Maryland
319 Nonpoint Source Program
2014 Annual Report

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Cover Photograph: Completed stream restoration project on Scotts Level Branch near McDonogh Road in Baltimore County, Maryland. Annual pollutant load reduction by the project is estimated to be 415.2 lb/yr nitrogen, 136.4 lb/yr phosphorus, and 306.2 tons/yr sediment. Total project cost was $1,213,340 including $320,004 from the Federal 319(h) Grant (FFY2012 project #5), including $680,000 from the Maryland Chesapeake and Atlantic Coastal Bays Trust Fund and the remainder from County funds.

Maryland's Nonpoint Source Program is funded in part by a Section §319(h) Clean Water Act Grant from the U.S. EPA. Although this program is funded partly by U.S. EPA, the contents of this report do not necessarily reflect the opinion or position of EPA.

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Preface

Nonpoint source (NPS) pollution is defined as polluted stormwater runoff associated with rainfall, snowmelt or irrigation water moving over and through the ground. As this water moves, it picks up and carries pollutants with it, such as sediments, nutrients, toxics, and pathogens. These pollutants eventually reach lakes, rivers, wetlands, coastal waters, ground waters and, most of the time in Maryland, the Chesapeake Bay.

NPS pollution is associated with a variety of activities on the land including farming, logging, mining, urban/construction runoff, onsite sewage systems, streambank degradation, shore erosion and others. For example, stormwater flowing off the land carries the nutrients nitrogen and phosphorus into local streams and eventually into the Chesapeake Bay. Under natural conditions, this is beneficial up to a point. However, if excessive nutrients enter a lake or the Chesapeake Bay, and cause nuisance algae blooms, then these nutrients are considered to be pollutants.

The pollution contributed by nonpoint sources is the main reason why many of Maryland's waters are listed as impaired because Water Quality Standards are not being met for designated uses including fishing, swimming, drinking water, shellfish harvesting among others.

Progress in managing NPS pollution in Maryland is presented in this report. It was produced by the Maryland Department of the Environment (MDE) to meet 319(h) Grant conditions (text box) and to demonstrate consistency with three essential elements:

1. EPA Strategic Plan Goal 2 Protecting America's Waters
2. EPA Strategic Plan Objective 2.2 Protect and Restore Watersheds and Aquatic Ecosystems
3. Work plan commitments plus time frame (overall progress is reported in this document).

The FFY14 319(h) Grant award contains a programmatic condition:

"2. Reporting Requirements
… The recipient agrees to provide information required under sections 319(h)(11) of the Clean Water Act for the purpose of annual reporting on progress under the State's NPS management program. The Section 319 Annual Program Report will be due by February 1st. At a minimum, the report shall contain a brief summary of progress in meeting the schedule of milestones in the approved management program and reductions in nonpoint source pollutant loading and improvements in water quality that has resulted from implementation of the NPS management program. Load reduction and water quality improvements shall be identified and reported in all priority Watershed Based Plans. These accomplishments should be compared to the implementation milestone goals/objectives identified in each priority plan. The goal information can be displayed in the form of a watershed goal/accomplishment chart showing percent achieved, supplemented by a short narrative that should give the reader a clear understanding of the actions being taken and the outputs and outcomes which are occurring from the actions. If monitoring was completed, a summary of that information should also be included. For example, if 1000 feet of streambank stabilization was completed, then how does that compare to the needs identified in the watershed based plan, i.e. what percent of streambank stabilization was completed compared to the overall needs as identified by the plan. Similar comparisons should also be provided for each significant pollutant load reduction. Data from the Watershed Plan Tracker may be used to satisfy this requirement. Failure to submit the annual NPS program report may affect the recipient's eligibility for future 319 grant funding…"

Abbreviations Used	
319	Clean Water Act, Section 319(h)
AMD	Acid Mine Drainage
BAT	Best Available Technology
BMP	Best Management Practice
COMAR	Code of Maryland Regulations
DNR	Maryland Department of Natural Resources
EPA	Environmental Protection Agency, United States of America
FFY	Federal Fiscal Year (October 1 thru September 30)
MDA	Maryland Department of Agriculture
MDE	Maryland Department of the Environment
MDP	Maryland Department of Planning
MEP	Maximum Extent Practicable
NGO	Non-Government Organization
NPS	Nonpoint Source
RFP	Request for Proposals
SCD	Soil Conservation District
SRA	Sassafras River Association
SRF	State Revolving Fund
SFY	State Fiscal Year (in Maryland, July 1 thru June 30)
SWAP	Small Watershed Area Plan (another name for a watershed-based plan)
SW Conversion	Converting an existing stormwater facility to provide water quality benefits
SW Retrofit	Adding stormwater management to existing development that had none
TMDL	Total Maximum Daily Load
Trust Fund	Maryland Chesapeake and Atlantic Coastal Bays Trust Fund
WIP	Watershed Implementation Plan for the Chesapeake Bay TMDL
WQA	Water Quality Analysis
WRAS	Watershed Restoration Action Strategy (aka watershed-based plan)
WRE	Water Resources Elements (components of a local comprehensive plan)
WWTP	Waste Water Treatment Plant (sewage treatment)

I. Mission and Goals of the NPS Program

In January 2015, the Maryland Department of the Environment (MDE) requested that the US Environmental Protection Agency (EPA) approve Maryland's revised the State nonpoint source (NPS) program presented in the draft *Maryland's 2015-2019 Nonpoint Source Management Plan*. The document's draft vision, mission, goals are shown on the right. The complete draft is available on the Internet at http://www.mde.state.md.us/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319NPS/index.aspx

Draft Maryland's 2015-2019 NPS Management Plan

1.A Vision
Ensuring a clean environment and excellent quality of life for Marylanders.

Maryland's vision is to implement dynamic and effective nonpoint source pollution control programs. These programs are designed to achieve and maintain beneficial use of water; improve and protect habitat for living resources; and protect health through a mixture of water quality and/or technology based programs; regulatory and/or non-regulatory programs; and financial, technical, and educational assistance programs. (*Maryland Nonpoint Source Management Plan*, December 1999)

1.B Mission
Maryland's Nonpoint Source Management Program (Program) mission is to protect and restore the quality of Maryland's air, water, and land resources, while fostering smart growth, a thriving and sustainable economy and healthy communities.

1.C Goals
The Program has the following seven broad goals to advance its mission and vision:

1. Improving and protecting Maryland's water quality.
2. Promoting land redevelopment and community revitalization.
3. Ensuring safe and adequate drinking water.
4. Reducing Maryland citizen's exposure to hazards.
5. Ensuring the safety of fish and shellfish harvested in Maryland.
6. Ensuring the air is safe to breathe.
7. Providing excellent customer services to achieve environmental protection.

Until the document is approved by EPA, the mission for the 319 Nonpoint Source (NPS) Management Program relates directly to the December 1999 *Maryland Nonpoint Source Management Plan* long-term goal "Meet 100% of designated uses in all waters of the State".

During 2014, the program focused the majority of its efforts on meeting two 1999 Management Plan milestones in particular: "By 2010, correct all nutrient-related problems in the Chesapeake Bay and its tidal tributaries sufficient to remove the Bay and the tidal portions of its tributaries from the list of impaired waters under the Clean Water Act", and: "By 2010, correct all sediment-related problems in the Chesapeake Bay and its tidal tributaries sufficient to remove the Bay and the tidal portions of its tributaries from the list of impaired waters under the Clean Water Act".

Both the State and the EPA Chesapeake Bay Program agreed to update the 1999 milestones to be consistent with the Chesapeake Bay total maximum daily load (TMDL). In 2012, Maryland's Chesapeake Bay Watershed Implementation Plan (WIP) included the revised the date for achieving these milestones to 2025, with a check on progress in 2017.

