Integrated Trends Analysis Team (ITAT)
Meeting

Wednesday, January 25, 2023
10:00 AM – 12:00 PM
Meeting Materials: Link
This meeting was recorded for internal use only to assure the accuracy of meeting notes.

ACTION ITEMS

- **Breck Sullivan will invite Olivia Devereux to do a webinar for the Mid-Atlantic Planning Commission regarding the new mapping capabilities for CAST.**
- **Breck will reach out to Angie Wei about updating Figure 3 in Section 2.2 of the James Tributary Summary with updated impervious surface coverage using the 1-meter land use data.**
- **Breck and Kaylyn Gootman will work to produce a template for the climate change section of the tributary summaries. This will include a link to the NOAA seasonal summaries. This draft section will be brought back to the group for input.**
- **ITAT members and interested parties with suggestions on where to host an in-person ITAT meeting outside of the Annapolis area are requested to share potential locations with Alex Gunnerson, Breck, and Kaylyn.**
- **Breck, Kaylyn, and Alex will consider the following topic for the March 2023 ITAT meeting: presentations on the data and methods of both tidal and nontidal monitoring networks so disconnects between the two categories are very explicitly identified. Alex will reach out to representatives for tidal and nontidal network teams.**

Meeting Minutes

10:00 – 10:05 **Welcome – Kaylyn Gootman** (EPA) and **Breck Sullivan** (USGS)

Announcements –

- Chesapeake Student Recruitment, Early Advisement, and Mentoring (C-StREAM) Proposal submitted and approved for assisting with a story map and communicating the tributary summaries.
    - Please send the application out to your networks. There are ten internships available, and the deadline is February 21st. More information can be found here.
- Conferences of potential interest
    - National Water Quality Monitoring Council's 13th National Monitoring Conference – April 24-28, 2023. Location TBD. Session proposals were due June 24, 2022.
        - Peter Tango will be a keynote speaker and plans to discuss monitoring in the Chesapeake Bay.
    - Species on the Move – May 15-19, 2023. Everglades National Park, FL.
    - CERF 2023 Conference: Resilience & Recovery – November 12-16, 2023, Portland, Oregon. Session and workshop proposals due September 19, 2022. Abstracts due May 10, 2023 and are open on January 30, 2023.

- Citizen Science Association conference, C*Sci 2023 - May 22-26, 2023, Arizona State University campus in Tempe/Phoenix, Arizona.

10:05 – 10:30 **Planned Mapping Capabilities for Chesapeake Assessment Scenario Tool (CAST) – Olivia Devereux (**Devereux Consulting**)**

A short presentation on the new and exciting mapping features planned for CAST later this year.

Summary

Olivia began with a review of the current use of CAST, including its roles in tracking Best Management Practices (BMPs) and planning for TMDLs, conservation districts, and MS4 permits. Olivia outlined the audience for CAST, distinguishing between the primary and secondary users.

Olivia described the process of integrated land use data into CAST and its limitations of use. Olivia compared the currently available geographic scales for planning with proposed additional scales for planning with the high-resolution land use data.

Olivia stated the goal of this work is to link BMP planning to explicit land use. Olivia identified objectives for planning scenarios and the impacts of this goal on CAST Results.

Olivia explained the approach for displaying the 1-meter dataset and the currently available spatially explicit data sources. While the 1-meter land use data is available for 2012 and 2017, the land use data going back to the start of the model period in the 1980s is at 30-meter spatial resolution. Olivia concluded with a review of the benefit of this added functionality to restoration professionals and an overview of the CAST timeline.

Discussion

Jimmy Webber asked if there is a consensus timeline on when Phase 7 will be in use. Olivia said there is a specific timeline on the Phase 7 webpage, but 2028 is the short answer for when the new model will be in use. Gary Shenk and the Modeling Workgroup have been focused on the development of the new watershed model. Jimmy said the context for his question is that the CAST team has worked to downscale input data sets which have applications for different Spatially Referenced Regression on Watershed attributes (SPARROW) models and empirical studies. Jimmy said there have been questions about whether to update SPARROW models with the current data or to wait until 2028 when phase 7 is complete, but that is a conversation for the SPARROW team to have.

