Modeling Workgroup Conference Call

February 6, 2018

Meeting Summary

Event webpage:

https://www.chesapeakebay.net/what/event/february_2018_modeling_workgroup_quarterly_meeting_day_2

Announcements

- Chesapeake Modeling Symposium will be held on June 12-14, 2018 and the deadline for abstract is Mar 1, 2018. Lew highlighted the session of the modeling climate change and the session of results from recent studies of Conowingo Pond.
- Lee Currey will resign from his co-chair position in May 2018. Dave will remain his co-chair position for another year. In April, we will put together an agenda to discuss Modeling WG leadership. Lee pointed out management perspective is important in developing the tools.

Scenario Optimization Tool for CAST – Daniel Kaufman, CRC

Danny will give an overview of the development of an optimization tool for scenarios run in Phase 6 CAST. The initial development will be described, as well as the major developmental steps anticipated for final development. In addition, a discussion will look into an exploration of the options available to the CBP partnership in order to best serve decision making at all scales from the state-basin to local levels.

Daniel discussed the vision of the optimization tool for CAST, its current phase, utilization and next step forward. Optimization tool will choose mixes of BMPs that will allow users to meet the target loads at the lowest cost. Various algorithms can be used to identify optimal solutions. The plan to investigate and develop the tool was presented. The secondary objective of the optimization tool is to maximize co-benefits. Two types of constraints will be considered in each scenario. The Optimization tool sandbox is an early pre-prototype that will be carried out in Python. Besides co-benefits and baseline optimization scenario, other objectives include cost tradeoffs and local targets. Discussions:

- Lee suggested Daniel work with State and local jurisdiction managers while developing the tool. Gary mentioned that Oliva will help by contacting the State contacts. Lee suggested that in Maryland they have webinar series and regular meetings that Daniel can present to.
- Norm suggested Daniel to present to various Workgroups before reaching out to the state. Karl added that Daniel should build flexibility into cost.
- Lee added that pilots are needed before the tool is to put in use.
- Daniel added that the timeline of completion will be a few years. The complete tool will not be available for WIP3 development.

Review of PSC Briefing on 2025 Climate Change Simulation – Lew Linker, EPA-CBPO and Zoe Johnson, NOAA-CBP Attachment B1 **and** Attachment B2

The PSC directed the Modeling Workgroup, working with the Climate Resiliency Workgroup to develop and distribute a briefing package in advance of the Principals' Staff Committee's [March] 2018 meeting that will provide greater detail on how the additional nutrient and sediment loads due

to 2025 climate change conditions were developed, and the data and assumptions behind those calculations.

The briefing document to the PSC can be found on the meeting webpage (Attachment B2). This presentation is based on this document. Workgroup members' comments are welcome. Zoe Johnson is the point person in designing this approach. By 2019, an estimate of pollutant load changes will be developed. By 2021, the Partnership will consider updated methods and revisit estimated loads due to climate change and determine if any updates are needed. By 2025, jurisdictions will be expected to account for additional loads caused by climate change. The presentation discussed the changes in the sea level rise and the nutrient types, and the impacts of these changes. Lew further discussed the current estimates for 2025 with the help from the STAC scientists, and the plans to increase the confidence in estimation.
Zoe added that Mark will discuss the proposal for the STAC workshop in summer 2018. Comments are welcome for the briefing document by COB Feb 7.

Update on Bay Assimilation Analysis for NY & WV Special Cases – Lew Linker, EPA-CBPO and Gary Shenk, USGS-CBPO Attachment C1 **and** Attachment C2
A summary of latest developments and findings on the analysis of additional loads to accommodate the special conditions of the New York basin of an additional allocation of 1M and 0.1M pounds TN and TP, respectively, and in West Virginia's basin for 1.5M pounds of TN. Approaches that examine additional loads based on assimilation capacity and on the estimated 2025 freeboard in the EPA atmospheric deposition of TN allocation to tidal waters and the watershed will be reviewed.

