Climate Resiliency Workgroup

September 25th, 2023

10:00 – 11:30 AM EST

Event webpage:
https://www.chesapeakebay.net/what/event/climate-resiliency-workgroup-meeting-september-2023

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

Workgroup Action Items:

- *Identify opportunities for the CRWG to provide input during the Beyond 2025 effort*
- *Follow-up with Denice on opportunities for the CRWG to connect the work they support with the CESR recommendations. Explore opportunities to participate in the CRC Roundtable discussions.*

Minutes

10:00 AM **Welcome, Opening Remarks, and Announcements – Mark Bennett, Co-Chair (USGS), and Julie Reichert-Nguyen, Coordinator (NOAA), and Jamileh Soueidan (CRC) [5 minutes]**

Focus of meeting:

- *Share updates on the Chesapeake Bay Program's Reaching 2025 and Beyond efforts*
- *Share the findings from the Comprehensive Evaluation of System Response (CESR) report*
- *Hold a discussion about how climate resiliency can inform the Beyond 2025 discussions*

Workgroup Announcements:

- *Chesapeake Community Research Symposium 2024 (June 10-12, 2024) call for special session proposals (**due October 2, 2023**). Theme of the symposium is "Chesapeake Bay Restoration: Managing Water Quality for Living Resources in a Changing Climate."*

10:05 AM **Chesapeake Bay Program's Reaching 2025 Efforts (Rachel Felver, Alliance for the Chesapeake Bay) [20 Minutes]**

Rachel will present on the Chesapeake Bay Program's recent Reaching 2025 efforts as a part of addressing the Executive Council's Charting a Course to 2025 and Beyond charge. This work is focused on understanding the progress that the Bay Program has made since the Chesapeake Bay Watershed Agreement was signed in 2014 and charting a course forward to help outcomes meet their 2025 goals.

Summary

Rachel provided an update on the Charting a Course to 2025 report; this effort supports the Executive Council charge that was signed at last year's Executive Council meeting. The charge states that the "Principals' Staff Committee (PSC) is to report back to the Executive Council at the 2023 annual meeting with recommendations on how best to address and integrate new science and restoration strategies leading up to 2025," which includes identifying new and emerging scientific data to inform adaptive management approach, enhance monitoring and reporting capabilities, define the existing and emerging challenges, identify opportunities to leverage action across multiple goals, and provide highlights of outcome attainability.

This effort began in early 2022, with the formation of a steering committee. A subset of the committee formed the report's drafting team, which included the Chesapeake Bay Program's Indicators Coordinator and the Communications Director, and was chaired by Sean Corson (former NOAA Chesapeake Bay Office Director). The team set the outline for the report, which include an executive summary, high level recommendations, detailed sections (i.e., Phase III WIPs/ Bay TMDL, Forest Buffers and Wetlands, Climate Change and Diversity, Equity, Inclusion, and Justice (DEIJ), and Emerging Science, Monitoring, and Analysis, and updated outcome attainability template, pulling information from each outcome's Strategy Review System materials. She mentioned that through the outcome attainability tracking, they found that 18 outcomes are on course to meet their 2025 target, 11 are off track, and 2 are uncertain.

Rachel then reviewed the common challenges and common opportunities that were identified through this effort for outcome attainability. Outcomes that were successful had a number of common characteristics, including accounting, monitoring or tracking systems, a champion to move the effort forward, plays a role in economic or ecological success, has public support, important for equity and inclusion, contributes to the success of other outcomes, and is recognized as a success outside of the partnership. The common challenges that the outcomes faced include tracking and accounting for progress made on qualitative outcomes, not having geographic or numerical targets, undefined roles responsibilities and coordination, not having a matching scope defined or a cost estimate, lacking community engagement networks, and then experiencing the tragedy of the commons.

Rachel provided a more detailed overview of the Climate Change and DEIJ section, which Julie and Jamileh assisted in drafting. Currently, the CBP does not currently have the structure in place to accommodate cross-cutting outcomes. Despite this, the Diversity and Climate Resiliency Workgroups are making progress on their outcomes, with some intersection with the

Executive Council directives. These directives, however, are ambitious and far-reaching and appropriate, but they are not sufficiently or consistently supported. Lastly, there still needs to be specific objectives/actions, cost estimates, commitments, and accounting succeed in meeting these outcomes.

