



**Chesapeake Bay Program's (CBP)
Scientific and Technical Advisory Committee (STAC)
March 8-9, 2022 Quarterly Meeting Minutes
Webinar Meeting**

Tuesday, March 8th

Members: Andy Miller, Ben Hayes, Bill Dennison, Brandon Jones, Catherine Kling, Celso Ferreira, Chanceé Lundy, Chris Brosch, David Martin, Deidre Gibson, Efturi Oghenekaro, Ellen Gilinsky, Ellen Kohl, Eric Smith, Erin Letavic, Greg Noe, Hamid Karimi, Jason Hubbart, Jeni Keisman, Jeremy Testa, Kathy Boomer, Kenny Rose, Kirk Havens, Larry Sanford, Leah Palm-Forster, Leon Tillman, Leonard Shabman, Mark Monaco, Mike Runge, Scott Knoche, Shirley Clark, Tess Thompson, Tom Ihde, Tony Buda, Weixing Zhu, Zach Easton

Guests: Alex Echols (Campbell Foundation), Alex Gunnerson (CRC), Alyson Santoro (UMD), Amy Goldfischer (CRC), Amy Handen (EPA), Becky Golden (MDE), Breck Sullivan (USGS), Brooke Landry (MD DNR), Carin Bisland (EPA), Charles Hegberg (Ecotone), Dinorah Dalmasy (MDE), Doreen Vetter (EPA), Doug Austin (EPA), Evan Isaacson (Chesapeake Legal Alliance), Gary Shenk (USGS), Greg Allen (EPA), Gregory Barranco (EPA), Harry Zhang (Water Environment & Reuse Foundation), Jennifer Starr (Alliance), Jeremy Hanson (CRC), Joanna Mok (UMD), John Clune (USGS), John Karl Bohlke (USGS), Justin Shapiro (CRC), Karl Blankenship (Bay Journal), Katie Brownson (USFS), Katie Walker (Chesapeake Conservancy), Katlyn Fuentes (CRC), KC Filippino (Hampton Roads Regional Planning Framework), Kristin Saunders (UMCES), Kurt Stephenson (VT), Lew Linker (EPA), Loretta Collins (UMD), Lucinda Power (EPA), Marc Stern (VT), Marjorie Zeff (AECOM), Mark Dubin (UMD), Matthew Houser (TNC), Melissa Fagan (CRC), Olivia Wisner (CRC), Peter Claggett (USGS), Peter Tango (USGS), Pierre Glynn (USGS), Rachel Felver (Alliance), Renee Thompson (USGS), Sara Weglein (MD DNR), Scott Heidel (PA DEP), Scott Phillips (USGS), Stephen Faulkner (USGS), Taylor Blackman (PSU), Theodore Lim (VT)

Administration: Meg Cole, Denice Wardrop

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

Kathy Boomer (FFAR) called the meeting to order at 9:00 am. Boomer acknowledged and welcomed seven new at-large STAC members – Celso Ferreira (George Mason), Jeni Keisman (USGS), Catherine Kling (Cornell University), Scott Knoche (Morgan State), Ellen Kohl (St. Mary's College), Dave Martin (Nature Conservancy), and Efturi Oghenekaro (DOEE) – to their first STAC Quarterly Meeting. New members introduced themselves briefly, discussing expertise area and current research. Following this Membership announcement, Meg Cole (CRC) provided the group with a recap on both the December 2021 Quarterly Meeting and February 2022 Executive Board Meeting. Boomer requested a motion to approve the December 2021 Quarterly Meeting Minutes, February 2022 Executive Board Meeting Minutes, and Executive Board Consent Agenda (January-March 2022). With no discussion of corrections, all documents were approved.

Jeremy Testa (UMCES) commented on the ongoing STAC conversation around Conowingo, stating that a small group of STAC members are continuing to work with Karl Blankenship (Bay Journal) on responding to relevant questions addressing this issue. Blankenship will be publishing an article on Conowingo for a broader audience in the near future. Members interested in weighing in on these questions or hearing more about this effort, can contact Testa.

