



**Chesapeake Bay Program's (CBP)
Scientific and Technical Advisory Committee (STAC)
March 2023 Quarterly Meeting Minutes
Webinar Meeting**

Tuesday, March 14th

Attendance:

Members: Kathy Boomer (FFAR), Shirley Clark (PSU), Bill Dennison (UMCES), Zach Easton (VT), Lara Fowler (PSU), Ellen Gilinsky (Gilinsky, LLC), Kirk Havens (VIMS), Ben Hayes (Bucknell University), Scott Knoche (Morgan State, PEARL), Ellen Kohl (St. Mary's College of Maryland), Erin Letavic (Herbert, Rowland, & Grubic, Inc.), Andy Miller (UMBC), Mark Monaco (NOAA), Greg Noe (USGS), Efeturi Oghenekaro (DOEE), Kenny Rose (UMCES), Mike Runge (USGS), Larry Sanford (UMCES), Leonard Shabman (Resources for the Future), Eric Smith (VT), Jeni Keisman (USGS), Jeremy Testa (UMCES), Tess Thompson (VT), Weixing Zhu (Binghamton)

Guests: Greg Allen (EPA), Kofi Asante-Duah (DOEE), Marisa Baldine (CRC), Greg Barranco (EPA), Alicia Berlin (USGS), Carin Bisland (EPA), Karl Blankenship (Bay Journal), John Karl Bohlke (USGS), Sarah Brzezinski (EPA), Melissa Fagan (CRC), Katlyn Fuentes (CRC), August Goldfischer (CRC), Chris Guy (USFWS), Emily Hoyt (Morgan State, PEARL), Amy Hruska (SERC), Tom Ihde (Morgan State, PEARL) Dave Jasinski (GreenFin), Dede Lawal (CRC), Lew Linker (EPA), Pam Mason (VIMS), Scott Phillips (USGS), Julie Reichert-Nguyen (NOAA), Matt Royer (PSU), Gary Shenk (USGS), Kelly Smalling (USGS), Jamileh Soueidan (CRC), Jennifer Starr (Alliance for the Chesapeake Bay), Kurt Stephenson (VT), Breck Sullivan (USGS), Harry Wang (VIMS), Harry Zhang (Old Dominion University)

Administration: Denice Wardrop (CRC), Meg Cole (CRC), Tou Matthews (CRC)

Call to Order, Announcements – Kathy Boomer (STAC Chair – FFAR)

Kathy Boomer (FFAR) called the meeting to order with a brief review of the 2014 Chesapeake Bay Agreement and role of STAC. Boomer recognized the following STAC member contributions and respective role changes: Eric Smith (VT) for his contribution in discussion of system dynamics and management as he cycled off following the December meeting; Efeturi Oghenekaro (DOEE) for moving from an at-large member to DC mayoral appointee; and Scott Knoche (Morgan State, PEARL) for joining the Executive Board (EB). Boomer reviewed the schedule of STAC meeting themes, including the March 2023 meeting topic addressing human pathogens in the Chesapeake Bay. March themed panel discussions were coordinated with the help of STAC members Mark Monaco (NOAA), Oghenekaro, Ellen Kohl (St. Mary's College of Maryland) and Knoche; the June meeting will address the triblet and T-zone concept. Following, a quick overview of the [March meeting agenda](#) was given.

STAC Business, Approvals & Announcements – Kathy Boomer (FFAR), Meg Cole (CRC)

STAC Staff introduced Tou Matthews (CRC) as the new STAC Projects Manager. Previously this role was described as 'STAC Staff' but due to changing responsibilities and a desire to reduce confusion with the [Environmental Management Career Development Program](#), the title has been updated. STAC recognizes and applauds Meg Cole (CRC) for fulfilling the roles of STAC Staff for almost a full year. Due to this limited capacity of STAC Staff, the December 2022 Meeting Minutes draft was not available until the start of the March quarterly meeting so Kathy Boomer proposed deferring approval of the minutes to the June Meeting to allow members time to review, Kirk Havens (VIMS) seconded this proposal. Lara Fowler (PSU) suggested members review the minutes overnight and approve them on Day 2; Boomer requested a motion to approve the December 2022 Meeting Minutes at beginning of Day 2; Weixing Zhu (Binghamton) seconded the request and no objections were made.

