Status and Trends Workgroup (STWG) Meeting

Monday, May 9, 2022

1:00 PM – 2:30 PM

Meeting Materials: Link

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

Meeting Minutes

1:00 Opening, Roll Call, & Announcements – Caroline Donovan, Chair

- Status and Trends structure document available on the webpage.

Summary

Caroline reminded attendees about the new structure of the workgroup, where the workgroup is aiming for shorter, more targeted meetings. Today's focus is on quantitative outcomes that are developing quantitative indicators. The themes of upcoming meetings and groupings of outcomes can be found on the STWG structure document here. Alex Gunnerson will list out those expected to attend each meeting on the calendar invite and on communications leading up to the meeting.

Caroline added that the STWG webpage will serve as a central repository for workgroup documents.

Julie Mawhorter commented that the Tree Canopy outcome should be added to the quantitative indicator under development column of the structure document, although they hope to have it finished in a few months, so it is in a transition period currently.

1:10 Overview of Indicators and Their Role in Adaptive Management – Katheryn Barnhart, Coordinator

> Katheryn gave a short overview of the purpose of indicators and how they fit into adaptive management.

Summary

Caroline asked if we can record this presentation, clip it out, and then post it to the CBP. Katheryn said she is fine with that, and at the very least we can post this presentation to the main STWG webpage. Alex will investigate the feasibility of this idea.

Katheryn commented that this is a tailored version of the presentation she gave at the January meeting. Katheryn began with an overview of the six questions that guide indicators at the Chesapeake Bay Program (CBP). Katheryn defined some key terms, and the corresponding questions that they answer, such as: indicators, influencing factors (factors of a system that will impact our ability to achieve an outcome), outputs (directly measure management actions taken), and performance (most direct measurement of achievement towards an outcome). Katheryn then showed the graphic in the Indicators Framework (page 2), a 2015 document developed to communicate the importance of indicators and standardize the indicator

development process. The graphic lays out the role indicators play in the adaptive management process graphic. Katheryn explained how the graphic on slide 5 corresponds to the CBP, saying that the desired outcomes are set in the Chesapeake Bay Watershed Agreement, influencing factors are key assumptions about a system and are represented in Logic and Action Plans, outputs are the management strategy, and assessing performance is about a performance indicator. Metrics and indicators are helpful and informative at the consider influencing factors, establish strategy and produce outputs, and assess performance stages. Katheryn emphasized that if performance assessments do not indicate ecosystem wide progress toward the outcome, then adaptive management comes into play to reconsider assumptions or change the management strategy.

Katheryn then all the important qualities for an indicator (slide 6), based on a presentation by Peter Tango. With these considerations in mind, Katheryn listed six of the steps needed for developing new indicators, but a more comprehensive list can be found in the Indicators Framework (page 3). Katheryn reminded everyone that all of the indicators are ultimately reported on ChesapeakeProgress and they go through a quality assurance/quality control process to ensure communication to stakeholders is effective.

Caroline said this presentation was clear and anyone with questions should reach out to Katheryn directly at barnhart.katheryn@epa.gov.

1:25 Tree Canopy Indicator – Julie Mawhorter, Tree Canopy Outcome Point of Contact

> Julie presented on the proposed indicator for Tree Canopy for feedback from the group before seeking GIT approval. She did not seek workgroup approval.

Summary

Julie began with a refresher of the language for the Tree Canopy Outcome and then explained how the outcome is defining and measuring tree canopy (slide 3). Urban tree canopy is defined broadly, meaning that this refers to small patches of trees, urban street trees, or parks in vicinity of development. The other key definition Julie shared is that this outcome is focused on net gain, so while the number of trees being planted is recorded, the number lost due to various landscape forces is also included. Julie added that Tree Canopy was a new outcome in 2014 so there has been work for quite a while to develop an indicator. There is a two-pronged approach, the first being sharing tree planting Best Management Practices (BMP) data as reported by the states for urban tree planting (dispersed planting), urban forest planting (larger patches intended to grow into forest), and urban forest buffer through the National Environmental Information Exchange Network (NEIEN). This first approach reports on annual progress from 2014-present since the outcome is based on the start of the Chesapeake Bay Watershed Agreement and uses a custom "no expiration" scenario to make sure all new annual acres are counted. The second component of the approach is using the high-resolution land cover dataset developed by the CBP and is considered to be the best tracking of tree canopy gains and losses over time. Since there is both 2013/2014 and 2017/2018 data available, it creates a nice baseline of initial change as future datasets are expected every four years of so for tracking long term trend and progress.

