Nontidal Network Workgroup Monthly meeting

Wednesday, January 19th, 2022
1:00 PM – 2:30 PM

Meeting Materials:
https://www.chesapeakebay.net/what/event/nontidal_network_workgroup_january_2022_meeting
This meeting was recorded for internal use to assure the accuracy of meeting notes.

Actions

- ✓ Doug Moyer (USGS) will reach out to Tammy Zimmerman (USGS) and to the PA Water Science Center to get their feedback on two items: the PSC monitoring review and the expansion of continuous monitoring River Input Monitoring (RIM) sites.
- ✓ Peter Tango (USGS) will expand recommendation for continuous monitoring RIM sites from 6 to 8 sites, and keep the inclusion of the SUNA nitrous oxides (Nox) sensors in the recommendations.
- ✓ Peter will talk to Chesapeake Monitoring Cooperative (CMC) partners and see if he can get a summary of their workshop so a future meeting can include a discussion in line with what's going on with the Environmental Protection Agency (EPA), National Resource Conservation Service (NRCS) and United States Geological Survey (USGS) on Best Management Practice (BMP) related interests and monitoring.
- ✓ Doug Moyer will bring the issues with states' historical data sets to the Data Integrity Workgroup (DIWG) and may seek input from the states and the labs that are analyzing those.

Minutes

1:00 PM **Welcome and announcements**

Peter Tango (USGS) announced that the World Seagrass Conference is coming to Annapolis in August. Abstracts for this conference are due February 15th. Peter announced that the annual request from the Scientific and Technical Advisory Committee (STAC) for workshops is open, and those are due February 16th to Annabelle Harvey (harveya@chesapeake.org). More information can be found at this link. He also urged the group to consider ideas for Goal Implementation Team (GIT) funded projects, as proposals will be solicited this spring, and he noted that 98% of proposed projects last year were funded. Peter also commented that Bob Hirsch and Chris Mason will be presenting at the February Nontidal Network Workgroup meeting. Bob Hirsch will present on Weighted Regressions on Time, Discharge and Season - Kalman (WRTDS-K) – WRTDS enhancements for improved load estimates, and Chris Mason will present on River Input Monitoring (RIM) load and trend results through 2021.

1:05 PM **Update on the Principal Staff Committee (PSC) monitoring report – Peter Tango (USGS) and Breck Sullivan (USGS)**
Nontidal Network specific items for sustaining the existing network

Peter Tango gave an overview of the PSC report outline (link to presentation). Section 1 of the report provides a summary of the monitoring recommendations with high level funding recommendations on the order of 6 million dollars to both sustain and advance networks. Section 2 provides network portfolios of existing Chesapeake Bay Program (CBP), monitoring networks to highlight status, vulnerabilities, monitoring gaps, enhancements, and available cost estimates to support resource need with more detailed funding recommendations. Section 3 has a more in-depth assessment and emphasizes monitoring needs for all outcomes. The appendix includes answers to the original 8 questions. The 3 themes addressed in the review are 1) unassessed water quality criteria and standards, 2) explaining change in response to management actions, and 3) accountability to the 2014 Watershed Agreement with its 31 outcomes. Peter showed a table illuminating the 3 themes and broke down what networks fill those themes, what those networks do, and what additional investment is needed along with present sustaining investment for those networks. Peter emphasized that this review is just the beginning of the process towards progressing networks.

Peter showed the funding recommendations for the nontidal network in particular. Recommendations include improving the RIM sites with nitrous oxides (NOx) sensors and having advanced monitoring at all RIM sites plus one or two. The table showed the breakdown of costs.

Doug Moyer (USGS) commented that the cost estimates are what it takes to purchase and operate continuous equipment in the Virginia Water Science Centers, and it would be good to get feedback from other USGS centers operating continuous monitoring sensors in the network to get a range and see how different they may or may not be outside Virginia.

Peter agreed this was a good idea. He commented the other item that came up happened with grants when they had re-organization and they hope to correct in Pennsylvania and garner support that gives the network continuation a stronger support there. The Pennsylvania Department of Environmental Protection (PA DEP) has helped overcome those challenges and will discuss with Lee McDonald adjustments that will help keep the integrity of the program in near term and hopefully long term. Peter also commented on partner site losses or movements which under Peter's tenure have been a risk annually, and either states, EPA or USGS have backfilled for those losses. Lee would like to have funding prepared for this issue given the frequency of how often it happens, so they'll be including dedicated funds for this just in case.

