Modeling Workgroup October Quarterly Review

Day 1 – January 7, 2025

9:00 AM – 3:30 PM

Event webpage: Link
For Remote Access – Microsoft Teams Link: Join the meeting now
Meeting number: 274 827 435 449 Password: UXuCPc
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To enter the webinar, please open the webinar link first.
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 Conowingo Model Development – Earl Hayter, Jodi Ryder, CoE-ERDC and Matt Rowe, MDE
Progress in the development of the Conowingo Model will be presented.

9:30 Discussion of the Conowingo Model Development and Application

9:40 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. Implementation of the WQGIT approved application of HUC12 segmentation for Phase 7 Watershed Model river-segments will be discussed.

9:55 Discussion of the Phase 7 Model Overview

10:05 Update on CalCAST Development – Isabella Bertani, UMCES-CBPO
Isabella will describe the progress made in improving CalCAST for phosphorus and sediment. The different approaches that have been tried will be reviewed.

10:25 Discussion of CalCAST Development

10:35 Progress in Phase 7 WSM Development – Gopal Bhatt, Penn State-CBPO
A key theme of the last quarter has been the linkage of the Dynamic Watershed Model (DWSM) and Main Bay Model (MBM). The initial linkage and plans for future improvements leading to an automatic NetCDF transfer of calibration and scenario files will be discussed. In addition, work to provide atmospheric deposition loads to the MBM coastal water domain and general progress in the DWSM will be described.

11:15 Discussion of Phase 7 WSM Development Progress

11:25 Development of Efficient Multi-Objective Optimization Procedures – Kalyan Deb, Pouyan Nejadhashemi, Gregorio Toscano, Ritam Guha, 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. The upcoming webinar on application of the optimization tool will be discussed.

11:50 Optimization Discussion

12:00 LUNCH

12:45 Future Climate Impacts of CBP BMP Efficiencies – Maya Struzak, David Rounce, and Sarah Fakhreddine, Carnegie Mellon University
Progress will be presented on application of APEX and SWMM, well-documented, open source, and public domain watershed and stormwater models, under different future climate hydrologic conditions to determine relative pollutant removal efficiency change of current CBP-approved NPS and stormwater management BMPs.

1:15 Discussion of Stormwater Management in a Changing Climate SWM & AG BMPs

1:25 Updating and Improving Loading Sensitivity to Inputs and Phosphorous Loading Processes – Joseph Delesantro, ORISE-CBPO
Joseph will follow-up from his last Quarterly presentation on agricultural sensitivities and crop uptake and expand on the possibility of using proposed refined sensitivities. In addition, progress in the sanitary exfiltration loads will be described including the approach to apply it systematically everywhere in the Chesapeake watershed in a generalized fashion that will be consistent with the available data on gravity sewer systems.

1:55 Discussion of Updating and Improving Loading Sensitivity to Inputs, Phosphorous Loading Processes, and Related Activity Update

2:05 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.

2:20 Discussion of Key Airshed Scenarios for Phase 7

2:30 Application of ISAM for CBP Nitrogen Emission Reductions – Gary Shenk, USGS-CBPO and Gopal Bhatt, Penn State-CBPO
A presentation of how ISAM output can be used to distribute credit for nitrogen (ammonia and NOx) emission reductions will describe tables of the final ratio between

emission and delivery to tidal waters. Additional tables for NOx and ammonia delivered to the watershed, from the watershed, and direct to the Bay will also be presented. The Modeling Workgroup will decide if ISAM should be used in both Phase 6 and Phase 7 or will be applied for Phase 7 only.

2:50 Discussion of Applying ISAM for CBP Nitrogen Emission Reductions

3:00 Agricultural Modeling Team Progress – Tom Butler, EPA-CBPO
Tom will outline progress being made by the Agricultural Modeling Team (AMT). In addition, previous limitations in the Phase 6 pasture and hay nutrient application rates will be summarized along with proposed changes to the hay/pasture land cover class and their associated nutrient application curve groupings now being considered by the AMT will be briefly discussed.

3:15 Discussion of Potential New Pasture and Hay Land Uses

3:25 ADJOURN

Modeling Workgroup October Quarterly Review

Day 2 – January 8, 2025

10:00 AM – 2:45 PM

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

10:05 Preparing for Linkage of Phase 7 and CBP Habitat Models – Ryan Woodland, Victoria Coles, Xiaoxu Guo, and Raleigh Hood, UMCES
Development of Phase 6 scenario NetCDF files of key water quality scenarios for development and support of ancillary living resource models of oysters, white perch, crabs, and blue catfish will be presented. The Phase 6 NetCDF library of base, WIP, climate change, and all-forest scenarios will be made to be freely available to all requesters as part of a new initiative at UMCES called Chesapeake Global Collaboratory (CGC). CGC will leverage preexisting water quality predictions from the previous Phase 6 CH3D-ICM hydrodynamic-water quality model as input for CB living resource/habitat models. Predictor variables include temperature, salinity, and DO (for white perch) and they simulate things like respiration, metabolism, etc. Ultimately, Net CDF links between the Phase 7 SCHISM-ICM and CB living resource/habitat models will be made.

10:20 Discussion of Phase 7 and CBP Habitat Models

10:30 Update on Main Bay Model (MBM) Progress – Zhengui Wang, Joseph Zhang, and Jian Shen, VIMS
Ongoing progress on the MBM water quality (ICM) living resource modules of oysters, SAV, and tidal marsh will be presented. Sensitivity scenario comparisons between Phase 6 and Phase 7 living resource modules and shoreline erosion inputs will be reviewed and progress in the linkage of the Phase 7 Dynamic Watershed Model (DWSM) and MBM will be presented.

11:15 Discussion of the Main Bay Model (MBM) Progress

11:25 New Approaches in Model Criteria Assessment – Richard Tian, UMCES-CBPO
The criteria assessment for the period for 2021-2023 is being developed with the addition of continuous data in the Main Bay and in shallow water and with the shallow water data flow observations. Progress in the development of this new approach incorporating all the available data will be presented.

11:40 Discussion of New Approaches in Model Criteria Assessment.

11:50 Initial Assessment of Decarbonization on Chesapeake Airshed, Watershed, and Tidal Bay Loads – Richard Tian, UMCES-CBPO; Jesse Bash, EPA-ORD; and Gopal Bhatt, Penn State-CBPO

The decarbonization sensitivity scenarios developed on GLIMPSE-GCAM-CMAQ by Jesse Bash, Chris Nolte, and Dan Loughlin, (EPA-ORD) were run on the Phase 6 Watershed and Estuary Models to understand the influence of reduced atmospheric nitrogen loads on tidal water quality.

12:05 Discussion of Initial Decarbonization Sensitivity Scenarios

12:15 LUNCH

12:45 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.

12:55 Discussion of Algal Temperature Correction for Algal Growth

1:05 Progress with the Patapsco-Back MTM – Harry Wang, VIMS and Jeremy Testa, UMCES

The Patapsco-Back MTM Team, one of the three MTMs supported by a five-year grant, will describe progress on the MTM.

1:35 Discussion of Patapsco MTM Progress.

1:45 Progress on the Rappahannock MTM & P7 Linkage – 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.

2:05 Discussion of Rappahannock MTM Progress

2:15 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 and P7 linkage will be described by the Choptank MTM Team.

2:35 Discussion of Choptank MTM Progress

2:45 ADJOURN