STAC Staff updated the committee on STAC FY22 workshops. The [Local Monitoring workshop](#) from earlier in the month, March 7 and 8th, was the first of the season with an in-person/virtual hybrid format. All FY22 workshops will have an AV component to allow for a hybrid format: the Ecosystem Services workshop is planned for two non-consecutive days on March 16th and April 18th, the Stream Restoration workshop will convene over three days from March 21-23rd, the Solar Farm workshop is planned for April 6-7th, and finally, the Biochar workshop will be held over two days on May 25th and 26th. More information on FY22 workshops can be found on the [STAC website](#).

Boomer opened the floor to announcements from STAC Members. Kenny Rose (UMCES) informed STAC that he will be reporting on findings from the living resources document that informed the Comprehensive Evaluation of System Response (CESR) report at the Scientific, Technical Assessment and Reporting (STAR) meeting in March. Bill Dennison (UMCES) followed up that both he and Jeremy Testa (UMCES) presented on the stream portion of the estuary CESR resource document at the previous STAR meeting.

Boomer continued STAC announcements. Upcoming quarterly meetings are planned to be in-person on June 13-14th in northern Virginia and on September 12-13th in Baltimore. The final meeting of the year will convene virtually on December 5-6th. In partnership news, Carin Bisland (EPA) announced her plan to retire in May 2023.

Federal Guidance on Incorporating and Implementing Indigenous Traditional Ecological Knowledge (ITEK) – Denice Wardrop (CRC)

Denice Wardrop (CRC) reviewed the federal [guidance](#) on and [implementation](#) of Indigenous Traditional Ecological Knowledge (ITEK) released November 2022. Language in the documents relevant to STAC includes recognition and inclusion of Indigenous Knowledge in government research, policy, and decision making; "Indigenous Knowledge is a valid form of evidence for inclusion in Federal policy, research and decision making." The guidelines specify ways to

engage with Indigenous Knowledge and what relationships with Tribal Nations and Native communities should look like. Though the guidance is directed towards federal agencies, STAC should also be aware of these guidelines to ITEK in the process of incorporating knowledge into decision-making. One guidance of note is to pursue co-production of knowledge as STAC often produces scientific information and proposes solutions to inform decision-making. Agencies were asked to respond to the implementation guidance within 180 days of Guidance for Federal Departments and Agencies on Indigenous Knowledge .

ACTION: Federal STAC appointees are asked to bring their agency-specific plans on incorporating ITEK to STAC and work with STAC Staff to formulate a plan for STAC to implement .

Fowler asked Wardrop how the ITEK guidance aligns with [Justice40](#), in which the Federal Government commits 40% of climate-related funding to disadvantaged communities overburdened by pollution. Wardrop suggested reviewing Appendix B of the ITEK guidance, “Select Federal Agency Guidance Documents on Indigenous Knowledge”, which lists existing agency-specific guidance. Kenny Rose mentioned that he is co-advising Nicole Holmes, a Native American master’s student, who is surveying the roles Indigenous peoples have played in Bay restoration historically; Rose mentioned Holmes’ research may be a resource to STAC in this context.

[Update on Comprehensive Evaluation of System Response \(CESR\)](#) – *Denice Wardrop (CRC), Kurt Stephenson (VT)*

Wardrop refreshed STAC on the previous CESR update given during the STAC December 2022 quarterly meeting, which requested STAC members provide feedback on the drafted document. On December 23rd, the Executive Summary was sent to be reviewed by a committee of outside reviewers gathered by Erin Letavic (Herbert, Rowland, & Grubic, Inc). A draft of the CESR report without the Executive Summary was sent to technical editor Pat Norris (Michigan State). On January 20th, the Executive Summary was revised and included in the draft final report, which was shared with the CESR steering committee with a document collating all comments and responses to those comments on February 2nd. On February 23rd, the steering committee met to assess any remaining major comments needing resolution and submit the document for USGS agency review. Although the report release will be delayed by two months for this three-part USGS review, Wardrop emphasized that the document will be “much stronger” and that USGS approval will increase the report credibility. The first round of comments was received on March 1st, including technical comments and rephrasing suggestions. Wardrop and Kurt Stephenson (VT) addressed the review and will resubmit the report for another round of revisions on March 20th. Once this third review is complete, the steering committee will finalize

and approve of the CESR report. STAC members will then review the report and decide whether they would like to sign on as contributing author.

