Summary and Minutes from Kick Off Webinar:
Enhancing CBP Monitoring to Improve Data Driven Decision Making

Wednesday, January 11, 2022
9:00 AM – 4:00 PM
Meeting Materials: Link

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

Overview

The Kick-off Webinar for enhancing Chesapeake Bay Program (CBP) monitoring was organized by the STAR monitoring leadership team and attended by monitoring managers from federal and state agencies, along with NGOs (see Appendix A, participants list). The meeting focused on:

- Understanding the basis of the monitoring recommendations for each of the CBP core networks.
- Reviewing how the core CBP monitoring networks are currently funded and specific agencies' role, and identifying information needed to complete the funding accounting that sustains each network.
- Indicating which monitoring recommendations agencies have the highest potential interest in supporting.
    - Short-term support (1-3 years) is needed to implement and ramp up the monitoring recommendations
    - Longer-term support is needed to sustain the networks' enhancements.
- Determining next steps to develop/finalize funding strategies for the CBP core monitoring networks.
- Getting feedback on priorities to establish monitoring for Watershed Agreement goals and outcomes that currently lack coordinated efforts.

The core CBP networks discussed during the meeting included (1) nontidal, (2) tidal water quality, and (3) SAV, with ideas also presented and discussed for toxic contaminants. The additional core CBP networks (tidal benthic macroinvertebrates, community science, and land use and land change) will be addressed in future discussions.

The following actions were identified by meeting participants with progress to be made in the coming months (the minutes are in Appendix B). Two more full meetings of the monitoring managers are being considered for 2023.

Short Term Actions for core CBP networks

Nontidal Network:

- Mark Nardi (USGS) and Kaylyn Gootman (EPA) will reach out to points of contact provided by jurisdictions and agencies for more detailed information on how various aspects of the Nontidal Network are funded.

- Discussion on sustaining recommendations and prioritization of location for additional stations will continue in the Nontidal Network Workgroup meetings.
- The CBP outcomes for stream health and climate resiliency had the highest interest for additional watershed monitoring.

Tidal Water-Quality Network:

- The Hypoxia Collaborative Team will consider an optimization plan for vertical array site locations.
- Continued representation of VA and MD representatives in Hypoxia Collaborative Team.
- The Bay Oxygen Research Group (BORG) will investigate linkage of living resources to the 4-Dimensional interpolator while continuing to develop and test the model.
- Discussion will continue in Hypoxia Collaborative Team, BORG, and the Criteria Assessment Protocol (CAP) Workgroups.
- The BORG will investigate incorporation of temperature assessment into the 4D interpolator.

The CBP Outcomes with the most interest with the tidal network monitoring included fish habitat, wetlands, and climate resiliency, and included these actions:

- The organizers of this kick-off meeting will share interested parties with outcome leads and begin discussion on how to build out monitoring need details.
- Toxic Contaminants Workgroup and Fisheries Goal Implementation Team will work together on outreach opportunities with recreational, subsistence and commercial fishing stakeholders.

SAV Network

- The Submerged Aquatic Vegetation (SAV) Workgroup will connect with Fish Habitat, Toxic Contaminants Workgroup, and the National Park Service for partnerships on SAV sentinel sites.

Proposed Toxic Contaminant Monitoring

- The Toxic Contaminants Workgroup (TCW) will connect with interested partners to discuss recommendations on PCBs and funding opportunities. The TCW will use the upcoming STAC PFAS workshop report to consider approaches for better coordination across watershed for PFAS. Both the PCB and PFAS discussions will require funding for monitoring designs and implementation.

Long Term

- Convene as a large group 2 more times in 2023, perhaps in person/hybrid.
- Consider threshold monitoring in Tidal Water Quality.
- Share data, methods, and protocols from SAV satellite use with other topics/workgroups.
- Equip interested partners with additional information they need to show the value and critical need for sustaining the monitoring networks.
- Partners share this information with their leadership and Principals' Staff Committee (PSC) members.
- Begin discussion on developing funding strategies for long-term support.

Appendix A: PARTICIPANT LIST

Amber Metallo (US Army Corps of Engineers), Amy Goldfischer (CRC), Amy Williams (PA DEP), Apurva Patil (DC DOEE), Becky Golden (MD DNR), Bhanu Paudel (DE DNREC), Breck Sullivan (USGS), Brooke Landry (MD DNR), Bruce Vogt (NOAA), Bryant Thomas (VA DEQ), Carl Friedrichs (VIMS), Catherine Wazniak (MD DNR), Cindy Johnson (VA DEQ), Doug Austin (EPA), Denice Wardrop (CRC), Doug Moyer (USGS), Emily Majcher (USGS), Erik Arnold (PA DEP), George Onyullo (DC DOEE), Greg Allen (EPA), Holly Plaisted (NPS), Jeremy Hanson (CRC), John Hoertz (US DoD), Jonathan Champion (DC DOEE), Josh Lookenbill (PA DEP), Katie Brownson (USFS), Kaylyn Gootman (EPA), Kevin Schabow (NOAA), Lee McDonnell (EPA), Leonard Schugam (MD DNR), Mark Hoffman (Chesapeake Bay Commission), Mark Nardi (USGS), Mark Trice (MD DNR), Matthew Kierce (IWLA), Michael Bott (DE DNREC), Mike Naylor (MD DNR), Nick Murray (WV DEP), Nicoline Shulterbrandt (DC DOEE), Peter Tango (USGS), Renee Karrh (MD DNR), Roberto Llanso, Stephen Williams (DE DNREC), Sandy Mueller (VA DEQ), Scott Phillips (USGS), Sean Corson (NOAA), Tammy Zimmerman (USGS), Tom Parham (MD DNR), Zachary Smith (NY DEC)

Appendix B: MEETING MINUTES

9:00 AM **Welcome, Introductions, and Objectives of today's meeting** – ***Scott Phillips (USGS)***

Review Objectives of today's meeting:

- Understand the basis of the monitoring recommendations for each of the CBP core networks.
- Review how the core CBP monitoring networks are currently funded and your specific agency's role, and identify information needed to complete the funding accounting that sustains each network.
- Indicate which monitoring recommendations your agency has the highest potential interest in supporting.
    - Short-term support (1-3 years) is needed to implement and ramp up the monitoring recommendations
    - Longer-term support is needed to sustain the networks' enhancements.
- Determine next steps to develop/finalize funding strategies for the CBP core monitoring networks.
- Get feedback on priorities to establish monitoring for Watershed Agreement goals and outcomes that currently lack coordinated efforts.

Quick review of findings and results from December Webinar.

Questions?

9:30 AM **Overview of current monitoring network funding and partnership approach on proposed investments** ***– Lee McDonnell (EPA).***

- Overview of total partner commitments to monitoring
- Need for partnership approach: growing opportunities among multiple partners
- Discussion of each network during the meeting will include:
    - Introduction to each core CBP monitoring network.
    - Overview of current monetary support for the network.
    - Basis of recommendations to enhance the network.
    - Discussion of recommendations and identification of candidate agencies for partnering.

Questions?

10:00-10:15 AM Break

10:15-11:30 AM Nontidal Network overview ***– Kaylyn Gootman (EPA), Mark Nardi (USGS), and Breck Sullivan (USGS)***

- Purpose and overview of network
- Current funding of network
- Monitoring recommendations: what value-added information will outputs of new monitoring investments provide and how much will they cost.

