Narrative Analysis

Version: September 1, 2022 (Quarterly Progress Meeting)

2025 WATERSHED IMPLEMENTATION PLAN (WIP) OUTCOME SEPTEMBER 15, 2022 QUARTERLY PROGRESS MEETING

ABSTRACT: Overall, our current outlook on the 2025 WIP Outcome is **off course.** Recent progress has increased over the last two years. The latest data for 2021 shows that our 2025 sediment reduction targets have been met, while our nitrogen and phosphorus reduction targets have made continued progress yet remain off course to meet our goals in the time indicated. Actions completed tended to benefit from having a defined workplan and identified responsible parties who were committed to meeting that action. Challenges toward meeting our outcome include new science and data that increase growth in loads that was not originally anticipated at the development of the Phase III WIPs in 2019, while the remaining time to meet our outcome dwindles. Our 2025 WIP Outcome and the Water Quality Standards Attainment and Monitoring Outcome share a management strategy that offers an opportunity to utilize recent science and monitoring data to help accelerate progress toward the 2025 WIP outcome.

1. Are we, as a partnership, making progress at a rate that is necessary to achieve this outcome? Would you define our **outlook** as on course, off course, uncertain, or completed? Upon what basis are you forecasting this outlook?

Outcome: "By 2025, have all practices and controls installed to achieve water quality standards as articulated in the Bay Total Maximum Daily Load (TMDL)." The Phase III Watershed Implementation Plans (WIPs), which are developed by the Bay watershed jurisdictions, in partnership with federal and local partners, provide a roadmap to achieve the targets associated with this outcome.

Overall, our current outlook on the 2025 WIP Outcome is **off course.** Recent progress indicates that our 2025 sediment reduction targets have been completed, while our nitrogen and phosphorus reduction targets have made significant progress yet remain off course to meet our goals in the time indicated. The Phase III WIPs, which are developed by the Bay watershed jurisdictions in partnership with federal and local partners, provide a roadmap to achieve the targets associated with the outcome.

Nitrogen – Off course

Between 2009 and 2021, jurisdiction's nitrogen loads were reduced by 30 million pounds (2.5 million pounds of nitrogen reductions per year).

Over the past year (2020-2021), progress indicates that 77 percent of the nitrogen load reduced during that period was achieved in the agricultural sector. This was aided by practices and controls undertaken by jurisdictional partners. Initiatives included: increasing investment funds in Delaware's cover crop program; investment of funds into New York's verification program; increased efforts at educating county partners on reporting practices in Pennsylvania, improvements to report unreported practices in Virginia; and in Maryland, an increase in the nutrient management plan compliance rate.

Despite these successes, we are not progressing at a rate necessary to achieve the 2025 WIP outcome.