Mike Runge (USGS) asked how the three rounds of review work, since USGS typically only performs two rounds. Greg Noe (USGS) explained that in this categorization, the center level review was split for description. Since Round 2 and 3 can generate more comments, Wardrop confirmed that there may be an additional round; only when all USGS comments are addressed will the report go through the steering committee a final time. Ellen Gilinsky (Gilinsky LLC) asked if the USGS review will cover the needs of any other federal agency reviews though no other federal agency has requested approval of this STAC document. Wardrop stated the EPA does not have a process in place to review STAC publication and recalled from a prior conversation with Monaco that NOAA likewise does not require a review. Monaco elaborated that the technical review by USGS is sufficient for NOAA as their process is very similar. Special acknowledgement was voiced for Noe by CESR steering committee members for his help in facilitating the USGS review process for this effort.

Boomer requested further explanation of the separation between policy and science as described by the USGS review process. As provided by Noe and Scott Philips (USGS-retired), Wardrop relayed suggestions and best practices for moving a STAC report through the USGS review process with the intention of gaining approval and expediting the review. The first recommendation is on delivery: rather than “the program should do *this*,” the language should read “if the program wants to achieve *this*, then *this* is something they could do”: the report cannot direct the policy. Comments received helped in questioning whether there is a sufficient amount of evidence within the report to stand behind recommendations. Andy Miller (UMBC) wondered whether comments may be satisfied if directed to the CESR resource documents, Wardrop said the response to these comments were to further specify the exact finding or implication and to make sure the evidence was well stated in the specific section. Noe clarified that the USGS review process does not include the CESR resource documents though citing these documents within the main report is sufficient evidence/justification.

Letavic asked how delays to finalize the report are being communicated to the Chesapeake Bay Program’s Executive Council (EC), Principals’ Staff Committee (PSC), and Management Board (MB) as all groups have expressed interest in the report recommendations; Wardrop answered that the Management Board was made aware of the review and supported the decision to delay the release of the report. Rose asked how the supporting documents will be released; Wardrop predicted the three resource documents would be published as individual STAC reports with their respective cited authors. The Living Resources document does not have a listed USGS author, so Rose suggested that if a co-author would like to have the report reviewed, it should be done as soon as possible. For a NOAA review, Monaco stated that it depends on how the report is published. If the final report is trackable or provided a Digital Object Identifier (DOI) number, a NOAA review will be required. Rose and Monaco concluded

that the authors of the Living Resources document will determine internally how the document will be released. Boomer strongly encouraged the Living Resources authors pursue the review process for their respective document as the Estuary and Watershed resource papers are committed to moving through the process; Rose argued that the Living Resources document will not go through USGS review since there are no USGS authors and that NOAA reviews are comparable but not at the same level as the USGS review. Monaco verified that the steps of the NOAA review are similar but the intensity is not: a NOAA review usually takes a handful of weeks and Monaco suggested he may be able to expedite the process. Rose acquiesced that the NOAA review would be reasonable; Wardrop underscored that this review would add credibility to the document and CESR package.

Following the agency review discussion, Wardrop opened the conversation as to what role STAC and the CESR steering committee may play in future CBP discussions that intersect with findings/implications brought forward by CESR. She noted that the CESR document has started to open space for conversation on difficult topics, and Wardrop expressed the desire to keep up this momentum in part with the support and engagement of STAC members and the committee as a whole. The CESR steering committee requests time at the STAC June quarterly meeting to discuss an outreach and engagement plan for communicating findings once the report is published. Wardrop said this CESR team will work in tandem with Rachel Felver (Alliance) to develop this outreach strategy. Boomer proposed a subgroup of STAC members reflect on CESR and develop a strategy for engagement. This suggestion was tabled until the end of Day 1 and included in an afternoon session looking at the CBP Strategy Review System (SRS) Biennial Meeting.

STAC Membership Update – Meg Cole (CRC)

Meg Cole (CRC) detailed current and upcoming STAC Membership vacancies. Ongoing vacancies include the following: 1 Federal appointment (Brandon Jones (NSF) stepped down), 2 Gubernatorial appointments (Hamid Karimi retired from DOEE, Chancee Lundy (Nspiregreen LLC) stepped down), and 2 at-large appointments (Lee Blaney (UMBC) rotated off in December 2022; Diedre Gibson (Hampton University) stepped down in February 2023). STAC plans for Oghenekaro to assume the role of a DC Mayoral appointment. In March, Zachary Easton (VT) and Smith will rotate off allowing for two additional at-large vacancies. Four at-large appointments will also open by the end of September: Fowler and Miller will cycle off after two terms, Testa will step down after his term ends to go on sabbatical, and finally, Jay Stauffer (PSU) will cycle off at the end of his term. In summary, STAC will have vacancies for one (1) Federal appointment, two (2) Gubernatorial appointments, and eight (8) at-large appointments by the end of September.