Boomer then provided Membership with a briefing on the Chesapeake Bay Program's (CBP) response to the STAC STAC 2021 letter to the CBP Executive Council (EC). STAC recommendations included 1) investing in research to support science-based decision-making relevant to all Bay Program goals, 2) expanding DEIJ efforts to focus on understanding challenges, concerns, and opportunities to advance CBP goals from within diverse communities, and 3) maximizing opportunities by aligning CBP objectives and strategies with federal priorities. The Management Board highlighted several upcoming workshops to address the wetland and forest riparian buffer initiatives. Boomer suggested STAC use similar language to that of the Bipartisan Infrastructure Law to build off its investment and momentum in key areas such as climate resiliency and ecosystem benefits. After this recap, Boomer opened the floor to Member announcements.

Mark Monaco (NOAA) shared that the National Centers for Coastal Ocean Science has hired Dr. [John Jacobs](#) as the Director of the Cooperative Oxford Laboratory. Monaco offered his contact to newer members if they were interested in hearing more about the [Cooperative Oxford Laboratory](#).

DECISION: The December 2021 Quarterly Meeting Minutes, February Executive Board Minutes, and Executive Board Consent Agenda (January-March 2022) are approved.

[Briefing on New Land Cover, Land Use and Change Data from Chesapeake Conservancy, USGS and the University of Vermont](#) —

Katie Walker (Chesapeake Conservancy), Peter Claggett (USGS)

Katie Walker (Chesapeake Conservancy) is a Geospatial Program Manager who focuses on geospatial technology and analysis to support restoration and conservation efforts throughout the Chesapeake Watershed. Peter Claggett (USGS), Research Geographer, joined Walker in describing an ongoing project on 2017/18 1-meter land use/land cover data release. The 2017/18 land cover data were produced by the University of Vermont team after preliminary data was reviewed by local stakeholders, LUWG, and other Chesapeake Bay Program partners. Feedback was used to revise classification protocols and reclassify the landscape. The 2017/18 land use data are being produced by Chesapeake Conservancy in partnership with staff at USGS. Preliminary data was reviewed by Chesapeake Bay Program partners; feedback was used to revise the decision rules and protocols used to produce the classification.

STAC members interested in being notified when data is released can email Walker at kwalker@chesapeakeconservancy.org. Boomer acknowledged the value of high-resolution data for its utility in engaging stakeholders on the ground. Responding to a chat question by Miller, Claggett stated that all tree cover is not equivalent and a primary objective moving forward is

to map and track forest age. This will likely be performed with digital surface models (DSMs), either derived from Light Detection and Ranging (Lidar) or the imagery directly. For cropland characterization, priority is to separate crop and pasture from transitional lands such as natural succession or suspended succession. Further, there are plans to map 2021 animal operations using artificial intelligence. Claggett referred to work done by W. Dean Hively (USGS) on cover crops and remote sensing as a means to make inferences about management. Sanford asked about the usability of the data for mapping estuarine edges and shorelines, Claggett responded it is difficult as the Lidar and aerial imagery are not tide-coordinated.

Update from the Water Quality GIT: Proposed changes to BMP review protocols

- [Expert Panel Protocol History: Overview and](#) insights — *Mark Dubin (UMD)*
- [Introduction to CBP BMP evaluation protocols and discussion](#) — *Lucinda Power (US EPA), Jeremy Hanson (CRC)*

Mark Dubin, Senior Agricultural Advisor (UMD), began the session with a review of Chesapeake Bay Program Panel protocol history. After an overview on the historical process, Brandon Jones (NSF) asked if tribal ecological knowledge was discussed or included in discussions during the expert panel protocol; Dubin said it was not stated directly. Dubin mentioned the CBP Agriculture Workgroup developed a process to draw together a temporary committee to fill missing expertise on the expert panel. Letavic commented that as a new member, the presentation was a good reminder of the long history of Best Management (BMP) protocol development and recognition that the protocol should continue to evolve.

