DRAFT – 05/02/2019

PSC Background Paper: Process and Schedule for Developing Sediment Planning Targets in Phase III to Meet Water Clarity/SAV Water Quality Standards

Background

EPA established the Chesapeake Bay TMDL to meet the applicable water quality standards (WQS) in the Bay, including sediment – specifically, water clarity/submerged aquatic vegetation (SAV) water quality criteria. Excessive sediment fines (silts and clays) in the water column can reduce light to levels insufficient for SAV growth. The sediment allocations in the TMDL were established differently than those for nitrogen and phosphorus, given scientific and technical findings on the importance of nutrient loads relative to sediment loads in the impairment of SAV in tidal waters as described below. It is important to note that while all lines of evidence point toward nutrients playing a larger role in SAV recovery, there are detrimental effects that sediment has on the clarity/SAV WQS and state-level regulatory frameworks of the tidal CBP States address this issue.

Development of Sediment Planning Targets in Phases I and II

In Phase II, the partnership estimated that full implementation of the Phase II WIPs would reduce the sediment loads to the Chesapeake Bay by about one third from 1985 loads, compared to a reduction of about one half for nitrogen and phosphorus over the same period. In Phases I and II, the partnership found that a greater level of BMP implementation was needed to meet the nutrient-based WQS, primarily for Deep Water and Deep Channel dissolved oxygen (DO), than was needed to meet the sediment-based water clarity/SAV WQS. This is because many of the BMPs implemented to achieve nutrient load targets, such as farm plans, cover crops, conservation tillage, and stream restoration, also remove considerable loads of sediment. In addition, we found that the water clarity/SAV WQS is generally more responsive to nutrient load reductions than it is to reduction of sediment loads.

The CBP partnership agreed in the 2010 Chesapeake TMDL document for the Phase I WIPs, and subsequently at a June 2011 WQGIT meeting for the Phase II WIPs, that the primary emphasis in the WIPs should be on nutrient reduction management practices, which by their nature of reducing both nutrient and sediment loads in the watershed also achieve the water clarity/SAV WQS (Figure 1). This decision was further supported by research and findings in the Chesapeake (Gerbisz and Kemp, 2014; Lefcheck et al., 2018). In addition, sediment is already the subject of thousands of local sediment TMDLs in streams and rivers being implemented by the Chesapeake Bay Program partners. There are also many streams impaired for sediment for which TMDLs have not yet been completed. Accordingly, the Phase II sediment targets were calculated using estimated sediment load delivered to the Bay resulting from the BMPs that the jurisdictions planned to implement to meet the Phase II nutrient targets. An additional 10 percent buffer was added to the calculated sediment target in each major basin-jurisdiction to account for the overall model uncertainties in the calculation of the sediment targets, including uncertainties in the estimated sediment reductions of the BMPs and overall uncertainties in sediment fate and transport in watershed streams and rivers.

