Criteria Assessment Protocol Workgroup (CAP) Meeting

Wednesday, April 12, 2023
10:30 AM – 12:00 PM

Meeting Materials

This meeting was recorded for internal use to assure the accuracy of meeting notes.

Action Items:

- Invite Carl Friedrichs (VIMS) to future CAP meeting to discuss his work exploring the integration of dataflow, hyperspectral drone imagery, and satellite technology.
- Matt Stover (MDE), Gary Shenk (USGS), Tish Robertson (VA DEQ), Tom Parham (MD DNR) and Peter Tango (USGS) meet regarding Gary's question on potential criteria assessment paths.
- Plan for a STAC workshop on temperature-adjusted DO criteria in 2024

Minutes:

Participants

Amanda Shaver (VA DEQ), August Goldfischer (CRC), Becky Monahan (MDE), Breck Sullivan (USGS), Cathy Wazniak (MD DNR), Cindy Johnson (VA DEQ), Claire Buchanan (ICPRB), Clifton Bell (Brown & Caldwell), Fred Irani, Gary Shenk (USGS), Joe Wood (CBF), Juan Vicenty-Gonzalez (EPA), Leah Ettema (EPA), Lew Linker (EPA), Mark Trice (MD DNR), Matt Stover (MDE), Melinda Cutler (MDE), Najma Khokhar (MDE), Peter Tango (USGS), Rebecca Murphy (UMCES), Tish Robertson (VA DEQ), Tom Parham (MD DNR), Tony Timpano (VA DEQ), Lucretia Brown (DC DOEE), Richard Tian (UMCES)

10:30 AM **Welcome, Introductions & Announcements – Peter Tango** (USGS), Chair

Upcoming Conferences, Meetings, Workshops and Webinars

- 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.
- Citizen Science Association conference, C*Sci 2023 - May 22-26, 2023, Arizona State University campus in Tempe/Phoenix, Arizona.
- CERF 2023 Conference: Resilience & Recovery – November 12-16, 2023, Portland, Oregon. Abstracts due May 10, 2023.

- Brief overview of issues for the workgroup's attention and ongoing projects.

10:45 AM **Updates – Peter Tango** (USGS)

11:15 AM **Next Steps/Brainstorming – Discussion, all**

- Tish Robertson (VA DEQ) commented in the chat: I think it is more precise to say we don't have any segments that have full CBP monitoring data. In PMKTF and PMKOH, we have some really great Continuous Monitoring (ConMon) datasets that I think we should be using to assess all DO criteria. We just need to get the Partnership to support this.
- Peter Tango (USGS): Thanks Tish - I think you nailed a question we are looking at with the Hypoxia Collaborative on design support and which segments need what for monitoring.
- Gary Shenk (USGS): All the development of the 4-Dimensional Interpolator will be complete as of 2025. Then in 2026 the tool will undergo review, and we will be able to use it in 2027 (it will be fully operational).
- Rebecca Murphy (UMCES): Elgin Perry is doing work capturing continuous data and thinking about how we'll incorporate it into this approach.
- Tom Parham (MD DNR): MD DNR is working with MDE on assessing Fishing Bay. We're trying to see they'll do the next round of shallow water monitoring. Want to make sure we have the data in line for you to do your testing/development wherever you stand. For the testing are you pulling existing data?
- Rebecca: Yes, we are pulling existing data. That line is timed to an EPA project through the EPA's Office of Research and Development's Regional-ORD Applied Research Program (ROAR) program and we'll get a fellow to focus on shallow water. Talking with you all about the Fishing Bay progress and data will be a first step.
- Tom: Are you also looking at vertical DO arrays for shallow water?
- Rebecca: We're thinking about short term variability in both deeper and shallower waters. Digging into the DO in some of the shallower tributaries is unique and different from how we do it in the deeper waters. We definitely want to incorporate new data streams from these vertical profilers. Elgin is looking at Gooses Reef data which has been helpful.
- Peter: When we get into the sampling design question and habitat representation, we get into the issue of offshore nearshore and we want to have some discussions. We need to bridge both worlds (hypoxia and 4-Dimensional interpolator).
- Claire Buchanan: Why are you putting a vertical profiler in the tidal fresh Potomac? Everything there is pretty well mixed.
- Peter: It is a RIM con-mon, NOT a vertical profiler.
- Gary: There was only one proposal for STAC workshops this year so there is extra money they're figuring out what to do with. Not sure if they've figured it out but there's a possibility that a STAC workshop could be done this year.
- Peter: Would the group be interested in a STAC workshop this year?
- Gary: For the funding it would have to be completed by May of 2024.
- Tish Robertson (VA DEQ): What do you mean by temperature adjusted criteria? I'm thinking of criteria expressed as percent saturation.