Expertise leaving when the above mentioned STAC members step down is the following: 'watershed – hydro-aquatic,' 'social science,' 'urban/WWTPs,' 'environmental data analysis,' 'estuarine – living resources,' 'estuarine – physical/biogeochemical,' and 'toxic contaminants'

and CECs.’ Topic and experience areas identified as lacking on the committee by the STAC Executive Board was agriculture and ITEK expertise, researchers and academics affiliated with historically black colleges and universities , and representation from agency partners National Science Foundation (NSF) and the Environmental Protection Agency (EPA). Prioritizing expertise by numbers, two of five ‘urban/WWTPs’ STAC members are rotating off, there are no members for ‘toxic contaminants,’ three of four openings are filled for ‘agriculture,’ and two of six ‘watershed – hydro-aquatic’ members are rotating off.

In order to promote a more diverse pool of applicants , STAC released a call for self-nominations in 2021. Cole shared the 2021 self-nomination form, which will be revised for 2023 and updated to include needed expertise. Miller asked what the strategy for the timeline is, seeing as vacancies are opening up over a period of multiple meetings. He suggested allowing the self-nomination form to stay open through early- September; Cole agreed and underscored that applicants should be informed of their accepted nomination before the September quarterly meeting so that they may join STAC at the September quarterly meeting in-person. Fowler noted that representation from Virginia Tech and Penn State will be decreasing as members cycle off over the next year. Gary Shenk (USGS) pointed out that the Federal members are appointed by the CBP Director; STAC Staff has a list of potential candidates floated over the last few years that may be helpful to review. Larry Sanford (UMCES) highlighted Fowler’s comment and recommended the online self-nomination form stay open. Cole suggested the EB review submissions each month as they roll in and discuss potential nominees on monthly EB calls. Boomer requested STAC consider the outcomes the committee and the CBP are striving for and seek out experts who can help achieve those outcomes - Kohl proposed including three dates on the self-nomination form stating applications will be reviewed on a rolling basis and decisions will be made on the agreed upon monthly dates.

DECISION: The 2023 STAC self-nomination form will remain be open until September and **the EB** will discuss candidates as applications are received each month on Executive Board meetings.

Cole reviewed the March 2022 call for self-nomination form with STAC and asked the committee to weigh in on whether a prioritization of needed expertise was necessary. Boomer believed sub-group of STAC members representing the CESR effort at the 2023 SRS Biennial Meeting may be able to identify knowledge needed most immediately. Letavic inquired how the number of slots available for each expertise originated from; Cole stated the current committee expertise makeup has been passed down from previous STAC Coordinators and she proposed evaluating the composition of member expertise to better balance the current needs of STAC and the CBP. Wardrop noted that STAC and the Scientific, Technical Assessment and Reporting (STAR) have been working closely over the past 3-4 years and STAR Coordinator, Breck Sullivan (USGS), might have input on expertise areas that are lacking or need additional

support by reviewing the [Science Needs Database](#); Sullivan was willing to provide suggestions for the committee.

STAC has partial influence over Federal appointees as STAC Chair can submit a nomination on behalf of STAC to the CBP Director. Similarly, the Bay Program is allowed to submit recommendations. During previous quarterly meetings, STAC discussed eight or nine possible Federal candidates as a whole committee. On-boarding of new members will need to be considered; Fowler advised. The new membership packet STAC Staff distributes to incoming members could be updated to include recent partnership materials and STAC products. Dennison proposed a mentor system between new members and current members.

STAC Workshop RFP FY23 Results – Meg Cole (CRC)

One workshop proposal was submitted for the fiscal year of 2023 (FY23) entitled, “*Chesapeake Bay Program Climate Change Modeling III – Post-2025 decisions.*” Shenk, a workshop steering committee member, joined the meeting to answer questions from the committee on the workshop proposal. The requested funds for this event are \$10,000 and the estimated time-frame for convening is early 2024. Jeni Keisman (USGS) and Zach Easton are the STAC representatives for the workshop.

STAC members submitted comments and scores on the proposed workshop prior to the meeting. STAC Staff reviewed feedback received on the proposal; overall, members were supportive of the proposal. One comment suggested the steering committee add a climate scientist and/or additional expert with experience using climate change projections to model watershed response. Another asked whether shallow water would be addressed in the workshop.

Gilinsky questioned if the workshop could convene with a budget of \$10,000; to cut down on additional cost, Shenk stated this workshop would be over 1 ½ days, with an emphasis on in-person participants. Zhu underscored the importance of the proposal in regard to timing and climate change, Miller and Monaco also strongly supported the proposal and requested more consideration of living resources in the overall objective.