To realize these outcomes, the State's NPS programs are designed to: achieve and maintain beneficial uses of water; protect public health, and; improve and protect habitat for living resources. The State programs use a mixture of water quality and/or technology based approaches including regulatory and non-regulatory programs, and programs that provide financial, technical, and educational assistance.

Through program management and financial/technical support, Maryland's Section §319(h) NPS Program plays a significant role in helping to protect and improve of Maryland's water quality. The NPS Program promotes and funds State and local watershed planning efforts,

implementation of NPS projects consistent with watershed plans, water quality monitoring to evaluate progress, stream and wetland restoration, education and outreach, and other measures to reduce, prevent and track nonpoint source pollution loads. The NPS Program also plays a role in promoting partnerships and governmental coordination to reduce nonpoint sources of pollution. Program partners include State agencies, local government (counties, municipalities, Soil Conservation Districts), private landowners and watershed associations.

Consistent with these priorities, selection of NPS implementation projects for 319(h) Grant funding incorporates the following goals:

GOAL 1 To support meeting Total Maximum Daily Load (TMDL) nonpoint source reduction targets.

GOAL 2 To significantly contribute to reducing one or more nonpoint source water quality impairments in a water body identified in Maryland's 303(d) list of impaired water bodies leading toward full or partial restoration.

GOAL 3 To implement projects from EPA-accepted watershed-based plans that will produce measurable nonpoint source pollutant load reduction consistent with Goals 1 and 2.

II. Executive Summary

In accordance with Section 319 of the Federal Clean Water Act, this report documents the activities and accomplishments by the State of Maryland 319 NPS Program. The Maryland Department of Environment (MDE) is the lead agency for administering Section 319, including the 319(h) Grant. In this responsibility, MDE helps to protect and improve Maryland water quality by promoting and funding State and local nonpoint source (NPS) programs for best management practice implementation and tracking, water quality monitoring, education and outreach, and other measures to reduce NPS pollution loads. MDE is also the lead 319 NPS management agency responsible for coordination of policies, funds, and cooperative agreements with state agencies and local governments. Several other state agencies have key responsibilities, including the Maryland Department of Natural Resources (DNR), Maryland Department of Agriculture (MDA), and Maryland Department of Planning (MDP). The 319 NPS Program is housed within MDE's Science Services Administration (SSA). During the past 25 years, Maryland has received over $52.7 million through the 319(h) Grant to support the Maryland's NPS management program including on-the-ground implementation of best management practices (BMPs). (See Appendix A)

In calendar year 2014, there have been notable successes and accomplishments:

- Six implementation projects funded by 319(h) Grant were completed. These projects reported implementing best management practices resulting in pollutant load reductions:
    - 33,381 lbs/year nitrogen;
    - 4,571 lbs/yea phosphorus, and
    - Nearly 524 tons/year sediment. (see Table 2)
- Monitoring of the Aaron Run watershed acid mine drainage remediation, funded in-part by the 319(h) Grant, demonstrated that the water quality standard for pH is being met in treated areas.
- Implementation of 10 Maryland watershed plans is eligible for 319(h) Grant implementation funding (and one additional plan has completed implementation). These planning areas are called 319 priority watersheds in the Annual Report. Overall nonpoint implementation in these watersheds funded by 319 and other funding sources resulted in significant pollutant load reductions based on calendar year reporting by local implementers:
    - 33,781 lbs/yr nitrogen;
    - 4,594 lbs/yr phosphorus, and;
    - 1,103 tons/yr sediment.
- For State Fiscal Year 2014, Maryland State agencies reported expending over $54 million for nonpoint source programs and implementation*.

* Does not include all State agencies or NPS expenditures of Federal, local or private funds.

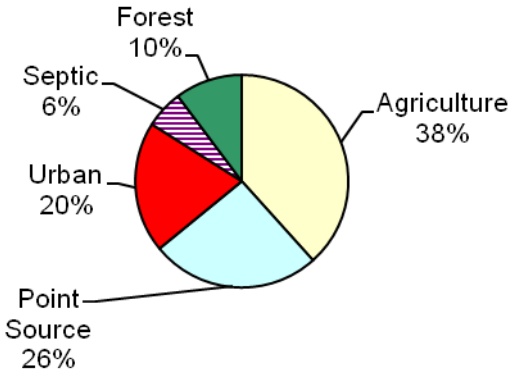
III. Overview

Maryland surface waters flow into three major drainage areas:

- The Chesapeake Bay watershed receives runoff from of Maryland's mid section and encompasses more than 90% of the State. Most 319-funded implementation projects are in this watershed. These projects are designed to reduce nitrogen, phosphorus and sediment pollutant loads. Many also involve improving stormwater infiltration.
- Maryland's Coastal Bays receives runoff from Maryland's eastern-most coastal plain in Worcester County. During 2014, no 319-funded implementation was active.
- Maryland's Appalachian area runoff drains thru the Youghiogheny River and Casselman River watersheds toward the Ohio and Mississippi Rivers. In the Casselman River watershed, the 319(h) Grant is helping to fund acid mine drainage remediation.

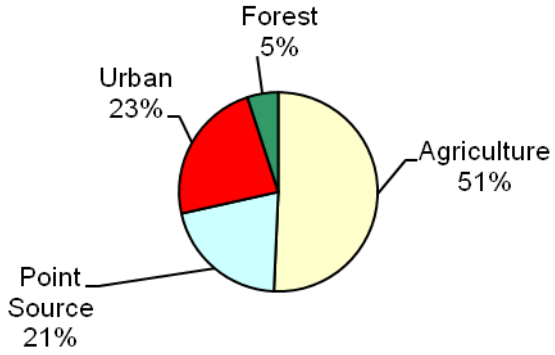
Overall, Maryland has over 9,940 miles of non-tidal streams and rivers. These waters and the Chesapeake Bay have provided a rich bounty that been the foundation for much of Maryland's rich heritage and prosperity. The State's water resources continue to provide food and water for its residents, jobs for the economy and a place where people may relax and enjoy the natural environment. Our quality of life, including drinking water, recreation/tourism, commercial and recreational fishing and wildlife habitats depend on healthy waters supported by healthy watersheds.

Figure 1. 2014 Total Nitrogen Sources in Maryland



However, Maryland's water resources are under stress from a variety of causes -- with nonpoint source pollution being the greatest single factor. The sources of excessive nitrogen and phosphorus in Maryland arise in large part from major land uses as shown in Figures 1 and 2 respectively. The state's waters are increasingly impacted by and remain impaired due largely to nonpoint sources of pollution and related habitat degradation, which are most commonly due to altered land uses. The lands that are altered from natural conditions contribute various forms of nonpoint point source pollution such as excessive levels of the nutrients nitrogen and phosphorus.

Figure 2. 2014 Total Phosphorus Sources in Maryland



*Data source for the pie charts is the 2014 Chesapeake Bay Model version 5.3.2 (2014 Progress V7N21915) delivered loads.

The best methods for controlling NPS pollution are commonly called conservation practices or Best Management Practices (BMPs). These BMPs are designed to meet specific needs, like increasing tree cover to capture stormwater, grassed buffers to control sediment and phosphorus that could leave farm fields, or wet stormwater ponds to capture sediment and nutrients in urban runoff. Every year, Maryland reports the cumulative total number of BMPs implemented in the State. The most recent statewide aggregate reporting is summarized in **Appendix – BMP Implementation Progress in Maryland**.

Maryland's NPS management program has responsibilities set forth in the Federal Clean Water Act Section 319. To help meet these responsibilities, the State program has received Federal grant support each year since 1990 and is required to maintain at least a minimum annual level of nonfederal expenditure. A summary that covers the period 1990 thru 2014 for Maryland is in **Appendix – Financial Information**.

