Modeling Workgroup Quarterly Review

January 9, 2024

Event webpage: Link
For Remote Access - WebEx Link:
https://umces.webex.com/umces/j.php?MTID=m96f00c362a7eb98cc0aee3bf6547e66e
Meeting number: 2620 259 6989 **Password:** d3A66qnzQvZ
Phone number: +1-408-418-9388 **Access code**: 2620 259 6989
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.

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

10:05 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.

10:20 Discussion of the Phase 7 Model Overview

10:30 Update on CalCAST Development – Isabella Bertani, UMCES-CBPO
Isabella will provide an update on the progress made in: 1) gathering water quality data to expand the calibration dataset for CalCAST and the dynamic watershed model, and 2) incorporating new calibration stations in CalCAST.

10:50 Discussion of CalCAST development

11:00 Progress in Phase 7 WSM Development – Gopal Bhatt, Penn State-CBPO
The NHDplus 100K scale Phase 7 Dynamic Watershed Model (DWM) prototype with simulations of hydrology, sediment, nutrients, water temperature, DO, and phytoplankton is now operational for the entire watershed. The 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. During the last quarter, progress has been made on the implementation and testing of a simplified water quality routing for the small NHDplus streams. Gopal will survey the ongoing model development progress on the structure and implementation of water quality routing for small streams for nitrogen and describe activities upcoming in the next quarter.

11:30 Discussion of Phase 7 WSM Development Progress

11:40 Development of Efficient Multi-Objective Optimization Procedures – Kalyan Deb, Pouyan 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.

12:10 Optimization Discussion

12:20 LUNCH

1:20 Stormwater Management in a Changing Climate SWM & AG BMPs – Michelle Miro and Krista Grocholski, RAND

Existing, well-documented, open source, and public domain stormwater and/or watershed models will be applied under different future climate hydrologic conditions to determine relative change in pollutant removal efficiency in existing CBP-approved stormwater management BMPs under future increased volumes and intensities of precipitation in the Chesapeake watershed. The work will inform CBP managers of adjustments needed for urban, agricultural, or other BMP load reductions in the context of the Phase 7 Chesapeake Bay Watershed Model.

2:00 Discussion of Stormwater Management in a Changing Climate SWM & AG BMPs

2:10 Crop Yield Calculations for Estimating Nutrient Application and Projecting Future Demand – Joseph Delesantro, ORISE- CBPO

We aggregated crop yield data for 24 crops accounting for 95% of cropland N application and estimate annual crop yields from 1950 to 2022 using weather, climate, soil, and topographic variables. We then applied trend analyses to estimate the farmer expected yields, which attract nutrient application, and average yields to inform CAST scenarios.

2:30 Discussion of Crop Yield Calculations for Estimating Nutrient Application and Projecting Future Demand

2:40 Progress of the Agricultural Modeling Team – Tom Butler, EPA-CBPO

Tom will describe progress of the Ag Modeling Team in its role in determining the agricultural data inputs for the Phase 7 Watershed Model.

2:55 Discussion of Agricultural Modeling Team Progress

3:05 ADJOURN

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January 10, 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 and Joseph Zhang, VIMS
Progress in the MBM development will be presented.

10:35 Discussion of the Main Bay Model (MBM) Progress

10:45 Further Refinement of the Temperature Dependence of Algal Growth Rates in the MBM and MTMs –Tish Robertson, DEQ; Carl Cerco, Attain; and Richard Tian UMCES-CBPO
Tish has expanded on Carl Cerco's examination of the shallow water monitoring data of continuous temperature and chlorophyll observations and other data sources for the purpose of refining the algal growth response to temperature in the MBMs and MTMs. The Modeling Workgroup will decide how to apply the current understanding of how temperature effects algal growth rates in the Phase 7 MBM.

11:10 Discussion of the Refinement of the Temperature Dependence of Algal Growth Rates

11:20 Sediment Input Approach – Richard Tian, UMCES-CBPO
Shoreline Erosion Testbeds of Corsica and Choptank Rivers – Richard Tian, UMCES-CBPO
Richard will provide progress on the new dynamic input of shoreline erosion inputs based on 1) wave power (f wave speed, wave energy, and depth), 2) shoreline height, 3) protected shoreline, 4) bulk density, 5) sand, silt, clay classes, 6) eroded shoreline TN & TP species.

11:50 Discussion of Shoreline Erosion Testbeds.

12:00 LUNCH

1:00 Initial Progress With the Patapsco – Back MTM – Harry Wang, VIMS and Jeremy Testa, UMCES

The Patapsco MTM Team, one of the three MTMs supported by a five year grant. will be presented. The CBPO will also support two in-house MTM teams for the James and Potomac.

1:15 Discussion of Patapsco – Back MTM

1:25 Progress on the James and Potomac MTMs – Nicole Cai, ORISE-CBPO

Initial work on the James MTM will be described.

1:45 Discussion of James and Potomac MTM Progress

2:00 ADJOURN