July 27, 2020

Dear Data Integrity Workgroup committee members:

The next meeting of the Data Integrity Workgroup (DI) of the Chesapeake Bay Program (CBP) Scientific and Technical Analysis and Reporting (STAR) will be Thursday, July 30, 2020. This meeting will be a virtual meeting in place of our usual face to face meeting due to the COVID 19 restrictions. Meeting logistics are below:

Join by Webinar
WebEx Meeting Link:
https://umces.webex.com/umces/j.php?MTID=mcf4d5e36d39fd550c38f5fa70971a880
Meeting Number: 120 300 1462
Password: Q27tJRf3Bjj

Or join by phone
Phone Number: +1-408-418-9388
Access Code: 120 300 1462

CBP calendar web page:
https://www.chesapeakebay.net/what/event/data_integrity_workgroup_july_2020_meeting

The meeting will be held from 10:00 AM to 1:00 PM. A draft agenda is attached. If you have any additions to the agenda, please bring them to the meeting.

Sincerely,

Bruce Michael
Cindy Johnson
DI Workgroup Co-Chairs

AGENDA
Data Integrity Work Group (DI)

Virtual Meeting

Thursday, July 30, 2020
10:00 - 1:00

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https://umces.webex.com/umces/j.php?MTID=mcf4d5e36d39fd550c38f5fa70971a880
Meeting Number: 120 300 1462
Password: Q27tJRf3Bjj

Action Items:

- ✓ Doug Moyer will provide a presentation at the next meeting on the USGS Story Map.

Announcements, Meetings, Conferences, Webinars:

- Executive Council Virtual Meeting, August 18, 2020
  - Governor Hogan Chair of EC but passing it on this year to VA Governor possibly.
- Fishable Swimmable Summit, September 23, 2020. Baltimore, Md.
- Chesapeake Watershed Forum, October 29 - October 30, 2020. Virtual.
- Cities Alive Conference, November 15-18, 2020. Virtual Conference.
- Behavior, Energy and Climate Change Conference, December 7 - 10, 2020, Washington, D.C.
- American Geophysical Union Fall Meeting, December 7-11, 2020.
- Sustainable Agriculture Conference, February 3-6, 2021. Lancaster, PA.
- A Community on Ecosystem Services (ACES), December 13-16, 2021. Bonita Springs, FL.

Doug Moyer shared a new and exciting product that the US Geological Survey (USGS) just released that communicates the load and trend results for the Chesapeake Bay nontidal network sites for the period through 2018. This new tool can be accessed by going to the following web location:
https://va.water.usgs.gov/storymap/NTN/

This tool (aka Story Map / Geonarrative) allows the user to choose how they want to explore the latest load and trend results. They provide multiple layers/windows of information related to our results. Each information layer has 2 communication windows. The left-side information window provides an overview of results and definitions; while the right-side information window provides an interactive application for the user to explore the results. The left-side information window also provides instructions for using the right-side interactive window. In a future meeting, Doug will give a demonstration of the tool.

The Current State of Monitoring and Laboratory Analysis During the COVID 19 Pandemic: Updates from all Jurisdictions All Tidal and Non Tidal

MD DNR:

The Maryland Department of Natural Resources shut down the Chesapeake Bay long-term water quality and habitat monitoring programs on March 13, 2020 due to the COVID-19 shut down and mandatory stay at home policy implemented by Maryland Governor Larry Hogan. During the shut down, staff that could telework, process and review existing data, conduct data analysis and update critical documents, did so. Field staff also conducted data verification and worked on Quality Assurance (QA) Plans.

By the middle of May, the Department developed rigorous Field Operation guidelines that included detailed descriptions on social distancing, wearing personal protection equipment (PPE) and following strict protocols on how to work in the field while ensuring staff safety to the greatest extent possible under the pandemic circumstances. These procedures were approved by the Maryland State House and staff were ultimately allowed back in the field in late May.

The May Chesapeake Bay Mainstem monitoring cruise was conducted the week of May 25. Staff also began the implementation of shallow water monitoring, tributary and nontidal network sampling. All QAPPs are up to date and data already collected has been reviewed and quality assured, with data analysis continuing. Maryland's Chesapeake Biological Laboratory, the analytical lab that processes and analyzes our tidal chemical parameters (nitrogen, phosphorus, sediment and chlorophyll), was able to reopen and begin processing samples in June, ensuring that all water quality samples that are collected are able to be processed within the proper holding time. All Bay-related tidal and non-tidal monitoring is being fully implemented in Maryland. There was an approximate two and a half month gap in our monitoring programs, the longest gap since most of the Bay monitoring program began in 1985. Although the monitoring gap is significant, our statisticians and academic partners are looking at the impact on assessing long-term water quality trends and characterizations, if any.

