A LAND OF RIVERS

FY 2025 REPORT

Anne Arundel County
Bureau of Watershed
Protection
& Restoration

AARivers.org

A LAND OF RIVERS

FY 2025 REPORT

Dear Anne Arundel County Resident,

In the twelfth year of our watershed restoration efforts and four years into the County's 5-year State-issued stormwater permit, we are well on our way to achieving our current clean water goals. Our implementation progress over the past few years has positioned us to comply fully with this new permit well in advance of our required benchmarks, and to go above and beyond in accelerating the recovery of our local waterways.

The Bureau of Watershed Protection & Restoration (BWPR), within the Department of Public Works, leads these efforts in its role to provide clean water under its Municipal Separate Storm Sewer System (MS4) permit and the Chesapeake Bay Total Maximum Daily Load (TMDL). To date, the County has completed over 314 restoration projects and over 1,600 stormwater infrastructure projects to preserve our waterways for future generations.

In Fiscal Year 2025, the unofficial theme for BWPR has been "partnerships." Some notable examples include: the Bureau's partnership with the Department of Recreation & Parks and the Alliance for the Chesapeake Bay to install native pollinator meadows and reforestation projects on Park property; partnership with the Bureau of Waste Management, Bureau of Highways, Anne Arundel Watershed Stewards Academy, and Maryland Re-Entry Resource Center to conduct multiple community litter cleanup events; and, partnership with the Chesapeake Bay Trust and multiple nonprofit grantee organizations to design and implement cost-effective local restoration projects through the County's Watershed Restoration Grant Program. Partnerships are invaluable for enhancing community engagement, maximizing impact potential, and minimizing costs to taxpayers. The Bureau of Watershed Protection & Restoration is committed to engaging in intra/intergovernmental, private, and nonprofit partnerships to achieve clean water goals.

The Bureau's 2025 Anne Arundel County *A Land of Rivers* report summarizes the watershed protection and restoration actions initiated by the County and our partners during fiscal year 2025 (July 1, 2024 – June 30, 2025). These actions, combined with those from previous years and work by countless community groups and individual residents, will continue to restore our waterways and protect our communities.

In Anne Arundel County, we are inexorably tied to these streams, wetlands, rivers, and the Chesapeake Bay. This *A Land of Rivers* report continues to document the conditions of our waterways, describe solutions and communicate the urgent need to protect our County's waters, and live up to our promise to make Anne Arundel County *The Best Place – For All.*

Sincerely,

Steuart Pittman
County Executive

Watershed Health

For many residents, a key draw of living in Anne Arundel County is being close to the Chesapeake Bay and its tributaries. Everyone lives in a watershed, which is the area of land that drains rainfall and snowmelt into a particular waterbody – kind of like a bathtub where water ultimately moves towards the drain. Past polls have repeatedly shown support for healthy watersheds, rivers, and streams. Over the course of the last 15 years, regulatory mandates from the State and Federal government have increased pressure to address evolving ecological problems in the face of dramatic population growth in the region. As Anne Arundel County continues to expand, it has adopted a watershed-based approach to restoration that acknowledges the direct connections between human behavior, land use, and water quality.

The County's stormwater restoration projects are designed to achieve multiple benefits beyond just improved wildlife habitat and water quality, actively contributing to improved public safety, economic vitality, and community stewardship. By integrating the activities of various County departments and maximizing resource utilization, these projects enhance public safety through the reduction of flooding risks and the stabilization of eroding areas, which can pose hazards to infrastructure and residents. Economically, the projects contribute to vitality by protecting property values and natural resources that attract tourism and support local businesses, while also creating jobs related to restoration and maintenance. Furthermore, the collaborative approach of the County, which involves partnerships with regional watershed groups, community associations, and individual citizens, fosters a strong sense of community stewardship, encouraging residents to actively participate in and take ownership of efforts to protect and restore their local waterways.

Regulatory Drivers

There are two (2) major regulatory drivers behind our work: the National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System (NPDES-MS4) permit and the Chesapeake Bay Total Maximum Daily Load (TMDL). The NPDES-MS4 permit is a State-issued permit that requires Anne Arundel County to develop and implement a robust stormwater management program that addresses the harmful effects of stormwater runoff pollution. Additionally, the Chesapeake Bay TMDL sets limits of nitrogen, phosphorus, and sediment that are allowed to reach the bay and still meet water quality standards.

When it rains on impervious surfaces like roads, parking lots, and buildings, the water picks up and transports trash and other pollutants into storm drains. This polluted stormwater travels through the storm drains and is discharged directly into local waterways. The MS4 permit authorizes the County to discharge this polluted stormwater into local waterways under certain conditions; some activities required by the permit include implementation of stormwater management practices, illicit discharge detection and elimination, and water quality monitoring. Under the previous MS4 permit term (2014-2019), the County treated stormwater from the equivalent of 4,996 acres of impervious surface area. The current MS4 permit requires the management of stormwater from an additional 2,998 acres of impervious surfaces.

Anne Arundel County is also required to reduce the amount of nitrogen, phosphorus, and sediment from reaching waterways for compliance with the Chesapeake Bay TMDL and several local TMDLs. A TMDL can be thought of as a "pollution diet"; it is the maximum amount of a pollutant allowed to enter waterways and still meet water quality standards. Nitrogen, phosphorus, and sediment are considered pollutants when they reach levels that disrupt the natural balance of aquatic ecosystems. For example, excessive nutrients can trigger massive algae blooms that, when they die and break down, consume oxygen in the water and can cause dead zones. Sediment can increase cloudiness of the water, blocking sunlight for plants, clogging gills of fish, and smothering bottom-dwelling habitats.

Progress toward meeting the MS4 permit required activities and the Chesapeake Bay TMDL is reported in the County's MS4 annual report to the Maryland Department of the Environment. Many of the elements provided in this A Land of Rivers report will also be included in the MS4 annual report later this year.

The current MS4 permit requires the management of stormwater from an additional 2,998 acres of impervious surfaces.

The Restoration Plan

The Water Reclamation Facility (WRF) upgrades that Anne Arundel County completed in 2018, and the stormwater restoration work that the County has done over the last decade, have helped the County remain compliant with its Chesapeake Bay clean-up goals. That said, the broader Chesapeake Bay Total Maximum Load (TMDL) reduction effort is unlikely to meet its goals by the original deadline of December 2025, which requires the work of six states and Washington, DC.

At this point, it looks like many of the broader goals - particularly those around nutrient reductions - are likely to be pushed out to 2035 or 2040. Even so, Anne Arundel County is committed to continuing to do its part to improve the health of the Chesapeake and our cherished tributaries to the Bay. We're planning for stormwater project implementation beyond our November 2026 MS4 permit deadline, and working with sister agencies, like the Anne Arundel County Health Department, to chip away at the nutrient pollution from septic systems in our most sensitive areas of the watershed. More information can be found at www.ourwAAter.org.

Water Reclamation Facilities

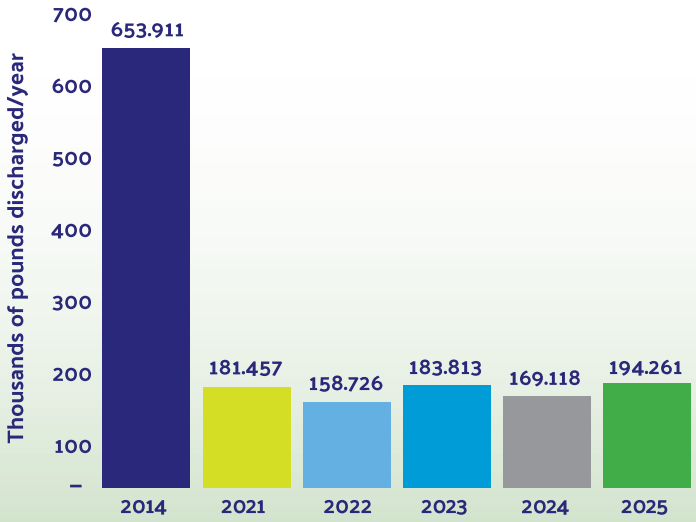
The health of Anne Arundel County's waterways is directly connected to the health of its watersheds. While the health of the Chesapeake Bay itself is integrally tied to inputs from the region's largest waterways, such as the Susquehanna and Potomac Rivers, the health of our rivers and creeks has been demonstrated to be largely driven by activities – both past and present – in our own, local watersheds. Sediment and nutrients delivered from the impervious surfaces around our businesses and homes, septic system discharges, and nutrient discharges from our water reclamation facility are the drivers of our local impairments. Our restoration work, paired with what is required of the other bay jurisdictions, can ensure that our creeks and rivers, as well as the Chesapeake Bay, are on the path to recovery.