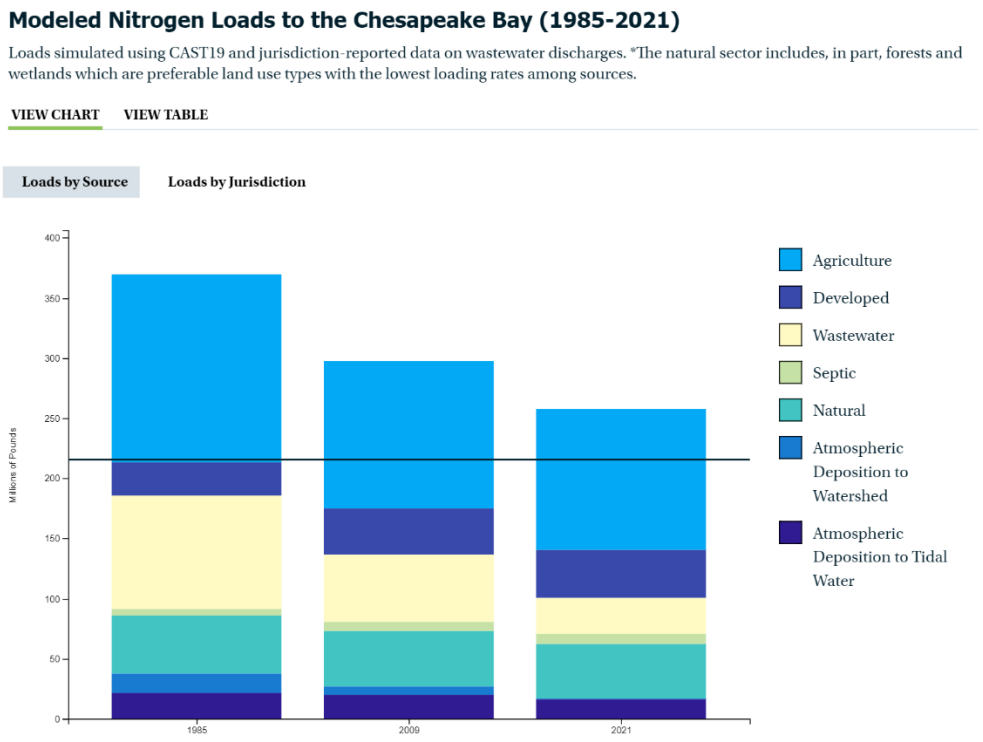


Figure 1. Modeled Nitrogen Loads to the Chesapeake Bay (1985-2021).
Source: Chesapeake Progress.

If we assume that the past rate of annual nitrogen load reductions across the jurisdictions will be similar in future years, we are at least twelve years off course. In other words, if our progress rate remains the same as in the past, we will hit the 2025 nitrogen planning target around 2037. That average reduction rate includes wastewater treatment plant upgrades, most of which have been completed. The remaining load reductions are largely expected from nonpoint source agriculture based upon the jurisdictions Phase III WIPs. To meet our nitrogen planning target in 2025, the rate of nitrogen reductions needs to increase four-fold, from 2.5 million pounds per year to about 10.3 million pounds per year for the years 2022-2025. To do this, the partnership needs to install more impactful practices and controls that results in more nitrogen reductions across the watershed.

Phosphorus – Off course

From 2009-2021, phosphorus was reduced by 2.5 million pounds (about 0.2 million pounds of phosphorus reductions per year). The target for phosphorus is 13 million pounds, as indicated in Figure 2 by the black line.