Discussion: *Jurisdictional and agency views of opportunities to enhance this network – Denice Wardrop (CRC) Facilitator*

- Are any of the technical aspects of the recommendations unclear?
- Is there something else about the current funding you'd like to better understand?
- Which recommendations is your agency willing to partner on supporting? (Jamboard used for agencies to show their interest)

Discussion:

- Peter Tango (USGS): The Nontidal Network (NTN) formed with a Memorandum of Understanding (MOU) across the jurisdictions in 2004 (Scott Phillips helped coordinate it). Some stations have longer monitoring histories than that. The MOU contained an agreement to provide consistent methods in all jurisdictions at this suite of monitoring stations making up the NTN.
- Bruce Vogt (NOAA): Does the financial picture that Kaylyn and Mark presented on include funding for quality assurance/quality control (QA/QC), data analysis, product development or just operation and maintenance costs? The former items seem important to deliver data driven decision support.
- Mark Nardi (USGS): QA/QC is included, but not analysis.

- Tom Parham (MD DNR): Our 117e grant is due in the next several months, what time frame are Mark and Kaylyn looking to get things together?
- Kaylyn Gootman (EPA): As soon as possible, ideally well before the summer. Within 90-120 days would be ideal but it depends on your availability. This is a cooperative effort so there will be some flexibility.
- Bruce Vogt (NOAA): From a big picture perspective, if the goal is to make sure data is provided to decisionmakers in a format they can act on it, the funding needed to use and apply data from the NTN would be a useful addition to the financial landscape.
- Denice Wardrop (CRC): Mark and Kaylyn, since doing this exercise, did anything emerge that you wouldn't have known any other way? For example, finding a least cost pathway.
- Mark Nardi (USGS): We don't yet have enough information to fully understand the least cost pathway or all of the stops that money makes before it gets to the station. I run the NTN USGS-EPA Interagency Agreement (IA) and I understand where that money comes from. However, it's not just federal dollars funding the network; a good part depends on local dollars and local cooperation. For example, there may be stations part of the NTN but fully covered by Harford County or Lancaster County. Local entities funding NTN stations may not understand the importance and robustness of the entire network as a whole. We still need to be able to explain how the money flows in those situations.
- Sean Corson (NOAA): Thank you for the presentation. This kind of information is exactly what we need to ask for changes in funding. It sounds like the NTN is relying on a network of sampling sites to analyze progress on a regulatory issue, but not all the folks maintaining those sites are fully cognizant of the fact that those data are incorporated into a higher-level aggregate result. It's hard to imagine a decoupling between the money and the roles and the responsibilities (who is responsible for data, operations and maintenance, and reporting) if the chain of money isn't understood. If money at a local level is fluctuating and stations come on and offline or certain QA/QC/data collection/operations and maintenance may not be happening, is the network fluctuating in a way that impacts the science down the road? Or is it possible to decouple the science and money here?
- Kaylyn Gootman (EPA): It's hard to decouple the two. Getting a clear picture of the funding can help with figuring out how to not be in a position where we have to rely on short-term, not guaranteed funding like infrastructure funds in the future.
- Mark Nardi (USGS): Right now we don't know how many network participants are unknowingly participating in the network. It would be good to know which stations are not funded any way by the NTN (in other words, totally locally funded). If they're not invested in the whole NTN, it makes it easier to pull the plug on those stations. Conococheague was one station where people thought it had run its course but it's actually a really important network station that needs to be picked up. I am looking into the funding situation.

- Kaylyn Gootman (EPA): It's a delicate balance of how the 123 nontidal stations are funded. Getting that picture clear helps us maintain, enhance, sustain it and all networks.
- Mark Nardi (USGS): Yes. And you can't talk about removing stations without the impact on the network and the science and analysis side.
- Bryant Thomas (VA DEQ): While the economy and state revenues have been strong in the recent past, the future is not certain. Given limited resources but expanded monitoring wants/needs, I'd be interested to hear and discuss ideas on establishing a network of fixed and rotating monitoring stations. So, not necessarily maintaining all historical nontidal stations each year, but rotating or cycling select stations.
- Peter Tango (USGS): Doug Moyer has looked at ways to augment sampling regimes relative to impact on analyses of loads and trends with funding challenges over time.
- Doug Moyer (USGS): The most direct answer is to maintain consistent sample collection (20 samples) and lab analyses. This will yield the most statistically defensible results. There are short-term adjustments that can be implemented to bridge funding shortfalls; however, this would fall under the proceed-with-caution scenario. We have looked into the effects of changing sample protocols such as lowering the sampling number and things of that nature, and although we used that strategy to bridge funding shortfalls, long term, it could work against you. That's because it could bring in noise into a data set that shows up as a trend but really isn't a trend. Noise can be caused by a reduction in samples or a change in how we collect the samples. We have to be concerned about lab side as well. We try to keep it consistent year to year and across states as much as possible so we limit artifacts coming in and so that changes we see are actually environmentally based.
- Peter Tango (USGS): In the tidal waters, rotating stations is a strategy used now. For example, water clarity assessments of segments have rotated in 3-year blocks for about 15 years to get through 92 segments. That was the best we could do with the available resources but as a function of protocol we agreed to and the technology used. However, going forward, if we adopt a new protocol - if satellite imagery can allow us to look at the entire Bay all in the same year, and if imagery were free, we have the potential to do more for equal or less cost. We continue to look at such options across networks. We need that strategy of rotation in the mix depending on the network and the analysis needs.
- Bryant Thomas (VA DEQ): The infrastructure funds are great, but they are short term, and it is a presumption that expansions to the network made possible by infrastructure funds can be maintained after those funds are gone. We should have the discussion as though the infrastructure funds are not there, because they're not permanent. From the state perspective, if we can't add to the pools of money we're funding, how can we make the dollars go farther? If we're looking for efficiencies in funding entities and how

the monitoring is getting conducted, all the better. We don't want a false sense of ability from the infrastructure money.

- Kaylyn Gootman (EPA): We need to look at infrastructure funds as they bought us some time. 5 years will go by quickly.
- Mark Nardi (USGS): Ideally, we'd get those new infrastructure sites to maturity to be trends sites, but it won't happen without operations and maintenance dollars for years. How do we invest in new sites if we know they'll be on the chopping block when the infrastructure funds run out?
- Bryant Thomas (VA DEQ): There are pros and cons of having rotating stations in any network. It allows you to have more broad coverage over a longer period of time, but less continuity. You miss some things when you rotate off a station. It needs to be a part of the conversation particularly if we're trying to collect information we haven't before.
- Lee McDonnell (EPA): Part of this as we roll into and past 2025, is the phase 7 model, a tool that will trigger a lot of activities, including the way we look at things in the future. We have to be cognizant of the fact we may not be able to sustain this level of funding. The PSC agreed that monitoring is important. We need to impress upon them what the information gets them and how it can be used to make better decisions, and how it will inform them going forward. The conversation we'd be having without infrastructure money would be about triage. Costs are escalating for everything.
- Bruce Vogt (NOAA): Are stations within the NTN prioritized to see if their importance aligns (or not) with sustained funding?
- Scott Phillips (USGS): The monitoring report focused on what we do for field and lab collection. It didn't say what other interpretation do you need if you enhance these networks. Secondly, as Mark was unpacking funding, when we set the network up 15 years ago, we relied on existing streamflow gauges. Those gauges were funded not for the NTN, but for more local priorities such as flooding. While we can unpack that, a lot of the partners are funding the gauges not for the network purposes. That's why we often run into situations where someone drops the gauge because they don't need it anymore and we have to backfill it.
- Peter Tango (USGS): In 2004, there were hundreds of candidate stations. The initial network was 85 stations when it was established. The network with input from jurisdictions moved to 126, then was pared down to 123 in a funding adjustment. Rich Batiuk and I went back to all jurisdictions in 2011-2012. Everyone then was settled that the stations were what they needed (with few exceptions). The bottom line is that yes, alignment has been tested over the years. New needs have arisen - hence, new recommendations to address new priorities.
- Bruce Vogt (NOAA): Thanks. I was asking because if I heard it correctly one of the sites Mark mentioned as important sounded like it was also at higher risk of going dark because of how it is being funded within the network (partner maintaining it may not be

aware of the stations role). Mark's proposed analysis may be a way to pinpoint where these "weak" points may exist.

