Scientific, Technical Assessment and Reporting Team
(STAR) Meeting
Theme: Ecosystem services as a framework to advance multiple outcomes

Thursday, May 23, 2024
10:00AM – 12:00 PM
Meeting Materials: Link
This meeting was recorded for internal use only to assure the accuracy of meeting notes.

Next steps

- ✓ Kaylyn Gootman, Ken Hyer, John Wolf, Andy Fitch and Krissy Hopkins will get the Floodplain Ecosystem Services Mapper incorporated into the Targeting Tools Portal and the Chesapeake Bay Watershed Data Dashboard.
    - Olivia Devereux will add the Mapper link to CAST and the habitat tracker.
- ✓ Jeremy Hanson and Kaylyn Gootman will provide input to Greg Allen and Elliott Campbell on the planned STAC workshop called "Identifying natural and social sciences gaps to enable market-based approaches".

Minutes

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

Announcements

Upcoming Conferences, Meetings, Workshops and Webinars

- Chesapeake Community Research Symposium – June 10-12, 2024, Annapolis, Maryland.
- American Planning Association (APA) Virginia 2024 Conference – July 21 – 24, 2024, Williamsburg, Virginia.
- American Planning Association (APA) Maryland 2024 Conference – October 22-24, 2024, Ellicott City, Maryland. Session Proposals are due May 31st.
- 14th National Monitoring Conference – March 10-12, 2025, Green Bay, Wisconsin.

Guiding Questions

- How do you see your workgroup, GIT, or organization using this information? How do you hope other decision makers will use this report?
- Where should we start on implementing these recommendations from the report - is there a sequencing we think makes sense?
- What science needs must be addressed to successfully implement the STAC recommendations?

10:05 AM **Beyond 2025 Update** ***– Ken Hyer (USGS) and Breck Sullivan (USGS)***

Presentation summary:

The Beyond 2025 Steering Committee was developed to determine the scope and breadth of what should be done to meet the Chesapeake Bay Program's Executive Council's (EC's) charge to the Principals' Staff Committee (PSC) on charting a course beyond 2025. The Steering Committee worked for a period of time in small topical groups focusing on clean water, shallow water habitats, climate, people, and healthy watersheds. These small groups are no longer meeting but the information is being incorporated into the recommendations of the Steering Committee. These recommendations are currently being assembled and they will go the Management Board (MB), then the PSC, then the EC. There will be a feedback window for the recommendations open in early July. The Steering Committee is endeavoring to provide updates to different GITs and workgroups to share that this comment period is coming. Following the EC meeting, Phase 2 will begin which is implementing the recommendations.

The Beyond 2025 Steering Committee is composed of representatives from the Chesapeake Bay Watershed Agreement signatories, federal agencies, jurisdictions, advisory committees, and Goal Implementation Teams, and two at large nonvoting members from Chesapeake Bay Trust and Choose Clean Water Coalition. In addition to the Steering Committee a contractor, ERG, has completed an independent evaluation of the partnership. ERG has provided an Evaluation Report that will be used along with the findings of the Steering Committee's small topical groups to build out recommendations to the MB, PSC and EC. ERG used a vast range of materials to inform their evaluation along with interviews across the partnership.

The Beyond 2025 Steering Committee's report/recommendations is divided into sections: critical path forward which will be their recommendations and vision for the partnership; synthesized, analyzed summary which will be high level considerations related to science, restoration/conservation and partnership; and additional source material.

The feedback period for the Beyond 2025 Steering Committee's report/recommendations is from July 1-August 31. Anyone can submit comments to comments@chesapeakebay.net, all comments will be posted online, and comments will be addressed by theme rather than individually. After the feedback period the document will be reviewed by subject matter experts, then by the MB and PSC before delivery of the final product to the EC.

Discussion:

Denice Heller Wardrop (CRC) said she was surprised that in the process diagram the MB and PSC have the final editorial authority and not the Steering Committee. The Steering Committee was charged with filling this mandate. She also noted that it is a public feedback period and not an official public comment period (which is different). It's a big deal that the final control is with the MB and PSC, while there is a lot of language about reaffirming the commitment to partnership, which is in conflict with having the MB and PSC having the final say.

