Modeling Workgroup October Quarterly Review

Day 1 - October 8, 2024

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This meeting will be recorded for internal use only to assure the accuracy of meeting notes.

9:00 Announcements and Amendments to the Agenda – Mark Bennett, USGS and Dave Montali, Tetra Tech

9:05 Phase 7 Watershed Model Overview – Gary Shenk, USGS-CBPO
Gary will provide an updated timeline for completion of the Phase 7 Model in time for the 2026 partnership review.

9:20 Discussion of the Phase 7 Model Overview

9:30 Update on CalCAST Development – Isabella Bertani, UMCES-CBPO
Isabella will describe the progress made in work on improving CalCAST with a focus on updating and expanding land uses and load sources to match those used in CAST.

9:50 Discussion of CalCAST Development

10:00 Progress in Phase 7 WSM Development – Gopal Bhatt, Penn State-CBPO
The NHDplus 100K scale Phase 7 Dynamic Watershed Model (DWM) is using a nested model segmentation of streams and rivers with a hybrid structure for the simulation of water quality processes using HSPF and non-iterative routing models. Gopal will describe October plans for linking of watershed model flows and loads with the estuarine models.

10:35 Discussion of Phase 7 WSM Development Progress

10:45 Conowingo Model Development – Earl Hayter, Jodi Ryder, CoE-ERDC and Matt Rowe, MDE
The Corps of Engineers and Maryland Department of the Environment are moving forward with a 50/50 cost share project totaling $1.4 million for the development of a new Conowingo Model. The model will take input from the CBP's Phase 7 models of the Susquehanna watershed and airshed and deliver estimated flows and loads of nutrients and sediment to the CBP Phase 7 Main Bay Model (MBM). The objectives of the MDE/CoE Conowingo Model are to 1) examine Conowingo infill and scour under different future climate change hydrologies, 2) investigate extreme storms and events and

their influence on the Conowingo pool and tidal Chesapeake, and 3) explore the feasibility of Conowingo dredging as an approved CBP management practice. The schedule calls for the Conowingo Model to be completed December 2025 in order to join all the Phase 7 Models in CBP's 2026 year of model review. The CBP Modeling Workgroup will assist and guide the Conowingo Model development, review, and application in CBP's assessment of water quality standards under 2035 climate change conditions beginning in 2027.

11:20 Discussion of the Conowingo Model Development and Application

11:30 Development of Efficient Multi-Objective Optimization Procedures – Kalyanmoy Deb, Amirpouyan Nejadhashemi, Gregorio Toscano, and Hoda Razavi, MSU
Progress on the integration of web-user and decision-making interfaces, and tasks for multi-state implementation using machine learning and parallel computing platforms will be presented.

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11:40 Optimization Discussion

12:00 LUNCH

12:45 Updating and Improving Loading Sensitivity to Inputs and Phosphorous Loading Processes – Joseph Delesantro, ORISE-CBPO
Joseph will discuss progress on identifying literature and models to inform load sensitivity to nutrient inputs and testing of potential values to begin in fall 2024. Joseph will also discuss phosphorous (P) loading processes and seek input on potential opportunities to improve P modeling.

1:15 Discussion of Updating and Improving Loading Sensitivity to Inputs, Phosphorous Loading Processes, and Related Activity Update

1:25 Key Airshed Model Scenarios for Phase 7 – Jesse Bash, Chris Nolte, and Dan Loughlin, EPA-ORD
Progress on the completion of the Phase 7 library of CMAQ Airshed Model scenarios this month will be presented. Scenarios include the 2002-2019 Base, 2016 Base Scenario, 2035 Inflation Reduction Act (IRA) Scenario, 2035 IRA and State Targets Scenario, 2035 Net Zero Carbon Scenario, 2050 IRA Scenario, 2050 IRA and State Targets Scenario, and 2050 Net Zero Carbon Scenario.

