

EPA EVALUATION OF PENNSYLVANIA'S 2022-2023 and 2024-2025 MILESTONES

Executive Summary

The Chesapeake Bay Program (CBP) partnership established the goal to have all practices and controls in place by 2025 that were necessary to meet applicable water quality standards in the Chesapeake Bay (Bay) and its tidal tributaries (“2025 Goal”). The CBP partnership, including the seven jurisdictions (Pennsylvania, the District of Columbia, Maryland, New York, Pennsylvania, Virginia, and West Virginia) and the U.S. Environmental Protection Agency (EPA), agreed to develop and implement a framework for holding each partner accountable for reducing nitrogen, phosphorus, and sediment loads to meet the 2025 Goal. EPA is providing this evaluation of Pennsylvania’s 2022-2023 and 2024-2025 milestones to the CBP partnership and the public in accordance with its oversight role and responsibility under the CBP partnership’s accountability framework.

In that role, EPA has evaluated Pennsylvania’s statewide progress toward attaining its portion of the 2025 Goal. This evaluation includes an assessment of progress toward attaining nutrient and sediment goals at the state and state-basin level and progress toward meeting sector-specific programmatic commitments for the 2022-2023 milestone period. This evaluation also provides an assessment of sector-specific programmatic and numeric commitments (e.g., Best Management Practices (BMP) or BMP implementation targets) for the 2024-2025 milestone period and the status of the relevant water quality monitoring trends.

In reviewing Pennsylvania’s final programmatic progress for the 2022-2023 milestones, the 2023 numeric progress, and the draft 2024-2025 milestone commitments, EPA identified sector-by-sector strengths as well as areas for improvement. According to the data provided by Pennsylvania for the 2023 progress run, Pennsylvania did not achieve its statewide 2023 targets for nitrogen, phosphorus, or sediment. EPA stands ready to assist Pennsylvania with implementing its 2024-2025 two-year milestone commitments.

Some notable strengths identified in this evaluation of Pennsylvania’s 2022-2023 milestone progress and the draft 2024-2025 milestone commitments include:

- Provided detailed progress updates on all key initiatives with a focus on new funding programs to support work in agricultural sector and evolving outreach through the Countywide Action Plans (CAP).
- Updated several programmatic milestones to connect programs with targeted increases in BMP implementation. The 2024-2025 milestone progress report will attribute BMPs to specific funding sources.
- Continued to advocate for a sustainable source of funding to support both regulatory and voluntary programs strategically designed to accelerate BMP implementation and meet reduction targets for the Watershed Implementation Plan (WIP).
- Increased staff capacity to make progress on programmatic priorities that support the WIP and the CAPs.
- Advanced programmatic milestones associated with outreach and CAPs to address barriers to BMP implementation.
- Completed publication of the Chesapeake Bay Nutrient Trading Tool (CBNTT).

- Met programmatic milestones associated with distribution of Infrastructure Investment and Jobs Act (IIJA) and American Rescue Plan Act (ARPA) funding for the Clean Streams Fund and associated state programs.

Some key areas that EPA expects Pennsylvania to address in the final 2024-2025 milestone submission include:

- Accelerate BMP implementation in the agricultural sector, especially since several BMP implementation targets were not met in the 2022-2023 milestone period.
- Incorporate recommendations from Animal Agriculture Assessment Report in milestone language in addition to reporting progress.
- Consider adjusting milestones for developed sector to reflect work outside of the permitting program, to describe specific programmatic efforts to incentivize collaborative approaches across CAPs, and to provide more information about programmatic efforts to address numeric milestones that showed no progress in most recent reporting period.
- Continue to work with EPA in offsetting any new or increased nutrient and sediment loads identified in their portion of the Chesapeake Bay watershed.
- Consider updating wastewater programmatic milestones to reflect any changes to program strategies and priorities in 2024-2025.

