Status and Trends Workgroup Meeting

Monday, April 5, 2021
12:30 PM – 2:00 PM

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

Action Items

- ✓ There will be a future meeting dedicated to indicator development since there are other potential indicators the workgroup would like to address along with other indicator development needs
- ✓ Doreen Vetter and team will work with Mandy Bromilow to describe their progress of forage indicators and reflect the work they are doing on Chesapeake Progress
- ✓ Follow up with Qian on the opportunity of reporting the trends of the nutrient loads with the current indicator
- ✓ Follow up on feedback for local leadership survey at a future meeting

AGENDA

12:30 Opening and Roll Call - Katheryn Barnhart, Coordinator

The newly convened workgroup readjusted the workplan priorities for 2021 within their scope of work and mission which were presented to STAR and ranked in the following order:

- Indicator Development
- Updating Indicators to Chesapeake Progress
- Factor Influencing Indicators
- Involvement in Strategy Review System

Future 2021 meetings will focus on themes based on these priorities. The theme of this meeting is indicator development.

12:35 Presentation on Forage Fish Development of Indicators – Mandy Bromilow

The Forage Outcome does not contain a quantified target, so the Fisheries GIT has been working to develop a suite of indicators that address management questions such as is there enough food for predators and what factors affect prey abundance. They will present on how they

prioritized the current list of indicators and show specific examples of indicators for prey status and trends and habitat suitability. The aim is for the indicators to be used to guide bay program decisions and inform ecosystem-based fishery management at a regional and federal level.

Desired takeaways/Goal: To provide an example of how one GIT has tackled developing an indicator for an outcome without a quantified target that may help others who face similar obstacles. A discussion on communications would hopefully lead to a tentative schedule for indicator release/update frequency and how to communicate the outcome's story if not able to release all indicators at once.

To address the outcome, they want to know if there is enough prey available in the Bay and how it changes over time. The Forage Action Team took steps to develop a suit of indicators to track prey availability. Important factors for this development are to identify key forage species and quantity environmental relationships. If the end goal is to understand how much prey is available to predators, they also need to understand prey consumption habits over time (i.e., how much proportion of prey is contributing to predator diet.)

Indicator development started in 2014 with a STAC workshop that identified key forage species and discuss potential indicators. An important takeaway from the workshop was to include not only forage fish but also benthic macroinvertebrates. It also identified three predator species that are important for management. In 2015 – 2016, the Forage Action Team preformed GIT-funding studies on informing forage indicator development. NOAA CBP funded studies also for forage indicator development related to habitat use and suitability in 2017 – 2019. There was not a clear plan on how to transition the results from the studies into indicators. Last year the Forage Action Team took all the feedback from members and put forward ideas for potential indicators that could be developed initially. This lead to the Forage Indicator Development Plan which states their intentions for developing indicators to hopefully avoid repeating conversations and getting side tracked with other potential options. The Plan is broken down into three Tiers of potential indicators. The first tier includes more direct indicators of tracking abundance of benthic invertebrates, demersal finfishes, and pelagic finishes. The second tier is more indirect factors between habitat and environmental factors that affects forage abundance. The last tier is focused on predator consumption. They have narrowed their focus even more within the last few months to three indicators with more data available currently and can start working on right away.

They will be working on the springtime warming indicator soon. One of the primary drivers for abundance is springtime warming. The earlier it warms in the spring the less forage abundance available in the summer. A study has found this relationship, but there is not enough to develop an indicator so there is a GIT Funding project to build off of the work and create the indicator.

The Habitat Suitability Index done by NOAA CBP assessed the extend of suitable habitat for four key forage species. They found suitability extent had significant effect on anchovy abundance in the winter. This project recently wrapped up, and they are working with the Forage Action Team to create indicators. They have talked about making heat maps for suitable habitat as the indicator to show viable habitats for conservation, and they have also discussed timeseries to show area or volume of suitable habitat since there is a relationship with forage abundance.

