Modeling Workgroup Meeting

June 15, 2017
CBPO Room 305A
410 Severn Avenue Annapolis, MD 21403
Event webpage: http://www.chesapeakebay.net/calendar/event/25164

MINUTES

Introductions and Announcements – Lee Currey, MDE, and Dave Montali, TetraTech: Modeling Workgroup Co-Chairs

- Lee noted the efforts completed by the Modeling WG to reach this stage of the Phase 6 development, and Dave echoed the same sentiments.
- As a reminder, the next webinar will be held on Tuesday, June 20, that will cover Phase 6 Physical Transport.

Phase 6 Roll Out and Status of Phase 6 Review Period – Gary Shenk, USGS
Attachment A

- Gary reviewed the outline of Phase 6 documentation chapters that are available for review, and emphasized points regarding which sections workgroup members should target when carrying out their review.
- Gary also outlined the ways in which partners can review the Phase 6 Watershed Model (WSM), from the broad general overview to very fine detailed comparisons of particular areas of interest.
- Olivia stated that there are no differences between the dashboard graphs of constituents for the entire watershed shown on CAST versus those shown on Tableau over the past few months.
- Scenarios are now live on CAST as well, and include the Progress Scenarios for any year during the calibration, the No-Action scenario, the WIP Phase 2 scenario, and the E3 scenario.
- Gary also explained the ways in which partnership feedback is tracked, recorded, and incorporated. Comments and feedback can be sent to Gary Shenk, Lewis Linker, Lee Currey, or Dave Montali.
- Dave asked if we had any fatal flaws submitted, Gary to go over them on slide 20.
- Gary also explained the fatal flaw criterion that had previously been decided upon (slide 19)
- The June 1 documentation that was uploaded is finalized, but comments may be added for items that were missed initially
- Gary also showed the schedule for the watershed model up until the release of the final Phase 6 WSM and WQSTM model dependent upon the WQGIT's decisions regarding the schedule).
- Karl Berger asked a clarifying question about progress runs, and Gary and Olivia stated that all the progress runs through 2013 are out now, but the years following that do not have runs published as Phase 6 land use initial conditions data have not been provided past 2013.

- Dave asked about the time needed after the delivery of the final model to determine geographic efficiencies.
    - The Modeling Team thinks that small changes in the versions of the model will not greatly affect the geo runs.
    - Richard Tian has made a great deal of progress in moving the geo runs to the cloud to efficiently develop these results, and they will be completed in August
- Dave noted that it would be good to have a link to the comment document on the Modeling webpage, rather than just hosting the document on the Midpoint Assessment webpage. This will be added to the Modeling WG webpage.
- Hassan asked if the WQSTM was also available for review.
    - Lew stated that Carl is working to deliver an interim calibration to the Modeling WG at the end of June, and he will continue to finalize the model through August.
    - What was presented for STAC peer review, including the full documentation, on June 5-6 can be made available. This information will be added to the Modeling WG webpage as a project.

Final Phase 6 – Gopal Bhatt, Penn State
Attachment B

- Gopal began by reminding the workgroup of the decision made at the May 18 Modeling Workgroup conference call to not use regional factors, and discussed the few remaining inputs that were utilized in the Draft Phase 6 WSM.
- Gopal also discussed the comparisons made in matching WRTDS loads to WSM simulated loads, conditions of change under Conowingo infill, and the different components of nutrient species.
- Lew emphasized again the importance of a partnership review period, which offers the potential for even further refinement of the final Phase 6 model. If we were to enter into analysis today, we would have a demonstrably better model as compared to Phase 5.3.2, without the incorporation of regional factors.
- Lee asked what the plan was for developing plots that looks at the contribution from each source across the whole Bay watershed, and plots showing changes in delivery factors.
    - Gary and Olivia explained that the loads by source are all in CAST, and delivery factors can be downloaded from the source data in CAST as well.
    - Currently, all the scenarios have the Conowingo reservoir at the 1990's level, and a separate set of delivery factors will be developed for the Conowingo in a condition of dynamic equilibrium.
- Lee stated that the partnership would benefit from seeing the contribution of sources now from Phase 6 as compared to prior versions of the model.
- Jeff reminded the workgroup that the current conditions for scenarios is 2013, the Bay Program has not received data from the states for years past 2013 as those data are due September 1. An update on the current status will not be completed until that time. Additionally, there has been no review of E3 scenario or the WIPs and Jeff emphasized the draft nature of those scenarios.

Atmospheric Deposition Loads of Nitrogen to the Chesapeake Watershed and Tidal Waters – Kyle Hinson, Chesapeake Research Consortium
Attachment C

- Kyle discussed the methodologies by which regressions were applied between Jeff Grimm's wet deposition dataset and the shorter CMAQ dry deposition dataset to develop a full time series of dry deposition species in the watershed and on the Bay for the calibration period and future scenarios.
- Norm Goulet asked if this dataset takes into account changes that are occurring on the federal side to improve air quality.
    - Kyle explained that the projections out into time did incorporate reductions as a result of the Clean Power Plan, but there is still a downwards trend in NO_x deposition regardless of federal action or inaction.

