Proposed Wetlands Land Uses for the Phase 6 Watershed Model

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Presented to Wetlands Workgroup

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Agenda

- Welcome and verify participants (Amy)
- Background on panel charge (Erin)
- Overview of process and current timeline (Jeremy)
- Overview of land use recommendations (Pam)
- Discussion of newly or previously raised concerns (Everyone)
- Summary of consensus and/or options (Amy, Erin, Pam and Jeremy)

Context and Panel Charge

- Back in October 2014, the WQGIT knew that some land uses needed more time (wetlands and tree canopy)
  - The wetlands panel was just getting underway at that time.
- The panel is charged with proposing wetlands land uses for the Phase 6 Watershed Model, and also with evaluating three BMPs (wetland restoration, wetland creation and wetland enhancement).
  - Only the recommended land uses are proposed at this time.
  - Methods/values to quantify the nutrient processes and sediment retention for these natural wetlands are forthcoming later this year (more on this later).
  - The BMP recommendations will be provided in detailed report(s) next year.

Current decision timeline for wetlands land uses

- August 14th-August 24th
  - Memo released; Wetlands workgroup and others requested extension
- August 24th-September 3rd
  - Hold a call/briefing with Wetlands Workgroup to discuss the recommendations and comments in detail (8/28)
  - Comments/feedback requested by COB August 31st (for any comments/feedback outside of the Wetlands Workgroup call)
- September 4th: Distribute revised memo to WQGIT, Wetlands Workgroup, Habitat GIT. This version will be considered for a decision on September 14th.
- September 14th WQGIT: Deadline to approve Phase 6 wetlands land uses
  - If there is no proposal or no decision, then wetlands will remain lumped with forest, as they are in the current Watershed Model (Phase 5.3.2)

Proposed land uses for decision

- Tidal wetlands will NOT be a land use in the P6 Watershed Model. They will be simulated in the estuarine water quality and sediment transport model.
  - These wetlands interact with the tidal water column so the Modeling Workgroup is working to simulate their effects in the estuarine model.
- **For nontidal wetlands, three land use classes are proposed:**
  - **Palustrine forested**
  - **Palustrine emergent**
  - **Palustrine scrub-shrub**
- The **loading rate** from the wetland acres are equal to the TN, TP and TSS rates for Forest
  - As noted in the memo, the water quality benefits and watershed services associated with these natural wetlands is still under consideration by the panel

What is NOT being proposed by the panel at this time

- “Efficiencies” or estimates of the upland benefits of wetlands will be presented later this year
  - This ongoing analysis considers landscape position, soils, and other hyrdogeologic aspects important to wetland
  - Would be ready for the next calibration in 2016
- Restoration, creation and enhancement BMPs will be presented in detailed report(s) next year
  - Restoration is an existing BMP; creation and enhancement will both be new BMPs

Some points of clarification

- Criteria for land uses in Phase 6 (from Land Use Workgroup):
  1. Unique loading rates
  2. Unique efficiencies or effects associated with the land use
  3. Unique BMPs applied to the land use
- In the Watershed Model, “loading rates” can be understood as the nutrients and sediment that are annually generated in, and transported from, a given land use **irrespective of surrounding land uses**.

Clarification: loading rates (cont'd)

- I.e., what is the contribution of the wetland itself? Plenty of studies look at loads-in and loads-out, but not a "loading rate" for the wetland itself separately from other land uses in the study area
  - Also, for wetlands the loading rate should not be a major focus (relatively few acres) and setting the loading rate equal to Forest is the reasonable choice. Accounting for the affects of wetlands on reducing loads from upslope sources is a much larger effect ("treated" acres >> wetland acres)
- The nutrient and sediment effects of a wetland with respect to the surrounding landscape can be captured through an efficiency estimate applied to, but distinct from, the wetland itself
  - What we need now (for the October calibration) is agreement of how to map and classify acres of wetlands throughout the entire watershed
    - NWI is not perfect, but it's the only option for our 64,000 sq. mile watershed

Summary of recommendations

Table 1. Recommended land use classes and relative loading rates for nontidal wetlands in the Phase 6 Watershed Model			
Proposed wetland land uses for Phase 6 Watershed Model	Relative Loading Rate (TN)	Relative Loading Rate (TP)	Relative Loading Rate (Sediment)
Palustrine Forested (PFO)	100% Forest	100% Forest	100% Forest
Palustrine Scrub-Shrub (PSS)	100% Forest	100% Forest	100% Forest
Palustrine Emergent (PEM)	100% Forest	100% Forest	100% Forest

Summary of the recommendations

- The panel considered many different approaches to classifying and mapping wetlands as a new land use
- Again, NWI is not perfect, but the panel agreed early on that it is the best option for the entire watershed.

