Background on of the CBP Partnership Thinking on the Conowingo WIP's Use of Most Effective Basins for Nitrogen and Phosphorus

Summary

It has been understood since at least 2016 that the Conowingo was influencing both nitrogen and phosphorus delivery, although phosphorus had the greater effect on dissolved oxygen (DO) as documented in the 2010 Chesapeake Bay TMDL. Early efforts using draft models for the Midpoint Assessment focused on phosphorus since the nitrogen modeling was not complete. 'Effective basins' were designated using phosphorus effectiveness maps during this period. The final assessment of reductions necessary to offset the Conowingo include both nitrogen and phosphorus reductions however the designation of effective basins was not updated to reflect nitrogen effectiveness. The Conowingo WIP steering committee has chosen to focus on nitrogen reductions but using the effective basins as defined for phosphorus.

It was known since at least 2016 that the Conowingo effect on DO was from both nitrogen and phosphorus increases

Conowingo phosphorus has a larger effect, but nitrogen is still an important contributor

- The 2016 STAC Conowingo workshop report stated that the pool traps sediment and phosphorus more efficiently than nitrogen. A finding of the workshop was that the nitrogen that is stored is organic and released in large storms, therefore having less of an effect on oxygen. The report recommended that the CBP model the effects of sediment, phosphorus, and nitrogen, including the availability of organics.
- Lee Currey presented to the WQGIT on Oct 24, 2016 WQGIT that N, P, and S were all increased under conditions where Conowingo was filling (slides 4-6). A similar presentation was also made to STAC on March 14, 2017

Early discussions focused on phosphorus since the modeling was not yet complete

The CBP watershed model had to be modified for nitrogen Conowingo effects and new scenarios needed to be run through the estuarine model prior to any decisions being made on how to account for the additional nutrient loads. Initial discussions just focused on reducing watershed phosphorus by the 1.7 million pounds that was expected to increase due to the infill of the Conowingo. Different methods of dividing up the reduction were discussed.

- Lewis Linker delivered a science assessment to the WQGIT on Aug 14, 2017 showing an increase in phosphorus of 1.7 million pounds
- Lee Currey, James Martin, and Lewis Linker led a discussion on Conowingo at the Sept 25-26, 2017 WQGIT meeting with a presentation which showed the results of allocating the 1.7 million pounds of phosphorus
  - Four options of 'Susquehanna Basin only', 'Susquehanna Basin + Most Effective Basins', 'All but DE and WV', and 'All' were presented.
  - The 'most effective basins' for this presentation were based on EPA's interpretation of the phosphorus effectiveness values for each basin shown on slide 34 of a presentation made earlier in the day. They were listed in slide 2 of a presentation put together during the evening between the first and second day by Gary Shenk. These are the basins that are still known as the 'most effective basins' by the Conowingo WIP Steering Committee.
- WQGIT decides to present "Susquehanna + effective basins" as the preferred option to PSC for how to assign responsibility for addressing Conowingo Dam – decision captured in slide 12 here

- On October 3, 2017, the PSC agreed that the four options for allocation previously identified were still under discussion

A new analysis was conducted with completed models that considered both nitrogen and phosphorus

- On Nov 28: 2017: A presentation to the Modeling Workgroup showed TN increases as well as TP for the first time on slides 13 and 14.
- Dec 4 and 5, 2017: the WQGIT and MWG in a joint meeting considered all facets of the Midpoint Assessment, including Conowingo through this presentation. The Conowingo discussion starts on Slide 343 with Lee Currey presenting. Both N and P increases are shown. On slide 351 it is shown that the filling of the Conowingo adds 13 million lbs of N and 1.8 million lbs of P, but due to the timing and nutrient species effects, these are equivalent to 6 Mlbs N and 0.26 Mlbs P from the Susquehanna. These amounts increase if reductions are expected from different areas are used (slide 355). The selection of basins for the 'most effective basin' map was not updated to include nitrogen basins.

PSC creates the Conowingo WIP

- At the Dec 19-20, 2017 meeting, the PSC decided (slide 13) to separate out the Conowingo into its own WIP with nitrogen and phosphorus reductions. The PSC did not discuss an option of having most effective basins that included nitrogen as well as phosphorus. It is also unclear as to whether the PSC members realized that the maps they were presented were for phosphorus effectiveness only.
- From Dec 2017 through Jan 2019 the PSC developed the Conowingo WIP framework which includes pooling resources and, on page 3, directing implementation to the "most effective locations (i.e., the locations with the most influence on Bay water quality)"
    - There is room for interpretation of the meaning of "most effective locations". It could refer to the previously selected "most effective basins" or a new analysis locations that were most effective. The maps and charts in the framework document reference the previous four options, however, the document itself does not list specific areas and does not specifically call out nitrogen or phosphorus as being the focus of the Conowingo WIP.

Related Conowingo WIP Steering Committee actions

- A draft targeting proposal for Conowingo WIP delivered to PSC on May 9, 2019 said that the CWIP would target Susquehanna plus most effective basins as defined in the PSC's framework document.
- On Sept 23 2019, the Conowingo WIP Steering Committee decided, that the WIP should focus solely on nitrogen loads but to do so most effective basins for phosphorus (i.e., the phosphorus geographies"). There is limited documentation of the rationale other than the phosphorus effectiveness maps being used in the CWIP Framework and not the nitrogen ones which were unavailable at that time .
- In Nov 2019, the CWIP were made aware of the most effective basins calculation and the N and P differences by Emily Trentacoste. The CWIP decided that "Due to the tight timeframes for the Conowingo WIP, differing opinions on the preferred most-effective basins geography as well as what has been or needs to be approved by the PSC regarding the most-effective basins geography, the Steering Committee agreed the grantees should continue using the most effective basins geography map included in the PSC-approved Conowingo WIP framework

document, which are based on phosphorous not nitrogen. The Steering Committee also agreed that this can be revisited as part of the adaptive management process for the WIP and as necessary to facilitate WIP implementation."