Water Reclamation Facilities/ Enhanced Nutrient Removal - Anne Arundel County's $249 million investment to upgrade each of its six Water Reclamation Facilities (WRF) with Enhanced Nutrient Removal (ENR) technology was completed in July 2017. These ENR upgrades have enabled each plant to remove a far greater amount of nutrients, like nitrogen and phosphorus, from treated wastewater discharged to our rivers, creeks, streams, and the Chesapeake Bay after the treatment process.

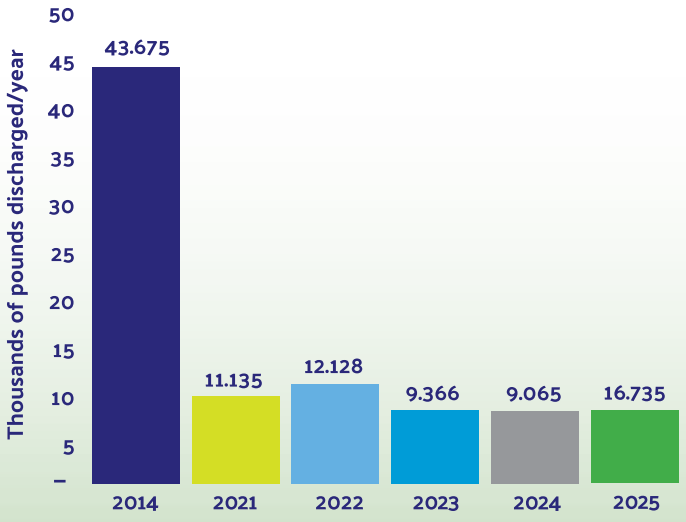
All County-owned facilities have been upgraded to achieve annual average nutrient goals of wastewater effluent quality of Total Nitrogen (TN) at 4 mg/l and Total Phosphorus (TP) at 0.3 mg/l. Over the past six years, the new facilities have been performing at a level well below the required limits for Total Nitrogen and Total Phosphorus discharge rates.

DPW will be examining ways to further improve performance and reliability at the facilities to ensure continued excellent performance into the future.

Anne Arundel County Permitted Nitrogen Discharge Limits



Anne Arundel County Permitted Phosphorus Discharge Limits



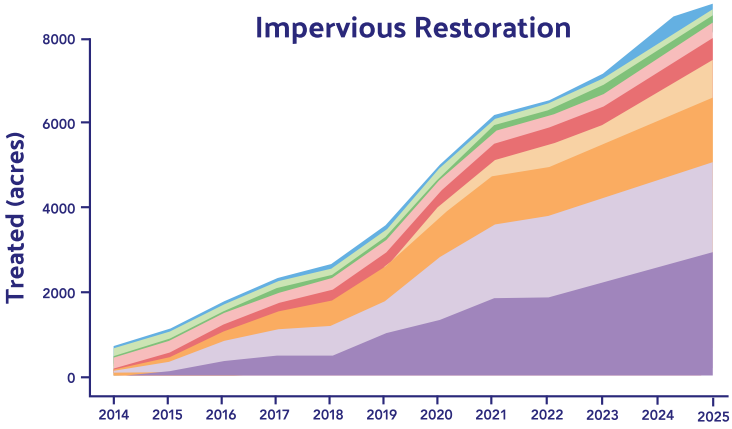
Stormwater Remediation – As of the end of FY20, the County met the primary restoration goal of its fourth-generation MS4 permit by restoring the equivalent of 4,996 acres of impervious surface. The County's fifth-generation MS4 permit was issued in November 2021 and set a new goal requiring the restoration of an additional 2,998 acres of impervious surface by November 4, 2026. The County has been making excellent progress and by the end of FY25 has restored the equivalent of 3,420 acres of impervious surface and has met its permit goal well before its permit deadline.

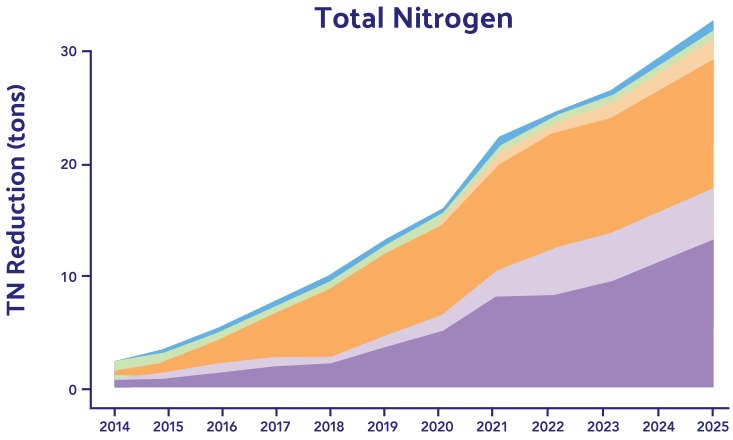
Septic System Conversions – There are approximately 41,500 septic systems in Anne Arundel County. Of these, over 14,000 are located within the "Critical Area," land within 1,000 feet of tidal waters. The typical septic system does not remove nitrogen, instead delivering about 23.2 pounds of nitrogen per year to the groundwater, which eventually makes its way to our streams and rivers.

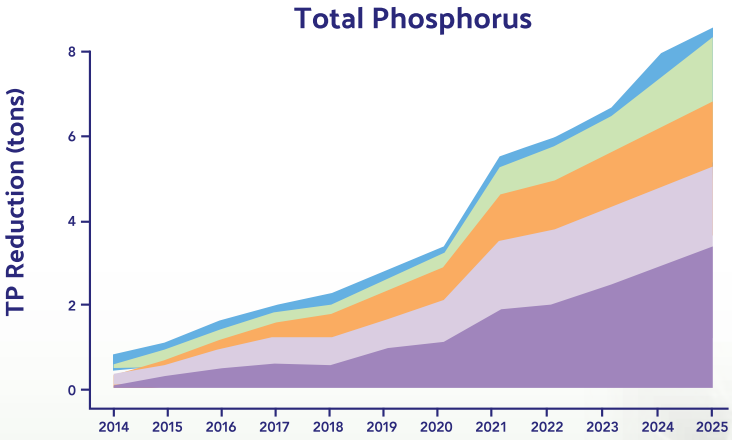
The Anne Arundel County Department of Health locally administers the Bay Restoration Fund (BRF). The BRF is a state-supported initiative that provides funding to replace conventional septic tanks with nitrogen-reducing technology. The units reduce the amount of harmful nutrients, such as nitrogen, that septic systems discharge. An upgraded, nitrogen-removing septic system cuts a system's nitrogen load in half. The Department of Public Works and the Department of Health continue to work closely together to direct Bay Restoration Funds for septic conversions and septic-to-sewer connections, as revenues are available. Subject to available funds, property owners in Anne Arundel County with septic systems may be eligible for grant-supported upgrades to their septic systems. In FY25, BRF funds were leveraged to cost-share 157 pretreatment units and 8 connections to public sewer. For more information on the BRF grant program, visit www.aahealth.org.

