Nontidal Network Workgroup Monthly meeting

Wednesday, February 15th, 2023
1:00PM – 2:30PM

Meeting Materials: Link
This meeting will be recorded for internal use to assure the accuracy of meeting notes.

NEXT STEPS:

- ✓ Tom Parham (MDNR) will check whether all of MDNR's historical water quality data is present in the Water Quality Portal and let Doug Moyer (USGS) know what the status of that data is.
- ✓ Leadership will follow up with workgroup members within the next 3 weeks to solicit feedback on criteria for site selection for small agricultural watershed monitoring.
- ✓ The Data Integrity Workgroup (DIWG) will host a lab specific discussion in the future to discuss issues such as decision rules on how to add constituents together, and which version of nitrate to use.
- ✓ In the future, Mike Mallonee (ICPRB) will report out to the NTN WG on the Water Year Summaries that he gives to the USGS.
- ✓ Peter Tango (USGS) will inform Lee McDonnell (EPA) that there may be a delay in WY2022 Load and Trend results due to first working on evolving the database.

MINUTES:

1:00 PM Welcome and announcements

- National Water Quality Monitoring Council's 13th National Monitoring Conference - April 24-28, 2023, Virginia Beach, VA.
- Species on the Move – May 15-19, 2023, Everglades National Park, FL.
- Interagency Conference on Research in the Watersheds (ICRW8) – June 5-8, 2023, Corvallis, Oregon.
- CERF 2023 Conference: Resilience & Recovery – November 12-16, 2023, Portland, Oregon. Abstracts due May 10, 2023.
- Citizen Science Association conference, C*Sci 2023 - May 22-26, 2023, Arizona State University campus in Tempe/Phoenix, Arizona.
- Scott Phillips (USGS) retiring at the end of March – retirement party is March 23rd from 4-7pm at the IAN office in Annapolis

- Ken Hyer (USGS) said that people should RSVP to Breck Sullivan (bsullivan@chesapeakebay.net) for Scott's retirement party.
- Peter Tango (USGS) announced that Carin Bisland would be retiring in a few months.
- Kaylyn Gootman (EPA) announced the Environment Virginia Symposium is at the end of March and she will be presenting at this conference.

1:10 PM **Updated NTN Loads and Trends – *Chris Mason (USGS)***

Chris Mason will review the revised WY2020 Nontidal Network loads and trends. He will give an overview of the data issues that were discovered, explain what changed in the analysis due to these issues, and where in the watershed the changes occurred. A summary of the updated results can be found here.

Chris explained that 5 years of data is a load, 10 years of data is a short-term trend, and trends using pre-1990 data are a long-term trend. He said that a red flag for the data issues was that there were instances where the constituents were larger than the total. He said the cause was a scripting error that was dividing the value by 100, which led to greater amounts of dissolved constituents than total constituents. USGS corrected this issue during the revision process, first pulling all of the data and doing another check. Doing this, they also found some bad ratios, which were mostly due to blanks or replicate samples being coded wrong.

1:30 PM **Discussion of data issues – *all***

Peter Tango (USGS) commented that this week the monitoring team leaders have a discussion with EPA region 3 administrator Adam Ortiz on monitoring results and will showcase the loads and trends. Adam is interested in seeing how the CBP is using this information. Peter said he liked the idea of publishing historical data as a fixed dataset and asked if there is a timeline on that. Chris did not provide a timeline.

Doug Moyer (USGS) said that the question that they're trying to address is how to handle the database pre-2010. USGS just went through this revision to the database based on these errors that were caught, and now they know there are steps they need to take to make sure the database is reproducible. Right now, it's not very reproducible. It's easier to reproduce results post 2010/2012 because there's been an organized effort of data transfer through data review through EPA through the Data Upload and Evaluation Tool (DUET) and a transfer of data to the USGS-PA office (James Colgin) to look at those data. Pre 2010, there is data provided by Mike Langlin. A lot of historical data was provided by database dumps from the states. Doug said in order to make sure that the final data is data that every agency would sign off on, efforts could begin with the water quality portal. He asked does each state believe that the pre-2010 data are present on the water quality portal, and is there any reason they might not be?

Lucretia Brown (DC DOEE) said they didn't come on board until 2013 so all their information should be there. Cindy Johnson (VA DEQ) said all of VA DEQ's data is on the Water Quality Portal. They pulled the historical data and re-loaded it into the Water Quality Portal, all the way

back to 1932. Tom Parham (MDNR) said he will check and get back to Doug. Jamie Shallenberger (SRBC) said he thinks their data are all available but would welcome a comparison to verify that. Bhanu Paudel (DE DNREC) said all of their data should be available in the portal. Doug emphasized that the goal is to have all the data both historic and current in one spot where it can be obtained easily rather than having to go to individual states. The next part would be seeing if these historical datasets can be run through the DUET process.

