EPA EVALUATION OF VIRGINIA's 2018-2019 and 2020-2021 MILESTONES

Executive Summary

The seven jurisdictions (Delaware, the District of Columbia, Maryland, New York, Pennsylvania, Virginia, and West Virginia) in the Chesapeake Bay Program (CBP) partnership agreed to develop and implement a framework for holding each partner accountable for reducing nitrogen, phosphorus, and sediment loads to meet water quality standards in the Chesapeake Bay (Bay) and its tidal tributaries. The CBP partnership established the goal to have all programs and practices in place by 2025 that were necessary to achieve applicable water quality standards in the tidal Bay. Part of the U.S. Environmental Protection Agency's (EPA's) role in the partnership's accountability framework is to evaluate and report each jurisdiction's progress toward meeting this goal every two years.

In that role, EPA has evaluated Virginia's progress toward attaining the goal of having programs and practices in place by 2025. This evaluation includes an assessment of progress toward attaining this goal at the state and state-basin levels and progress toward meeting sector-specific programmatic commitments for the 2018-2019 milestone period. This evaluation also provides an assessment of other sector-specific programmatic and numeric commitments (e.g., Best Management Practices or BMP implementation targets) for the 2020-2021 milestone period and the status of the relevant water quality monitoring trends.

In reviewing Virginia's final progress for the 2018-2019 milestones, the 2019 numeric progress, and the final 2020-2021 milestones, EPA found many areas in which the Commonwealth achieved the goals it had set. EPA also identified key areas to address during the 2020-2021 milestone period and beyond, such as providing programmatic milestones to support the anticipated implementation for soil and water conservations plans, animal waste management storage, and cover crops. According to the data provided by Virginia for the 2019 progress run[1], Virginia did not achieve its statewide 2019 targets for nitrogen and phosphorus. Virginia achieved its 2019 nitrogen target for the James River basin but did not achieve its 2019 targets for nitrogen and phosphorus in all other major basins (Potomac River, Eastern Shore, Rappahannock River and York River). Virginia achieved its statewide and basin wide targets for sediment.

The data submitted by Virginia for 2019 progress were incomplete, missing approximately 44,000 BMP records. As a result, the 2018-2019 simulations are not indicative of Virginia's actual 2019 progress. These data transmission errors have been corrected for the release of the new version of model, CAST 2019, which will be used for evaluations of 2020-2021 milestone goals.

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[1] Each year, jurisdictions in the CBP partnership report on the BMPs installed, tracked and verified and the pollutant load reductions from wastewater treatment plants. Using the Chesapeake Assessment Scenario Tool, this information (or "annual progress runs") provides an estimate of how much nitrogen, phosphorus and sediment has been be reduced.

Some notable strengths identified in this evaluation of the 2018-2019 milestones and the final 2020-2021 milestones include:

- Developed Resource Management Plans (RMPs) on more than 18,000 acres, wrote 77 new nutrient management plans on small farms, exceeding the 2018-2019 goals, and issued two Virginia Pollutant Discharge Elimination System Concentrated Animal Feeding Operation permits.
- Commitment to pursue legislation to reach its goals of 85% implementation of nutrient management plans on cropland and livestock exclusion from perennial streams and to track implementation rates for these BMPs.
- Intent to conduct cover crop/conservation tillage surveys of agricultural producers to evaluate effective approaches for documenting BMPs implemented without cost share dollars.
- Processing 6 Chesapeake Bay Total Maximum Daily Load (TMDL) action plans and issued its Industrial Stormwater General Permit, Phase II municipal separate storm sewer systems (MS4) permit and its Construction General Permit in 2018-2019.
- Adopting the final regulation on the certification of nonpoint source credits.
- Commitment to reissue the Fairfax, Henrico County, Chesapeake, Hampton, Newport News, Norfolk, Portsmouth and Virginia Beach MS4 permits within the 2020-2021 milestone period.
- Commitment to reissue its watershed general permit and complete amendments to its Water Quality Management Planning Regulation to include chlorophyll-a based wasteload allocations for significant James River dischargers and to re-evaluate industrial significant wasteload allocations.

