**[Wetland Workgroup Meeting](http://www.chesapeakebay.net/calendar/event/24297/) Minutes**

Maryland DNR, Conference Room C1A

Thursday, September 15th, 2016

1:00-3:00 PM

**Participants:**

|  |  |
| --- | --- |
| Amy Jacobs, TNC (Co-Chair) | Jill Whitcomb, PA DEP |
| Erin McLaughlin, MD DNR (Co-Chair) | Dave Gorman, PA DEP |
| Kyle Runion, CRC (Staff) | Patrick Raney, USC |
| Jeremy Hanson, VT | Aileen Molloy, Tt |
| Kathy Boomer, TNC | Alana Hartman, WV DEP |
| Michele Henicheck, VA DEQ | Chris Spaur, USACE |
| Greg Noe, USGS | Jeff Sweeney, EPA |
| Ralph Spagnolo, EPA | Melissa Yearick, USC |
| Denise Clearwater, MDE | Anne Wakeford, WV DNR |
| Rich Mason, USFWS | Carol Petrow, EPA |
| Olivia Donachie, CCC USFWS | Pam Mason, VIMS |
| Steve Strano, NRCS  Alison Rogerson, DNREC | Judy Denver, USGS |

**Actions and Decisions:**

* **Action:** Please contact Amy Jacobs and Kyle Runion if you would like to join the Outreach Committee to guide the GIT Funding project development.
* **Action:** Please let Amy Jacobs and Kyle Runion know of any contractors that would have the web design and training expertise the GIT funded project requires to which we can include in our distribution list.
* **Action:** After the meeting, the group was asked for responses to questions via email by noon on Friday, September 23rd, 2016 to confirm how to represent wetland BMPs in the next calibration of the Phase 6 Watershed Model. If a workgroup member’s answer is “no” to a question, an explanation and alternative must be provided (questions detailed below and via email to the workgroup). Responses should be sent to Kyle Runion by noon, Friday September 23rd.

**Welcome and Updates**

* Strano: 520 acres of wetland restoration were completed this year with another 45 by end of the fiscal year.
* Clearwater: MDE is holding preliminary stakeholder meetings before proposing changes to compensatory non-tidal wetland mitigation regulation. Public meetings will be held to discuss any proposed changes:
  + October 4 – Hagerstown (library) – 1:00-5:00;
  + October 6 – Cambridge (303 Gay Street) – 1:00-5:00;
  + October 11 - MDE -Aqua/Terra/Aeris – 1:30-5:30.
  + For more information, please contact Kelly Neff, [Kelly.Neff@maryland.gov](mailto:Kelly.Neff@maryland.gov).
* Gorman: We are presenting to our water resource advisory committee to finalize rapid condition assessments for lacustrine, riverine, and palustrine wetland resources. We have funding to move forward to complete land cover/land use mapping in the western portion of Pennsylvania using the same methods used for the Chesapeake and Delaware Bay watershed portions. In development of our Wetland Resources Registry geospatial tool development for compensatory mitigation.
* Whitcomb: Pennsylvania submitted edits to the 2012-2015 wetland restoration acreage. A glitch in our reporting system led to multiple years of zero reported acres.
* Raney: Have been working on floodplain restoration in New York. Recently published a paper on tree responses to climate change in wetland settings.
* Yearick: We are starting data collection and hope to start processing in early October.
* Jacobs: About 1100 acres of floodplain reconnection to begin construction on the main stem Pocomoke shortly.
* Henicheck: We recently received the 2015 state program innovation award from ECOS, the Environmental Council of State, for [our wetland monitoring and assessment strategy.](http://www.deq.virginia.gov/Programs/Water/WetlandsStreams/MonitoringAssessmentStrategy.aspx)

**Final 2015 Acreage Check**

* Jacobs: As states begin to develop their Phase III WIPs we’d like to get a sense of where states are and what role wetlands will play and how our progress towards the goal may be affected. Please try to keep tabs on this in general as it will be a topic of conversation in the future.
  + Clearwater: We should be cognizant of the potential for double counting floodplain reconnections as a stream restoration and a wetland BMP. A decision needs to be made of what types of project will fit under which BMP.

**Cross-Goal Climate Resiliency Analysis**, Erin McLaughlin

* The wetland Management Strategy is a bit too complicated to fit into the climate resiliency decision matrix project. The project steering committee decided to focus on black duck outcome. Workgroup members are still invited and encouraged to call/attend as the black duck outcome is largely based on wetland restoration/creation/conservation.