- Scott Phillips (USGS): As we go to see which recommendations you want to partner on, did you hear enough about the technical benefits of the recommendations?
- Peter Tango (USGS): Scientific and Technical Advisory Committee (STAC) workshops can be used to look at research and effectiveness of monitoring designs. On the nontidal side the inclusion of the continuous monitoring and building of models that relate sediment data to phosphorous data to have more detailed analysis is a way to get higher resolution information at a modest cost. Those approaches come into play to extract more information for our resources. Understanding the latest opportunities, technologies and analysis are constant ways to address efficiency questions and leverage available resources.
- Peter Tango (USGS): Some of the data are of value to multiple outcomes, answering questions that we couldn't otherwise without those data. For example, benthic integrity of stream health, or conditions influencing brook trout habitat. Scott and Breck have documentation of cross outcome benefits. The local value vs overall network value is also a consideration.
- Sean Corson (NOAA): NOAA has folks looking at satellite data to evaluate water clarity over oyster restoration sites. Depending upon the resolution required, they may be able to provide clarity data to VA DEQ. Bryant, we can follow up regarding this.

Jamboard results:

Addressing additional watershed-related outcomes that need coordinated monitoring - Breck Sullivan (USGS)

- Review CBP outcomes that require more coordinated monitoring in the watershed (such as stream health, fish habitat)

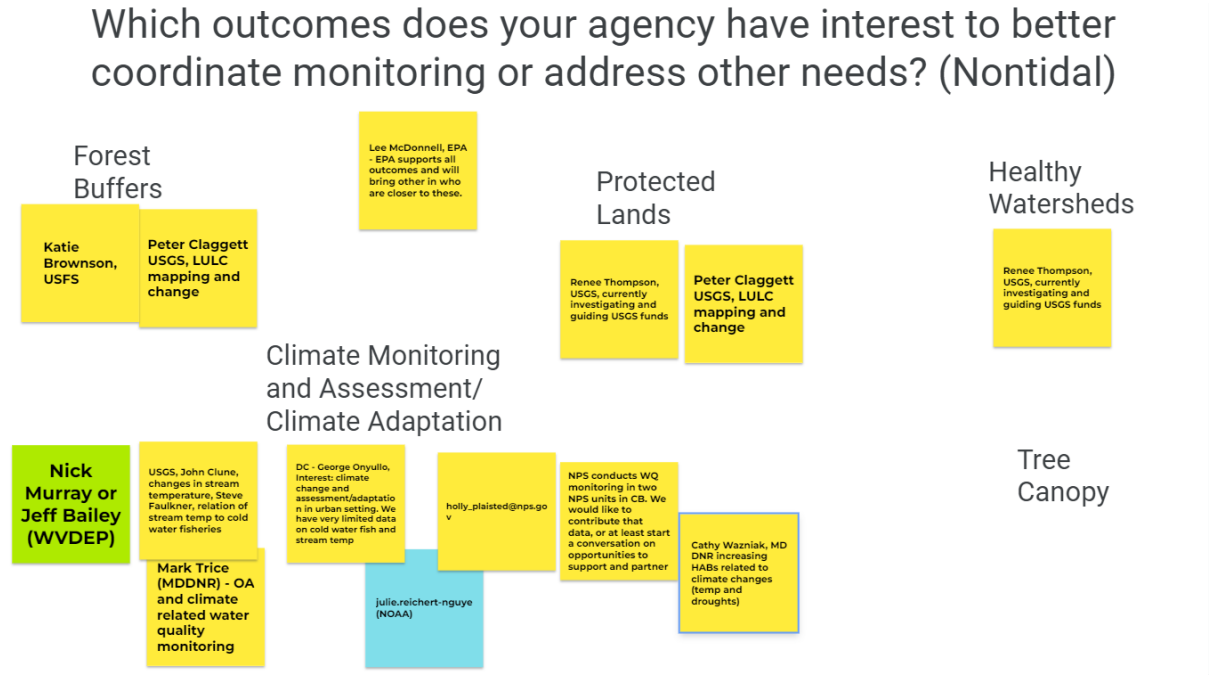
Discussion:

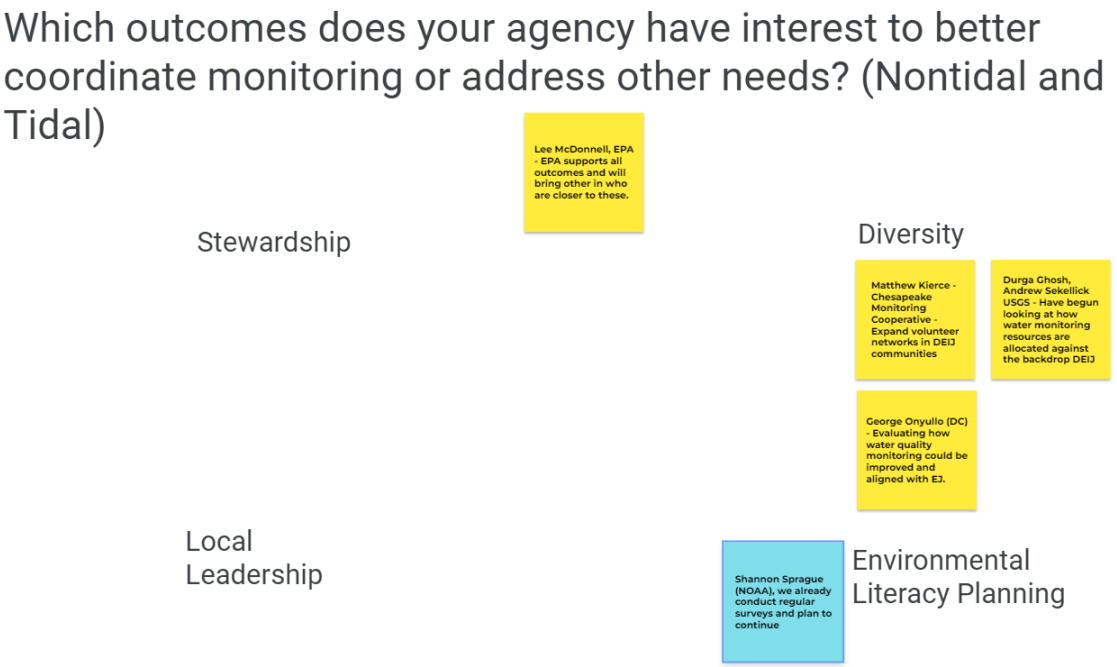
- Bruce Vogt (NOAA): If there is interest in discussing plankton ideas further, Tom Parham and Jim put together some more detailed ideas. There's a link between spawning habitat and some of our interest in plankton where there's a mismatch occurring between prey availability and larval striped bass. Tom and Jim had suggested some other ideas in the GIT funding process that weren't in the PSC report.
- Breck Sullivan (USGS): When we were collecting the priority monitoring needs, that was about 6 months ago so they may have changed since then. We want to get an interested group together to start those conversations.
- Bruce Vogt (NOAA): I have a question for Steve Faulkner and the Brook Trout workgroup – if they've learned anything about the monitoring data availability and identified any gaps or if there is enough information to develop these tidal nontidal fish habitat assessments like the pilot they're working on in the Patuxent. (However, Steve was not on the call.)