Ken said he agrees. He says they need to confirm where final editorial authority lies because it should be with the Seering Committee. Denice said that the comments from the MB and PSC should be explicit and formal and there should be a record of how the Beyond 2025 Committee responds to that. Ken clarified the red line document is before it goes to the MB and agreed about a formal documentation of comments.

Julie Reichert-Nguyen (NOAA) commented in the chat: 100% agree it [final editorial authority] should be with the steering committee.

Gina Hunt (MD DNR) said when the public provides their feedback, she thought there is a process for grouping the comments and how they will be addressed. What do you mean by a red line document? Anna said there isn't time to respond to each and every comment, but they would be put into themes and responses made for the themes. Gina said she assumed that the Steering Committee would be responding to the public comments, not the EC or the PSC.

Ken said he remembers the discussion but not where they landed.

Rachel Felver (Alliance) commented in the chat: @Denice--Anna presented at the Stakeholders meeting this morning and the same concern came up. She said there that the Steering Committee would be addressing the comments that come in. Rachel said she's heard the same thing as Gina. She believes they [Beyond 2025 Steering Committee] did commit to posting all the comments received grouped into different themes as well as the red line version once it's been amended.

Ken added that the June STAR meeting will be devoted to Beyond 2025. Breck said she recommends attending the Beyond 2025 meeting next week.

Douglas Bell (EPA) said he's grabbed the conversation and will bring it to the Chairs of the Beyond 2025 Steering Committee. There will be time to address these considerations next week.

10:30 AM **Ecosystem Services 101 Presentation** **– *Dr. Susan Yee (EPA-ORD)***

Presentation summary:

In 2019, ORD was approached by the Chesapeake Bay Program and Region 3 EPA about a need to motivate lagging conservation and vital habitat BMPs, and enhance stakeholder buy-in to implement conservation related BMPs especially in the headwaters. The question was how to better communicate and quantify benefits associated with these practices, specifically beyond water quality. Resource managers and community partners engaging in restoration projects often say they need methods to inspire the public to act, determine local priorities for action, evaluate alternative restoration options, gain public support for planned projects, identify metrics to monitor progress and communicate benefits post restoration. To address some of these challenges, ecosystem services can serve as a bridge between ecosystems and people. Actions to restore, conserve, or protect landcover & habitat can be linked to social and economic benefits to people and communities through ecosystem services.

Dr. Yee defined ecosystem services as biophysical components of nature that are most directly enjoyed, consumed, or used to yield human well-being. This definition thinks of ecosystem services in 3 pieces: the environmental context or where, the beneficiary or who, and the ecological attribute or what. A beneficiary focused perspective helps to clarify what is meant and reduce ambiguity, be directly relevant to stakeholders, and ensure key stakeholders or benefits aren't overlooked. A review of planning documents shows that communities and resource managers are talking about ecosystem services and their importance, and yet widespread implementation of ecosystem services assessments is still limited. This may be because it is perceived as too technical or nuanced to convey to stakeholders or as requiring economic or monetary valuation (special expertise), or because management & restoration fall back on ecological proxies (habitat cover, water quality) as "easy wins". Thus, approaches and tools are still needed to simplify ecosystem services assessment.

ORD's research program aims to provide frameworks, tools, and approaches to link restored biological condition to social and economic benefits via ecosystem services. Dr. Yee provided 2 examples of this program: a Chesapeake Bay RESES project aimed at motivating implementation of conservation BMPs in the upper watershed, and an on-going project in

Crisfield, MD to evaluate nature based solutions for storm related flooding. Dr. Yee then went over the research approach and provided details on each of the two examples.

Discussion:

Larry Sanford (UMCES) said this work was particularly relevant to the Beyond 2025 work. He said something that stood out to him in the presentation was that what people care about is local, not universal across the entire watershed. It might change the way specific BMPs are evaluated. It changes the emphasis from only focusing on nitrogen, phosphorous and sediment, to focusing on what the local people care about. From Larry's point of view that's a fundamental part of the Beyond 2025 effort – rethinking what determines the major priorities locally throughout the watershed.