Chapter IV of the Annual Report provides brief summaries of grant-funded NPS Program activities during 2014 with particular to 319 priority watersheds, because these watersheds are eligible for implementation funding from the 319(h) Grant. Chapter IV is supported with additional details provided in two appendices.

- Statewide information on 319-funded projects during 2014: **Appendix – Project Status**.
- Watershed scale information for priority watersheds: **Appendix – Watersheds**.

Demonstrating improvements in water quality resulting from nonpoint source program implementation and successes in achieving nonpoint source management goals and objectives are important for the program. Each year, at least one success story is submitted to EPA. Maryland's 2014 success story is based on MDE analysis of monitoring data from Aaron Run in Garrett County. The in-stream data documented that pH levels have significantly improved following implementation of acid mine drainage remediation projects that were partially funded by the 319(h) Grant. Additionally, the Maryland Integrated Report assesses water quality monitoring information from across the State to determine the status of impairment, which involves finding water quality improvements. (see **Appendix – Success Story** and **Appendix – Integrated Report**).

IV. Major Accomplishments, Successes and Progress

A. Statewide

1. Overall Progress

Maryland's NPS Management Plan includes priority goals for correcting nutrient and sediment-related problems. To gauge progress toward meeting these goals, Maryland tracks implementation progress for selected categories of BMPs that have been recognized by the EPA Chesapeake Bay Program and the Chesapeake Bay States. Every year, Maryland updates the cumulative total of BMPs implemented in each category and the associated nitrogen and phosphorus load reduction. A summary of Maryland's most recently reported statewide information is in Appendix – BMP Progress.

Maryland's 2015-2019 Nonpoint Source Management Plan, was completed, reviewed by the public and submitted to EPA for approval. It contains milestones beginning with 2015 that, pending EPA approval, will be used to gauge progress in the 2015 Annual Report.

2. NPS Work Plan

Maryland's NPS work plan supported by the 319(h) Grant focuses on three primary areas that contribute to meeting the 1999 Maryland Nonpoint Source Management Plan goal "Meet 100% of designated uses in all waters of the State" as summarized below, with supplemental information presented in Appendix – Project Status:

- Implementation to eliminate or reduce impairments consistent with TMDLs. In 2014, 18 319-funded projects included funds for on-the-ground NPS implementation. These projects are located in the 319 priority watersheds shown in Figure 3. Additional information on progress in these watersheds is in the next section of this report.
- Monitoring and tracking to gauge progress. During 2014, three 319-funded projects included either monitoring or tracking of implementation progress/results.
- Management/planning necessary to support associated State and local assistance needs. During calendar year 2014, two projects received Federal 319(h) Grant funds to support NPS program management.

3. Improvements Resulting from NPS Implementation

In 2014, MDE reported a success story on improvements in Aaron Run resulting from successful acid mine drainage remediation. This stream, a tributary to the Savage River watershed in Garrett County Maryland, had in-stream pH was as low as 3.5 caused by seepage from abandoned deep coal mines and no trout survival. In response, MDE conducted an acid mine drainage remediation beginning in 2005 thru 2011 that was funded in-part by the 319(h) Grant. After implementation, water quality monitoring conducted 2011-2013 documented that in-stream pH was consistently meeting State standards for pH 6.5-8.5. This improvement, allowed the Maryland DNR Fisheries Service to transplant native brook trout from nearby streams. Since

that time, the trout are surviving and reproducing in the Aaron Run mainstem. EPA has accepted and published the Aaron Run success story. (see Appendix – Success Story).

Based on the Aaron Run results, the draft 2014 Integrated Report delists the mainstem of Aaron Run for pH impairment. This is the first time in Maryland that specific NPS implementation has been linked directly to attaining designated use for aquatic life by reducing impairment.

The 2014 Integrated Report also removes 39 other waterbody-pollutant combinations from Category 5, which lists impairments needing a TMDL or other pollutant abatement initiative. However, it notes that the removals cannot be traced to a particular action but some may be associated with extensive restoration practice implementation. The report also indicates that water quality improvements associated with nutrient impairments are being documented but many of these areas continue to be listed as impaired. (See Appendix – Integrated Report)

4. National Water Quality Initiative

The National Water Quality Initiative (NWQI) focuses on priority watersheds with impaired streams to help farmers and forest landowners improve water quality and aquatic habitat. With help from state agencies, partners, and the NRCS State Technical Committee, Maryland NRCS selected the Catoctin Creek Watershed in 2012 to focus on agricultural conservation investments which deliver the greatest water quality improvement benefits.

The NWQI helps farmers in the Catoctin Creek Watershed invest in voluntary conservation to help provide cleaner water for their neighbors and communities. Farmers are implementing conservation and management practices through a systems approach to control and trap nutrient and livestock waste. Since 2012, NRCS Maryland provided over $400,000 in financial assistance for installing conservation practices such as waste storage facilities, prescribed grazing systems and livestock exclusion from stream corridors.

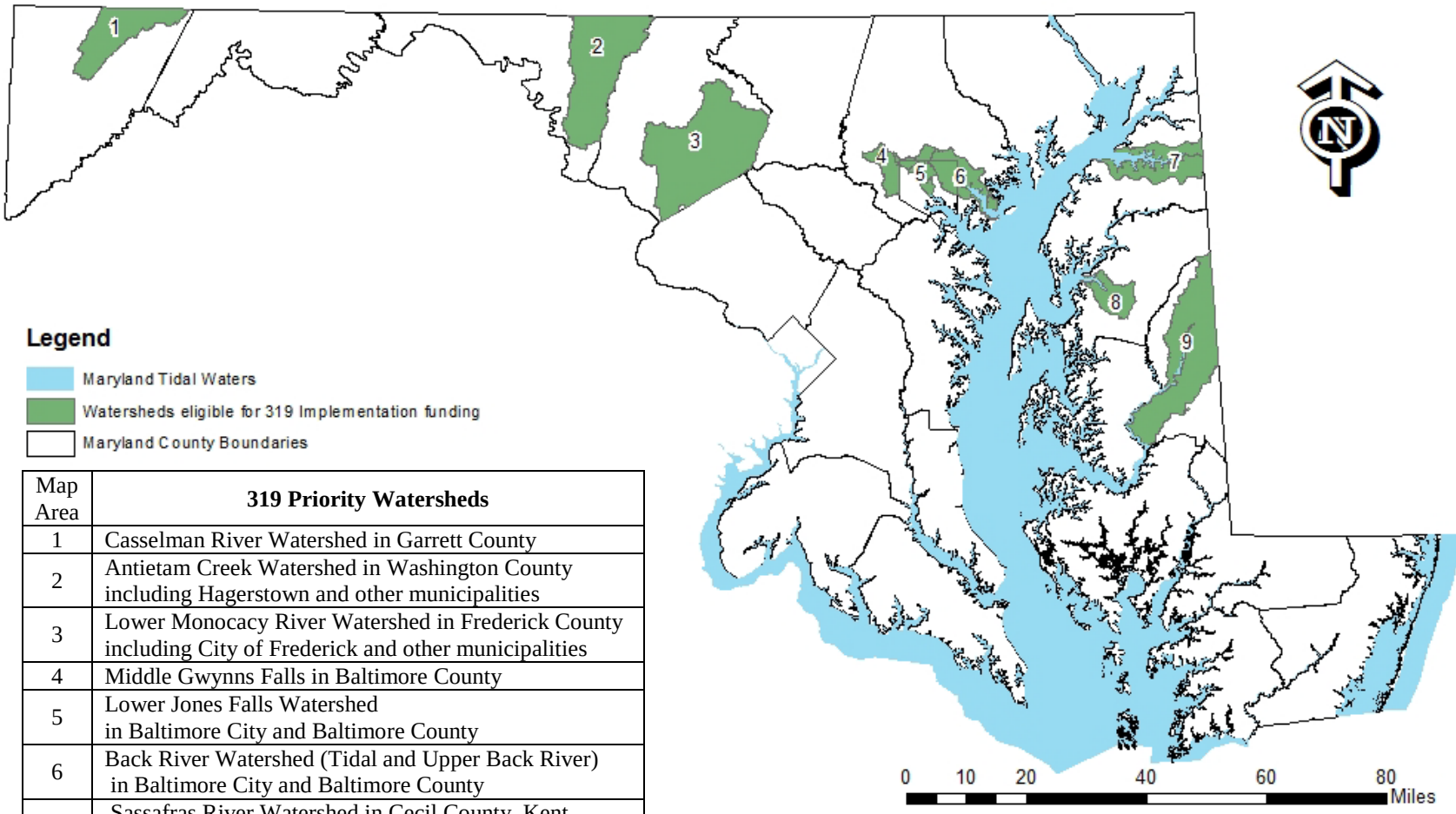
The Catoctin Creek Watershed encompasses the southwestern portion of Frederick County and is framed by Catoctin Mountain on the east and South Mountain on the west. The Catoctin Creek watershed drains an area of 120 square miles, which includes areas of forested mountain slopes, agricultural valleys, and small towns. The area's waters are impaired by sediments, nutrients, impacts to biological communities, and fecal coliform. The land use distribution in the watershed is approximately 43% agricultural, 42% forest/herbaceous and 15% urban, with agricultural land mostly planted in row crops and pasture.