The request for workshop funding was approved for \$10,000. STAC Staff will begin coordinating FY23 workshops by June 1st, 2023. FY23 activities will convene by May 31st, 2024.

DECISION: The FY23 STAC Workshop Proposal was approved for funding, contingent that the steering committee reviews comments and suggestions provided by the STAC membership.

Committee Discussion of Remaining FY23 Workshop Funds: Considerations of STAC priorities, funding availability, and opportunities for engagement – Meg Cole (CRC)

STAC discussed utilization of workshop funds for FY23 and the following years. The EPA Cooperative Agreement that provides funding for STAC has three primary tools to convene science: technical reviews (\$10K annually), workshops (\$40K annually), and targeted synthesis work (\$30K annually in years 2-5, targeted towards climate change and environmental justice). Excess funds can be rolled over into subsequent years, over the 5-year lifetime of the grant. \$30k is currently available for FY23 workshops. STAC brainstormed how best to utilize these remaining funds, fitting actions under four themes, outreach, workshop ideas, follow-up, and communication:

- Outreach
 - Create more specific and tailored RFPs to attract a determined type of proposals.
 - Identify the peoples that are missing from scientific needs conversations and the reasons they may not be in these conversations (e.g. they are unaware of the available funds, or they cannot afford to be unpaid to attend meetings).
 - Reach out directly to underrepresented communities and consider allowances for nontraditional peoples to be in the room.
 - Award technology innovations specific to targeted scientific needs.
- Workshop Ideas
 - Partner with the Habitats GIT for a [Workshop on Structured Decision Making](#)
 - Establish a second tier of workshops that has a larger budget; these workshops can have different criteria and elements, such as more days and inviting peoples from outside the region.
 - Fund workshop preparation roles, such as hiring a graduate student to write a background section.
 - Potential workshop topics: remote sensing, oyster / filter feeders as BMPs
 - Work with STAR on science needs that require additional exploration.
- Follow-Up
 - Dedicate conversations to further discuss and follow up with previous workshops and their recommendations, such as Rising Temps and PFAS.
 - Host significant workshop(s) to discuss the CESR report and implementing recommendations for beyond 2025.
- Communication
 - Create guidance manuals and documents to stakeholders and practitioners on outcomes from these science discussions.
 - Improve the style, quality, breadth and diversity of communications from STAC.
 - Focus on different kinds of communication projects to different audiences.
 - Discuss communication strategies to best persuade the watershed program to accept STAC recommendations.

[Briefing on FY21 STAC Workshop “Improve the Understanding and Coordination of Science Activities for PFAS in the Chesapeake Watershed”](#) – Kelly Smalling (USGS)

Kelly Smalling (USGS) presented on findings and from the FY21 STAC workshop on the state of the science on PFAS. More information on this activity is available on the [workshop webpage](#).

After presenting high-level takeaways from the workshop, Smalling reviewed comments received on the draft report and how the steering committee responded/incorporated the feedback. Runge noted that the USGS report review process replicated the work of an associate editor for this report. Miller had a minor question regarding the recommendation grouping order in Smalling’s presentation, which differed from the report but Miller noted was effective for communicating the science. Fowler emphasized the importance of communicating this report as PFAS is a hot topic and the publication may receive more attention than predicted. The Chesapeake Bay Program’s Communications Office lost capacity over the last year and Wardrop was supportive of establishing a small group willing to be a first point of contact on questions related to this effort. Knoche wondered how many STAC members feel strongly about the need for an increased communications capacity and/or interest in piloting an approach. Members voiced that the Bay Program could invest in communications capacity.

Boomer called for committee approval of the STAC report on PFAS. Fowler made a motion to approve, seconded by Easton. No oppositions were made and the report was approved.

DECISION: STAC approved report for state of the science workshop “Improve the Understanding and Coordination of Science Activities for PFAS in the Chesapeake Watershed.”

Report Out Pennsylvania in the Balance – Lara Fowler (PSU), Matt Royer (PSU)

Fowler and Matt Royer (PSU) gave an overview of the [Pennsylvania in the Balance](#) conference, a forum started in 2016 as a long-standing set of conversations seeking to identify new, innovative solutions for productive agriculture that meet water quality goals. In 2022, an increase in federal and state funding allowed for an additional PA in the Balance workshop to convene in December. Several emerging themes were identified and recommendations drafted to progress towards these themes.

