Scientific, Technical Assessment and Reporting (STAR) Meeting
Theme: Sharing Science and Data for Application (Part 1)

Thursday, June 29, 2023
10:00 AM – 12:00 PM
Meeting Materials: Link

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

ACTION ITEMS

- **The STAR team will consider how to best frame the CESR implementation and communication question at a future STAR meeting.**
- **Julie Reichert-Nguyen will share information on the climate change data repository with Megan Thynge (thynge.megan@epa.gov).**
- **John Wolf and Megan Thynge will add suggested resources to ChesapeakeData:**
    - **NOAA Digital Coast also has the Coastal Flood Exposure Mapper (same team that developed NOAA Sea Level Rise Viewer): https://coast.noaa.gov/digitalcoast/tools/flood-exposure.html**
    - **USGS Coastal Hazard Portal Tool: https://marine.usgs.gov/coastalchangehazardsportal/**
    - **Qian's new shiny App: https://zhangqian0324.shinyapps.io/CBNTN_TMDL_Indicator/**
- **Anyone with data, applications, or other information products that they believe should be hosted on ChesapeakeData should contact Megan Thynge (thynge.megan@epa.gov) and John Wolf (jwolf@chesapeakebay.net).**
- **Kim Van Meter will reach out to Sarah McDonald to arrange a time for her to present to researchers at Penn State on the uses of the 1-meter land cover land use change data products.**
- **Julie Reichert-Nguyen will speak with Renee Thompson about using the 1-meter land cover land use change data products to inform recommendations from the STAC Rising Water Temperatures workshop regarding land use.**
- **Anyone who has questions or would like to brainstorm uses for the Chesapeake Bay 1-Meter Land Data Products should contact Sarah McDonald (smcdonald@chesapeakebay.net).**

Meeting Minutes

10:00 AM **Welcome, Introductions & Announcements – Bill Dennison** (UMCES), **Ken Hyer** (USGS) and **Kimberly Van Meter** (Penn State) - STAR co-chairs and vice chair, **Breck Sullivan** (USGS) STAR Coordinator, **Peter Tango** (USGS) CBP Monitoring Coordinator

Announcements

STAR Accessibility Survey

Bill Dennison announced the UMCES team released the Chesapeake Bay Report card on June 6th in Alexandria, VA. Officials from Virginia and Maryland attended. This report card release had the most media impressions, which Bill said is likely due to the focus on environmental justice indicators.

Bill shared how the Global Sustainability Scholars are doing listening sessions around the watershed to get impressions from a diverse set of stakeholders on their vision of the future of the Chesapeake.

Ken Hyer said the nutrient loads and trends team released their updated 2022 trends for the River Input Monitoring (RIM) stations. Since this is an off year, the update is only focused on the RIM stations. All stations will be updated next year.

The communications team is working on the strategic communications plan and has been reviewing the Strategic Engagement Team meetings. The communications team is also planning for the Executive Council meeting in October. The communications team would like to remind everyone that the 40-year anniversary of the Chesapeake Bay Program (CBP) is ongoing. Kristin Saunders commented that the communications team is also working steadily on the Reaching 2025 report in advance of presenting it to the Principals' Staff Committee (PSC) in July. Portions are being drafted and are under review by subject matter experts.

Breck Sullivan said Rich Batiuk will be the concluding speaker at the Chesapeake Studies Conference. The conference steering committee is looking for additional opening panelists. If anyone is interested, they should reach out to Breck (bsullivan@chesapeakebay.net) and she will connect them with the conference steering committee.

Upcoming Conferences, Meetings, Workshops and Webinars

- Mid-Atlantic Volunteer Monitoring Conference – June 29, 2023.
- Pennsylvania State-wide Solar Summit – July 19, 2023, College Park, PA.
- Chesapeake Studies Conference – September 15-16, 2023, Salisbury University, Salisbury, MD.

- Potomac Conference – September 21, 2023, Lorton, VA.
- Virginia Water Monitoring Conference – September 26, 2023, Henrico, VA.
- Chesapeake Watershed Forum – November 3-5, 2023, Shepherdstown, VA. Session proposals were due June 11. Poster proposals are due July 28.
- CERF 2023 Conference: Resilience & Recovery – November 12-16, 2023, Portland, Oregon. Abstracts were due May 10, 2023.
- National Conference on Ecosystem Restoration – April 14-19, 2024, Albuquerque, New Mexico. Abstracts are due September 1, 2023.

