Joint Scientific, Technical Assessment and Reporting (STAR)
and Coordinator & Staffer Meeting
Theme: Aquatic Life Cohort Science Needs Meeting

Thursday, December 16 2021
9:30 AM – 12:30 PM

Meeting Materials:
Joint C/S/STAR Science Needs December 2021 Meeting | Chesapeake Bay Program

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

ACTION ITEMS

- **Breck Sullivan will follow up with Stephen Faulkner on an eDNA for UMBC ICARE.**
- **Breck Sullivan will reach out to IMET about ICARE in the context of eDNA and invasive catfish in the Patapsco River.**
- **Denice Wardrop will share the upcoming CRC Roundtable topics at the January STAR meeting along with the STAC proposals thus far.**
- **The deadline for unmet monitoring needs for each outcome is January 6th.**
- **Scott Phillips will reach out to Tom McDonnell at USGS about the potential effects of invasive species, like blue catfish, on forage fish. Bruce Vogt will consider adding that as a science need.**

AGENDA

9:30 AM **Welcome, Introductions & Announcements – Bill Dennison** (UMCES) and **Scott Phillips** (USGS)-STAR co-chairs, **Peter Tango** (USGS) CBP Monitoring Coordinator, **Breck Sullivan** (USGS) STAR Coordinator

Announcements

- Communications Update - Marisa Baldine
- Status and Trends Workgroup Announcement - Breck Sullivan
- UMBC ICARE update: There is confirmation the industry mentor does not need a PhD - Breck Sullivan
- STAC call for workshop proposals. **Proposals are due to STAC Coordinator, Annabelle Harvey (harveya@chesapeake.org) by COB February 16, 2022.**
- Brief PSC Monitoring Updates - Peter Tango

Summary

Bill Dennison asked how the Executive Council (EC) meeting on December 15th went. Kristin Saunders responded there was an emphasis on climate change, environmental justice, and areas where the Chesapeake Bay Program is still working to make progress. The meeting also looked at the dashboard and places

of improvement for the next few years. The new chair of the EC will be EPA Administrator Michael Regan. Garrett Stewart added that the public EC meeting was recorded and will be available from the Communications team soon.

Julie Reicher-Nguyen introduced Jamileh Soueidan, the new Climate Resiliency Workgroup staffer.

Bill Dennison noted that Caroline Donovan has taken a new job at NOAA and is hoping to stay on as chair of the Status and Trends Workgroup.

Breck Sullivan reminded attendees that the Status and Trends Workgroup has been working to develop quantitative and helpful indicators for all of the outcomes and is looking for more coordinators and staffers to attend their meetings. The next Status and Trends Workgroup meeting is Monday, January 10, from 1-3pm, so it will not conflict with the Rising Water Temperature Scientific and Technical Advisory Committee (STAC) Workshop that many will be attending on Wednesday, January 12th.

Breck Sullivan provided a reminder about the UMBC-ICARE program and called for members of the partnership that may be interested in being a mentor to reach out. Breck announced that the previous requirement for the mentor to have a PhD has been waved. Breck shared that one of the students in the program is planning on doing their project on eDNA and looking for a mentor. Scott Phillips suggested reaching out to Stephen Faulkner to see if he had ideas related to a possible eDNA mentor or the EPA Region 3 Tactical Services Group. Stephen Faulkner said to feel free to follow up with him on eDNA and added there will also be a section on that in the STAC Brook Trout Genetics Workshop report that is being written now. Bruce Vogt asked if Breck has reached out to the Institute of Marine and Environmental Technology (IMET) about ICARE as the eDNA may be of interest to look for signs of invasive catfish in the Patapsco River. Breck said she will include them on her list to reach out to. Labeeb Ahmed asked if there is anyone they can contact to get more information on UMBC ICARE? Breck responded that one can reach out to her or the PI for ICARE, Tamra Mendelson, at tamram@umbc.edu.

Olivia Wisner shared a reminder from Lisa Wainger and Dan Reed about a social science survey intended for members of the Chesapeake Bay Program partnership. Olivia shared that the deadline for completing the survey has been extended to December 23rd, and everyone is highly encouraged to respond to the survey. Alex Gunnerson sent out an email to STAR with the survey and Renee Thompson shared the link in the chat. Questions can be sent to wainger@umces.edu. Julie Reichert-Nguyen commented that the social science survey was easy to complete, straight-forward and took around 10-15 minutes to fill out.