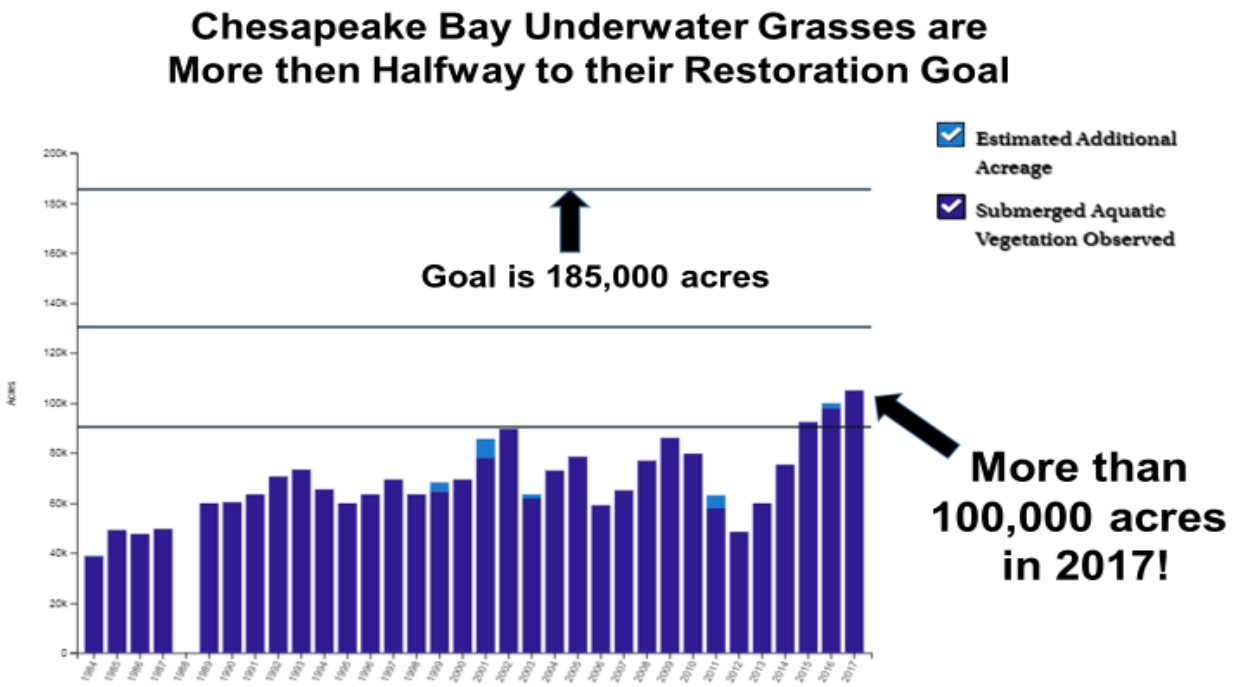
Additional Issues to Consider

At the April 22, 2019 WQGIT Meeting, jurisdiction partners raised two additional issues they felt were in need of additional analysis and consideration by the WQGIYT before presenting options and recommendations to the PSC on sediment planning targets for Phase III. Those issues were possible additional sediment reductions resulting from the Conowingo WIP and climate change assessment. The Water Quality GIT will be exploring some approaches for addressing these issues and plans to present options and recommendations to the PSC with draft sediment planning targets at the next PSC meeting/call (likely in July).

Proposed Schedule

1. May 13, 2019 – Water Quality GIT Meeting to address any PSC feedback from May 9 PSC Meeting and consider options for draft targets.
2. June 10, 2019 – WQGIT Meeting to approve options and recommendations for Draft Sediment Planning Targets to present to the MB and then the PSC for their consideration and approval.
3. July (TBD) – PSC Conference Call to approve Draft Phase III Sediment Planning Targets.
4. August 9, 2019 – Final Phase III WIPs submitted by jurisdictions incorporating Draft Sediment Planning Targets.
5. Fall 2019 – PSC Meeting to possibly include discussion on approach for Final Sediment Planning Targets depending on option approved by PSC at July meeting.

Figure 1. Observed SAV acres in the tidal Chesapeake from 1984 to 2017.



References

Gerbisz and Kemp, 2014. Unexpected resurgence of a large submersed plant bed in Chesapeake Bay: Analysis of time series data. *Limnology and Oceanography*, 59(2), 2014, 482–494.

Jonathan Lefcheck, R.J. Orth, William Dennison, David Wilcox, Rebecca Murphy, Jennifer Keisman, Cassie Gurbisz, Michael Hannam, Brooke Landry, Kenneth Moore, Christopher Patrick, Jeremy Testa, Donald Weller, and Richard Batiuk, 2018. Long-term nutrient reductions lead to the unprecedented recovery of a temperate coastal ecosystem.* *Proceedings of the National Academy of Sciences* 115:15 3658–3662.
*Awarded the National Academy of Science Cozzarelli Prize.