**GIT Funding Update**, Amy Jacobs

* The GIT Funding proposal “Increasing landowner participation in wetland programs through improved information access and program staff cross-training” was approved for funding. The project is looking to accomplish website development, a decision support tool, and a marketing and outreach plan.
  + **Action:** Please contact Amy Jacobs and Kyle Runion if you would like to join the committee to guide the GIT Funding project development.
  + **Action:** Please let us know of any contractors that would have the expertise the project requires to which we can include in our distribution list.
    - Clearwater: MES is a potential partner for website development.

**Pennsylvania Wetland Mapping Update**, Patrick Raney. [Presentation posted online](http://www.chesapeakebay.net/channel_files/24297/upper_susquehanna_wetland_mapping_update_9-7-2016.pdf).

* Discussion begun last fall on how to update wetland mapping throughout the Bay watershed. The plan was to use NWI, but PA’s NWI maps are dated and inaccurate. USC developed a proposal to improve wetland mapping and has been working on this since early 2016.
* We have been using using predictive modeling approach to identify areas likely to be wetlands. It is effectively two stage process: USC has been working on a terrain analysis using known wetland sites using data integrated from the Pennsylvania Natural Heritage Program and Riperia databases. Attributes such as elevation, soils, climate, geology, slope, and other topographic predictors were analyzed for how the effect wetland occurrence. A draft of this product is available as a heat map of likely wetland presence/absence.
* The University of Vermont (UVm) is soon starting to develop layers such as compound topographic index using base LiDAR
* Modeling steps included a literature review, multi-collinearity screening, model training and validation, and a review of model statistics
* A principle components analysis was conducted to reduce multiple correlated variables to a single variable which can be used as a predictor.
  + Ex. five climate variables (max temp, min temp, mean temp, dew point, and vapor pressure deficit) were highly correlated and could be dimensionally reduced to one variable while retaining over 90% of the variation.
* The model fit statistics was strong with an R2 = 0.86 after validation.
* Next steps include a filter of the model output with high-resolution CBP landcover product from UVm, providing UVm with updated predictive surfaces, and evaluating the accuracy of UVm’s intermediate product.
* The next update will show more detailed maps.

**Wetland Expert Panel Preliminary Final Report**, Jeremy Hanson & Kathy Boomer

* Recap and status
  + The Wetland Expert Panel (WEP) convened in fall 2014. In fall 2015, the CBP Partnership approved two nontidal wetland land uses for the Phase 6 Watershed Model (P6WM): Floodplain and Other. September 30th – deadline for new partnership decisions/inputs for calibration of 4th beta version of the P6WM.
* A preliminary report is a shortened version of the full report for consideration and approval of time-sensitive decisions given the development schedule and deadlines for the Phase 6 Watershed Model (such as Sept. 30 deadline above). This allows modelers to incorporate BMP frameworks and efficiencies to more closely resemble the final partnership-approved version of the BMPs while the partnership goes through a review of the full report that takes 3+ months on average.
  + The WEP has definitions for four categories of wetland BMPs in Phase 6: Wetland Restoration (aka re-establishment), Wetland Creation (aka establishment), Wetland Enhancement and Wetland Rehabilitation. However, the WEP is only able to suggest new Phase 6 efficiencies for Wetland Restoration at this time. Phase 6 efficiencies for Creation, Enhancement, and Rehabilitation will be addressed by a future panel.
  + This preliminary report recommends the panel’s Phase 6 efficiencies for Restoration and suggests how to use the current Phase 5 efficiencies and assumptions as placeholders for estimating a benefit for acres of creation, enhancement, and rehabilitation. The alternative is to “turn off” these categories for the calibration, which will create difficulties for reporting progress or incorporating the BMPs in the modeling tools once the future panel has made its recommendations.
* Whitcomb: Should reiterate that these will only be applied to voluntary wetland restoration, not regulatory practices or mitigation banking.
* The CBP currently defines the agricultural wetland restoration BMP as reestablishment (restore), or establishment (create). This results in a gain in wetland acres.
  + Reduction efficiencies in the Phase 5 Watershed Model (P5WM) are broken down by three broad geographic regions spanning the Chesapeake Bay watershed (i.e., lumping Blue Ridge and Piedmont; also Appalachian Plateau and Ridge and Valley regions) with first order kinetic equations developed by Tom Jordan and STAC in 2007-2008 to estimate the efficiency by wetland area as a percent of the watershed. [See presentation for specific efficiencies.](http://www.chesapeakebay.net/channel_files/24297/wep_slides_for_wwg_15sept2016.pptx)
    - Efficiencies are applied to one upland acre in the P5WM.
* The panel recommends:
  + For Phase 6 **Wetland Restoration**: Land use change plus apply panel’s new efficiency to new upland acre ratios. Update if changes made as result from review/approval process of full report.
    - Use efficiencies derived from the panel’s literature review: 42% TN, 40% TP, 31% TSS, based on a literature review which built on former meta-analysis of nutrient and sediment retention in natural wetlands Given the large variability across all studies, the Panel concluded that the available information is inadequate to refine retention estimates based on physiographic province. Additional understanding of how wetland water quality benefits vary in relation to watershed position and hydrogeologic setting could provide a basis to refine these estimates.
    - Upland acre ratios: The Panel recognized that the distribution and form of wetlands in different physiographic provinces of the Chesapeake Bay watershed likely influences 1) the potential for excess nutrient and sediment loads delivered to wetlands in a region; and 2) the probability that such ‘contaminated’ water intersects a natural wetland filter. Accordingly, based on the hydrogeographic setting and predominant land cover land use conditions within each physiographic province, the following wetland ratio acres are recommended:

|  | **Upland Acres Treated** | | **Watershed Model HGMR** |
| --- | --- | --- | --- |
| **Physiographic Subregion** | **Floodplain Wetlands** | **Other Wetlands** |  |
| Appalachian Plateau | 2 | 1 | Appalachian Plateau Siliciclastic |
| Appalachian Ridge and Valley | 2 | 1 | Valley and Ridge Siliciclastic |
| Blue Ridge | 3 | 2 | Blue Ridge |
| Piedmont | 3 | 2 | Piedmont Crystalline  Mesozoic Lowlands |
| Inner Coastal Plain | 6 | 4 | Western Shore: Coastal Plain Uplands  Coastal Plain Dissected Uplands |
| Outer Coastal Plain- Poorly Drained | 2 | 1 | Eastern Shore:  Coastal Plain Uplands |
| Outer Coastal Plain- Well Drained | 3 | 2 | Eastern Shore:  Coastal Plain Dissected Uplands |
| Coastal Plain Lowland | 3 | 2 | Coastal Plain Lowlands |
| Karst Terrain | 3 | 2 | Piedmont Carbonate  Valley and Ridge Carbonate  Appalachian Plateau Carbonate |

The Panel provided a more detailed rationale of the proposed acreage assignments by first providing an example overview of where different wetland types occur in the three of the nine mapped physiographic provinces of the Chesapeake Bay:

* Appalachian Plateau – sedimentary geology, sloping ground-water fed wetlands and floodplain wetlands often associated with deep aquifer discharge wthat aren’t exposed to as much surface impacts, forested areas.
* Ridge and Valley – metamorphic rock, fractured geology that strongly influences how surface water moves and where ground water emerges at the landscape to form riparian sloping wetlands. Forested in the ridge, agricultural and developed in the valley.
* Coastal Plain – complex geology, unconsolidated sediment, and nested groundwater system leads to greater prevalence of wetlands exposed to contaminated surface- and shallow groundwater resources across the landscape.

In contrast to previous CBP model applications, the Panel pushed to recognize distinct patterns in wetland distribution, form, and function divided into nine physiographic provinces across the Chesapeake Bay watershed. Variation across the Coastal Plain and the potential for groundwater by-pass was of particular concern.

The Panel then proposed to estimate wetland retention based on a generic decomposition model, which combines factors describing contaminant delivery rate and reaction or removal rate. Accordingly, the following assumptions were presented as the recommended modeling approach to estimating wetland retention benefits:

* Discharge from assigned upland acres (based on land use and land cover conditions and likelihood of interception) reflects contaminant concentrations delivered at the edge-of-wetland or by groundwater discharge
* Floodplain wetlands provide additional retention capacity due to additional overbank flow providing a delivery mechanism that elevates delivered loads. The Panel suggested 1.5x the upland acres assigned in Table 1.

Retention efficiencies for the specific constituents of concern reflect decomposition rates

The treated upland acreage assignments in Table 1 were developed in two steps. First, based on the description of the hydrogologic setting and land use/land cover history, each floodplain and other wetlands types in each province were rated qualitatively, as high, medium, or low, to indicate the likelihood that such wetlands intercept nutrient- or sediment-enriched waters. A review of wetland restoration records throughout MD state indicated that local contributing areas often are smaller than 10 acres, thus providing an order of magnitude by which to scale and convert the qualitative assignments to numeric values needed to predict wetland retention.