10:10 AM **Watershed Components of the CESR Report –** *Kurt Stephenson (Virginia Tech)*

Kurt Stephenson presented the Watershed section of the Comprehensive Evaluation of System Response (CESR) Report. A discussion followed the presentation.

Discussion Questions:

- How can we implement some of the recommendations in the CESR report? What shifts in our work are needed to address the findings in this Appendix?
    - What is a manageable example?
- How can these findings inform the Beyond 2025 effort?
- Now that we have heard about all 3 appendices, is there anything else you would like to hear at STAR on the CESR report?

Summary

Kurt began with the context that from the CESR team's perspective, the focus of efforts post 2025 will be largely on nonpoint sources. Kurt said one pillar of implementation policies for nonpoint source reduction on the agriculture side is voluntary financial assistance: cost-share. The second pillar is the crediting and accountability framework for non-point source reductions, which utilizes the Chesapeake Assessment Scenario Tool (CAST).

One high level finding from CESR is that existing nonpoint source water quality programs are insufficient to achieve the nonpoint source reductions required by the TMDL. There are two main reasons for this:

1. Implementation Gap: Nonpoint source programs are not generating the scale of behavioral change needed.
2. Response Gap: Implementation may not be as effective as expected.

Kurt walked through progress on reducing nonpoint source nutrient loads and compared results from CAST with results from the Spatially Referenced Regression on Watershed attributes (SPARROW). Kurt highlighted how CAST (a scenario model) shows a decrease in phosphorus, but SPARROW (a hybrid statistical and mechanistic model) shows an increase in Phosphorus.

Kurt focused on two possible reasons for the limited progress in implementation: nutrient mass imbalances and the limits to current voluntary financial incentive programs (cost-share). Kurt then outlined a list of possible reasons why nonpoint source efforts may not be producing expected efforts. The first was lag time since legacy nutrient sources delay and obscure pollutant reduction outcomes. For example, nitrogen is very prevalent in groundwater. The second reason was uncertainty in Best Management Practice (BMP) effectiveness, such as removal effectiveness, incomplete literature on loss pathways, performance over time, and maintenance (expected vs realized). The third reason was uncertainty in the behavior of landscape managers. A fourth reason was data limitations, like nutrient inputs.

Kurt concluded to improve program effectiveness, policies need to change. Possible policy options include a shift in focus to outcome based incentive systems (with less emphasis on counting practices), additional emphasis on addressing mass imbalances, a willingness to reform and experiment, and more explicit acknowledgement and evaluation of uncertainty. Kurt emphasized there is no single solution, and tools and incentives needs to be improved for better targeting. The CESR team also concluded there needs to more willingness to innovate, so the idea of sandboxing was suggested to test out alternative methods of nutrient reductions without penalties.

Discussion Summary

Meg Cole said the final report, resource documents, news articles, and recent outreach/communications are available on the STAC CESR page.

Katie Brownson shared a recent article written by former University of Georgia colleagues that had some similar findings about the efficacy of nonpoint source programs nationwide.

Gary Shenk shared a resource that looks at CAST and flow-normalized loads at all nontidal network stations with a long enough record.

Kristin Saunders said it feels like the timing on addressing these policy options is opportune, and the CBP should consider the most effective places to have a conversation about what we might do differently because of CESR. At the Chesapeake Research Consortium (CRC) roundtable, representatives from the Natural Resources Conservation Service and the Chesapeake Bay Commission

said they are not aware of ongoing conversations within their organizations on how the Farm Bill could be reformed to improve incentives. Kristin said those conversations may be going on, but they are not looped into the conversation at the CBP, Kristin identified Farm Bill conversations as critically important and a current gap. Kristin said there is opportunity to use Beyond 2025 to have this incentives conversation. The Beyond 2025 steering committee could be looking at our crediting system in CAST and talking about program/policy changes to improve the cost share and benefits through the next Farm Bill. Kristin said it feels like an opportunity to really address CESR within and outside our program, or at least begin to chip away at it. The CBP needs to think critically about how to implement recommendations from CESR in the context of existing or new venues. Bill Dennison agreed and said the Farm Bill is on the minds of leaders like Senators Van Hollen and Cardin, as he heard from them after the UMCES report card release.