Some key areas that EPA recommends addressing during the 2020-2021 milestone period and beyond include:

- Reissuing the MS4 permits for Arlington, Prince William and Chesterfield Counties, which expired in 2018 and 2019.
- Reporting on programmatic actions that will achieve the anticipated implementation rates for soil and water conservations plans, animal waste management storage, and cover crops. Programmatic milestones were not provided and/or did not support an increase in implementation levels for these BMPs.
- Reporting on specific metrics for measuring success of the milestones related to unregulated stormwater, including marketing of funding opportunities in non-MS4 localities and expanding the Healthy Virginia Lawns program.
- Tracking progress on non-wastewater (e.g., agriculture and urban/suburban stormwater sector) reductions in the James River to ensure that both the dissolved oxygen and new chlorophyll-a criteria are met.
- Ensuring that programs and practices are in place to achieve the state-basin Phase III WIP planning targets by 2025 if water quality trades occur across state-basins.
- Ensuring the timely reissuance of MS4 permits because that is the mechanism Virginia intends to use to incentivize trading.

Load Reduction Review

When evaluating 2018-2019 milestone implementation, EPA compared nutrient and sediment loads simulated using the 6.0 suite of the CBP partnership's modeling tools and wastewater discharge data reported by Virginia to the statewide and state-basin Phase III WIP planning targets.

According to the data provided by Virginia for the 2019 progress run[2], Virginia did not achieve its statewide 2019 targets for nitrogen and phosphorus. Virginia achieved its 2019 nitrogen target for the James River basin but did not achieve its 2019 targets for nitrogen and phosphorus in all other major basins (Potomac River, Eastern Shore, Rappahannock River and York River). Virginia achieved its statewide and basin wide targets for sediment.

This progress review was conducted using the 2017 version of the Chesapeake Assessment Scenario Tool (CAST). Virginia did not submit a complete data set for this evaluation. According to the Commonwealth, significant data transmission errors occurred during Virginia's submission of data that were used to evaluate progress for the 2018-2019 milestone review, resulting in the loss of 44,000 BMP records. As a result, the 2018-2019 simulations are not indicative of Virginia's actual 2019 progress. These data transmission errors have been corrected for the release of the new version of model, CAST 2019, which will be used for evaluations of 2020-2021 milestone goals, as noted in the BMP table below.

Virginia developed specific BMP implementation targets for the 2020-2021 milestone period for the BMPs, as recommended in EPA's evaluation of Virginia's Phase III WIP. Virginia provided programmatic milestones to support most of these BMP implementation targets. In the sector-specific sections below, EPA provides its evaluation of these programmatic milestones. Virginia also committed to BMP implementation targets, and associated programmatic milestones, for urban nutrient management, poultry litter management, stream restoration, forest planting on developed lands, tree planting, tree planting for forest canopy, wetland management, restoration and/or enhancement and oyster restoration. Virginia did not provide programmatic milestones to increase implementation for soil and water conservations plans, animal waste management storage, and cover crops.

A summary of the 2019 progress, the 2020-2021 commitments and the 2025 goals for these BMPs is listed below. The summary progress from the CBP partnership's modeling tools for 2009 and 2019 incorporate BMP credit duration. The CBP partnership decided to remove reported BMPs from the model simulation at the end of their established lifespans unless verified by the state as inspected and continuing to function as designed.

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[2] Each year, jurisdictions in the CBP partnership report on the BMPs installed, tracked and verified and the pollutant load reductions from wastewater treatment plants. Using the Chesapeake Assessment Scenario Tool, this information (or "annual progress runs") provides an estimate of how much nitrogen, phosphorus and sediment has been reduced.

BMP[3]	2009 Progress	2019 Progress	2020/2021 Milestone Target	2025 WIP Target
Nutrient Management – Core Plans (acres)	543,549	499,565	675,000	951,395
Nutrient Management – Precision Rate Nitrogen (acres)	None reported. [4]	39,643	100,000	758,474
Nutrient Management Precision Timing Nitrogen (acres)	None reported.	30,704	50,000	427,076
Cover Crops – All types (acres)	101,688	149,594	199,000	443,557
Animal Waste Storage - livestock and poultry (animal units, unless otherwise noted)	1,448,824	963,830	250 new units[5]	2,228,900
Livestock Exclusion (acres)	No reported acres of forest buffer on fenced pasture[6]; 5,262 acres grass buffer on fenced pasture	No reported acres of forest buffer on fenced pasture; 9,688 acres of grass buffer on fenced pasture	10,000 acres of newly excluded buffer acres, including 3,000 acres of forested buffers and 2,300 acres of existing grass buffer that is converted to forested buffers	72,156 acres of forest and grass buffers on fenced pasture

[3] BMP levels are units reported or planned by the jurisdiction. The levels are calculated using 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 2019, etc., not just new reported implementation unless otherwise noted.