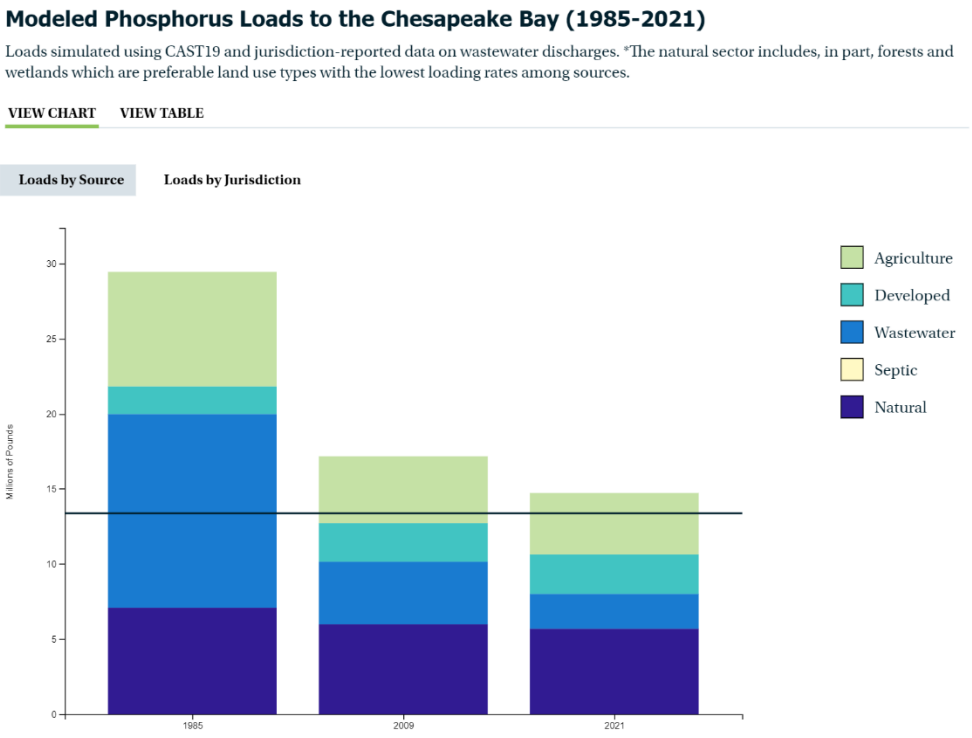


Figure 2. Modeled Phosphorus Loads to the Chesapeake Bay (1985-2021).
Source: Chesapeake Progress.

Relative to nitrogen, we are not as far off course from the 2025 phosphorus planning target. If we apply the same rationale as described above, we will meet the 2025 phosphorus planning target in 2028. To meet the 2025 phosphorus planning target, the rate of phosphorus reductions needs to increase from 0.2 million pounds per year to 0.35 million pounds per year for the years 2022-2025.

Sediment - Completed

Thanks to steady progress and implementation trends for sediment-reducing best management practices (BMPs) we have completed the basin-wide sediment target of 18,587 pounds per year as of 2021. This is four years ahead of schedule and illustrates partial success in meeting the outcome. Figure 3 shows the sediment load reductions in comparison to our 2025 reduction target.

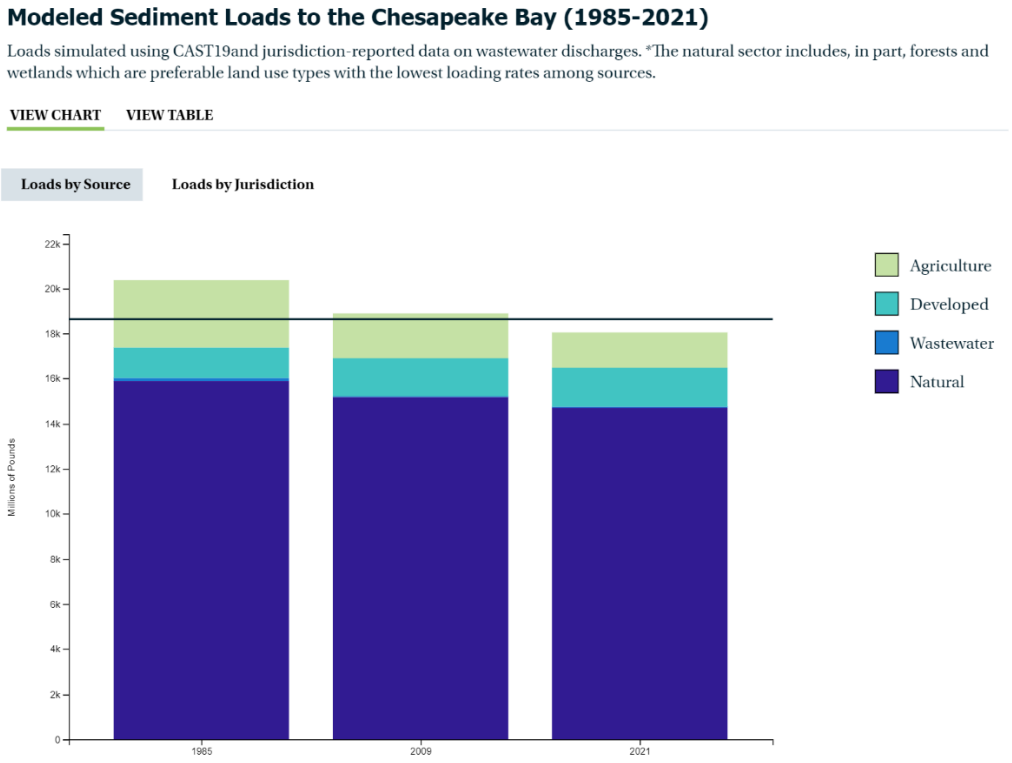


Figure 3. Modeled Sediment Loads to the Chesapeake Bay (1985-2021).
Source: Chesapeake Progress.