In 2012, Maryland was among the first States to create a cooperative monitoring agreement to support the NWQI effort. MDE and the NRCS Maryland office executed a one-year agreement in which MDE took on responsibility for water quality monitoring/analysis designed to detect changes associated with conservation practices. MDE's contribution entails approximately 378 in-stream water samples and monitoring at 82 synoptic survey sites twice a year. NRCS earmarked about $30,000 of EQIP funds to reimburse MDE's work under the agreement and MDE contributes an equivalent level of cash or in-kind services.

The cooperative monitoring agreement has been renewed. As of the end of 2014, MDE and NRCS continue to cooperate on gathering and analyzing water quality monitoring data.

In October 2014, MDE received an analysis of minimum detectable change for water chemistry (selected nitrogen and phosphorus species) and bacteria (enterococci). The analysis was conducted because EPA selected the Catoctin NWQI monitoring project for technical assistance. The analytical findings will be used by MDE to help gauge the likelihood that monitoring findings reflect real change in water quality.

Figure 3
319 Priority Watersheds in Maryland
Currently Eligible for 319(h) Grant Implementation Funding



Map Area	319 Priority Watersheds
1	Casselman River Watershed in Garrett County
2	Antietam Creek Watershed in Washington County including Hagerstown and other municipalities
3	Lower Monocacy River Watershed in Frederick County including City of Frederick and other municipalities
4	Middle Gwynns Falls in Baltimore County
5	Lower Jones Falls Watershed in Baltimore City and Baltimore County
6	Back River Watershed (Tidal and Upper Back River) in Baltimore City and Baltimore County
7	Sassafras River Watershed in Cecil County, Kent County and including municipalities
8	Corsica River Watershed in Queen Anne's County and Centreville
9	Upper Choptank River in Caroline County including Denton and other municipalities

B. Watersheds

At the end of 2014, eleven areas in Maryland are eligible for 319(h) Grant implementation funding, which are called priority watersheds. The table below lists these watersheds and summarizes information on their watershed-based plans. Each plan was reviewed and accepted by EPA during an eligibility determination. The locations of the priority watersheds are mapped in Figure 3.

Table 1. Watershed-Based Plans Eligible for 319(h) Grant Implementation Funding

Major Drainage	River Basin	Plan Watershed	Status	Lead Entity	Plan Name	Plan Date	Internet (1)
Chesapeake Bay	Back River	Tidal Back River	Implementing	Baltimore County Dept. of Environmental Protection and Sustainability	*Tidal Back River Small Watershed Action Plan*	2010	http://www.baltimorecountymd.gov/Agencies/environment/watersheds/swap.html
		Upper Back River	Implementing		*Upper Back River Small Watershed Action Plan*	2008	
	Gwynns Falls	Middle Gwynns	Implementing		*Middle Gwynns Falls Small Watershed Action Plan*	2014	
	Jones Falls	Lower Jones Falls	Implementing		*Lower Jones Falls Watershed Small Watershed Action Plan*	2008	
	Loch Raven Reservoir	Spring Branch	Completed		*Spring Branch Subwatershed – Small Watershed Action Plan (Addendum to the Water Quality Management Plan for Loch Raven Watershed)*	2008	
	Choptank River	Upper Choptank	Implementing	Caroline County Planning & Codes	*Upper Choptank River Watershed Based Plan*	2010	http://www.carolinemd.org/138/Planning-Codes
	Chester River	Corsica River	Implementing	Town of Centreville	*Corsica River Watershed Restoration Action Strategy*	2004	www.townofcentreville.org/departments/environment.asp
					Corsica River Targeted Initiative Progress Report: 2005-2011 [includes revised watershed goals]	2012	
	Potomac River	Antietam Creek	Implementing	Washington Co SCD	*Antietam Creek Watershed Restoration Plan*	2012	http://www.conservationplace.com/
		Lower Monocacy River	Implementing	Frederick County Community Development Division	*Lower Monocacy River Watershed Restoration Action Strategy (WRAS) Supplement: EPA A-I Requirements, Frederick County Maryland*	2008	http://www.watershed-alliance.com/mcwa_pubs.html
	Sassafras River	Sassafras River	Implementing	Sassafras River Association	*Sassafras Watershed Action Plan*	2009	www.sassafrasriver.org/swap/
Casselman & Youghiogheny Rivers	Casselman River	Casselman River	Implementing	MDE Land Management Administration	*Casselman River Watershed Plan for pH Remediation*	2011	http://mde.maryland.gov/programs/Water/319NonPointSource/Pages/casselman.aspx

(1) Internet links in the table are generally associated with the agencies most directly responsible the watershed plan creation and implementation. Additionally, these watershed plans are also available thru MDE: http://mde.maryland.gov/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319nps/factsheet.aspx

In the 319 priority watersheds, 319(h) Grant-funded implementation projects were completed during 2014. These projects and their reported pollutant load reductions are listed in Table 2. Additional information on the projects is provided in the following sections of this report and in Appendix – Project Status.

Table 2. Pollutant Load Reductions Reported by 319 Projects Completed in 2014

319 Priority Watershed	319(h) Grant Project Completed	Nitrogen lbs/yr	Phosphorus lbs/yr	Sediment ton/yr
Antietam Creek	Little Antietam Cr, Greensburg Rd	110	37.4	85.25
Back River - Tidal	no projects active or completed	0	0	0
Back River - Upper	1 project active, none completed	0	0	0
Casselman River	Casselman Remediation Phase I	0	0	0
Corsica River	Agricultural Technical Assistance	32,830	4,394	38.28
	Board of Education, etc.	2.16	0.12	93.96
Lower Jones Falls	no projects active or completed	0	0	0
Lower Monocacy River	1 project active, none completed	0	0	0
Middle Gwynns Falls	Scotts Level stream restoration	415.2	136.4	306.2
Sassafras River	1 project active, none completed	0	0	0
Upper Choptank River	Watershed Restore (Greensboro)	8.01	0.85	0
	Watershed Restore (Denton)	16.06	2.69	0.23
TOTAL		33,381.4	4,571.5	523.9

Also, in the watersheds listed in Table 1, implementation progress was accomplished using funding from sources other than the 319(h) Grant. Table 3 summarizes the aggregate pollutant load reduction reported by projects receiving funds from 319, Maryland's Chesapeake and Atlantic Coastal Bays Trust Fund, and the State Revolving Fund. Additional overall implementation progress is summarized in the following sections for these watersheds.