[4] 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.

[5] Virginia will detail the number of units installed and the number of animal units served in its progress report.

[6] Virginia reported forest buffer on fenced pasture as forest buffers BMP in 2009.

BMP[3]	2009 Progress	2019 Progress	2020/2021 Milestone Target	2025 WIP Target
Soil Conservation and Water Quality Plans (acres)[7]	None reported.	None reported.	200,000	1,183,460
Denitrifying Bioreactors (load reduction in pounds per year)	None reported.	None reported.	Seek funding for bioreactors on 4 springs in Shenandoah Valley	300,000 pounds nitrogen per year (see Phase III WIP page 154)
Forest Buffer (acres)[8]	12,248	3,374	4,400	21,965
Forest Harvest Practices (% of area, unless otherwise noted)	79	84	Maintain 95% BMP compliance	96

Agriculture
2018-2019 Milestone Achievements
- Developed Resource Management Plans (RMPs) on more than 18,000 acres in 2018-2019. More than 25,000 acres of land were included in RMPs that were certified as having completed implementation in state fiscal year 2019.
- Seventy-seven new nutrient management plans (NMPs) were written for small farms during fiscal year 2018-2019, exceeding the goal of 25 new NMPs for small farm each year.
- Issued two Virginia Pollution Discharge Elimination System (VPDES) Concentrated Animal Feeding Operations (CAFO) permits in the Chesapeake Bay watershed on April 23, 2018.
- Completed its Agricultural Needs Assessment in October 2019 and updated it to incorporate the Phase III WIP planning targets. This assessment continues to be a valuable tool in funding decisions.
- Made progress in acquiring precision agricultural application data from fertilizer companies.
- Prepared 18 NMPs for beef operations in 2018 and 2019.

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[7] The 2020-2021 milestone and WIP targets for this BMP include: (a) Conservation Plans written by Soil and Water Conservation Districts in the Chesapeake Bay watershed under the Department of Conservation and Recreation (DCR) Conservation Planning Certification Program; (2) Resource Management Plan Acres; (3) Department of Environmental Quality (DEQ) acres of Chesapeake Bay Preservation Act agricultural plans; (4) USDA-NRCS/FSA acres newly enrolled in EQIP, CSP, or CREP in a given year (all such acres must have a federal conservation plan).

[8] Virginia reported forest buffer on fenced pasture as forest buffers BMP in 2009.

2018-2019 Milestones Missed
Did not report on whether it met its goal of completing evaluations of 95 poultry farm operations. Virginia should report on how many evaluations were completed in the 2018-2019 milestone period and how many are outstanding.

2020-2021 Milestone Strengths
- Intends to conduct cover crop and conservation tillage surveys of agricultural producers in the Chesapeake Bay watershed seeking information on BMPs and will conduct spot checks of 10% of producers participating in the survey. This information will be used to evaluate effective approaches for documenting BMPs implemented without cost share dollars.
- Conducted a pilot study to determine where to best target stream exclusion practices.
- Commitment to pursue legislation to reach its goals of 85% implementation of NMPs on cropland and livestock exclusion from all perennial streams. Virginia also committed to track and report on implementation rates for these BMPs.
- Continues its plan to conduct an Agricultural Needs Assessment and report funding needs to Governor and Virginia General Assembly.
- Linked its implementation projections for such BMPs as nutrient management, livestock exclusion, and poultry litter transport to programmatic milestones such as bundling all of its RMP plans into one cost share contract, conducting periodic reviews of nutrient management regulations, recommending and pursuing regulatory changes, and reissuing its Virginia Pollution Abatement Regulation and General Permit for Poultry Waste Management.
- Provided implementation targets for the BMPs that EPA recommended in its Phase III WIP evaluation. Most of these targets are linked to programmatic milestones.