2. Looking back over the last two or more years, describe any scientific (including the impacts of climate change), fiscal, and policy-related developments that impacted your progress or may influence your work over the next two years. Have these resulted in revised needs (*e.g.*, less, more) to achieve the outcome?

Scientific:

The COVID-19 pandemic impacted partner ability to work directly with landowners and limited access to BMP implementation and verification during the past two-years. In addition, the avian flu outbreak during 2022 limited the Bay partnership interaction with the agriculture community. Despite these challenges each Bay jurisdiction was able to demonstrate continued nutrient reductions across sectors to make incremental progress in meeting the 2025 WIP outcome.

Climate change projections estimated additional nutrient reductions needed by the partnership in order to achieve applicable water quality standards by 2025 and recognition that climate change conditions will likely increase nutrient and sediment loads looking out to 2035 and beyond.

Conowingo Dam was found to be in steady state earlier than originally anticipated which resulted in additional loads that need to be reduced and the development of an additional Partnership WIP to address loads associated with the Conowingo Dam.

Partnership concerns are being elevated about certain data inputs that are used to inform the partnership's modeling tools and assess progress. Workgroups are exploring these datasets and associated processing methodologies further to determine if there are alternative data inputs and assess their potential use within the partnership.

Phase 7 model development is underway and the Water Quality Goal Implementation Team (WQGIT) has worked with the Modeling Workgroup to define the tasks and timelines associated with six aspects of this effort, as seen on the associated Phase 7 development webpage. Additionally, there are efforts to understand the spatial resolution of the Bay TMDL, to refine nutrient speciation accounting, and to begin development of an estuarine model with improved shallow water simulation. While these are positive outcomes these will not be completed prior to 2025 and the benefit of this information will be available in Phase 7 of the partnership modeling tools.

The WQGIT intends to spend more time with the Water Quality Monitoring and Analysis Workgroup moving forward, as our outcomes are linked, to better integrate water quality trend information with implementation efforts in the next Logic and Action Plan (LAP). The 2025 WIP outcome is to have practices in place to achieve water quality standards. In order to achieve the 2025 WIP outcome, the partnership needs to ensure there is adequate capacity to monitor and assess the impacts of the management activities and to use the monitoring results to report on attainment of water quality standards. Recent Chesapeake Bay Program (CBP) partnership meetings have called for a greater emphasis on using monitoring results to demonstrate progress in meeting the 2025 WIP outcome. Beyond reporting progress, the WQGIT will collaborate with the Water Quality Monitoring and Analysis workgroup team to explore how to adapt our management approaches based on the monitoring and attainment information to improve the attainment of water quality standards to achieve both outcomes.

In understanding that other outcomes are also off course there is interest in discussing opportunities to increase the emphasis on implementation projects that address multiple Bay agreement outcomes. Understanding there are capacity constraints across the partnership, where can we find projects that address as many outcomes as possible to be more effective and more efficient with future implementation to reduce nutrients.

Fiscal:

Since 2020 there has been a large influx of federal COVID relief as well as infrastructure dollars in 2022. The infrastructure dollars will support implementation and the incremental progress made to achieve our outcome over the next several years. Infrastructure funding will also be used to support the monitoring network to assess water quality trends and attainment of water quality standards in the watershed. In addition to support for monitoring networks, projects funded through these federal programs may further support our 2025 WIP outcome when the projects collect and publish pre- and post-implementation monitoring data. Such data, when published always supports a critical science need to understand how practices or suites of practices empirically influence loads and conditions.

Bay jurisdictions have continued to enhance and expand programs to support additional technical assistance and to support BMP implementation across the watershed. For example, Delaware's cover crop funding, the Clean Streams Fund in Pennsylvania, and the funding from Maryland to support Conowingo restoration projects.

