Integrated Trends Analysis Team (ITAT)
Meeting

Wednesday, June 22, 2022
10:00 AM – 12:00 PM

Meeting Materials: Link

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

- **Breck Sullivan will collaborate with Dave Parrish on the State of the York report to incorporate information into the Tributary Summaries with the goal of getting more viewers and users of the Tributary Summaries.**
- **Alex Gunnerson will resend the Tributary Summary timeline and climate change materials for final comments.**
- **Alex, Breck, and Vanessa Van Note will ensure the Rappahannock Tributary Summary is properly formatted when the final version of content is ready.**
- **Alex will distribute the three different versions of the Rappahannock Tributary Summary for reviewers to compare.**
  - **ITAT members who previously reviewed the Rappahannock Tributary Summary should review the most recent version, specifically the cluster analysis section (5.2.2). In particular, it would be helpful to have Qian Zhang look at the Water Quality Standards Attainment Section, Rebecca Murphy look at the Tidal Trends and Cluster Analysis, and Roberto Llanso look over to see if his comments were addressed.**
- **ITAT members to review the abbreviated Logic and Action Plan pertinent to ITAT and reply to Alex, Breck, and Vanessa if they feel any of these actions should be coded a different color based on the effort's status.**
- **Alex will invite ITAT members to attend the WQSAM Outcome SRS Dry Run Presentation at the August 18th Coordinator/Staffer meeting.**
- **Alex will send ITAT's feedback on the webpage to the Chesapeake Bay Program (CBP) Web Team and begin making the changes possible under the current webpage architecture.**
- **Amy Goldfischer will include ITAT publications in the STAR newsletter publications section. Alex will help Amy identify which ITAT publications to include.**
- **Elgin will create an example graph with the salinity zone overlaid for the stations on the X axis of the cluster analysis graphs (Figure 23) and send it to Breck, Vanessa, and Alex for review.**
- **Authors of future Tributary Summaries will incorporate Rebecca Murphy's suggestion to including pop out boxes with questions about certain sections of the report. The purpose of these pop out boxes would be to document potential project ideas for future efforts or other researchers.**
- **Alex, Breck, and Vanessa will follow up with Mike Lane to ask about his reasoning and response to the comments which he did not incorporate into the Rappahannock Tributary Summary.**

MEETING MINUTES

10:00 – 10:20 **Welcome – Vanessa Van Note** (EPA) and **Breck Sullivan** (USGS)

<u>**Announcements –**</u>

- Conferences of potential interest:
  - [Environmental measurement Conference](#) – August 1-5, 2022, Arlington, VA.
  - [World Seagrass Conference & International Seagrass Biology Workshop](#) – August 7-12, 2022, Annapolis, MD.
  - [11th U.S. Symposium on Harmful Algae](#) – October 23-28, 2022, Albany, NY. [Abstracts/posters due July 15](#) and [registration closes September 16](#).
  - [Chesapeake Watershed Forum](#) – November 4-6, 2022, Shepherdstown, WV. [Request for Proposals](#) were due June 3, 2022.
  - [A Community on Ecosystem Services](#) – December 12-15, 2022, Washington, DC. [Abstracts](#) due July 15, 2022.
  - [National Water Quality Monitoring Council's 13th National Monitoring Conference](#) – April 24-28, 2023. Location TBD. [Session proposals](#) due June 24, 2022.
- We have a new director at the Bay Program! Dr. Kandis Boyd has been named as the new Director of EPA's Chesapeake Bay Program. The press release can be [found here](#).
- Opportunity to provide input on the updated Tributary Summary timeline.
- Opportunity to provide input on the climate change materials.

<u>Summary</u>

Breck asked any new attendees to introduce themselves. Alex Soroka from the USGS Maryland-Delaware-D.C. Water Science Center in Baltimore introduced himself.

Breck outlined some of the upcoming conferences, specifically the Chesapeake Watershed Forum. Breck mentioned she submitted a proposal on behalf of ITAT to the Chesapeake Watershed Forum to present on the Tributary Summaries. The acceptance of the proposal is currently uncertain.