There are two priorities they are trying to address with the forage indicators. These priorities are addressing fisheries and CBP priorities and interest while focusing on striped bass and summer flounder as managed species.

Renee Thompson commented the Healthy Watershed Outcome is in a similar situation with having information but not knowing how to form it into an indicator. She would like to talk with Mandy Bromilow because she sees connection with the Healthy Watershed Assessment. They do not have information where abundant fish are in the assessment, but people care about what is in the water. Mandy agreed there is a connection with the habitat suitability index. She also said they have been working with the GIS Team for assessing a shoreline hardening map to tie together effects of hardening and thresholds on forage abundance.

Peter Tango commented there use to be spring time data for benthic. It would be helpful to know if the summer assessment is providing all the information needed or is there other monitoring data needed such as a different season or a different location. Peter would like to follow up if the benthic survey needs to be extended.

Katheryn Barnhart asked if there is an estimation of when these three indicators will be developed for reporting. Mandy Bromilow said there is a strict timeline for the springtime warming because it is connected to a current GIT Funding project. She is working on the abundance indicator which shouldn't be much longer, but she doesn't know the timeline for the habitat suitability indicator. Justin Shapiro stated for the shoreline effort they are working on with the GIS team is separate from the indicator effort. Those layers are completed, but they are not at the point of developing an indicator for it.

Julie Reichert-Nguyen asked if the habitat suitability index considers marsh habitat and loss of marsh habitat. Mandy Bromilow said it would determine what species were being looked at used marsh habitat. She doesn't remember habitat structure being included in it. Bruce Vogt said no, it is looking just at the water column. In the future, they could maybe connect these environmental factors to more structural factors. Bruce said they can go back to the group to discuss this option. Bruce said one challenge they come across is that the shallow water areas are less sampled so some of the habitat utilization on marshes might be data limited. He also stated there is new funding for a fish activity model looking at submerged aquatic vegetation, so they are talking about doing more sampling to support their model. He can follow up with Julie on this effort.

Doreen Vetter asked what is the best way to capture this information and update it on Chesapeake Progress. The site does not say much about the progress toward the outcome. She would like to work with Mandy Bromilow on how to describe progress for the forage indicator work.

1:05 **Review of Updates and Corrections to the Water Quality Loads and Flow Indicator – Qian Zhang**

Qian will present a summary of this indicator and the proposed changes/corrections followed by an opportunity for the workgroup to provide feedback or ask questions.

Desired takeaways/Goal: To obtain feedback and, hopefully, approval on proposed changes to the Water Quality Loads and Flow indicator, agreeing on the messaging of these changes in the next update.

River Input Monitoring (RIM) stations are near the fall line. Loads computed for the Loads to the Bay indicator compute loads both from the RIM watershed and the below RIM area which is simulated by the watershed model where there is not USGS monitoring. The total load for this indicator is the sum of the RIM load, Non-RIM load, and tidal air deposition directly onto bay water. The Non-RIM load is estimated from Chesapeake Assessment Scenario Tool (CAST) and is calculated by the point source, non-point source from the shoreline, and non-point sources from non-shoreline.
Doreen Vetter asked for an example of non-shoreline non-point source load?
Peter Tango said it would be items like fertilizer runoff from fields and yards on the land into the water. It is not shoreline erosion. It is non-point source runoff, and it is not from above the fall line.

Qian showed what is currently shown on Chesapeake Progress. The graph breaks the nitrogen loads into atmospheric deposition to tidal waters, downstream nonpoint sources, downstream wastewater treatment plants, and river input. There is a similar graph for phosphorous, but phosphorous does not have an atmospheric deposition variable. The sediment graph shows the RIM load, but there has not been the computation for the below RIM sections.