Rachel provided some high level findings from the overall effort. She highlighted that while some outcomes are off track, as a whole there is significant progress being made towards the goals of the Watershed Agreement. Impacting this progress is the fact that the Chesapeake Bay Watershed contains dynamic landscapes that are changing overtime and are impacted by factors like climate change and land-use change. This effort provided evidence that partnerships work and this model of partnership does lead to progress. Additionally, the partnership needs to focus on the new and emerging science, monitoring, and analyses that are produced to inform next steps. The effort underscored the fact that the program will not meet its 2025 TMDL targets, but will continue to make progress towards it with emphasis on nonpoint source pollution. In the report, they also called out conservation and highlighted that the program needs to be more proactive in protection of lands and restoration investments. She highlighted the fact that there are large, once-in-a-lifetime funding opportunities through the Bipartisan Infrastructure Law and the Inflation Reduction Act. Lastly, a high level overview of the recommendations included accelerating investments (e.g., capitalize on funding opportunities and target lagging outcomes), integrate emerging science and monitoring, and fast-track implementation of action plans. These recommendations are to be presented to the PSC for approval.

Next steps for this effort will include addressing the comments received during the public comment period. These comments were divided into five categories: grammatical edits, referring comments to the subject matter experts, no response required, referring comments to Beyond 2025 steering committee, and general comments applied to the whole report. Climate specific comments included splitting the climate change and DEIJ section into two distinct sections; better communicate impacts of climate change to elected officials; understanding local governments'' current climate readiness; prioritize the need for greater investment in communities most impacted by climate change; move towards climate adapted stormwater management; develop climate-adopted best management practice efficiencies; and develop project management strategy and cross-cutting coordination approach before applying funding.

Discussion

Kevin Du Bois commented that as he was looking at the common factors for success and common challenges, he was thinking about how they would be a good aspects to inform the Beyond 2025 questions regarding partnership structure and process. Rachel responded by saying that this report will be informing the Beyond 2025 effort, including those common factors for success and challenges that outcomes face. Kevin also highlighted the factor for success that focuses on having a champion; in the current structure of the Bay Program, many people are taking on Bay Program initiatives in addition to their current, full-time positions. He

mentioned that maybe other structures like "paid" champions should be explored. Elizabeth Andrews agreed with Kevin's point, commenting that it would be good for this to be a point of emphasis when the overall structure is revisited during the Beyond 2025 discussions. Lew Linker commented to Kevin's point about the champion, that he interpreted it in a way that meant it was someone who held power in the sense that it is not an individual, but more a commitment from an agency for funding or resources. Kevin does not disagree to that approach, but he did highlight that those agencies exist now, so he wondered what the missing link is to get those commitments. Lew posited that what was missing is the willingness to become a champion.

To the point about the common challenges and the tragedy of the commons, Jim George shared an article about the tragedy of the commons, and how while the tragedy of the commons exists, there is also deep capacity for sharing resources with generosity and foresight.

In the chat, Vamsi Krishna Sridharan asked what they envision the role of private consultants in this process will be. Rachel responded that she thinks the greatest opportunities will be in the funding realm as new grant opportunities continue to roll out for advancing progress on the outcomes.

10:25 AM **Chesapeake Bay Program's Beyond 2025 Efforts (Anna Killius, Chesapeake Bay Commission) [20 Minutes]**

Anna will present on the Chesapeake Bay Program's recent Beyond 2025 efforts as a part of addressing the Executive Council's Charting a Course to 2025 and Beyond charge. This work is focused on recommending a critical path forward to continue making progress post-2025.

Summary

Anna Killius shared an update on where they are in the process for the Chesapeake Bay Program's Beyond 2025 effort. Although they have had a handful of steering committee meetings thus far, they are still in the process of determining what this effort will look like. As a whole, there has been months and years to think about the big challenges and issues within the Chesapeake Bay Program, and now there is the opportunity to discuss these issues and ideas. Similarly to the presentation before, this effort is based on the Executive Council charge, particularly the portion that refers to the PSC preparing "recommendations that continue to address new advances in science and restoration, along with a focus on our partnership for going beyond 2025."