Greg Allen said with due respect to our STAC colleagues, CESR is tragically regressive for toxic contaminants issues. The Toxic Contaminants Workgroup (TCW) concerns for CESR are:

- Irresponsibly defines “pollutants” as nitrogen, phosphorus and sediment, disregarding thousands of other pollutants that compromise the health and value of living resources and are a threat to human health
- Refers to water quality standards and “the TMDL” only in relation to nutrients disregarding dozens of TMDLs in the watershed related to other pollutants and non-attainment of water quality standards
- Fails to mention critical emerging science related to new understanding of the ubiquitous distribution of dangerous pollutants such as PFAS
- Silent on the range of impacts on living resources from other contaminants including endocrine disruption, mutagenicity, carcinogenicity, reproductive compromise all of which impact fish and invertebrate species living in different habitats and at different life stages.

Denice Wardrop said she wishes CESR could have helped the TCW because CESR is trying to be helpful and replied Greg raises some fair points, but to be fair to the CESR effort, the concepts raised in CESR can apply to toxics as well. The report raises broad issues about how other factors besides nitrogen and phosphorus affects living resources. Additionally, CESR points out the tradeoffs that are on the horizon, i.e. attention to the current TMDL versus other things that affect the vitality of the Bay (both ecological and human). Denice said we are out of win-win scenarios, and CESR can benefit the CBP as a whole by

drawing more attention to tradeoffs. Kurt added the CESR team had to limit the scope of the report given the lack of space and time, but we hear Greg's concern. Additionally, the TMDL looms over Bay restoration and needed to be addressed, since the currency of the CBP is nitrogen, phosphorus, and sediment. Greg replied he understands the need to put boundaries on the scope of the analysis, but the TCW would have appreciated more recognition of the emerging science and pressing threats to human health and the environment from toxics. Greg said CESR would have been an ideal opportunity to draw attention to an issue that consistently struggles to do so. Greg said he understands the point on tradeoffs, but he felt CESR was so singularly focused on one set of pollutants that CESR was not well balanced despite the need to balance efforts across CBP outcomes. Denice replied she wished they could support Toxic's, but one of the conclusions of CESR is that we are out of win-win solutions, and we are confronted with tradeoffs we are unprepared to make.

Greg Allen asked if it is possible to do a CESR on PCBs. Greg suggested checking out the extent of PCB water quality impairments and TMDLs.

Kim Van Meter emphasized the importance of land manager behavior and incentives. Kim said she regularly works with the mass balance data, and seeing the diagram comparing two farmers, underlined the need to spatially target conservation at a much finer scale. Kurt said within the existing system, both CAST and cost-share programs, farmers with higher loading rates are counted the same as farmers with lower loading rates. Kurt emphasized the need to shift incentives away from simply encouraging implementing as many BMPs as possible, to targeting those higher load locations. The current accounting system needs to be revisited to address this incentives misalignment.

Katie Brownson said thanks for the great presentation - she learns something new every time she hears you all talk about this report. Katie appreciated the discussion on the limitations of cost-share programs. This is something that comes up a lot at the Forestry Workgroup as we identify strategies for accelerating progress towards the riparian forest buffer outcome. The Forestry Workgroup has been developing an outcomes-based approach through a GIT-funding project with EPIC, but they are also increasingly hearing from our partners that just having simple, flexible programs without any out-of-pocket costs for landowners have been very popular and cost-effective to implement. Does the report speak to other programmatic approaches for incentivizing practices where we have a high degree of confidence about their efficacy? Kurt replied Katie is absolutely right regarding other issues that would increase adoption short of a pay for performance program. Adoption will increase by 1) reducing or eliminating out of pocket costs and 2) reducing admin costs/hassle.

For example, turnkey programs where buffers can be installed without landowner cost could significantly boost adoption. Inflexibility in design specs can also limit adoption (e.g. not offering financial assistance if every design criteria cannot be met, but the goals of the practice can). We mention those in the report, but they were admittedly not a focal point.