Jurisdictions continue to identify technical assistance and capacity support as a need in order to meet the outcome. New funding sources are often targeted to implementation projects, but not the technical

assistance to support the projects or the administrative support to apply for and manage the funding either within the jurisdictions state programs or at the local implementor level. Partners conveyed there is limited willingness to hire additional state staff to support new funding sources and programs that are only slated for one or a few years which impacts the internal capacity to achieve multiple outcomes by 2025. This impacts jurisdictions abilities to spend the new funding in an effective and efficient manner. In addition, each new set of funding often has specific new/different requirements on how and where funding can be used in order to be eligible receive the funding. It can take time to pivot efforts from prior funding requirements, reeducate local implementers, and report progress on the new funds. This is an ongoing challenge in jurisdictions who have responsibility to ensure ongoing success with the 2025 WIP outcome as well as the other Bay agreement outcomes. Often it is the same set of technical state and local staff responsible for progress across multiple outcomes.

Inflation has wide-ranging impacts for partners, notably with respect to the cost of materials and labor to implement BMPs, and similarly for the costs to operate and maintain BMPs and monitoring networks. This inflationary pressure is relatively recent and so the overall impact to restoration efforts is unknown/unquantified at this time. Fixed and reduced funding levels of the Federal and State water quality monitoring program funding sources have negatively impacted the CBP partnership's ability to evaluate status and assess progress toward achieving water quality targets associated with implementing WIPs to achieve the Bay TMDL. The Monitoring Report developed for the CBP Principals' Staff Committee provided recommendations and cost estimates to address development, maintenance, and improvement of CBP core networks. The menu is designed to help CBP partners choose where they can support individual items that will collectively improve monitoring toward multiple outcomes.

While updated costs were included into Chesapeake Assessment and Scenario Tool (CAST)-2019, the cost estimates may not reflect current costs from recent inflation. CAST users can edit cost profiles when they create or edit scenarios. The Partnership will need to determine the frequency in which cost data is updated for the cost profiles provided for all users.

Additional federal funding was provided to support implementation in the Most Effective Basins (MEB), however that funding level has the potential to vary year to year.

Policy:

As noted in question 1, the average pace of reductions for nitrogen and phosphorus are not on a trajectory to meet the water quality goals by 2025. Policy decisions to incorporate scientific information and partnership decisions impact the ability to achieve this goal. While these decisions are important to ultimately achieve the water quality goals in the Bay, it results in an increased level of effort for the Bay partners to meet the goals. Over the past two years there were decisions related to Climate Change, Conowingo, and updated data inputs in CAST, that tend to result in an increased level of effort to reduce nutrients and sediment. All of these items cause a change in loads and impact our ability to meet the 2025 goal moving us occasionally closer to the goal and more often further from the goal with less time to implement additional actions to meet the targets.

BMP verification remains a challenge across the Partnership. A common concern is whether to prioritize the limited state technical capacity on verifying existing BMPs or implementing new BMPs. The Partnership members worked diligently through the BMP Verification Ad-hoc Action Team to address various issues identified related to verification, such as credit durations. Significant issues were discussed; however, challenges remain from a lack of partnership consensus, lack of access to certain federal data, lack of resources to conduct BMP verification, and potential issues with access to operations. These challenges remain and are beyond the control of the Action Team and the WQGIT. The BMP Verification Framework was approved by the Principals' Staff Committee in 2014 and thus larger issues or changes to the Framework will require elevation to that level. Significant time is spent

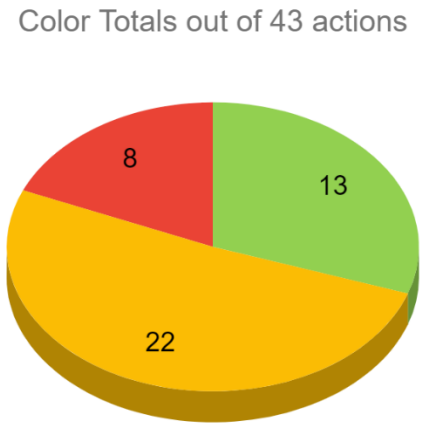
discussing verification concerns for existing BMPs which impacts the ability of the WQGIT to focus on accelerated implementation strategies to meet the WIP outcome.