Table 3. 2014 Pollutant Load Reductions in Priority Watersheds

319 Priority Watershed	Sub Watershed	Nitrogen lbs/yr	Phosphorus lbs/yr	Sediment ton/yr
Antietam Creek	All in Maryland	402.71	51.62	88.00
Back River	Tidal	24.41	0.67	49.44
	Upper	36.1	5.4	0.6
Casselman River	All in Maryland	22.13	0.92	0.17
Corsica River	All	32,832	4,394	132
Lower Jones Falls	All	1.24	0.10	0.03
Lower Monocacy River in Frederick Co.	Lake Linganore only	0	0	0
	All including Lake Linganore	23.14	1.57	526.49
Middle Gwynns Falls	All in Baltimore County	415.2	136.4	306.2
Sassafras River	All in Maryland	0	0	0
Upper Choptank River	All in Caroline County	24.07	3.54	0.23
TOTAL		33,781.2	4,594.3	1,103.4

Notes: 2014 is calendar year. Table includes both 319 and non-319 load reductions. Zero means no progress was reported for 2014.

1. Antietam Creek

Location

The Antietam Creek watershed encompasses 290 mi^2 in total. It drains part of Washington County, Maryland (118,400 acres, 185 mi^2) with its headwaters in Pennsylvania. The 54 mile-long Creek flows into to the Potomac River and the Chesapeake Bay. Watershed land use in Maryland is 42% agricultural, 31% forest and 27% developed.

Goals

In the 2012, the Washington County SCD developed the watershed plan to meet TMDLs for sediment and fecal bacteria. The watershed plan accounted for implementation progress achieved prior to 2012 and set NPS pollutant reduction load goals based on 2012 benchmarks:

- Sediment: 12,923 tons/year
- E. coli bacteria: 5.4 million billion MPN/year.

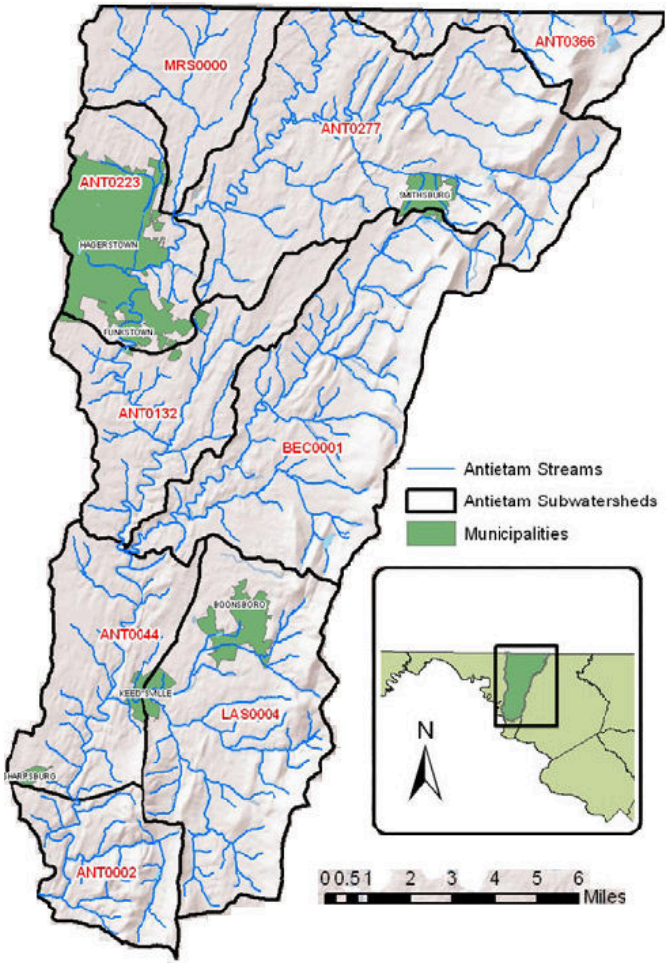


Figure 4. Antietam Creek Watershed.

Figure 5. Sediment from stream bank erosion along Little Antietam Creek adjacent to Greensburg Road in rural Washington County was identified in the Antietam Creek watershed plan as a high priority water quality problem. (above) To prevent continuing erosion and to eliminate the water quality problem, construction was conducted from September 2013 thru February 2014 supported in part by FFY2012 319(h) Grant funds. Part of the grant project involved a temporary diversion of the creek and placing imbricated rip-rap next to the road. (above right) (Photos: Washington County Dept. of Public Works)

Table 4. Antietam Creek Watershed Plan 2014 Implementation Progress Summary (1)

Sediment Reduction Goals			Implementation Progress			Bacteria Reduction Goals			Implementation Progress		
BMP	Unit	Goal	2014	2012-13	Goal % Achieved	BMP	Unit	Goal	2014	2012-13	Goal % Achieved
Cover Crops	acres/yr	4,000	5,462		136.6%	Failing Septics Correction	systems	559	0	15	2.7%
Conservation Tillage	acres/yr	6,200	1,160		18.7%	Septic System Upgrades	systems	645	0	26	4.0%
SCWQP	acres	9,050	2,440	3,956.9	70.7%	Grass Buffers	acres	35	7.4	2.5	28.3%
Stream Protection not fenced	acres	1,300	60	40.0	7.7%	Riparian Forest Buffers	acres	260	2.5	56.8	22.8%
Stream Protection fenced	acres	780	4.62	2.6	0.9%	Stream Protection fenced	acres	300	4.62	2.6	2.4%
Buffers (grass/forest)	acres	295	9.9	59.3	23.5%	Stream Protection not fenced	acres	500	60	40.0	20.0%
Erodible Land Retirement	acres	130	0.25	8.3	6.6%	Livestock Stream Crossing	units	17	0	0	0.0%
No Till	acres/yr	4,800	495		10.3%	SCWQPs	acres	15,460	2,440	3,956.9	41.4%
Stream Restoration	acres	0.25	0	0	0.0%	Runoff Control Systems	acres	12	1	4.0	41.7%
Forest Harvest Practices	acres	250	196	722.0	367.2%	Animal Waste Mgmt Systems	units	26	7	2	34.6%

(1) 2014 is Calendar year. Zero means no progress or not reported. Washington County Soil Conservation District is the lead plan implementer/reporter and partners with other agencies.

Implementation Status
Antietam Creek Watershed Plan

Table 5. Summary of Grant Projects Completed During 2014 - Antietam Cr Watershed

Grant Project Expenditures					Pollutant Load Reduction Reported			
Grant Name	Federal Grants	State Grants	Non Federal Match	Total Expenditures	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)	Bacteria (MPN/yr)
319	$229,555.73		$153,037.15	$382,592.88	121.00	6.42	1.07	0
Trust Fund		$5,652.78		$5,652.78	171.71	7.80	1.68	0
TOTAL	**$229,555.73**	**$5,652.78**	**$153,037.15**	**$388,245.66**	**292.71**	**14.22**	**2.75**	**0**

Following two years of implementation to help meet watershed plan goals, some progress is reported for pollution reduction as summarized in the table above. Also during 2014, Federal and State grants invested over $388,000 in NPS implementation projects as summarized in the second table (above right). (See Appendix – Watersheds for details)

In addition to an information kiosk installed in 2013, a second was installed in 2014 along Antietam Creek at the Funkstown Fire Hall. Funding for the kiosk was provided by a local developer. Two additional kiosks scheduled for installation Spring 2015 have been purchased. One was funded by the local home builders association and is slated for the Antietam National Battlefield at a canoe access point on Antietam Creek. The other kiosk is funded by the 319(h) Grant and will be placed at Kiwanis Park in the City of Hagerstown at the canoe access walkway.