Letavic shared that reaching out to local stakeholders during the planning process has been an effective way to implement more practices compared to through the state and/or federal bureaucracy. Wardrop asked Fowler if there has been an assessment of benefits and challenges of the local engagement model approach to building watershed implementation plans, Royer emphasized that this approach connects with those who have the greatest understanding of local happenings and effects, and is embraced by localities.

Science Needs of the Chesapeake Bay Program: Climate Change and Resiliency Cohort – Breck Sullivan (USGS), Julie Reichert Nguyen (NOAA), Pam Mason (VIMS), Alicia Berlin (USGS)
Sullivan, along with outcome leads Julie Reichert-Nguyen (NOAA), Pam Mason (VIMS) and Alicia Berlin (USGS), reported out on the [Climate Change and Resiliency Cohort](#), which contains the outcomes within the CBP for climate adaptation, climate monitoring assessment, wetlands and black duck.

Following Reichert-Nguyen's presentation on climate science needs, Gilinsky asked what the Bay Program can do to publicize these needs to partner universities and agencies; Reichert-Nguyen stated the cohort currently works with the University of Maryland Center for Environmental Science (UMCES) and the Local Government Advisory Committee (LGAC), and open to discuss more on these needs at the STAC June meeting. Sullivan added that the next step in sharing the science needs database is educating users that it is available and can be easily used while coming up with a potential project. STAR requested STAC's help in finding and building relationships with the academic community. To better facilitate this interaction, Fowler requested a short communication email with the science needs and contacts for STAC to help distribute; Sullivan agreed to draft the email and share it with those interested. Letavic commented appreciation for the collaborative team approach on the EPA proposal and support for the social science behind the acceptance of natural design solutions. Tess Thompson (VT) suggested including in the drafted email that support letters are provided to applicants seeking large national proposals, and advised compressing research timelines for funded graduate students.

Following a presentation on wetlands outcomes given by Mason, Boomer announced the Conservation Drainage Network meeting on April 4-6th. In the meeting chat, Carin Bisland (EPA) asked how it is shown that progressing wetlands will help fish habitats and water quality and other outcomes. There were no questions or comments following Alicia Berlin's (USGS) presentation on black duck outcomes.

Breck Sullivan ended the science needs section with a last announcement for the [STAR April meeting](#) that will focus on the local action cohort science needs.

[Brief on the CBP's Strategy Review System \(SRS\) Biennial Meeting](#) – Carin Bisland (EPA)
Bisland discussed the upcoming [Strategy Review System \(SRS\) Biennial Meeting](#) planned for May 11th and 12th at the Graduate in Charlottesville, VA. Wardrop confirmed the CESR report will be published prior to the meeting so that the findings and implications can be discussed. Sanford wondered if the question "do we have the right outcomes?" has been asked, Bisland replied that internal conversations are revolving around this but shifting the conversation from reaching 2025 to beyond 2025 may be more valuable. Boomer asked how helpful single-, double- and triple-loop learning is for making decisions and Bisland responded that it took time for SRS to look at determining if outcomes are the right ones and figuring out if the

partnership is most effectively organized. Wardrop mentioned that the last section of CESR, while not using specific language of multiple-loop learning, has a diagram of different types of learnings and how they can be applied and inferences on governance that can be made by comparing the structure of the CBP to the diagram. SRS has not gotten to triple-loop yet as it focuses so much on asks of the MB and anything STAC can do to move the CBP along on adaptive management would be helpful, Bisland.

For the upcoming Biennial, Gilinsky asked if STAC would have a platform to discuss CESR and other messages on adaptive management, Beyond 2025, etc. Bisland said there was not a slot for STAC specifically. The meeting aims to be more interactive than presentation-based and MB asks for STAC's contribution to the discussion. Boomer was at the last MB meeting and advocated for a role for STAC; STAC will have to define their role with MB before moving forward. Boomer suggested a subgroup of STAC members support the meeting and Bisland agreed that such a group would be helpful. Miller noted that groups that have already heard about CESR have expressed relief that the report gives them permission to think beyond TMDLs. The key for big change, Bisland said, will be in understanding the implications of recommendations and considering whether to extend time frames or to step back and rethink the path to reach goals and the overarching vision. Dennison supported STAC representation at the Biennial, including a presentation on funding, new leadership, and recognition the strategies that pushed to this point may not be the practices able to achieve the remaining necessary change.

ACTION: Carin Bisland, Denice Wardrop, and an interested subgroup of STAC Members will meet to discuss the messaging of CESR at the Biennial Meeting.

