Chesapeake Bay Program
Watershed Technical Workgroup (WTWG)
Meeting Minutes
Thursday, August 1st, 2024
10:00 AM to 12:00 PM
Meeting Materials

<u>**Summary of Actions and Decisions**</u>

Decision: The WTWG approved the July 2024 Meeting Minutes.

Decision: The WTWG approved the final version of the NEIEN Appendix for 2023.

Action: Jess will follow up with WTWG Leadership on a demo presentation next week.

Action: Auston will help facilitate a meeting with the LUWG and Tom Howard.

Action: The WTWG will discuss the Phase 7 catchments again at a future meeting.

<u>**Meeting Minutes**</u>

10:00   **Introductions and Announcements** – Cassie Davis, NYS DEC (10 min).

- *Please put your name and affiliation in the chat box for attendance purposes. Thank you!*
- **Decision requested:** Approval of July Meeting Minutes.

Decision: The WTWG approved the July 2024 Meeting Minutes.

- Jess Rigelman, J7 mentioned that on August 12th the CAST team will be deploying a whole new backend to NEIEN processing. The backend and connection to the open node will be offline so CAST will be offline as well.
    - Auston Smith: That would be BMP data and land use data, to hold off until the 12th, or just BMP data?
    - Jess Rigelman: Just the BMP data. The land use data gets submitted via regular Excel files. It's just when submitting via the open node to NEIEN that you should hold off on that. The reason we're doing this is because we're redoing the backend to better support the new verification report that Olivia has presented before. Hoping that next month Olivia and the technical team will be able to present on those changes and give a demo of what has been done and what it means regarding the new report.

Action: Jess will follow up with WTWG Leadership on a demo presentation next week.

10:10   **NEIEN Update** – Auston Smith, EPA (5 min)

Auston provided an update on the final NEIEN Appendix which, pending approval, will be uploaded to the CAST website by the end of this month.

Decision requested: Approval of the final version of the 2023 NEIEN Appendix.

Discussion:
Cassie Davis (in chat): TMDL Link

Decision: The WTWG approved the final version of the NEIEN Appendix for 2023.

10:15   **Progress Schedule Overview** – Auston Smith, EPA (15 min)

Auston provided an update on the 2024 Progress Schedule and upcoming activities this fall. This included the schedule for the next three months and that the team hopes to have initial QAPP updates by September 3rd.

10:30   **PA DEP Remote Sensing** – Ashley Hullinger, PA DEP and Tom Howard, Resolve Hydro (45 min)

Ashley and Tom provided an update on the use of remote sensing for BMP Verification in PA.

Discussion:
Cassie Davis (in chat): Link to Ag Workgroup July Meeting
Auston Smith: Really appreciate all the hard work that's gone into getting through Phase 1 and standing up Phase 2. If you wouldn't mind going to slide 26 of the presentation, which outlines tasks in Phase 2, are you going to be trying out all three of these approaches no matter what the input is, or are you seeking direction from us and the AgWG on what to focus on?
Tom Howard: Great question, we are seeking direction on which to focus on. We can do smaller scale testing, but if we're thinking of applying this model more broadly, it becomes difficult to do over 2 million acres of agricultural land in PA.
Auston Smith: I'd encourage workgroup members to be thinking through that. I know in the verification framework there are several bullets throughout where random sampling is encouraged or necessary. The middle option, virtual field survey, immediately jumps off the page to me as low hanging fruit.
Bill Keeling: [Referring to slide 26] I kind of disagree because you're developing a method here and you have a current transect process with defined outcomes that you can simulate and reproduce. After that you may want to try it on a random sampling. The total area classification is giving me a lot of heartburn because I have very little faith in the CBP LULC Dataset being accurate, so I don't know what you would be doing with that data.
Tom Howard: Having the established observation points to reference is a great component. For all three methods, in field verification will be required. In this model testing phase, evaluation, and performance phase, what we'll be doing is holding out all data collected in 2024. The model will only be trained on data collected from 2020-2023, and then at approximately 10,000 different observation points throughout PA collected in 2024, we'll be calculating key performance metrics and comparing the machine learning approach to the in field collected data. It will be providing that very direct comparison the virtual transect survey does, which will be one of the reports of Task 4.
Auston Smith (in chat): Thanks Bill, that staggered approach using virtual transect survey then virtual field survey does make sense to me.
Bill Keeling: I think what you would find is you may classify something remotely and that may be correct versus. Understanding how the Bay Program is developing their land cover, and using

