Finalizing the 2017 Phase 6 Models

Water Quality Goal Implementation Team
October 23, 2017

Lew Linker and the
CBP Modeling Team

Chesapeake Bay Program
Science, Restoration, Partnership

SCHEDULE FOR PHASE 6 WATERSHED MODEL COMPLETION

P6 Watershed Model October Recalibration Timeline

September 26 – all inputs are final for the October re-calibration. **DONE**

September 26-Oct 12 – four auto-calibrations & analysis [1] (4 x 3 days = 12 work days) **DONE**

October 6 - Select auto-calibration runs to go forward with and combine the four auto-calibrations as needed to make the final auto-calibration run. **DONE**

October 12 – WQGIT: report out progress and completed products at WQGIT conference call **DONE**

October 13 – Auto-calibration final (1 work day) **DONE**

October 17 – Mod WG Quarterly – progress on Phase 6 calibration status including nutrient budgets by basin and State incorporating tidal shoreline nutrients. **DONE**

October 16-19 – hand calibration (3-4 work days) **IN PROCESS**

October 20-27 – lower Susquehanna reservoirs + DE (5-6 work days) **IN PROCESS**

October 23 – WQGIT: report out progress and completed products at WQGIT conference call

October 30-30 – below fall line (1 work day)

October 31-31 – calibration final (1 work day)

SCHEDULE FOR PHASE 6 WATERSHED MODEL COMPLETION

November Post Re-calibration Timeline

November 1-8 – Key scenarios [2] completed by the WSM including 2010 No Action, 1985, 1993, 2013, 2010 WIP2 LOE, 2010 E3, All-Forest, and other scenarios (6 work days - See note 2)

November 6-10 – CERF

November 9-13 – Generate calibration plots.

November 13 – WQGIT: report out progress and completed products at WQGIT conference call

November 9-30 – Generate visualization products with final Phase 6 models (Olivia Devereux and John Wolf leads). Prep for December ~4-6 – Combined Mod WG & WQGIT 2-day meeting.

- Figure out drivers of WIP2 changes (WV, DC, VA)
- Develop new Relative Effectiveness values and graphics
- Assessment of assimilative capacity with Conowingo infill and no climate change
- Redo Climate Change assessment with 0.17 SLR
- Develop assessments of four Conowingo alternatives for who (Susquehanna only, Sus+MD &VA, All, Sus+effective)
- Need to include 2025 base conditions into Note 2 scenarios (2025 to be delivered from Peter 11/15…could be a timing problem)
- Rework presentation materials with final data for Combined Mod WG & WQGIT meeting

November 27 – WQGIT: report out progress and completed products at WQGIT conference call

December ~4-6 – Combined Mod WG & WQGIT 2-day meeting.

December 19-20 – PSC Meeting

SCHEDULE FOR PHASE 6 WATER QUALITY AND SEDIMENT TRANSPORT MODEL (WQSTM) COMPLETION

October-November Timeline

September 29 – Receive WQSTM Alternate Final Runs 214 and 223. **DONE (Already Had Run 196 (August run) and Run 199 (September run.)**

September 30-Oct 2 – Benchmark Runs 214 and 223. **DONE**

October 3-5 – Run 196 (August WQSTM calibration) Run 199 (September WQSTM calibration), Run 214, and Run 223 on the same Base input from September Phase 6 WSM **DONE**

October 6-10 – Using chlorophyll assessment from CoE ERDC and hypoxia volume day assessment from CBPO [3] and weighting toward the hypoxia calibration select the WQSTM version that has the highest fidelity to the observed data. **DONE**

October 12 – WQGIT: report out progress and completed products at WQGIT conference call **DONE**

October 11-16 – Run key scenarios on September P6 WSM calibration. Key scenarios needed in priority order are: WIP2 LOE, WIP2+Cono Infill, WIP2+Cono Infill+CC, E3, 1993, 2013, No Action, 1985, and All-Forest. **IN PROCESS**

October 17 – Mod WG Quarterly - Review selection approach for WQSTM and selected final WQSTM version as well as draft key scenarios. **DONE**

SCHEDULE FOR PHASE 6 WATER QUALITY AND SEDIMENT TRANSPORT MODEL (WQSTM) COMPLETION

October 18-25 – Complete new geographic isolation runs on final WQSTM. **DONE**

October 23 – WQGIT: report out progress and completed products at WQGIT conference call

October 26-Dec 3 – Develop presentations and analyses for combined Mod WG & WQGIT meeting, PSC, and other meetings.

