Charge and Scope of Work
Nutrient Management Phase 6.0 Expert Panel
March 19, 2015

Background

The current version of the Chesapeake Bay Program (CBP) partnership's Watershed Model (Phase 5.3.2 or P5.3.2) credits Crop Group Nutrient Application Management (or Tier 1), under the following definition: "Documentation exists for manure and/or fertilizer application management activities in accordance with basic land grant university (LGU) recommendations. This documentation supports farm-specific efforts to maximize growth by application of nitrogen (N) and phosphorus (P) with respect to proper nutrient source, rate, timing and placement for optimum crop growth consistent with LGU recommendations. Particular attention is paid to: (1) standard, realistic farm-wide yield goals; (2) credit for N sources (soil, sod, past manure and current-year applications); (3) P application rates consistent with LGU recommendations based on soil tests for fields without manure; and (4) N based application rates consistent with LGU recommendations for fields receiving manure."

Enhanced Nutrient Management and Decision Agriculture BMPs are currently represented in the P5.3.2 Model. However, these practices are expected to be replaced by Nutrient Application Management Tier 2 and Tier 3 practices respectively, which are being finalized by the Nutrient Management P5.3.2 Expert Panel in 2015.

- Proposed Tier 2
  The implementation of field-specific nutrient application management efforts to maximize growth by application of nitrogen (N) and phosphorus (P) with respect to proper nutrient source, rate, timing and placement for optimum crop growth consistent with LGU recommendations incorporating a P risk assessment tool.
- Proposed Tier 3
  The implementation of subfield-specific nutrient application management efforts to maximize growth by application of nitrogen (N) and phosphorus (P) with respect to proper nutrient source, rate, timing and placement for optimum crop growth incorporating sub-field monitoring and operational practices to further refine the LGU recommendations for the specific farm site and conditions.

Recommendations for Expert Panel Member Expertise

The AgWG expert panel organization process[1] directs that each expert panel is to include eight members, including one non-voting representative each from the Watershed Technical Workgroup (WTWG) and Chesapeake Bay Program modeling team. Panels are also expected to include three recognized topic experts and three individuals with expertise in environmental and water quality-related issues. A representative of USDA who is familiar with the USDA-Natural

[1] http://www.chesapeakebay.net/channel_files/22312/january_9_2015_agwg_expert_panel_organization_process.pdf

Resources Conservation Service (NRCS) conservation practice standards should be included as one of the six individuals who have topic- or other expertise.

In accordance with the July 13, 2015 Water Quality Goal Implementation Team BMP Expert Panel Protocol (BMP Protocol)[2], panel members should not represent entities with potential conflicts of interest, such as entities that could receive a financial benefit from Panel recommendations or where there is a conflict between the private interests and the official responsibilities of those entities. All Panelists are required to identify any potential financial or other conflicts of interest prior to serving on the Panel. These conditions will minimize the risk that Expert Panels are biased toward particular interests or regions.

The Agriculture Workgroup directs that the P6.0 Nutrient Management Panel should include members with the following areas of expertise:

- Nutrient management planning and agronomy.
- Expertise in farm- and field-level nutrient risk assessment tools for N and P.
- Experience with carrying out research projects relating to nutrient management.
- Expertise in fate and transport of N and/or P in agricultural systems.
- Knowledge of nutrient management practices implemented in the Bay jurisdiction(s).
- Knowledge of how BMPs are tracked and reported, and the Chesapeake Bay Program partnership's modeling tools.
- Experience with verification of nutrient management plans and other forms of nutrient management.
- Knowledge of relevant USDA-NRCS practice codes or standards.

Expert Panel Scope of Work

The general scope of work for the Nutrient Management P6.0 Panel(s) will be to define and configure the Nutrient Management BMPs in the P6.0 model. Specifically, the Agriculture Workgroup defines the following four charges with associated tasks for the P6.0 Nutrient Management Expert Panel:

1. Review the P5.3.2 definitions and effectiveness estimates for the implementation of component practices of Nutrient Management and make adjustments or modifications as needed for Phase 6.0.
    a) Consider the current P5.3.2 Tier system used for identifying levels of nutrient management implementation activities to be credited to the model, and
    b) Recommend if the current proposed Tier process should remain or if a more component oriented process for crediting nutrient management practices is more appropriate.
2. Determine how nutrient management practices can be applied to the P6.0 land uses, taking into consideration the mass balance data and nutrient spreading routine in Scenario Builder.