Breck gave a brief update on the new director of the Chesapeake Bay Program, Dr. Kandis Boyd. Dr. Boyd started her role at the beginning of June and is very welcoming and eager to learn more about the CBP. The Monitoring Team met with her to give her an overview of their responsibilities and an update on the monitoring report to the Principals' Staff Committee. Breck shared the coordinators of ITAT will have an opportunity to meet with her and update her on the work the group produces.

Breck reminded ITAT members to provide any final comments on the updated tributary summary timeline or the climate change materials. Some comments were made via email or at previous meetings.

Vanessa asked about the presentation Breck gave on the Tributary Summaries at the Chesapeake Community Research Symposium and any feedback given. Breck said there was interest in collaboration from Dave Parrish about the State of the York report that the Virginia Institute of Marine Science (VIMS) is putting together, and that components of that report could be woven into the York Tributary Summary. Dave commented that the report should be done in the spring or summer of 2023 and the

team working on the State of the York will reach out about collaborating since there is likely information that both teams could benefit from. Breck reiterated the need to communicate the Tributary Summaries to a larger group and to share them with stakeholders to gather feedback about utilization and how to improve the Tributary Summaries in the future. Vanessa encouraged ITAT members to talk about the Tributary Summaries, if appropriate, at the conferences they attend and to let ITAT know about potential collaborators on Tributary Summary development. Breck commented there were many great presentations from ITAT members about different topics at the Chesapeake Community Research Symposium as well.

10:20 – 11:00   [Introduction to the CBP Strategy Review System](#) – Breck Sullivan

> Breck Sullivan introduced the Strategy Review System (SRS) and how it connects to ITAT through the Water Quality Standards Attainment and Monitoring Outcome (WQSAM). ITAT members used Mentimeter to provide insight on actions in the [WQSAM Logic & Action Plan](#) that connect to ITAT's work.

<u>Summary</u>

Breck began with an overview of the SRS process, such as its role as the adaptive management system used in the CBP. Breck explained the SRS process exists to help outcomes practice adaptive management by walking them through exercises that encourage learning, taking action, monitoring results, assessing progress, and then adjusting efforts accordingly. The purpose of adaptive management in the CBP is to assist outcomes as they strive to meet the targets set under the Chesapeake Bay Watershed Agreement. The three major components of the SRS process are the Pre-Quarterly Progress Meeting (QPM), the QPM at the Management Board, and the Post-QPM. The WQSAM outcome is currently in the Pre-QPM stage and is preparing to present on successes and challenges from the past two years to the Management Board. Breck emphasized the role of ITAT will fully come into play in the Post-QPM stage when the group can provide input on the work ITAT would like to do in the next two years to help achieve the WQSAM outcome. Breck added that there is some insight that ITAT could provide in the current stage, which is why the SRS process is being introduced now.

Breck introduced the different materials in the SRS process. For the Logic and Action Plan, Breck explained its purpose is to illustrate the link between the factors that could impact the partnership's ability to achieve an outcome and the actions it is taking to manage them. The Logic and Action Plan does not develop new actions and is focused on addressing the status of actions from the past two years during the Pre-QPM stage. The WQSAM outcome team has just completed color coding the actions in the Logic and Action plan as green, yellow, and red to indicate if the actions are progressing as expected or not. Breck then outlined the actions that connect to ITAT's work and mission and provided them in an [abbreviated Logic and Action Plan](#). Some examples of work completed in ITAT that connect to these actions are: the development and communication of annual tidal trends, cluster analysis, preparation and communication of the Tributary Summaries, and analysis of the influence of River Input Monitoring stations (RIM) loads on trends. The other material that needs to be completed for the QPM is the Narrative Analysis, which is a summary of findings from the Logic and Action Plan and describes whether new information will impact how to achieve an outcome and recommends course corrections.