Julie said the original proposal for an indicator was to track changes in: tree canopy over turf, tree canopy over impervious, and urban forest (only forest that falls within census urban areas and clusters). This proposal would not have included trees on agricultural land or forest outside of census urban areas and clusters. The problem with this original proposal is that the developed landscape is always expanding and census boundaries are too narrow and static, so the baseline was not steady. Therefore, a new approach was developed using Land Use Change Matrices to help target specific changes of interest, which in this case refers to changes in tree cover on developed/developing lands. Julie then described and explained the matrices, including the relevance of color coding. Cells shaded bright green represented a net gain (change from impervious/turf/pervious developed to tree canopy/forest) and cells shaded bright yellow represented a net loss (change from tree canopy/forest to impervious/turf/pervious developed).

Peter Tango commented it is excellent to hear you are testing the methodology, as this is critical to indicator method development.

Breck asked a clarifying question regarding slide 9, asking what the tan color in the top left corner represents. Julie said those colors represent a change between classes that did not involve tree cover. The ones in green and yellow just involved tree cover. Breck asked why some of the green and yellow were blank. Julie said since the final land cover/land use change data is not yet released, those cells are blank. If any cells are still blank after the final data is released, it means that type of change was not detected.

Julie then presented one of the outcome team's ideas for displaying the data on ChesapeakeProgress (slide 10). Julie concluded with next steps, such as asking for feedback from STWG before seeking approval from the Forestry Workgroup and Water Quality Goal Implementation Team (WQGIT). Katheryn asked about the communications goals of this chart and from a communications perspective, what message does the combination of these three metrics represented in this visualization convey. Julie said they may want to separate these metrics on to two graphs since they are showing two different things: the land use change data is showing what happened during that period of time and the planting data records trees planted during a given year. These two metrics cannot be directly compared because the trees take 10-15 years to show up in the Land Use data. Julie said perhaps they could take the net loss and offset it by the number of acres planted. Julie emphasized this is why they have brought this question to the STWG.

Katheryn asked if all of the acres planted on this chart were in urban areas. Julie replied yes, these trees were all planted in developed areas, so not tree planting on agricultural land. Katheryn suggested reporting the two metrics separately because they come from different sources and are communicating different information.

Peter Tango asked how they got -30,000 + 6500 to be a positive quantity. Julie Mawhorter commented that it is not a net positive quantity, but that 2400 acres is the goal. Katie Brownson replied this is a revealing question and another reason why it makes sense to track the planting numbers separately from the net change numbers. Peter Claggett suggested the

blue line should be horizontal and probably dashed. Peter Claggett and Caroline Donovan said in its current state, this chart portrays the goal as gradual progress being achieved in equal intervals, which is not accurate. Peter Tango and Julie agreed.

Peter Tango asked for a translation from the tree planting metric to the net change metric, specifically if a tree is planted, what is the likelihood it will be detected in ten years by the land use change data. Julie said that in looking at the imagery from tree plantings while evaluating crediting for the model, it was determined that the trees can reliably be identified in the imagery in a range from 10 to 15 years.