Gary said D.G. Webster of Dartmouth released a survey of managers and many felt they were not receiving enough credit. However, model results show that despite predicting decreases in Phosphorus we are seeing increases. Gary emphasized the need to reconcile this misnomer. The study report, executive summary, and presentation can be found here.

Ken Hyer said this was a great presentation and nice work. One component Ken highlighted is the nutrient mass balance issue since if the CBP does not get that issue handled somehow, it is going to be really hard to make progress.

Bill suggested having more conversation time for CESR at a future STAR meeting, perhaps talking about the new multimedia resources. Ken suggested the conversation be framed with the question of "How to implement and communicate CESR."

10:50 AM **Chesapeake Data** – *John Wolf (USGS)*

John provided an overview of ChesapeakeData, which is a new website developed with the Data Center, Web Team, Chesapeake Conservancy, and Blue Raster that will serve as an umbrella site for the Targeting Tools Portal and related resources.

Summary

Based on findings from user research, the Data Center, GIS Team, Web Team, Chesapeake Conservancy, and Blue Raster are working to provide access to authoritative data, decision support tools and web applications of the Chesapeake Bay Program and its partners in a centralized location using ESRI ArcGIS Hub software. ChesapeakeData is envisioned as the third pillar of ChesapeakeStat - the umbrella site that currently houses ChesapeakeProgress and ChesapeakeDecisions. Using audience input, ChesapeakeData will be structured around collections, galleries, and an explore feature that allows users to direct a search with their own criteria.

John said potential upcoming roles for STAR include establishing ChesapeakeData content liaisons for STAR, nominating potential science collections and respective subject matter experts, and participating in user testing.

John concluded with next steps for ChesapeakeData and said the ideal launch date is in fall 2023.

Discussion

John asked the following questions to start the discussion:

- What audiences should this site reach?
- What are we missing in Phase 1? Are there ideas we should consider for future content and functionality?
- How would you like to be kept informed of the evolution of ChesapeakeData?
- What should be the role of STAR?
    - Nominate content?
    - Compose and curate Collection content?
    - Serve as liaison to identify Science content of other partners that should be included?

Julie said there was a climate change data repository project a few years back. This occurred before she was coordinator, but she can share the information. Julie believes it had GIS data related to climate change. Megan Thynge replied that would be great! Please feel free to share with me (thynge.megan@epa.gov).

Katie Brownson asked are you looking for curated partner content that is specific to the Chesapeake? Or will you also be pulling in broader, nation-wide content if there is material relevant for Chesapeake goals/outcomes? John said they would like to include application and data products that are relevant to the Chesapeake, but they do not need to be Chesapeake specific. Some examples include EPA's EJScreen and the NOAA Sea Level Rise viewer, which are national in scale. Bill added that national datasets are useful for comparisons when evaluating problems in the Chesapeake Bay watershed.

Julie said NOAA Digital Coast also has the Coastal Flood Exposure Mapper (same team that developed NOAA Sea Level Rise Viewer): https://coast.noaa.gov/digitalcoast/tools/flood-exposure.html and Another great one to highlight would be USGS Coastal Hazard Portal Tool: https://marine.usgs.gov/coastalchangehazardsportal/. Julie said we are heavily using this tool to help with the marsh adaptation project and has a lot of great data sources and decision framework. John said they are good suggestions, and they will include them.

Breck Sullivan said tools like Qian Zhang's shiny apps would be great to be hosted on ChesapeakeData. Breck asked if the water quality data hub would be hosted here as well. John and Megan said the water quality data hub would be

searchable through ChesapeakeData, but would not be rehosted or re-invented on ChesapeakeData. Over the next few years the GIS and data team will consider where information, data, and applications are hosted.

Gary Shenk said the CBP has produced many tools that are well used and others that are not. If there was a way to track traffic and give feedback to the developers, it would help us develop more broadly useful tools. Megan said we are looking into how user analytics can be tracked in the platform; hopefully, we can track it at that scale to give us useful information. John Wolf said we have some Google Analytics that start to get at what Gary is describing.

Ken said ChesapeakeData presents an opportunity to connect datasets and connect outcomes, which is very timely given the recent focus on this nexus.

