

COG's Navigation Guide to Chesapeake Bay Program's Phase 6 Watershed Model Analysis Tools (as of 7/19/17)

Purpose

This Guide provides basic information about reviewing data and analyzing scenarios from the Chesapeake Bay Program's new Version 6 of its Watershed Model (WSM), including links to review sites and tools. The new WSM and other upgrades to the Bay Program's modeling suite will be used in the Midpoint Assessment process for the Bay TMDL. The WSM will be used by the Bay states to develop their Phase III watershed implementation plans (WIPs) and it can be used by local governments to track progress toward achieving local area targets.

Background

The Chesapeake Bay Program's (CBP) Watershed Model (WSM) uses multiple input data to estimate the amount of nutrients and sediment reaching tidal waters from the watershed. Inputs include land use, fertilizers and other nutrient amendments like biosolids, wastewater and combined sewer overflow discharges, septic system numbers, atmospheric deposition, and several other factors that affect loading rates. Much of this data originated at the local level, such as local zoning information used to modify the high-resolution imagery depicting land use or the extent of sewer and MS4 service areas. Output from the Watershed Model is fed into the Water Quality and Sediment Transport Model (WQSTM), which estimates attainment of the three water quality parameters – dissolved oxygen, water clarity and chlorophyll-A – that are the basis for the Bay TMDL water quality goals. The WSM will continue to be the main accounting mechanism for assessing progress toward meeting the Bay TMDL.

Raw input into and output from the WSM is detailed in very large Excel files that require major manipulation to extract information at geographic scales likely to be of most interest to local government users. For Phase 6, the Bay Program has developed or modified several online tools to assist the Bay Program partners, local governments and other parties to review input and output data. These tools also will be useful in developing model scenarios for the Phase III WIPs.

Basic Documentation:

Text describing how the model works is documented in the Bay Program's ftp site for model information – <ftp://ftp.chesapeakebay.net/Modeling/Phase6/>. The Bay Program also conducted a series of webinars on various aspects of the new model. They are available in the non sign-in portion of the CAST site at: <https://cast.chesapeakebay.net/Documentation/ModelDocumentation>.

CBP's WSM Online Tools:

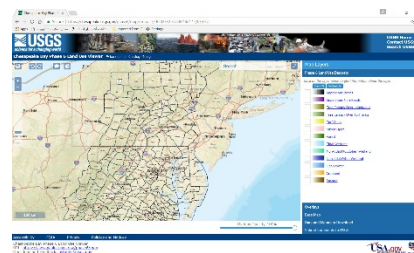
Input Data

1. Land Use Data

Improving the accuracy of the land use data used in the model from previous versions by combining high resolution imagery with local information on zoning, parcels, imperviousness and other features, was a key Bay Program goal for the Phase 6 WSM. The Bay Program created a new workgroup and devoted increased resources to obtain and transform local data into its modeled land use. The final results of that effort are available for review at three sites in different forms.

The interactive “Land Use Viewer” provides a series of maps that depict the final Phase 6 Bay Program current land use (in 10-meter pixel form) and show various overlay tabs, such as sewer service areas, federal facilities and MS4 service areas.

- <https://chesapeake.usgs.gov/phase6/map>



The tabular version of the land use data is available at:

- ftp://ftp.chesapeakebay.net/Modeling/Phase6/Draft_Phase_6/Land_Use/

This ftp link allows users to download land use data in a .csv format, which can then be opened in Excel. In addition to “current” land use – keyed to 2013 – the tabular data has been extrapolated back to 1984 to cover the model calibration period. The spreadsheet data is denominated at the land-river segment level, but can be aggregated to the county or higher levels. Tabular land use data at the county scale is also available in CAST, which is described below.

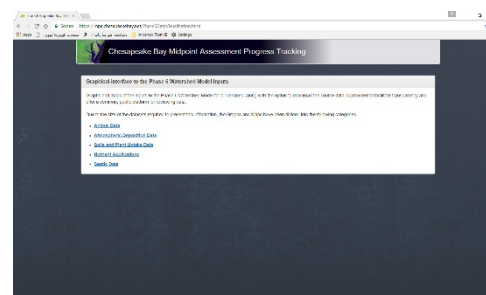
Note: MDE’s Science Services Administration maintains its own Phase 6 WSM web site, which includes the land use data for all Maryland counties:

http://www.mde.state.md.us/programs/Water/TMDL/DataCenter/Pages/phase6_development.aspx

2. Graphical Interface to the Phase 6 WSM Input

This tool allows users to generate charts and maps of the various input data to the watershed model, including tabular land use data at the county level. Many of the other inputs are specific to agricultural lands, but the tool does include atmospheric deposition and fertilizer application rates to the various turfgrass land uses. It also has septic data, such as number of systems, percent population on septic vs. sewer, and people/system.

- <https://mpa.chesapeakebay.net/Phase6DataVisualization.html>

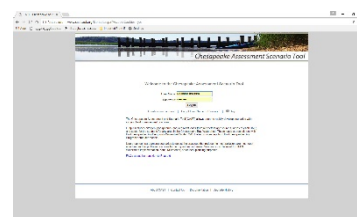


Output Data

3. CAST

This tool (the acronym stands for Chesapeake Assessment Scenario Tool) is now the main tool for downloading and processing model output, as well as generating what-if scenarios at the local, state and watershed-wide scales. It represents an upgrade from the previous state-specific versions of the tool, such as MAST and VAST. The new version is completely consistent with the watershed model itself. Users need to apply for passwords at:

- <https://cast.chesapeakebay.net/>



It also comes with a FAQ document: <https://mpa.chesapeakebay.net/Phase6FAQ.html> that provides useful information on the transition from previous versions to the new version based on WSM Phase 6. Note that certain data are available on the CAST home page without the need for a password or for engaging in the CAST scenario development methodology. Scenario output is typically available via an Excel spreadsheet sent via email.

Note: There continue to be regular updates and edits made to the data and processes - made on a weekly basis (normally every Tuesday). Those updates/corrections are summarized at: <https://cast.chesapeakebay.net/About/UpgradeHistory>. So, it is important to check that tab, as one may

need to review those edits to determine whether one needs to re-run saved scenarios in order to reflect the most up-to-date information.

Members needing assistance in navigating the CAST site can contact Mukhtar Ibrahim of COG staff. See below for contact info.

COG Staff Contacts for Further Information:

- Watershed Model analysis & assistance to members in navigating analysis tools
 - Mukhtar Ibrahim mibrahim@mwkog.org 202-962-3364
- Watershed model overview & process dynamics, and landuse issues
 - Karl Berger kberger@mwkog.org 202-962-3350 Landuse Workgroup Chair
- Wastewater-related data & GIS matters
 - Tanya Spano tspano@mwkog.org 202-962-3776 Wastewater Workgroup Chair
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- Overall policy
 - Tanya Spano tspano@mwkog.org 202-962-3776
 - Water Quality Goal Implementation Team (WQGIT) At-large Member