Wetland Workgroup Meeting Minutes

CBP Conference Room 305

Thursday, March 23rd, 2017

1:00PM – 3:00PM

Attendees:

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| Erin McLaughlin, MD DNR (Co-Chair) | Diane Prosser, USGS |
| Kyle Runion, CRC (Staff) | Greg Noe, USGS |
| Jeremy Hanson, VT | Mark Biddle, DNREC |
| Denise Clearwater, MDE | Ken Murin, PA DEP |
| Jake Reilly, NFWF | Dave Gorman, PA DEP |
| Patrick Raney, USC | Alana Hartman, WV DEP |
| Sean MacFaden, University of Vermont | Anne Wakeford, WV DEP |
| Marian Norris, NPS | Michelle Henicheck, VA DEQ |
| Julie Minde, GMU | Diane Davis, DC DOEE |
| Chris Spaur, USACE | Carol Petrow, EPA |

**Action Items**

**Action**: Reilly will coordinate with the Black Duck Action Team and return to the Wetland Workgroup in May to discuss the NFWF Business Plan Refresh.

**Action**: Workgroup members should contact runion.kyle@epa.gov by April 6th if they are willing to volunteer to join the group to write the panel charge. This charge will be presented at the next Wetland Workgroup’s meeting for approval.

**Action**: Members who can help develop a Phase 6 wetland restoration BMP fact sheet should contact runion.kyle@epa.gov by April 6th.

**Action:** Workgroup members should send any ideas for presentations to runion.kyle@epa.gov.

**Introductions and Updates**

* Raney: In New York, we are in the process of buying the only northeastern bulrush site in the state.
* Gorman: Pennsylvania’s level 2 wetland rapid assessment was finalized and technical guidance becomes effective in July 2017.
* Hanson: The Chesapeake Stormwater Network recently awarded their Best Urban BMP in the Bay Awards (BUBBAs) and announced a free upcoming webcast on April 6th to discuss award-winning projects, including some wetland projects. Link: <http://chesapeakestormwater.net/events/webcast-bubbas-highlights-stream-and-wetland-restoration-success-stories/>

**NFWF Business Plan Refresh, Jake Reilly**

* The National Fish and Wildlife Federation’s (NFWF) Chesapeake Bay Stewardship Fund delivers about $10-15 million a year in grants for restoration and conservation work to support the Chesapeake Bay Program’s Watershed Agreement. The funding largely is awarded to water quality improvements but NFWF has developed organizational priorities focused on habitat restoration and searches for opportunities to connect these goals.
* NFWF is in the process of updating our existing conservation investment strategy titled the Chesapeake Bay Business Plan, developed in 2011-2012. With the 2014 Watershed Agreement and new tools available, this refresh has the goal of incorporating and utilizing the most up to date resources and collaborating with Bay Program partners in setting priorities.
	+ NFWF has the opportunity to define a new set of wetland restoration and enhancement goals in support of other outcomes such as black duck.
	+ Need from NFWF to investigate work being done in the watershed to align priorities and needs, identify challenges, and promote opportunities.
		- This process is currently taking place and will be brought to the workgroup again in the coming months.
	+ NFWF’s timeline previously described at the Habitat GIT meeting has been expanded to allow NFWF to connect with more stakeholders and partners.
* NFWF will conduct outreach through the workgroup in manner similar to the CBP Management Board’s Strategy Review System (SRS) process in order to minimize workload.
* There’s an opportunity for collaboration with the Black Duck Action Team in refreshing the NFWF Business Plan.
	+ **Action**: Reilly will coordinate with the Black Duck Action Team and return to the Wetland Workgroup in May to discuss the NFWF Business Plan Refresh.

**Upper Susquehanna Wetland Mapping Update**

LiDAR-aided hydrogeologic modeling, Patrick Raney

* This project came together with the need for updated wetland mapping in Pennsylvania from the late-1970s to mid-1980s in order to identify restoration areas to meet the TMDL.
* Two contrasting approaches were used and merged for wetland identification: Terrain modeling (described by Raney) and Object Based Image Analysis (OBIA) (described by MacFaden).
* The terrain modeling utilized climate, soil, geology, and topography data in predicting wetlands on the landscape. The Object Based Image Analysis (OBIA) takes topography, land cover, and aerial imagery data to develop the object-based wetland mapping and categorization. Each of these were reviewed and wetland categorization maps were developed.
* How wetland modeling works:
	+ Presence/absence data is combined with background environmental conditions to develop an outcome of predicted wetland features
	+ Climate downscaling from a coarser scale and relating it to other coarse scale landscape variables is required to identify scale independent relationships between climate and the landscape and translate to a finer scale.
* Results
	+ Our predictions were reasonably accurate (R2 = 0.85 - 0.86) compared to NWI.
	+ UVM’s OBIA can take a coarse wetland prediction and filter it by other datasets to delineate fine scale landscape features.
		- Statistical models aren’t able to capture local modifications on the ground. The OBIA allows us to filter out these areas of unsuitable habitat based on land cover data, for example.
	+ Classification rate of 96% accuracy.
* Thoughts on next steps for statistical modeling
	+ Looking to expand this work to state-wide in PA.
	+ Upgrading from 10 to 5m resolution.
	+ Shift to alternate modeling algorithms to reduce the rate of false positives.
* Hanson: Has this been done on such a scale before?
	+ Raney: Many studies at the larger scale using coarser data or smaller scale watersheds using high resolution data. This study is one of the first to merge the benefits of the two approaches, delivering a high resolution product that addresses major environmental gradients while capturing local, fine scale topography and land cover data.
* Clearwater: How well might this work in the coastal plain with smaller elevation difference?
	+ Raney: Models are driven from input data with regards to region. Our approach can be adapted to increase strength and accuracy in different landscapes.