The briefing document to the PSC can be found on the meeting webpage (Attachment C2). This presentation is based on this document. Comments are welcome for the briefing document by COB Feb 7. The special case required by New York is 1M pounds of Nitrogen and 100,000 pounds of phosphorous. The special case required by West Virginia is 1.5 M pounds of Nitrogen. NY's and WV's special cases can be satisfied by three sources of additional pounds: additional bay assimilative capacity and the atmospheric deposition to the tidal surface water and to the Bay.
Norm asked for clarification for the reference of the allocation. Lew responded that this can be found in the documentation of 2010 TMDL.
James asked if NW and WV's special cases can be met because WV's special case is 1.5M instead of 2M pounds of nitrogen. Lew confirmed.
James suggested that this briefing document should be presented to the WQGIT since the jurisdiction representatives need to brief the PSC members before the PSC meeting.
Dave suggested more explanations are needed for the extra available pounds of nitrogen. Lew responded that details can be found from the briefing document.

Modeling Team Priorities for 2018 & STAC Workshop on Modeling in 2025 and Beyond – Gary Shenk, USGS-CBPO
Now that the work on planning target development is beginning to draw to a close the Modeling Workgroup will be 'turning the page' and turn our efforts to supporting the development of the draft Phase 3 WIPs, full documentation of the CBP models and their findings in support of the 2017 MPA, and other key activities that Gary will describe. Outcomes of the January 2018 STAC workshop on Modeling in 2025 and Beyond will be briefly summarized. The workshop goals included the description of the anticipated management challenges the CBP faces in the coming years and the changes and upgrades that will have to be made to the CBP modeling system to meet the challenges.

Gary reviewed the Watershed Model development history for phase 6 and the priorities for the modeling team for 2018. From Feb to May, modeling team will support WIP development. Phase 6 documentation is expected to be done by April 1, 2018. Phase 6 will migrate to Cloud by the end of June 2018. Other priorities such as climate change and uncertainty analysis were discussed. Phase 7 is expected to be completed by 2025.

Gary reviewed the 3-day STAC workshop held in January 2018 and a series of recommendations received. Several common themes from the workshop were discussed: Phase 7 will likely be evolutions of Phase 6 rather than revolutions, primary and experimental models, and local applications of the models. Three more workgroups are proposed under the Modeling WG: Watershed Sediment WG, Biogeochemistry WG, and Ecosystem WG.
Discussion:

- Lee commented that development should be move on carefully considering the managers are using the Phase 6 models. Managers' inputs are critical in developing next phase model.
- Marjy commented that the coding for new hydro dynamic model has started already.

Oyster Aquaculture Influence on Water Quality – Lew Linker, EPA-CBPO, Richard Tian, UMCES, and Carl Cerco, Attain, LLC
Estimates of the influence oyster aquaculture has on Chesapeake water quality will be reviewed.

Richard and Carl are the point persons in performing oyster aquaculture analysis. The method to determine the amount of aquaculture oyster biomass is developed of Carl Cerco. The depth criteria and salinity criteria were used in determining the oyster location. Results of the estimated DO attainment in deep channel, deep water and open water were reviewed. No change estimated anywhere in the open water DO standard. Estimated DO improvement in selected CB segments with full build out of oyster aquaculture under WIP conditions were discussed.

- Lee suggested the need to look more locally with the water quality benefits of oyster aquaculture. He added that a recent progress scenario be used to augment the WIP2 Scenario analysis. The progress scenario will be more sensitive than the WIP2 with hypoxia reduction because the WIP2 already reduces so much hypoxia in the Bay the benefits of oyster aquaculture are difficult to measure with the stoplight plots when most of the DO water quality standards are already achieved at the WIP 2 level of reductions.
- Jeff Cornwell mentioned diversions in net water quality value.

Larry commented that the aquaculture BMP group is also reviewing a similar subject.
Marjy mentioned this topic will also be considered in the CCMP Symposium under the biogeochemistry section.