It was critical to implement the May Chesapeake Bay Mainstem monitoring cruises in May in order to track the 2020 summer hypoxia conditions. The Hypoxia Forecast was released on June 17 and called for a smaller than normal "dead zone" due to slightly less nitrogen entering the Bay from January - May from the nine major River Input Monitoring stations and the point source loads from below the fall line. The dissolved oxygen monitoring results from the May cruise confirmed less than average hypoxia compared to previous May cruises. The cruise-by-cruise Maryland hypoxia results during May - September will be available on the Department's Eyes on the Bay website.

Kristen – head of the field office for DNR – commented that the cruises for the mainstem are operating with reduced crew and they trying to keep the same teammates to promote social distancing.

Mark Nardi asked if they were able to quantify what COVID cost the monitoring program and understand the loss for analysis. Bruce said that individually they have shared this information to the CBP. Mark reached out to the Non-Tidal Network members earlier to gather information on monitoring closings/reopening and was wondering if he should do this again in terms of what was loss for science. Bruce said this information may not be available yet since some networks are not fully operating, and water samples are still being analyzed. Only a few collections were missed for the mainstem cruises, and historically they have missed some sampling due to bad weather so he is hoping it will not impact the long-term trends and analysis too much.

VADEQ and ODU:

The Virginia Department of Environmental Quality (VA DEQ)suspended monitoring for all its programs on March 17 in response to the mandatory social distancing policy implemented by Virginia Governor Ralph Northam. During the shutdown, staff focused on mandatory Standard Operating Procedure (SOP) training, Quality Assurance Project Plans (QAPPs) and SOP review and participation on committees to develop field procedures on how to best implement sampling under COVID-19 conditions. Field staff also conducted data verification and review of Quality Assurance and Quality Control sample results. All QAPPs have been submitted to the Bay Program and approved or are under review. After consulting with DEQ regarding the university's policies implemented in response to COVID-19 and at the direction of the governor, Old Dominion University (OUD) also suspended field sampling in May. Virginia's shallow water monitoring conducted by the Virginia Institute of Marine Science and River Input Monitoring conducted by the US Geological Survey continued uninterrupted. VIMS also picked up additional sites in the York River to allow for continuous monitoring in the tributary.

On May 4, DEQ resumed single party field operations after developing rigorous field operation guidelines that included detailed descriptions on social distancing, wearing personal protection equipment (PPE) and following strict protocols on how to work in the field to maximize staff safety. These procedures were developed in conjunction with regional directors. Once the single party runs were implemented, DEQ turned its focus on boat sampling protocols. After rigorous review, the field staff were allowed to reinstate boat sampling the second week of June. Regions initiated sampling for Bay tributary runs after testing equipment and boats for any mechanical issues due to the two to three month hiatus. Stage Three of getting DEQ's Bay Program back on track was the development of close quarter sampling protocols developed in coordination with regional directors and currently under review by our leadership team. These protocols were approved Tuesday. Prior to this approval, they did their sampling in phases with some non-tidal sampling under the phased protocols, but they did not follow CBP sampling protocols because they used two people for DH95.

ODU also developed its sampling protocols and purchased PPE during April and resumed monitoring on the mainstem in May.

There was an approximate two and a half to three month gap in the mainstem and tributary monitoring programs, which should not affect the ability to determine long-term trends due to the long period of record (25 plus years) for these programs. No gaps were introduced to the shallow water monitoring program data or for data collected at most sites under the nontidal program.

Dough confirmed there was no lapse in sampling in VA for USGS.
Maryland/Delaware/DC Water center was able to do the same for keeping up with sampling.

Lab update:
MD – Originally, they cut back on staff due to social distancing, but they quickly needed to bring everyone back to the lab because staff needs to help with COVID testing. They are getting their regular load of work for water samples so they are trying to keep up with everything which sometimes leads to employees working overtime. The volume of COVID testing is massive so they need their full staff, plus they have incorporated Pfas testing for water samples. They also have a new division chief chair – Dr. Urban.

CBL – This lab started first week of June with only one person in the building. All instruments are working again and now there are six analysists at a time in the building. They are not full staff, but they are close. They are working through samples well with the new normalcy and shorter staff.