November 9-16 – Final key scenarios [2] completed by the WSM now run on the final WQSTM including 2010 No Action, 1985, 1993, 2013, 2010 WIP2 LOE, 2010 E3, All-Forest, and other scenarios.

November 13-24 – Estimate Bay assimilation capacity. Estimate change in assimilation capacity due to Conowingo Infill. Estimate change in assimilation capacity under 2025 climate.

November 13 – WQGIT: report out progress at WQGIT conference call

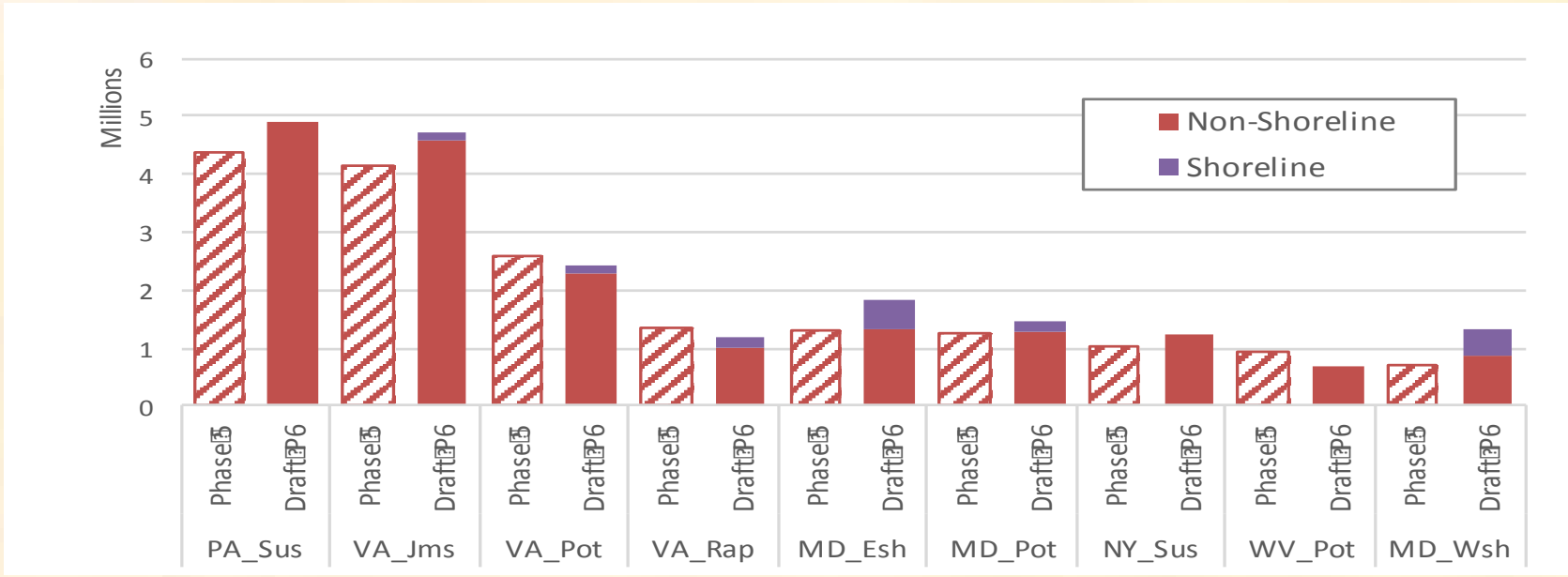
November 27 – WQGIT: report out progress at WQGIT conference call