Status of the Watershed Model and WQSTM Peer Reviews –Bill Ball, Chesapeake Research Consortium
Attachment D

- Bill Ball reviewed the multitude of completed and ongoing STAC peer reviews and workshops that are being used to help refine and evaluate CBP modeling tools. Bill also went over the steps taken for different reviews in the modeling process.
- Lee asked about whether the team completing the WSM review will be studying the bioreactivity of material in the Conowingo reservoir.
    - Lew stated that this point will also be covered by the WQSTM review team will in their peer review, and will be studying specific sensitivity scenarios to be completed in June. It's important to let the WSM panel know that they are off the hook on this issue.
- Bruce Michael asked if the updated bioreactivity information had from UMD had been provided to the CBP.
    - Lew affirmed this, noting that the Modeling Team has whatever was submitted by the set deadline. This is the same data as what the Exelon report authors used.
    - This panel is not charged with reviewing the movement of nutrients through the Conowingo reservoir. This issue is being considered by the WQSTM panel, as well as the transport of nutrients and sediment through the Bay.
    - Lew emphasized that there are other aspects of review surrounding the Conowingo as they relate to the STAC peer review of the WQSTM including: Maryland's review of the Conowingo Pool model put forth by HydroQual, other aspects of research completed in this effort, and the Modeling Workgroup's study of WSM analysis for scour and fractionation from data provided by Qian Zhang and Jim Fitzpatrick.
- Bill also made an announcement about the upcoming STAC Model Visioning Workshop that will be held in January 2018.
- There will be a call set up to follow up and ensure that any review gaps regarding the Conowingo have been thoroughly covered as the partnership review is completed.

WQSTM Assessment of the 92 TMDL Segments – Richard Tian, UMCES
Attachment E

- Richard reviewed the improvements that have been made in terms of R^2 correlations and relative bias between the WQSTM simulations and data.
- Analyses are based on the designated use domain for each segment. All data available are screened and are compared to the model results. This method results in over 1000 stations and over 700,000 data points for parameters like chlorophyll-a.
- Overall, there are improvements in the simulation and assessment of comparisons as compared to Phase 5.3.2. It is important to utilize the capability of applied relative changes as compared to absolute values.

Exploring Land Based Strategies to Address Conowingo Infill Phosphorus and Sediment Increases – Lee Currey, MDE and Olivia Devereux, Devereux Consulting
Attachment F.1, *Attachment F.2*

- Lee reiterated that the Conowingo, Climate Change, and Growth were some of the large areas that the Water Quality Goal Implementation Team (WQGIT) was evaluating in the decision to incorporate additional loads. Lee explained the framework for dealing with the Conowingo set up by the WQGIT.
- Best estimates of cost effectiveness presented to the Principals' Staff Committee in December 2016 were also reviewed, essentially showing the potential range of additional reductions required (in terms of a percentage increase) in addition to the WIP efforts if Conowingo infill is included for jurisdictions in the Susquehanna watershed, additional Bay states using allocation rules, and the inclusion of all jurisdictions in the watershed.
- **ACTION**: Lee asked that comments be returned by the end of the month, June 30 on the draft report titled, ""Allocation of Conowingo Infill Nutrient and Sediment Loads: Comparing Cost Effectiveness in Different Phosphorus Load Allocation Scenarios among Jurisdictional Partners".
- George Onyullo suggested that Lee incorporate the Wastewater WG in addition to the Urban Stormwater WG, the Forestry WG, and the Agricultural WG to provide the possibility of loads sharing with D.C.
    - Olivia explained that the Wastewater WG was avoided not to avoid the group, but it was rather due to the cost prohibitive nature of adding additional reductions to wastewater treatment plants on top of what had already been included in the WIP. The recommendations in the BMPs did not recommend changes for WWTP facilities.
    - Lee agreed, and stated that it would still be good to get the Wastewater WG's input regardless.
- Lee explained charts from the report further, emphasizing that the additional phosphorus load reductions would be largely borne by Pennsylvania, as would the cost of the additional reduction beyond the WIP. It is important to note that the 88% of the cost assigned to PA is related to the additional phosphorus reductions and **is not** an additional 88% cost on top of all practices implemented in the WIP.
- Olivia explained that when all jurisdictions are included in the additional load reduction resultant from Conowingo infill, PA actually sees a cost decrease due to feed additive

BMPs for agriculture, livestock, and poultry. Those BMPs are cost-saving to the farmer, and because of this and the fact that there are many animals to implement the BMP upon that were not predominantly in the WIP previously, the reduction is balanced for PA.

- While load reductions change among sectors for different scenarios, water quality standards are still achieved in the Bay even with the infill. Although they change among scenarios, the same effect is produced.
- Concerns were raised about the difference in total cost between Scenarios 2 and 3, as a smaller land area is being added. The breakdown of these numbers is more substantially explained within the report.
- George noted that one of the premises behind the different scenarios is that there are potential opportunities to implement BMPs. When taking the District into account, it becomes clear that there is a point where BMP installation saturation is being reached. This point should be taken into account when dividing among additional jurisdictions.
    - Olivia reiterated that E3 was not a restrictive constraint for these scenarios. It is known from Lindsey Gordon's analysis that, for example, additional forest buffers increasing to 20% is non-feasible and that is why additional workgroup inputs are needed. The breakouts are included in the report.
- **ACTION:** Lee will send out a reminder to the Modeling Workgroup to submit comments to Olivia on the draft report directly by the end of June.

ATTENDANCE

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