



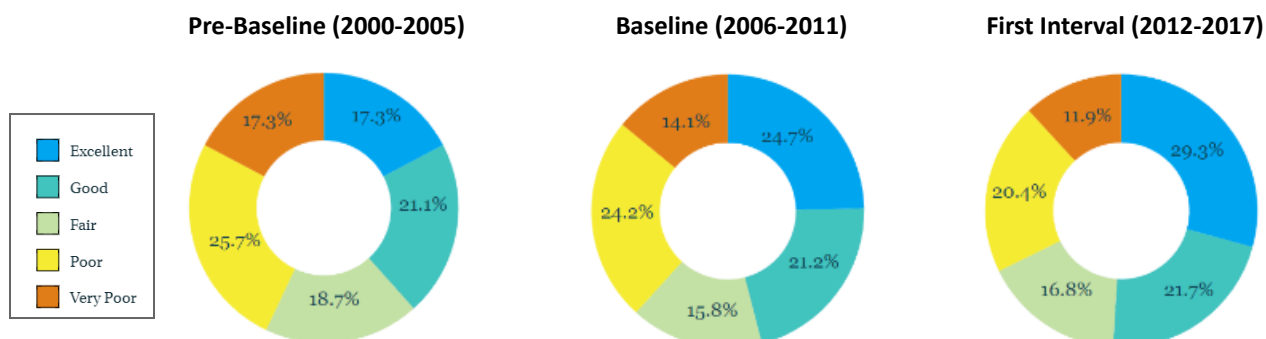
STREAM HEALTH OUTCOME JUNE 2024 QUARTERLY PROGRESS MEETING

LOOKING BACK: LEARNING FROM THE LAST TWO YEARS

Celebrate Our Accomplishments & Best Practices

1. Since your last QPM, what key successes would you like to highlight to the Management Board?

- We have observed a ~6% improvement in the Chesapeake Basin-wide Index of Biotic Integrity for stream macroinvertebrates (Chessie BIBI) indicator between the baseline (2006 - 2011) and first interval (2012 – 2017), continuing an earlier improving trend (ICPRB report #23-1, publication in review).



Chesapeake Basin-wide Index of Biotic Integrity for stream macroinvertebrates

- In March 2023, we held a STAC workshop “The State of the Science and Practice of Stream Restoration in the Chesapeake: Lessons Learned to Inform Better Implementation, Assessment, and Outcomes”. A report is in review and will be released soon.
- With FY20 GIT Funding, we quantified the effects of select management actions on significant stressors impacting stream health in the Bay, completing Phase 2 of our work plan.
- We have begun work on Phase 3 of the work plan, which will identify a suite of non-biological metrics (flow, sedimentation/erosion, water quality, etc.) that may complement the Chessie BIBI. Phase 3A, a data review and development of multi-metric stream health indicators, was completed with FY21 GIT Funding. Phase 3B will expand on the 3A analysis to include water quality metrics and has been proposed for FY24 GIT Funding.
- We completed a Stream Restoration Permitting Survey to assess progress and need to improve permit process and project outcomes related to functional lift. The survey was distributed amongst

practitioners, regulators, and the regulated community to identify issues with regards to obtaining permits to complete stream restoration projects. Overall, comments pointed to a greater need to understand the full breadth of ecosystem benefits and impacts from stream restoration projects.

Evaluate Our Progress

2. 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?

- **On course.** The Chessie BIBI Indicator has shown a ~6% improvement between the baseline and first interval.
- However, the Chessie BIBI has limitations. In the first interval, 41.5% of overall stream miles did not have enough data for a BIBI rating. This, combined with the 5 year data collection cycle make it difficult to establish trends. Because we have only completed one interval from baseline, we cannot be sure that the 10% change is related to management actions as opposed to natural fluctuations.
- In addition, it is not certain that we can sustain a 10% improvement goal. Modeling results and anticipated changes with continued landscape and population pressures, plus climate change effects may negatively affect stream health.

3. How would you summarize your recent progress toward achieving your outcome (since your last QPM)? Would you characterize this progress as an increase, decrease, no change, or completed?

- The percentage of non-tidal stream miles that likely supported healthy macroinvertebrate communities increased from approximately 61.7% in the baseline period to 67.8% in the first interval, demonstrating an increase in recent progress for this outcome. Despite this roughly 6% net improvement, some areas of the watershed show degrading trends. The net improving trend, however, suggests the collective impact of multiple environmental stressors on streams may be slowly lessening in many parts of the Chesapeake watershed. Metrics for a variety of environmental stressors are currently being explored and will help future investigations of stream macroinvertebrate responses to those stressors and can help explain why the current trend is happening.

Lessons Learned

4. If our outlook is off course, what has been the most critical influencing factor or gap that needs to be addressed to accelerate progress?