Key Areas to Address in the 2020-2021 Milestone Period and beyond
- Provide information on the number of evaluations completed in 2020-2021 under the Small AFO Assessment Strategy.
- Provide information on the programmatic actions that will achieve the anticipated implementation rates for soil and water conservations plans, animal waste management storage, and cover crops. Programmatic milestones were not provided and/or did not support an increase in implementation levels for these BMPs.

Urban/Suburban Stormwater
2018-2019 Milestone Achievements
- Processed the Chesapeake Bay Total Maximum Daily Load (TMDL) action plans for Chesapeake City, Hampton City, Newport News City, Norfolk City, Portsmouth City and Virginia Beach City by July 2018.
- Issued its Industrial Stormwater General Permit with an effective date of July 1, 2019.
- Issued its Construction Stormwater General Permit with an effective date of July 1, 2019.
- Issued its Phase II Municipal Separate Storm Sewer System (MS4) permit with an effective date of November 1, 2018 and reissued coverage for 103 facilities by that date. The remaining facility was issued coverage on January 23, 2019.

- Although Virginia did not release a solicitation in 2018 for Stormwater Local Assistance Funding (SLAF) due to funding issues, it authorized $20,000,000 in 2019 for 24 projects in 15 localities.

2018-2019 Milestones Missed
- Did not meet its commitment to issue the Arlington County Phase I MS4 permit, which expired in 2018. The new goal is to issue the permit by July 30, 2020.
- Did not meet its goal to expand its Master Gardener program into 3 additional urbanizing counties. To help achieve this goal, a new grant was provided to 4-H at Virginia State University in 2019.

2020-2021 Milestone Strengths
- Commitment to reissue the Fairfax and Henrico County MS4 permits by March 2021 and the Chesapeake, Hampton, Newport News, Norfolk, Portsmouth and Virginia Beach MS4 permits by December 2021. All these permits will expire in the 2020-2021 milestone period.
- Commitment to conduct an annual SLAF Requests Estimates Report and include findings in the annual Chesapeake Bay and Virginia Waters Clean Up Plan Report for the Governor and Virginia General Assembly so that SLAF funding can be renewed each year to assist communities with funding Bay clean-up activities.
- Commitment to publish a Notice of Intended Regulatory Action to amend statewide Erosion & Sediment Control Regulations.
- Commitment to establishing a Stakeholder Advisory Group for re-evaluating post-construction water quality design criteria requirements and updating the Chesapeake Bay TMDL Special Condition Guidance for MS4s.

Key Areas to Address in the 2020-2021 Milestone Period and beyond
- Reissue the Arlington County MS4 permit, which expired in 2018, and the Prince William and Chesterfield County MS4 permits, which expired in 2019. Delays in reissuing these permits will further extend the date by which Virginia intends to meet its TMDL reduction goals. Originally, Virginia intended to meet these reduction goals over three permit cycles by 2025 and then extended that date to June 2031 in its Phase III WIP. Virginia has committed to meet the Chesapeake Bay TMDL reduction goals in aggregate by 2025 and noted that individual sectors may be ahead of or behind the 2025 deadline. EPA will continue to work with Virginia to assure the TMDL reductions goals are met for each state basin.
- Because over 70% of Virginia's stormwater sector is unregulated, milestones such as enhancing the marketing of funding opportunities for non-MS4 localities and expanding the Healthy Virginia Lawns program will be critical to Virginia's success. Virginia should:
  o Report on how the marketing survey results will be used and how metrics for the implementation of the strategy will be set to demonstrate the program's success.
  o Report progress toward achieving the goal of a 20% increase in clients, plans or acres under urban nutrient management in its Healthy Virginia Lawns Program beyond the baseline, which was established from past progress under the state certification requirements for lawn care companies and requirements for state agencies and golf courses.

Wastewater Treatment Plants and Onsite Systems
2018-2019 Milestone Achievements
- In 2019, the General Assembly approved legislation requiring Virginia Department of Health (VDH) to develop a plan to transition oversight and enforcement of the septic pump-out program from localities to VDH in the Northern Neck, Middle Peninsula and Eastern Shore regions of Virginia.
- Installed 846 alternative on-site sewage systems, resulting in over a 21,000-pound reduction in Total Nitrogen (TN) load compared with conventional on-site sewage systems, which surpassed Virginia's goal of a 13,500-pound reduction in TN.

