CBP Modeling Team 2012 Work Plan

May 8, 2012

CBP Modeling Support for 2017 Midpoint Assessment:

Extend the Watershed and Bay Model Simulations To the Present Period

Why: The current CBP watershed and Bay model simulations extend from 1985 to 2005. To bring in recent shallow water monitoring data, which is mostly post- 2005, and to allow a more complete estimate of progress in the years close to 2017, the Airshed, Watershed, and WQSTM models will be updated.

When: Work on the 12 tasks to extend the CBP models began last quarter and will continue to the close of this calendar year.

CMAQ Airshed Model

Why: The CMAQ Airshed Model will be updated with improved bidirectional ammonia chemistry and will incorporate an updated base year of emissions, changes in the ozone standard, inclusion of the Tier 3 fuel standard (when enacted), and any changes in the transport rule.

When: Work on a new library of CMAQ scenarios to support the 2017 Midpoint Assessment has begun this calendar year and will continue until the last quarter in 2014 in order to update the latest regulatory changes.

Water Quality and Sediment Transport Model (WQSTM)

Why: The Water Quality and Sediment Transport Model simulation of the key water quality standards of deep water and deep channel DO is stable and only minor improvements are recommended. Improvements in the shallow water simulation of clarity, SAV, and Open Water DO are the major thrusts of the refinements recommended for the WQSTM. Linkage of the WQSTM to potential multiple shallow water models and to the James chlorophyll model are discussed below.

When: Work on the WQSTM should begin at the start of 2013 and continue for 3 years until the close of 2015.

Shallow Water Multiple Models for Management (M3)

Why: The STAC has advocated investigating the utility of multiple models for management decisions in the Chesapeake TMDL and the CBPO has agreed to support a prototype application of shallow water modeling in order to investigate its potential for improving management decisions. If the prototype work is successful, then either several multiple model sites or a full blown shallow water ribbon model could be developed for the Chesapeake shallow water simulation of SAV, clarity, and open water DO.

When: Potential funding for this activity will be from the FY13 budget. Work on the prototype multiple shallow water models could begin in calendar year 2013 and continue until the close of 2015, with decisions on if and how to integrate successful shallow water multiple models with the WQSTM determined in late 2014.

Climate Change Simulation and Analysis

Why: The EO and EC direction to evaluate climate change influences on the Chesapeake TMDL could include modeling temperature changes, changes in precipitation timing, volume, and intensity, the synergy of climate change and land use changes, sea level rise, wetland loss, and changes in the DO/nutrient response.

When: This work would primarily be in 2014 and 2015, but modeling support for climate change studies is already being provided to 4 teams of researchers in the watershed including the University of Maryland, USGS, Penn State, and ICPRB.

James River Chlorophyll Model

Why: Virginia has begin a major multiyear investment in the simulation of chlorophyll in the James River. The James watershed influences the water quality standards of DO, SAV, clarity, and chlorophyll in the James, and DO in the Chesapeake deep waters. In the 2010 TMDL achieving the water quality standards for chlorophyll in the James was the most stringent standard and this set nutrient reductions in the James watershed. How multiple James models, or a single integrated model, will be used to determine the various water quality standards influenced by the James watershed is yet to be decided.

When: Tracking progress on the development of the James chlorophyll model has begin this year and any final integration of the James model with the Bay WQSTM will be in 2015.

Watershed Model

Why: The premier CBP model for tracking TMDL progress and planning for future reductions of nutrients and sediment in the watershed is the Watershed Model. Refinements to the Watershed Model include recommended changes from States in BMPs, land use, and simulated practices, expert team recommendations of model refinements, refinements to Scenario Builder and CAST, and integration of SPARROW, PIM, and CREP into the watershed analysis.

When: Work on extending the simulation period, forming expert teams, and model development planning by the Modeling Team has begun. Work on the Watershed Model will continue to the close of 2015 and includes a transfer of calibration input data to the WQSTM at the close of 2014.

CBP Modeling Support for 2-Year Milestone Assessment:

The 2-Year Milestone Assessments are a check on the implementation progress of the Watershed Implementation Plans (WIPs) as well as implementation progress on Federal lands across the watershed. The 2-Year Assessments began with the base year of 2009, have been completed for the 2011 Assessment, and have been initiated for the 2013 Assessment. Future 2-Year Assessments are planned for the 2015 and 2017. Working with the CBP partners the CBP Modeling Team supports the detailed quantification of the 2-Year Assessments from initial development of the 2-Year targets and plans to the final assessment.