Looking Forward for Future Reviews of Progress

At the 2022 [Executive Council meeting](#), the Executive Council discussed the upcoming year of 2025—the target date the partnership set for achieving certain outcomes under the [2014 Chesapeake Bay Watershed Agreement](#). At that meeting, the Executive Council [charged the Principals' Staff Committee](#) (PSC) to recommend a critical path forward that prioritizes and outlines the next steps for meeting the goals and outcomes of the *Chesapeake Bay Watershed Agreement* leading up to and beyond 2025 with specific considerations for science, restoration, and partnership. Recommendations for actions beyond 2025 will be presented at the 2024 Executive Council meeting.

At the [September 2023 PSC meeting](#) the partners agreed to define the targets to be met by 2025 as the Phase III planning targets, the 2025 targets for climate change, and Conowingo targets¹. Consistent with that decision, this evaluation measures progress toward the goal of meeting the 2025 planning targets and 2025 climate change targets. In doing so, this evaluation of Pennsylvania's 2022-2023 progress and 2024-2025 commitments uses the Chesapeake Assessment Scenario Tool (CAST) 2019, as agreed to by the CBP partnership.

In the next round of two-year milestones progress will be measured using CAST-23 and will include progress toward unaccounted additional loads and 2025 climate change conditions. In September 2023, the PSC approved the finalization and use of CAST-23 (expected by mid-2024) for tracking progress until the Phase 7.0 suite of modeling tools is complete (estimated in 2028). The PSC also determined that unaccounted additional loads (i.e., modeled load increases identified after the PSC adopted the jurisdictions' Phase III planning targets in 2018) will be

¹ The PSC approved a phased approach for what can be achieved at Conowingo by 2025. Conowingo has a separate WIP and milestones to meet those targets.

added to the jurisdictions' existing Phase III planning targets to create interim planning targets and that these will be addressed in the Phase 7.0 suite of modeling tools along with 2035 climate change loads.

In addition, in January 2024 the CBP partnership finalized the [Chesapeake Bay Total Maximum Daily Load \(TMDL\) indicator](#), which is a new indicator designed to combine monitored and modeled data to estimate the progress of annual pollutant loading rate reductions since 1995 in response to implemented management practices. This indicator was developed to address a CBP partnership interest to compare modeled and monitoring data. This indicator may be used in future evaluations of progress.

Detailed Evaluation of Overall Load Reductions and Source Sectors

Load Reduction Review – Statewide and by Major River-Basin²

Each year, jurisdictions in the CBP partnership report on BMPs installed, tracked, and verified and the pollutant load reductions from wastewater treatment plants. Using CAST-19, this information (or “annual progress runs”) provides an estimate of how much nitrogen, phosphorus, and sediment has been reduced. When evaluating Pennsylvania’s 2022-2023 milestone implementation, EPA simulated nutrient and sediment loads using CAST-19³ and wastewater discharge data reported by Pennsylvania and compared those simulated loads to where Pennsylvania’s progress should be by 2023 (90% of the statewide and state-basin Phase III planning targets).

According to the data provided by Pennsylvania for the 2023 progress run, Pennsylvania did not achieve its statewide 2023 targets for nitrogen, phosphorus, or sediment. These targets include adjustments for 2025 climate change as approved by the PSC. At the major river-basin scale, Pennsylvania did not achieve its 2023 targets for nitrogen, phosphorus, or sediment in any of its major basins (Eastern Shore, Western Shore, Potomac, and Susquehanna).

² Major river-basin refers to the eight major river basins draining to the Chesapeake Bay, some of which are shared by more than one Bay jurisdiction. For example, the Susquehanna River is shared by New York, Pennsylvania, and Maryland; Pennsylvania-Susquehanna refers to the Pennsylvania portion of the river. The phrase major river-basin is interchangeable with "state-basin" in this document.

³ CAST-19 is part of the Phase 6.0 suite of modeling tools for the Chesapeake Bay

Table 1. Loads and Targets for Pennsylvania based on CAST-19 and reported wastewater data.