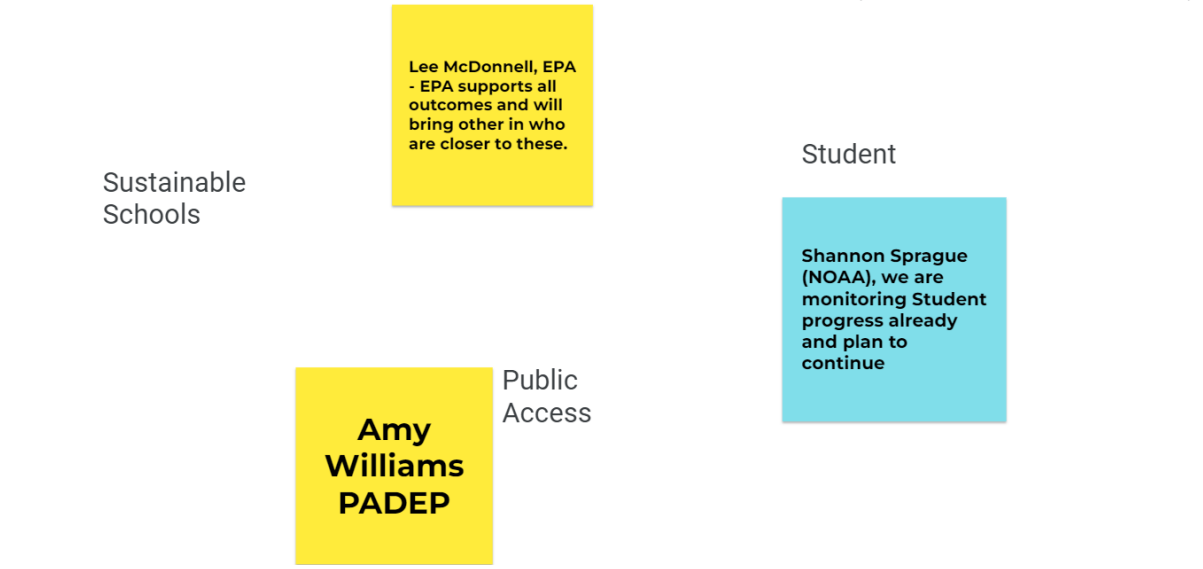
Discussion: *Jurisdictional and agency views - Denice Wardrop (CRC) Facilitator*

- Which outcomes does your agency have interest to better coordinate monitoring or address other needs? (Jamboard used for agencies to show their interest)

Jamboard results:







<u>Wrap up – Lee McDonnell (EPA) and Denice Wardrop (CRC)</u>

- How can we sustain and enhance the networks when the infrastructure money goes away?
- Short discussion on ideas for next steps.

Discussion:

- Lee McDonnell (EPA): Remember, our goal is to get to the least cost pathway for the work we do, and embrace transparency in order to move forward in the best way possible collectively. We'll find most success collaboratively. How do we align ourselves so when the infrastructure money goes away, we still sustain our monitoring networks? Please provide the point of contact for your agency/jurisdiction to understand the funding of the NTN stations. Between these meetings we will work on continuing to better understand the funding. And I'd like to start 117e conversations earlier than July this year. We put a lot of band aids in places and there were a lot of asks but it would be beneficial to think about what do we all need to provide a better long term strategy. What other things would you like us to be working on to bring back for strategy in terms of helping you approach your PSC members in terms of growing funding? Let us know what we can do to assist.
- Scott Phillips (USGS): We'll have these discussions in the NTN workgroup and many folks are already involved. Some may want to come in for the funding discussions. As much as possible we will assign it to existing workgroups to have further discussions.

11:30 AM Lunch Break

12:15-1:15 PM Tidal Water Quality Monitoring Network overview – *Peter Tango (USGS) and Breck Sullivan (USGS)*

- Purpose and overview of network.
- Current funding of network
- Monitoring recommendations: what information will they provide and how much will they cost.
- Other Outcomes

Discussion: *Jurisdictional and agency views of opportunities to enhance this network – Denice Wardrop (CRC), Facilitator*

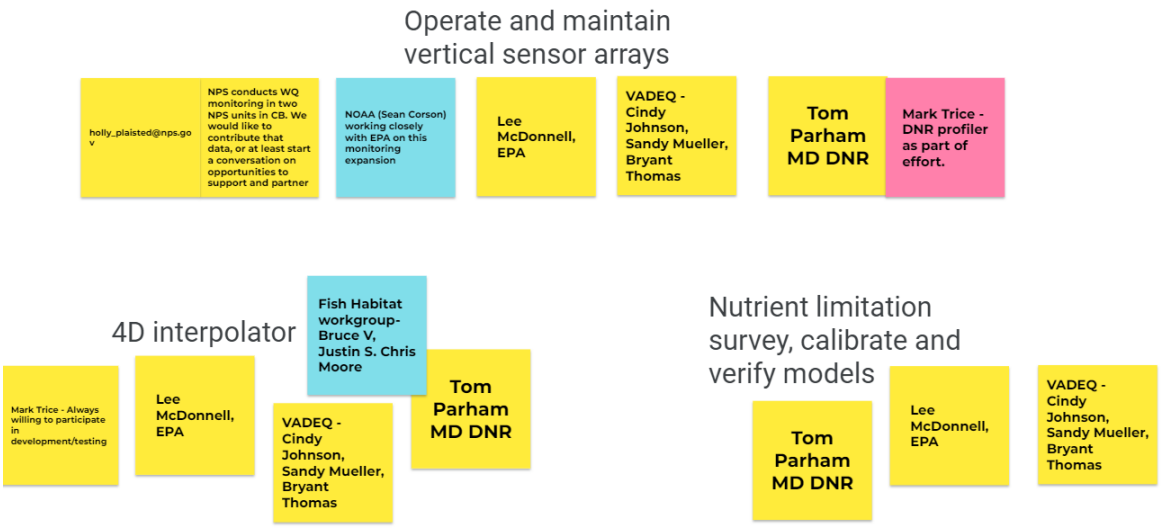
- Are any of the technical aspects of the recommendations unclear?
- Is there something else about the current funding you'd like to better understand?
- Which recommendations is your agency willing to partner on supporting? (Jamboard used for agencies to show their interest)