3. Based on the red/yellow/green analysis of the actions described in your logic and action plan, summarize what you have learned over the past two years of implementation.

Overall, almost a third of the actions (13 out of 43) were achieved or are on track (green), with about half showing mixed progress (22 out of 43 as yellow) and the remainder encountered significant barriers or were not addressed (8 out of 43).

What worked well?

There was continued incremental progress to achieve the 2025 WIP outcome even in the face of challenges that were out of the control of the WQGIT. The Partnership continues to make steady improvements to get closer to meeting the 2025 WIP outcome although current progress rates show we will not achieve the goal in the time remaining to 2025. Jurisdictions publicly report on their progress in implementing the two-year milestones which allows the partnership to track implementation progress annually.



The WQGIT was able to complete several actions in our LAP related to the CAST modeling tool by following the CAST-2021 workplan and receiving frequent updates on progress on the workplan. There was also a substantial increase in outreach opportunities on leveraging available funding resources to fund nonpoint source implementation in the watershed through state revolving fund (SRF) programs and an EPA/NRCS workshop. In addition, EPA continue to provide funding for the Bay grants, the Most Effective Basin funding, and there was an increase in NFWF's funding. Additional infrastructure funding targeted in the Bay watershed will support implementation over the next several years. Actions that had a clear workplan and committed points of contact were easiest to track and had the most success in being completed during the two year timeframe. A significant number of our actions are yellow which demonstrates a fair amount of progress across a large number of action commitments, however, there may have been a difference in interpretation for what constitutes progress for an action or there may have been actions reported by some jurisdictions vs. others which resulted in a yellow coding. For example, individually, jurisdictions continue to enhance and expand programs available to support technical assistance in the watershed, however it remains a need that impacts meeting the 2025 outcome. In addition, there are factors noted above that are not always within the control of the WQGIT that impact the ability to complete the actions.

What didn't work well?

The WQGIT has learned a lot about how we can improve moving forward. While the WQGIT was able to narrow down our focus to 7 factors in our Logic and Action plan there were 40+ accompanying actions. This represented too many actions to make effective progress for each action in the short timeframe. Future LAPs should be more defined about the responsible party and limit actions that are beyond the control of the WQGIT, its workgroups, or specifically defined partners. When there was a clear

responsible party or workplan for actions to be completed it was easier to track progress to completing those actions. Items assigned to the WQGIT as the responsible party without a clear champion were not as concise to track or appeared to identify the WQGIT by default.

Furthermore, we recognized through this process that there is misalignment in our LAP and where the WQGIT spent our time and focus over the two years. Those action items that had a defined workplan and a champion seeking WQGIT feedback received more time and attention than those actions where there was no clear champion. We did not spend the WQGIT's time focusing and making progress on all 40+ actions – and recognize that we do not currently have an established process to track which factors or actions account for the WQGIT's attention over time. We would like to explore opportunities to use existing available tools to report progress, such as the annual progress reports developed by each jurisdiction for the two-year milestone commitments. Two-year milestones are the actions laid out by each jurisdiction on the incremental steps to meeting the 2025 WIP outcome. Those milestones should be included more prominently in future LAPs to make a stronger connection to the actions being taken by the WQGIT members to meet the 2025 WIP outcome.

Many of the actions were not the sole responsibility of the WQGIT and our associated workgroups. For actions associated with other responsible parties, it could be difficult to understand and track progress, particularly when intentional collaboration did not occur early on for a given action. This was exacerbated since we did not update or check on progress of actions as a group since the end of the last SRS cycle. Actions outside of the WQGIT responsibility or control that impacted progress included the COVID-19 pandemic and the avian influenza outbreak which restricted the ability to work with partners. As noted above, challenges with having the technical capacity to support both implementation and BMP verification in the face of additional unaccounted loads create challenges beyond the control of the WQGIT to meet this outcome.

Going forward, the WQGIT should get a better understanding of responsibility level before we include an action in the WQGIT's plan. For example, is the WQGIT responsible, accountable, consulted, or informed on a given action.

