Request for Scientific and Technical Advisory Committee (STAC) Peer Review of the Nutrient Inputs to the Watershed Model
June, 2016

The Chesapeake Bay Program's Modeling Workgroup requests a review of the procedures used to estimate nutrient inputs[1] to the landscape in the Phase 6 Watershed Model. These procedures are described in the Phase 6 Watershed Model's documentation. All questions listed reference the sections of the documentation relevant to the nutrient input procedures.

The Chesapeake Bay Program and Modeling Workgroup are currently reviewing all procedures within the Phase 6 Watershed Model, and adjusting procedures as necessary based upon comments received. The Modeling Workgroup requests responses to the questions/requests listed below by August 31, 2016 in order to ensure that STAC's comments are adequately addressed, and any potential changes to nutrient procedures resulting from these comments can be addressed by the workgroup.

Questions/Requests for STAC Review of the Phase 6 Watershed Model's Nutrient Input Procedures

- Given the state of available manure and fertilizer data, please comment on the overall appropriateness of the methods used to estimate total manure and fertilizer available for application to agricultural lands.
    - Relevant sections: 3.2.1 – 3.2.5 (manure estimates); 3A (for additional information regarding poultry nutrient generation estimates); 3.3.1 (inorganic fertilizer estimates)
- Understanding that farmer-reported nutrient application rates are not available for the majority of agricultural acres throughout the calibration period (1984-2013), please comment on the overall appropriateness of the methods used to distribute applications to crops, hay and pasture.
    - Relevant sections: 3.2.7 (manure applications); 3.3.3 – 3.3.4 (inorganic fertilizer applications)
- Given the lack of data available to estimate acres on which two crops were harvested (double-cropped acres), please comment on the overall appropriateness of the method used to estimate these acres.
    - Relevant sections: 5.3.3
- Considering the current state of the science related to agricultural forecasting and agricultural economics, please comment on the overall appropriateness of the agricultural forecasting method. Are there alternative forecasting methods you would recommend?
    - Relevant sections: 5.3.1
- Does the documentation sufficiently describe the data and methods used to estimate nutrient inputs for the Watershed Model? Please expand if there are particular sections that should be expanded upon or improved.

[1] The Phase 6 Model will incorporate all sub-models and database systems into a single tool available to managers and partners at the push of a button through on online portal. Scenario Builder was a term used in previous model versions to describe the database system which provided the Watershed Model with nutrient applications, land use, best management practices and other data inputs for any given management scenario. In this way, Scenario Builder could be thought of as the "input model." The Watershed Model then ran separately to estimate runoff of nutrients and sediment into the rivers and the Chesapeake Bay. In this way, the Watershed Model could be thought of as the "fate and transport model." Because the tools were separate and required extensive run-time, online users could only receive approximate results when setting up a given management scenario. Now the "input model" and "fate and transport model" will be combined, allowing users to receive exact results each and every time they run a management scenario.

- Do the reviewers have any concerns or comments about the data or methods described within the documentation aside from those already listed above?
- Are there additional technical data or scientific findings that could be employed by the Chesapeake Bay Program now, or developed in the future, to better inform nutrient input estimates across the watershed?

Sincerely,

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