Dr. Yee said she did another research project for Massachusetts Bay where they looked at how priorities differed across cities along the coastline. They tried to see if they could predict what they cared about based on things like location along coastline, age, income levels and other parameters. The main result of that study was communities are so distinct with their own culture and history, their priorities can't be predicted, and it can't be a one size fits all solution.

11:00 AM **Estimating floodplain benefits in the Chesapeake** ***– Dr. Krissy Hopkins (USGS)***

Presentation Summary:

The project's goal is to quantify and value the capacity of floodplains to retain sediment and nutrients in the Chesapeake Bay watershed. They also conducted a small pilot study to quantify benefits for flood attenuation in a small watershed near Philadelphia and the Delaware River watershed, though Dr. Hopkins did not have time to go into that study.

The study looked at nontidal wadable streams with a drainage area of less than 3000 square kilometers in the Chesapeake Bay and Delaware River watershed, including floodplains across all 5 physiographic settings within the Chesapeake Bay Watershed. Floodplain sediment deposition and streambank erosion rates were quantified in the field at 53 field sites. Annual floodplain deposition rates were measured using dendrogeomorphic techniques. They cored trees to determine the age of the tree and measured how much sediment accumulated over the root collar of the tree. This allowed for an estimate of the floodplain accretion rate. This was done for 562 trees with a mean age of 48 years. The average across sites was around 2-5cm/year of sediment accumulating on the floodplain.

Erosion was measured using exposed tree roots “cookies”. They took 492 root “cookies” with a mean exposure age of 17 years. Bank erosion rates across sites were around 2.5-5cm/year of erosion, though some sites had more erosion than others. They also measured the soil characteristics (such as bulk density, particle size, nutrient enrichment and more) at the field sites. There were differences in soil characteristics between different physiographic settings.

With those data, they estimated the flux of sediment on the floodplain. In the coastal plain many sites were net depositional, and in the Piedmont there was a lot of streambank erosion. They then gathered predictor variables to predict sediment fluxes; these included watershed characteristics and fluvial geomorphometrics. They developed a tool called the Floodplain and Channel Evaluation Tool (FACET) which allowed for automated fine scale detection of things like stream banks within a stream channel. This tool allowed for a broad scale mapping of metrics like bank height, channel width, channel area and floodplain width. All of these data were fed into a random forest model to predict fluxes across the catchments within the Chesapeake Bay and Delaware River Watersheds.

Some results they found were that there is a rapid increase in streambank erosion when developed land exceeds 30% of the watershed area, and floodplain sediment deposition amount saturates when developed land gets to 20%. The FACET can help identify areas more prone to stream bank erosion or hotspots for deposition on the floodplain, to target restoration or identify areas that are high value for conservation.

They used a benefits transfer approach for ecosystem service valuation to evaluate the value of flood plain benefits and found a total floodplain trapping benefit of about $233 million USD/yr in the Chesapeake and $38 million USD/yr in the Delaware River watershed. Streambank erosion cost was $123 million USD/yr in the Chesapeake and $14 million USD/yr in the Delaware River watershed. Net nitrogen retention was calculated to be $100 million USD per year for the benefit of nutrient trapping in floodplains in the Chesapeake Bay Watershed. They also looked at the county scale and across different types of landscapes and found that the coastal plain provides the highest nutrient trapping benefits. The Piedmont is a hotspot for stream bank erosion and the coastal plain is a hotspot for floodplain trapping. First order streams have the highest amount of sediment deposition. Headwater streams are a net source for sediment but a net sink for nitrogen. Higher order streams provide the most nitrogen trapping per length of stream.

They’re currently working on a Floodplain Ecosystem Services Mapper that lets you zoom into specific areas and see estimates for floodplain deposition and benefits estimated for different catchments. This website is almost completed and will be released soon. Currently it’s available at a HUC12 scale but will be available soon at a finer level.