Figure 6. Washington County's Little Antietam Creek project adjacent to Greensburg Road was completed during 2014 (right). The County hosted EPA and MDE at the project site in November 2014 during the annual review of Maryland's NPS program.

2. Back River Watersheds

Location

The Back River watershed is located in Baltimore County and Baltimore City. It is divided into two subwatersheds as shown in the map and table below. EPA accepted the Tidal area watershed plan in 2010 and the Upper Back River area plan in 2008.

Implementation

Projects that are implementing watershed plans goals are summarized on the next pages. All 319-funded projects initiated after 2008 have been in Baltimore County's portion of the watersheds. Other implementation progress contributing to watershed plan goals included in the tables was reported by Baltimore County, including projects conducted by nongovernmental organizations.

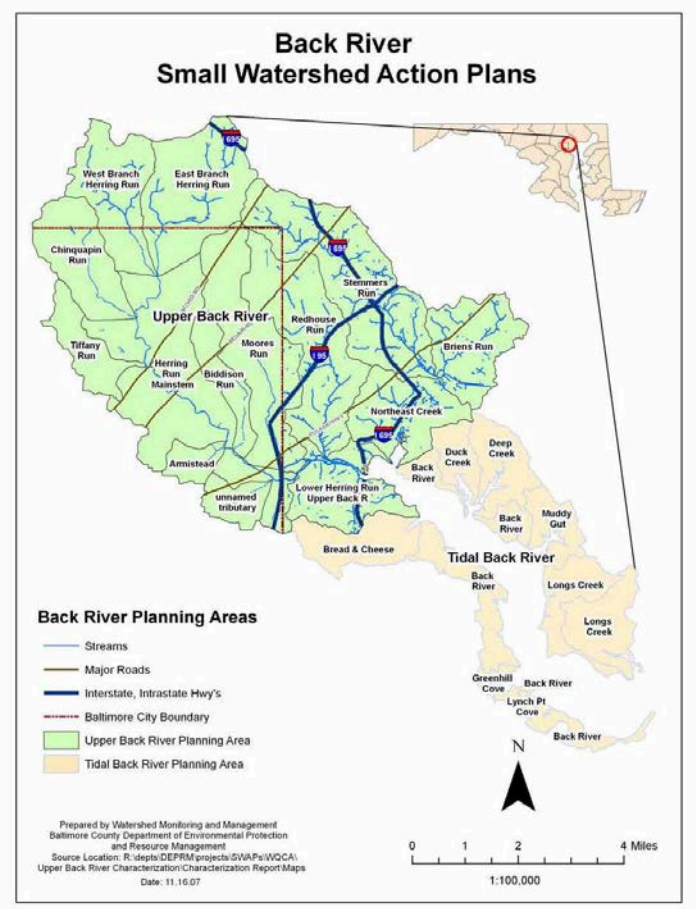


Figure 7. Back River Watersheds.

Table 6. Back River Small Area Watershed Plans	
Upper Back River Watershed	**Tidal Back River Watershed**
Lead NPS Implementers: Baltimore County, Baltimore City Other NPS implementers report progress thru the Lead. Pollutant Load Reduction Goals - Total nitrogen: 48,190 pounds - Total phosphorus: 6,056 pounds Total drainage area: 27,716.7 acres (43.3 mi^2) - Total open tidal water: NA - Baltimore Co.: 55.5%; Baltimore City: 44.5%. - Impervious cover: 30.7 % Land Use - Agriculture: --- - Commercial: 9.9% - Forest: 11.5% - Industrial: 6.5% - Institutional: 8.0% - Residential low density: 8.5% - Residential mid density: 26.5% - Residential high density: 20.4% - Urban open: 6.2% - Water/Wetlands: ---	Lead NPS Implementer: Baltimore County Other NPS implementers report progress thru the Lead. Pollutant Load Reduction Goals - Total nitrogen: 6,498 pounds - Total phosphorus: 679 pounds Total Drainage area: 7,720 acres (12 mi^2) - Total open tidal water: 3,947 acres (6.2 mi^2) - Baltimore County: 100% - Impervious cover: 18.4% Land Use - Agriculture: 4.4% - Commercial: 7.2% - Forest: 32.1% - Industrial: 3.5% - Institutional: 4.4% - Residential low density: 2.4% - Residential mid density: 23.0% - Residential high density: 8.6% - Urban other: 11.4% - Water/Wetlands: 3.0%

Implementation Status – Tidal and Upper Back River Watershed Plans

In the Back River watershed, there were numerous grant funded NPS implementation projects identified but none were completed during 2014. In the Upper Back River watershed, over $1.1 million in Federal and State grants was earmarked for 20 projects. No active grant projects were identified in the Tidal Back River watershed. Progress in meeting watershed plan goals for pollutant load reduction is presented in the tables below. Both efforts are in early stages of plan implementation. (See Appendix – Watersheds for details)

Table 7. Tidal Back River Watershed Plan - 2014 Implementation Progress Summary (1)

Goals			Progress (3)					
			Implementation			Pollutant Reduction (2008-2014)		
Category (2)	Unit	Goal	2014	2008-2013	Percent of Goal	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)	Sediment (tons/yr)
Reforestation - Forest Land Mgmt	acres	35	1.18	7.61	25.1%	42.7	2.1	0.2
Buffer Reforestation, Forest Stand Mgmt	acres	156	0	0	0%	0.0	0.0	0.0
Nutrient Management	acres	186	0	0	0%	0.0	0.0	0.0
Downspout Disconnect, Roof Runoff Mgmt	acres	31	0.1	0.24	1.1%	3.7	0.7	49.2
Stream Channel Restoration	feet	17,040	0	1,980	11.6%	148.5	134.6	15.0
Street Trees, Tree/Shrub Establishment	acres	1.7	0	0	0%	0.0	0.0	0.0
Stormwater Retrofits & Mgmt Wetlands	acres	6.4	0	7.67	119.8%	38.2	5.9	1.8
Stormwater Conversion, Urban Wet Pond	units	2	2	0	100.0%	18.2	2.3	0.3
Shoreline Protection/Enhancement	units	NA	3	1	NA	764	503	1,047
					Total Cumulative Pollutant Reduction	1,015.3	648.6	1,113.80
					Pollution Reduction Goals (Watershed Plan Table 3-2, page 23)	6,498	679	NA
					Percent of Goal Achieved	15.6%	95.5%	NA

Table 8. Upper Back River Watershed Plan - 2014 Implementation Progress Summary (1)

Goals			Progress (3)					
			Implementation			Total Pollutant Reduction 2008-2014		
Category (2)	Unit	Goal	2014	2008-2013	Percent of Goal	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)	Sediment (tons/yr)
Reforestation - Forest Land Mgmt	acres	50	0.95	4.36	10.6%	26	1	0.1
Buffer Reforestation, Forest Stand Mgmt	acres	200	0	1.36	0.7%	17	2	71.1
Nutrient Management	acres	3,000	0	0	0.0%	0	0	0.0
Downspout Disconnect, Roof Runoff Mgmt	acres	180	0.65	5.0	3.1%	25	4	1.2
Stream Channel Restoration (5)	feet	66,000	0	4,000	6.1%	800.0	272.0	108.5
Street Trees, Tree/Shrub Establishment	units	4,000	0	133	2.9%	6	0	0.0
Stormwater Retrofits & Mgmt Wetlands	units	50	0	1	2.0%	2	0	0.1
Stormwater Conversion, Urban Wet Pond	units	17	2	4	35.3%	81.2	12.60	2.9
					Total Pollutant Reduction	958	292.5	183.98
					Pollutant Reduction Goal (Watershed Plan Table 3-2, page 3-8)	48,190	6,056	---
					Percent of Goal Achieved	2.0%	4.8%	---

1. 2014 is Calendar year. NA is not applicable. Zero means no progress or not reported.
2. Categories for watershed plan goals tracked by EPA for progress.
3. Data reported by local government for 2008-2012 includes local government and NGO NPS implementation.