tabular data from the ag census survey. In what we report, we have many thousands of acres of BMPs thrown away because it says there's no cropland. We know there is cropland because for cover crops we do 100% verification. So, I don't think that's necessarily going to work well for you even if you're confirming with the real world land uses, they may not reflect Bay Program land cover data.

Dave Montali: Are you coordinating in any way with the CBPO Land Use team?

Ashley Hullinger: We at this time are not bringing in the Land Use team, we are staying in touch with Mark Dubin and Auston Smith. With our coordination activities we're hoping to pull in a wide swath of information, also with our monthly meetings with the AgWG.

Dave Montali: That's fair enough. Like Bill said, their ability to properly classify cropland is in question. Big picture thinking, can the work here help them later, that's the real question, how confident do you think your model will be in distinguishing cropland from pasture and hay?

Tom Howard: I like that thinking. I don't know how accurate it will be. The approach will be used to answer that question directly, at the end of phase 2. In past studies, we've gotten above 80% accuracy using different high resolution datasets for classifying conservation tillage.

Dave Montali: Your presentation is great, and it'll be appreciated by a bigger audience in PA if it's successful. The newer land use I'm looking at lately, it is doing a better job of picking out cropland, but it seems like that's got to be the first thing. How good is it to distinguish cropland, because if it isn't then you have to rely on the field observations to throw out calls it makes on something that isn't cropland.

Tom Howard: Yes, and I think that some of the data will be able to speak to that directly for ag lands you expect certain behavior from that time series of change, and you can classify that.

Dave Montali: Do you hope it will be able to make a call on all four categories of residue, or just the greater than 60 or 30-60?

Tom Howard: The way the model we're training is set up is to be able to classify each of those four tiers. We have an extensive training dataset with over 40,000 points and growing once the 2024 data is available.

Auston Smith (in chat): Thanks Dave for flagging that interaction, I can help facilitate that discussion with the LUWG for perhaps a similar presentation and discussion after speaking with Ashley, Tom, and others.

Caitlyn Tynes: I had a question about the slide in field verification required for all approaches. What percentage of these observation points are you looking to be verified in the field, or is it a certain number of acres? How will the in field verification go along with these approaches?

Tom Howard: We are going to reference back to this recommendation report on uniform evaluation. In the back of my mind, the 15% number sticks out. Maybe Mark can confirm the requirements and recommendations.

Mark Dubin: Normally we use a baseline of 10% but it's based on how many observations we're making. If you're dealing with a small population, you may need to go higher than that. It's based on the level of deviation when you do the analysis.

Tom Howard: Yes, and I think that in the recommendation report that's reflected and established in confidence intervals around these estimates. That would be similarly followed.

Bill Keeling: I don't know how big a deal it is, but construction sites would likely be viewed as bare ground or continuous tillage, do you have any idea on how you may be able to train that out of what you may find?

Tom Howard: This almost relates to Dave's question earlier regarding how we can identify fields where conservation tillage is an eligible practice. For agricultural lands we expect a parameter called NDVI to start at low values before the crop has started to grow, and then it peaks and falls. We will be able to set filtering parameters so that at different points in the season we are suspecting vegetation and in the same way we can say at these construction sites the spectral curve over time will be notably different from what we expect from agricultural lands and can filter those out automatically.