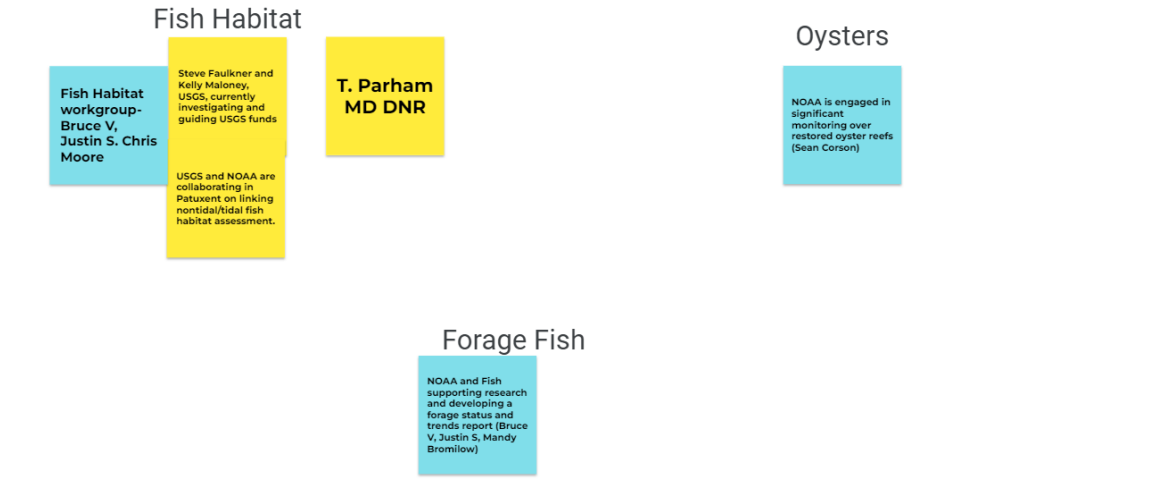
Discussion:

- Bryant Thomas (VA DEQ): From the Total Maximum Daily Loads (TMDL) perspective the standards and dissolved oxygen (DO) impairments are an underlying driver, and if that is fixed, living resources should respond accordingly. For Virginia, the vertical arrays and getting to a point with the 4-Dimensional (4-D) interpolator to assess criteria not previously assessed is a fundamental need and at the top of our priorities. VA would like to support it as much as they're able to.

- Peter Tango (USGS): With the 4-D interpolator and the hypoxia vertical profilers, CBP will have the capacity to assess all 92 segments for all criteria by 2026. Having continuous monitoring data offshore and nearshore is the holy grail.
- Bryant Thomas (VA DEQ): Is it an option to expand the current selection of sites for deployment of the vertical arrays? There is interest in expanding in VA at the mouth or at certain key locations in the tributaries or the Bay. What's the best way to have those conversations? First things first would be to secure the recommendations' funding for off years when funding is not yet identified, but how would we proceed to get additional locations?
- Peter Tango (USGS): There are a couple of options. This past year there was a publication out of University of Maryland that took the lower Potomac and lower Choptank and analyzed how much of the off-shore nearshore monitoring there should be. That analysis hasn't been done on all 92 segments. But if there is a particular segment of interest for investment, you could pursue that. How we came up with the existing stations is a combination of publications suggesting how to improve conditions and the number of stations that would provide adequate resolution, and talking with research community, modelers, hypoxia collaborative about important locations. The fisheries community advised on habitat justifications. For example, the lower Potomac is important to fisheries and we don't have much information there, and the modeling community agreed. We can continue working with the hypoxia collaborative and research community to use existing tools in monitoring design to answer questions about expansion.
- Bruce Vogt (NOAA): In addition, the Rappahannock is one of the areas identified as a priority site for continuous vertical profilers for this year. The recommendations going forward are the Choptank, mid-Bay area Peter mentioned, and the Potomac, but the idea is to expand the profiler network out.

Jamboard results:



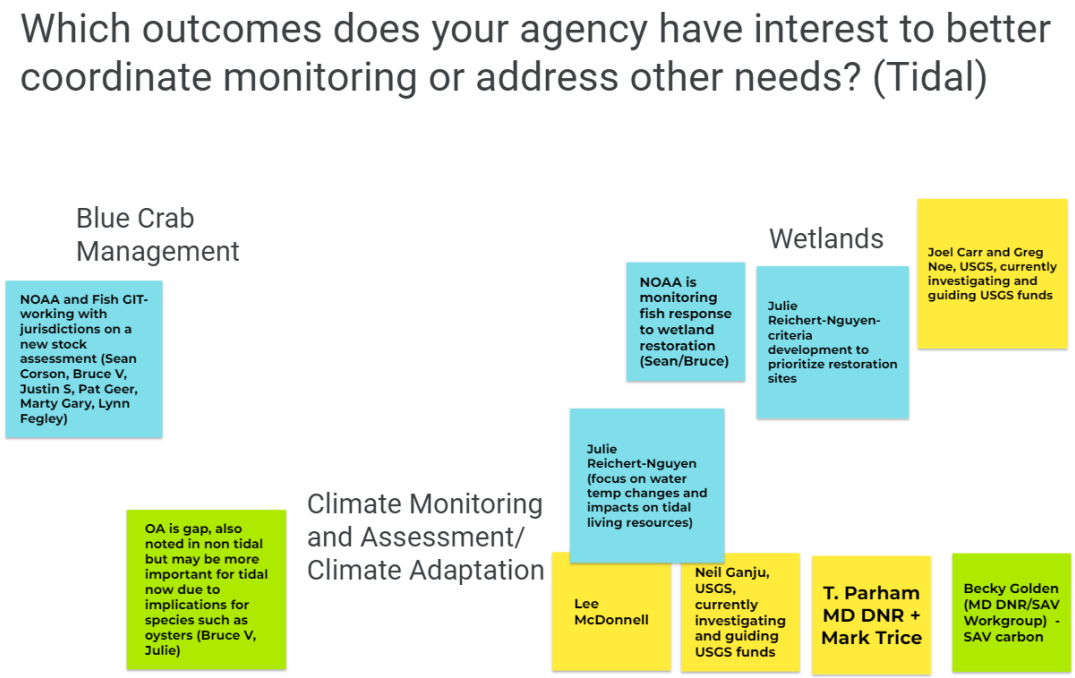


[Addressing additional estuary-related outcomes that need coordinated monitoring] - Breck Sullivan (USGS)

- Review CBP outcomes that require more coordinated monitoring in the estuary (such as fish habitat, oysters, crabs)

- Discussion: *Jurisdictional and agency views - Denice Wardrop (CRC) Facilitator*
- Which outcomes does your agency have interest to better coordinate monitoring or address other needs? (Jamboard used for agencies to show their interest)

Jamboard results:



Wrap up – Peter Tango (USGS) and Denice Wardrop (CRC)

- How can we sustain and enhance the networks when the infrastructure money goes away?
- Next steps

Discussion:

- Bruce Vogt (NOAA): NOAA will be releasing a funding opportunity soon. There will be interest in projects highlighting the effectiveness of nearshore habitat restoration, for example looking at new methods to look at fish habitat lift. Also, if we (fisheries folks) have new information on key thresholds for fish (such as temperature) that may be more specific than the current criteria, could those be built into the 4D interpolator?
- Peter Tango (USGS): We are focused on the interpolator for the Dissolved Oxygen (DO) side, but in order to make the assessment, we do need salinity and temperature fields that define the habitats. I'm not sure if those data would be fed through the interpolator or how they would set up the habitat assessment in order to apply the criteria. I'd have to check with Rebecca Murphy and Elgin Perry.
- Denice Wardrop (CRC): What would your interest be in thresholds? This may be a question CBP can look at more once we're able to assess all criteria in 2026.
- Holly Plaisted (NPS): Interested in temperature thresholds for SAV species.
- Sean Corson (NOAA): Interested in thresholds for temperature, oxygen, and salinity.
- Becky Golden (MD DNR): Interested in thresholds for SAV habitat, such as temperature.