4. Based on what you have learned through this process and any new developments or considerations described in response to question #2, how will your work change over the next two years? If we need to accelerate progress towards achieving our outcome, what steps are needed and what specific actions or needs are beyond the ability of your group to meet and, therefore, you need the assistance of the Management Board to achieve?

Moving forward we are proposing that the WQGIT prioritize fewer actions to focus our time and attention and to ensure success in completing more of these actions to support the 2025 outcome. WQGIT leadership intends to change how we manage our time by aligning agendas and efforts with the LAP and having more frequent discussions on progress. WQGIT could discuss the possibility of convening a series of agendas to focus on opportunities/tech transfer across jurisdictions to increase the rate of practices implemented to reduce nitrogen and phosphorus, especially considering the additional infrastructure funds that will be available for Bay jurisdictions starting later this year.

Considerations to realign the WQGIT efforts with both the goal and the outcome which can include:

- Convening more discussion on success stories to reduce pollutants to achieve water quality, what are the lessons learned and can other jurisdictions learn from success stories elsewhere in the watershed
- Spending more time coordinating with the monitoring and attainment outcome to understand how we can adapt our management approaches to increase our efficiency in reducing nitrogen and

achieving water quality standards to support designated used and living resources based upon the monitoring data

- Increasing collaboration with our fellow Clean Water Cohort workgroups and Scientific, Technical Assessment and Reporting (STAR)to explore opportunities to support projects that address multiple workgroup outcomes or actions
- Creating space in our agendas for jurisdictions and other partners to talk about opportunities to accelerate implementation efforts to achieve water quality standards and be more effective in reducing nutrients
- Supporting workgroups exploring new or improved data for use in the Partnership modeling tools.
- Improving communications and understanding of emerging information with a focus on how this updated information supports accelerated implementation and how we implement more effectively, such as climate resilient BMPs

The WQGIT will adapt our approach to our water quality goal as noted above to spend our time more effectively on topics that will speak to accelerated implementation, especially in nitrogen reduction practices and controls, moving forward. However, we have also identified where there are challenges to meeting our assigned outcome that are beyond our control. There are changing factors within the Bay watershed such as climate change and increasing water temperature that result in growth in loads that impact meeting the 2025 WIP outcome on time.

The WQGIT and STAR intend to increase collaboration as part of our adaptive management to better align the water quality monitoring trends with the expected or modeled water quality trends. We can focus on understanding the water quality trends where water quality is improving and not, and the potential factors as to why. The recent monitoring report provided to the Management Board and the Principals' Staff Committee proved valuable to identify a need to support our monitoring system. This adaptation is necessary to increase the connection for how the WQGIT spends our meeting time relative to the goal and outcome. In addition, recent CBP partnership meetings have called for a greater emphasis on using monitoring results to demonstrate progress in meeting the 2025 WIP outcome and how jurisdictions could adapt management approaches to improve attainment to achieve the 2025 WIP and attainment outcomes.

The Partnership as a whole (including the WQGIT) and the public would benefit from the Management Board developing early communication to explain or clarify what to expect as we approach 2025 and what happens beyond 2025. The outcome is for practices in place, but that does not equate to meeting water quality standards in 2025. Additional communication materials could clarify the challenges in meeting 2025 from factors such as climate change and growth. Messaging should focus on the positive impact from the implementation efforts over the years and recognize where progress continues to be demonstrated and also identify where and why growth in loads occurs in order to target outreach and implementation to be more effective and efficient in meeting our outcome.

At this time, we are waiting for the release of the Science and Technical Advisory Committee's (STAC) Comprehensive Evaluation of System Response (CESR) report, that is expected this Fall. The WQGIT has previously been briefed on the report, but the final version is still under review by STAC and the report authors. The findings and recommendations for that report will certainly be invaluable to the WQGIT, its workgroups and the broader partnership. We ask that the partnership discussions and communication of the report from its STAC authors be coordinated at a cross-GIT level, with input from the Management Board and GIT leaders to maximize the impact of the report. The WQGIT's and other GITs' would like to ensure the ability to adapt priorities within the SRS documents and plans prior to finalization of these materials based upon the information released in the CESR report.