* + For Phase 6 **Wetland Creation**: Land use change plus apply Phase 5 efficiencies using Phase 5 upland acre ratio (1:1 acres). Update based on future panel.
    - Use the average of P5WM efficiencies, which was used as default if the geomorphic region was unknown: 16.75% TN, 32.18% TP, 9.82% TSS
  + For Phase 6 **Wetland Enhancement** and **Rehabilitation**: Apply Phase 5 efficiencies using Phase 5 upland acre ratio (1:1). No land use change since it is a gain in function. Update based on future panel.
    - Use the average of P5WM efficiencies, which was used as default if the geomorphic region was unknown: 16.75% TN, 32.18% TP, 9.82% TSS
  + Wetland Restoration for tidal areas: use existing [Shoreline Management BMP](http://www.chesapeakebay.net/documents/Shoreline_Management_Protocols_Final_Approved_07132015-WQGIT-approved.pdf).
  + Federal definitions are used for wetland BMP category definitions.
  + BMP acres in the current Phase 5 NEIEN appendix will be correlated with one of the following BMP categories and reduction efficiencies in Phase 6: Restoration, Creation, Enhancement, or Rehabilitation.
* Boomer: For the workgroup/partnership’s radar: cross walk to understand what’s already being counted or will already have credit by virtue of being mapped. There is an inconsistency in the model treatment of enhanced acres – the water quality benefits would be knocked back to that of creation.
  + Hanson: This second issue will be addressed by a future panel. The efficiencies we are borrowing from Phase 5 are placeholders until then. Another panel likely won’t have recommendations for a year, so by removing these we would have no efficiencies in the final Phase 6 model for that time period.
* The wetland BMPs will be cumulative (does not require annual reporting) and have a credit duration of 15 years, unless the partnership wishes to set a different credit duration.
* The workgroup should address the issue of reporting towards the CBP goal (specifically the 150,000 acres of enhanced functionality) vs. that of the WIPs.
* Mason: Wants to remind everyone that this is an adaptive management process, and that there will be opportunities later to adjust numbers, but we are against a deadline to incorporate this framework into the beta P6WM. Numbers may not be perfect, but are an improvement based on what we’ve found in the literature.
* Concerns shared:

\*Jacobs concerned about small upland acreages assigned to Coastal Plain provinces, recognizing that artificial hydrology has changed form and function of wetlands. Boomer responded that it will be challenging to map and identify these altered wetlands based on the Phase6 input.

Noe expressed concern about the 1.5x floodplain factor, suggesting this should be higher

Boomer expressed concern about not applying retention model to all wetlands in the Bay watershed. Suggested that, for now, natural, as well as enhanced and restored wetlands all receive retention benefit.

**Adjourned**

**Action:** After the meeting, the group was asked for responses to the following questions via email by noon on Friday, September 23rd, 2016. If no, an explanation and alternative must be provided.

1. Do you support having 4 categories of wetland BMPs in Phase 6?

·       Wetland Restoration (re-establishment). This is an acreage gain.

·       Wetland Creation (establishment). This is an acreage gain.

·       Wetland Enhancement. This is a functional gain.

·       Wetland Rehabilitation. This is a functional gain.

Note: If all four categories are desired in the Phase 6 Watershed Model, the deadline for a decision is September 30th. If no decision is reached, there will only be ONE category: Wetland Restoration. Adding categories or changing the overall framework will become more difficult after the September 30th deadline and nothing can be guaranteed. If the four categories are included by the Workgroup’s decision before September 30th then the specific values (the efficiency rates, ratio of upland acres treated, etc.) can more easily be adjusted in the future.

2. Do you support the overall framework? Specifically: the two acreage gain categories will be a land use change plus treatment of set ratio of upland acres to each acre of wetland; and the two functional gain categories will treat a set ratio of upland acres to each acre of wetland with no land use conversion.

3.  The values suggested as placeholders can be changed in the future. For the Panel’s suggested Phase 6 Wetland Restoration values, this means the values can be adjusted based on the review/approval process of the Panel’s full report over the next 3+ months. For the other three categories for Phase 6 wetland BMPs (Creation, Enhancement, Rehabilitation), this means they can be adjusted once a future panel has provided recommended improvements or changes.

Do you understand that the numbers can be changed in the future as described above?

4. Knowing that the numbers can be adjusted based on future partnership review, do you support using the proposed numbers in the next beta version of the watershed model for the **Wetland Restoration BMP?** These number can be adjusted during the comment period for the full Expert Panel report that will be released soon.

5. Do you support using the proposed numbers in the next beta version of the watershed model for the **Wetland Creation, Wetland Rehabilitation, and Wetland Enhancement BMP**?  These numbers would not be able to be adjusted until a new Expert Panel is formed in the future.