Pollutant	2009 Progress Loads (M lbs/year)	2023 Progress Loads (M lbs/year)	2025 Planning Target Load (M lbs/year)	Additional Load due to 2025 Climate Conditions (M lbs/year)	2025 with Climate Target load (M lbs/year)	% of goal Achieved (90% is considered on track to meet 2025 with climate load)
Nitrogen	113.23	101.07	73.49	1.81	71.68	29%
Phosphorus	4.461	3.634	2.905	0.095	2.81	50%
Sediment	3,300	2,643	2,161	N/A	2,161	58%

Pennsylvania developed specific BMP implementation targets for the 2022-2023 and draft 2024-2025 milestones for those practices identified in Pennsylvania's final amended Phase III WIP that account for the majority of the nitrogen reductions. Table 2 provides a summary of Pennsylvania's 2023 progress compared to the 2009 baseline and the 2025 targets, as well as the draft 2024-2025 commitments, for these priority BMPs.

Table 2. Progress toward Targets for the Pennsylvania's priority BMPs (those that account for the majority of the nitrogen reductions).

BMP⁴	2009 Progress	2023 Progress	2024-2025 Milestone Target	2025 WIP Target
Nutrient Application Management Core Nitrogen (acres)	162,567	592,134	2,058,447	1,953,675
High Residue Tillage Management (acres)	None reported ⁵	788,105	850,450	935,775
Cover Crop, Traditional (acres)	267,279	247,126	227,955	225,162
Cover Crop, Traditional with Fall Nutrients (acres)	None reported	689	496,470	484,762
Forest Buffers (acres)	33,539	17,899	73,378	73,235
Forest Buffers, Streamside Exclusion Fencing (acres)	None reported	2,247	20,920	20,920
Soil Conservation and Water Quality Plan (acres)	446,464	680,129	2,314,594	2,466,186
Animal Waste Management Systems	242,678	1,205,126	2,320,984	2,195,754

The summary progress from the CBP partnership's modeling tools for 2009 and 2023 incorporate BMP credit duration. The CBP partnership decided to remove reported BMPs from the model simulation at the end of their established credit durations unless verified by the state as inspected and continuing to function as designed. Pennsylvania is expected to provide detailed programmatic milestones to support these BMP implementation targets. In the sector-specific

⁴ BMP levels are units reported or planned by the jurisdiction. The levels are calculated using CAST-19 of the Phase 6.0 suite of modeling tools and include everything established or installed, reported, and functioning through the particular year, e.g., through 2009, or through 2023, etc., not just new reported implementation, unless otherwise noted.

⁵ CBP partnership modeling tools evolve based on CBP partnership decisions. As a result, some BMPs have "none reported" listed since those particular BMP names were not available for reporting. These practices were often included in another BMP category before the refinement to be more specific in the naming convention.

sections below, EPA provides its evaluation of these programmatic milestones and the connection to increased implementation.

Source Sector Review

Agriculture

Pennsylvania is predominantly relying on agriculture BMP implementation to meet its 2025 targets based on its amended Phase III WIP. Pennsylvania continues to make incremental progress toward its goals, but the current pace of implementation is not on track to meet its statewide nutrient and sediment targets. EPA expects Pennsylvania to accelerate BMP implementation in the agricultural sector.

2022-2023 Milestone Achievements

- Provided a detailed report on the impact of expanded funding programs designed to incentivize BMP implementation.
- Met goals for implementing or expanding programs associated with the Clean Streams Fund including the Agriculture Conservation Assistance Program (ACAP), Nutrient Management Fund, and Pennsylvania Clean Water Procurement Program. Funds were allocated in a timely manner.
- Met the 2025 WIP goal for traditional cover crops.
- Strengthened efforts to direct funding for various programs to areas of highest need and potential impact with ACAP distribution formula that considers the number of farms and animal operations and impaired stream miles in each county.
- Completed 222 Phase 2 inspections of Concentrated Animal Feeding Operations (CAFO) and Animal Feeding Operations (AFO) across 11 counties under the Chesapeake Bay Agriculture Inspection program (CBAIP).
- Used compliance inspections to advance outreach and education goals on several high-priority BMPs related to erosion and sedimentation (E&S) control plans.
- Met goal for poultry mortality disposal.