1:40 Discussion of Key Scenarios for Phase 7

1:50 Development of Maryland Carbon Emission Mitigation Targets – Rachel Lamb and Michael Macon, MDE
The Maryland Department of Environment is developing carbon emission mitigation emission targets which will have the potential for accelerating the reduction of atmospheric deposition of nitrogen. Work is underway to ensure proper credit for the

nitrogen reductions while avoiding double counting in the Phase 7 Airshed Model scenarios.

2:10 Discussion of Carbon Emission Mitigation Targets

2:20 ADJOURN

Modeling Workgroup October Quarterly Review

Day 2 - October 9, 2024

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10:00 Announcements and Amendments to the Agenda – Dave Montali, Tetra Tech and Mark Bennett, USGS

10:05 Update on Main Bay Model (MBM) Progress – Zhengui Wang, Joseph Zhang, and Jian Shen, VIMS
Progress on the MBM water quality (ICM) living resource modules of oysters, SAV, and tidal marsh will be presented.

10:40 Discussion of the Main Bay Model (MBM) Progress

10:50 Phase 7 Update of Model Criteria Assessment – Richard Tian, UMCES-CBPO
Richard will provide progress on a water quality assessment of the entire tidal Bay.

11:10 Discussion of Whole Bay Criteria Assessment.

11:20 Initial Assessment of Decarbonization on Chesapeake Airshed, Watershed, and Tidal Bay Loads – Jesse Bash, EPA-ORD; Gopal Bhatt, Penn State-CBPO; and Richard Tian, UMCES-CBPO
The decarbonization sensitivity scenarios developed on GLIMPSE-GCAM-CMAQ by Jesse Bash, Chris Nolte, and Dan Loughlin, (EPA-ORD) will be run on the Phase 6 Watershed and Estuary Models to understand the influence of reduced atmospheric nitrogen loads on tidal water quality.

11:40 Discussion of Initial Decarbonization Sensitivity Scenarios

11:50 Final Documentation of Algal Temperature Correction for Algal Growth – Carl Cerco, Arlluk
Carl will review the final documentation of algal temperature correction for algal growth for Model Workgroup decision.

12:05 Discussion of Algal Temperature Correction for Algal Growth

12:15 LUNCH

1:15 Identification and Characterization of Surface Water Intakes on the Chesapeake Bay – Raymond Najjar, Penn State

Surface water intakes in coastal regions are being increasingly threatened by saltwater intrusion resulting from climate change. To address this threat, intakes must be identified and characterized, but this is difficult in the United States, where there is no national database distinguishing between tidal and non-tidal intakes. In this presentation, Raymond Najjar describes a new database for Chesapeake Bay water intakes that was developed from state agency databases with collaborators at Penn State, Horn Point Laboratory, and Salisbury University.

1:35 Discussion of Characterization of Surface Water Intakes on the Chesapeake Bay

1:25 Stormwater Management in a Changing Climate SWM & AG BMPs – Michelle Miro and Krista Grocholski, RAND

Progress on applying existing, well-documented, open source, and public domain stormwater and/or watershed models under different future climate hydrologic conditions to determine relative change in pollutant removal efficiency in existing CBP-approved stormwater management BMPs under future climate conditions will be discussed.

1:55 Discussion of Stormwater Management in a Changing Climate SWM & AG BMPs

2:05 Progress on the Rappahannock MTM – Qubin Qin, East Carolina University and Jian Shen, Zhengui Wang, Pierre St-Laurent, VIMS

Progress on the Rappahannock MTM will be reviewed by the Rappahannock MTM Team.

2:25 Discussion of Rappahannock MTM Progress

2:35 Progress on the Choptank MTM – Jian Zhao, William Nardin, Elizabeth North, Larry Sanford, Jeremy Testa, UMCES and Jiabi Du, Texas A&M

Progress on the Choptank MTM will be described by the Choptank MTM Team.

2:55 Discussion of Choptank MTM Progress

3:05 ADJOURN