Discussion:

Denice asked if the mapper shows tradeoffs between wetland functions (like trappings sediment and the impact of the sediment on other ecosystem services). Dr. Hopkins said no, they don't in this particular mapper. They look at floodplains, that may include wetland areas but they don't specifically call out wetlands. Denice said her general point is there will be tradeoffs between ecosystem services. There will be a consequence of using a floodplain for sedimentation or maximizing its ability to retain sediment may have a negative impact on other things desired out of the same floodplain habitat. Dr. Hopkins said while that's not in the mapper you can use the data to answer those questions. Greg Noe may have thought about that more.

Kaylyn Gootman (EPA) and Ken Hyer suggested this information could be included in the Targeting Portal and the Chesapeake Bay Watershed Data Dashboard. Dr. Hopkins said that would be great and she'd be happy to help. Andy Fitch has been helping and a lot of files are hosted on the Bay server so hopefully it will be easy to feed it into these locations. Kaylyn suggested including summaries in communications materials to make the tool more accessible to use when sharing it with audiences such as local governments.

Jeremy Hanson (CRC) commented in the chat that he was be curious how this floodplain and streambank information might help explain some of what's seen in the METRIC tool when there are large disconnects between CAST estimated loads and the monitored trends.

Olivia Devereux (Devereux Consulting) said she will add the mapper link to CAST and the habitat tracker.

11:30 AM **STAC Ecosystem Services Workshop Report** ***– Jeremy Hanson (CRC)***

Presentation Summary:

Ecosystem services has a specific definition as Dr. Hopkins went over. Ecosystem services can be intrinsic though we often hear about the quantifiable extrinsic benefits. At the Chesapeake Bay Program co-benefits is a term that is often used that is similar to ecosystem services – it usually refers to additional social or community or other environmental benefits associated with the implementation of practices, often in reference to BMPs implemented to reduce nutrient or sediment roles. Co-benefits also may refer to when management actions simultaneously benefit multiple Watershed Agreement Outcomes. Jeremy used ecosystem services in this presentation as a catch all including co-benefits because that is what was used at the STAC workshop.

The workshop's objectives were to engage with stakeholders on the effective application of new ecosystem services results into tools and decision making at multiple levels, and develop recommendations for an actionable workplan of how ecosystem services can be used to address multiple CBP outcomes both short term and long term. They also wanted to hear from potential users of tools that use ecosystem services information. The workshop included a variety of presentations and case studies. Participants also spent time brainstorming gaps and barriers and opportunities for ecosystem services in CBP work. At the end of the workshop the information was synthesized and actions/recommendations were developed. The report is available at this link: STAC Workshop Report: Using Ecosystem Services to Increase Progress Toward, and Quantify the Benefits of Multiple CBP Outcomes.

The context for this STAC workshop is wide ranging and the foundation and need for ecosystem services has continued to grow since a previous STAC workshop on ecosystem services that took place in 2017. CESR and Reaching 2025 have reminded us that CBP's current approaches have fallen short of reaching water quality, nutrient and sediment goals, but those are not the salient incentives for most target audiences. Beyond 2025 represents a major pivot opportunity.

Some of workshop findings in words from workshop participants:

- "Make it easier."
    - For our partners at a local level.
- "Ecosystem services can be the bridge between water quality and all the other outcomes we care about."
- "Making the case for ecosystem services is the next big economic driver for us in agriculture."

Workshop recommendations included:

- Develop a tool that quantifies ecosystem services currently being provided across the Chesapeake Bay Watershed.
- Build capacity to support the integration of ecosystem services throughout the Chesapeake Bay Program.
    - A dedicated staff person would be very helpful.
- Develop a framework for quantifying the ecosystem service impacts of select BMPs.
- Improve consideration of ecosystem services in land use planning and decision-making.
    - Examples of this have been shared from Charles County and Crisfield, MD.
- Improve consideration of ecosystem services in the funding and financing of Chesapeake Bay restoration activities.

- Identify and follow pathways to improve institutional structures and supporting policies to better integrate ecosystem services into the next phase of the Chesapeake Bay Program beyond 2025.