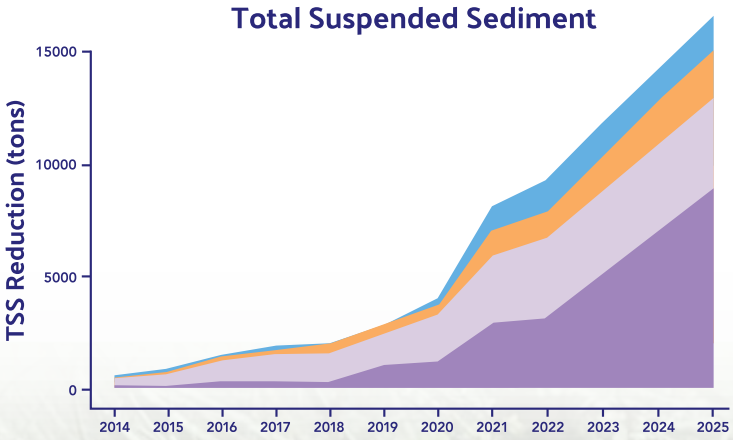
Progress toward MS4 Goals

While the currency of the County's MS4 permit is "impervious acres treated," that number represents the nutrient and sediment pollution reduced by those water quality practices. Both through its stormwater permit, and as a condition of the Chesapeake Bay Total Maximum Daily Load (TMDL), the County is required to reduce those pollutants both to local waterways, such as the Patapsco and Severn Rivers, and to the Chesapeake Bay. The MDE has assigned each jurisdiction within Maryland a pollution allocation to address. The following figures demonstrate the County's progress towards reducing nitrogen, phosphorus, and sediment in local waterways through its clean water efforts associated with the stormwater sector. Each figure also indicates the share of pollutants reduced by various sorts of practices.









- Land Cover Conversions
- Inlet Cleaning
- Street Sweeping
- Septic to Sewer Connections
- Septic Pumping
- Septic Denitrification Units
- Outfall Stabilizations
- Upland BMPs
- Shoreline Restorations
- Stream Restorations

The Funding History

Through fiscal year 2025, the majority of the County's stormwater-related work was funded through the Watershed Protection and Restoration Fee (WPRF), an impervious surface-based fee on properties throughout the County implemented in 2015 to provide dedicated funding for the County's NPDES-MS4 permit required activities. The types of activities funded by the WPRF include designing and installing clean water restoration projects, maintaining and replacing existing drainage infrastructure, inspecting public and private stormwater facilities, and monitoring restoration projects to evaluate their success. As detailed in this report, the WPRF supports staff in the Department of Inspections and Permits, the Department of Public Works Bureau of Highways, the Anne Arundel County Soil Conservation District, and the Department of Public Works Bureau of Watershed Protection and Restoration that are working to protect and restore the County's watersheds.

As required by Anne Arundel County's NPDES-MS4 permit, the FY24 Financial Assurance Plan was passed on November 4, 2024 at the Anne Arundel County Council Meeting. The FY24 Financial Assurance Plan was submitted to the State on December 31, 2024 and MDE ratified their recognition of the Financial Assurance Plan data on May 1, 2025.

How is the fee calculated? The Department of Public Works utilizes Geographic Information Systems (GIS) technology along with parcel data collected from the Consolidated Property File and County Zoning Maps to estimate the imperviousness of residential properties in the various zoning districts. This information was used to determine a baseline Equivalent Residential Unit (ERU) of impervious surface of 2,940 sq. ft., which is the approximate average of impervious area for properties in County residential zones R1, R2, and R5. An ERU is the base unit for calculating the annual charge for residential and non-residential properties. Currently, the charge is $98.40 per ERU, per year. The fee structure varies between land use type and intensity as seen in the table below:

Annual Watershed Protection And Restoration Fee Rates

Zoning	Rate Calculation	Current Fee
R10, R15, R22	$98.40 x 0.4	$39.36
R1, R2, R5	$98.40	$98.40
RA, RLD	$98.40 x 2	$196.80
Non-Residential	Actual sf of impervious surface divided by 2,940 x $98.40	Varies

Bureau of Watershed Protection & Restoration – Carrying out the Plan

The Bureau of Watershed Protection and Restoration develops and delivers technical environmental assessment, restoration planning and implementation information, and regulatory support to the Departments of Public Works, Inspections and Permits, and the Office of Planning and Zoning. This support enables these agencies to carry out their responsibilities for successfully managing delegated programs outlined in the County's NPDES-MS4 Permit, the State's Critical Area program, and the State Forest Conservation Act, as well as their responsibilities for land use decisions set forth in the County Code. Implementation of the BWPR stormwater restoration strategy is focused on three key areas:

Stormwater Pond Retrofits – Existing facilities, such as dry ponds, detention ponds, or infiltration basins that have failed or are outdated are rebuilt to optimize their pollution reduction capacity.

Stormwater Outfall Repairs – Eroded or failing stormwater outfalls – locations where drainage systems discharge onto erosive soils – are reconstructed into systems that can both safely convey high flows as well as provide water quality benefits and habitat.

Stream & Wetland Restoration – Stream erosion is the largest contributor of sediment and phosphorus to our local rivers, and the County's strategy to stabilize and re-hydrate valley bottoms through restoration will provide benefits to water quality, floodplain connection, and native habitat on a broad scale.

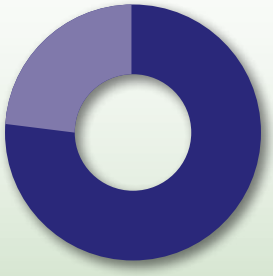
In addition to the work above, funds from the WPRF are used to address a multi-million-dollar portfolio of stormwater infrastructure repairs and replacement, ensuring that the County's culverts and drainage infrastructure are functioning properly and are not a threat to public health and safety

FY25 BWPR Restoration Project Pipeline:

As of FY25, the County has treated over 100% (3,420 out of 2,998) of the required equivalent impervious acres under the current NPDES-MS4 permit - but the work is never done! The charts below depict projects completed under the current NPDES-MS4 permit, as well as those currently in the pipeline.

Number of Projects Completed and Anticipated Under Current Permit

Stream & Shoreline Restoration
56 out of 110 completed

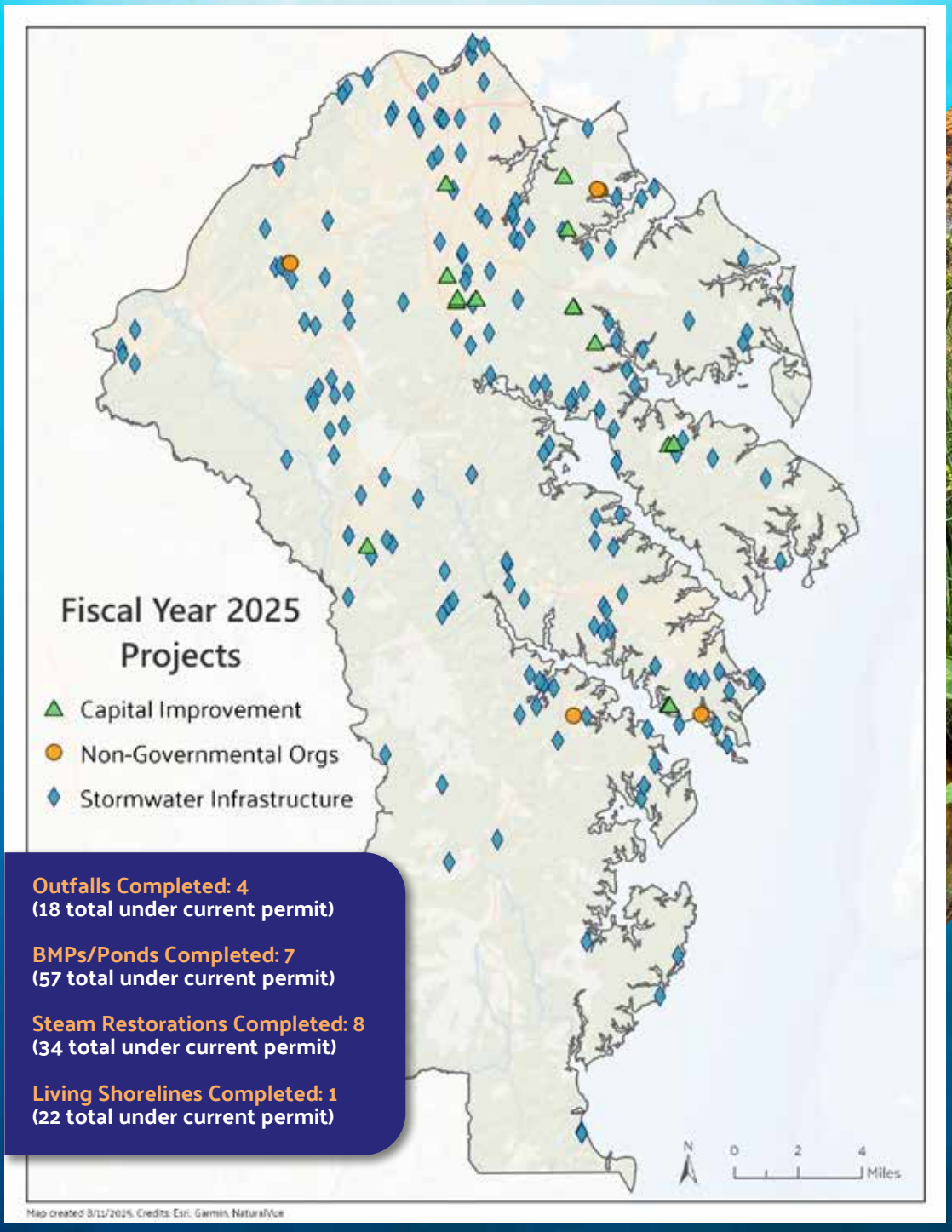


Stormwater Management
57 out of 73 Completed

Outfall Stabilizations
18 out of 26 Completed

BWPR Restoration Projects Completed in FY25

The following projects were constructed to meet multiple objectives including water quality enhancement, infrastructure protection, improved flood attenuation, improved fish habitat, and improved riparian functions.