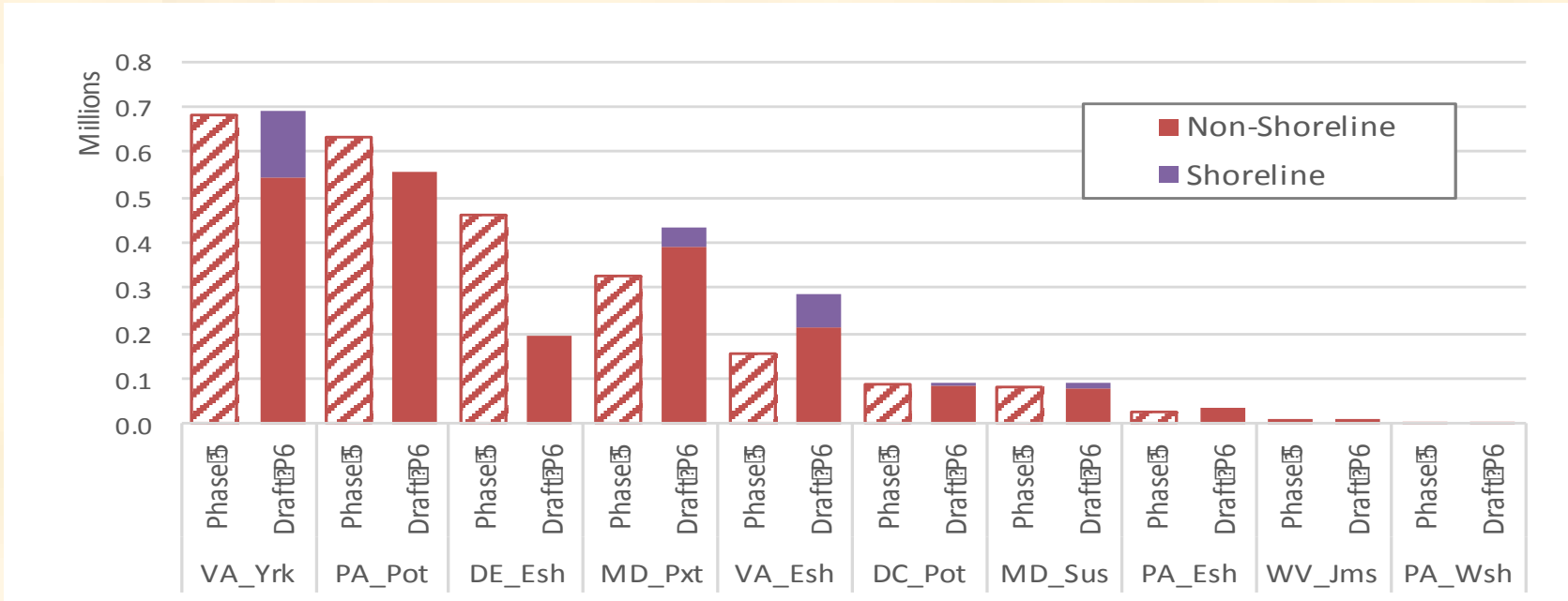
December ~4-6 – Combined Mod WG & WQGIT 2-day meeting at MDE.