1:15 PM **Feedback from NTN workgroup members on PSC Review and expansion of continuous monitoring of RIM sites**

Discussion and feedback were solicited for both the PSC Review and proposals for expanding continuous monitoring of RIM sites.

Breck Sullivan (USGS) added that they are still in the process of building out the report so if anyone has more information to share, please do share that. Breck again emphasized that once they present to the PSC that's not the end of it, and they can continue the discussion in the future.

Peter added that every year around this time Lee (or in the past Rich) comes to the monitoring groups, and based on funding needs they have and projections for the next year asks what are the priority items. In other words, this is similar to what has happened historically, just with more intensity this year with the infrastructure funds and opportunities to build out continuous monitoring at RIM sites.

There were no further comments regarding the PSC Review.

Doug Moyer said he would reach out to Tammy Zimmerman (USGS) for comments since she was not able to be on the call today, and that the PA Water Science Center would like to have some input.

Peter said that NOAA has been looking at the sensors on the tidal side and recognizing there is some uncertainty in terms of what the infrastructure costs given the number of sensors on any given array, and the flexible understanding about what the likely operations and maintenance are. He said that the nontidal folks have a good feel and narrower window of understanding around operations and maintenance. Across different institutions, the recommendations would be if they're erring on the side of caution to build in 5% more. If 5% more will cover anyone's likely investment need, then they would like to reference that as an adjustment. It won't be less than that, for sure, and they want to capture the uncertainties as well.

Peter asked the group, for the RIM continuous monitoring (Con-Mon) sensor packages, are you in favor of NOx sensors going in? Or is this more experimental to build into a more robust sensor coming down the road soon and should be phased in later? Is now the time or do we pull back the proposal to the cost of not including these sensors (which are $25,000 per sensor plus $5000 for annual operations and maintenance per sensor)?

Doug Moyer responded that there is discussion to be had on the NOx equipment. There is discussion in USGS and there are workgroups and comparison groups looking at the sensors. They had great optimism for some of the cheaper sensors, such as the YSI sensor. The more they use them, the more those cheap sensors become problematic, however. They are getting ready to go back to the more expensive SUNA unit because that seems to be the best quality right now. Doug said the view is that you can pay now for the more expensive equipment, or you pay later trying to fix the cheaper equipment. The jury is still out a bit on what is the right equipment to go with.

Doug Chambers asked if the cost estimate that Peter gave was based on using the Nitro LED sensor or some of the lower priced Nox sensors? Doug Moyer responded that he can send out that cost sheet to the group to show what they based it on. He didn't recall if they put the SUNA unit or the cheaper unit. Peter said he doesn't know. Doug Chambers said the high end sensor would be the $25,000, so they must have used the better quality sensor for those calculations

Doug Chambers said the nitrate data is valuable. Talking about having it in addition to the 5 parameter sond - all that information together provides context, and it is worth it and a good investment to deploy the more reliable and expensive units.

Peter said part of this is to recognize the connectivity between the hypoxia monitoring network, the buildout of the 4-dimensional interpolator. The unassessed criteria challenge in the Bay has been to deal with instantaneous 1-day averages, 7-day averages and that gets to some higher resolution temporal frequencies that they haven't had the data for to work with that level of criteria assessment before. By having the Con-Mons, as the model is driven by factors, there may be some hybrid work, there are interpolator approaches that as they advance drive the structure of water quality at the end members. This is an opportunity for emphasizing that watershed to Bay connection, not just an independent thought. The nitrate influences Bay health and conditions, to the degree that it gets down to not just the flow but some of the individual parameters that they're able to have at high frequency that will tie in well with advances they're making in the modeling group with the phase 7 model, and the hypoxia network growing out and supporting the 4D interpolator for water quality criteria assessment. Peter added these are all good reasons to push the envelope with the best equipment they can to establish that time series across all of the RIM sites.

Doug Moyer commented that there are national teams within the USGS starting to focus on questions relevant to this expansion of the network – such how to merge historical discrete data with continuous data sets, especially if using the continuous data as surrogates for predicting other water quality variables. For total nitrogen (TN), total phosphorous (TP), and sediment, the question is how to bring those two worlds together without losing investments in discrete data, for both loads or trends. There are multiple groups working on those issues. How to bring tools like Weighted Regressions on Time, Discharge and Season (WRTDS), surrogate technology, or Generalized Additive Models (GAMs) to take advantage of what both datasets have to offer. Investments here will help with taking advantage of some of those determinations here very shortly.

