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# Proposed Improvements to the Current Tidal water Quality Indicators

Chesapeake Bay Program (CBP) Senior Managers' monitoring program priorities and objectives (MRAT 2009): http://www.chesapeakebay.net/content/publications/cbp_52995.pdf

The priorities of the CBP funded monitoring programs should be:

1. Delisting the tidal segments of the Bay; and
2. Determining the effectiveness of management actions in the watershed

*Which indicators are TMAW responsible for?*

1) Reported CBPO Bay indicators linked to water quality standards and criteria attainment

| **Indicator *(analyst)*** | **Applicable designated use(s)** | **What is it supposed to indicate? (target)** | **What is it really measuring?** | **Is the correct data used to evaluate target?** | **Is the target evaluated correctly?** | **What Method is being used?** |
|---|---|---|---|---|---|---|
| **Dissolved Oxygen *(Liza Hernandez)*** | Open-water, Deep-water, Deep-channel | Acceptable DO levels for important animals | Excessive consumption of DO by bacteria | Yes | Yes | CFD |
| **Water Clarity *(Liza Hernandez)*** | Shallow-water Bay Grasses | Acceptable light needs for underwater grasses | Phytoplankton light needs in open waters | No (uses mid-channel Secchi depth) | No | Area-weighted Pass/Fail Scoring |
| **Chlorophyll *a* *(Liza Hernandez)*** | Open-water (only 7 segments) | Acceptable phytoplankton biomass | A phytoplankton photopigment | Yes, when clarity of open water is acceptable | No | Area-weighted Pass/Fail Scoring |

## RECOMMENDED CHANGES –

**a) Continue annual reporting of the dissolved oxygen indicator via the CBPO website, given:**
- **Alignment with Partnership's management priorities to track progress towards the attainment of water quality standards**

**b) Recommend discontinuing reporting the water clarity and chlorophyll *a* indicators featured on the CBPO website, given:**
- **Inconsistencies with Partnership priorities and management objectives;**
- **Limited personnel resources at CBPO;**
- **Continued reporting by UMCES via Report Card; and**

- **Development of water quality standards executive order outcome indicator** ***(see next Section)***

2) Supporting indicators calculated by CBPO staff but not **yet** reported on CBPO webpage

| **Indicator** ***(analyst)*** | **Applicable designated use(s)** | **What is it supposed to indicate? (target)** | **What is it really measuring?** | **Is the correct data used to evaluate target?** | **Is the target evaluated correctly?** | **What method is being used?** |
|---|---|---|---|---|---|---|
| **WQS EO Outcome Indicator** ***(Liza Hernandez)*** | All | Status of baywide attainment of WQS | Status of baywide attainment of WQS | Yes | Yes | Area-weighted approach to account for segment difference in 1) number of applicable designated uses and 2) size |
| **Incremental progress** ***(Liza Hernandez)*** | All | Status of attainment for each designated-use segment | Deviation from attainment of WQS is each designated-use segment | Yes | Yes | Percent attainment calculations for every designated-use segment |
| **Current Conditions** ***(Liza Hernandez, Lea Rubin)*** | Open-water, Deep-water, Deep-channel | Monthly changes in dissolved oxygen levels, temperature, and salinity. | Hypoxic/Anoxic volume; temporal and spatial patterns temperature and salinity | Yes | Yes | Inverse-distance squared interpolation model |

# RECOMMENDED CHANGES –

**a) Move forward with the finalization of the water quality indicator and the incremental progress indicators and begin reporting on CBPO website once final approval from the Management Board is obtained.**

**b) Handing over of current conditions analytical responsibilities to EcoCheck , given:**
- **Inconsistencies with Partnership priorities and management objectives;**
- **Limited personnel resources at CBPO; and**
- **EcoCheck is the only end user (for hypoxic volume summer review)**

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**Next Steps**

As they relate to:

1. Water Quality Indicator:
    a. Further analysis of the underlying 25-year history of indicator assessment data
        i. Which designated-use segments are approaching attainment over time and could be expected to come into attainment by 2017? By 2025?

ii. Which designated-use segments are clearly going to be out of attainment come 2025?

b. Further analysis of existing Chesapeake Bay WQSTM scenario results
    i. Based on current nutrient loading to the Bay and progressing towards the achievement of the Bay TMDL loads, which designated-use segments are projected to come into attainment at what nitrogen/phosphorus loads?

c. Taking an initial cut at answering the following question: "to have practices in place by 2017 that are expected to achieve 60% of the load reductions necessary to achieve applicable water quality standards compared to 2009 levels, and to have all controls installed by 2025 achieve the Bay's DO, water clarity/SAV, and chlorophyll a criteria, what actual reductions are we likely to see delivered to the Bay accounting for time lags witnessed in the past quarter century of monitoring data?"
    i. Evaluate history of progress run results through time along with the jurisdictions' 2017 targets and 2025 TMDL allocations
    ii. Work to match up with forthcoming USGS WRTDS trend analysis results

d. Further development of incremental progress indicators
    i. Graphical presentation options working with Communications Workgroup and the TMAW

2. Changes to current tidal indicator framework:
    a. Vote: Continuation vs. discontinuation of water clarity and chlorophyll a indicators?
    b. Pursue the development of the phytoplankton habitat index as a surrogate for the phytoplankton index of biotic integrity?

3. Formalize recommendations and present to WQGIT in upcoming months