They are taking a two-phased approach to this effort, with the first step focused on determining the scope and breadth of what will be undertaken to meet the EC Change and develop a plan to complete the work and second phase is executing that plan after EC approval at the 2024 meeting. The first phase includes the use of a steering committee to develop a plan of work for all activities to be undertaken to strengthen the Bay Program in the years ahead; membership on the committee is based on the Management Board and has representation from the jurisdictions, the Chesapeake Bay Commission, eight core federal agencies, the Scientific and Technical Assessment and Reporting Team, the three advisory committees, the six goal

implementation teams, and two at-large stakeholder representatives. Additionally, ERG is contracted to provide support in this process.

Anna then reviewed the goal statement that was developed to guide this effort, which states "we will assess where we are and where we want to be in reaching our shared vision for the Chesapeake Bay and its watershed; and identify a path forward for the Chesapeake Bay Program focused on what we do and how we work." Anna highlighted points within this statement, where the effort will focus in on specific questions that will guide the discussions, in addition to the reports and external information that will be pulled into the discussions (e.g., the Rising Water Temperature STAC Workshop report, the Comprehensive Evaluation of System Response report, and the Reaching 2025 report). The components of the goal statement are a blueprint for the components of the report they are hoping to draft through this effort. These components include a summary of where the Bay Program is with regard to the 2014 Watershed Agreement, a vision, an impact assessment, an assessment of the overall partnership, recommendations for what to do with the Watershed Agreement post-2025, and recommendations on the Partnership. Throughout this effort, ERG has been contracted to conduct an independent evaluation that will hopefully speak to the two assessment pieces of this effort. The findings of the evaluation will be used as foundational information for the steering committee as they develop the recommendations that will be presented to the Principals' Staff Committee.

Anna spoke to the public and stakeholder engagement that will be taking place throughout this effort. First, they added two at-large, non-voting seats on the steering committee. They widely disseminate meeting dates and materials, as well as ensure opportunities throughout the meeting agendas for public comment. They collect and disseminate public feedback received between meetings. Lastly, they coordinate with network organizations to share periodic updates and to organize opportunities for additional public and stakeholder engagement.

Anna finished the presentation by reviewing the timeline for this effort and next steps. Between October and December 2023, the steering committee will be discussing high profile topics and common themes. In January to March 2024, ERG will execute their independent evaluation. From April to June 2024, the steering committee will form recommendations across deliverables and ERG will present their evaluation findings to the steering committee for discussion. From July to September 2024, the steering committee will review the ERG report, finalize the deliverables, and presents them to the Management Board. The final products will then be presented to the PSC and Executive Council between October and December 2024.

Discussion

Denice Wardrop asked about the prevailing "theory of change" that Anna mentioned in her presentation when reviewing the goal statement, when discussing this effort. She highlighted that it is a very complex question, and she had never heard it articulated. She wondered if it has been clearly stated in the Beyond 2025 materials to the steering committee. She added context to this question by explaining that she is used to a theory of change being developed once a

desired outcome is already identified and are planning what interventions will be needed to get to that outcome. Anna responded that when she mentioned the theory of change in the presentation, it was in context to the current theory of change for the current Watershed Agreement and the goals and outcomes within that agreement. She said that this effort is an opportunity to examine the current theory of change before even discussing what a new one might look like.

Lew Linker commented that since Anna was presenting to the Climate Resiliency Workgroup, he wanted to suggest that part of the Beyond 2025 discussions and final products should focus on climate change and how it impacts all facets of the Partnership. He commented that there should be some emphasis on the hyper connection of climate change to all processes in the Chesapeake Bay, and he thinks it would be great for the Partnership to commit to always defend the water quality standards and defend the habitat that we need for a healthy, resilient Bay. Anna thanked Lew and commented that climate change is something that is very specifically mentioned in the Executive Council charge.

Jamileh thanked Anna for presented, and Anna mentioned that if anyone had any further comments to feel free to send them her way.

10:45 AM **Comprehensive Evaluation of System Response (CESR) Report Findings (Denice Wardrop, Chesapeake Research Consortium/ Pennsylvania State University) [25 Minutes]**

Denice will be reviewing the findings from the CESR report and effort, which evaluated why progress toward meeting the TMDL and water quality standards has been slower than expected and offered options for how progress can be accelerated. This report is a summation of a three year investigation into the 40 year effort to reduce nutrient loads to Chesapeake Bay.