Jamie Shallenberger commented that at the Susquehanna River Basin Commission (SRBC) they've tried the less expensive Nox sensors but they've been disappointed in them, and jettisoned them altogether. As an agency that runs 75 of the normal 5 parameter monitors in addition to the nontidal network monitoring that SRBC takes part in, the ability to integrate both streams of data is completely desirable and they look forward to how that comes together.

Peter said that if anyone disagrees, please speak up now, if not the plan will be to go forward with proposal that includes the SUNA sensors at this time for these sites. There was no opposition to this proposal.

Peter went on to say, there are 7 RIM con-mon sensor packages recommended here. VA has 3, normally they talk about 9 RIM sites, obviously 7 gives us 10 packages. Peter asked for clarity around interest in Richmond as a complementary site and if this would be considered a proper RIM site or a different RIM site or something that confirms something on the James? Then Marietta as aligning with the Conowingo results is something that's been deemed important and significant. Peter added that he could see it being 7 or 8 sensor packages if they consider Richmond and Marietta, and he asked what people are thinking about when they talk about not just the 6 RIM sites but one or two more in what they're asking for here. Peter asked for feedback from MD, VA and PA people. He said Tammy Zimmerman has insight on the Marietta.

Doug Moyer said he could speak for VA - they already have 3 instrumented. The Rappahannock, the Pamunkey, and then the James at Cartersville is located about 45 miles west of actual fall line so that would be the argument for instrumenting James River at Richmond. They are collecting the full suite of anolites at James River at Richmond, it just has a shorter record compared to what we have out at Cartersville. At some point either have comparable data between the two sites or transition RIM site from Cartersville to Richmond. Wondering what is being collected at the Potomac River James bridge. At one point the Occoquan Lab operated sensors at that location. Doug asked, does anyone from the MD office or state agency know if this is still occurring?

Kristen Heyer (MD DNR) said not sure what the Occoquan Lab was doing. Doug said at one point they did but not sure if they still did.

Peter said responded that he remembered looking at that data with Joel but that he didn't know any more about it since then.

Doug Moyer commented that the infrastructure would be there and the know-how of how to monitor that site. They did that for a while. Joel is the best person to say what is and isn't happening there outside of talking directly with Occoquan Lab.

Peter said for Richmond, it's questionable if it's a new site or it gets moved or added to, that still sounds within the realm of possibility. The PA question on the desire to have some alignment between the pools and thinking about the Marietta connection to the Conowingo.

Doug Moyer said the goal is to bring some consistency between monitoring at Conowingo and at Marietta because those two sites are probably the most important sites within the Bay watershed and that input and output from the reservoir system. From a continuous monitoring perspective that was the suggestion at the PA office – add continuous monitoring to that location. Tammy would be the right person to talk to and get her perspective.

Mark Brickner from PA said he agreed that Tammy would be the best one to field that question.

Peter replied at a minimum they can have the 6 additional RIM sites and two in play that would add a little bit, and asked is anyone opposed to putting 8 RIM sites in the package? There is justification for both of those two. Peter said that he was willing to advocate for adding these two additional sites to their request and didn't think it was an exceptional addition and is still in line with some of the expected proposed costs.

Dough Moyer said he supports the 8 and wanted to give credit to Cindy Johnson in DEQ for the support of the 3 existing VA RIM stations and instrumentation of those. That could be another argument of why the 8 stations are needed, and DEQ has made these contributions and freed up funding to put these other high priority sites on.

Peter said while he and Breck are doing the network portfolios, highlighting the partnerships they're leveraging already is one of the things the PSC wants to know ahead of time – are they starting from

scratch or is something there to the extent they can utilizing leveraging existing work both tidal and nontidal. 3 sites out there is something they definitely want to highlight.