Meg Cole shared a reminder that STAC is starting to accept proposals for workshops for the FY 2022. The deadline is February 16 and more information can be found here. Reach out to Meg (colem@chesapeake.org) with any questions. Scott Phillips suggested doing a round robin at the January STAR meeting to share what topics are being proposed. Denice Wardrop suggested continuing to use the CRC Roundtable as a format for getting the discussion started on certain issues. Scott followed up that maybe Denice can share the upcoming CRC Roundtable topics at the January STAR meeting along with the STAC proposals thus far.

Peter Tango provided an update on the PSC monitoring update and Breck Sullivan shared that the deadline for unmet monitoring needs is January 6th.

Bruce Vogt shared that the NOAA Chesapeake Bay Office (NCBO) will be publishing their fall 2021 seasonal summary before the holidays.

Upcoming Conferences, Meetings, Workshops, & Webinars -

- A Community on Ecosystem Services - December 13-16, 2021, Virtual.
- American Geophysical Union Fall Meeting - December 13 - 17, 2021, New Orleans, LA and Virtual.
- Sustainable Agriculture Conference - February 10-12, 2022, Lancaster, PA. (Virtual pre-conference in January).
- Joint Aquatic Sciences Meeting - May 14-22, 2022, Grand Rapids, MI. **Abstract submissions due January 10, 2022.**
- Chesapeake Community Research Symposium - June 6-8, 2022, Annapolis, MD. (Hybrid: virtual and in-person. Subscribe here for updates.) **Session proposals due December 1, 2021.**
- World Seagrass Conference and International Seagrass Biology Workshop - August 7-12, 2022, Annapolis, MD. **Abstract submissions due April 1, 2022**.
- 5th National Adaptation Forum - October 25-27, 2022, Baltimore, MD. Proposal submissions due February 1, 2022.

9:45-10:05 **Hypoxia 2021 Report** - *Aaron Bever (VIMS), Mark Trice (MD DNR)*
Chesapeake Bay Hypoxia 2021 year end report

Summary

Aaron Bever summarized the 2021 Hypoxia report and its focus on comparing hypoxic conditions in the bay to previous summers. He explained the take home message was this year the maximum daily hypoxic volume was near average, but that daily hypoxic volume was longer in duration and extended the farthest into October compared to the previous five years. He also showed the interactive data visualization viewer and explained with the viewer one can see the different metrics for understanding hypoxia in the bay. Bill Dennison commented that he likes the data viewer because it provides a multifaceted approach for

understanding hypoxia in the Chesapeake Bay. Peter Tango agreed with Bill and expressed visual story telling with the data is very helpful.

Mark Trice walked through Maryland Department of Natural Resources website which houses previous and current monitoring results for hypoxia in the mainstem of the Chesapeake Bay. He then showcased an animated map that visualizes the hypoxic conditions in the Chesapeake Bay. Bill Dennison commented that he likes the phrasing and visualization of these data outputs.

Discussion

In the chat, Scott Phillips asked Aaron if there is any possibility to have an additional long-term graph (1985-present and if they can make any statements about relation to nutrient reduction efforts?) Aaron responded that they have not included the 1985-present figures on the reports to not overwhelm, readers and they have looked at them internally. Aaron said that Mark's reports do have the longer-term figures. Aaron added the relation to nutrient reductions is hard from this work because the weather is so different from year to year. Luke Frankel from Marjy Friedrich's lab worked on the nutrient reduction question and has a paper submitted on it. Scott responded saying that he understands the need to keep messages and results concise. Scott suggested providing just a link to the CBP Website if people want more info on dissolved oxygen and long-term criteria assessment. Peter and Breck thanked Aaron, Mark, and all the individuals who helped make these reports possible. Bruce Vogt also thanked everyone involved in the hypoxia reports, and they are referencing potential impacts on fish, oysters, crabs in their seasonal summaries based on the hypoxia reports.

10:05-10:30 **Connecting CMC's NFWF project to relevant CBP restoration projects –** *Liz Chudoba (CMC)*

The Chesapeake Monitoring Cooperative (CMC) has partnered with NFWF to develop a volunteer friendly monitoring protocol targeting restoration projects. Liz provided an overview of the NFWF project, and STAR members provided examples of their work on how monitoring can support restoration projects, or how monitoring can be used to assess stream health impacts from restoration projects.

Summary

Liz Chudoba began by discussing the overall goal and process of CMC's restoration monitoring project. The process involved a literature review which covered six topic areas, including assessing sediment pollution in stream, benefits of buffers, habitat and bird recovery, invasive species, stream visual assessment protocol, and photographic assessment. The next step was a stakeholder survey sent to NFWF grantees and the CMC network, and it received 44 respondents. The top parameters monitored were temperature, pH, conductivity, sediment, benthic macroinvertebrates, dissolved oxygen, and

nitrate. The third step is focused on study design and will take place in the second week of January. The fourth step is the generation of methods testing.