Outfalls Completed: 4
(18 total under current permit)

BMPs/Ponds Completed: 7
(57 total under current permit)

Steam Restorations Completed: 8
(34 total under current permit)

Living Shorelines Completed: 1
(22 total under current permit)

More detail on the locations of these projects can be found at aarivers.org using the BWPR Watershed Restoration Projects Viewer.

Highlighted NGO Project - Chestnut Hill Cove Stream Restoration

The Bureau of Watershed Protection and Restoration (BWPR) is excited to announce the successful completion of the Chestnut Hill Cove Phase III stream restoration project. This milestone is the culmination of a long-term effort to combat the damaging effects of stormwater runoff on the Chestnut Hill Cove community's stream and shoreline.

The journey began in 1997 when Baltimore Gas and Electric (BGE), searching for a mitigation project for the Key Crossing Electric Lines, selected Chestnut Hill Cove. This led to Phase I, completed in 2023, which involved restoring 1,200 feet of the degraded waterway, removing invasive phragmites and planting over 20,000 marsh grasses, plants, and trees and marked the beginning of the community's efforts to create a healthier ecosystem.

A critical challenge emerged in late 2022 when severe erosion under the BGE electric lines exposed sewer mains. This emergency led to Phase II, which was completed in just 60 days. These emergency repairs addressed the immediate danger but also revealed a 500-foot gap between the Phase I and Phase II restoration areas. This gap threatened to undo all the progress that had been made, concentrating stormwater discharge and creating an eroded channel through the downstream wetland.

Closing this critical gap became the mission of Phase III. Construction began in 2025 and was completed in May of the same year. This final phase utilized the Regenerative Stream Channel (RSC) technique, a nature-based method that transforms degraded waterways into resilient, connected ecosystems. The RSC approach involved filling the deeply eroded streambed with native materials and installing a series of pools and riffles. This not only decreases stream energy and safely conveys larger storms but also encourages the exchange of surface water and groundwater to remove pollutants.

This project has already produced remarkable results. It has eliminated a significant source of sediment pollution to Nabbs Creek, significantly reduced annual pollution loads of sediment, nitrogen, and phosphorus, and created over 35,000 square feet of native wetlands. This restoration is a testament to the power of community leadership and collaborative partnerships. It provides a model for other communities facing similar challenges and is a key part of Anne Arundel County's efforts to build a healthier Chesapeake Bay.

The project was a collaboration between Anne Arundel County's Bureau of Watershed Protection and Restoration, Chesapeake Rivers Alliance, Inc., Underwood & Associates, the Maryland Department of Natural Resources, the Resilience Authority of Annapolis and Anne Arundel County, BGE, Century Engineering, and Borne Environmental.

To learn more about this project, please visit www.aarivers.org.

Stormwater Infrastructure Program (SIP)

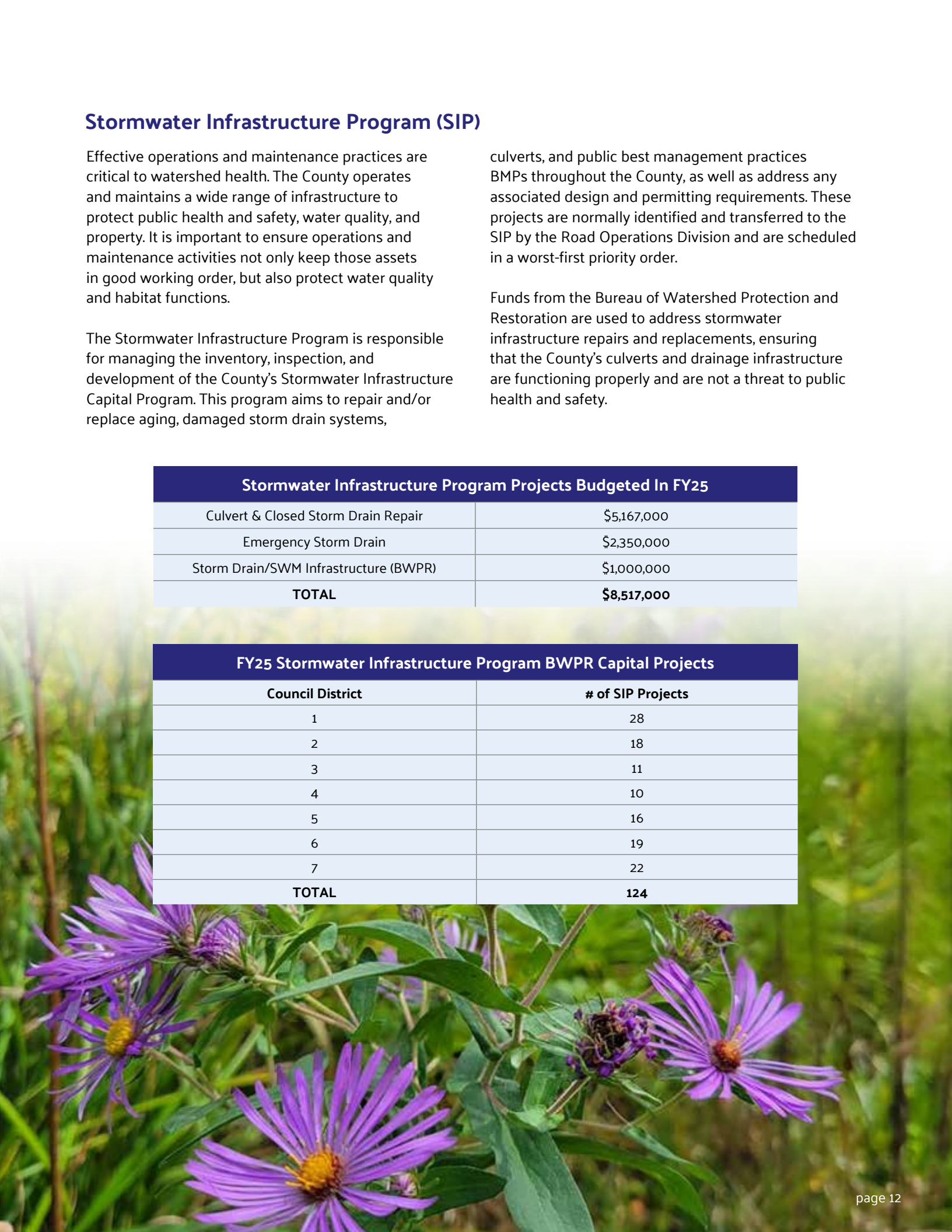
Effective operations and maintenance practices are critical to watershed health. The County operates and maintains a wide range of infrastructure to protect public health and safety, water quality, and property. It is important to ensure operations and maintenance activities not only keep those assets in good working order, but also protect water quality and habitat functions.

The Stormwater Infrastructure Program is responsible for managing the inventory, inspection, and development of the County's Stormwater Infrastructure Capital Program. This program aims to repair and/or replace aging, damaged storm drain systems, culverts, and public best management practices BMPs throughout the County, as well as address any associated design and permitting requirements. These projects are normally identified and transferred to the SIP by the Road Operations Division and are scheduled in a worst-first priority order.

