Modeling Workgroup Quarterly Review

July 7, 2020

Event webpage:
https://www.chesapeakebay.net/what/event/july_2020_modeling_workgroup_quarterly_review
For Remote Access:
Zoom Link: https://zoom.us/j/569368345
Phone number: 929-205-6099 **Meeting ID:** 569 368 345
Password: 750955
To enter the webinar, please open the webinar link first

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

10:10 Fine-Scale Chesapeake Regional Hydrology Model (CRHM) Development – Gary Shenk (USGS-CBPO), Gopal Bhatt (Penn State), Jeffrey Chanat (USGS), and Joseph Zhang (VIMS)
The presentation will provide progress updates on the aspects of (a) the development of fine-scale distributed hydrology model of the Chesapeake Bay watershed at NHDplus catchment scale, (b) the hydro-ecological analysis of daily observed and simulated streamflow for hydrologic indicator and aquatic habitat and living resource modeling and prediction, and (c) the linkage of fine-scale distributed hydrology simulation with SCHISM (Semi-implicit Cross-scale Hydroscience Integrated System Model) estuarine model and initial findings.

11:10 High-resolution Landscape Characterization to inform the Next Generation of Hydrologic Models – Peter Claggett, USGS
A key aspect of support for the CRHM is provided by a one-meter-resolution land-cover and land-use datasets and complementary 1-meter resolution hydrography data now being developed. The land-cover datasets will be translated into three, 58-class, land-use datasets using a variety of local (e.g., tax parcels) and regional (e.g., soils and roads) ancillary datasets. To complement these data, the development of hydrography data consisting of 1-meter resolution (1:2400-scale) fluvial features such as channels, gullies, and ditches are also being developed. Channels will be attributed with estimates of flow permanence and channel dimensions (width, depth, and bank angle) and the mapping of floodplains and other hydrologically active areas on the landscape will be refined.

11:40 Development of NHDplus Inputs for the Fine-Scale Chesapeake Regional Hydrology Model (CRHM) – Isabella Bertani, UMCES
Inputs needed for the CRHM at the NHDplus scale of more than 80,000 model cells will be a big job in 2020. Isabella will describe the initial development of input data and provide a look forward at the overall task at hand.

12:00 IDF Curve Development for the Chesapeake Watershed– Arthur DeGaetano, Cornell U.

Art will present the recommended approach to IDF development for current and future time periods to help Modeling Workgroup understand the similarities and differences in the methods that the Cornell-RAND team is using for the future precipitation estimates for IDFs, and the methods CBP uses for future precipitation estimates for climate risks to the Chesapeake TMDL.

12:30 Comparison of Modeled and Monitored Nutrient Trends – Gary Shenk, USGS-CBPO; Isabella Bertani, UMCES; and Gopal Bhatt, Penn State

Maturation of the CBP's non-tidal monitoring network and the inclusion of lag time components in the CBP's Phase 6 Dynamic Watershed Model have created the opportunity to better compare modeled and monitored trends. This initial presentation will focus on obtaining an appropriate comparison between the output of the Phase 6 Dynamic Watershed Model and flow normalized loads from WRTDS. Future work will involve statistical methods for a comparison of trends.

1:00 Future Directions and the Importance of Scale in Estimating Atmospheric Nitrogen Loading to the next generation Chesapeake Bay Model – Jesse Bash, EPA-ORD

To provide relevant inputs to the next generation of watershed/water quality models, the U.S. EPA's Community Multiscale Air Quality (CMAQ) model has a new land use specific deposition option. Additionally, the land use specific dry deposition results will be mapped to higher resolution versions of the CMAQ land use data, 30-meter NLCD data, to parameterize finer scale atmospheric deposition rates for inputs in the next generation of high-resolution water quality models.

1:30 Adjourn

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July 8, 2020

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10:10 Application of the Refined Hypoxia Forecast and Exploration of Future Directions – Isabella Bertani, UMCES
In 2020, the hypoxia forecast model was updated and refined through a collaborative effort by scientists at the University of Michigan, UMCES, VIMS, and CBP. The enhanced model now provides hypoxia projections for an average July, average summer, and total annual hypoxia volume, and is based on nitrogen inputs from the entire watershed and tidally discharged point sources. Approaches to further refine the Hypoxia Forecast for next year will be explored.

10:25 STAC Climate Change Technical Synthesis Shallow Tidal Water DO Dynamics – Jeremy Testa, UMCES
A comprehensive synthesis that includes a statistical analysis of the shallow water data in concert with numerical model simulations and linkages to local physical conditions and watershed features will explore the DO dynamics of shallow tidal waters. The synthesis will generate an improved understanding of how local eutrophication and the effects of future climate will impact oxygen criteria and dynamics in shallow waters, provide estimates of uncertainty for how sensitive oxygen will be to future climatic change, and lead to improved numerical tools to CBP assessment of future shallow habitat change in response to the Chesapeake restoration.

11:00 Refined Analysis of Tidal Bay Nutrient Limitation and Potential Applications to the 2017 Bay Model – Qian Zhang and Richard Tian, UMCES and Lew Linker, EPA-CBPO
The importance of nutrient limitation to Bay Model calibration and as applied to broad CBP policy such as the Watershed Implementation Plans (WIPs) will be discussed and the basis of a refined nutrient limitation analysis will be presented. An application of examining estimated nutrient limitation of key scenarios such as the WIP3, No Action, and Progress Scenarios will be described.

11:30 SAV Nutrient Dynamics and DO Impacts – Carl Cerco, Attain and Richard Tian, UMCES

An update on the 2017 WQSTM estimated nutrient flux by submerged aquatic vegetation will be presented. Examination of net nutrient flux is anticipated to simulate net import to SAV in the growing season, augmented by simulated enhanced settling of particles in SAV beds. However, after the SAV growing season a nutrient flux out of the SAV beds, mostly as organics, is anticipated.

11:45 Co-Benefits Module for WMOST (Watershed Management Optimization Support Tool – Naomi Detenbeck, EPA Atlantic Coastal Environmental Sciences Division and Emily Trentacoste, EPA-CBPO

A co-benefits module for WMOST is under development and will provide a considerable head start for the CBP development of CAST co-benefit estimates. Naomi will give a broad overview of the new WMOST co-benefits module and Emily will describe the initial work in the CAST co-benefit effort.

12:10 ADJOURN