Scientific and Technical Advisory Committee Workshop

Chesapeake Bay Program Climate Change Modeling 2.0

September 24-25, 2018
Crowne Plaza Hotel, Annapolis MD
Arundel C Ballroom

Workshop Webpage: http://www.chesapeake.org/stac/workshop.php?activity_id=289

Workshop Motivation and Goals

- The motivation for the workshop stems from the decision of the Chesapeake Bay Program (CBP) Principals' Staff Committee to develop a framework for addressing climate change impacts in jurisdictions Phase III Watershed Implementation Plans (WIPs). The CBP Partnership recognizes that further work is needed to have jurisdictions account for additional nutrient and sediment pollutant loads, due to anticipated 2025 climate change conditions, in their 2-year milestones beginning in 2022.

- The goal of the workshop is to develop recommendations for new and/or refined methods and modeling techniques to be completed and fully operational by 2019, to assess the potential impacts of 2025 and longer term climate change on watershed loads and estuarine processes, to characterize and manage the risk of climate change impacts to CBP goals.

- In addition, guidance is sought in formulating a long-term plan of study, including field sampling and data analysis, monitoring and modeling that will improve understanding of long-term climate change impacts, vulnerability and risk management in the Chesapeake watershed and estuary, which could be considered in the conceptual framework in the next phase of CBP model development.

Day 1: Monday, September 24

**8:30 Sign-In for Attendees ****Coffee and light breakfast provided for attendees*

9:00 Welcome – Lee Currey, MDE

9:20 Plenary: Global Perspectives on the Effects of Climate Change on Coastal Eutrophication – Don Boesch, UMCES
A state-of-the art overview of efforts to model the effects of climate change on hypoxia and ecosystem conditions will be presented. What are the "big things" that we need to get right?

9:50 Introduction and Purpose of Workshop – Mark Bennett, USGS

10:00 Overview of Climate Impact Assessment Framework and Implementation – Gary Shenk, USGS-CBPO

Short description of the models and analysis methods used in the climate change impact assessment completed by the CBPO in 2017. Linkages between models and key sensitivities to climate inputs.

10:30 Findings of the Phase 6 Watershed Model – Gopal Bhatt, Penn State and Gary Shenk, USGS-CBPO

Key findings of the Phase 6 Watershed Model under the estimated 2025 climate change conditions and details of the simulation method relative to climate will be presented. In addition, the influence of the relative rates of increasing precipitation and temperature on watershed on flow and loads to the tidal Chesapeake in 2035, 2045, and 2055 will be estimated.

10:50 Findings of the WQSTM – Richard Tian, UMCES and Carl Cerco, Attain

Key findings of the CBP Water Quality and Sediment Transport Model (WQSTM) under the estimated climate change conditions and details of the simulation method relative to climate will be presented. The influence of the relative rates of increasing precipitation and temperature on watershed flow and loads to the tidal Chesapeake in 2035, 2045, and 2055 will be estimated.

11:10 DISCUSSION / Q&A (Moderator - Lew Linker, EPA-CBPO)

What additional or different climate change approaches and methods should be incorporated into the **Phase 6 Watershed Model** for the 2019 Climate Change Assessment?

What additional or different climate change approaches and methods should be incorporated into the **WQSTM** for the 2019 Climate Change Assessment?

What additional or different climate change approaches and methods should be incorporated into **potential next generation CBP watershed and estuarine models** for climate change assessment?

**12:00 Break ****Boxed lunch provided for attendees*

12:30 Round Table: Management Actions in Response to Climate Change – Tony Buda, USDA-ARS; Jon Butcher, Tetra Tech; and Curtis Dell, USDA-ARS; Adel Shirmohammadi, UMD

Anticipating longer growing seasons, crop rotation changes, and changes in BMP efficiencies, the panel will consider important features in the simulation of watershed loads under climate change conditions that are currently unaddressed in the current CBP climate change assessment framework.

What management approaches that address climate change in developed land, agricultural land, and undeveloped (natural) land should be included in **future CBP modeling**?

1:30 Instructions for Break-out Groups

Group 1: Simulation of Climate Change Processes and land management in the Phase 6 Watershed Model Influencing Chesapeake Water Quality
Group 2: Simulation of Climate Change Processes in the WQSTM Influencing Chesapeake Water Quality
Group 3: Assessment of the overall CBP framework of climate change analysis

Breakout Session I

Each breakout will have two chairs who will lead and facilitate discussion, and a recorder. The goal of the afternoon is for each breakout to produce 2 items:

1. *List of draft recommendations, with focus on the top consensus priorities*
2. *Longer list of thoughts and notes from discussion, for inclusion in workshop report*

1:45 Breakout Round-Robins
Group members should come prepared to share their reactions to the morning's larger group discussion in regard to their breakout topic and in consideration of the breakout questions. Discuss resource and data needs, advantages, and disadvantages.

2:45 Break (15 mins)

3:00 Focused Breakout Discussion
Discuss alternative development strategies in detail. The goal of the focused breakout session is for the breakout members to fully understand the questions and proposed solutions.

4:30 Cross-Pollination
Breakout Group 3 will divide in half and meet with Groups 1 and 2. This time will be used to share ideas heard this afternoon and get input from other participants to help refine recommendations and inform prioritization.

5:30 Recess & Happy Hour
Evening Homework! Adjourn to the bar and learn something new from someone in another breakout group

Day 2: Tuesday, September 25

8:00 ***Coffee and light breakfast provided for attendees***

Breakout Session II

8:30 Prioritizing Breakout Recommendations
Breakout groups will reach consensus on draft recommendations from the previous day for presentation to the wider group. As time allows, groups can begin to work on longer descriptions of the draft recommendations.

10:30 Break (30 mins)

11:00 Plenary Presentation of Breakout Proposals (20 mins per group)
All participants will reconvene and chairs for each breakout group will briefly present the group recommendations

12:00 Break * *Boxed lunch provided for attendees*

12:45 Compiling Recommendations & Cross-Cutters Response
Facilitated discussion of final recommendations presented before lunch focused on compatibility between proposed components with a view toward formulating a realistic and unified vision for future CBP modeling. 'Cross-cutters' will present their perspectives on the consensus recommendations and their major takeaways.

1:45 Looking Ahead: STAC Science Synthesis
Engage participants in a discussion on potential topics for a 'deeper dive' synthesis effort through STAC, based on findings and recommendations of the workshop.

2:30 Wrap-up Discussion – Looking Ahead for the CBP Climate Change Assessment Framework

What new and/or refined methods and modeling techniques could be used to better assess projected impacts on watershed loads and estuarine impacts for a range of future scenarios in 2019? In a future 2025 assessment?

What improvements could be made to the methodology used to develop jurisdiction-specific nutrient pollutant loads due to 2025 climate change conditions and beyond?

What are the remaining research gaps and highest priority information needs for the 2019 CBP Climate Change Assessment (e.g., data, research, modeling methods and techniques, programmatic efforts)? For climate change assessments in 2025 with the next generation of the CBP models and assessment methods?

3:00 Adjourn