3. Casselman River Watershed Implementation

Location

In Maryland, the Casselman River flows about 20 miles from Savage River State Forest into Pennsylvania. The watershed area is 66 square miles and is part of the Mississippi River drainage. Land use in the watershed can be aggregated into three broad categories: forest (89%), agriculture (9%), and developed land (2%).

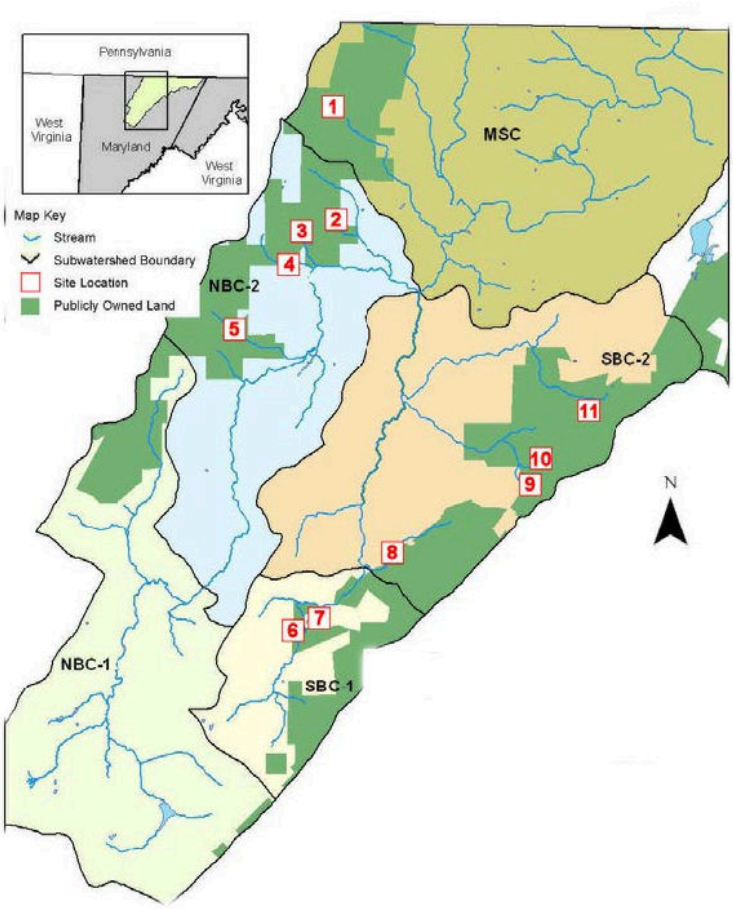


Figure 8. Casselman River watershed Phase 1 AMD mitigation sites.

Goal

MDE's 2011 watershed plan goal is to meet the pH water quality standard of no less than 6.5 pH and no greater than 8.5 pH by increasing alkalinity (mg $CaCO_3$/l). This goal is derived from the Western Maryland pH TMDLs approved in 2008 based on in-stream water quality data collected in 2005 or earlier.

Implementation

MDE's Phase 1 implementation project completed construction on public lands in 2013. In 2014, early in-stream pH results show significant pH improvements at all 11 Phase 1 sites. The 319(h) Grant contributed over $614,000 to this project. Currently, over $480,000 is budgeted in two 319(h) Grant projects for Phase 2 implementation on private lands and for development of a GIS tool to track progress, results, costs and efficiencies. (see Appendix – Watersheds)

Figure 9. In November 2014, EPA visited the completed Phase 1 project at the Big Laurel Run headwaters (site 11). Shown here is inspection of the siphon (above left) that draws stream water to the limestone leach bed (above center), which discharges back to the stream thru a limestone sand dump (above right). (MDE photos)

4. Corsica River Watershed Implementation

Location

The Corsica River, which is 6.5 miles in length, is located in Queen Anne's County. The watershed area is 40 square miles and is part of the larger Chester River Watershed. Land use in the watershed aggregates into three broad categories:
- 66% agriculture,
- 26% woodland,
- 8% developed lands.

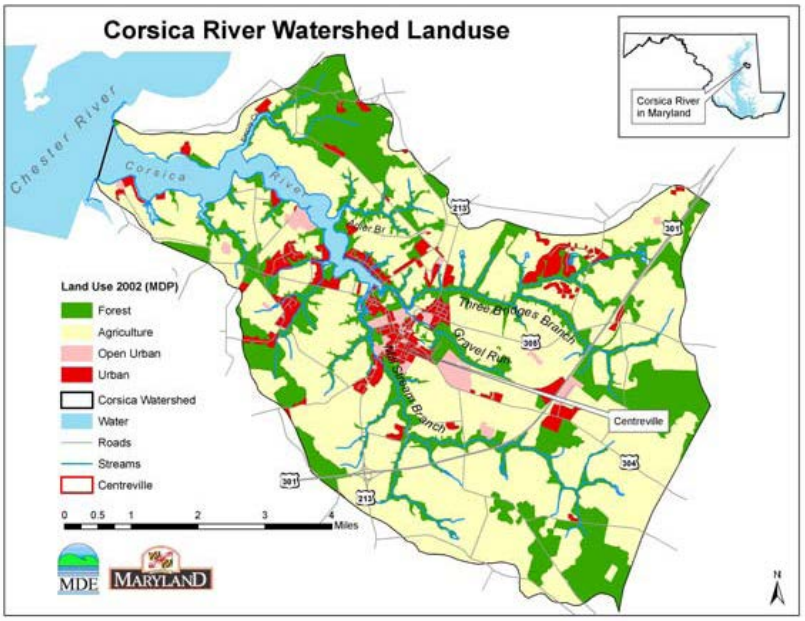


Figure 10. Corsica River Watershed

Goals

Centreville developed the Corsica River watershed plan in 2005 with input from Queen Anne's County, Queen Anne's Soil Conservation District and others. The NPS annual TMDL load allocation for nitrogen is 268,211lbs and for phosphorus is 19,380 lbs. Corsica River watershed ambient NPS nutrient loads already met the TMDL when it was approved by EPA, so the TMDL serves as a benchmark to prevent degradation (TMDL page 4 and 20). In addition, a progress report covering 2005-2011 summarized watershed plan implementation status and updated BMP implementation goals. The report is available: http://www.townofcentreville.org/departments/environment.asp

Figure 11. Adjacent to Powell Street in Centreville, part of an asphalt parking lot was converted to a stormwater infiltration area in 2013 as part of a 319(h) Grant project that continued thru 2014. The area receives runoff from an impervious area of parking and rooftops including private commercial businesses and the local fire department. (photos courtesy of the Town of Centreville)

Implementation Status – Corsica River Watershed Plan

Federal and State funds from two grant sources invested about $0.5 million in NPS implementation projects that were completed during 2014 as summarized in the table below. Also during 2014, the same Federal and State grants had over $1.4 million budgeted for other NPS implementation projects that were not yet completed. (See Appendix – Watersheds for details)

Table 9. Summary of Grant Projects Completed 2014 - Corsica River Watershed

Grant Project Expenditures					Pollutant Load Reduction Reported		
Grant Name	Federal Grants	State Grants	Non Federal Funds	Total Expenditures	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (tons/yr)
319	$114,435.47		$76,290.31	$577,725.78	32,945.20	4,405.16	41.56
Trust Fund		$387,000.00					

Following nine years of implementation to help meet watershed plan goals, significant progress is continuing to be reported for pollution reduction as summarized in the table below.