Funds from the Bureau of Watershed Protection and Restoration are used to address stormwater infrastructure repairs and replacements, ensuring that the County's culverts and drainage infrastructure are functioning properly and are not a threat to public health and safety.

Stormwater Infrastructure Program Projects Budgeted In FY25	
Culvert & Closed Storm Drain Repair	$5,167,000
Emergency Storm Drain	$2,350,000
Storm Drain/SWM Infrastructure (BWPR)	$1,000,000
TOTAL	**$8,517,000**

FY25 Stormwater Infrastructure Program BWPR Capital Projects	
Council District	**# of SIP Projects**
1	28
2	18
3	11
4	10
5	16
6	19
7	22
TOTAL	**124**



SIP & Road Operations Division Milestones

The Stormwater Infrastructure Program is also responsible for managing the inventory, inspection, and maintenance of over 1,250 stormwater management facilities that are collectively referred to as Best Management Practices (BMPs).

In addition, SIP works alongside the Road Operations Division to sweep County roads to remove loose materials, litter, and other debris that is unsightly, hazardous, or could cause possible drainage obstructions.

2025 Milestones	
Action	**Result**
BMPs Inspected	429
Curb Miles Swept	6,674
Tons of Litter Collected (Street Sweeping)	257
Storm Drain Structures Cleared	4,907
Linear Feet of Drain Pipe Cleared	39,585
Linear Feet of Ditch Cleaned	35,619

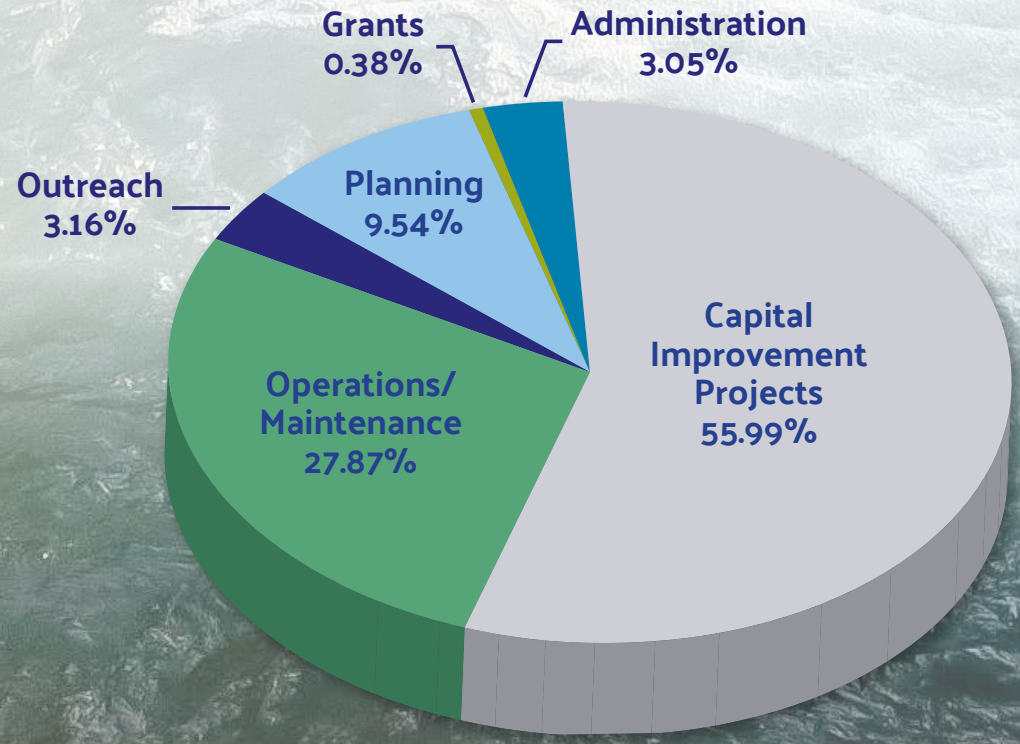
Watershed Protection & Restoration Fund Revenue and Expense Report

Maryland Environment Code Ann §4-202.1 requires that a county make a report publicly available annually. The following report is being issued to meet these revised requirements, and includes revenues and expenses for FY25, the tenth year of implementation for the Watershed Protection and Restoration Fund in Anne Arundel County, Maryland. This report includes expenses incurred beginning July 1, 2024 through June 30, 2025.

Revenues – The Stormwater Fee was first billed on property taxes on July 1, 2013. There were 224,785 properties in Anne Arundel County that were subject to the fee. For FY25, Anne Arundel County has received $27,016,094 in revenues as of June 30, 2025, which comes out to about $120 per property on average. In addition to the Stormwater Fees, the County has received $1,913,631 to fund watershed protection and restoration projects from other sources.

Expenditures – Operating expenditures for FY25 totaled $28,460,720. It should be noted that beginning in FY20, the County has taken a more aggressive approach to debt service. Anne Arundel County currently has a triple-A bond rating, so we sell bonds at the most competitive rates available to finance our Capital Improvements, including the infrastructure being created through the Bureau of Watershed Protection and Restoration and the Watershed Protection and Restoration Fund, in turn, services these bonds throughout their life cycle. In FY25, the County has paid $15,067,930 out of the total operating expenditures directly towards debt service. Of the remaining operating expenditures, $7,932,105 was spent on operations and maintenance activities for the county's stormwater infrastructure. An additional $2,715,967 was spent for planning for future improvements to these systems.

FY25 Operating Expenditures



Monitoring Stream Health Across the County

An important component of the County's watershed restoration plan is monitoring stream health. Monitoring allows the County to evaluate if stormwater management and habitat restoration projects are achieving their intended results and provides the opportunity to learn and improve restoration practices over time. The County has been monitoring non-tidal waterways to assess aquatic insect communities, water quality, and habitat health since 2004, and added fish monitoring in 2017.

This Countywide Biological Stream Survey has helped establish a general baseline of knowledge upon which continued assessments can be compared to evaluate how stream health has changed over time.

Aquatic Insect and Fish Surveys – The Ecological Assessment and Evaluation team within BWPR is responsible for monitoring biological health of the County's streams. The County's NPDES-MS4 permit requires assessment of macroinvertebrate (aquatic insect) communities, but BWPR also voluntarily conducts fish surveys. These biological assessments are a highly effective, scientifically validated approach to understanding the overall health and quality of streams.

While taking a water quality sample can provide useful information about the stream at that point in time, surveying streams for the types of aquatic insects and fish they support can provide a more holistic, longer-term picture of that stream's health. Since these organisms live their lives completely in the water, they're exposed to that stream's full suite of environmental conditions, not just those water chemistry parameters that are easy to monitor.

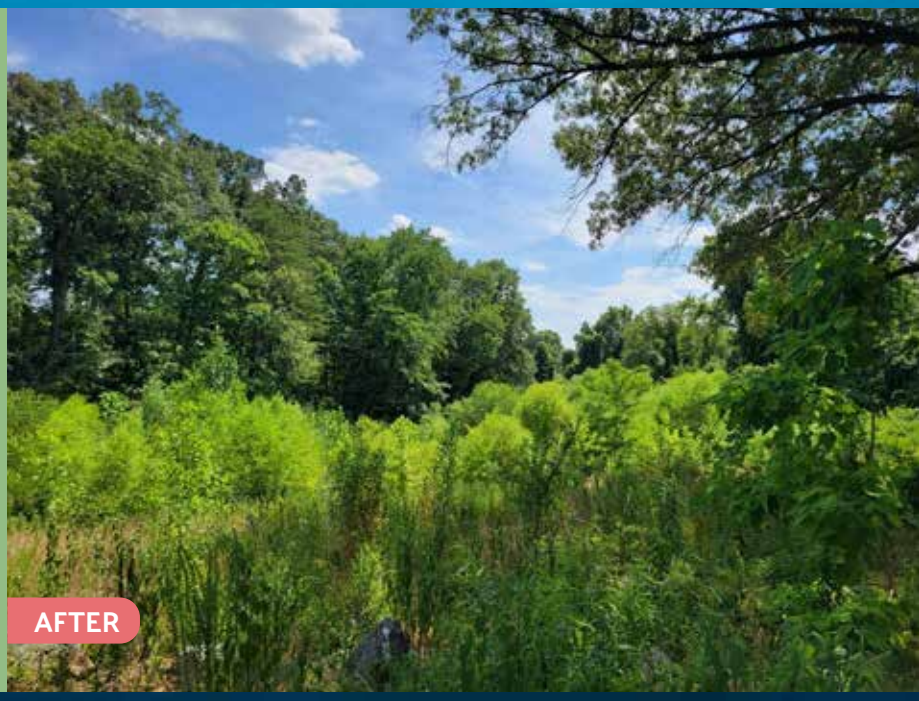
Some insect and fish species are more tolerant of pollutants than others, so knowing which species are present and in what numbers is extremely important. If a stream has mostly insects and fish that are tolerant to pollutants, that probably means the stream is in poor health. However, when streams start to support higher species diversity and intolerant species, that's a good indication of a healthy stream!