- Bruce Vogt (NOAA): Interested in thresholds for multiple species, including summer flounder, blue crab, oysters, etc, as well as thresholds for different life stages, and reproduction, and thresholds for species that have moved north into the Bay due to climate change. It raises a lot of questions and opportunities especially in the shallow water area.
- Sean Corson (NOAA): Salinity, DO and temperature link physical and biological oceanography. The implications could include changing currents impacting larval transport, changing temporal components for spawning and migration, shifting turbidity max may impact plankton distribution and timing, etc.
- Peter Tango (USGS): I will add understanding of building temperature assessment into the 4-D interpolator to the agenda for Bay Oxygen Research Group (BORG) this year.
- Carl Friedrichs (VIMS): How will the assessments be made in all the different segments and is that based on the 4-D interpolator? Because we will have the ability to calculate them, but we won't know if they're correct. We'd have to do uncertainty analysis and field testing to see what degree they're accurate. It's an interpolator, not observations. It's a fantastic direction, but we have to also think about field tests using high resolution observations which we'll have with some of those vertical arrays.
- Peter Tango (USGS): The output of the interpolator is in probability of attainment. That's something we introduced in the 2017 documentation as an option of how to think about reporting and giving credit to attainment. That conceptual model in terms of practice deserves some more community discussion since it's different than before. There will be places with limited certainty. The interpolator is being built to recognize the data and patterns we see but some places have more data than others.
- Denice Wardrop (CRC): Regarding Comprehensive Evaluation of System Response (CESR) report implications for tidal monitoring, much of that is a greater attention to the shallows. There's a lot of spatial heterogeneity and biogeochemical processing we don't understand. The CESR report talks to 2 kinds of tidal monitoring: understanding processes that we have in that zone, and what should we be monitoring for to boost living resource response to the water quality gains we're getting.
- Sean Corson (NOAA): Getting a better sense of what's happening with temperature, oxygen, and salinity can provide a lot of insight into what's happening with life history at various stages of various species. Many of the species we're interested in have to be at specific places in specific times for spawning to line up with different prey assemblages at different times of the year, that has to do with the timing of specific temperature and salinity regimes. Once you start messing with temperature, oxygen and salinity it impacts the way the water is moving, the way it might stratify, and what the habitat in the water column looks like in both time and space. That's especially true in shallow water areas. Some specific examples are that the changing currents at the mouth of the bay might be responsible for interruptions in larval ingress and egress for blue crabs. There's concerns that the Potomac, a well known spawning area for striped bass, might

have a mismatch in timing related to when certain species of plankton that are the right size for the mouth of the young striped bass are available in the year. You need to have the right plankton at the right time with the right striped bass or it could affect the population. In addition to all of these important questions around structured habitat like marshes and SAV, there's also a series of questions related to physical oceanography and what's happening in time and space from the bottom to the top in DO, temperature and salinity.

- Peter Tango (USGS): Many of the criteria and thresholds I've seen are built on data collected at a daily, weekly, monthly scale, and now we're using data to assess habitat that are incongruent with how the criteria were originally derived. It gives a new opportunity to get insight into habitat conditions, drivers and relationships that are at scales that provides us with exciting new insights.
- Sean Corson (NOAA): Time is key. A habitat's viability may change throughout the year.
- Bruce Vogt (NOAA): Shoreline hardening is another variable that we have thresholds for, but it may fall under the land use section, not water quality.

1:15-1:30pm Break

1:30-2:30PM Submerged Aquatic Vegetation (SAV) Monitoring Network Funding overview – *Brooke Landry (MD DNR) and Peter Tango (USGS)*

- Purpose and overview of network.
- Current funding of network
- Monitoring recommendations: what information will they provide and how much will they cost.
- Other Outcomes

Discussion: *Jurisdictional and agency views of opportunities to enhance this network – Denice Wardrop (CRC), Facilitator*

- Are any of the technical aspects of the recommendations unclear?
- Is there something else about the current funding you'd like to better understand?
- Which recommendations is your agency willing to partner on supporting? (Jamboard used for agencies to show their interest)

Discussion:

- Peter Tango (USGS): Regarding the imagery - government contract negotiations with commercial industries are ongoing regarding details of need, access and use. Also to clarify, funding for SAV database work in RFAs is ahead, not awarded.
- Greg Allen (EPA): EPA contributes about $375k per year for the aerial survey.
- Bruce Vogt (NOAA): Could we use SAV sentinel sites for fish monitoring?

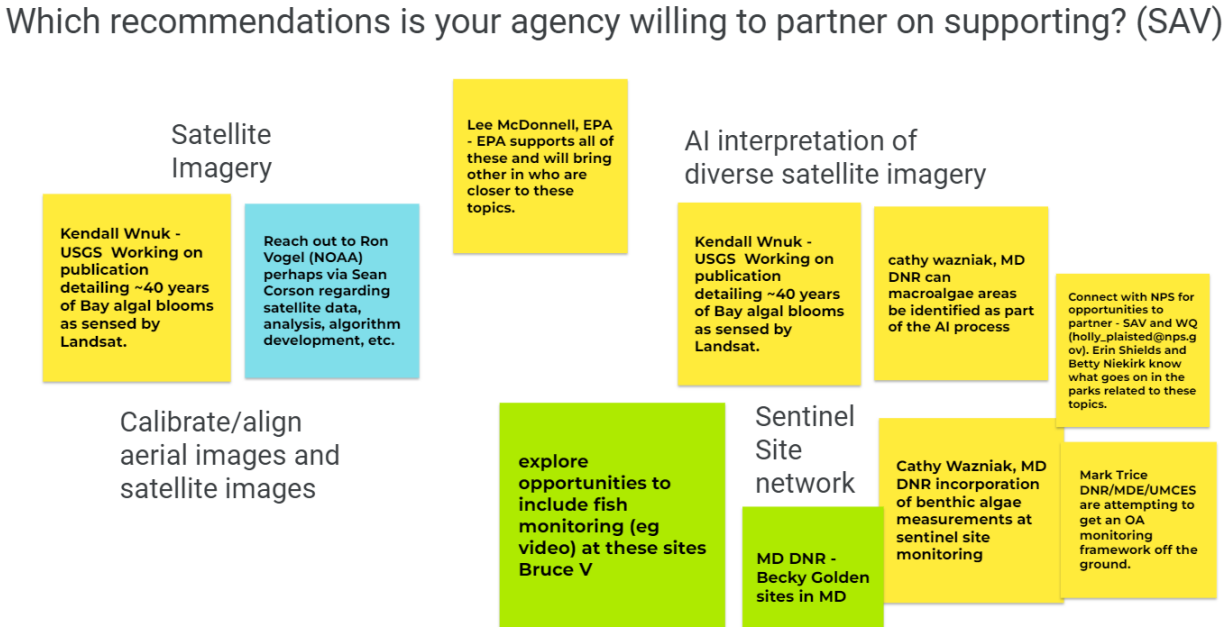
- Brooke Landry (MD DNR): Yes. We are hoping to have many uses for the sites including fish monitoring, and the more purposes they are used for the better to leverage resources efficiently.
- Nicoline Shulterbrandt (DC DOEE): Have the sentinel sites been identified or finalized?
- Brooke Landry (MD DNR): Somewhat. 4 years ago in the SAV workgroup meetings we voted on where we would like to see sites and produced a map including the 20 desired sites. The tributary itself is identified, but not the site within the tributary itself. In the protocol, there is criteria for how to select a site. It is a volunteer program, so if anyone wants to set up a site in an area not prioritized by SAV workgroup you're welcome to. I've had riverkeepers and other watershed groups express interest in setting up a sentinel site in their tributary. We're working with nonprofit groups on setting these up and maybe contributing to the cost.
- Bruce Vogt (NOAA): I'm not sure if it's still a really good idea to link up the sites but it's worth discussing. NOAA has someone on board now, Dr. Wilmelie Cruz-Marrero, who has experience in doing underwater video of fish. There may be other ways of sampling that captures information on SAV and fish.
- Greg Allen (EPA): If the sentinel sites are funded and open to additional objectives, getting numbers for pesticides, specifically herbicides, would be great for those sites. For example, we see atrazine, an agricultural herbicide, all year around. A while ago CBP took a look at this issue and concluded that the concentration spikes in the spring from below 1 ppb to increasing an order of magnitude around July. It would be an interesting thing to tie into those sites and see if our level of concern around atrazine is the same as the last time we looked at it couple decades ago.
- Brooke Landry (MD DNR): Our plan is to do 3 monitoring events throughout the growing season (early, peak, and late) so we could get that information on atrazine. How are toxics sampled? Is it a water grab or a sediment grab?
- Greg Allen (EPA): It's a water sample, either whole water or a semi permeable membrane device. Measuring atrazine would be wanted specifically for sites that are adjacent to agricultural land.
- Holly Plaisted (NPS): I'm interested in opportunities for the National Park Service (NPS) to partner with the SAV workgroup on the sentinel sites. NPS has long term water quality monitoring in two park service units in Chesapeake Bay, and there are other park service units in the region that don't currently have monitoring. NPS would be interested in resources near and in park boundaries.
- Brooke Landry (MD DNR): That would be great, and I should have mentioned that not all of the sentinel sites will be new; we will incorporate some existing long term monitoring sites. Most are in VA surveyed annually by VIMS and CB-NERR VA component. Which areas are you talking about?
- Holly Plaisted (NPS): York River, James River and Popes Creek which is the Southern portion of the Potomac.