Volunteers: Mike Runge, Ellen Gilinsky, Bill Dennison

Boomer asked about the stakeholder involvement in the Biennial Meeting and urban/agriculture representatives, Bisland acknowledged that stakeholders are underrepresented on the agenda and that they are still looking to include voices that are not typically involved. This includes an extension to indigenous voices Boomer added. Sullivan and Wardrop have had conversations on the STAC and STAR partnership and will present lessons learned at the Biennial Meeting: highlighting this is important as the Biennial Meeting is the only time the entire Chesapeake Bay Partnership will convene in the near future. STAR will also focus on the Living Resource CESR Appendix at their [next meeting](#). There is an opportunity for STAC and STAR to think bigger and more creatively on tackling the outcomes by reflecting on the science brought into the program, Dennison. Bisland mentioned that while this is a difficult conversation to have with political people, that is the audience that will need to be convinced.

Fowler brought up that Baltics had this conversation 3 years ago and changed direction in their [2021 Baltic Sea Action Plan](#); she advised it may be beneficial to consult with them on their

lessons learned as well. Miller emphasized that we are not trying to convey to the program the impression that “everything you’re doing is wrong” or that “you have to throw it all out and start over again.” The message to present is “we are giving you the opportunity to accomplish these goals and it does not mean necessarily it will cost more.” The next stage of the CESR report will be to present this positive change.

To close Day 1, Boomer requested the approval of December 2022 Meeting Minutes be deferred to the June Meeting. Noe and Miller approved this motion and no objections were raised.

DECISION: STAC approval of December 2022 Quarterly Meeting Minutes are deferred to the June 2023 Quarterly Meeting.

Wednesday, March 15th

Introduction to Meeting Theme: Waterborne Human Pathogens and the Chesapeake Bay – *Kathy Boomer (FFAR)*

Boomer introduced the meeting theme of waterborne human pathogens and the Chesapeake Bay. The targeted outcomes were to refine system-based understanding, assess whether waterborne human health risks are adequately addressed within the CBP and identify information gaps and collaboration opportunities. Two panels with varying specialties were planned to help STAC understand land and water connections from the perspective of human-health risks in the bay system.

[Panel: Update on Waterborne Human Health Concerns and Incidence Rates](#) – *Salina Parveen (UMES), Cliff Mitchell (MD of Health), Eric Schott (Institute of Marine and Environmental Technology), Pat Gilbert (UMCES)*

In the first panel, Cliff Mitchell (MD of Health), Eric Schott (IMET), and Pat Gilbert (UMCES) presented on waterborne human health concerns and incidence rates. Letavic asked how to effectively communicate the heightened sense of awareness for waterborne health risks, Gilbert responded that scientists do know harmful algal blooms (HABs) are increasing in the Bay but face challenges with a decreased intensity of data acquisition and phytoplankton collection. HAB patterns are increasing and changing around the world, more awareness is needed of the impact of developing aquaculture industry and models need to be downscaled to regional sites. Mitchell added that there is a need to monitor and be more proactive rather than reactive, and that it is important to understand the political context of using risk models. Shirley Clark (PSU) asked what the next steps would be if immediate sewage leaks were cleaned up. Schott replied that each of the sites would need to be viewed independently, which is difficult from a regulatory perspective, and sewage-related bacteria would have to be measured rather than

environmentally-related bacteria. Schott and Mitchell had a conversation on the difficulty of determining the source of illness and how to communicate the various risks of water-related activities to the public.

Sanford commented on the time scales of variability between illnesses and HAB presentations and Gilbert further detailed some of the factors that influence this longevity of blooms. Sanford asked if the model predictive technique has been used to for humanborne pathogens and Schott confirmed that a lot of places have tried, such as Chicago and San Diego, and UMCES has submitted a proposal to the [Waterfront Partnership](#) to try a modeling approach in the Baltimore harbor. Pat Gilbert mentioned that models are only as good as the data available and that the Bay monitoring program has been cut significantly. Schott brought up an [Eyes on the Bay](#) sonde installed in Middle Branch to collect data on vibrios, which is at odds to a model the Oxford Lab is creating and Gilbert summarized that data is fragmented across the Bay and inconsistent in terms of time series. Zhu asked if the harmful pathogen count goes up after a storm and Gilbert said that there are examples of this occurring; Schott confirmed fecal indicators increase.