From 2023 through 2027, BWPR will be conducting the fourth round of the *Countywide Biological Monitoring program*, focusing on randomly selected watersheds each year. In 2024 forty aquatic insect and fish surveys were completed across 4 watersheds including Rhode River, Ferry Branch (Patuxent River), Sawmill Creek, and Lower Patapsco. Using Maryland Biological Stream Survey protocols, BWPR's researchers found 24 species of fish in those 4 watersheds! The most frequently found species included American Eel, Blacknose Dace, and Green Sunfish.

Monitoring for Restoration Success

To determine if stream restoration projects are meeting their objectives and to ensure that funds are spent efficiently, monitoring is completed on select projects to measure water quality, biological response, and stream valley stability both before and after restoration activities. For example, biological monitoring (aquatic insects and fish) was recently completed to characterize post-restoration conditions for the Furnace Creek stream restoration project. Prior to restoration, Furnace Creek was a long, winding concrete channel that had collapsed at the end, which impeded fish passage and provided very little habitat. The restoration project included removing and burying the concrete channel, creating 6 acres of new floodplain wetlands, and installing a stable stream channel connection to the downstream waterbody. Pre-restoration monitoring (2016) showed that the concrete channel only supported 3 fish species (with only 9 total individuals), but post-restoration monitoring (2024) showed an increase to 8 fish species with almost a thousand individuals! This incredible floodplain wetland complex is now providing better water quality and wildlife habitat.

BWPR's Ecological Assessment and Evaluation team is always looking for ways to use new and innovative scientific methods to meet restoration and monitoring priorities. In 2024, staff began a pilot study to test the collection and analysis of eDNA from select sites across the County. This promising new method includes collecting genetic material directly from streams, sending those samples to a laboratory, and comparing the DNA results against a comprehensive list of species that are likely to be found in the County. Some preliminary results are showing eDNA to be particularly successful in identifying fish and amphibian species!



Highlighted Partnerships

BWPR values its partnerships with academic institutions and other governmental agencies. Bureau staff work closely with a variety of Federal, State, and local governmental agencies and various non-governmental organizations to further its mission. By working closely with partners, the Bureau can participate in cutting edge research and monitoring work, encourage stream and wetland restoration, and support other cost-effective research opportunities.

PCB Monitoring in the Sawmill Creek Watershed – Polychlorinated biphenyls, or PCBs, are human-made compounds that were historically used in manufacturing and industrial processes due to their fire-retardant and insulating properties. While the federal government banned the sale and production of PCBs in 1979 due to their toxic and carcinogenic effects, these compounds degrade very slowly and persist in stream systems to this day. Anne Arundel County has several waterbodies that are listed as "impaired" by PCBs in water, sediment, and fish tissue, including the Baltimore Harbor and Curtis Creek/Bay portions of the Patapsco River; a PCB Total Maximum Daily Load was approved in 2012.

In compliance with regulatory guidelines, BWPR developed a PCB TMDL Restoration Plan in 2016 that included actions for identifying sources of PCBs with the ultimate goal of reducing PCBs in the Baltimore Harbor watersheds. As a component of the restoration plan, BWPR initiated a partnership with the University of Maryland Baltimore County (UMBC) and MDE in 2020 to begin a multi-phase PCB source identification project. The project initially focused on the Sawmill Creek portion of the Curtis Creek watershed, with the expectation that it would eventually expand to the other waterbodies.

Phase I of the project identified two tributaries of Sawmill Creek - Ferndale Branch and North Glen Branch - with elevated water column PCB concentrations. Phase II focused on these two streams to verify results from Phase I and also included additional short-term sampling at outfalls during storm events. Interestingly enough, a decrease of PCB concentrations from Phase I was observed in both streams, with water column concentrations in Ferndale Branch even meeting the TMDL endpoint.

While these results were encouraging, BWPR and UMBC began additional monitoring in fall 2024 to verify

the PCB concentration decreases in these two streams and to further evaluate the contribution of storm flows on PCB concentrations in North Glen Branch. Results of this Phase III effort in Sawmill Creek will be available later in 2025.

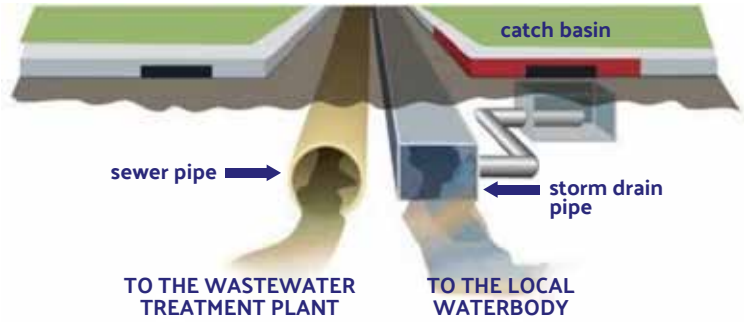
In order to continue making progress on identifying and reducing PCB contamination in the TMDL watersheds, BWPR and UMBC also began deploying sampling equipment as a Phase I exercise in Marley Creek and Cabin Branch in fall 2024.

Creating native meadows with R&P - In 2025, BWPR partnered with the Department of Recreation and Parks (R&P), to implement Conservation Landscaping BMPs at Lake Waterford Park and Fort Smallwood Park. Conservation Landscaping is a BMP that entails the conversion of managed (mowed and/or fertilized) turf to perennial meadow habitat using regionally native plant species. Once established, the meadow will be minimally maintained in order to arrest succession and remove invasive species as needed. A total of 2.55 acres of meadow habitat was created between the two sites. Meadow habitats contribute to water quality goals by reducing stormwater runoff and preventing erosion, but the benefits of meadows don't end there. Meadows provide food and shelter for a variety of animals, including beneficial pollinator species. Meadows also act as carbon sinks, capturing and storing carbon from the atmosphere in plant biomass and soils. BWPR will continue to look for opportunities to implement Conservation Landscaping in the future.

Illicit Discharge Detection & Elimination (IDDE) Program

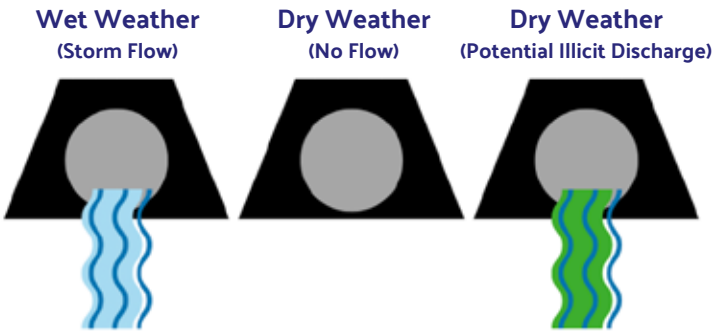
BWPR is responsible for implementing the County's Illicit Discharge Detection and Elimination (IDDE) Program, which focuses on identifying and eliminating illicit discharges to the County's storm drain system. The disposal of anything other than stormwater into and through the storm sewer system is illegal, so any non-stormwater flow from an outfall is called an "illicit discharge" (unless otherwise allowed by an issued permit). Some examples include when wastewater pipes are accidentally or deliberately connected to the storm sewer, the improper disposal of commercial or industrial hazardous waste into a storm drain, septic tank seepage into the storm sewer, and many other scenarios. BWPR collaborates with other County agencies that have the legal authority to inspect and enforce any identified illicit discharges.