Carl Friedrichs asked how many cycles of the SRS process the CBP has gone through. Breck replied this is the beginning of the third cycle for the WQSAM outcome. Breck added she was not at the CBP during the first cycle but was present as a staffer for the second cycle, and that in preparation for the third cycle the second Logic and Action Plan was very helpful.

Breck then requested ITAT members provide input on the status of current projects, lessons learned, and factors that will influence ITAT's future work, like policy, finance, and science. For lessons learned and influencing factors, Breck asked ITAT members to use Menitmeter. These responses will be incorporated into the Logic and Action Plan and Narrative Analysis documents.

For input on the status of current projects, Breck reviewed the abbreviated Logic and Action Plan pertinent to ITAT and explained the color coding system where green means the action is moving forward as planned, yellow means the action has encountered minor obstacles and red means the action has not been taken or has encountered a serious barrier. Breck asked for ITAT members to review this abbreviated Logic and Action Plan pertinent to ITAT and reply to Alex, Breck, and Vanessa if they feel any of these actions should be coded a different color.

Using the Mentimeter, ITAT members shared lessons learned from ITAT efforts related to the WQSAM Outcome:

- The insights on change section of the Tributary Summaries requires a lot of time and capacity because it is not easily automated or quickly created. Perhaps going forward, communication of the Tributary Summaries can emphasize how other sections besides the insights on change section can provide useful information.
- Nutrient reductions are working to improve water quality conditions.
- Stakeholders are often really pleased to see results based on monitoring data instead of just modeling results. Breck added that conversations with the Anacostia Riverkeepers on the Potomac Tributary Summary led to the interest in developing water quality tidal trends for the Anacostia. Breck shared how communicating this information with stakeholders identified a gap and then who to collaborate with to fill that gap.
- We do not have a good understanding of why poor water clarity is still poor.
- Maps are extremely helpful in communicating trends. Breck added that maps should be included in all Tributary Summary communication products, as well as the QPM presentation to the Management Board.
- Breck asked ITAT members what challenges they see in the grant financing needed to produce tidal trends. Claire Buchanan commented about the need to have financial support for data management at the CBP, such as Bay-wide efforts like natural resource data. Claire said Mike Mallonee needs additional capacity. Claire said the Interstate Commission on the Potomac River Basin (ICPRB) has held a 117e grant with the CBP that supports data management and plans to respond to the upcoming request for proposals.

Which financial factors will influence ITAT's work in the next two years?

- Support for data management (currently done through a 117e grant).
- Breck commented how many recommendations on how to improve the monitoring networks will come from the report on monitoring to the PSC, with much of the focus on the need for funding to maintain monitoring.
- Continued and expanded funding for monitoring, analysis, and interpretation is paramount. Contraction would be tough.

Which policy factors will influence ITAT's work in the next two years? (There were only a few responses since ITAT is more focused on the science.)

- Breck commented on ITAT's effort to incorporate the D.C. Department of Energy and Environment (DOEE) monitoring data into the Tidal Trends for the Potomac and Anacostia River

stations. Breck said this shows DOEE the importance of having consistent monitoring data for determining and interpreting tidal trends.

- Changes in national/regional policies to address current economic issues and impact on water quality changes in the short term.

Which science factors will influence ITAT's work in the next two years?