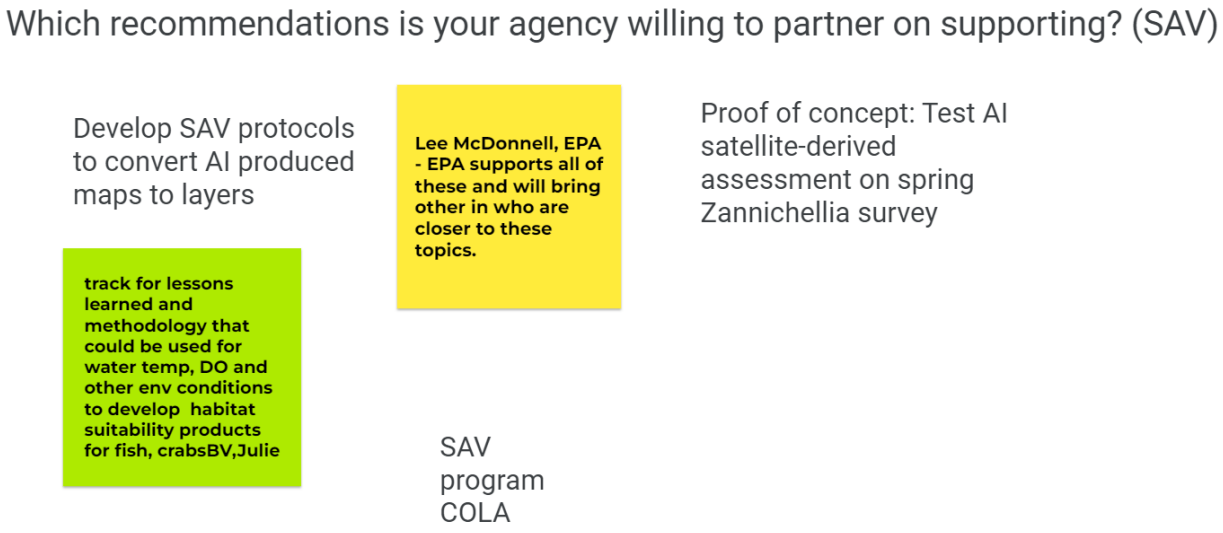
- Brooke Landry (MD DNR): The CB-NERR sites in VA and in the York and the James were identified for sentinel sites. Erin Shields (CN-NERR) is hoping to assist with those.
- Holly Plaisted (NPS): The sites that NPS has been monitoring water quality near or in these parks through a contract with VIMS since approximately 2008: George Washington Birthplace National Monument and Colonial National Historic Park. The trend reports on these are almost ready to publish, but I am happy to share drafts with the group.
- Bruce Vogt (NOAA): Is ocean acidification (OA) an important variable for meeting SAV goals?
- Brooke Landry (MD DNR): Yes, it's an important variable to monitor, but I'm not sure if sentinel sites would be appropriate for monitoring OA since they would only be monitored 3 days a year. OA would need to be monitored on a more continuous basis. If we were to put something like a continuous monitor (con-mon) at our sentinel sites, then yes, I'd like to include it. I've talked to Dick Zimmerman at Old Dominion University (ODU) about including con-mons at our sentinel sites. That is very funding dependent. Ocean acidification affects SAV, and SAV affects ocean acidification. OA is also closely related to oyster productivity, and we've been discussing potential restoration projects that incorporate both SAV and oysters - would be applicable to the OA issue.
- Bruce Vogt (NOAA): I will follow up about this. Also, I'm curious about the potential for using artificial intelligence (AI) and machine learning for analyzing hypoxia data. Julie Reichert-Nguyen (NOAA) is also interested in that for temperature indicators and climate data. There may be lessons learned that could apply to some of the other interests.
- Brooke Landry (MD DNR): Using high-res satellite data for non-SAV purposes was a significant part of the conversation during the STAC satellite workshop. There's still significant work to be done to streamline the process of obtaining the data. More and more agencies are recognizing that this high-resolution satellite data is out there and we need it. The NextView License Agreement with the National Geospatial-Intelligence Agency (NGA) is working on getting this data available for federal agencies for environmental uses. Once we get can the data reliably and consistently, we'll have high resolution data available daily for the Chesapeake Bay. Dick Zimmerman is working on this at ODU.
- Bruce Vogt (NOAA): The marine heat wave idea came out of the STAC workshop on rising water temperatures, so water temperature was one idea. We've also considered it for the hypoxia continuous vertical monitoring. As we build out that network, maybe there's a way to use AI to develop the products we're interested in from that. That could be tied to segment delisting, fish habitat suitability models that are dynamic. Maybe there is even better forecasting that we could do with that information, and link environmental data to how we expect fish species to respond.

Links with additional information:

- CBP SAV Monitoring Program
- STAC Workshop report on satellite integration for the SAV program
- SAV Workgroup Page with most programs and publications described and linked

Jamboard results:





2:30-3:00 pm Toxic Contaminants Monitoring Network Funding overview – *Scott Phillips (USGS)*

- Purpose and overview of proposed network
- Current funding.
- Monitoring recommended plan: what information will they provide and how much will they cost.