Liz concluded by asking STAR the following questions: 1) Are there any resources that we should be aware of to help inform the Study Design process? 2) Is there any ongoing work being done at the CBP that is relevant to this process? 3) Are there any specific questions or ideas we should consider during the Study Design or method development stage?

Discussion:

Scott Phillips commented that this work is much needed and is addressing large data gaps.

Scott asked if people could get involved in the workshop. Liz said yes. They want to keep it small, but if you want to get involved, you can email her at lchudoba@allianceforthebay.org.

Scott then asked if this work could be better integrated with Bay Program efforts, such as being nested within the non-tidal network or considering nitrate trends. Scott asked if there has been discussion of a targeting approach for monitoring. Liz said that has come up in conversation. It looks like they can start with some of the monitoring data they currently have, but it is not focus of this project.

Julie Reichert-Nguyen commented in the chat that the Climate Resiliency Workgroup and Healthy Watersheds Goal Implementation Team (GIT) have been interested and looking into stream temperature data related to brook trout habitat and how the surrounding landscape could be influencing the stream temperature (impervious surfaces versus forested land). Bill Dennison added that he would like to see the climate change angle emphasized, especially temperature. Peter Tango added that a space through time analysis could be helpful for informing the performance of Best Management Practices (BMPs) under the impacts of climate change. Peter Tango added in the chat that one recommendation discussed in the climate context is to understand BMP effectiveness in the context of temperature, precipitation exposure, and wind conditions. It can provide insight and value to understanding why the same BMP applied in Virginia is not operating the same as one in West Virginia or again in Pennsylvania. That will inform climate impacts on BMP effectiveness, an important CBP and overall research community need. Renee Thompson added that looking at the intersection of these groups is essential and that these conversations should continue in part at the STAC Rising Temperature Workshop. The Healthy Watersheds GIT is looking at interim indicators and metrics using those aforementioned datasets as well.

Greg Allen added in the chat, that the Toxic Contaminants Workgroup would be interested in the chemical indicators component.

Denice Wardrop commented in the chat that STAC produced the following in 2007 "Recommendations for Establishing a Process to Improve Pre- and Post - Monitoring Programs for Small Watershed Grants Projects Funded by NFWF", link at https://www.chesapeake.org/stac/document-library/recommendations-for-establishing-a-process-to-improve-pre-and-post-monitoring-programs-for-small-watershed-grants-projects-funded-by-nfwf/. Denice also recommended checking out the Small Watershed Monitoring Designs at https://www.chesapeake.org/stac/document-library/small-watershed-monitoring-designs/.

Stephen Faulkner commented in the chat that he is assuming the lit review is capturing the earlier work on this topic (e.g., https://cbtrust.org/wp-content/uploads/Hilderbrand-et-al_Quantifying-the-Ecological-Uplift.pdf) as well as the on-going efforts updating the Chessie Biological Indicator for Benthic Macroinvertebrates (BIBI) with the Stream Health Workgroup (SHWG).

10:30-12:10 **Science Needs of the Aquatic Life Cohort** (4 Outcomes 25 minutes each)
Materials: Blue Crab Abundance Outcome, Submerged Aquatic Vegetation (SAV) Outcome, Oysters Outcome and Forage Fish Outcome science needs.

In follow-up to the Management Board (MB) review, each of the leads for the Aquatic Life Outcomes will discuss their updated science needs. STAR will provide input on potential opportunities to address science needs.

10:30-10:55 **SAV** - Brooke Landry

Summary

Brooke Landry began by sharing that she has had SAV workgroup members rank and review the science needs for their workgroup, so some of the science needs being presented are a review and some are new. Brooke then went through each science need and provided a status update and the reason why each one is a knowledge gap. She also added where discussion has been happening and potential resources in addressing each science need.

Discussion

In the chat, Bruce Vogt suggested connecting with Brooke Landry on SAV and fish habitat, expressing that there may be interest in summer flounder as well. Bruce explained that they just submitted a proposal for internal NOAA funding to use video for investigating fish utilization of SAV in the Pocomoke and Tangier Sound. Scott Phillips responded that it is great to consider connections between SAV and fisheries, and that he is glad NOAA is putting resources towards these topics.