- Breck and Elgin Perry suggested operationalizing cluster analysis through the creation of a tool. Elgin emphasized this could be helpful to include in future Tributary Summaries and other reports to provide an overview of trends. Breck asked if the code is ready to be turned into a tool. Elgin replied now is the time to bring this to TetraTech to begin the process of helping them incorporate this code into a tool.
- The need to understand how shallow waters are responding to both climate change and management actions. Breck said this comment represents a big push that the WQSAM Outcome will be bringing to the Management Board this SRS cycle. Although much of the focus has previously been on deep water, there is now knowledge that many of the natural resources are in the shallow water.
- Uncertainties in effects of short-term and longer-term climate change vs. land-use changes.
- Explaining the complicated dynamics of why the bay has not met water quality criteria when the Total Maximum Daily Load (TMDL) deadlines are getting closer.
- More monitoring at the land-water interface.
- Both shallow-water and deep-water processes.
- Other explanatory variables to explain water quality trends.
- What are the trends in frequency of short-term events, such as heat waves or algal blooms. One potential speaker for a future ITAT meeting would be Piero Mazzini of VIMS and Alex, Breck, and Vanessa have reached out to him. Dave Parrish said it would be good to collaborate with Piero.
- Trend analysis on water density given that climate change may have an effect on mainstem stratification.
- Possible reduction in non-tidal monitoring stations. Lack of funding may result in reduced data collection. Breck commented the WQSAM Outcome applies to both tidal and non-tidal areas so this will be included in the SRS materials.

Breck concluded with some next steps and the SRS timeline for the WQSAM Outcome. For example, these comments will be included in the materials and will be presented at the Dry Run at the C/S meeting. ITAT members are welcome to attend to provide comments. The refined presentation will be given at a Management Board meeting. The finalized dates for these meetings will be shared with ITAT members soon.

11:00 – 11:20   Discussion on how to improve the ITAT webpage – Alex Gunnerson (CRC)

The Chesapeake Bay Program Web Team has requested that all workgroups respond to a set of questions about how to improve workgroup webpages. These questions were distributed to the workgroup in an email on May 25th from Alex Gunnerson. ITAT members used Jamboard to respond to these questions and provided feedback on the ITAT webpage.

Summary

Alex began with the context that although the webpage was discussed briefly at the April ITAT meeting, there is a more thorough conversation at the June meeting since the CBP Web Team is preparing to make changes to the format of workgroup webpages. The CBP Web Team specifically asked for the

workgroups to respond to the following questions: 1) what additional features would you like to see on the ITAT page; 2) is there any additional functionality that you would like to see added or improved upon; 3) the current available sections are Upcoming Meetings, Scope and Purpose, Publications, Projects and Related Links -is there another section/more information you would like to see added; 4) how could we make the ITAT page better? Alex added that any suggestions must be applicable to all workgroups' webpages and that if suggested changes are made in the structure of the webpage, then Alex can go in and make those changes to the ITAT webpage. Alex then briefly walked through the current ITAT webpage, how it is structured, and its major components.

In response to these questions, ITAT members provided the following feedback on the ITAT webpage:

- Highlight when sections or content is new.
- Add drop boxes to show all categories and sections at the top of the page. Add a navigation bar/pane or a webpage directory with quick links for that workgroup.
- Add subpages for workgroups, for the purpose of particular projects or content to make access to groups of files easier to navigate. For example, the Tidal Trends or Tributary Summaries.
- Add the ability to embed an interactive map with adjustable layers and other visuals into the webpage directly. For example, trend parameters where tributary basins are delineated, and associated data and publications are linked. Breck commented there could be a subpage for the baytrendsmap app, and it could showcase static and interactive maps since that is already part of its functionality.
- Add a section to list the partner organizations that support the work of the workgroup.
- Add a section titled along the lines of "Related Software" which includes links to software used to produce those results. For example, include baytrends and the baytrendsmap app.
- Add links to the following related resources: Non-Tidal Network (NTN), RIM, and the Chesapeake Bay Story webpages and/or Story Maps.
- Ensure all documents are up to date.
- Continue to consistently provide links to webpages for past meetings and make sure all presentations are posted on past meeting webpages.
- Consider adding a function where members can receive an email when the ITAT page is updated.
- Add a newsletter section since it is not a publication.
- Highlight the publications of members and write publications out in the same format. Group links to publications under the topics they relate to, for example: General Additive Model (GAM) Documentation or Long-Term Change. Rebecca Murphy suggested sending out recent publications in a newsletter. Breck replied it might be more helpful to incorporate these publications in the STAR newsletter since it already has a section for publications. Amy Goldfischer said she would make a note of this addition to the quarterly STAR Newsletter. To register for the STAR Newsletter, go to the STAR webpage and scroll down to the gray box and enter the email address.
- Add a short paragraph on how ITAT has impacted the work of the Chesapeake Bay Program.