2022-2023 Milestones Not Achieved

- Did not fully implement training for Manure Management Planning and Agricultural Erosion and Sediment Control Planning but is on track to finalize training materials in 2024.

2024-2025 Milestone Strengths

- Updated milestones to connect funding sources to BMP implementation. These milestones will allow Pennsylvania to track the direct impact of programs and funding on water quality improvements.
- Updates several milestones to track BMP implementation driven by new or revised programs, e.g., milestone 2.3.3A commits Pennsylvania to tracking Animal Waste Management Systems (AWMS) in addition to progress on technical assistance efforts to promote AWMS.

Key Areas to Address in the Final 2024-2025 Milestones

- Set milestones to accelerate BMP implementation in the agricultural sector and identify what programs will be implemented to achieve the implementation targets, especially since several BMP implementation targets were not met in the 2022-2023 milestone period.
- Consider including new or expanded efforts to secure sustainable sources of funding that could be tracked in milestones.
- Include updated actions for the 2024-2025 milestones related to communications and outreach within the agriculture sector that do not have any planned updates for this two-year period. Pennsylvania could consider revising some milestones to account for expansion of outreach efforts that are reaching a wider audience and engaging more stakeholders in WIP-related efforts.

Urban/Suburban Stormwater

2022-2023 Milestone Achievements

- Onboarded five new regional watershed forestry specialists at Pennsylvania Department of Conservation and Natural Resources (DCNR).
- Published training materials for aquatic ecosystem restoration and started work on revisions to the Post Construction Stormwater Water management manual.
- Issued Chapter 102 Inspection Standard Operating Procedures (SOP).
- Reported successful projects in generating Municipal Separate Storm Sewer Systems (MS4s) credits to demonstrate local water quality improvement using MS4 Flexibilities.
- Developed a series of training videos for inspection and maintenance of select BMPs.
- Formed a stakeholder group to discuss the next iteration and developed a draft version of the Pennsylvania General Permit for small MS4s (PAG-13).
- Completed an e-reporting application for MS4 annual reports and had a small number of MS4 communities beta test the system.
- Reissued the Pennsylvania Industrial Stormwater General Permit (PAG-03) with an effective date of March 23, 2023.

2022-2023 Milestones Not Achieved

- Did not complete revisions to the Pennsylvania Stormwater BMP Manual. However, the draft Manual was published for public comment in 2023.
- Did not complete approvals for all pollutant reduction plans (PRPs) and total maximum daily load (TMDL) Plans for 2018 MS4 permittees. EPA offered technical assistance to help Pennsylvania address this issue. The agencies are coordinating to get the remaining PRPs submitted and approved.

2024-2025 Milestone Strengths

- Continues to identify opportunities to implement administrative improvements, including flexible use of funding and tools to identify most impactful locations for certain types of BMPs.
- Establishes a new interactive tool to help stakeholders understand permitting requirements for maintaining wetlands and streams to address erosion and sedimentation and debris around bridges and culverts.
- Continues to work with partners to develop and implement urban nutrient management plans.

- Continues to support and fund external coordinators to assist with CAP planning and implementation efforts.