[Panel: Patterns in Occurrence Across the Bay: Knowns and Unknowns](#) – *John Jacobs (NOAA), Rita Colwell (UMD), Raleigh Hood (UMD), Harry Wang (VIMS), Andrea Brookfield (University of Waterloo)*

For the second panel, John Jacobs (NOAA), Rita Colwell (UMD), Raleigh Hood (UMD) and Harry Wang (VIMS) presented on patterns of waterborne human pathogen occurrence across the Bay. Clark commented that this conversation fits well with the recent FY22 [STAC workshop on local monitoring](#), where septic systems and sewers leaking nutrients into the Bay were discussed. Letavic wondered if Wang's animation was overlaid with human interaction in the harbor, if more attention could be drawn to this conversation. Schott believes the urban inputs may tell us more about the ecology of these organisms at a finer scale; Boomer mentions a [paper by Haiyong Ding and Andrew Elmore](#) on urban impacts in the subestuaries. Schott suggested STAC engage with the [federal urban waters partnership](#) and the [Baltimore Ecosystem Study](#).

Miller asked if the model shown was the third hydrodynamic model and if not, how the concentrations step averaged - Wang stated the model is 3-dimensional with the surface concentration (Concentration I) being the most interested parameters associated with the floating particle. Noe questioned how water clarity influenced vibrio and Jacobs said that particle attachments occur with vibrios and they can be found in high concentrations in the sediments; Hood added that cholera is associated with crustacean zooplankton which is particulate matter. Schott asked about the role of grazers and Jacobs spoke about potential biological interactions and mechanistic modeling – understanding is limited and this is an area for future growth. Temperature salinity dependence found for vibrio vulnificus is similar to

relationships for sea nettle, Hood added. Boomer noted that the high-resolution maps would be very valuable to stakeholders.

Boomer wondered where the Bay Program stands in addressing human health risks. Hood responded that the CBP modeling structure does not run pathogen models or address risks at all. Schott could not comment on the CBP perspective but predicted that if human health were included, these risks would be elevated in the consciousness of municipalities, cities and urban areas; he cited an engaged workgroup that is discussing bacteria testing on a regular basis. Boomer reflected that these communities are not as centered as they should be and present an opportunity to be more inclusive. While the CBP is unable to run models for all tributaries of the Bay on a regular basis, they are able to identify high-level questions with the models and use them as an educational tool for raising awareness Gilbert noted. Jacobs recalled a CBP workgroup that attempted to look at health issues fifteen years ago but was unable to make much progress considering the regulatory community. Efforts now could help from an informative standpoint and advance bacterial TMDL and shellfish classification of growing waters. Jacobs also suggested the CBP become more involved in public communication of health risks, particularly in the areas of recreation and harvesting.

Theme Group Discussion – Kathy Boomer (FFAR)

Boomer opened the discussion to connect waterborne human pathogens to other STAC priorities. She prompted connections with CESR and the Biennial Meeting, as well as asking whether health risks need to be elevated in the Bay Program structure. Lara Fowler mentioned a network of researchers working on water quality bacteria related health questions at Penn State that she would like to send these materials and incorporate into future discussions. There is a lot of funding available on the health side related to climate; some of these funds could be used to address waterborne human pathogens. Boomer doesn't see a reason for the Bay Program not to elevate these issues as risk to human health can drive people to pay attention and engage. Kohl added that this also gives STAC an opportunity to build on environmental justice and DEIJ while considering more equitable monitoring, Schott suggested the CBP can help elevate the issues by connecting advocacy groups with health departments. Wang noted that his own model is for short-term hotspots while Hood's model is better for long-term prediction. Sherk emphasized past efforts to address the issues that faced pushbacks and proposed a new strategic approach to connect the watershed to general happenings; with the focus on CESR and the Biennial Meeting, the Bay Program should reconnect the dots back to goals of swimmable and fishable waters.

Meeting Wrap-Up and Summary

Boomer summarized the discussion as: STAC agrees that there is a timely and needed opportunity for health risks to be elevated in the CBP. These risks have close connections with existing Bay Program concerns, are relevant to stakeholders, and are increasing over time. With more advanced modeling technologies, it is time to revisit this concern and elevate it within the

partnership. Schott opened for consideration whether STAC is responsible for articulating how human health risks tie into other goals. Boomer continued to summarize the discussions as the following: STAC gained a better understanding of hydrochemical dynamics within a substrate in the shallow waters of our base systems, as well as connections between humans and land and water and between surface and groundwater.

The [STAC June 2023 Quarterly Meeting](#) will take place in-person on Tuesday and Wednesday, June 13th and 14th, 2023 at the Potomac Science Center in Woodbridge, VA. The theme will be 'Advancing the T-Zone Concept: Connecting living resources to estuarine dynamics.'