Breck asked when these changes might be implemented to the ITAT webpage. Alex said some of the simpler items can be done with the current structure, but the larger suggestions like subpages and interactive maps would require the CBP Web Team to implement the suggestions. The CBP Web Team has not explicitly said when it plans on incorporating these changes, but they have requested the feedback by June 30th, presumably to begin making changes in the near future. Breck cautioned that

staffers need to be careful about the workload for this item, as the CBP Web Team may only be able to help with functionality and not so much the content.

11:20 – 11:50 [Rappahannock Tributary Summary Update](#) **– Breck Sullivan**, and **Vanessa Van Note**

> Breck provided an update on the status of the Rappahannock Tributary Summary. Breck and Vanessa led a discussion on if the new sections and changes made to this summary should be applied to the other Tributary Summaries, or if the Rappahannock should be a unique case. If yes, ITAT will discuss how the Tributary Summary Update Timeline should be revised accordingly.

Summary

Breck gave a brief overview of the updates Mike Lane made since he was not able to make it to the meeting. The main updates are that Mike is very close to completing the Rappahannock Tributary Summary, and he wants a few members of ITAT to review the cluster analysis section since it was updated with the graphs Elgin provided. Mike also included an attainment criteria section for water quality goals with the attainment deficit graphs that Qian Zhang made. Mike agreed to hold off on including the model definitions since it requires more extended discussion from ITAT.

Breck asked ITAT members if they felt there were any new components in the Rappahannock Tributary Summary that should be included in the rest of the Tributary Summaries. In an email, Mike had suggested incorporating the cluster analysis work into all the Tributary Summaries since it improves understanding of the GAM results for water quality and tidal trends. Breck and Rebecca agreed, saying they think the cluster analysis would be valuable in all of the Tributary Summaries.

Breck asked if the code for the cluster analysis is automated enough to facilitate the production of cluster analyses for multiple Tributary Summaries. Elgin commented it is fairly well automated, but that he is continuing to make adjustments, such as making the color scheme consistent for the plots where red indicates degrading trends and blue indicates improving trends. Elgin said in the past the attempts to make the code a tool was unsuccessful, but that he has changed a lot since then. Elgin emphasized that someone with better programming skills needs to work on the code to make it a tool. Rebecca Murphy commented that in the past Tetra Tech was very helpful in making her plots fit well in the tool and working with Tetra Tech would be a good way to build the cluster analysis into the Tributary Summaries. Breck said it will end up being Elgin or Tetra Tech's time, but she wants to be cognizant of Tetra Tech's work load since they are heavily involved in the 4-D interpolator work. Breck will reevaluate work load with Tetra Tech and the 4-D interpolator team to see if there are resources to fit this work into their contract.

Vanessa brought up some of Mike's comments from an email in which he suggested making the cluster analysis the main focus of the GAMs results. Vanessa showed [Figure 23 from the report](#) as an example of how to communicate the cluster analysis results. Rebecca commented that Figure 23's scatter plots appear to show temporal trends, which might be different than what the GAMs was originally portraying. Jon Harcum suggested comparing Figure 23 to [Figure 10](#) to illustrate differences in visualizing the cluster analyses. Jon also suggested it might be more holistic to include both types of figures in the report to show trends over time and grouping by categories. Breck agreed with this statement. Jon commented that if ITAT decides it wants to include all these types of metrics in the report as the main focus of the GAM results, it would require a fair amount of work. Jon said it would be wise to not let the perfect become the enemy of the good and hold up the Rappahannock or other reports for minor cluster analysis tweaking. Elgin agreed and suggested that the Rappahannock Tributary Summary proceed as is and that it will serve as a beta test to gauge interest in the usefulness of cluster analyses in this type of report. Breck agreed with this statement. Elgin added how with the cluster analysis

software, one can use the stations as a profile or use time (years, months) as a profile, which can create a wide variety of analysis results. Elgin said Mike's focus is on using the profiles as the X axis to see the whole estuary and parameters for each tributary at a glance. Elgin commented by using the cluster analysis this way, one can see Total Nitrogen decrease closer to the Main Bay, trends at each station, and general variability.