Key Areas to Address in the Final 2024-2025 Milestones

- Consider including additional milestones or strategies to identify sustainable sources of funding for this sector. The 2022-2023 progress updates for several milestones related to BMP implementation mention the need for sustainable funding sources (especially in forestry sector) and indicate that there may be more interest among landowners than Pennsylvania can currently support. E.g., expanded flexible funding options for riparian buffers and funding opportunities for turf conversion and turf conversion assistance.
- Urban Stream Restoration progress is not on track to meet the anticipated milestone projected numbers. Consider additional information in the 2024-2025 milestones to explain how Pennsylvania intends to meet this goal.
- Explain how Pennsylvania is engaging with other entities identified in milestone 2.1.1S regarding implementation of stormwater BMPs in areas outside of the scope of permitting programs.
- Determine whether expansion of regulated MS4 areas is necessary because of the 2020 Census and Pennsylvania's designation criteria/process.
- Commit to reissue the small MS4 general permit (PAG-13) and construction stormwater general permit (PAG-02) during the milestone period.
- Consider incorporating references to Pennsylvania's [Riparian Forest Buffer Action Strategy](#) and [Tree Canopy Action Plan](#) to appropriate Forestry milestones to show full scope of Pennsylvania's effort.
- Pennsylvania is expecting additional nutrient and sediment reductions from the stormwater sector by 2025 according to its amended Phase III WIP. EPA expects Pennsylvania to accelerate BMP implementation in the urban/suburban stormwater sector.

Wastewater Treatment Plants and Onsite Systems

2022-2023 Milestone Achievements

- Completed technical assistance at 16 wastewater treatment plants (WWTPs) in 2023.
- Purchased or replaced field equipment, including equipment for technical assistance clients.
- Provided Activated Sludge courses to certified operators at multiple venues and developed on-demand video training by Pennsylvania technical assistance staff for staff receiving the field equipment purchased with grant funding.
- The Manual for Land Treatment of Treated Wastewater was routed for approval and will be sent for public comment.
- Funding from the State Revolving Fund Technical Assistance contract was fully allocated.
- GIS based online monitoring and reporting program for on-lot system operation and maintenance reporting was on hold in 2022, but state funds were approved in 2023 and the project is moving forward.

2022-2023 Milestones Not Achieved

- None.

2024-2025 Milestone Strengths

- State Revolving Fund Technical Assistance and Outreach for small and disadvantaged wastewater systems has been successful and the contract is being funded again in 2024.

Key Areas to Address in the Final 2024-2025 Milestones

- There were few 2024-2025 proposed wastewater milestones. Pennsylvania should consider providing 2024-2025 milestones for wastewater and or septs indicating anticipated efforts.

Growth, Offsets, and Trading

2022-2023 Milestone Achievements

- Developed and published a credit calculation tool, Nutrient Trading Tool (CBNTT), that will be used to quantify nonpoint source (NPS) credits used for compliance and offsetting increased and/or new loads in the Chesapeake Bay watershed.
- Published a revised draft Nutrient Trading Supplement and policies, incorporating CBNTT performance-based methods to Pennsylvania's website. This documented the state program's decision to move to a performance-based agriculture baseline determination and nutrient credit calculation process.
- Now implementing a 2:1 uncertainty ratio for all nonpoint source credit generators. Pennsylvania discontinued implementation of 3:1 trading ratio for NPS credit generation and trading since establishing the performance-based tool (i.e., CBNTT).
- Pennsylvania continued work regarding the potential calculation of nutrient credits from alternative manure treatment technologies, other potential strategies to address areas of excess manure nutrient generation, and capital investment required for implementation of manure treatment systems. Pennsylvania is exploring options for the Partnership to credit alternatives to the current method and to prevent creating a disincentive for these technologies. Timeline for completion is December 2025.
- Pennsylvania received funding to update CBNTT which is used by the Nutrient Trading Program. The Program is in the process updating the Regulatory In-lieu fee and Bank Information Tracking System (RIBITS) to serve as a tool for administering the Program.

2022-2023 Milestones Missed

- Did not complete work on the registry aspects of RIBITS. Pennsylvania is continuing to work on the registry aspects of the website, customizing it for Pennsylvania, and it should be completed for rollout by March 2024.

2024-2025 Milestone Strengths

- Commits to use RIBITS to facilitate program activities and increase consistency and transparency in trading among Bay states. Currently, Virginia is participating as a pilot state, and Maryland also intends to use RIBITS.
- Commits to investigate the incorporation of alternative manure treatment technologies and other potential strategies to address areas of excess manure nutrient generation and capital investment required for implementation of manure treatment systems for the purpose of generating nutrient credit reductions. Expected timeframe is December 2025.