December 19-20 – PSC Meeting

Calibration

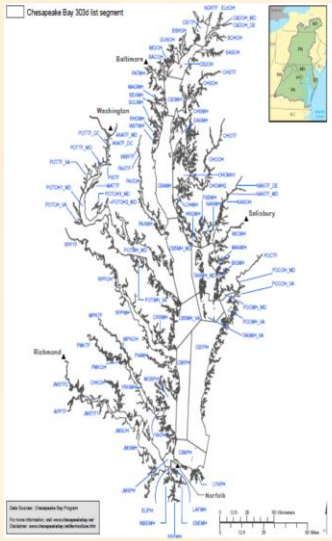
PHOSPHORUS

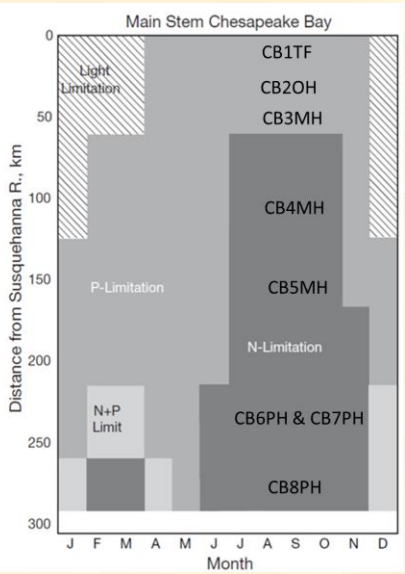