The WQGIT discussed the biggest barriers to meeting the 2025 WIP outcome and funding and capacity building continue to rise to the top. Jurisdictions noted a lack of internal capacity to oversee and

manage programs across multiple outcomes. New funding is often targeted to direct implementation and does not address increased technical assistance and the workforce development needs to administer new funds or programs. The WQGIT will continue to assess the barriers and elevate challenges and concerns to the Management Board and others to seek solutions to meeting our outcome.

5. What steps are you taking, or do you recommend, to ensure your actions and work will be equitably distributed and focused in geographic areas and communities that have been underserved in the past?

For this outcome, it should be acknowledged that water quality concerns for underserved areas and communities are more commonly stories of historic environmental injustice and unlikely to stem from excess nutrients and sediment. For the WQGIT to target its efforts on issues that intersect between water quality and environmental justice, the emphasis would need to shift toward community-specific concerns such as drinking water (lead pipes), toxic contaminants or contaminants of emerging concern, and other non-water-quality yet closely related issues such as inland flooding. However, in the context of nutrients and sediment, the WQGIT can still continually improve efforts, particularly through diversity, equity and inclusion efforts that can more effectively link TMDL-driven conservation and restoration to underserved areas that might welcome prospective benefits associated with those investments, such as fixed infrastructure, flood protection, workforce and economic development.

Most of our success in this area involves jurisdictional efforts to prioritize underserved areas. For example: Pennsylvania has provided additional outreach and preference towards environmental justice (EJ) and underserved communities in competitive grant programs; New York's Environmental Justice Grant Program and priority scoring for EJ communities in a variety of funding opportunities; Maryland's Trust Fund now prioritizing EJ as a co-benefit and using this metric when awarding implementation grants. In addition, for FY2021 and FY2022, EPA allocated an additional $1.25 million in their MEB funds to environmental justice areas.

The WQGIT did participate in many of the Diversity, Equity, Inclusion and Justice (DEIJ)related conversations during the last two years. As a GIT, however, we are struggling to understand how to implement equity related actions. In our current Logic and Action Plan, we included equity related actions under the "Communication and Coordination" factor. For example, one action focused on building on the work of the DEIJ Action Team to identify and engage under-represented groups. During our last at-large member nomination process we did reach out to under-represented groups, but we did not get any nominations. We need guidance at a GIT and staff level to understand how we might better establish relationships and collaboration with individuals or communities that would create a WQGIT that is more reflective of residents in the watershed. The WQGIT can seek this guidance from the Stewardship GIT and the DEIJ Coordinator in in the short term. In addition, the WQGIT can assess the role of the at-large members and improve our communication on the role of these members and the mutual benefit of participating in the WQGIT. We recognize that all GITs and workgroups have room to grow in this space, and we will do our part to integrate the four focus areas of the DEIJ Implementation Plan into our next two-year logic and action plan.

Moving forward, we have identified potential areas of collaboration within the Bay Program to help ensure our work is more equitable. For example, the STAR team and the Nontidal Network Workgroup are conducting a prioritization process for monitoring stations when funding levels may not support all locations. Filters such as geography and community representation are being considered. WQGIT members could use this information in their decision-making to assess equity in their own decision-making. Another example of potential collaboration is working with the Diversity Workgroup on project-siting criteria to help focus in EJ areas where that work could most benefit underserved

communities. Collaboration with STAR and the Stewardship GIT may also serve as an avenue to understand how participatory science and community monitoring programs, such as data and emerging plans from the Chesapeake Monitoring Cooperative, may illuminate local stressors and inform targeting for restoration and EJ projects. Lastly, we see an opportunity to work with EPA and other Chesapeake Bay Program Office staff to provide a space for dialogue about targeting, especially pertaining to the MEBs, to ensure underserved areas are accurately captured when combined with effectiveness ratios.