Mark Dubin: Looking at these various levels of observations, the one is that really the existing counties that have transect survey data as their starting point and that's really providing us the control dataset that we can use and is available to us. That's the first place to start here that we looked at. As Tom mentioned, there are other counties in PA we can't implement surveys on typically because we don't have enough observation points to generate valid data for analysis. We look at that as an opportunity to expand into a field scale survey to collect data on those counties and bring it in. We're looking at this as a method we can use for annual Progress reporting. The last step, the land use data of course is looking backwards, looking at older data, so working our way through these stepwise.

Auston Smith (in chat): See here the Verification Framework, please reference Appendix B, page 72 for those percentage follow up requirements for Ag practices.

Tom Howard: In addition to my presentation today, there is a report that goes into the methodology and verification plan. We would appreciate your feedback and review.

Action: Auston will help facilitate a meeting with the LUWG and Tom Howard.

11:15   **Phase 7 Proposed Catchments** – Bill Keeling, VADEQ (30 min)

Bill provided an update on the proposed NHD+ catchments for the Phase 7 model, including the current state of the data available for review by the partnership. Bill used the Chesapeake Bay Model Segmentation Viewer Website as part of the presentation.

Discussion:
Norm Goulet (in chat): I'd argue that in the urban piped area these catchments probably don't even exist.

Dave Montali: I think we're lacking Gary here, and I'm probably the only representative of the modeling team. I think your comments, Bill, were taken to heart. The viewer hasn't been updated yet, but there have been extensive improvements to shoreline so it's likely that the shoreline coverage you're seeing on this viewer is not what we're going to be using. The viewer was thought of as a repository for all we're doing and we're going to load it with what we have now and as we make improvements you'll have the good stuff in the end. There was a

recognition for some of the line work that needs to be done, it was a commitment in May to do this, but I don't think it's been finished.

Bill Keeling: I didn't get these layers from the viewer; I don't think you can do that. We asked separately for the data behind the viewer. What we were given is grossly insufficient to be upscaling or downscaling with any accuracy. I don't know what we've been seeing at the modeling workgroup.

Dave Montali: You've got to honor a commitment that it's going to be fixed. If what's in the viewer is the old version and they give you the old version directly it's still the old version. I think we just need to stay tuned. Its fine for the WTWG to see your concerns, but I thought what you heard in May gave you hope that your concerns would be addressed.

Bill Keeling: What I heard was that we're not going to use the catchments at all, because the Data doesn't support their use. We're currently using the state fertilizer data and the best guess at county manure, the current distribution is not valid and carrying it down to ten or fifty times more won't make us feel any better. Now I heard we're not going to use it in CAST but we're still going to use it in CalCAST and the dynamic model.

Dave Montali: The management scale is a decision of the WQGIT and its workgroups. The current scale of management is the Land River Segments at their finest. Unless there's a change proposed to shift management to the NHD+ scale that's where we'll be. Even in Phase 6 there were numerous things evaluated at the catchment scale and rolled up to the Land River Segment scale and this is just an extension of that. Land to water factors, small stream attenuation, all those things were evaluated at a catchment scale and rolled up for the land river segments. It's absolutely true that there were things done in Phase 6 at the catchment scale.

Bill Keeling: That may be part of why we say the anomalous outputs we've been seeing in Phase 6. I was not aware they were using catchments. If I had known that I'd have had bigger heartburn back, then. The thing that feeds the estuarine model is not CAST. The thing that creates the time series inputs is the watershed model.

Dave Montali: Down to the RIM stations, yes. What are we going to do about the land below the RIM stations with a fine scale estuarine model, the idea is to load those segments below the fall line at the NHD scale.

Bill Keeling: The catchment scale.

Dave Montali: We can find problems in both directions. If we have a coarse loading of segments going into a hundred estuary grids, we'll have to find a different way to do that, and the idea is to use the NHD loading from down there.