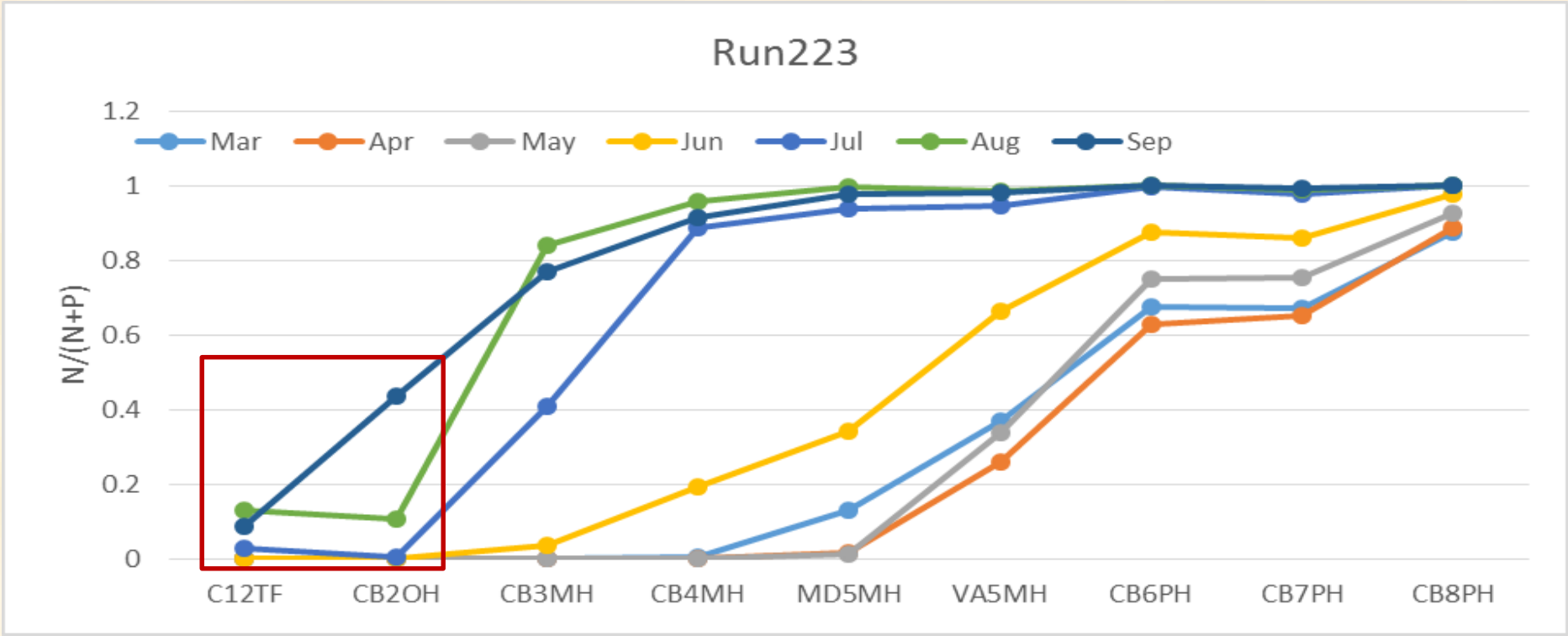


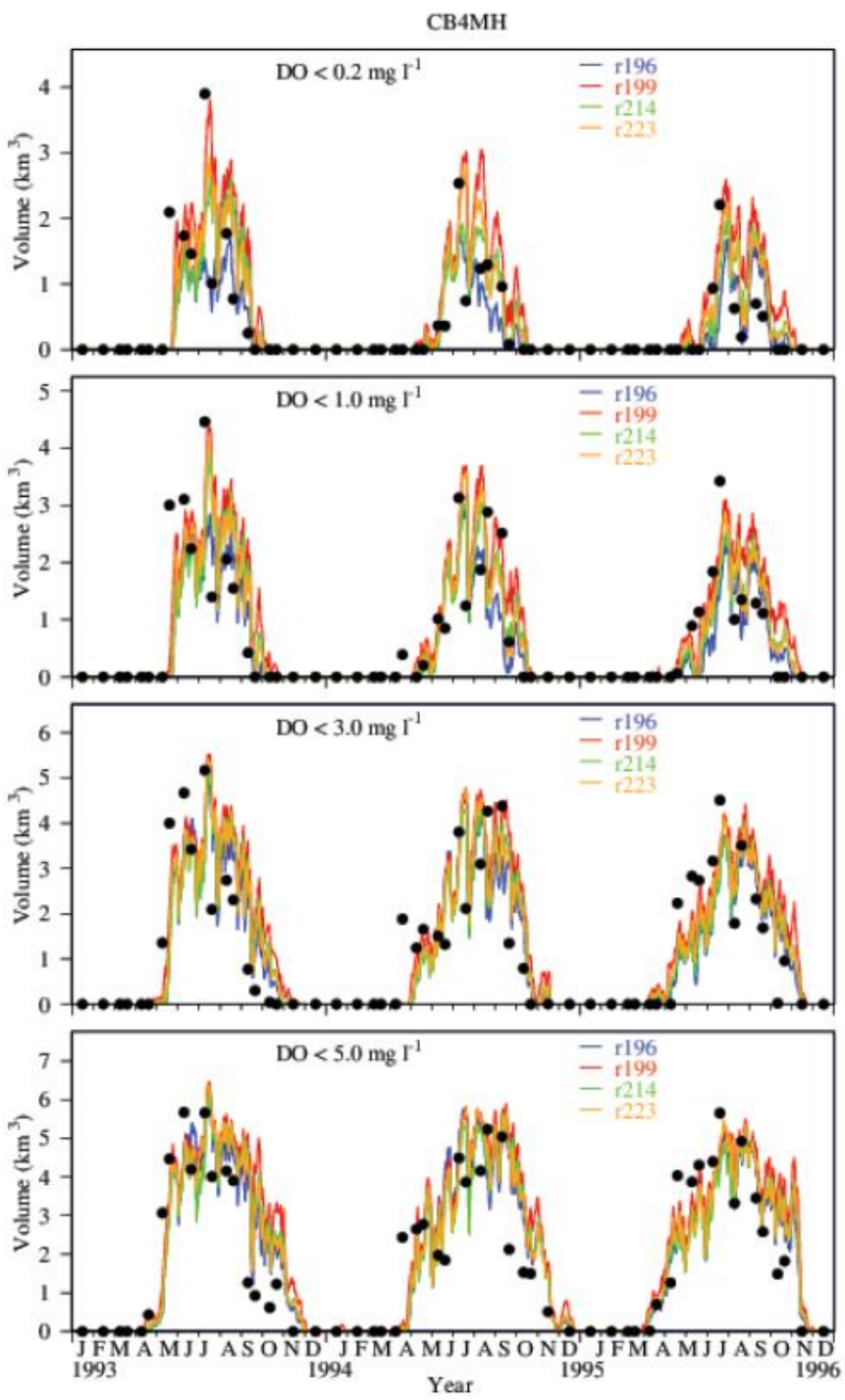
Run 223

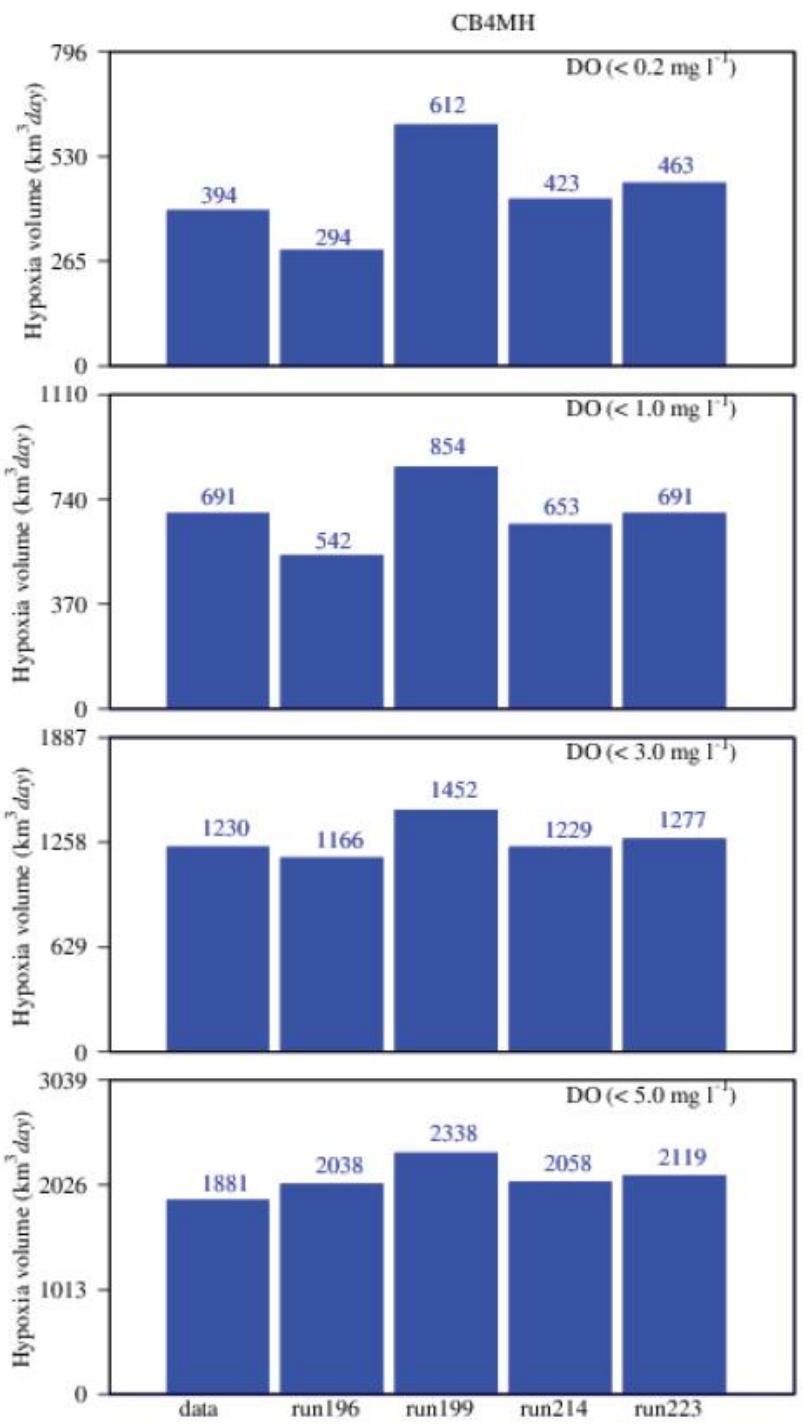
- Improved representation of P limitation in CB1 & CB2 (should be P limited at all times).
- Appropriate N limitation in CB4, CB5, CB6 & CB7 in July (Should be N limited in July).