Vanessa asked if more needs to be written in the text to clarify whether the stations or segments are being represented since both are discussed at different parts of the report. Rebecca replied that there is a map at the start that should address this, but added that considering the audience is important. Rebecca said that in Figure 18, she thinks the actual observations are as important (the gray dots) as the actual trends. Rebecca said whether we talk about individual stations versus just the segment depends on how the Tributary Summaries will be used. Vanessa said she asked this question because she and reviewer Roberto Llanso emphasized the need to geographically situate the reader using the map since many readers do not know the locations of stations or which segment the stations are associated with.

Vanessa and Jon asked if Elgin could make the legends clearer for the cluster analysis figures. Elgin said they were clear when he produced them and they only became fuzzy once being processed so Mike would need to fix the resolution issue.

Vanessa said section 5.2.2 is the cluster analysis section, the figures being discussed earlier in the meeting, and that since it is brand new to the Tributary Summaries, others in addition to Elgin are asked to review the section and consider how it might be received. Breck asked about the time needed to produce this section, both graphs and the textual description. Elgin said it is relatively quick and easy to make the graphs but describing and explaining the figures in the text takes more time, especially since in its current state the section is light on interpretative text. Elgin said Mike drafted the original text. Elgin provided some comments, and they discussed the section back and forth over email. Elgin emphasized for the Rappahannock Tributary Summary these results are unique because they run counter to the common narrative; instead, the results show low Dissolved Oxygen in the Mesohaline in dry years. Elgin emphasized it could be interesting to discuss these trends and present a new narrative based on the data. Breck said this information illustrates the capacity question ITAT will need to answer: how much time should be devoted to any one section or Tributary Summary. Rebecca suggested including pop out boxes with questions about certain sections so that way it can document potential project ideas for future efforts or other researchers. Breck and Vanessa liked this idea and suggested this could help cater the Tributary Summaries to a research audience, in addition to local governments and non-profits.

Vanessa said the next step here is to do another full review of the document and that reviewers should note any graphics, text, or research to include in other Tributary Summaries. Most of the comments from the November review have been incorporated, but a few have not. Mike has not yet explained why some comments were not incorporated, but Alex, Breck, and Vanessa plan to follow up with Mike and learn about his reasoning and response to those comments. Vanessa summarized the comments and changes that were made since the last time it was reviewed. Some sections that had major revisions were Sections 4 and 5, where graphics were updated as well as Secchi disk depth. Some new sections since the previous review are the appendix and glossary.

Breck, Alex, and Vanessa agreed to reorganize the Rappahannock Tributary Summary document to make it align more with the Tributary Summaries format, although it will remain somewhat different since a lot of new information has been incorporated since the last round of Tributary Summaries were produced.

Elgin said that the report as it stands is focused a lot on individual stations, but that for the cluster analysis figures the X axis stations could be overlayed with salinity zones for Figure 23. Elgin will create an example graph with this overlay and send it to Breck, Vanessa, and Alex for review.

12:00   Adjourn

Next Meeting: Wednesday, July 27, 2022

Participants: Alexander Gunnerson, Alex Soroka, Amy Goldfischer, Andrew Keppel, Breck Sullivan, Carl Friedrichs, Carol Cain, Cindy Johnson, Claire Buchanan, Dave Parrish, Doug Austin, Efeturi Oghenekaro, Elgin Perry, Helen Golimowski, Jesse Turner, Jimmy Webber, Jon Harcum, Mukhtar Ibrahim, Renee Karrh, Rikke Jepsen, Rebecca Murphy, Roger Stewart, Tish Robertson, Tom Butler, Vanessa Van Note.