Summary

Denice presented an overview of the Comprehensive Evaluation of System Response (CESR) report, which was an independent effort by the Scientific and Technical Advisory Committee, with 60 contributors. This report examines the reasons why the Chesapeake Bay is not currently meeting their water quality standards (i.e., the only regulatory goal), despite making significant progress, and identifies where there might be opportunities to improve the progress that is being made.

Denice first provided background information on the Water Quality Goal and standards. The goal encompasses water quality criteria including dissolved oxygen, water clarity/submerged aquatic vegetation, and chlorophyll-A. To support these water quality criteria, the Total Maximum Daily Load (TMDL) was developed to meet nutrient reduction goals for nitrogen, phosphorus, and sediment. The CESR report looks into if the TMDL is being met, and how does

that support meeting the water quality standards, and lastly is there a living resource response from this effort.

Denice provided a brief overview of the findings, which she elaborated on later in the presentation. Currently, the nonpoint source programs that are in place are not generating the scale of reductions needed to achieve the TMDL. They found that Bay water quality is improving but the magnitude by which it has improved is lagging compared to the expectations. For living resources, they found that the impact of water quality improvements depends on where these improvements occur and the antecedent conditions, and that the impacts vary across species. Overall, CESR found that this is a decision problem in that there are multiple objectives in the Bay, leading to tradeoffs, and that there is no single answer to achieve all the objectives.

For the first finding about nonpoint source programs, they identified two challenges. The first is that these programs are not generating the scale and type of adoption/behavior change needed to meet the TMDL (i.e., the "Implementation Gap"). Second, these programs may not be as effective as expected in producing nutrient reductions (i.e., the "Response Gap"). She showed figures for both nitrogen and phosphorus, showing that there have been reductions in the nutrients since 1985. When looking at the rate of nonpoint source pollution reduction nitrogen, however, it will take a lot longer to meet the overall nutrient reduction goals. For phosphorus, there has been a response gap in reducing nonpoint source pollution, which may be attributed to legacy nutrients and lag times, nutrient mass balance, best management practice (BMP) effectiveness, behavior, and monitoring. She highlighted that there is an opportunity to examine why BMP effectiveness might be limited. She explained that there are opportunities to target nonpoint source BMPs. She mentioned that there is opportunity to "sandbox" innovations for targeting BMPs that can be tested to see if they improve ecosystem outcomes.

Denice then reviewed the findings that focused on achieving the water quality standards, and what impact nutrient reductions may be having on them. She highlighted that CESR examined what is happening, what was expected to happen, and if there is a gap, how can it be closed. The figures she reviewed showed nutrient loadings impact on water quality attainment in the open water, deep water, and deep channel. The figures included modeled data and observed data, and she highlighted that there is a gap in what was modeled or expected, versus what was actually observed for dissolved oxygen across all habitats, with the largest gap seen in the deep channel, while the expected results for open water are the closest to what was observed. She also highlighted that the response gap is the greatest at lower nutrient loads. Some hypothesized reasons for these response gaps include climate change, tipping points, shift in biotic communities, and land-use/land cover change. The implication in this that water quality standards will likely be met first in the open water and last in the deep channel; when examining the cost curve for attainment, the current Water Quality Criteria may be unattainable in the Bay under existing technologies, as it will potentially be expensive to meet these criteria in the deep channel.

The last component Denice reviewed was the living resource response. CESR found that the impact of water quality improvements on living resources depended on where those improvements occurred, what were the antecedent conditions, and varied by species. She commented that the living resource response is also dependent upon other external factors not controlled by the TMDL or water quality standards. When it comes to opportunities, Denice commented that as stated before, the cost of implementation increases the closer the Bay is to meeting water quality standards in the three habitats examined (i.e., open water, deep water, and deep channel). However, when looking at the implementation cost curve alongside living resource response, there is the possibility of seeing a positive response before 100% attainment. In conclusion, Denice highlighted that there is opportunities to manage adaptively at each of these components (i.e., water quality standards, TMDL, and living resources).

Discussion

Jamileh thanked Denice for the presentation and commented that the work that the CRWG focuses for their Adaptation Outcome on supporting natural and nature-based resilience strategies could align with recommendations developed through the CESR report.