Bill Keeling: In developing models, one of the first things you set is your land use and based on that you set up the segmentation. It seems like we're going to set the segmentation towards the end of things. It sounds like the decision has been made that we're going to use the catchments somewhere, and the problem is that a lot of people have problems at the current scale and what we do with inputs. It isn't going to improve things but will just be a smear of our current assumptions used to create the land use.

Dave Montali: We probably need to set up another consult with the WTWG. Maybe start with the big one which is are we going to use NHD catchments for modeling. The idea is still for management everything can be rolled up. We can look at things both ways. Do we feed it with a

coarse land river segment into multiple grid cells or are there things we can do with CalCAST and get more confident in the flow, the atmospheric deposition, things like that. There's an idea that if you model at a fine scale and roll it up, you get a better answer in your roll up.

Bill Keeling: I don't see how you're rolling up or down with the current set of data. I have deep misgivings about taking these large scale inputs down to the catchments and thinking that's going to be meaningful. If it's not meaningful, how will it be better. I don't know about the roll up process, what is being presented at the MWG, just the current land river segments, or are they running things at the catchment in CalCAST and doing something to create outputs.

Dave Montali: We're not there yet but the idea is to run CalCAST and figure out the sensitive things for representing load. With regard to line work I trust when they said they would clean it up, but it hasn't happened yet.

Norm Goulet: Dave, I agree, we need to have some more conversation on this. This has been a pet peeve of mine for years now, the level of detail that we're constantly trying to achieve. We're getting way over our skis now. It's getting to a level that I don't even know if some of these catchments exist in the urbanized area which is highly piped. There's not a lot I can disagree with on what Bill has said. Taking county level data, slicing it down, then rolling it back up introduces more error. We keep talking about modeling, but this is also used in assessment. We need to have some further conversation on this.

Cassie Davis: I would be interested in revisiting how the Phase 6 segments were created. I feel like they were from a SPARROW model, but it would be interesting to see why we didn't use the HUCs to begin with. At the state level we use HUCs for almost all our monitoring and modeling. In the Bay we have the Phase 6 land river segments.

Dave Montali: I think we can present things at the HUC 12 level and that might be a valid thing. I'm fairly certain we could organize our information by HUC12, and the catchments would line up with the HUC 12's. Let's work to either schedule a fairly long, couple hour meeting with either this group or components of this group to report back to this group.

Bill Keeling: The question is why are we retaining the Phase 5/6 river segments when we could be using the NHD HUC 12 as our river segment. What I'm saying is why can't we do that for Phase 7 since it's a whole new model, isn't that the time to introduce new segmentation?

Dave Montali: I don't know that we actively considered that proposal across the watershed. Have you proposed it?

Bill Keeling: I proposed it to the modeling team on May 16th.

Dave Montali: I think the modeling team will honor what the WQGIT says as to the scale of management.

Ruth Cassilly: I do with either Gary or Olivia were here but one reason for the county boundaries were that catchments cross state lines and our land river segments do not. They stop at the county boundaries, so it allows for separation of loads and things.

Bill Keeling: The Land River segmentation is just the intersection of the land segment and the river segment. You can still do that with the HUC 12 you just end up with a different set of land river segments. The Land segment is set up to deal with orographic precipitation and things like that which is why some counties have multiple segments and others don't. I'm not proposing changing that, I'm assuming that we may retain that even though we changed the segments

between Phase 5 and 6. Maybe there's a proposal to change them again for Phase 7, I don't know.

Action: The WTWG will discuss the Phase 7 catchments again at a future meeting.

11:45   **QAPP Update** – Auston Smith, EPA & Ruth Cassilly, UMD (10 min)

Auston and Ruth provided an update on the recent QAPP Update Email that was sent to jurisdictions. The major ask was to update QAPPs to the new standardized format. The first draft of point/nonpoint QAPPs are due September 3rd.