Breck Sullivan expressed her gratitude to Brooke for including the priority of the needs as this is very helpful when trying to address these science needs with outside partners. Breck then asked about the aquaculture science need and if it might be considered a mapping need. Brooke said yes, she would consider it to be a mapping need and that Briana Yancy laid the foundation of the project from her time in the Chesapeake Conservation Corp.

Peter Tango asked what can be done collectively to enhance SAV Watcher contributions to calibrate data for supporting AI algorithm tuning? Brooke said she doesn't think the SAV Watcher program would be right for this work due to the need for analysis of sample cores. Instead, the SAV Sentinel Sight program would be the best fit for generating this data as part of its protocol will be to map density and biomass from cores. Bruce suggested tying in monitoring of fish at the Sentinel sites as well.

Peter Tango asked in the chat, is there evidence that Halodule is moving north without intervention (i.e., transplanting)? Brooke responded no, there isn't any evidence that Halodule is moving north at this point.

Greg Allen stated the next Request for Proposals for SAV is due in six months and he has begun working on this with Carin Bisland and Scott Phillips. Greg said others very interested in it should email him to get involved. Greg also expressed the need to understand soon whether or not the SAV workgroup expects large changes in monitoring protocol or plans to continue with the current line of protocols.

Denice Wardrop commented in the chat that for access to resources, a searchable database of all STAC reports is at https://www.chesapeake.org/stac/publications/.

Breck asked Brooke and Julie Reichert-Nguyen if they know if the blue carbon market for SAV is different than for wetlands? Do they require different protocols? Breck said she was wondering if these efforts could be combined or if they need separate work. Brooke responded that she believes they could be combined but is unsure. Brooke added that they would have different monitoring protocols and sequestration is a focus on the Bay Program's, but that entering the market may be similar for both. Julie responded that regarding carbon markets, not all blue carbon crediting protocols include SAV, but all include tidal wetlands - they may define these a bit different, but she would have to check.

10:55-11:20 **Blue Crab Abundance** - Mandy Bromilow

Summary

Mandy Bromilow began by explaining that most of the science needs for Blue Crab Abundance fall into two categories: improving model performance and understanding population dynamics.

First, Mandy talked about science needs in progress, which are currently in the STAR science needs database and have had some actions taken to address the need. These in progress science needs include evaluating the effects of environmental factors on blue crab abundance and recruitment, improving the accountability and harvest reporting for commercial/recreational fisheries, improving characterization of catch composition and effort using fishery dependent sampling, and evaluating the efficacy of the Winter Dredge Survey (WDS) as an index of abundance.

Mandy next talked about ongoing science needs that will likely be routinely updated. These needs include a stock assessment update, examining differences in gear efficiency between Maryland and Virginia WDS, and blue catfish predation in the tidal reaches of tributaries.

Mandy also discussed science needs that are not being addressed. These science needs include: investigate the stock assessment model's poor fit to sex-specific catch and abundance indices, development of a blue crab data hub, evaluate models for fishery-independent indices to identify the most appropriate form and standardize index development, investigate potential applications of existing fishery-independent data sets, improve documentation of sex ratio and shedding mortality in the peeler fishery for more accurate harvest reporting, and gauging public perceptions and commercial fishery stakeholder views on key Bay resources.

Mandy concluded with some recent considerations that the Chesapeake Bay Stock Assessment Committee (CBSAC) has produced. Those include looking into a science workshop to improve understanding of drivers of abundance and recruitment and identify questions, data sources, science gaps, resource needs for a potential benchmark stock assessment in the near future. CBSAC is also considering additional science needs may be added after CBSAC develops the 2022-2023 Logic & Action Plan (Jan 2022) and holds the science workshop (TBD).

Discussion

Breck Sullivan added that science needs can be added to the science needs database at any time.

Bill Dennison asked what social science aspects have been included in this work given the status of being an active fishery? Mandy responded that there was a meeting a few weeks ago for CBSAC about engaging the fishing industry and including them in upcoming science workshops and discussing habitat monitoring.

Scott Phillips asked as a follow-up discussion to possibly bring to STAC, does anyone know of opportunities to help address these unmet Blue Crab science needs? Mandy mentioned that the recently approved GIT funding project can help address one need.

11:20-11:45 **Oysters** - Bruce Vogt

Summary

Bruce Vogt prefaced that the current list of science needs will be updated soon, and they are working to revise them. He began by discussing the current needs that are being addressed, which include: pre-restoration data collection and analysis, restoration progress tracking, monitoring of restored reefs, developing streamlined monitoring protocol, quantifying ecosystem services and economic impact, monitoring performance of restored reefs, oyster restoration of best management practices. For each of these science needs, he provided context and ongoing projects that are working to address the knowledge gaps.