Mike Mallonee (ICPRB) said about a year ago he sent out the NTN data holdings of what is in Chesapeake Environmental Data Repository (CEDR) for historical data. Since then, he had a couple of conversations with agencies, but nothing was resolved on how they would get the historical data to him. It is possible to upload water years to DUET just as it is currently done. On the Bay Program side, he hasn't pushed anything as far as the Nontidal Network holdings in the CEDR to Water Quality eXchange (WQX). He said he assumed the states responded that they are directly submitting their data to WQX. He said that DUET has a tool in place where he can push any dataset imported through CEDR through the WQX. Mike said he doesn't do that, but some agencies have informed him they do that directly. Doug emphasized that the goal is to pull data from the source and make sure they are not generating slightly different databases for the data collected at each location.

Ken Hyer (USGS) suggested either setting up a small team to work through these issues, and/or bring it to the Data Integrity Workgroup. He said it would take some time and asked what the process will be and what kind of timeline it would be. Doug responded that this process is in the works and they're fighting the clock because the next process for generating NTN loads and trends through 2022 begins this summer. The data they have, anything that's been put in post 2012-2013, we have a lot of confidence in them. They can add on additional Quality Assurance (QA) processes. They want to instill greater confidence in the historical dataset and reproducibility of the dataset and streamline the process. Doug said they are looking for guidance and support through the Nontidal Network Workgroup, but a smaller group would probably be dealing with the construction of that new database. He added that they wanted to keep owners of that data in the process.

Doug said he doesn't think they can move forward with the new loads and trends without the database evolution. He proposed to get the database evolved to the point where they've verified the historic and current data before starting the loads and trends. He also proposed each year having a publication with the raw data used for the NTN so it's reproducible and transparent, and so any individual could do the Weighted Regressions on Time, Discharge and Season (WRTDS) analysis.

Tammy Zimmerman (USGS) said she agreed that it makes sense to verify the historical database prior to moving forward with next loads and trends. She also suggested that each of the jurisdictions and USGS has a Quality Assurance Project Plan (QAPP), and maybe one for the whole NTN. She said her assumption is when Doug and Mike get the data the appropriate QA steps have already happened prior to compiling and running loads. She added that it might

make sense to have a template for QA checks that each jurisdiction/agency goes through before the data gets to Mike for DUET to ensure consistent documentation and QA checks for each agency. Mark Nardi (USGS) said that on the USGS QAPP for the NTN, that's exactly what they do. They refer back to the contributing documents and expect all the data to be QA/QCd. Speaking with Durga Ghosh, he added that he thinks there will be some major changes in the QAPP coming shortly.

Peter asked if it was feasible to put together a data release annually, and whether it was feasible to get the entire historical dataset reviewed before summer. Doug said he thinks it is feasible. He said the database would be the already approved and reviewed data by NTN partners (data owners), and they would just be pulling it into one central location and checking the metadata. Doug said his USGS center has a streamlined process for getting data releases approved.

Jamie Shallenberger (SRBC) asked if Chris knew why there was an issue with some of these concentrations where the soluble form had a higher concentration than the total recoverable form. Chris said that error was due to a relic of a conversion of a Statistical Analysis System (SAS) script to the R programming language. It was known by SAS coders for years and that was eventually rectified. Chris said that he and his team confirmed each individual value before they flagged it, verifying the values in the discrete database. Jamie asked for clarification if that's different than a marginal uncertain result, and Chris said that was correct. Jamie then asked if the team had developed a rule for dealing with that which everyone could apply to all of their data. Chris said they didn't specifically have that in place, but will institute it in the future and he can easily do so on his end. Once he gets his input files (which, he added that those are published with the data release) he can do a final check on his end but he's uncertain where it happens before it gets to him. Jamie commented that SRBC has data going back to the 1980s and he could imagine those issues are replicated and magnified going further back in time. Chris said that speaks to more open communication with each water science center's lab. When his team was investigating, they were talking to Durga, and labs. This was happening at too many sites, so they did Nation Water Information System (NWIS) verification.

Doug said that he agrees and his USGS center looks at the distribution of those relations within the population. There is a range around where the dissolved constituents may exceed the whole, but if it's a consistent pattern over time, that's not an issue – they are looking for deviations from the population of data. Within DUET it's only within that sample, so it would be handled differently and would be a hard and fast threshold. Jamie said he agrees they need to reconcile this evenly. Doug said he appreciates that, and there's pressure on his team when they have data that's not their data and see an outlier. They have no field sheets or information to know whether to believe it, and need to rely on individual owners of the data to tell them.

Doug commented he thinks a lot of the initial QA of data and the construction of the database should be channeled through the NTN WG. Chris mentioned decision rules on how we're adding constituents together, or which version of nitrate are we using – those are lab specific

questions and that's where the DIWG would be helpful. Kaylyn agreed with Doug. Tammy also agreed, and added that there is some member overlap between DIWG and NTN.

Cindy said regarding historical data, the NTN didn't start until 2005. At 2000, they flipped databases. Going back, the lab only has 5 years of records. VA DEQ only has field sheets that start in 2005. They'd be happy to look at outliers, but as far as actually having the lab verify data it will be difficult prior to 2005.