Discussion:

Samuel Canfield: I just wanted to make a note that when looking at the crosswalk for the QAPP it took us a little bit to figure out where to start within it. The first few sections had a focus on change from the R5 to the new standard, and then to actually apply changes to our QAPP was multiple sections down. I figure most jurisdictions have already looked at it but just a note.

Ruth Cassilly: Thanks for bringing that up, Samuel. I was going to mention that after we sent the first email, we got a QAPP template which has been sent to everyone. I think it will make the process easier to use the template. If you just start with the beginning and make sure it matches with the old QAPP it makes the process easier. If you have questions about the template or anything don't hesitate to reach out.

Action: WTWG members with questions on the QAPP Update should email Auston Smith (smith.auston@epa.gov) and Ruth Cassilly (rcassilly@chesapeakebay.net).

<mark>Next Meeting:</mark> **Thursday, September 5th, 2024**, from 10:00 AM – 12:00 PM.

Participants

Alicia Ritzenthaler, DC DOEE	Eugenia Hart, Tetra Tech
Alisha Mulkey, MDA	Guido Yactayo, MDE
Arianna Johns, VA DEQ	Helen Golimowski, Devereux Consulting
Ashley Hullinger, PA DEP	Holly Walker, DE DNREC
Ashley Kelly, DoD	Jeff Sweeney, EPA
Auston Smith, EPA	Jessica Rigelman, J7 Consulting
Bill Keeling, VA DEQ	John Lancaster, PA DEP
Caitlin Tynes, LCCD	Joshua Glace, Larson Design Group
Carol Cain, MD DNR	Katie Brownson, USFS
Cassie Davis, NYS DEC	KC Filippino, HRPDC
Chris Brosch, DDA	Kendrick Flowers, NRCS
Christina Lyerly, MDE	Lori Brown, DE DNREC
Clint Gill, DDA	Mark Dubin, UMD
Dave Montali, Tetra Tech WV	Megan Thynge, EPA
Emily Dekar, USC	Natahnee Miller, PA DEP
Eric Hughes, EPA	Normand Goulet, NVRC

Patrick Thompson, Energyworks
Pearl Ashitey, Jacobs
Ruth Cassilly, UMD
Samuel Canfield, WV DEP
Scott Heidel, PA DEP
Shelly Frie, Jacobs

Sophia Grossweiler, MDE
Stuart Blankenship, VA DCR
Sushanth Gupta, CRC
Tom Howard, Resolve Hydro
Tyler Trostle, PA DEP

Acronym List

BMP: Best Management Practice
CAST: Chesapeake Assessment Scenario Tool
CBP: Chesapeake Bay Program
CRC: Chesapeake Research Consortium
DCR: [VA] Department of Conservation and
Recreation
DDA: Delaware Department of Agriculture
DEC: [NY State] Department of Environmental
    Conservation
DEP: [PA or WV] Department of Environmental
    Protection
DEQ: [VA] Department of Environmental Quality
DNR: [MD] Department of Natural Resources
DNREC: [DE] Department of Natural Resources and
    Environmental Control
DoD: [US] Department of Defense
DOEE: [DC] Department of Energy and Environment
EPA: [US] Environmental Protection Agency
HRPDC: Hampton Roads Planning District
    Commission
HUC: Hydrologic Unit Code
LCCD: Lancaster County Conservation District
LULC: Land Use Land Cover
LUWG: Land Use Workgroup
MDA: Maryland Department of Agriculture
MDE: Maryland Department of the Environment
MWG: Monitoring Workgroup
NEIEN: National Environmental Information
    Exchange Network
NHD: National Hydrography Datset
NRCS: [USDA] Natural Resources Conservation
    Service
NVRC: Northern Virginia Regional Commission
QAPP: Quality Assurance Project Plan
RIM: River Input Monitoring
TMDL: Total Maximum Daily Load
UMD: University of Maryland
USDA: United States Department of Agriculture

USFS: United States Forest Service
USC: Upper Susquehanna Coalition
WTWG: Watershed Technical Workgroup