Summary of recommendations

- Early debates about the wetland classification scheme for Phase 6 included classes such as tidal saline, tidal fresh, non-tidal depressional, non-tidal isolated, non-tidal floodplain, and non-tidal headwater.
- The panel learned in July that tidal wetlands no longer needed a land use in the Watershed Model.
- The classification scheme focused on major vegetation types (forested, scrub-shrub, emergent) rather than landscape position because the latter will be accounted for by the wetland efficiencies.
  - No matter how we split or label the wetland land uses, the acres will still need to be based on NWI (i.e. the sum of the land uses will be the same whether we amend the panel's proposed land uses or not)

Concerns

1. Landscape position vs. vegetation Class
2. Justifications and documentation
3. Additional approaches
4. Process and Wetland Workgroup approval

1. Landscape position vs. vegetation class

- [MDE] The Expert Panel report clearly acknowledges that the most important factor to consider in regard to wetland loading and retention rates is landscape position. It is unclear why a unique land use classification *[loading rate?]* for wetlands could not be established, given the extensive literature on wetlands and their role in nutrient processing and sediment retention, and including references provided to the panel which include loadings into and exiting from wetlands.
- [MDE] The rationale for changing from a wetland classification system based on landscape position to a system based on vegetation type is not described. Maryland has nearly completed its mapping effort to distinguish between estuarine, floodplain, and headwater wetlands and believes that a landscape approach is more reflective of relative effectiveness in nutrient and sediment retention or transformation.

1. Landscape vs. vegetation (cont'd)

- The literature review indicated: 1) wetland nutrient and sediment retention efficiency varies widely among wetlands, from less than 0 to 100%; and 2) retention largely depends on the relative importance of ground- and surface-water inputs and hydrologic exchange rates. Further, there was ample evidence to conclude that potential for denitrification or sediment deposition depends upon landscape position. The literature review did not reveal any close linkages between wetland water quality function and vegetation cover type, nor did it suggest that vegetative structure relates to landscape position.

1. Landscape vs. vegetation (cont'd)

- While there are strong patterns among wetland community, hydroperiod, and water chemistry, differentiating wetlands based on cover type (emergent, scrub/shrub, or forest) does not capture these linkages or adequately capture attributes of landscape setting.
- Even a cursory split of floodplain versus non-floodplain wetlands would be useful for delineating wetland landuses and the basis for considering efficiencies for wetland restoration and enhancement BMPs. This should be (quickly) achievable using NWI and SSURGO soils.

2. Justifications and documentation

- It is important that the Wetlands Expert Panel state the justification for explicitly mapping wetlands and wetland effects on downstream water quality (i.e., for their unique efficiencies).
- Provide justification for the decision to exclude tidal wetlands because of their inclusion in the estuarine model. Include a description of how these wetlands are represented in the estuarine model and an assessment of whether the model adequately address the concerns of the Wetlands Expert Panel. It also may be helpful to evaluate the consistency of how nontidal and tidal wetlands are modeled.

3. Additional approaches

- MDE requested consideration of applying the SPARROW model to wetlands as a land use, as was done for forest land. This effort could not be investigated nor completed in the time frame allotted to the expert panel.
- MDE believes that with additional effort, it is possible to recognize the unique contributions of wetlands in natural nutrient and sediment processing, which differ in certain aspects from nutrient and sediment pathways in upland forest. Appropriate recognition to the documented benefits of wetlands has the potential to reduce load allocations for some jurisdictions, and thus reduce the extent of additional best management practices needed to comply with current load reduction requirements.

4. Process and Wetland Workgroup approval

- The Expert Panel recommendations were to be reviewed and approved by the Wetland Work Group prior to advancing in Chesapeake Bay Program Review. The Wetland Work Group has not approved these recommendations to date. The Expert Panel report does not have the endorsement of the Wetland Workgroup and we do not recommend that the WQ GIT vote on this until the WWG has had a chance to comment. We also feel that the Ag Workgroup should have an opportunity to review and provide input.

Questions?

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