2018-2019 Milestones Missed
- Did not meet its target of 36,000 septic tank pump-outs each year. In 2018, Chesapeake Bay Preservation Act (CBPA) localities and the VDH reported a total of 3,344 septic tank pump outs throughout the Chesapeake Bay watershed. In 2019, CBPA localities and VDH reported a combined total of 2,473 systems throughout the Bay watershed.
- Although Virginia conducted a pilot project to determine the feasibility of using online county information to update data on septic systems, it did not meet its goal of 600 sewer connections during the milestone period. Virginia included an initiative in its Phase III WIP and a 2020-2021 milestone to amend its Sewage Collection and Treatment Regulations to require reporting of connections.

2020-2021 Milestone Strengths
- Commitment to reissue its watershed general permit by December 31, 2021.
- Commitment to complete amendments to its Water Quality Management Planning Regulation to include chlorophyll-a based wasteload allocations for significant James River dischargers and to re-evaluate industrial significant wasteload allocations by December 31, 2021.
- Designated VDH as a state certifying authority to provide a sales tax exemption for community on-site systems serving 10 or more households that use TN reducing treatment systems.
- Committed to establish a regulation to limit TN for all on-site sewage systems dispersing greater than 1,000 gallons per day, including conventional on-site sewage systems.

Key Areas to Address in the 2020-2021 Milestone Period and beyond
- Include specific milestones on wastewater permittees' overperformance that will address gaps in more challenging sectors, including the resulting reductions. While Virginia did not develop specific 2020-2021 milestones, it has committed to meet the Chesapeake Bay TMDL reduction goals in aggregate by 2025.
- Ensure that programs and practices are in place to achieve the state-basin Phase III WIP planning targets can be achieved by 2025 if the proposed amendments to state regulations 9VAC25-720 and 9VAC25-820, containing, among other things, the concept of a floating Wasteload Allocation are implemented through trades across state-basins. (EPA understands that Virginia has already conducted basin-to-basin exchanges as part of its WIP Initiative 9 that are reflected in Section 8.6 Table 4 of its Phase III WIP and its final Phase III WIP planning targets.)

Growth, Offsets, and Trading
2018-2019 Milestone Achievements
Virginia's Final Regulation on the Certification of Nonpoint Source Credits was adopted by the State Water Control Board on December 13, 2019.

2018-2019 Milestones Missed
None.

2020-2021 Milestone Strengths
- Commitment to publish annual reports on watershed general permit nutrient loads by April 1, 2020 and April 1, 2021.
- Commitment to publish annual reports on watershed general permit trades by July 1, 2020 and July 1, 2021.
- Included milestones that identify the process to develop a protocol for reviewing its post-construction design criteria. Evaluation of these design criteria will determine if these criteria will continue to be effective in offsetting new loads. As part of this evaluation, Virginia could also consider encouraging additional pollutant reductions for new development, perhaps through its trading program, to address pollutant loads from existing development to meet its goals of decreasing loads in the stormwater sector by 2025.

Key Areas to Address in the 2020-2021 Milestone Period and beyond
- Final Regulation on the Certification of Nonpoint Source Credits, adopted by the State Water Control Board on December 13, 2019, will be promulgated as regulations once executive review is completed in 2020.
- Ensure timely reissuance of MS4 permits to provide an incentive to use Virginia's trading program.

Natural Sector
2018-2019 Milestone Achievements
- Over 53,421 trees have been planted on riparian and urban projects throughout Virginia's portion of the Chesapeake Bay watershed.
- Recorded 8,570 acres of conservation easements on 25 properties in the Chesapeake Bay watershed.
- Conducted 44 classes on harvest planning and BMP implementation for 1,047 loggers, foresters and forest practitioners.

2018-2019 Milestones Missed
- Twenty-two of the anticipated 60 projects for BMP implementation by forest harvesting contractors were approved for funding in late 2019, using Virginia's Water Quality Improvement Fund. Virginia anticipates funding an additional 22 projects in the next milestone period. Virginia acknowledges that additional Water Quality Improvement Fund support will be needed to achieve the goal of 60 projects.