11:20 AM **High resolution land use and land change data uses** **–** *Sarah McDonald (USGS)*

Sarah provided an overview of the high resolution land use and land change data and focused on examples of how this data is applied and used by workgroups and CBP partners.

Discussion Questions:

- Do you use high resolution land cover and land use data products to support your outcome?
- What projects are ongoing that this data might help inform?
- What do you need to use the land cover and land use data in your projects?
    - How can STAR help?

Summary

Sarah began with a review of the Chesapeake Bay 1-Meter Land Data products, which included land cover, land use, and the land use change. Sarah explained how to interpret the change matrix and highlighted examples of how the data products have been applied. Provided examples include the Chesapeake Healthy Watersheds Assessment 2.0, Tree Cover Status and Change Fact Sheets, State of the Chesapeake Forests 2.0, Land Use Methods and Metrics (LUMM) Outcome indicators, and the Maryland Forest Technical Study. Sarah provided a list of other use cases (slide 19), and encouraged anyone with questions about how to apply this data or interest in brainstorming to contact her (smcdonald@chesapeakebay.net).

Discussion

Ken Hyer expressed his appreciation for these data products and the potential they hold for answering key questions.

Breck said at LGAC (Local Government Advisory Committee) they raved about these Tree Cover Factsheets. Bill Dennison said the localized tree cover fact sheets are great. We hear about the various tree planting schemes, but these fact sheets will provide context. Bill said it will be interesting to start connecting tree cover to environmental justice. A recent study determined that living near green space makes you 2.5 years younger. Katie Brownson said we will definitely be looking at environmental justice implications of forest/tree cover distribution during Phase 2 of the project.

Julie said I may have missed this, but for the land cover change and land use change is there an interactive tool that we can view the mapped data and change? Katie Walker and Sarah explained there is an interactive viewer, in addition to static maps.

Katie Walker said if you use the data, I highly encourage you to fill our this Google Form to help us identify use cases.

Kim invited Sarah to present this work to her colleagues at Penn State as she believes many at the university would be interesting in using this data and learning more. Sarah said she would be interested in doing that. Kim will reach out to Sarah about this.

Kristin Saunders said in addition to seeing goal teams use this data, many of us have heard that local planners could really benefit from this data and information, but they do not necessarily have the time or capacity to learn how to use and apply it. I would love to see us explore some workshopping with local planners as well as some pool of experts who can help them learn to use and apply it.

Regarding the first discussion question, Julie Reichert-Nguyen said another use case is identifying forested area to inform water temperature and resiliency relative to other impervious areas. Results could then inform developing strategy for especially vulnerable areas to rising temperatures resulting from climate change. This will help with implementing recommendations from the STAC Rising Temperatures workshop. Sarah said this is a good idea and aligns well with ongoing projects on similar topics. Sarah recommended Julie speak with Renee about this topic further.

Jeff Sweeney said I didn't see information specific to the change in estimated riparian forest buffers coverage. Is this a separate project or is it included in the more general tree cover categories? Sarah said this is a separate project and the new layer (1:24,000 streams) is currently under peer review. As soon as the layer is ready, the team will work with the Forestry workgroup to implement the project.

Bill Dennison said this was a superb meeting STAR meeting and thanked the presenters for their information-rich talks that help connect data to outcomes.

Ken encouraged workgroups with further interest in these topics to invite the presenters to their individual workgroups for follow up conversations.

12:00 PM Adjourn

Participants: Alex Gunnerson, Amy Handen, Angie Wei, Ann Foo, August Goldfischer, Bailey Robertory, Bill Dennison, Breck Sullivan, Britt Slattery, Carmen Constantine, Cara Johnson, Chigo Ibeh, Dede Lawal, Denice Wardrop, Doug Austin, Doug Bell, Erin Penzelik, Fred Irani, Gary Shenk, George Onyullo, Gopal Bhatt, Greg Allen, Jamileh Soueidan, Jeff Sweeney, John Wolf, Julie Reichert-Nguyen, Katheryn Barnhart, Katie Brownson, Katie Walker, Ken Hyer, Kevin Asplen, Kim Van Meter, Kristin Saunders, Kurt Stephenson, Lew Linker, Mark Nardi, Meg Cole, Megan Thynge, Sarah McDonald, Tom Parham, Tou Matthews, Will McGrath.