Modeling Workgroup Conference Call

May 21, 2020

CBPO Conference Room - The Fish Shack
410 Severn Avenue Annapolis, MD 21403

Event webpage:
https://www.chesapeakebay.net/what/event/may_2020_modeling_workgroup_conference_call

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

10:05 Progress in Open-Water DO Analysis using Shallow Water Data – Breck Sullivan, CRC; Rebecca Murphy, UMCES; and Jeni Keisman, USGS

An update on the trend analysis of open-water DO and temperature, focused on the shallow water monitoring data, was presented.

Discussion:

- Dave recommended looking into local sources for stations with opposing trend in DO and Temperature differences.
- Lew recommended putting the results into a white paper to preserve this result for future reference.
- Mark commented that some of the long-term monitoring sites usually have relatively worse water quality than others. Breck responded that local factors mattered in this analysis.
- Dave recommended not calling violation because attainment criteria is based on 30-day average not less than 5.
- James recommended to looking into high DO values over the past years since the it is decreasing.
    - Breck responded that they are planning to look into the DO saturation.

10:50 Progress in Management Actions Responding to CBP Climate Change Risk – Lew Linker, EPA-CBPO

Progress in adapting stormwater and agricultural BMPs to future climate hydrology and temperatures was outlined. The upcoming joint Climate Resiliency, Stormwater Workgroup, and Modeling Workgroup on current and future Intensity, Duration, and Frequency (IDF) curve development for the entire Chesapeake watershed was discussed. Urban stormwater workgroup will invite CRWG and Modeling WG to Urban Stormwater WG June 16th with RAND to discuss the IDF work. Urban stormwater, CRWG, and Modeling WG will have a joint meeting in mid-August.

Discussion:

- Julie added that August timeframe is a good timing because our summer intern may bring analysis results to share as well.

10:55 Update on STAC's Shallow Water Technical Synthesis – Jeremy Testa, UMCES

A STAC Science Synthesis Project is underway that will provide insights into shallow water dissolved oxygen (DO) under climate change conditions with respect to attainment of suitable habitat for fish and invertebrates. Open-Water DO nonattainment in shallow water and controls on oxygen dynamics in shallow water habitat types is being investigated from several avenues using observed data, research, and modeling tools.
Discussion:

- Lew recommended setting temperature above 30 degree C in the use of CART.
- Larry asked if Jeremy has thought about using the trend input multiple spectrum analysis. Larry commented that local temperature has an opposite influence on the oxygen.
- Richard asked if Jeremy has thought about the influence of solar radiation.

11:25 **Update on STAC's BMP Technical Synthesis – Emily Bock and Zach Easton, Virginia Tech**

Progress will be described on a STAC Science Synthesis Project *A Systematic Review of Chesapeake Bay Climate Change Impacts and Uncertainty: Watershed Processes, Pollutant Delivery, and BMP Performance*. The technical synthesis is designed to answer three specific questions:

1. How do climate change and variability affect nutrient/sediment cycling in the watershed?
2. How do climate change and variability affect BMP performance?
3. Which BMPs will likely result in the best water quality outcomes under climate uncertainty?"

Discussion:

- Julie commented that WQGIT have identified a list of key BMPs and CRWG is interested in working with Emily to go over the list.
- Olivia commented that the most cost effective BMPs should also be investigated besides the most common one in the WIP.
- Julie asked Emily to present to CRWG and this work will be able to inform inter-agency agreement.

11:55 **Influence of SAV on Chesapeake Nutrients and DO – Carl Cerco, Attain Inc. and Richard Tian, UMCES**

Analysis of the 2017 WQSTM estimated inorganic and organic nutrients from flux-in and flux-out of SAV and the implications for Tidal water dissolved oxygen will be discussed.
Discussion:

- Greg asked why denitrification is not showing in the conceptual diagram.
    - Carl responded that it is computed and account for in the model, and he explained that this can be further investigated if requested.
- Lew mentioned that literature search on plant physiology would help understand this issue.
- Lew asked if Carl could pull together 10 year mass balance on three different SAV groups. Carl responded that it is not a trouble to compute.

12:45 **Application of a Habitat Volume Visualization for Key Bay Model Scenarios – Zhaoying Wei, UMCES**

Application of a habitat volume visualization tool for striped bass and blue crab to key scenarios of the WQSTM will be presented. Results of blue crab and striped bass habitat volume under the scenarios of current conditions, No Action, WIP3 and others will be discussed.

Discussion:

- Dave recommended having more scenarios on more recent years due to communication purposes.
- Julie asked the meaning of No Action. Lew explained it is no BMPs and secondary treatment. She is interested in future climate scenarios to project future habitat condition. She also suggested overlay fish distribution data with help from summer intern.
- Gary Shenk recommended working with John from NOAA.
- John Wolf commented that it would be interesting to use the slice functionality vertically through the water column and slice from south to north. Basically a cross-section/fence diagram that the user can move north and south.

1:15 **Collaborative Work on the CBP Fine-Scale Hydrology Model – John Brakebill and Scott Ator, USGS**

Progress on the CBP Fine-Scale Hydrology Model by utilizing enhancements to NHDplus data, specifically the addition/removal events, and diversions, as well as other progress was discussed.

Discussion:

- Lew mentioned that CBP can provide CSO data if needed.
    - John responded that they didn't include it in the CBP regional model.
- Dave commented the primary diversion channel is not one. John responded that it is possible. Scott added that the network is easily customizable and if new information comes along, they can correct this.

1:45 **AEIOU WS presentation – Lisa Wainger, UMCES and Gary Shenk, USGS-CBPO**

In keeping with STAC's and the Management Board's new workshop communication method, Lisa Wainger and Gary Shenk, the co-chairs of AEIOU workshop, will deliver a presentation on the recently released STAC workshop report on nutrient speciation and its possible utility and application for TMDL accounting. In general, inorganic nutrient species have a greater effect on dissolved oxygen than organics so that management actions have higher reductions of inorganic nutrient species could be given greater credit, resulting in cost effective CBP management.

Discussion:

- Lew commented that WG could help answer the questions related to spiraling effect in waters.
- Lisa commented that they need to start characterizing the result on different geography level.
- Gary mentioned that the next step is to bring this result to WQGIT. Lew recommended presenting the report to AgWG.

2:15 Progress with CBP Optimization – Danny Kaufman, CRC

Progress on the optimization work was described.

Danny mentioned the optimization work will transition to Michigan State University and he is planning to publish the optimization work in two manuscripts.

Meeting Participants:
Lew Linker
Gary Shenk
Gopal Bhatt
Isabella Bertani
Richard Tian
Daniel Kaufman
John Brakebill
Scott Attor
Carl Cerco
Jeremy Testa
Breck Sullivan
Rebecca Murphy
Jeni Keisman
James Davis Martin
Cassandra Davis
Karl Berger
George Onyullo
Arianna Johns
Mark Trice
Lisa Beatty
Cliton Fried
Dave Montali
Lee MacDonnell
Kyle Hinson
Larry Sanford
Clifton Bell
Norm Goulet
Wei Liu
Olivia Devereux
Yeonjeong Park
Emily Bock
Zach Easton
Mark Bennet
Guido Yactayo
Mukhtar Ibrahim
Qian Zhang
Bhanu Paudel

Brian Smith
Carl Cerco
Carlington Wallace
Ted Tesler
Carl Friedrichs
Jim George
Julie Reichert-Nguyen
Katherine C. (KC) Filippino
Greg Bush