Object Based Image Analysis (OBIA), Sean MacFaden

* OBIA focuses on objects rather than pixels and can better approximate landscape objects. It also permits contextual analysis, improving classification rates. Datasets from many different sources can be incorporated. The eCognition program used permits enterprise processing, creating maps on broad scales quickly.
* Data forms and datasets used: LiDAR, Digital Elevation Model (DEM), Normalized Digital Surface Model (nDSM), leaf-off Orthoimagery, NHD hydrology, road centerlines, building locations, among others.
* Land-Cover Mapping
	+ Before this wetland project, we developed a 12 class, 1-meter resolution land cover map for the Chesapeake watershed. This was an important source dataset.
* High-Resolution Wetlands Mapping
	+ The primary input was 1m DEM. A compound topographic index (CTI) was used with this input to develop a layer that more highly textures the map.
	+ Edge Extraction mapping highlights the areas of high context.
	+ Objects were segmented and created from CTI layer and aerial imagery.
		- The 1m land-cover map was then introduced to remove areas from potential wetland classification that were classified as non-wetland in the 1m land-cover data.
			* A 10m statistical model map provides a good overview of where the wetlands are. A series of different variables are used to zoom in to a finer scale.
	+ Height information (vegetation) used as a proxy for compositional information and develop wetland classes: emergent, forested, scrub/shrub, open water
	+ Areas that are no longer mapped of wetlands but have wetland characteristics can be identified as potential restoration areas.
* Raney: We have been in conversations with PA DEP in regards to expanding this effort state-wide. Greater coordination with PA Natural Heritage Program can improve the accuracy of wetland mapping. A technique to rely on both point based and polygon based metrics is being developed to improve accuracy. Very little of overall wetland reference data is in the form of a field delineated wetland occurrence polygon, which is what we need to QAQC. We are in the process of developing other methods of ensuring correct classification.
	+ We would like to see how often we correctly classify unsuitable habitat and ways to improve this. In New York, we experienced an 80-86% accuracy range when focusing just on the statistical component (before OBIA).
* Spaur: How are you classifying wetlands? Using NWI/HGM? An HGM scheme could be more durable than the NWI.
	+ Raney: Found that vegetation classes change over time. New toolkits have become available that can capture and categorize landscape features to produce HGM classes over a large region, which we hope to utilize for this project.
* Gorman: We should have enough funding to apply enhanced techniques to state-wide mapping effort in PA.
	+ Raney: The production of the initial dataset is the first step in deriving more useful projects down the road. The Chesapeake Conservancy categorized to other wetland classes used in the bay model.
	+ MacFaden: More individual categorizations can be developed and added to the eCognition based analysis.
* McLaughlin: ability to connect NWI and HGM classes would be great
* Are other state representatives interested in this type of mapping effort for your state?
	+ Biddle: Delaware is getting new statewide imagery and looking at options to refine mapping, for which funding has been secured. Coastal plain features of Delaware have been an issue for accurate mapping.
	+ Hartman: West Virginia was approached by this in the past and is interested but it will depend on funding.

**Wetland Expert Panel**, Jeremy Hanson

* The Wetland Expert Panel’s final report received full partnership approval and recommendations will be adopted in the Phase 6 Watershed Model. [The full report is available online](http://www.chesapeakebay.net/publications/title/24978). The next step is to develop scope of work for a future Wetland Expert Panel to provide further BMP recommendations.
* Four wetland BMPs were approved for Phase 6: Restoration, Creation, Enhancement, and Rehabilitation.
	+ Effectiveness values for creation, enhancement, and rehabilitation are preliminary; a new panel is needed to recommend more accurate estimates
* BMP panel process can be as short as a few months and as long as 2+ years
* Panels consist of 6 or more experts, including the panel chair. Representatives from sector workgroups such as the watershed technical workgroup, CBPO modeling team and EPA Region 3 may serve as resources.
* The Wetland Workgroup has the responsibility of writing the panel’s charge to provide background, recommendations for panel member expertise, proposed timeline, and others.
* **Action**: Workgroup members should contact runion.kyle@epa.gov by April 6th if they are willing to volunteer to join the group to write the panel charge. This charge will be presented at the next Wetland Workgroup’s meeting for approval.
* **Action**: Members who can help develop a Phase 6 wetland restoration BMP fact sheet should contact runion.kyle@epa.gov by April 6th.
* Clearwater: Is there an option of examining the loading rates (currently equal to forest) with this next panel?
	+ Hanson: The added value of recommending BMP efficiencies is likely higher than pursuing an update of loading rates.

**Request speaker for future meetings**

* May: NFWF Business Plan, Jake Reilly and Black Duck WG; NOAA shoreline waterbird findings, Diane Prosser; WEP charge, Jeremy Hanson
* July: Delaware wetland outreach, Brittany Haywood
* Clearwater: Tetra Tech’s project considering ancillary benefits of BMP goals should be revisited. The inclination is for single scores to feed into model, but this may be misleading with regards to variability and caveats for the habitat consideration of resources. A presentation from the project team would be a start to potentially kickstart an action to develop detailed guidance.
* **Action:** Workgroup members should send any ideas for presentations to runion.kyle@epa.gov.

Next meeting is tentatively set for May 18th

**Meeting Adjourned**