Breck asked if spatially explicit data is necessary going back to 1985 for planning purposes. Olivia said typically they make any data available for the entire period of the model (1985-2025), but she is not sure and said this question requires more attention and discussion. While they would need to have spatially explicit data for the baseline of a local implementation plan, the exact date of the baseline could vary and might not go back to the start of the model period.

Elgin Perry commented that at a finer scale one can see problems that are not visible at an aggregated scale. Elgin said the challenge for the Chesapeake Bay Program (CBP) is to create a monitoring program that generates data at finer scales to match the modeling. Elgin asked if CAST could not only identify areas where Best Management Practices

(BMPs) have been implemented, but also look at areas with a lack of BMPs and which require more concerted focus from the CBP. Olivia agreed this is important and noted that a recent series of maps created by Helen Golimowski displaying agricultural loads and their projected impacts on the Bay tried to answer this question. Olivia said a third component to add to CAST is identifying the BMP density of a given geography, so that relative numbers of BMPs can easily be compared. These could all be added as may layers and integrated into CAST.

Karl Berger offered some cautionary remarks, saying that some Phase 7 inputs will not be as sufficient at a finer scale. One example is urban fertilizer which has many issues even at the state basin scale. Karl suggested following the advice of statistical analysts who can inform appropriate scales for specific data inputs for loads. Olivia agreed and replied that while land use data is known at a finer scale, fertilizer is at a state scale and agricultural data is at a county scale, so those inputs and run off will not be misrepresented by being displayed at a finer scale. Gary added that the knowledge of the land to water factors, meaning the propensity of the landscape to deliver loads, is at the National Hydrography Dataset (NHD) catchment scale and will probably remain at that scale, but it might not be applied at the NHD scale. Gary emphasized the need to make sure people are aware of the appropriate scale data inputs should be used. Kaylyn said this demonstrates the importance of scale in the model and monitoring results.

Breck invited Olivia to do a webinar on this new mapping capability for CAST for the Mid-Atlantic planning commission. Olivia said she would be interested in doing that because that is the target for CAST.

10:30 – 11:00 Tributary Summary Check-In – Breck Sullivan (USGS**) and Kaylyn Gootman (**EPA**)**

The target deadline for completing work on the James Tributary Summary Pilot Update is mid-February 2023. Following this draft completion date, ITAT leadership will review the James Tributary Summary prior to sending it to USGS for approval. This time was set aside for any questions or discussions on the James Tributary Summary before it goes through multiple rounds of review.

Summary

Breck went through the spreadsheet tracking the tributary summary updates and provided updates on the progress for each section of the James Tributary Summary report.

Jimmy Webber said Chris Mason will be the point of contact on the flow normalized nontidal network loads. Jimmy added that the revised nontidal network loads have been officially released so the load and trend data can be uploaded to the documents.

Olivia said she will make the updates to the document once the most recent annual progress review is wrapped up on February 7th. This progress review will include data up through 2022.

Alex Soroka shared that he and Chris Mason have been working on rerunning the Parameter-elevation Relationships on Independent Slopes Model (PRISM) data from 1985 to present so they can extract monthly means of precipitation for land river segments. The plan is to have completed a data release by mid-February. Kaylyn asked if these will be the land river segments for the James River or all the tributaries. Alex replied they will be for the entire Bay.

Tom Butler shared that he still has not been able to get R installed on his computer, but he will work with Kaylyn and Breck to get the watershed volume section updated.

Jimmy confirmed that section 5.1.1 probably has not changed much, although a review of recently published literature would not hurt.

Olivia confirmed that section 2.1 does not need to be updated.

Breck asked if there is an opportunity for updating figure 3 in section 2.2 with the new land use data. Rebecca Murphy said Angie Wei created this map and Breck should reach out to her about updating it. Breck said she would ask Angie to update the map with the new land use data.

Breck and Kaylyn will work to produce a template for the climate change section of the tributary summaries. This will include a link to the NOAA seasonal summaries that were presented at the November ITAT meeting. This draft section will be brought back to the group for input.