DCLS – Jay said the lab has been operational the entire time because it is considered essential. Everything USGS and DEQ and Department Health collected, they have been able turn around the results.

PA DEP – The lab was closed from the middle of March to the end of April. They were part time for limited testing until the end of June. Come the second week of July, all employees were considered essential so everyone could come in but at staggered times along with social distancing protocols. The lab struggled with getting enough hand sanitizer and PPE. With sample load being low, it has allowed them to re-evaluate their techniques. They are able to sample any non-tidal samples they receive.

West Virginia – Samples go through USGS National Quality lab so there were no distributions to sampling.

Delaware – The state was able to sample normally throughout COVID.

New York – The five stations in NY were in tack and sampled throughout the COVID shutdown.

At this moment, they are collecting almost everything the monitoring networks were before the shutdown and the labs can analyze those samples.

Status of USGS Stream Gages **USGS**

Bruce commented for MD the status of stream gages is in jeopardy due to funding sources. The Highway Administration was funding around 16 stream gages, and as a cost saving exercise, they decided to stop funding the stream gages which some are associated with the long-term monitoring network. They brought up this issue at the Bay Cabinet to try and maintain state funding for these gages and emphasized how the information from these stream gages help the jurisdictions meet the TMDL by tracking nutrient reduction. Sometimes the first place to see response is in these non-tidal stream gages. They are working with Highway Administration to try and get funding, and they don't need as much money as originally thought. USGS has maintained them while funding was lost, but they took them offline so no one can get storm event samples or see what is happening at the stream gage. MD DNR is keeping up with getting monthly samples, but it is hard for them to get storm samples when the storms are intermittent and not planned. Bruce will follow up with Peter on the status of this issue.

Doug Moyer is not aware of any stream gages in jeopardy in VA and or WV. There is stable funding for USGS stream gages.

What to Plan for Over the New One and Two Year Budget Cycle

For state budgets, there is a 10% - 20% reduction of state revenue so employees are concerned about furlough and reduced matched funding for monitoring. There has been a little bit of cost savings from last years grants, but some costs have increased due to COVID to make sure people have PPE, separate vehicles, and cruises take longer with three people doing a five person job. There is no expected reduction in grants but also no expected increases in grants.

MD had done some budget reduction exercises. In the scenarios for 10 % reduction, MD was able to have no cuts to monitoring programs.

VA has not heard about the final budget yet. They do not expect to hear back until the general assembly has looked at everything which will be around September. All state funding is matched for the federal grant so at least the CBP will not experience a cut. They were told to cut back on anything they could, and their discretionary funding has been halted since April.

Peter commented on the CBP budget. Nothing has changed for EPA level funding moving forward.

PA legislature only approved the state budget through November so they do not know what will happen budget wise come November.

Progress on the Training Modules for Field Audits **Ghosh**

Audits are not in operation. Durga is in conversation with Mark Nardi on how to carry on with the audits during this time. The videos were originally supposed to support the Audit process, but now in lieu of audits, the videos will help provide review of sampling procedures. Durga does not have an updated video because they needed to find funding for it. Mark was able to find money, but it is for the current FY which ends tomorrow. Mark is 99% sure that the money will be obligated for this FY and work will get done next FY.

Lab Participation Update and Performance Testing Samples **Ghosh**

Over the past few years, labs have approached the CBP to join the program and have their samples analyzed. The Data Integrity Workgroup has helped develop measures for quality assurance of participating labs. Durga provided a summary of what is in the manual for data submission and the quality assurance.

Field measurements require:

- Well-developed sampling schedules
- Adherence to CBP sampling procedures
- Annual servicing of the routine calibration using standard reference solutions
- Precision information from replicates
- Bias information from blanks

Laboratory Analysis:

- Accuracy from spiked samples
- Precision from replicates
- Bias from blanks
- Detection/reporting limits

All labs must participate in:

- Coordinated split sample program
- Blind audit program
- USGS standard reference sample study

Durga provided an example of the Blind Audit testing results. She had conversations with a participating lab because she was not sure if they were participating in all three programs stated above. She pulled their data and compared it with data from other labs. There were several samples that did not meet standards. This exercise was not too call out a lab but to make sure the data is comparable to other labs and that partners are comfortable using the data. This highlights how participating labs and newly joined labs should participate in all three programs. They recognize there are rising costs for laboratory analysis of samples and funding uncertainties so to encourage inclusion of new laboratories into the fold, the workgroup may want to consider only requiring two out of the three programs.

