



Modeling Workgroup Meeting

May 18, 2017

NPS Small Conference Room

410 Severn Avenue Annapolis, MD 21403

Event webpage: <http://www.chesapeakebay.net/calendar/event/25082/>

Announcements and Amendments to the Agenda – Lee Currey, MDE and Dave Montali, WVDEP

- Dave announced the date of the next upcoming Modeling Workgroup conference call, which will be held on June 15. The meeting website has already been set up and an agenda has been posted.

Phase 6 Calibration Status – Gary Shenk, USGS

- Gary reviewed the status of the Phase 6 calibration and discussed the reasons behind the push to not include regional factors in the final draft Phase 6 Watershed Model (WSM).
- As a reminder, regional factors is a term that is used at the Bay Program but is not commonly found in modeling although they are commonly implemented when completing a calibration. Regional factors are loading factors that are applied to all non-point sources upstream of a monitoring station to improve calibration.
 - These regional factors were also used in Phase 2 and Phase 4.
 - When the calibration process was automated for Phase 5, the use and calculation of regional factors was systematized. These regional factors improved calibration of the model, but was difficult to explain to partners and managers.
- In the Phase 6 model structure, there is no point for regional factors but there does exist differential delivery from different areas based on land to water factors, stream delivery factors, or the calibrated river delivery factor. In essence the same functionality of regional factors is present in Phase 6 but these are determined *a priori* from outside information, making them easier to explain and understand.
- James Davis-Martin noted that the point made about planning targets may be slightly undersold, particularly on the planning side as the model is used at a much finer scale to assess source specific progress.
 - Gary suggested that the point being made may hold across scales as well.
- Alisha Mulkey asked about the relationship between regional factors and SPARROW land to water factors.
 - Gary explained that regional factors are like the SPARROW factors, but are calibrated around a monitoring site.
- Gary also reviewed how the WSM linked to the Water Quality and Sediment Transport Model (WQSTM) is used as a system of models to determine the assimilative capacity of the Bay, by looking at the changes in tidal water

dissolved oxygen to determine water quality standards attainment. The systems of models is working in a relative sense, and not an absolute sense. Richard Tian helped to test this hypothesis, and confirmed it when adding or subtraction 10% of the calculated loads.

- The planning targets are set based on a curve relating effectiveness to percent change from a No-Action Scenario to an E3 (everyone, everywhere, doing everything they can to reduce loads) Scenario.

Progress and Final Steps in Phase 6 Development – Gopal Bhatt, Penn State

- Gopal reviewed the progress and the overall quality of the Phase 6 calibration with comparisons to WRTDS, observations, the previous Phase 5.3.2 calibration, and with a metric for evaluating the need for Phase 6 regional factors.
- Gopal described the comparison of loads between models as well as spatial efficiencies, demonstrating overall average improvements when comparing the final draft Phase 6 WSM with the Phase 5.3.2 WSM.
- Dave Montali proposed that at this point with the current calibration status the Modeling Workgroup recommend not utilizing regional factors.
- James Davis-Martin asked whether the land to stream and other factors had essentially taken the place of larger regional factors previously utilized in Phase 5.3.2.
- Bill Keeling asked if the improvements in model performance were observed across all regions, and Gary emphasized that this was the general case across all stations. On average, model performance at stations have improved, but there is no doubt that some sites may exhibit little to no improvements in performance. Plots of all stations will be generated and put online with the documentation for partner review on June 1.
- James asked if any adjustments had to be made to the SPARROW model factors. Gary explained that none of the factors were adjusted, but some factors were removed if they were considered to be double counting based upon other pieces of the WSM that were performing the same function. The only “knob twisting” that occurred took place in the large river deliveries.
- Bill asked about which graphs were being evaluated to compare and judge the models’ performance.
 - Gary noted that the graphs comparing spatial efficiency were extremely telling, and showed consistent improvements among nutrients and sediment across the entirety of the watershed.
- Bill also noted that the proposal to not use regional factors at this point would not necessarily preclude the use of said factors in the future should some fatal flaw come to light during the partnership review period.
- Dave again asked if there were any objections to the decision not to include regional factors in the draft Phase 6 WSM, and none were made. **A decision was thus reached with the consensus of the Modeling WG to not use regional factors for the draft Phase 6 Watershed Model.**