Jeremy concluded by sharing Anna Killius's remarks on why we need ecosystem services: to help understand the value of what we already have, what we might lose, and what we could gain, so that we can leverage every single dollar from every type of funding stream to get our projects paid for. There's already plenty of work going on, and the partnership has unique strengths and roles to play.

Discussion:

Greg Allen (EPA) in the chat: We are beginning planning for an accepted STAC workshop that will be a follow-on. Title: Identifying natural and social sciences gaps to enable market-based approaches.

Greg confirmed that this is an approved and funded STAC workshop. The fundamental reason for it started with the understanding that the fundamental macroeconomic of Bay restoration is a model where we're paying for the restoration. The workshop will be wondering what are the remaining gaps in reversing those macroeconomic so private funds want to pay for it. Can a market actually reverse the economics here? What are the remaining gaps that keep us from being able to use those kinds of approaches more effectively? Can the valuation of ecosystem services be converted into a market? These are the questions this workshop will explore.

Jeremy said he would like to provide input on the preliminary planning for the STAC workshop. (Greg will reach out). Kaylyn also wanted to help.

Meg Cole (CRC) added in the chat: The FY24 STAC workshop, "Identifying Natural and Social Sciences Gaps to Support Market-Based Approaches to Chesapeake Bay Watershed Restoration" is (as of now) a hybrid 1.5 day event which will convene in either November 2024 or January 2025 - planning start June 1st with the Steering Committee.

Olivia commented in the chat: We are adding the comet-planner quantifications for CO2 equivalent and soil carbon to CAST reports. That will be out later this year.

Julie commented in the chat: I recall that Bo Williams was leading an ecosystem services team, but I believe this falls under a group of people volunteering their time to integrate ecosystem services research. I'm unsure of the status of this group. I like the idea of a more formal team

within the CBP. Climate resiliency work depends heavily on connecting nature-based solutions with ecosystem-based services.

Bruce Vogt (NOAA) said linking Jeremy's presentation to earlier ones, the earlier ones say that local is really important: when using ecosystem services as a framework it's crucial to be working with people at a local level and identify what they care about. It's important to identify what people care about and intentionally design projects to address that. The Fisheries Goal Implementation Team has been thinking about how to do more with community involvement and articulate more clearly what they want to achieve as they move forward with oyster restoration. In addition to more oysters there are other things like water quality and fish habitat that are benefits people care about. Engaging with stakeholders more to better understand their interests and designing restoration to achieve multiple benefits is important.

12:00 PM Adjourn

Next meeting: June 27th, 2024 – Theme: Beyond 2025

Attendance:

August Goldfischer (CRC), Breck Sullivan (USGS), Peter Tango (USGS), Ken Hyer (USGS), Bill Dennison (UMCES), Kristina Hopkins (USGS), Susan Yee (EPA), Denice Heller Wardrop (CRC), Caroline Kleis (CRC), Jeremy Hanson (CRC), Douglas Austin (EPA), Bailey Robertory (CRC), Larry Sanford (UMCES), George Doumit (DNREC), Samuel Rendon (USGS), Ann Foo (UMCES), Mike Mallonee (ICPRB), Greg Barranco (EPA), Rebecca Murphy (UMCES), Gina Hunt (MD DNR), Matthew Kierce (IWLA), Sophie Waterman (CRC), Meg Cole (CRC), Mark Nardi (USGS), Liz Chudoba (Alliance for the Chesapeake Bay), Douglas Bell (EPA), Tou Matthews (CRC), Greg Allen (EPA), Julie Reichert-Nguyen (NOAA), Meighan Wisswell (VA DEQ), Jamileh Soueidan (CRC), Rachel Felver (Alliance for the Chesapeake Bay), Megan Thynge (UMCES), Labeeb Ahmed (USGS), Kathy Boomer (Foundation for Food and Agriculture Research), Qian Zhang (UMCES), Bruce Vogt (NOAA), Gary Shenk (USGS), Olivia Devereux (Devereux Consulting), Kaylyn Gootman (EPA), Bill Jenkins (EPA), Fred Irani (USGS)