The County screens a minimum of 150 outfalls yearly for dry-weather flow conditions; if dry-weather flow is observed, the discharge is tested for pollutants, and the source of the pollution is investigated. The County's IDDE program has been successful in the identification and removal of a wide variety of sources of pollutants, including illicit wastewater connections, upland pollutant sources, illegal dumping, and spills.



In addition to illegal discharge identification, the outfall screening process also entails a structural condition assessment of the stormwater infrastructure. Reports of infrastructure concerns such as pipe or storm drain damage, excessive debris jams, scour holes, and channel erosion, are investigated and evaluated for repair by BWPR's Stormwater Infrastructure Program (SIP)

Case Study: Damaged Infrastructure in Davidsonville
In November 2024, IDDE program outfall screening by the County's IDDE consultants revealed a large hole forming above an outfall pipe and severe downstream erosion occurring downstream of the outfall. Upon follow-up investigation by County staff, it was discovered that the hillside below the outfall was being eroded. A video inspection of the stormwater pipe revealed a pipe in poor condition and a badly separated joint with a large void on the outside of the pipe. The decision was made to re-line the entire 203 ft of pipe from the inlet to the outfall. The repair, which will occur in 2026, will prevent a significant amount of sediment from being discharged into the receiving stream - a direct tributary to the Patuxent River.



Watershed Restoration Grants

Successful conservation and preservation of Anne Arundel County's watersheds takes teamwork. In 2014 the Anne Arundel County Department of Public Works, in partnership with the Chesapeake Bay Trust, created the Anne Arundel County Watershed Restoration Grant Program, a community grant program to support watershed restoration activities throughout the County to improve water quality in local streams and rivers. The grant program was created to engage local nonprofit organizations, landowners, and communities in efforts to restore the County's waterways; to provide resources to these groups to enable them to implement greening and water quality projects; and to assist Anne Arundel County's efforts to meet the requirements of its state and federal stormwater permit and local waterway cleanup plans. This program encourages on-the-ground restoration activities that reduce stormwater flow and pollutants and engage Anne Arundel County residents in these activities.

For more information about the Anne Arundel County Watershed Restoration Grant Program, please visit www.cbtrust.org.

Below is a list of organizations that were awarded funding from Anne Arundel County for water quality restoration projects in 2025:

Organization	Project Description	Watershed	Funding Amount	Match Amount	Impervious Acres Treated
Arundel Rivers Federation	Edgewater Beach (Shaded Section) Living Shorelines & Marsh Protection	South River	$190,000	$314,853	11
Severn River Association	Fairwinds Stormwater Management & Living Shorelines	Severn River	$50,000	$68,500	34.3
Fishing Creek Farm HOA	Southbreeze Beach Shoreline Restoration	South River	$279,920	$1,194,260	21.6
Arundel Rivers Federation	Long Point Shoreline Resilience & Oyster Habitat	South River	$406,559	$251,000	39.6
Arundel Rivers Federation	Sunny Shores Stream Restoration Design	South River	$60,753	$123,000	9.7
Arundel Rivers Federation	Annapolis Waterworks Park Final Design	South River	$116,871	$94,869	28.6
	TOTAL		**$1,104,103**	**$2,046,482**	**144.8**

Anne Arundel County Watershed Stewards Academy (WSA)

The Anne Arundel County Watershed Stewards Academy was created in 2009 out of a partnership between Arlington Echo Outdoor Education Center and the Anne Arundel County Department of Public Works to build capacity within communities to reduce pollutants entering our waterways via stormwater runoff. The Bureau of Watershed Protection and Restoration continues to provide critical support in connecting Stewards and communities with watershed studies, planning, and restoration efforts.

The WSA trains citizens in Anne Arundel County to help neighbors reduce pollution in our local streams, creeks, and rivers. WSA's hands-on training course gives participants the tools to bring change to their communities, by turning knowledge and good intentions into action. Stewards work with communities to install projects such as rain gardens or conservation landscapes that capture polluted runoff. Collectively, these community and individual actions add up to better health for our local waterways and the Chesapeake Bay.

2025 WSA Successes:

- Certified 25 new Master Watershed Stewards in Class 16.
- Reached 47,714 Anne Arundel County residents, providing technical assistance or environmental education.
- Planted 33,904 native perennials, shrubs, and trees. The WSA Staff hosted an additional 31 outreach/ continuing education events and short courses, including their annual "Spring into Action" Conference, engaging over 1,000 people.
- Nearly 730,000 hours of training completed by residents as a result of WSA programs.

Replant Anne Arundel - A County-wide Tree Planting Initiative: WSA continued the Replant model to implement new tree planting projects across the county in fall 2024 and spring 2025. A summary of Replant Anne Arundel can be found here: aawsa.org/ replant-2 . This reporting period, 4,295 new trees were planted (included in the total above) during this project period as follows:

- *Backyard Buffers Program:* 1,954 bare root seedlings planted.
- *Groves of Gratitude Program:* distributed a total of 390 trees to over 64 County residents in fall 2024.
- *Tree Troopers* Program: 12 new volunteer Tree Troopers trained, 11 new paid Tree Ambassadors trained, and 1,141 containerized trees planted.
- Other Steward Projects: 1,511 trees planted.

RePollinate Anne Arundel: Inspired by the Replant Anne Arundel Program, Watershed Stewards, in collaboration with Anne Arundel County Master Gardeners and the USGS Bee Lab, the RePollinate Anne Arundel program has grown over 16,500 native plants and distributed the plants to over 90 different communities in the county since 2022. Due to program popularity, and working with the local Wild Ones Chapter, the program was opened to communities in Anne Arundel County and beyond. In fall of 2024, over 6,000 plants (included in the total above) were distributed to over 20 project sites, including residential communities, county parks, and Steward projects in Anne Arundel County alone. More information about the RePollinate Program may be found at aawsa.org/repollinate.

Save Our Trees: The Save our Trees (SOT) team has continued to have a significant impact on communities and trees throughout Anne Arundel County. The mission of SOT is to have immediate and long-term impacts on the removal of English ivy and other invasive vines that are killing off mature trees in Anne Arundel County and the City of Annapolis. Together, with over 740 community volunteers, SOT saved 5,084 trees (as of June 2025) by cutting and removing invasive vines from their trunks, resulting in nearly 17 acres of forest canopy released being smothered in vines. The SOT team has focused community outreach efforts through 121 presentations at community associations, educational workshops and articles in What's UP and Naptown Scoop. They partnered with high schools (Annapolis, Broadneck and Northeast) to establish ongoing education and action programs with students and have built significant partnerships with parks (Quiet Waters, Broadneck Park, Friends of Anne Arundel County Trails), non-profits (Severn River Association, Scenic Rivers Land Trust, Spa Creek Conservancy), government agencies (City of Annapolis, AA County Forestry Division, Maryland DNR, State Highway Administration), and corporations (HASI, BGE, M & T Bank). More information on Save Our Trees can be found at https://aawsa.org/save-our-trees.

For more information about WSA, please visit www.aawsa.org.

Public-Private Partnership - Full Delivery of Water Quality Improvements Contract

Indian Landing Boat Club Living Shoreline and Island Restoration Project - Launched in 2016, the County's "Full Delivery of Water Quality Improvements" contract was designed to increase the county's environmental restoration capacity. The contract is structured to help Anne Arundel County meet its federal pollution reduction permits and goals by partnering with the private sector to implement cost-effective restoration projects that reduce runoff. Specifically, the work supports the County's Municipal Separate Storm Sewer System (MS4) permit and Chesapeake Bay Total Maximum Daily Load (TMDL) requirements.

During FY25, the Bureau of Watershed Protection and Restoration awarded $1.999 million through its innovative Full Delivery of Water Quality improvements contract for the restoration of an eroding shoreline on the Severn River, as well as the protection and enhancement of two tidal islands in the Severn that provide critical habitat and water quality benefits. The winning design-build team, BayLand Consultants & Designers, Inc. will undertake the landowner coordination, design, permitting, and construction of all three projects.

The Indian Landing Boat Club Living Shoreline and Island Restoration project, located in Millersville, will use a variety of shoreline protection and marsh creation approaches to stabilize eroding areas, protect existing marsh, and create new marsh habitat in the upper Severn River.