Peter added there is high value in those two additional sites and it's not overextending what they've been talking about, highlighting the community talking about these as important sites with good justification. They'll double check with Tammy for final comments and any input on variability on potential costs and operations and maintenance that might change what's here for those two items with respect to sensor package recommendations. As a final note on the last item, the station loss backfill infrastructure costs to start up a site. It's different between whether they cover flow, water quality or both at a particular location. What they've seen when they do lose support - sometimes for a particular jurisdiction the cost of living increase causes them to need to reduce a station. They were talking earlier today with the monitoring team about continuing the optimization work that they started last year. Want to be able to include that so if they do come to these decisions at some point in time. If that comes about, there would be a plan b, not just cutting a station but having some fall back support. The $40,000 is what the Conococheague was. It does seem to cover water quality and/or flow. Peter asked the group if they think that's a significant underestimate of the typical change needed to support a station to let him know.

Peter wrapped up the discussion by thanking everyone for their insight and saying that he will work to update accordingly. He said that they are going forward with these recommendations, and looking forward to filling gaps and greater connectivity between watershed and Bay, and keeping the program sustained for the next 5 years.

2:00 PM **BMP monitoring discussion**
Highlighting the work of community science to inform the designs and considerations

This discussion was pushed to a future call.

Peter said National Fish and Wildlife Foundation (NFWF) and Stroud University and Chesapeake Monitoring Cooperative (CMC) are working together in a workshop to come up with volunteer related Best Management Practices (BMP) monitoring protocols. Some of it is tending toward what's qualitative that folks do in the field, and various discussions on what quantitative indicators may help inform relationships to tracking the impact of BMPS. Some of this connects to interest in folks having better data on BMP performance, and some of it connects to interest in climate influence on BMP efficiency. Peter will talk to CMC partners and see if we can get a workshop output that brings that discussion in line with what's going on with EPA, NRCS and USGS on BMP related interests and monitoring for a future meeting.

Peter requested that if you have any thoughts and questions, reach out to Peter (ptango@chesapeakebay.net), Breck (bsullivan@chesapeakebay.net) and Amy (agoldfischer@chesapeakebay.net).

Peter reminded the group that the PSC report will be presented to MB and WQGIT in February, and that will be a preview of the presentation to the PSC on March 2nd, which is the first PSC meeting of the with new leadership.

Peter asked for closing comments. He also highlighted that there is work underway on a nontidal TMDL indicator. When Qian Zhang (UMCES) has worked further with Gary and folks on the development and has more to present there, there will be an opportunity to see the output. It's been an item of interest to community for a long time. There's been significant progress to make it come to fruition. There's been work going on to update the database. Mike has been working on it with data from DC as well as the rest of our partners with new data and deliverables.

Mike Mallonee announced that Water Year 2021 is complete. March is quickly approaching so Mike reminded the group to start thinking of getting their 2021 data cells ready to go into Data Upload and Evaluation Tool (DUET).

Doug Moyer said along the lines of the database, the work that Mike Mallonee is doing and the work that the PA Water Science Center is doing as well, there is a good future topic. James Colgin has gone through the historical data, looking through the data that Mike Mallonee has provided (data from 2012-present), but also seeing that Mike Langlin had some historical data that was provided by the states that they might be seeing some issues in. A future topic might be identifying some of the questions and issues and working with each of the states to see how likely if it hasn't already happened, and Mike Mallonee says it may have already happened, to do a fresh pool for the period of record for many of these NTN stations to make sure they've got the same data that is in each of the states' databases. Doug said he will be bringing this up to the Data Integrity Workgroup (DIWG) because there are some things that are making it through the DUET analysis that are still showing up as problematic on their side, and they may need some input from the states and the labs that are analyzing those. So they'll start to aggregate some examples but there's a good discussion to be had and maybe future work.

Peter said to Doug to let us know when you see a convenient time when you have examples. Doug said he will probably have a call with James Colgin and Mike Mallonee to make sure they're on the same page and see what the best next steps are. After that call Doug will work with Peter to put this topic on the agenda.

Peter wrapped up the meeting by reminding everyone that next month's meeting will feature presentations from Bob Hirsch and Chris Mason, and any final updates and maybe final adjustments to numbers on the PSC work.

2:30 PM Adjourn

Attendance: Amy Goldfischer (CRC), Breck Sullivan (USGS), Cindy Johnson (VA DEQ), Jamie Shallenberger (SRBC), John Wirts (WV DEP), Kristen Heyer (MD DNR), Peter Tango (USGS), Gary Shenk (USGS), Lucretia Brown (DC GOV), Mark Brickner (PA GOV), Qian Zhang (UMCES), Doug Chambers (USGS), Mike Mallonee (ICPRB), Doug Moyer (USGS)