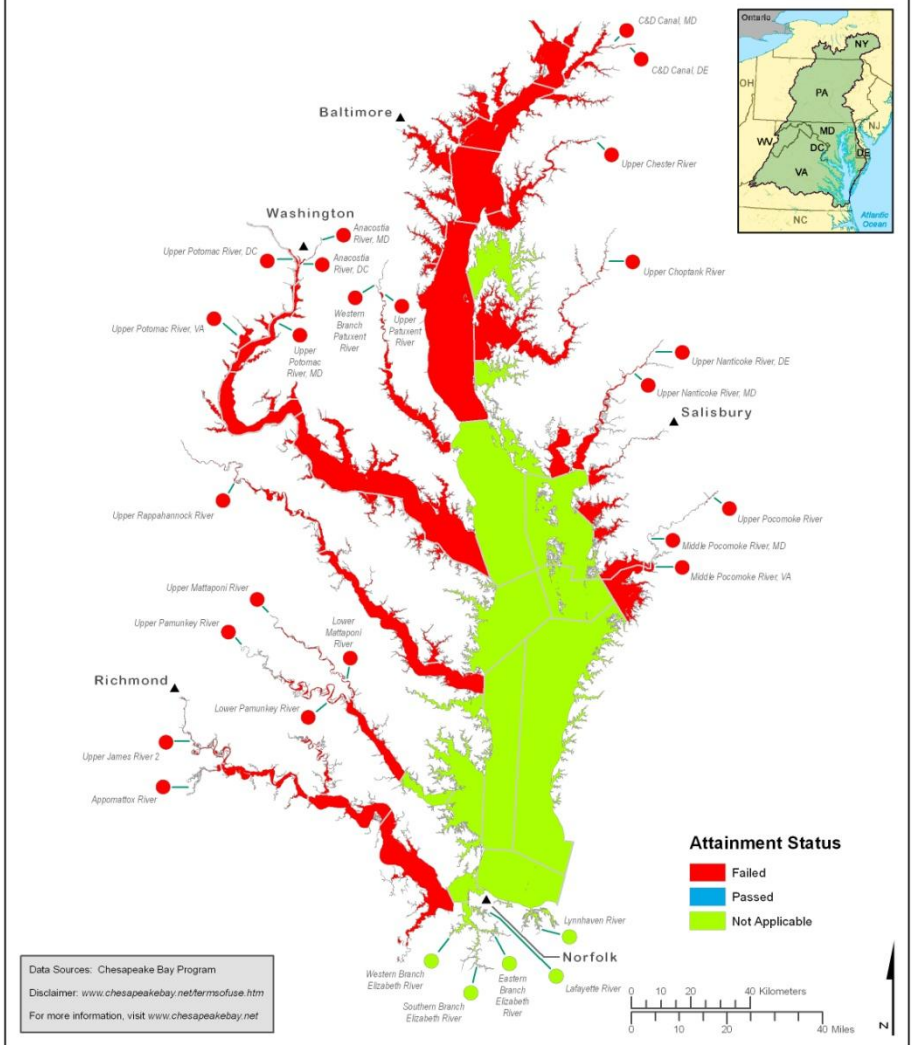
Chesapeake Bay Waters Meeting Water Quality Goals for the Migratory, Spawning and Nursery Habitat Use

2008-2010

Chesapeake Bay Program
A Watershed Partnership



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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 289 number of designated-use segments
- Reported annually as a baywide percentage based on a weighted-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

Recommended Next Steps

- Today: We are asking for approval to bring the new indicator forward to the Management Board next month for final Partnership adoption.

- Separate from the public indicator the partnership is recommending here, we will continue to explore a means to measure incremental progress towards the attainment of water quality standards.