Olivia asked about the process for next steps and review of the James Tributary Summary. Breck replied that Kaylyn, Alex Gunnerson, and herself will do an internal review before submitting to U.S. Geological Survey (USGS) for a final review so it can be a citable document.

Breck said the timeline is looking good and she looks forward to getting input from others on what to change for the next batch of updates and any other steps to complete for automating processes. Kaylyn thanked ITAT members for their work on updating the tributary summaries.

11:00 – 11:30 **Feedback from ITAT Members on Topics and Researchers they would like to hear from in 2023 – Breck Sullivan (**USGS**) and Kaylyn Gootman (**EPA**)**

Breck and Kaylyn shared initial ideas for ITAT 2023 meeting topics. ITAT members were asked what additional topics they would like to discuss and which researchers they would like to hear from in 2023.

Summary

Breck shared some potential topics for ITAT meetings in 2023. One potential topic for May is having a student presentation from Jeremy Testa's UMCES class on Patuxent Hypoxia in person at the CBP office. Bill Dennison plans to invite stakeholders, including Patuxent Riverkeeper. This presentation would be in early May. Once the date has been finalized, a calendar invite will be sent out to ITAT members.

Olivia said she would like to hear Mike Wieczorek present on the fertilizer and other inputs from this data.

Kristin Saunders said it be instructive and useful in the future to invite some of the riverkeepers or other professionals who are using the tributary summaries. Kristin also suggested inviting who you hope to encourage to use these summaries to come in and talk to ITAT about how the information is useful or how it can be improved to meet their needs and uses.

Rebecca and Jimmy suggested inviting Brendan Foster to present on his work in the York and Pamunkey when it is ready.

Carl Friedrichs asked for an update at some point on the progress associated with the 4-D interpolator. Tish Robertson and Rebecca Murphy agreed. Rebecca said it is related to ITAT's work and would fit into the schedule in late spring or the summer. Topics could include methods and analysis of oxygen trends in tidal waters. Breck said they can plan accordingly with the Bay Oxygen Research Group (BORG) to avoid repetition of material after the BORG quarterly.

Breck asked if people are interested in having an in-person meeting. There was not much response to the inquiry. Elgin said the Northern Neck of Virginia is a great in between place for a meeting. Carl Friedrichs asked for all meetings to be hybrid. Breck agreed that all meetings will be hybrid and suggested that if there is strong interest, an ITAT meeting can be held outside of Annapolis in a more in between location.

Rebecca Murphy said the 2022 tidal trends would be ready for either the October or November ITAT meeting. It would not be too much of a push to get it done by then since the team has done these trends for multiple years in a row now.

Tish Robertson asked if anyone is looking at percent dissolved oxygen saturation trends. Kaylyn said we can add that to our list of topics to discuss.

11:30 – 12:00 Tidal-Nontidal Follow-Up Items – Breck Sullivan (USGS**) and Kaylyn Gootman (**EPA**)**

Discussion focused on identifying accomplishable projects within the topic of tidal-nontidal linkages and setting reasonable expectations and timelines.

The key notes from the tidal-nontidal meeting on January 4th can be accessed here as a reference.

Summary

Jimmy Webber shared that USGS received funding increases from the most recent congressional spending package for Chesapeake Bay Science. Discussions on how to use these funds to support priority science topics includes improved integration of tidal and nontidal trends to address management priorities. Jimmy asked what some of the priority information to summarize from the trends would be from a management perspective. Karl Berger replied that from a management perspective, providing clearer explanations for the differences between modeled and monitored results is a priority. Topics like lag time need to be better articulated. Karl said additional priority topics are efficiency of BMPs, BMP efficiency under climate change, and the time it takes for BMP effects to show up in the monitoring data. Jimmy agreed, saying this is one of the major drivers of this work and that questions around how BMP nutrient reductions translate downstream to the tidal waters are key as well. Elgin said not only do we need to better understand how the BMPs are affecting nutrient concentrations in the water column, but we also need to consider that phytoplankton populations do not seem to be responding to reduced nutrients in the way we would expect.