Jeremy Hanson (CRC) and Lucinda Power (EPA/CBPO) are working together on the current iteration of proposed revisions to the BMP expert panel protocol. BMP expert panel protocols were last revised in 2015 and there have been questions and concerns raised about the process associated with convening and executing Expert Panels, as well as the application of existing protocols. STAC members can view the [Protocol for the Development, Review, and Approval of Loading and Effectiveness Estimates for Nutrient and Sediment Controls in the Chesapeake Bay Watershed Model](#) and the [Proposed Revisions to the Chesapeake Bay Program Partnership's BMP Expert Panel Protocols: Fact Sheet](#) on the STAC March Quarterly Meeting page. By the end of May/June, Hanson and Power will seek consensus from the Water Quality Goal Implementation Team (WQGIT) on the revised BMP Expert Panel Protocol. The final review and comment period for the revised protocols is from March 29-April 29. STAC members who want to weigh-in during the review and comment period, should contact Jeremy Hanson (hansonj@chesapeake.org) before Friday, April 29th.

Runge commented that in the field of structured expert judgment, there is extensive research and well-established protocols for how to elicit quantitative estimates from a panel of experts in a way to capture uncertainty, reduce group think, reduce overconfidence of experts, and aggregate individual experts to have a well-calibrated ensemble estimate – Runge asked if this literature was relied on when developing the protocols. Hanson replied there is an awareness (particularly expert elicitation) and in some panels, they have relied on a template from such processes to structure the approach, though this is on a case-by-case basis. Zach Easton (VT) and Boomer requested more information on characterizing BMP performance uncertainty and variability, Stephen Faulkner (USGS) and Keisman agreed this was an important point. Hanson acknowledged this concern and stated there isn't a single central assumed value used in the

model and there are different levels of performance based on what is known about the BMP. Although, the entities that track and report the practice may not know all characteristics of the BMP. Hanson welcomed speaking and collaborating with others on communicating the variability of these practices. In addition, Hanson stated that this protocol is only for future panels and there needs to be further discussion on existing practices to integrate this revised protocol more comprehensively into the full catalogue of BMPs.

Larry Sanford (UMCES) suggested including some or all individuals on both the implementation and science portions of the work; Power said that the Watershed Technical Workgroup and the panel coordinator typically lead the technical appendix in coordination with the expert panel and is often intermixed. The technical appendix is developed either towards the end of an expert panel deliberation or after, it is not always concurrent. Power said it will vary per panel but where overlap is relevant or necessary groups should be intertwined. Denice Wardrop

(CRC) recommended STAC help create links beyond the BMP efficiency estimate. Shirley Clark (PSU) mentioned not much research focusing on terms of analyzing field verification data has been completed and there is a need to further tease out the design parameters with the most influence in certain BMPs. Sandford followed up on Wardrop's point, highlighting a synergy between the FY22 local monitoring proposal and the conversation due to the mismatch in scale; Miller agreed, stating that pulling in local monitoring results could be used to improve understanding of sensitivity to controlling factors and resilience in response to perturbation.

[Science Needs of the Chesapeake Bay Program: Healthy Watersheds and Aquatic Life Cohort](#)

— *Breck Sullivan (USGS), Outcome Leads*

Breck Sullivan (USGS) oversees the CBP Strategic Science and Research Framework. Sullivan and Outcome Leads from the Healthy Watershed and Aquatic Life Cohort presented to STAC on current science needs and requested feedback from the Committee on addressing identified needs. For new members, Sullivan provided a high-level overview of the Strategy Review System (SRS) and Strategic Science and Research Framework as well as a reminder about the relationship between Scientific, Technical Assessment and Reporting (STAR) and STAC.