Doug said that's fair. There are VA and most likely MD state operated stations back to the late 80s and 90s when they started being considered part of the NTN. There were about 82 stations part of the original network. For any site treated as a long-term site, the question is whether the data is reproducible, and if there anything odd in there that the data owner can comment on, and remove problem data so the problem data isn't pulled into any other analysis.

Mike asked if it would be possible to have a listing of these 80 records that were bad so he can see what's in CEDR and what needs to be corrected. As far as dissolved constituents being greater than whole, CEDR has two problem codes in place. One where the values are considered within the level of accuracy, and one where they're not. Those are provided by the data provider unless it's a calculation performed in CEDR. CEDR will apply the appropriate problem code and those are included in Mike's Water Year summaries to the USGS. He added a reminder that for WY22 data, data is due to DUET in one month from now.

Mark asked Doug, regarding the publication he was talking about, they would review the data and fix issues and USGS would publish that, and would that reach to CEDR as well? Doug said that yes, it should. There should be consistent data in all these different databases. What they publish is the final product of that process to rebuild the dataset. What they put in the data release should be reproducible from any of those sources. They're just an outlet, not the source. Mike said exactly, each data source should be a carbon copy of the other. Doug said he likes Mike's report out and thinks the findings should be a report out to the NTN WG as well. A summary would be helpful.

Ken stated that new set of WY2022 NTN results may be delayed because of these data QA steps that the group is talking about, and that's a consequence that everyone needs to be aware of. Peter said he will inform Lee McDonnell (EPA) of this potential delay.

2:00 PM Updated NTN Scope and Purpose review – *Peter Tango (USGS)*

Peter will review the updated NTN Scope and Purpose based on feedback from the group last month and provide comments on updates.

The final deadline for commenting on updates to scope and purpose is a week before the next meeting (March 8th, 2023).

2:15 PM Brief overview of next steps in implementing monitoring recommendations for the NTN – *Mark Nardi (USGS) and Peter Tango (USGS)*

Peter and Mark will give an overview of next steps specific for nontidal recommendations.

Mark reviewed Nieko Santoro's (USGS) analysis process. Last time, the group discussed the possibility of adding more criteria, and asked for more criteria from everyone.

Ken Hyer (USGS) said Nieko's analysis he came back with 49 agriculturally dominated sites with in-place monitoring. They also asked, are there any obvious sites missed? That allowed consideration of more practical considerations as well. However, nobody has suggested new sites to Nieko since the discussion. Nieko's analysis provided focus areas, but those sites are not the only sites that can be considered. Since then, Mark, Peter and Kaylyn discussed some additional criteria. These criteria include:

- Places where additional conservation practices are possible/planned.
- Prescence of strong local/state/federal partners to help us work with landowners.
- Prescence of willing/cooperative landowners
- Sites as Outdoor Classrooms – sites as outdoor classrooms, accessibility, owner agreement, safety.
- Proximity to Underserved Communities – distance to HBCUs, MSIs, and communities identified as underserved.
- Local jurisdictional considerations
- Site Access
- Scale – Watershed Size, this is a critical consideration.

Kaylyn Gootman (EPA) said regarding outdoor classrooms, maybe there are opportunities to work with universities and high school students and leverage existing resources. Mark said for conservation practices, they can pull data from Chesapeake Assessment Scenario Tool (CAST) and conservation agreement. He also invited further discussion on definitions of small watershed. Peter said places like Rock Creek in DC may be around 2 square miles but are tightly linked to what's going on in the landscape. He said a small watershed is not more than 20 square miles.

Kaylyn asked, for nutrient sampling, is it limiting if the criteria is that previous nutrient sampling is required? What about the areas that haven't been sampled? Mark responded that idea behind that is it would be more likely to get access to sites that are previously sampled and they have historical data for. Kaylyn said, what about expanding that to include nutrients or suspended sediment? Mark said that was possible, and these criteria aren't mutually exclusive but are more likely to co-occur. These are guidance rather than hard and fast rules. Local jurisdictional considerations could trump many other criteria, and site access as well could be a big factor.

Participants:

August Goldfischer (CRC), Bhanu Paudel (DE DNREC), Breck Sullivan (USGS), Chris Mason (USGS), Cindy Johnson (VADEQ), Doug Chambers (USGS), Doug Moyer (USGS), Ellyn Campbell (SRBC), Jamie Shallenberger (SRBC), Kaylyn Gootman (EPA), Ken Hyer (USGS), Kristen Heyer (MDNR), Lori Brown (DE DNREC), Lucretia Brown (DC DOEE), Mark Nardi (USGS), Meighan Wisswell (VA DEQ), Mike Mallonee (ICPRB), Nick Murray (WVDEP), Nicholas Santoro (USGS), Peter Tango (USGS), Qian Zhang (UMCES), Tammy Zimmerman (USGS), Tom Parham (MDNR), Tyler Shenk (SRBC)