[2] http://www.chesapeakebay.net/documents/CBP_BMP_Expert_Panel_Protocol_WQGIT_approved_7.13.15.pdf

3. If possible, make recommendations using multi-year vs. annual model representation of soil nutrient residuals for calculation of available nutrients to meet crop requirements on an annual basis.
4. Collaboration with the Cropland Irrigation Management Expert Panel on fertigation and with Manure Injection and Incorporation Expert Panel will be critical to ensure that recommendations are complementary as well as to avoid double-counting and ensure effective reporting of practices.

This scope of work addresses nutrient management reduction efficiencies for N, P, and sediment.

Under the first charge, the Nutrient Management Phase 6.0 (P6.0) Expert Panel will review the P5.3.2 definitions and effectiveness estimates for the implementation of component practices of Nutrient Management and make adjustments or modifications as needed for Phase 6.0. This charge is necessary because the P6.0 model features a change in land use categories, a possible change in the baseline condition, and some likely changes in how BMPs are applied. While the Agriculture Workgroup considers the tiered approach to be an improvement over the previous P5.3.2 approach to nutrient management, there is interest in considering an alternative approach for P6.0. Both a tiered approach and practice-specific approach have pros and cons associated with reporting implementation and determining efficiency values. Items 1a and 1b specify that the P6.0 Panel will consider the current Tier system used for identifying levels of nutrient management implementation activities to be credited to the model and recommend if the current proposed Tier process should remain or if a more component oriented process for selecting nutrient management practices is more appropriate. Nutrient management Tiers 1-3 are described in the *Background* section of this document.

The second charge directs the P6.0 Panel to determine how nutrient management practices can be applied to the P6.0 land uses. Factors to consider when performing tasks under this charge include the baseline conditions assumed by the model (e.g., with or without nutrient management), the nutrient spreading routine and improved mass balance data for Scenario Builder, and potential variation in crediting for different land uses.

Residual nutrients are not adequately accounted for by the P5.3.2 model. Under the third charge, the P6.0 Panel will consider management of residual nutrients and how they are carried over to subsequent years in the P6.0 model. This will require close coordination with the Chesapeake Bay modeling team which is ultimately responsible for developing the capability to add this important feature to the model.

Collaboration with the P6.0 Cropland Irrigation Management Panel is specified under the fourth charge to ensure that recommendations from the two panels are complementary and that practice reporting and crediting are accurate. Either panel could address fertigation, but both panels should have a role in determining the final recommendations.

The Panel will follow the process described in the 2015 BMP Protocol for all activities including development of a final report. In addition, the Panel will develop a provisional paper including BMP structure and type, draft BMP definition(s), and initial elements of the BMP such as associated components and conservation practices, and USDA-NRCS associated conservation

practice codes. Initially identified literature citations will be included to provide a range of potential effectiveness values that the panel will consider and supplement with further evaluation. The panel will present their provisional BMP paper to the AgWG, WTWG, and WQGIT for informational purposes, and for initial Partnership comments on the proposed direction of the panel's evaluation. Provisional panel recommendations will be used only for initial Phase 6 model development and calibration, and not for future implementation progress reporting by the jurisdictions.

Timeline and Deliverables

The Expert Panel project timeline for the development of the panel recommendations is based on the Phase 6.0 model development schedule. This timeline includes the development of a provisional recommendation for this BMP prior to the finalization of a fully documented recommendation report with effectiveness values. Provisional panel recommendations will be used only for initial Phase 6 model development and calibration, and not for future implementation progress reporting by the jurisdictions. The Panel coordinator will work with the Panel to develop a detailed project timeline based on the deadlines below.

Summer 2015 – Panel stakeholder kickoff meeting

September/October 2015 – The Panel will present a provisional report to the AgWG, WTWG, and WQGIT for informational purposes, and for initial Partnership comments on the proposed direction of the Panel's evaluation. The paper will not represent a full recommendation report, and the Partnership will not be asked for formal approval at this time.

February 2016 – Target date for Panel to release draft report to the Partnership.

April 11, 2016 – Target date for full Partnership approval of the panel report.

Phase 6.0 BMP Verification Recommendations:

The panel will utilize the Partnership approved ***Agricultural BMP Verification Guidance***[3], as the basis for developing BMP verification guidance recommendations that are specific to the BMP(s) being evaluated. The panel's verification guidance will provide relevant supplemental details and specific examples to provide the Partnership with recommended potential options for how jurisdictions and partners can verify nutrient management practices in accordance with the Partnership's approved guidance.

[3] http://www.chesapeakebay.net/documents/Appendix%20B%20-Ag%20BMP%20Verification%20Guidance%20Final.pdf