STAC members were first requested to provide feedback on Healthy Watershed Cohort science needs. Sullivan described this presentation as the beginning of a conversation and invited Members to collaborate with the Cohort if they knew of any support or interest relevant to the described needs. Ellen Gilinsky (Gilinsky LLC) requested more information on underrepresented catchments and Sara Weglein (MD DNR) mentioned a large number are in Pennsylvania; Peter Tango (USGS) followed up, stating Community Science has used maps to target their new sampling support efforts that may become publicly available. Gilinsky followed up and suggested tapping into the [Water Quality Portal](#) (WQP) which integrates publicly available water-quality data from the United States Geological Survey (USGS), the Environmental Protection Agency (EPA), and over 400 state, federal, tribal, and local agencies, including probabilistic stream surveys. Scott Phillips (USGS) shared a recently published paper on flows and stream condition by Kelly Maloney (USGS) with the group, '[Altered flow affects the biological health of stream in the Chesapeake Bay watershed.](#)'

From experience of completing research on developing ecological indicators, Wardrop stated sampling is frequently done on low impact streams and she wondered how to produce the

appropriate data call to gather data (i.e., detailed macroinvertebrate sampling) from such underrepresented areas. Weglein said she was unsure of a present data call. Tango mentioned stream health data collections are evaluated on 6-year windows of time and data calls go out to agencies and institutions that are summarized into a database available to the CBP. On the Stream Health Outcome 'to better understanding the effects of climate change on stream processes', Boomer noted some overlap in the approved STAC FY22 workshop proposals and suggested linking with those efforts to learn of potential synergies.

Stephen Faulkner (USGS), Co-Chair of the Brook Trout Workgroup, presented on Brook Trout Outcome priority science needs. Boomer commented that the science needs presented parallel feedback from the Local Governmental Advisory Committee (LGAC) and Citizens Advisory Committee (CAC) on the need to better understand flood and drought risk in nontidal areas throughout the watershed. Letavic mentioned in Pennsylvania, they are working with local groups to map where these practices are happening on the landscape so that monitoring can occur. Major partners in this effort are the [Pennsylvania Fish and Boat Commission](#) and [Trout Unlimited](#). Letavic also shared the Chesapeake Monitoring Cooperative's [Chesapeake Data Explorer](#) available online.

Bruce Vogt (NOAA) and Justin Shapiro (CRC) reported out on the state of the science needs for the Fish Habitat Action Team. Shapiro shared an [example of a seasonal summary](#), which are used in a broader [state of the ecosystem report](#) for the Mid-Atlantic used by fishery managers. Phillips stated that the last science need, to 'better understand climate change impacts on water quality and fish habitat' applies both in the estuary and nontidal portion of the watershed. Mark Monaco (NOAA) asked if the science need to 'research to quantify success of nearshore/shoreline restoration sites' included evaluating natural based versus hardened infrastructure, Vogt responded not entirely – this effort is focused on determining how to utilize natural infrastructure designs to protect the shoreline while providing habitat value. There are similar needs in the watershed Phillips noted and mentioned a joint-project underway with NOAA to tie the watershed and estuary together.

Renee Thompson, Geographer and Coordinator of the Maintain Healthy Watersheds GIT (USGS), presented on Healthy Watersheds Outcome needs. In this round of SRS, Thompson said the GIT challenged themselves to think about science needs in a more holistic framework alongside social science and DEI. Thompson spoke about leveraging existing tools in the Chesapeake Healthy Watersheds Assessment Framework and better integrating other factors such as climate change, increased monitoring of healthy streams, into this framework. Ellen cautioned that there are many definition of what compromises a healthy watershed, programs at the EPA view this differently and states have their own designations, Thompson verified the healthy watersheds are state identified although they do not agree. STAC was requested to highlight the critical need for continued funding for very-high resolution land cover/use change monitoring in conversations with monitoring representatives. The Protected Land Outcomes science needs were discussed by Olivia Wisner (CRC). An urgent need Wisner highlighted is to provide green spaces that support improved public health, especially in traditionally underserved communities in both rural and urban settings. Gilinsky suggested Wisner connect with Ronda Chapman from the Trust for Public Lands; Letavic linked [WeConservePA's](#) webpage because the group also considers goals for preservation and advocates for funding supporting

preservation/research/implementation needs. For an existing bibliography on green space and health, Jeremy Hanson (CRC) suggested looking at the [Eco Health browser](#).