The two islands provide habitat for water birds such as great blue herons, bald eagles, osprey, cormorants, and a variety of ducks and geese. Due to erosion, Bird Island has lost all vegetation and remains only as sandy resting or mating grounds for shorebirds. Should it be restored, the island would also act as a vital nesting habitat to the same birds that visit it regularly. The surrounding waters also support exceptional numbers of other waterfowl throughout the year. Forest interior dwelling species (FIDS) utilize the islands as feeding grounds from adjacent designated FIDS habitat areas including the Severn Run Natural Environmental Area. Restoring marsh habitat on the islands would greatly improve their available food sources such as flying insects.

The primary threat to these islands is the loss of habitat due to erosion and sea level rise. The islands have lost considerable area since 1994 and without this project, they will be permanently lost. Given the unique and important role that these islands play, efforts should be made to protect them and restore the lost habitat. Erosion along the shoreline has increased by an alarming rate in recent years and if not addressed will result in the loss of both islands and the unique, vital habitat they provide.

For the living shoreline work, sand will be placed behind the sills and coir logs for approximately 20 feet until it reaches the existing grade. The sand will be planted with more than 21,860 SF of new intertidal marsh to create diverse marsh habitat and provide a natural transition to adjacent existing upland. Due to flow of fresh water from upstream areas the marsh will be planted with a mixture of brackish and salt water tolerant species. Gaps between the low-profile sills are proposed to create an irregular shoreline and develop pocket beaches. These gaps will function as wildlife corridors as well as allow some wave energy to pass through. The resulting beach habitat, shallow water, and marshland provides a diverse habitat for wildlife including small mammals, birds, turtles, crabs, fish, and waterfowl.

The full award will only be paid upon completion of the project and verification of the project's benefits, which is anticipated to be completed in the fall or winter of 2026. The County's capital program intends to make an additional solicitation in the fall of 2025.

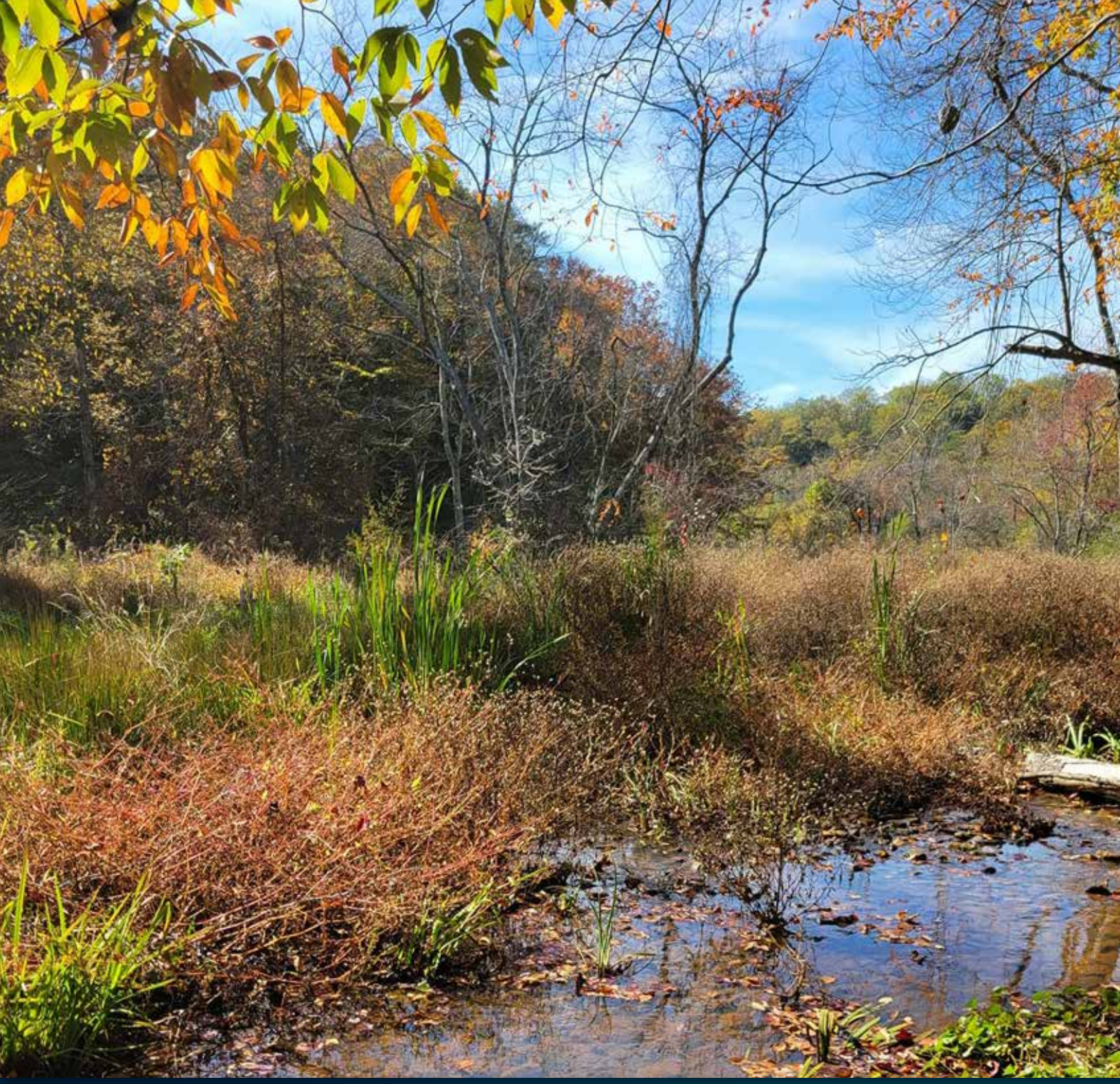
Anne Arundel County Soil Conservation District

Soil Conservation Districts were formed in response to the Dust Bowl that occurred in the 1930s when eroding land led to dust storms and economic devastation. There was an initiative to form Soil Conservation Districts throughout the country, and local landowners made up a Board of Supervisors that could convey to the federal government the needs of the local agricultural community.

The Anne Arundel District was formed in 1946. Working with agricultural landowners, the District provides guidance as well as engineering services to keep soil and nutrients on the land. The District partners with Anne Arundel County, the Maryland Department of Agriculture (MDA), the Natural Resources Conservation Service (NRCS), and the Southern Maryland Resource Conservation and Development (RC&D) to accomplish its mission. The office houses both state and federal employees, all working together to accomplish the same goals. The office currently works with approximately 510 agricultural cooperators throughout the County. One of the services the District provides is to develop a Soil Conservation and Water Quality Plan or plans if the cooperator owns or works multiple farms, for each cooperator, that outlines existing and proposed conservation practices on the farm.

Since Soil Conservation Districts have experience with controlling soil on agricultural land, when the Maryland Sediment Control Law was passed in 1970, the state assigned the Districts the task of reviewing all sediment and erosion control plans for urban development. Thus, the Anne Arundel Soil Conservation District reviews the sediment and erosion control portion of a grading plan that is submitted to the County as well as the sediment control portion of graded plans submitted to the City of Annapolis.

A high-priority mission of the District is to meet the federally mandated Chesapeake Bay Total Maximum Daily Load (TMDL) by 2025. These goals have been set by the Environmental Protection Agency, and reaching these goals in the agricultural community of the County is the responsibility of the Maryland Department of Agriculture. Soil Conservation Districts throughout the state have partnered with MDA to accomplish this task. Districts accomplish this by installing Best Management Practices (BMPs) on agricultural land. There are 125 Maryland BMPs, both agronomic and structural, each having its own standard and specification. One of our more recent tools to combat eroding streams on agricultural properties is the Step Pool Storm Conveyance (SPSC) that, until recently, has only been installed on urban sites. The farmers of Anne Arundel County have met the 2025 planning goals for the Watershed Implementation Plan (WIP). They have achieved specific water quality standards in the Chesapeake Bay by implementing Best Management Practices to help reduce pollutants like nitrogen, phosphorus, and sediment.



Anne Arundel County
Bureau of Watershed
Protection
& Restoration

AARivers.org

Bureau of Watershed Protection and Restoration
Department of Public Works
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FY 2025 REPORT