Kristin Saunders commented the rate of conversion is happening faster than the rate of planting, so we need to tell the story. Peter Tango agreed. Kristin said her instinct is that the net loss of trees is having a greater impact than planting. Kristin said it is important to provide context and tell the whole story about tree loss so that way the message to managers about the way to interpret this data is clear. Julie agreed and said that one of these metrics on its own is an incomplete portrayal of the situation, so she recommended having the two graphs side by side. Caroline Donovan suggested putting the metrics on two different graphs for the same reasons Katheryn mentioned, with some accompanying text to explain the context. Caroline suggested using cylinders on ChesapeakeProgress to visually represent tree height at different stages of growth and show why it is important to start planting these trees now.

Allison Ng asked what is the survival rate of trees planted? are you able to project acre net gain based on acres planted? Julie said the metric for acres planted is based on anticipated canopy size after ten years of planting and a typical survival rate based on the literature.

Breck Sullivan asked if it is possible to show these changes and where the trees are planted geographically because we might be losing trees in one urban area while trees are being planted in another area. Julie said the tree planting indicator will not have that level of detail because it is on a bay-wide scale and the data is not point data. Katie Brownson replied we are planning to develop a map showing net tree cover change by county, but this would not include planting numbers (at least in the same map). Julie added how a StoryMap will be used to direct viewers to more information about their county and local area.

Katheryn Barnhart said she will brainstorm with some communication specialists how to convey the context of these metrics while maintaining clarity. Renee Thompson commented that this indicator will be one of the first to take the new land use change data and turn it into a metric to be communicated to the public, so she recommended that Peter Claggett review the final numbers assist with the communications aspect. Peter Tango said survival rate might be translated to "recruitment rate" expected over time to offset the loss rate.

Allison Ng asked is there a way to show acres planted today (not how it will look in 10 years) on this chart and then have your second chart show the 6500 acres planted. Julie said she does not know if they can do this due to the way the data is reported. Katie added that the plan for updating the indicator is to show the actual numbers of trees planted each year. Caroline

suggested using a bar chart to represent the total number of trees planted. Peter Claggett suggested clarifying how many data points are represented by these metrics so the user understands the net change is a straight line since there are only two data points, and the tree plantings have many more data points. Katheryn said she likes the idea of bar charts for the tree planting metric because it is not cumulative.

Katheryn asked for if for land use change, there would be one metric showing change towards forest and another metric showing forest loss. Katie said it is already accounting for any growth, so overall it is a loss and represents net land use change.

Peter Tango said the net loss is what is visible and detectable as a status assessment over time, but the acres planted metric is different, representing implementation and an expectation of lag time to recruit to a detectable size. So, Peter said it feels like two different charts would be helpful here since these are two different stories: measurement and conversion.

Peter Tango asked do we have a total urban acres measured so we can judge -30,000 acres and then we are, as of 2018, -32,400 acres below goal. Planted trees will enter the record approximately 10 years after planting, and that will be detected in the data. It is like year class young-of-year in fish getting recruited into the fishery that has a harvest size of 15 inches minimum for example.

Renee Thompson shared some good examples of ways to display progress in this report. Renee said this report demonstrates ways of incorporating multiple levels of information into one chart.

Caroline commented she is appreciative of the work Julie and Katie have put into developing these metrics and she feels it is a strong indicator.

Katheryn asked if these indicators should be expected to update every four years when the new land use change data comes out or every one year to accommodate more trees that have been planted. Julie said she thinks the number of trees planted can be updated each time there is a new data point and that the land use change data can just be updated every two years.

Julie Mawhorter said she appreciates all the helpful feedback and suggestions.

1:55   Indicator Development Check-in

>   Opportunity for outcome representatives to provide an update on indicators they are currently developing and ask for any guidance from the workgroup.

<u>Summary</u>

Bruce Vogt asked for a reminder from you all about how qualitative and quantitative indicators are being defined here. Peter Tango replied he anticipated speaking a little to details of

indicator development that may dovetail with your interest here or be a place to play off the ideas together. Katheryn said every indicator is inherently quantitative, but this group has been separated from the group meeting in June based on the language of the outcome. For example, the language in the outcomes at this meeting is a bit more straightforward in terms of determining which metrics might be informative for progress towards the achievement of the outcome. The language in the outcomes at the June meeting is less clear, and sometimes uses terms like continually improve knowledge. These two sets of groups face different challenges when trying to report performance indicators, so the purpose of having two separate meetings is to allow for more focused conversation.