Key Areas to Address in the Final 2024-2025 Milestones

- Continue to work with EPA in offsetting any new or increased nutrient and sediment loads identified in the Pennsylvania portion of the Chesapeake Bay watershed.

Climate

In 2020, the PSC issued a directive that by 2022 all jurisdictions would account for the additional nutrient loads due to 2025 climate change conditions in a Phase III WIP addendum, or in the two-year milestones, if it had not already done so in its Phase III WIP. All Bay jurisdictions met this goal in 2022 to update Phase III WIPs or milestones to address the 2025 climate change conditions. Pennsylvania addressed the 2025 climate change conditions in its amended Phase III WIP. The Bay jurisdictions maintained the commitment to meet the 2025 climate change conditions by 2025.

2022-2023 Milestone Achievements

- Made progress with first cohort of 12 local governments participating in Pennsylvania's Local Climate Action Program.
- Pennsylvania's Energy Program's Office published the Clean Energy Program Plan (CEP).

2022-2023 Milestones Not Achieved

- None.

2024-2025 Milestone Strengths

- Commits to participating in the Pennsylvania Climate Pollution Reduction Planning Program, a new program established with \$3 million in Inflation Reduction Act funding.

Key Areas to Address in the Final 2024-2025 Milestones

- None.

Other (BMP verification, Segment-shed Goals for the Tidal Jurisdictions, Local Engagement, etc.)

2022-2023 Milestone Achievements

- Kept BMP reporting for CAPs on schedule and utilized standard template to keep reporting consistent.
- Completed second annual Healthy Waters, Healthy Communities annual report to share progress and success stories at county level.
- Continued offering innovative 'block grants' at state-level to assist with CAP implementation.
- Continued weekly and monthly communications with counties and CAP coordinators to share information about funding opportunities.
- Passed Turfgrass Fertilizer Bill that regulates use of fertilizers by homeowners, commercial lawn-care companies, and professionals maintaining parks and athletic fields, aimed at reducing nutrient loads entering waterways during wet weather.
- Pennsylvania continues to co-chair the Conowingo WIP (CWIP) Steering Committee and discuss cross-jurisdictional financing, including but not limited to the Maryland Conowingo Financing Program and the Pennsylvania Clean Water Procurement Program. The

PENNVEST Clean Water Procurement Program will be leveraged to fund projects that would be reported toward meeting the CWIP goals. Expected completion timeline is 2025.

2022-2023 Milestones Not Achieved

- Did not secure funding source to sustain Clean Streams Fund and associated programs like ACAP into future.
- Did not have adequate funding to fully implement innovative programs intended to incentivize establishment of new forested buffers.

2024-2025 Milestone Strengths

- Tracks efforts of newly established workgroups for CAP Coordinators, Conservation Districts, and State Program leads to identify solutions to critical barriers to progress on WIP programmatic goals.
- Requires CAP grant applicants to estimate reductions when applying for CAP grants.
- Commits to evaluating effectiveness of Pennsylvania Conservation Reserve Enhancement Program (CREP).
- Continues to track activities as co-chair of the CWIP Steering Committee. Met weekly with the Maryland Department of the Environment (MDE) and New York Department of Environmental Quality (NYDEQ) to discuss cross-jurisdictional programming and funding related to the CWIP. The PENNVEST Clean Water Procurement Program will be leveraged to fund projects that would be reported toward meeting the CWIP goals. Expected timeline is 2025.

Key Areas to Address in the Final 2024-2025 Milestones

- Consider expanding efforts to advocate for a sustainable source of funding to support both regulatory and voluntary programs strategically designed to accelerate BMP implementation and hit reduction targets for the WIP.
- Consider formally tracking expanded reach of outreach efforts to encourage participation in effort from new landowners.

Potential Federal Actions and Assistance

EPA remains prepared to assist each of the seven watershed jurisdictions in implementing the 2024-2025 milestones. EPA will work with each jurisdiction to develop specific oversight and assistance activities to provide prioritized support for implementation efforts, including funding, technical assistance and analysis, training, and regulatory reviews.