- Identifying additional metrics to describe and quantify stream health to complement existing biological indicators would help accelerate progress. Biological uplift (increased BIBI scores) may not be achieved immediately following management actions, but these actions can have a positive impact that may set the stage for future uplift. Additional indicators are needed to complement the Chessie BIBI and provide more immediate feedback regarding management actions in the interim between 5 year BIBI data sets.

5. Consider and reflect on the actions you intended to take during the past cycle. For actions that have not begun, or which have encountered a serious barrier, what is preventing us from taking action? Are these actions still needed?

- We have struggled to find meaningful ways to engage with under-served, under-represented communities to increase participation in stream health concerns and improve communications and understanding of stream health. While our workgroup recognizes the interplay between social and ecological dimensions, restoration efforts are largely shaped by legal and regulatory requirements, economic considerations, and environmental health challenges. Ensuring that restoration projects align with the values and goals of the people affected by them is important for more inclusive and successful restoration outcomes, and this action is still very much needed

6. What have we learned over the past two years that we'll need to consider in the coming two years?

- In the future, we intend to incorporate the Lessons Learned from our 2023 STAC workshop. The main lesson being that ecological uplift in stream restoration projects is achieved only if it is specifically planned for. By focusing beyond TMDLs and putting ecological considerations on the front end of planning and project implementation, we can address multiple outcomes and achieve more. By investing in ecological uplift, we can address water quality issues and make improvements to the natural resources that the people in the Bay watershed care most about thereby addressing social benefits as well.
- We will also incorporate findings from the CESR report. Particularly that there is a disconnect between modeling results and monitoring results. TMDL improvements do not necessarily create expected responses in water quality and it is difficult to determine large-scale effectiveness of management actions on water quality.
- We completed portions of our three phase plan to identify how stream health is changing and how it can be better characterized through both biological and non-biological metrics. In Phase 1, USGS conducted a literature review to determine what stressors and drivers are most affecting stream health and responsible for causing impairment of streams. Phase 2, completed by the Center for Watershed Protection with GIT funds, evaluated which of the stressors (and their causes/sources) can be alleviated through management actions. During the next two years we will continue to work on Phase 3 of this plan to answer the questions: Following the implementation of management efforts, how is stream health changing, and how can we better characterize the response through non-biological metrics?

ASSESSING OUR EFFORTS AND GAPS

Factors

7. Summarize here any newly identified influencing factors, and why they were added to your Management Strategy. If any factors have been deleted, are they the result of our actions, and what have we learned as a result?

- **BMP/Stream restoration tradeoffs**
 - Stream restoration projects often come with the risk of resource tradeoff considerations and unintended consequences (e.g. tree loss, increases in water temperature, and habitat loss) that may limit recovery. Proper site selection and design are crucial to target projects to areas of need and prevent negative impacts to existing resources.

8. Prioritize and summarize here the factors best tackled as a Partnership (or GIT/workgroup), that have the greatest impact to achieve our outcome.

- **Ecological stressors and factors**

- Removal/Loss of forested riparian or wetland areas and the benefits provided by shading and natural biogeochemical processes.
- Inadequate stormwater management controls (e.g. BMPs).
- **Policy and administrative factors**
 - Integration of water quality and living resource goals during WIP stream restoration.
 - Current lack of crediting for stream health beyond modeled nutrient and sediment reductions
- **Scientific knowledge and application of research factor**
 - Stressor identification and prioritization procedures.
 - Functional metrics that correlate with priority stressors identified for measurement.
 - Research needed to guide the selection of achievable reference conditions/design approaches based on watershed and stream functions to include an urban reference continuum.
- **Partner coordination**
 - There are many additional CBP outcomes that rely on stream health
 - The linear nature of streams causes them to cross borders into different states or jurisdictions. It is important to ensure that efforts are coordinated up and downstream.

Gaps

9. For those high priority factors summarized above, what is getting in the way of addressing them or what gaps continue to exist despite the current efforts to address those factors?

- The isolated structure of the various Chesapeake Bay Program outcome teams artificially limit the interconnections between related outcomes. We need better integration of complementary outcomes such as stream health, fish passage, riparian buffers, wetlands, water quality, and healthy watersheds. This would create greater opportunities for collaboration to achieve goals and help ensure that any outcome is not unintentionally undermined by another.
- Gaps in stream health monitoring throughout Chesapeake Bay watershed make it difficult to fully understand the status of stream health. In the first indicator assessment interval, 41.5% of overall stream miles did not have enough data for a BIBI rating. We need to expand data collection across the entire region and jurisdictional boundaries to better evaluate trends in stream health.
- Alleviating high priority stressors requires efforts beyond stream restoration and other watershed BMPs implemented for TMDL reduction metrics. For example, stormwater management facilities have limited ability to reduce salt inputs from deicing applications; a holistic approach by jurisdictions to minimize the initial application would have a better impact on stream health.
- There are mismatched and sometimes harmful local and state regulations that guide development. Current and planned development or changes to land use is not often part of our discussions.
- Our capacity for doing work related to the stream health outcome is limited. While there are many sources of funding for project implementation, there are limited funds for staffing efforts.