Qian provided the proposed changes for the indicator. There are three changes they do not believe will lead to differences in the results, but there are three more changes that will lead to moderate published results. This includes switching from CAST-2017 to the data now available in CAST-2019, using the corrected atmospheric deposition data available in CAST 2019, and flow adjust the non-shoreline part of the non-RIM non-point source loads. He then went through the updated graphs which include the additional changes, and they show similar results from the last update in 2018. The percent different between current and previous loads is much more apparent for phosphorus because the below shoreline non-point source is a major fraction of load for phosphorous. In wet years, the values for the recent loads is smaller than the previously reported value because they do not flow adjust it anymore.

He then described the recent 2019 values along with the long-term mean. The flow for 2019 is 60% higher than the long-term mean. The top table shows the actual unit in terms of mass and the bottom shows the fraction difference. For the bottom table, nitrogen river input is similar for increase in load as the increase in flow. The nitrogen point source load has decreased a lot due to management not hydrology. In addition, atmospheric deposition has also reduced despite a wetter year in 2019. Overall, there is a 40% increase in nitrogen loading. It is higher than the long-term mean, but the increase is much smaller than the flow increase of 60%. The results are similar for phosphorous. Qian did the same analysis to compare 2019 and 2018 so comparing two wet years. In 2019, the flow is 20% higher than in 2018. For phosphorous and sediment, despite a higher flow, the loading has declined in 2019 compared to 2018.

In 2019, the nitrogen point-source load has reduced, but for phosphorous and sediment, they have both increased. There might be some issues with the point source data from Pennsylvania and Maryland. This may be created in the next version of CAST, but those numbers do affect the

total values significantly because point source loads are very small compared to non-point source loads for the below RIM watersheds.

Peter said it is encouraging to see the flow is higher, but the total load is lower. It shows the management practices are working.

Doreen Vetter asked if Qian could make that connection to management practices. Qian said he doesn't have the information right now, but he might be able to dissect it. For shoreline load, they only began to include shoreline in last year's update so the changes in values between 2018 and 2019 only affects last year's update because shoreline was included in that report. Peter Tango said there is work on tributary assessments that continue to dissect the changes and contributions of the sources relative to the total loads. That information coupled with indicator information would help with the question of where do we have the data to support the inference of what is changing and why.

Qian mentioned the indicator only compares the previous year with the current year in the description part on Chesapeake Progress so it would be beneficial to show the long-term trend.

Peter Tango acknowledged the suggestion for them to expand the explanation and reporting for the loads indicator. He and Qian can provide some options and opportunities to which information is added and how to present it with tables and text.

1:30 **Local Leadership Indicator Development – Laura Noll**

The Local Leadership Workgroup has developed a baseline level of local elected watershed knowledge survey (pending OMB ICR approval) as a first step in indicator development for the local leadership indicator. Laura will provide a background on her outcome and then an overview of the survey the workgroup has developed for distribution. We will then open the floor for feedback on how we might develop an indicator for this outcome based upon the information that is collected in the baseline survey.

Desired takeaways/Goal: Based upon feedback and suggestions from the workgroup, have a general plan for how to turn this baseline survey into one or multiple performance indicators for the outcome, including logistics for what this may require.

Katheryn proposed following up at a future meeting to receive feedback since other outcome leaders had previous obligations.

Renee Thompson said when things come out to produce easily digestible summary of key items that can relate to any outcome. She is also interested on learning on how to apply some of the results to the Land Use Options Evaluation outcome.

Breck Sullivan asked if they intend to repeat the survey. Laura Noll said with ICR approval, they should be able to repeat it every 2 – 3 years.

Katheryn Barnhart suggested connecting with Amy Handen because this survey is a similar effort with the Stewardship survey.

1:55 **Next steps and Actions – Breck Sullivan, Staffer**

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Adjourn

Participants: Peter Tango, Qian Zhang, Katheryn Barnhart, Mandy Bromilow, Megan Ossmann, Rachel Felver, Briana Yancy, Karl Blankenship, Bruce Vogt, Kaitlyn May, Justin Shapiro, Doreen Vetter, Julie Reichert-Nguyen, Laura Cattell Noll, Angie Wei