Brooke Landry (MD DNR), Mandy Bromilow (ERT), Vogt, and Shapiro presented science needs from the Aquatic Life Cohort. Due to time constraints, the question-and-answer portion was cut short after the outcome presentations. STAC members are requested to submit feedback on the Healthy Watersheds and Aquatic Life Cohorts via email after the Quarterly.

ACTION: STAC members are requested to submit feedback on the Healthy Watersheds and Aquatic Life Cohorts. You may either email STAC Staff or Breck Sullivan directly (bsullivan@chesapeakebay.net) with your comments and suggestions on the following questions:

- Do you or any of your colleagues have interest in contributing to addressing one of these needs?
- Do you or any of your colleagues know of existing efforts to support one of these needs?
- Do you want more information to come back to STAC from any groups on specific needs/projects?
- Are these needs appropriate? Do you see something missing?

Links: [CBP Science Needs Database](#); additional information and [Healthy Watersheds Cohort STAR Science Needs Presentations](#); additional information and [Aquatic Life Cohort STAR Science Needs Presentations](#)

[Comprehensive Evaluation of System Response \(CESR\)](#) —Denice Wardrop (CRC)

STAC Executive Director, Denice Wardrop (CRC), discussed the current status of the STAC Comprehensive Evaluation of System Response (CESR) report. To introduce newer STAC members to CESR, Wardrop provided the group with a brief description of the report timeline and steps taken to this point. With nearly a quarter of STAC being new, Wardrop offered to discuss the history more completely with anyone interested in learning about the history of CESR. At one point, Wardrop requested Members to think about their definition of consensus. Answer given were ‘cooperation and compromise’, ‘forming, storming, norming, performing’, ‘no vetoes’, ‘something most people can live with’, ‘when the group can come to live with the decision made through compromise’, ‘unanimous willingness to proceed, if not unanimous support of all details’, among others. Gary Shenk (USGS) shared [this figure](#) on the consensus continuum from the University of Maryland, Center for Leadership & Organizational Change.

A highlighted important consideration by STAC members is that for any STAC report compiled for a workshop, review or other activity, STAC will vote to endorse a final editorial authority. The final editorial authority must be one of the following: 1) the STAC representative(s) on a review or workshop committee; 2) the STAC Executive Board; or 3) a majority of the entire STAC membership. Wardrop asked STAC to approve of a new revised process timeline, including 1) adding committed parties to the Version 1.0 review and 2) Version 2.0 will be sent to at-large STAC for individual inclusion/opt out decision. STAC members should expect version

1.0 for review by early April. Lew Linker (USGS) noted he would like to this version as a 'committed party.' There was some discussion regarding the listing of authors on the report. The STAC Executive Board (EB) will follow-up with federal partners to determine citation implications for institutional review and approval requirements.

ACTION: **STAC Staff** and the **Executive Board** will continue to follow-up with federal partners to determine citation implications for institutional review and approval requirements.

Wednesday, March 9th

[Introduction to Triple-Loop Learning: The varieties of adaptive management and what they might mean for the CBP](#) — *Mike Runge (USGS)*

STAC member Mike Runge (USGS) introduced the concept of triple-loop learning to the group, which distinguishes three fundamentally different levels at which management can adapt to new information. This brief overarching framework is meant to set the stage for a discussion of how the Chesapeake Bay Partnership could adapt as it approaches, and looks past, 2025. Gilinsky commented that she appreciated how the science roles have been superimposed on the adaptive management process model. Regarding BMPs, Miller wondered how these practices might be engaged in the third loop since they are baked into the Clean Water Act and Gilinsky if there is the right institutional structure to get us to our goals.