Kaylyn asked if it would be helpful to take stock of the differences in methods between tidal and nontidal water quality monitoring collection, analysis, and trends. Rebecca said this could be a good idea since there have been new members who have joined ITAT in recent years so this could benefit their understanding. Renee Karrh said methods for field/lab collections for tidal and nontidal would be very complicated over time but could be created. Rebecca said there should be a revisiting of differences in how tidal and nontidal trends account for monitoring data. Breck said tidal and nontidal trend

results are on the Data Dashboard but are on separate pages. Kaylyn said maybe a good idea would be to integrate them onto one page. Qian suggested reaching out to the Data Integrity workgroup about this question as they might have some ideas. Peter Tango said these are good ideas and that in its current state, things can be clunky. For example, questions about if certain data sets include replicates or not could be more effectively communicated.

Olivia asked where one could find tidal monitoring data and how would ITAT connect it. Breck replied the raw data are on the data hub and the trends data are available in dynamic and static form on the ITAT webpage. Olivia asked if it is possible to get the tidal and nontidal trends data on one map. Breck said they have note been able to put them all on one map because of different methodology in computing the trends. Some of these differences include nontidal trends using water year and tidal trends using calendar year. Kaylyn replied this is a good suggestion to get the tidal and nontidal results on one page. Elgin agreed it would be useful to have, giving the example of a cluster analysis trends in the James being not easily explainable with only the tidal or only the nontidal trends data. Tish commented geomorphology and point sources are the most common explanation she has heard for the trends Elgin is seeing by the Appomattox into the James. Breck said it looks like an area of collaboration with ITAT and USGS will be producing some sort of visual or tool for comparing tidal and nontidal trends data on one page.

Qian agreed and said it is important to have the data readily comparable for both managers and researchers. Qian suggested a tool where when a user clicks on a tidal area, the watershed and associated loading trends will also be displayed. Qian said he likes the watershed data dashboard but does not like the fact that tidal and nontidal are separate. Qian said making an integrated and interactive visualization will not only help the CBP teams, but also other researchers and students. Kaylyn suggested adding the ability to download the data from the tool as well so researchers could do analysis connecting the data to other issues, such as human health. Rebecca added we would want the local point sources too into the tidal segment. Olivia said point sources can be located here. Qian Zhang said yes, I think data should be made available in that tool. In some way, I envision it as an "interactive" version of the "tidal tributary summary". Kaylyn asked interactive of an entire "watershed summary?" Breck said ITAT should keep this in mind when the C-StREAM intern begins because while they will work on the story map, they can explore more interactive ways of showing the data.

Rebecca Murphy said for a March meeting, we might want presentations from those who know the most on each of the datasets so disconnects can be very explicitly identified. Rebecca said she is hearing a few different ideas which include showing tidal and nontidal trends side by side, adding other relevant nontidal data sources to tidal trend visuals (like point sources and modeling data), and providing a way to show magnitude of concentrations in various places. Kaylyn agreed these are promising ideas that would benefit from meeting time.

Olivia said she uses this source for tidal data and goes here for nontidal comparison with modeled data. Jimmy replied it looks like the nontidal data on the link Olivia shared are only updated through 2018, and they will eventually be updated with 2020 data. In the meantime, nontidal network data through 2020 can be visualized here.

12:00 **Adjourn**

Participants: Alex Gunnerson, Alex Soroka, Amy Goldfischer, Andrew Keppel, Breck Sullivan, Carl Friedrichs, Carol Cain, Claire Buchanan, Cindy Johnson, Efeturi Oghenekaro, Elgin Perry, Gary Shenk, George Onyullo, Helen Golimowski, Jimmy Webber, Jon Harcum, Karl Berger, Kaylyn Gootman, Kristin Saunders, Mike Lane, Mukhtar Ibrahim, Peter Tango, Olivia Devereux, Qian Zhang, Rebecca Murphy, Renee Karrh, Rikke Jepsen, Roger Stewart, Sushanth Gupta, Tish Robertson, Tom Butler.

Next Meeting: Wednesday February 22, 2022