Toward Modeling and Analysis Tools For the 2017 Midpoint Assessment

Part 2 – The WQSTM

Modeling Quarterly Review

April 18, 2012

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Background:

A system of models designed for the 2017 Midpoint Assessment will be applied to the last and most difficult reductions in CBP to take place from between 2017 to 2025.

Model refinements will be assessed on a *value added* basis for CBP decision making. Refinements should be forward-leaning in areas like water quality management by filter feeders or other innovative approaches.

By Summer 2011 We Need to Begin to Lay Out Our Specifications for Next Generation Chesapeake Bay Water Quality and Sediment Transport Model (WQSTM)

General specifications for the next generation Chesapeake Bay estuary regulatory model are a state of the science, mass balance, regulatory model with key DO, chlorophyll - primary productivity, and SAV-clarity simulations as good or better than the current simulation. Goal: deliver fully operational model with complete operational links to the airshed and watershed models by December 2015.

Potential Elements for Consideration – WQSTM:

- Extend calibration period beyond 2005 to get more observed data and more recent data, particularly for shallow water monitoring that came on line from 2003 forward.

- Full sediment diagenesis with scour, resuspension, fate and transport of organic material.

- Represent shallows and embayments with a finer grid, perhaps with a ribbon model, perhaps with finite volume grid to better represent clarity SAV and open water DO, and perhaps with multiple models.

Potential Elements for Consideration - WQSTM

- Refined chlorophyll simulation and assessment particularly in the James and DC waters.

- Consider including a simulation of estuarine wetlands.

-Keep the CH3D-ICM investment in menhaden, oyster, SAV, sediment transport while resolving shallow water embayment issues of scale and improving our understanding of shallow water processes and dynamics with multiple model prototype.

Potential Elements for Consideration - WQSTM

Oysters, Menhaden, and Other Filter Feeders

– Do we incorporate oysters in the Shallow Water Ribbon Model?

– Update oyster reef location, and biomass.

– Examine the role of aquaculture and sanctuaries. The previous work was all about restoration to historic distribution.

- Examine menhaden influence on James chlorophyll with reduced fishing pressure.

Potential Elements for Consideration - WQSTM

Need full climate change assessment capabilities including:

- SAV (Zostera)
- temperature
- winds
- watershed flows and loads
- sea level rise
- wetland inundation
- ocean boundary conditions