EPA plans to continue to commit staff, contractual and funding resources to support the seven watershed jurisdictions in implementing the 2024-2025 milestones and future two-year milestones. This support includes evaluation of the most-effective practices and locations, annual funding assistance to address priority implementation needs, evaluation of Bay jurisdictions' implementation capacity under various staffing, funding, regulatory and programmatic scenarios, local planning outreach, legislative and regulatory gap analysis, and monitoring trend analyses.

EPA will continue to take actions as identified in the 2023 Chesapeake Bay Settlement Agreement as part of our oversight in Pennsylvania. At the sector level, every jurisdiction, except the District of Columbia, is significantly off track in meeting its Phase III WIP

commitments in the urban/suburban stormwater sector. Recognizing this, and that the stormwater sector supplies a significant portion of the nutrient and sediment loads to the Bay, EPA is exploring opportunities for increased oversight in this sector.

In addition, EPA will continue to work with federal partners to provide leadership and coordinate with Bay jurisdictions on WIP and two-year milestone implementation to reduce pollutants from federal lands. EPA will continue its commitment to track annual progress of the Bay jurisdictions and make those results available to the partnership and the public. [See: <https://www.epa.gov/chesapeake-bay-tmdl/epa-oversight-watershed-implementation-plans-wips-and-milestones-chesapeake-bay> and <https://www.chesapeakeprogress.com/>]

Monitoring Trends Summary

The CBP partnership's Chesapeake Bay Program Nontidal Water Quality Monitoring Network, supported by EPA, the U.S. Geological Survey (USGS), the Susquehanna River Basin Commission, and the Bay jurisdictions, generates water quality monitoring data in freshwater rivers and streams throughout the watershed that is analyzed by USGS for nutrient and sediment loads and trends. The most recent USGS results (www.usgs.gov/CB-wq-loads-trends) over the long-term 1985-2020 and short term 2011-2020 were made available in January 2023. The analysis below mainly focuses on the short term 2011-2020 trends.

While identifying drivers behind individual trends is often complex, the monitoring results are worthy of Pennsylvania's consideration as it develops the programs and BMPs planned for the next two years. EPA's initial summary of how the monitoring results in Pennsylvania's watersheds can potentially inform planning are below.

- Implementing efforts in high loading areas can potentially yield the greatest nutrient reduction benefits. Trends are improving at some of Pennsylvania's highest loading monitored watersheds for nitrogen and phosphorus. However, for nitrogen, some of Pennsylvania's highest loading monitored watersheds show degrading trends than improving trends. Most of the highest loading monitored watersheds for both nitrogen and phosphorus are in the Lower Susquehanna region. Most of Pennsylvania's highest loading watersheds are agricultural, suggesting agriculture should continue to be a focus.
- Within the Susquehanna River basin, the Lower Susquehanna stations are mostly improving or show no trend for nitrogen, whereas the Upper Susquehanna and West Branch stations are relatively mixed with lower loading rates. For phosphorus, the Lower Susquehanna stations are mostly improving or show no trend, whereas most of the West Branch stations are degrading or show no trend.
- Additional exploration of these trends can help clarify what may be driving differences between nitrogen and phosphorus trends regionally and locally, which can in turn help inform adaptation of programs, policies, or practices.
- Most monitored watersheds in the Potomac River basin show improving nitrogen trends, while most show no trend in phosphorus. More exploration on what is occurring in improving watersheds or areas can potentially reveal successful programs, policies, or practices.

A comprehensive effort has been made to compile and analyze data sets for the watersheds of the Chesapeake Bay Program Nontidal Water Quality Monitoring Network stations. For the first time, station-level monitoring and modeling results, available through the [Monitored and Expected Total Reduction Indicator for the Chesapeake \(METRIC\) tool](#), can be compared to help resource managers gauge expectations on the trajectory and pace of reduction progress at a localized scale.