Two panels were invited to explore adaptive management at various scales, the first focused on the Chesapeake Bay Program and the second pivoted to opportunities to advanced program management using the single-, double-, triple-loop learning concept.

Session I: Chesapeake Bay Program Management today

- ... [at the Goal Implementation Team \(GIT\) scale](#) — *Kristin Saunders (UMCES)*
- ... at the Management Board scale — *Carin Bisland (EPA)*
- ... [at the field-scale](#) — *David Martin (TNC)*

Session II: Opportunities to Advance CBP Adaptive Management Going Forward

- [Improving feedback between monitoring, modeling, and implementation \(single-loop learning\)](#) — *Jeni Keisman (USGS)*
- [Integrating social and biophysical sciences: Insights from farmer research \(double-loop learning\)](#) — *Matt Houser (TNC, UMCES)*
- [Toward triple loop learning: Ideas on accountability, scale, and collective learning](#) — *Marc Stern (VT)*

After two sessions, Boomer invited questions for invited panelists. Runge discussed how the Bay Program holds people accountable for BMPs, which are outputs and not achievement of outcomes. This causes a lack of motivation to learn about why we didn't reach our goals as there is no accountability for learning. Stern agreed and stated social science questions need to be incorporated into the model as well as invest in personnel to entirely focus on linkages across the program. It is difficult to move quickly in a different direction with so many people

invested but not impossible Carin Bisland (EPA) said. Bisland wondered if there could be changes to shift accountability to a more productive place and can STAC help the program talk through this? Building on this point, Kristin Saunders said that it took a few years for the SRS process to be fully embraced and within the program, there are levels of resistance. Saunders stated the most success has been found when additional considerations are weaved into the system of accountability as the work is being done, reducing the overall ask. STAC members were asked to connect with the Strategy Review System team to help think through where to strategically shift from outputs to learning. Kirk Havens (VIMS) agreed with Saunders and emphasized how far the Bay Program has come with the SRS system since his time as Chair. As a second point, Havens discussed the concept of 'experimenting to learn' and the relative pushback he received for using the word 'experimenting': politicians and managers don't want public money as being categorized as being 'experimented with' so there was a switch to labeling it as 'learning while doing'. Keisman reinforced moving funding to understanding perverse incentives at the implementation level that are driving these decisions because there are some key levers necessary to understand.

Leah Palm Forster (UMD) asked Stern to briefly describe the organizations that report to him as it would be valuable to replicate a similar network for Chesapeake Bay initiatives; Stern said there are two different learning networks, one that is voluntary (funded by the Pisces Foundation and NSF) and the other part of a grant from the National Parks Foundation that required grantees to participate. There are many structures in which this can work but the grantor does not see the confidential reports only the engagement numbers, the majority of the conversation is 'for learning.' Sanford wondered what the most appreciate scale and level at which STAC should engage with these issues and encouraged the break out groups to consider this question in the afternoon.

STAC members and meeting participants were assigned to break out groups to consider the following: As we approach and look past 2025, are there insights about how the Bay Program may need to adapt to learning that has occurred at different scales? How can STAC help to articulate those adaptive opportunities? And what should STAC's role be in the future? Groups used a [Google Slide deck](#) to log their thoughts and met for 15-minutes afterwards to present highlights from the discussion. The STAC Executive Board will review the outcomes of the group discussion and evaluate how to best leverage what was learned in future quarterly meetings.

ACTION: The **Executive Board** will review the outcomes of the group discussion and evaluate how to best leverage what was learned in future quarterly meetings.

Wrap Up

The STAC [June Quarterly Meeting](#) will take place in-person on Tuesday and Wednesday, June 14th and 15th in Lancaster, Pennsylvania. This meeting will focus on the theme of soil health and include presentations centering around diversity, equity, inclusion, and justice (DEIJ). On the afternoon of Day 1, there will be an optional 3-hour field trip to sites relevant to the soil health discussion.