- Peter: You're correct. Our baseline is shifting, the Bay is warming, creating challenges to progress. Given the criteria we've used on concentration alone, the only temperature adjustment we currently have in our criteria is relative to sturgeon. Do we go to saturation instead of concentration, which assesses the issue of incorporating temperature influences relative to respiration needs of the fish. That goes back to early conversations about how to express the DO criteria. We could delve back into that world and see if it makes good sense for community to go down that path and update the criteria.
- Matt Stover (MDE): Tish and I take con-mon datasets we already have and use the interpolator in the existing framework. Something important to states right now is to fill in gaps with different DO criteria that we already have. That's my personal view. No doubt temperature adjusted DO criteria is something we should look at and go down that road, but I wonder if it's the top priority for right now given we're already struggling to monitor and assess other DO criteria we have in the books. We're trying to grapple with that in Maryland, and that's why we're putting so many resources in Fishing Bay. I'm wondering if something can be done with existing monitoring infrastructure to leverage it more given all the work DNR is doing with Eyes on the Bay, con-mon, calibration stations, etc. We may have some ideas. Tish has shared some. We could develop new criteria but if can't assess them, that's tough.
- Tish: I agree with Matt.
- Peter: Getting the protocol presents a gap regardless of what the criteria are.
- Matt: The 4-D interpolator is a huge improvement, but it won't be operational until 2027. We want to be able to show stakeholders that by 2025 we can at least assess a few segments for the full DO suite. Maybe there's a way we can do it using the current interpolator that still gives us an assessment for 303d list.
- Peter: I am behind what you're asking for and recognize the challenge of starting to do new assessments that have not yet been on our plate. Let's use the next year to look at the criteria assessment approaches for these other criteria given some of the con-mon data sets and applications. In the meantime, we can plan for working on the temperature adjusted criteria next year.
    - Decision: Wait for next year for the STAC workshop.
- **HABs workshop comments:**
- Cathy Wazniak (MD DNR): There's ways of pulling out dinoflagellate and cyano groups. For criteria development the only thing missing is third part of your 3-D (depth). We have temporal in cholophyll and we can look back in time. I've been tracking a bloom in the northern Bay that's been over 50 mg/liter around Gunpowder Bush in the mainstem for over a month.
- Tish: Carl Friedrich's work has been exploring the integration of dataflow, hyperspectral drone imagery, and satellite technology. Carl came to DEQ and gave us a great presentation on the work his lab is doing with drones, using drones to ground truth

satellite imagery. It is a way to fill in the shortcomings of the satellite imagery and still get a broad spatial scale. We use the data flow data now for water clarity and it's only limited in a particular tributary. I could see having a data set that's Bay wide that we'd be able to use if we had a chlorophyll threshold Bay wide we could apply that, or we could also do water clarity assessments throughout a big swatch of the Bay.
    - Action: Invite Carl Friedrichs (VIMS) to speak about this at a future CAP meeting.
- Lew Linker (EPA): Did the workshop cover what is the response of HABs to climate change, particularly temperature increases? The CBP is wrestling with the question of what happens to an algal growth curve as temperature continues to increase beyond 32C. Does it continue to increase, become asymptotic, or decline? We are exploring the shallow water monitoring data in terms of continuous temperature and chlorophyll monitoring.
- Peter: It did not. It focused more on immediate needs with aquaculture, recreational fisheries and others.
- Lew: There's a tension between HABs response as we reduce nutrients and what happens as we increase temperatures. We'll need to draw some conclusions; firstly, what's the response of the Bay in 2035, then 2045 and 2055.
- Cathy: I think the temp response of HABs is species specific. and there will likely be species changes as the bays warm (those that like it hotter will outcompete other species, e.g. cyanobacteria increase)
- Claire Buchanan: Agree with Cathy and add that changes in water clarity will also affect species composition.

DO Criteria Assessment:

- Gary Shenk (USGS): Re DO criteria – when Matt made his comment, that resonated with Tish and Tom. I am not clear what that comment was suggesting. From my standpoint, I think of the 4-D interpolator that will incorporate con-mon and profiler data and allow us to make criteria assessments. It seems there is an opinion that we have other methods to do that based on the con-mon data we have. If we do have methods to make that assessment, there are 3 paths we could take. 1) Not change our assessment methods, develop the 4-D interpolator, then make assessments for everywhere; 2) If we have the ability to make assessments without the 4-D interpolator, don't make the interpolator and take other methods; 3) Use other methods to make assessment by 2025, AND when 4-D interpolator is developed use that for assessment. My concern with the third is that we could make an assessment, then 2 years later come back with the 4-D interpolator, make an assessment again and find different results. Can you please clarify this issue?
- Peter: I recommend that we come back to this issue in-depth consulting with Tish and Tom.

- Gary: To clarify I am not against any of these paths, I just would like to be clear on which one we are following.
    - Action: Matt Stover (MDE), Gary Shenk (USGS), Tish Robertson (VA DEQ) and Peter Tango (USGS) meet regarding Gary's question.