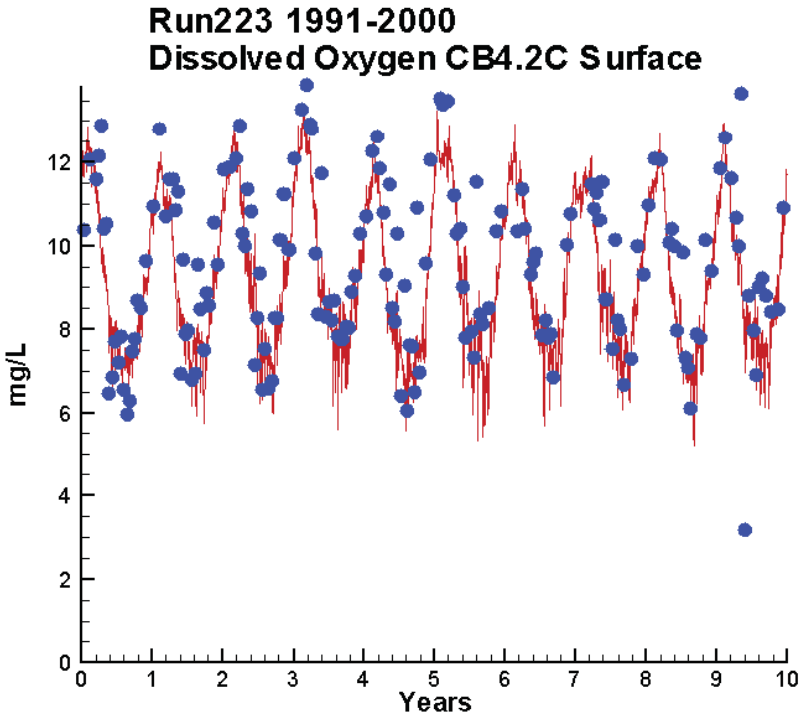


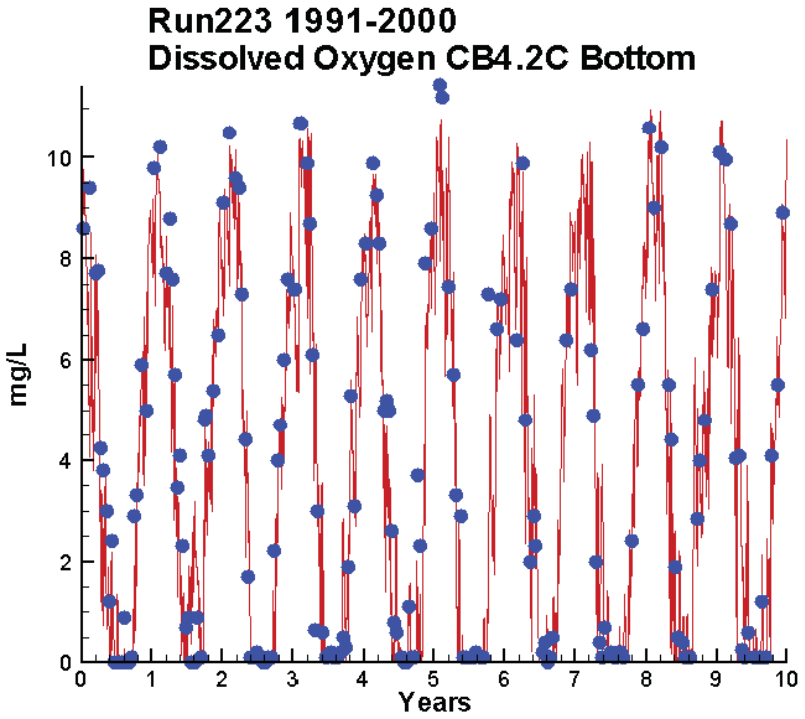


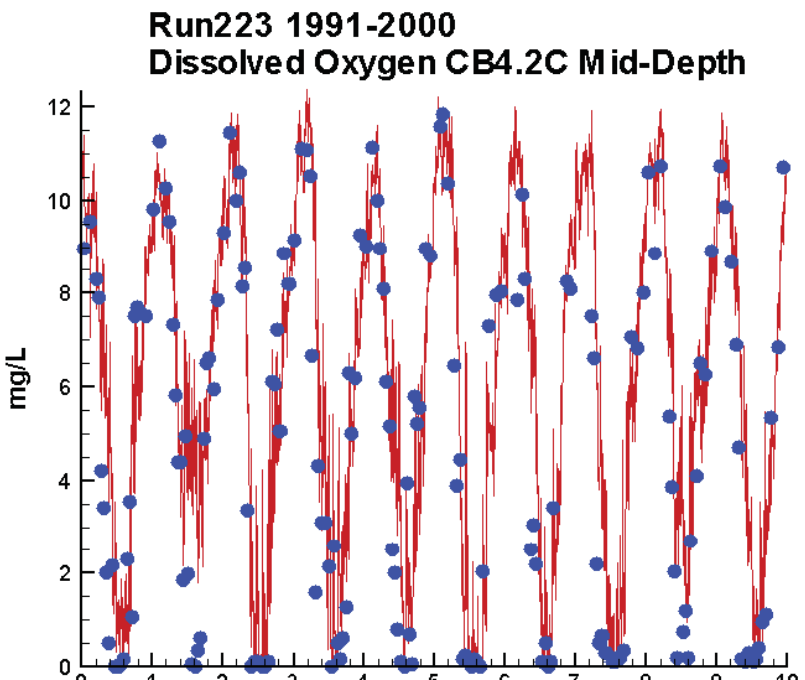



CB4MH
DO < 0.2 mg l-1
DO < 1.0 mg l-1
DO < 3.0 mg l-1
DO < 5.0 mg l-1
r196
r199
r214
r223
Volume (km 3)
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1993
1994
1995
1996
Year


CB4MH
DO (< 0.2 mg l-1)
DO (< 1.0 mg l-1)
DO (< 3.0 mg l-1)
DO (< 5.0 mg l-1)
Hypoxia volume (km3 day)
796
530
265
0
394
294
612
423
463
1110
740
370
691
542
854
653
691
1887
1258
629
1230
1166
1452
1229
1277
3039
2026
1013
1881
2038
2338
2058
2119
data
run196
run199
run214
run223







	Mean Difference	Absolute Mean Differen
Top DO	-0.5205	0.9002
Mid DO	1.0038	1.4866
Bot DO	-0.4165	0.9393

Conclusions:

- New methods and techniques were developed to take a deep look at the quality of the WQSTM calibration, particularly for nutrient limitation and anoxic volume days (AVDs).
- Based on all available information RUN 223 is the representation of the Chesapeake that has the highest fidelity to the observed data. (A small workgroup of the Modeling Workgroup is confirming choice of RUN 223 as the final calibration.)
- Key scenarios are now being run on RUN 223 based on the September version of the Phase 6 WSM. The final key scenarios will be run early November on the final Phase 6 WSM & WQSTM.
- Geographic Isolation Scenarios are now complete with the final WQSTM calibration.