Vamsi Krishna Sridharan asked about the role that consultants could play in this space. He commented that one of the things that stuck out to him in the presentation is that there are a lot of fine-scale, highly resolved watershed models for TMDLs and if they could be useful in determining where these potential legacy loads are coming from. Denice commented that she does not have specific answer on the role of consultants, but she also highlighted that CESR shows that there is a large breadth of research by a number of scientists from all sectors, but the challenge now is how to implement the research findings. She commented that the point Vasmi raised about targeting has a lot of opportunities for exploring how to close the implementation gap. Vasmi followed up commenting that he is hoping to find a way where private consultants like himself can collaborate with other private consultants in this industry so that they can use their individual projects to inform this greater, overarching needs of achieving water quality standards or supporting living resource response. Denice responded that the exploration of the sandboxing concept in CESR could be a space for this type of work to occur, where case studies or pilots can be shared to show some different approaches at a small scale that answer some of the questions set forth by CESR. Kevin Du Bois commented in the chat that consultants can also join workgroups and Goal Implementation Teams (GIT) at the Bay Program and submit proposals for GIT-Funding RFPs.

11:10 AM Climate Resiliency in the Chesapeake Bay Program Discussion (15 Minutes)

Discussion

Julie brought the themes heard over the three presentations together, commenting that she was thinking about the role of the Climate Resiliency Workgroup as the CESR report recommendations are further developed and the Beyond 2025 effort moves forward. She

proposed an idea that the workgroup could look at the CESR recommendations and work towards better addressing the response gap through the actions the workgroup is supporting around nearshore habitats and adaptation and the expertise of the members. She proposed that the workgroup can hold meetings in the future focused on making connections between the CESR recommendations and adaptation strategies that can be implemented. She also mentioned that this could be built into the greater Beyond 2025 discussions as well. Denice commented that Julie hit on one of the two big opportunities that she sees for the workgroup. She also thinks there can be some larger conversations about developing resilience goals that can support a greater living resource response. Denice also mentioned that CRC's next two Roundtable discussions will focus on opportunities in the nearshore environment and to reach out to her if there are suggestions for presentations or panelists.

11:25 AM **Partner Announcements and Wrap-up [5 Minutes]**

- Open NOAA Funding Opportunity (National Grant): Advancing the Habitat Restoration Priorities of Tribes and Underserved Communities. NOAA will accept proposals with a federal funding request of between $75,000 and $3 million total over the award period; there is a total of $45 million in funding available. Applications are due by **December 19, 2023**.
- Publication of Interest: Nezlin et al. 2023. Assessment of Changes of Complex Shoreline from Medium-Resolution Satellite Imagery. *Estuaries and Coasts*.

11:30 AM **Adjourn**

Meeting Attendance

First Name	Last Name	Affiliation
Alexander	Gunnerson	CRC
Amanda	Small	MD DNR
Amy	Freitag	NOAA
Anna	Killius	Chesapeake Bay Commission
Becky	Golden	MD DNR
Breck	Sullivan	USGS
Cassie	Davis	NYS DEC
Chris	Guy	USFWS
Chris	Feinman	
Debbie	Herr Cornwell	MDP
Denice	Wardrop	CRC
Elizabeth	Andrews	UVA
Jamileh	Soueidan	CRC
Jennifer	Starr	Alliance for the Chesapeake Bay
Jeremy	Hanson	CRC
Jim	Uphoff	MD DNR
Jim	George	MDE
Joel	Carr	USGS

John	Denniston	MD DOT
Julie	Reichert-Nguyen	NOAA
Ken	Hyer	USGS
Kevin	Du Bois	DoD
Lew	Linker	EPA
Lorenzo	Cinalli	USFS
Mark	Bennett	USGS
Peter	Clagget	USGS
Peter	Tango	USGS
Piero	Mazzini	VIMS
Qian	Zhang	UMCES
Rachel	Felver	Alliance for the Chesapeake Bay
Rebecca	Murphy	CBP
Ryland	Taylor	MD DNR
Sean	Emmons	USGS
Skip	Stiles	Wetlands Watch
Taryn	Sudol	MD Sea Grant
Taylor	Woods	USGS
Vamsi	Krishna Sridharan	Tetra Tech