Proposed 2018 STAC Workshop for CBP Climate Change Simulation – Mark Bennett, USGS
Mark will review a proposed climate change STAC workshop which is motivated by the PSCs direction to the Modeling Workgroup to refine the CBP climate change simulation over the next two years.

Zoe Johnson drafted the proposal for this STAC workshop. This two-day workshop will bring together experts in climate change to examine of the current results of the Chesapeake Bay Program's (CBP) Midpoint Assessment climate change modeling effort. Marjy and several other STAC members are part of the steering committee. A series of questions will be explored during this workshop were reviewed.

Discussion:

- Lew commented that managers are interested in the trends of the water quality in 2030, 2035 and 2040. Mark commented that this is inevitable because other modelers are also studying this question and we'd what to make the comparison with other models
- Norm asked for clarification for whether this is two-day or one-day workshop. Mark confirmed that this is a two-day workshop.
- Norm suggested adding various workgroup chairs. Mark responded that cost is the main obstacle.

Modeling Priorities of the STAR Workgroups – Scott Phillips, USGS

Scott will review the forward-looking modeling and analysis needs identified by the CBP Goal Implementation Teams (GITs) for the Modeling Workgroup.

STAR worked with each Goal Implementation Team to identify their science needs for each of the Chesapeake Agreement outcomes they are responsible to carry out. STAR need Modeling WG's help in carrying out these research needs of the GITs related to better understanding the factors that will affect achieving outcomes. Scott reviewed the needs of GIT teams: Fisheries, Habitat, Water Quality, Healthy Watershed, and Stewardship.

Discussion:

- Gary asked if these GITs have groups of scientists that are working on models. Scott confirmed. He added that brook trout team has a group of scientists and this could be a starting point.
- Lew asked what are modeling needs for Book Trout. Scott responded that BT is depended on a lot of things, such as genes. Lew added that connection should be made in the Phase 7 model.
- Gary suggested to start to communicate with the GIT leaders on these modeling needs. Co-benefits should be a part of the output.
- Lee added that a finer scale of hydrology should be incorporated in the Phase 7 model. Lee suggested that the GIT should work with regulatory agencies to turn the model findings into management action. A lot of work has been done through TMDL. Reaching out to regulatory agencies who are not attending our meetings.
- Gary commented that connecting to the co-benefit is important. One example is monetizing the co-benefits of human health by reducing the PCB and mercury
- Lew modeling needs for fish and habitat can be satisfied by a proposed new subcommittee of the Modeling Workgroup working on ecosystem modeling.
- Scott recommended the proposed sediment subcommittee of the Modeling Workgroup could be used in fulfilling the some of the STAR modeling needs.
- Lee commented that outstanding data are available to calibrate model. Maryland has been monitoring PCB for a decade and has existing PCB models which can be taken advantage of.
- Bruce M: MDNR need support from Modeling WG in determining the priorities of environmental monitoring program due to limited funding.
- Lee suggested that it would be helpful for Modeling WG to conduct a similar communication to STAR regarding the modeling needs. Dave seconds to Lee's comment since these new subgroups will be interacting substantially with the GITs.

Lew commented this can be included in the April in person meeting

Meeting Participants

Alisha	Mulkey	Larry	Sanford
Amir	Sharifi	Lee	Currey
Andrew	Sommerlot	Lew	Linker
Bruce	Michael	Marjorie	Zeff
Carl	Friedrichs	Marjy	Friedrichs
Clint	Gill	Mark	Bennet
Cuiyin	Wu	Mukhtar	Ibrahim
Daniel	Kaufman	Norm	Goulet
Dave	Montali	Olivia	Devereux
Dinorah	Dalmasy	Rachel	Dixon
Gary	Shenk	Richard	Tian
Guido	Yactayo	Ross	Mandel
Hassan	Mirsajadi	Scott	Philips
Jason	Keppler	Ted	Testler
James	Davis-Martin	Will	Hunley
Jeff	Cornwell	Xie	Xia
Jess	Bash	Zoe	Johnson
Karl	Berger		
Kyle	Hinson		