2020-2021 Milestone Strengths
- Commitment to use a variety of funding sources to implement its forest buffer, tree planting, urban tree canopy and forest harvesting practices goals.
- Set oyster restoration goals, developed a restoration plan for five tributaries, and sought state capital funding for oyster restoration.
- Commitment to collaborate with partners to secure over $2 million in new funding to support wetlands acquisition and enhancement or restoration projects and will leverage the Department of Game and Inland Fisheries Virginia Migratory Waterfowl Stamp Fund to implement six projects to restore or enhance wetlands.
- Commitment to update its standards/guidelines for living shorelines to allow only these approaches unless the best science shows they are not suitable.

Key Areas to Address in the 2020-2021 Milestone Period and beyond
None.

Other (Federal Facilities, Multiple Sectors, James River Phased Implementation/Chlorophyll-a Study, Segment-shed Goals for the Tidal Jurisdictions, BMP Verification)
2018-2019 Milestone Achievements
- For the James River Phased Implementation and Chlorophyll-a Study, Virginia completed its rulemaking and revised chlorophyll-a criteria assessment method, sending it to EPA in early November 2019 for review and initiating its intent for regulatory action to establish facility-specific wasteload allocations to achieve the remaining load reduction to meet the new criteria.
- Developed and deployed a local communication strategy used in Phase III WIP development.
- Conducted 1,830 inspections of structural and land management BMPs, determining that 1,582 were verified, 10 needed maintenance and 238 could not be verified.

2018-2019 Milestones Missed
Did not develop a verification Standard Operating Procedure (SOP) template for use by non-state data verifiers to satisfy the Chesapeake Bay Verification Program Plan requirements. Although Virginia noted that this commitment was contingent on WIP Assistance funding, Virginia did not seek funding for this effort. This SOP would strengthen Virginia's existing verification program. Virginia did seek and was awarded funding to conduct this work in 2020.

2020-2021 Milestone Strengths
- Approved the final amendments for the James River chlorophyll-a criteria and these amendments were approved by EPA on January 6, 2020. These revised criteria are effective for regulatory purposes.
- Will update its *ConserveVirginia* model to include a water quality layer to identify the highest non-point nitrogen, phosphorus and sediment loading reductions should the property be subject to BMPs and minimum conservation criteria.
- Will consider options to apply to EPA under the Clean Water Act for No Discharge Zones for all or portions of the Chesapeake Bay mainstem and its tributaries.
- Will complete an initial coastal resilience master plan.

Key Areas to Address in the 2020-2021 Milestone Period and beyond
- For the James River Phased Implementation and Chlorophyll-a Study, Virginia began testing its compliance results, varying point source nutrient loads coupled with the Phase III WIP non-point source control levels to determine which scenarios will meet the new chlorophyll-a criteria. Implementation of the scenario that complies with the new criteria will be key to meeting the 2025 goals.
- Commitment to using its process for segment-shed targeting to prioritize implementation in its 2020-2021 milestones.

Potential Federal Actions and Assistance

As noted in its Phase III WIP evaluations, EPA remains prepared to assist each of the seven watershed jurisdictions in implementing the 2020-2021 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.

2009-2018 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 (SRBC), 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 (https://cbrim.er.usgs.gov/summary.html) over the period of 2009-2018 were made available in March 2020. While identifying drivers behind individual trends is often complex, the monitoring results are worthy of Virginia'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 Virginia watersheds can potentially inform planning are below.
- Trends are improving in the majority of Virginia's highest loading monitored watersheds for phosphorus. Of the two highest loading watersheds for nitrogen, one is improving and the other shows no trend. Implementing efforts in high loading areas can potentially yield the greatest nutrient reduction benefits.
- Trends in Virginia's monitored agricultural watersheds show that most stations are improving for phosphorus. More exploration on what is occuring in these monitored watersheds can potentially reveal successful programs, policies, or practices. For nitrogen, equal proportions of monitored agricultural watersheds are improving and degrading. While more information would be needed to determine what is driving individual trends, this suggests agricultural areas should be a continued focus.
- Trends at the North and South Fork Shenandoah Rivers are improving for nitrogen and phosphorus, and the majority of monitored Shenandoah River tributaries are improving for nitrogen. More exploration on what is occuring in these monitored watersheds can potentially reveal drivers of these improving trends. Trends at the Rappahannock, Pamunkey, Mattaponi, and Appomattox Rivers are degrading for both nitrogen and phosphorus. All stations monitored in the Mattaponi River show degrading trends for nitrogen or phosphorus. These areas should be explored for potential focus in future milestones.