Discussion: *Jurisdictional and agency views of opportunities to enhance this network – Denice Wardrop (CRC) Facilitator*

- Do you have any questions about the proposed plan?
- Which part of the recommended plan is your agency willing to partner on supporting? (Jamboard used for agencies to show their interest)

Discussion:

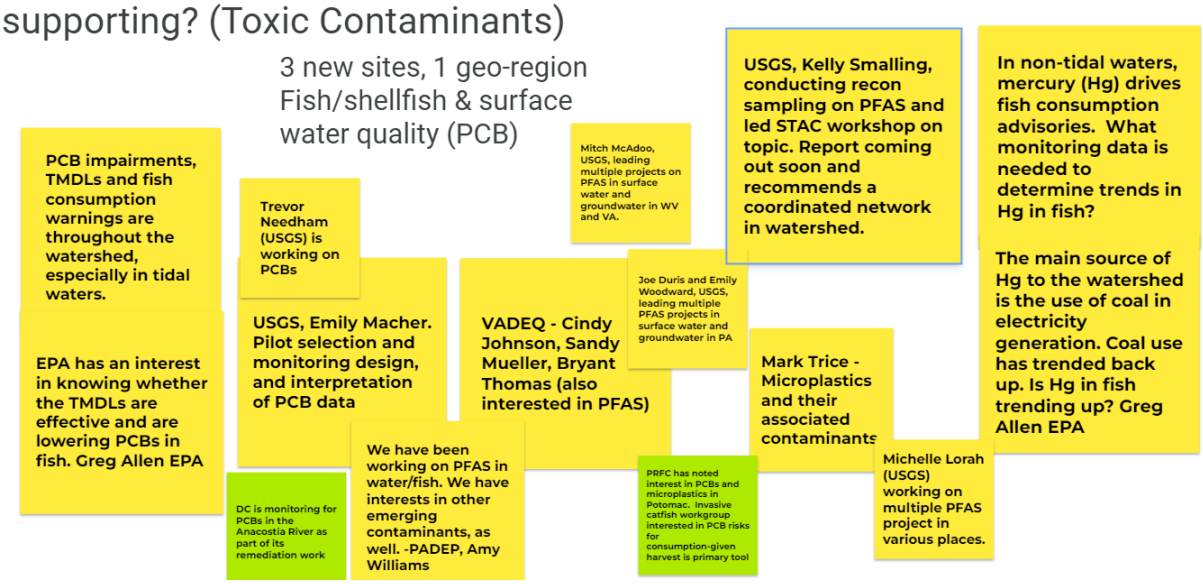
- Bryant Thomas (VA DEQ): I'd like to share an observation from my TMDL work especially in the Potomac related to some jurisdictions having the approach of "natural attenuation". If we turn off PCBS in every input into the estuary, it would still take decades to reach our goals. Due to resuspension, it would take decades before we would see PCB levels get significantly lower. This was predicted in the fish tissue, not the water concentration. I get the idea of wanting to evaluate and look to see if particular mitigation sites reveal measurable reduction. In VA, our approach is PCB monitoring of the fish, and we monitor in a rotating schedule around basins. Because we know it takes decades to get to the endpoint, the monitoring in place is sufficient to see trends over time and overall reductions. It's important to select sites carefully. Do they have to be equally distributed across jurisdiction, or just wherever there are good candidate sites?
- Scott Phillips (USGS): I agree it takes a while to see improvements in PCB reductions. That's why we didn't want to do something as big as the Potomac, but rather monitor a tributary to see a signal. We're saying we want to continue rotational sampling to get a wider look, but just get one pilot area to get advanced monitoring to see if we can note a reduction.
- Greg Allen (EPA): This gets us closer to a geographically focused piece of information that says are the things we're doing in this heavily impacted area (such as an area that is net loading of PCBs into the overall Bay load) working? Are we identifying the sources, are our management actions having the impact we think they do? The fish data doesn't quite get us there because of the rotation and other factors. This is intended to get us closer to the management actions. On the long term of seeing change – you mentioned 80 years – to my knowledge that would be when will PCBs be at low enough levels that we won't have fish consumption advisories or human health concerns. We know from places like the Delaware Bay that we can see change on the order of a decade or more. Concentrations are coming down in the Delaware, but they've been at this longer than us. When we see a reduction in a decade or so, that tells us that we're making the slope more steep in the downward trend in PCBs. We want to see that slope increasing

because that is a reduction in risk even if it doesn't get us within our career to no fish consumption advisories. It still gets us less risk to humans.

- Scott Phillips (USGS): It doesn't have to be just one jurisdiction. In the metropolitan DC area, there's enough going on there that there could be a pilot area that includes all the jurisdictions.
- Bryant Thomas (VA DEQ): Another thing maybe to consider is if there's a specific site where some remediation has occurred and we're hoping to see a system response, is there an option to engage these responsible entities to help fund if not conduct monitoring themselves and be contributors to help cover costs.
- Greg Allen (EPA): We just concluded a STAC workshop on PFAS and we know there's opportunities for monitoring coordination and partnership. And the last toxic we're investigating is mercury. In the nontidal part of the watershed, mercury drives the advisories. The use of coal is trending down (coal is the largest source of mercury) so we were standing by to see if we would see that signal in fish. In the meantime, however, that has turned around because we burned more coal in 2022 than we ever have before. And we're seeing deposition and concentration in fish trends that are trending in the wrong direction. In summary, we have monitoring interests in PCBs, PFAS and mercury, and microplastics is an emerging contaminant we have some interest in understanding risk. However, PCBs are the number one priority, and we'll keep the other issues percolating.
- Bruce Vogt (NOAA): Is there any partnership or outreach opportunities with recreational, subsistence and commercial fishing interests on these issues? The Fisheries GIT has brought this up a couple of times, mainly around invasive blue catfish. Right now, the management tool is to catch more of them and have a higher fish mortality. To what extent has the toxic contaminants workgroup reached out to constituents about this?
- Greg Allen (EPA): The toxic contaminants workgroup has not really worked on this, beyond a fish consumption advisory infographic, but would like to work with the Fisheries GIT on this.

Jamboard results:

Do you have any questions about the proposed plan?
Which part of the recommended plan is your agency willing to partner on supporting? (Toxic Contaminants)



3:00-3:15 PM Break

3:15-4:00 PM Next steps and wrap up – *Breck Sullivan (USGS) and Lee McDonnell (EPA)*

- Other CBP networks needing future discussion: Community Science, Tidal Benthics, Land use and land change
- Process for working with CBP groups on next steps
- Proposed next steps for meetings and progress

ACRONYMS

PCBs	Polychlorinated biphenyls
PFAS	Per and polyfluoroalkyl substances
MOU	Memorandum of understanding
IA	Interagency Agreement
LULC	Land Use Land Change
VIMS	Virginia Institute for Marine Science
ODU	Old Dominion University
NPS	National Park Service
VA DEQ	Virginia Department of Environmental Quality
WV DEP	West Virginia Department of Environmental Protection
PA DEP	Pennsylvania Department of Environmental Protection
DE DNREC	Delaware Department of Natural Resources and Environmental Control
DC DOEE	District of Columbia Department of Energy and Environment
MD DNR	Maryland Department of Natural Resources

EPA	Environmental Protection Agency
USGS	United States Geological Survey
STAC	Scientific and Technical Advisory Committee
STAR	Scientific, Technical Assessment and Reporting Team
NOAA	National Oceanic and Atmospheric Administration
CRC	Chesapeake Research Consortium
NY DEC	New York Department of Environmental Control
OA	Ocean acidification
SAV	Submerged Aquatic Vegetation
CBP	Chesapeake Bay Program
DO	Dissolved oxygen
CESR	Comprehensive Evaluation of System Response
GIT	Goal Implementation Team
WG	Workgroup
NTN	Nontidal Network
WQ	Water quality
IIJA	Infrastructure, Investment and Jobs Act
NGA	National Geospatial-Intelligence Agency

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