Bruce then talked about emerging science needs, which generally fell into two groups: climate change or refining restoration approaches. He further detailed some subcomponents of each category.

Discussion

Tom Parham asked Bruce when evaluating general reef restoration performance, do they assess site water quality (episodic/long-term) to help understand change? Bruce responded that historically they utilized the water profilers in Maryland to understand some components of water quality, but that it has not been exhaustive. Bruce added that some more discussion on water quality will take place at the upcoming fisheries goal implementation team.

Scott Phillips added that any research-based needs will be brought before STAC by Breck so hopefully they can help.

11:45-12:10 **Forage Fish** – Justin Shapiro

Summary

Justin Shapiro began by stating this presentation will focus on the science needs that are currently in the database. Justin first shared one of the science needs that has been completed, specifically the shoreline threshold analysis which utilized GIT funding. Second, Justin shared ongoing science needs for forage fish, such as a Bay wide inventory of shoreline condition/type, benthic forage abundance indicator in collaboration with the Status and Trends workgroup, and climate related changes in fish distribution. GIT funding, NCBO funding, and the Rising Water Temperature STAC Workshop has been leveraged to address the knowledge gap around impacts of climate change.

Justin then spoke about the new science needs expressed at the recent Management Board meeting. These new science needs include indicators to support Ecosystem Based Fisheries Management at bay and regional fishery management level and improved monitoring networks in shallow water and for plankton.

Discussion

Scott Phillips asked about the potential effects of invasive species (blue catfish) on forage fish? Bruce Vogt said that they are working to address this, but it is still uncertain. Scott suggested adding that as a science need. Bruce said that is a good idea, and that there should be outreach with Tom McDonnell at USGS. Scott offered to relay that message to him. Mandy responded that yes, juvenile blue crabs are important forage and there have been questions about impacts on things like herrings/shad.

Renee Thompson commented that the baywide inventory of shoreline has been identified as a complementary overlay to add to the Chesapeake Healthy Watersheds Assessment. Renee also brought up that they are working on a scoping project and wanted to consider if there was opportunity for synergy. Renee asked if forage abundance or other habitat needs can be investigated in the Chesapeake Conservation Partnership (CCP) priority Habitat scoping project? Renee is interested in understanding the nexus between fish habitat needs and high value conservation habitat. Renee asked if there is a way to combine these or if the terrestrial and aquatic habitat assessments are in two different worlds? Bruce said they should follow up on this and mentioned a pilot fish assessment run by the National Center for Coastal Science for the Choptank given its importance for striped bass. Bruce also mentioned a joint NOAA-USGS tidal and non-tidal fish habitat assessment for the Patuxent that is in the Logic and Action Plan. Bruce said those two systems might be good examples to examine the connection between land and water systems. Kristin Saunders added that is consistent with what they are hearing coming from the Comprehensive Evaluation of System Response (CESR) report about the transition zone and the need to understand what is going on there, including aquatic habitat. Denice shared STAC is hoping to have completed the CESR report by the beginning of March.

Breck Sullivan asked about the bay wide inventory science need and if there is a need for additional support in Maryland. Justin said that VIMS has expanded to Maryland for some counties, but there are still more resources and funding needed to cover the rest of the counties.

12:10-12:30 Coordinator/Staffer Meeting

Participants: Alex Gunnerson, Amy Goldfischer, Breck Sullivan, Scott Phillips, Peter Tango, Bruce Vogt, Mandy Bromilow, Brooke Landry, Liz Chudoba, Amy Handen, Aaron Bever, Becky Golden, Carl Friedrichs, Caroline Johnson, Denice Wardrop, Garrett Stewart, Jamileh Soueidan, Doug Austin, John Wolf, Julie Reichert-Nguyen, Meg Cole, Marjy Friedrichs, Mark Trice, Angie Wei, Chris Guy, Cindy Johnson, Chris Moore, Greg Allen, Greg Barranco, Jennifer Starr, Justin Shapiro, Katheryn Barnhart, Katlyn Fuentes, Ken Hyer, Kristin McCarthy, Kristin Saunders, Labeeb Ahmed, Marisa Baldine, Mark Nardi, Megan Ossmann, Olivia Wisner, Renee Thompson, Sarah McDonald, Sophie Waterman, Stephen Faulkner, Tom Parham, Bill Dennison, Briana Yancy, Emily Bialowas, Laura Cattell-Noll, Lee McDonnell, Britt Slattery, Alexandra Fries, Ola-Imani Davis