Justin Shapiro presented on the work towards developing an indicator for the Forage Fish Outcome. Justin began with background on the outcome, such as the need to assess the forage base and knowledge. Justin shared three tiers of metrics to be used for forage that were identified by a STAC workshop as the most important species to report on. For the first tier (forage abundance), time series modeling for Polycheates has been done and the results will be discussed at the Forage Action Team meeting in June. The second tier (habitat and environmental factors) involves a habitat suitability index developed for Bay Anchovy by Virginia Institute of Marine Science (VIMS). This involved relative abundance being compared to extent of suitable habitat. Other potential metrics for the second tier is Polycheate abundance connection to climatic factors and percentage of hardened shorelines in Maryland and Virigina. Justin said at the Forage Action Team meeting over the summer, they will discuss annual commitments to update, how they are presented, and funding needed for next steps. Justin concluded that at this point they are still working on assessing the forage base, so they have not been focusing on progress to complete the outcome.

Caroline said she has two comments regarding Bay Anchovy: the outcome team should loop in the UMCES Report Card team since they are doing a Bay Anchovy indicator as well and both parties could benefit from collaboration on understanding how to evaluate Bay Anchovy. Caroline also commented on the availability of Polycheate data and asked if this data will be provided in regular intervals so that the indicator can be updated. Bruce Vogt replied his understanding is that the benthic biomass and Polycheate data will continue to have surveys in place and be available, which should allow for indicator updates. For Bay Anchovy, the fishery survey it relies on continues to be updated but the models used for habitat suitability are proprietary and require funding for maintenance. Bruce said there is interest in developing an open-source model to save costs going forward. Peter Tango commented the Polychaete data should be from the annual benthic survey conducted by Old Dominion University (ODU) and Versar via Virginia Department of Environmental Equality (VADEQ) and Maryland Department of Natural Resources (MD DNR) funding.

Bruce provided some clarity on the next steps that Justin outlined, emphasizing they want to share this information with the public in two ways: ChesapeakeProgress and the State of the Ecosystem report (used by the regional fishery council to guide management). The goal would be to create indicators and visualizations that can be used in both contexts.

Katheryn said that based on what was discussed, these metrics seem like great quantifications of these broadly worded outcomes.

Peter Tango commented about percent hardened shoreline and how it connects to SAV and Black Duck outcomes. Peter suggested there might be potential for collaboration on this metric in regard to being informative for habitat suitability and recovery. Bruce expressed that ultimately, they want to use these indicators to influence decision making.

Justin said the Fish Habitat outcome is earlier along in the indicators process. There was not enough time for discussion of the Fish Habitat indicator development in this meeting.

Bruce commented if the Habitat Goal Implementation Team (GIT) Structured Decision Making concept discussed last week takes off, the shoreline data-thresholds could be really useful in assessing risk and tradeoffs. Peter Tango replied this is a cool topic to drive shallow water management questions and the give-and-take of it. Peter doesn't think they have stated the gradient of potential conditions to manage for, or the goal as to proportion of allowable development pitted against local economic development/landowner driven requests, etc. Justin commented we should note that there are folks at VIMS interested in those shoreline trends over time that were discussed. They are looking for partners and funding.

