Exploring Ways to Measure Incremental Progress toward the Attainment of Chesapeake Bay Water Quality Standards

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The Chesapeake Bay Program's (CBP), Water Quality Goal Implementation Team recommends the adoption of a combined indicator to measure progress towards the achievement of the four jurisdictions' Chesapeake Bay water quality standards into the Partnership's indicator framework. The indicator would be fully consistent with how Delaware, the District of Columbia, Maryland, and Virginia currently list their portion of the Bay's tidal waters and provide a means for illustrating improvements through time.

During the developmental process of the combined WQS Indicator, colleagues expressed interest in wanting to take the indicator one step further and formulate a means to measure segment-by-segment incremental progress toward the attainment of water quality standards. Below you will find a series of options we feel might fulfill the aforementioned request.

DISSOLVED OXYGEN

Option 1

Criteria Assessment Results reported in Stoplight Plots –

a) Obtain or produce stoplight plots for each round of criteria assessments (1985-present)
b) Develop a time series plot for each segment using the above information.

Cbseg	DO Open Water Summer Monthly	DO Deep Water Monthly	DO Deep Channel Instantaneous	DO Open Water non-summer Monthly
APPTF	0.0%	N/A	N/A	0.0%
BACOH	0.0%	N/A	N/A	0.0%
BIGMH	0.0%	N/A	N/A	0.0%
BOHOH	0.0%	N/A	N/A	0.0%
BSHOH	0.0%	N/A	N/A	0.0%
CB1TF	0.0%	N/A	N/A	0.0%
CB2OH	0.8%	N/A	N/A	0.0%

* extract from the 2008-2010 listing cycle

NOTE: Methodological difference

- *WQS Indicator: for those designated use criteria where a full suite of dissolved oxygen criteria assessment procedures have not yet been agreed to by the CBP Partnership, the segment is considered to be in non-attainment for that specific tidal water designated.*

- *Criteria Assessment: the procedure assumes that the umbrella criteria assumption is valid; based on the assessment of the 30-day mean for open water and deep water and does not assume that non-attainment for designated uses that cannot be fully assessed.*

Option 2

Calculate the WQS Indicator numbers for each segment for the 1985-2011 dataset

a. Create a time series plot for each segment
b. Determine the particular trend for each segment
c. Incorporate the dynamic maps developed by John Wolf --

DRAFT web links containing dynamic maps for Water Quality Standards attainment for each designated use:

http://gis.chesapeakebay.net/templates/water_quality_standards_1/index.html
http://gis.chesapeakebay.net/templates/water_quality_standards_2/index.html

Maps are synced in terms of scale and location, but may be manually turned off. Clicking on a segment will reveal the segment code. The collapsible legend provides the color key.

WATER CLARITY/SAV

First, calculate percent attaining over time for segments with SAV aerial photography:

$$\left(\frac{Single\ Best\ Yr\ SAV\ acreage}{SAV\ restoration\ goal}\right) \times 100 = \%\ SAV\ goal\ met$$

Unclear on how to proceed beyond using the SAV aerial photography:

- *What would be the proper approach to doing this when measuring water clarity acreage?*
- *Other considerations, options, etc.?*

CHLOROPHYLL *A*

Not familiar with the assessment output beyond attainment vs. nonattainment –

Any ideas how to do this for the VA and DC segments?