Durga then presented on Replicate and Bias data. She presented this information at a previous meeting, but there were some discrepancies so she has now updated it with more recent data. She understands that everyone is starting to begin sampling again and not at full capacity due to COVID so this information will serve only as a guideline.

The tidal replicates data collected is being met by all the agencies. The yellow dots on the graphs show the CBP required number to collect. For nontidal replicates collected, there is excellent representation by most agencies. There are a couple missing from MD RIM and USGS sites, but Durga believes there are some issues with uploading the data. There is a lower number for SRBC so Durga will contact them to make sure they are getting all the data that is collected.

Tidal Blanks collected show good results for all agencies. DNR data is collected, but it is not uploaded. It should be completed soon. Nontidal Blanks also show excellent results for most agencies. The same issue is occurring for SRBC for nontidal blanks as the nontidal replicates.

Coordinated Split Sample Program

- November 2019 and February 2020 Mainstem Results **Mallonee**
- June and December 2019 Tributary Results **Mallonee**

No issues were discussed during the meeting.

Blind Audit Program Update **Frank**

They plan to complete the FY20 Blind Audit. "Make-up" samples will be sent to participants in the next week or following week. Results are expected by early October, and a final report will be generated by December 15th. The first round of the FY21 Blind Audit will commence in November, as usual.

USGS Reference Sample Update **Sullivan**

No issues were discussed during the meeting. All the labs were not able to participate due to COVID.

2020 Summer Hypoxia – Forecast and Monitoring Results **Michael**

Bruce stated members of the CBP, UMCES, and University of Michigan worked hard his past year on the hypoxia model to make improvements. This group got together to evaluate the forecast because it is a key indicator of Bay health and is directly related to management actions to reduce excess nutrients. Before, the model forecast was only based on the Susquehanna nutrient loads. The lead in this endeavor, Isabella Bertani, tested multiple different scenarios and timeframes to include the nine River Input Monitoring stations across MD and VA. She also included the point source loads below the fall line. All these additions improved the results of the model. The 2020 hypoxia forecast showed slightly less hypoxia than the long-term average (1985 – 2019), and four

out of the five months (January – May) had lass than average nitrogen loads for the nine major River Input Monitoring sites.

The first June 2020 cruise had significantly less hypoxia than other previous June cruises, and the second June cruise also had lower levels of hypoxia. The first July 2020 cruise is slightly below the long-term average. The hypoxia for 2020 seems to follow the forecast. When comparing the MD and VA data, they used the exact same stations as the interpreted model and got really close results. MD has had conversations with VA to combine their hypoxia forecasts to make it bay-wide instead of just MD hypoxia results.

Peter asked Bruce what they consider as summer for the hypoxia forecast and results because warmer weather is starting earlier and ending later. Bruce said he did not show it, but they did collect data for late May. It showed lower hypoxia then previous Mays, but they are seeing the hypoxia starting in May more consistently, so the definition of summer is something to consider.

Topics for Next DI Meeting **All**

The next meeting will probably be held virtually in the November timeframe. Bruce would like to invite Chris Hire to present on programing data management and software. He has worked with Mike Mallonee before on this topic.

The affects of COVID will be a standing topic for the meeting. Bruce will also provide an update on funding and support for the stream gages.

Peter suggested Doug Moyer present on their recent publication of interpreting continuous monitoring data while applying Generative Additive Models (GAMs). Peter will also give an update on the feedback given by the Management Board from the Strategy Review System for the Water Quality Standards Attainment and Monitoring Outcome Quarterly Progress Meeting on August 14, 2020.

Bruce will give an update from the EC meeting in August.

Durga will have a QA update. Durga also suggested Caroline and Liz give a presentation on citizen monitoring because they have been working hard to incorporate citizen science into CBP work.

Participants: Breck Sullivan, Bruce Michael, Suzanne Doughten, Kim Blodnikar, Jamie Shallenberger, Bruce Michael, Sin Urban, Tyler, Mark Nardi, Kim Blodnikar, Kristen Heyer, Dough Moyer, Caroline Donovan, Cindy Johnson, Mike Mallonee, Dough Chambers, Heather Wright, Kelly Krock, Peter Tango, Carl Friedrichs, Betty Neik, Becky Monahan, Cynthia Stevenson, Shala, Lara Phillips