Renee Thompson said based on what she saw with the Fisheries GIT, indicators are in different phases of development. Renee suggested structuring meetings around indicators that are primed for action and ready for input, and other indicators that are waiting on data or other factors for progress. Renee shared that the Healthy Watersheds Outcome is in a place right now where they are waiting for other events before they can continue work on the indicator. Renee provided some updates, like how the Chesapeake Healthy Watersheds Assessment is about to start a GIT Funding project, the Maryland Healthy Watersheds Assessment is waiting on the release of the high resolution land cover/land use change, and the agreed upon interim indicators are also waiting on the release of the high resolution land cover/land use change. Renee expressed that one challenge for the Healthy Watersheds Outcome is that different states have different procedures for carrying out their assessments, so this makes it difficult to have a single baseline. Renee shared another challenge for the Healthy Watersheds Outcome is the semantics of the outcome language, as it does not leave much room for communicating the nuances of varying watershed health (watersheds in the "mushy middle") and each jurisdiction defines healthy watersheds differently. Peter Tango commented this is excellent Renee. Yes, we want to show progress. It is important to say something has gone from abysmal to 'meh.'

Renee said the Chesapeake Healthy Watershed Assessment Tool is the closest set of metrics they have to an indicator. Renee explained the same metrics are calculated for all of the catchments across the whole Chesapeake Bay Watershed so they can examine vulnerabilities, and opportunities for co-benefits, conservation, and restoration. Renee said the Chesapeake Healthy Watershed Assessment Tool 2.0 should be ready by July 2023 and should include updates, added analysis, user input, and data from the Chesapeake Conservancy.

Katheryn said she thinks Renee and the Healthy Watersheds team is not giving themselves enough credit as they are starting to ask similar questions as the Forage Outcome, such as data availability and communication. Renee said the middle step before communication is collaborating with the states to ensure the messaging is consistent and conforms to both CBP and state standards, which can be a political and compromised process. Katheryn replied she had a similar conversation with Peter Claggett about reporting Land Use Methods and Metrics and using thresholds to communicate. Renee said the challenge here is that states do not want to endorse something until they have seen it, which requires developing it first, so it is somewhat of a chicken and egg problem.

Renee said the interim indicators they expect to have once the high resolution land cover/land use change data is released are impervious surfaces and percent protected. Renee said that keeping in mind the protected lands data, an interim metric might be vulnerability to development. However, Renee felt since the full Healthy Watersheds Tool 2.0 should be ready for release in a year, perhaps it would be best not to release narrower, interim indicators and just wait for the release in a year. Katheryn replied that depending on the labor required to translate the current metrics available into an indicator for healthy watersheds, it might make sense to still do them since the question of how to communicate the tool released in 2023 could take a significant amount of time. Renee said their goal is to have substantive information to report on by 2025 and she is optimistic about that. Katheryn suggested following up with Renee about weighing the pros and cons of updating interim indicators or waiting for the new data to do the whole suite of indicators.

2:25   Next steps and Actions – Alex Gunnerson, Staffer
- **Alex Gunnerson will post Katheryn Barnhart's presentation to the STWG webpage and will work on posting the recorded presentation from the meeting, if possible.**

- **Katheryn will try to attend the Forage Action Team meeting in June since that will cover discussions pertinent to indicators. Justin Shapiro will send Katheryn an invite.**

- **Julie Mawhorter and the Tree Canopy Outcome team will focus on communication efforts, such as making the 2025 goal a dotted line, using bar graphs for non-cumulative tree planting data, and splitting the tree planting metric and net land cover change metric into two charts.**
    - o **Katheryn will brainstorm with some communication specialists in the STWG on how to convey the context of these metrics while maintaining clarity.**

- **Katheryn will follow up with Renee Thompson about weighing the pros and cons of updating interim indicators or waiting for the new data to do the whole suite of indicators.**

- **Alex will produce an end of meeting survey for future meetings.**

2:30   Adjourn

Participants: Alexander Gunnerson, Amy Goldfischer, Angie Wei, Breck Sullivan, Bruce Vogt, Caroline Donovan, Caroline Johnson, Chris Moore, Jamileh Soueidan, Julie Mawhorter, Justin Shapiro, Kaitlyn May, Katheryn Barnhart, Katie Brownson, Kristin Saunders, Peter Claggett, Peter Tango, Qian Zhang, Renee Thompson, Sophie Waterman.