FOCUSING ON THE NEXT TWO YEARS

Actions And Needed Support

10. Describe any scientific, environmental, fiscal, or policy-related developments that have already or may influence your work over the next two years.

- The Whole Watershed Act (SB0969) passed in Maryland. This legislation will reallocate existing state funds towards a 5-year pilot program. The initiative will focus on five strategically selected watersheds within Maryland, each representing the state's diverse land uses, geographical features, and perturbations. The program is intended to fund holistic projects to maximize results.
- The Covid-19 pandemic may have slowed or stopped stream monitoring, exacerbating the known gaps in stream health indicator data collection. This may affect the bay-wide computation of stream status indicators.
- New federal funding initiatives have increased the amount of funding available for programs and projects that improve watershed health, habitat, TMDL reductions and other ecological best management practices, as well as scientific research that can address gaps in our knowledge.
- The 2023 STAC workshop "The State of the Science and Practice of Stream Restoration in the Chesapeake: Lessons Learned to Inform Better Implementation, Assessment and Outcomes" was held in March 2023. The final report is undergoing review and will be published soon. Key findings from the workshop will help guide our strategies and action plans moving forward.
- USGS Chesapeake Science Strategy studies are increasing efforts to provide integrated science and are engaging stakeholders to inform the multi-faceted restoration and conservation decisions to improve habitat for fish and waterfowl, and socio-economic benefits. Completed studies that will have significant effects on assisting planning and implementation of watershed best management practices include:
 - New 'hyper' resolution stream maps may double mapped stream miles in many parts of the basin
 - Models of predicted stream reach condition for instream stressors, including physical habitat and instream salinity, to help in targeting biological uplift and conservation plans
- Beyond 2025 recommendations will guide our efforts to transition to the 2025 Chesapeake Bay Agreement.

11. Based on these developments and the learning discussed in the previous sections, summarize any new actions you are planning to address these gaps over the next two years.

- Collaborate with USGS as a part of their new Science Plan to investigate and define stream stressors and their management to improve stream health.
 - USGS is relating the implementation of BMPs and land use, to stream stressors and to stream health across the Chesapeake.
 - USGS is working to refine and update the predictive modeling for Chessie BIBI (beyond-BIBI), fish habitat, and select stressors of interest (e.g., instream habitat, conductivity).
 - USGS is examining the potential co-benefits of management practices to streams across the watershed.
 - USGS has launched a multi-year effort to assess status and trends in 7 stream health indicators across the watershed (flow, geomorph, salinity, temp, biota, toxics, nutrients)
- Coordinate with the CBP Diversity Workgroup to identify and implement actions that will engage with stakeholder groups not currently represented in the SHWG.

- Seek funding to continue implementation of Phase 3 to identify multi-metric indicators of Stream Health.
- Support the CBP STAR Stream Health Monitoring Workshop to identify additional watershed-wide monitoring needs for stream health and tasks to meet those needs.
- Coordinate with the Beyond 2025 Small Groups and other team members to integrate Stream Health aspects into the ongoing discussions.

12. Have you identified new needs, or have previously unmet needs, that are beyond the ability of your group to meet and, therefore, you need the assistance of the Management Board to achieve?

- We ask the Management Board to support the investment of resources to achieve a more holistic approach to improving ecological integrity of streams based on sound science, coupled with land management, planning, and protection to improve and sustain stream health.
 - The SHWG and its members continue to identify and obtain various sources of funding and other resources to advance scientific and technical needs to improve management practices related to the SHWG outcome. Examples include using CBP's GIT and STAC workshop funds previously described in this summary; SHWG partners rely on implementation grants such as the Small Watershed Grants and Innovative Nutrient and Sediment Reduction Grants to complete projects throughout the Chesapeake Bay.
 - Formal endorsement by the Management Board to support the investment of resources towards the outcome will strengthen these opportunities.

13. What steps are you continuing, or can you take, to ensure your actions and work will be equitably distributed and focused in geographic areas and communities that have been underserved in the past?

- USGS has some ongoing efforts to prioritize/target stream restoration and conservation efforts in marginalized & vulnerable communities.
- SHWG partners may explore the possibility of developing a biological reference condition for urban streams.
- SHWG will coordinate with the CBP Diversity Workgroup to identify and implement actions that will engage with stakeholder groups not currently represented in the SHWG.