Table 10. Corsica River Watershed Plan - 2014 Implementation Progress Summary

Goals			Progress (2)					
			Implementation Progress			Total Pollutant Reduction Reported 2005 thru 2014		
Category (1)	Unit	Goal	2014	2005 thru 2013	Percent of Goal Achieved	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)	Sediment (tons/yr)
Agricultural BMPs	units	50	3	6	18%	35,846	4,791	863
Cover Crop (3)	acres	5,500	4,827		88%	32,777	4,393	0
Agricultural Buffers	acres	100	0	94.3	94%	2,173	141	0
Forest Buffers (urban)	acres	200	0	14	7%	28	8	0
Manure Transfer (3)	tons	27.4	0		0%	0	0	0
Oyster Bed Restoration	acres	20	0	11	55%	0	0	0
Rain Gardens & Bioretention	units	408	0	373	91%	150	20	1.5
Septic Tank Upgrades	systems	30	0	18	60%	73.0	0	0
Stormwater Retrofits	acres	300	0	112.5	37.5%	61.7	5.9	0
Stream Restoration	miles	2	0	0	0.0%	0.8	0.1	0.1
Waste Storage Facilities (ag)	units	1	0	1	100%	210.0	42.0	0
Wetland Restoration	acres	108	0	88.3	82%	0	0	0
					Total Pollutant Reduction	71,320	9,401	865
					Watershed Plan Nutrient Reduction Goal	100,132	6,306	---
					Percent of Goal Achieved	71.2%	149.1%	---

1. Categories for watershed plan goals tracked by EPA for progress.
2. 2014 is calendar year. Town of Centreville is lead implementer/reporter in cooperation with the Corsica Implementers Group. All 319(h) Grant-funded implementation is reported. Zero means no progress or not reported. Grey shading means not applicable.
3. Accomplishments for cover crops and manure transfer are annual practices. This table includes the most recent calendar year only.

5. Lower Jones Falls 2014 Implementation Status

Location

The Lower Jones Falls watershed encompasses 16,550 acres (25.9 mi^2) that drains portions of Baltimore County (30.09%) and Baltimore City (69.91%). About 54 miles of streams in the watershed flow into the tidal Patapsco River and then the Chesapeake Bay. Land use in the watershed is 55.9% residential (11.1% low density, 23.7% mid density and 21.1% high density). Various developed land uses cover 21.7% of the watershed (6.9% commercial, 2.4% industrial, 10.5% institutional and 1.9% highway). Open land uses account for the remaining 22.2% of the watershed area (6.1% open urban, 13.6% forest, 1.3% agriculture, 0.6% bare ground, 0.6% extractive and 0.3% water). Overall impervious cover is 31.8%.

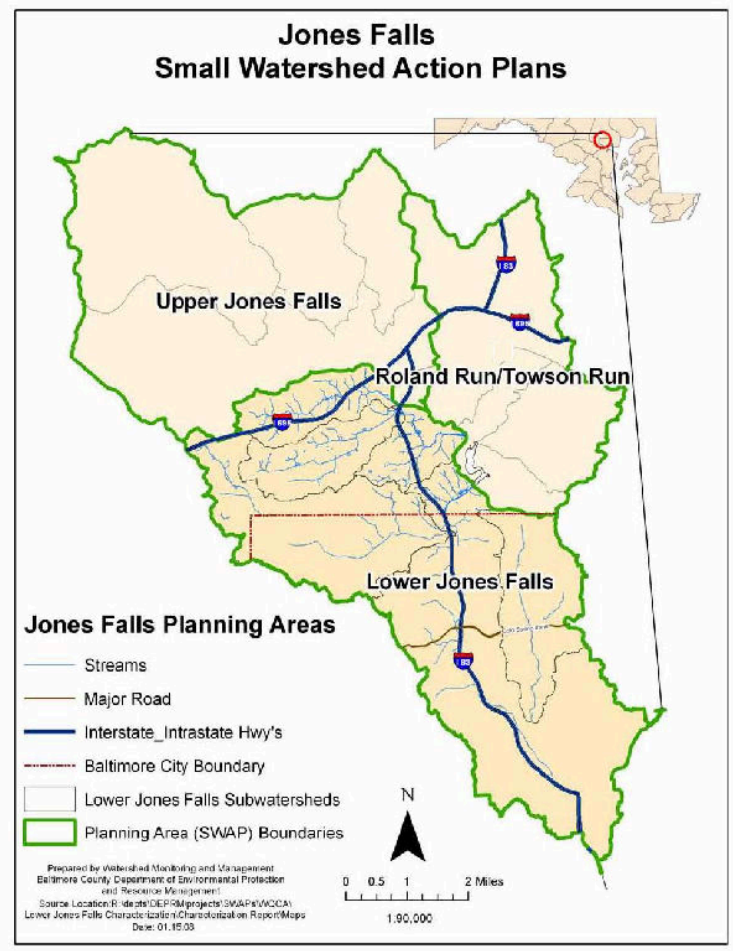


Figure 12. Jones Falls Watershed

Goals

The Lower Jones Falls Watershed Small Watershed Action Plan (Plan) was developed by Baltimore County in 2008 (CWA 104(b) funding) in partnership with Baltimore City and the Jones Falls Watershed Association. The plan accounts for pollutant load reductions prior to 2008, so only reductions after 2008 count toward plan implementation. The Plan was accepted by EPA in 2009 and it calls for the nutrient load reductions shown in the following table (including sanitary sewer overflow abatement). Baltimore County and Baltimore City are lead NPS implementers and reporters of progress for the watershed plan.

Implementation Status – Lower Jones Falls Watershed Plan

In 2014, twelve NPS implementation projects budgeted at over $1.27 million were under way in the Lower Jones Falls watershed with funding from Maryland's Chesapeake and Atlantic Coastal Bays Trust Fund. During the same period, no grant-funded NPS implementation projects were completed. (See Appendix – Watersheds for details)

Progress toward meeting the watershed plan's pollution reduction goals is summarized in the table below.

Table 11: Lower Jones Falls Watershed Plan - 2014 Implementation Progress Summary (1)

Goals			Progress (3)					
Category (2)	Unit	Goal	Implementation			Total Pollutant Reduction 2008-2014		
			2014	2008-2013	Percent of Goal	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)	Sediment (tons/yr)
Reforestation - Forest Land Mgmt	acres	2	0.26	3.06	166.0%	12.02	0.86	0.17
Buffer Reforestation, Forest Stand Mgmt	acres	NA	0	0.77	NA	8.84	0.37	40.24
Nutrient Management	acres	2,210	0	0	0.0%	0	0	0
Downspout Disconnect, Roof Runoff Mgmt	acres	250	0.03	2.71	1.1%	31.74	2.86	1.16
Stream Channel Restoration	feet	20,000	0	0	0.0%	0	0	0
Street Trees, Tree/Shrub Establishment	units	1,000	0	0	0.0%	0	0	0
Stormwater Retrofits, Urban SWM Wetlands	acres	100.0	0	1.29	1.3%	16.89	1.49	0.51
Stormwater Conversion, Urban Wet Pond	units	NA	0	0	NA	0	0	0
Total Cumulative Pollutant Reduction						69.5	5.6	42.1
Pollution Reduction Goals (Watershed Plan Table 5.4, page 85)						23,146	3,887	205
Percent of Goal Achieved						0.3%	0.1%	20.5%

1. 2014 is Calendar year. NA is not applicable. Grey shaded areas means not applicable or not reported.
2. Categories for watershed plan goals tracked by EPA for progress.
3. Data is reported by Baltimore City and Baltimore County, which includes results of nongovernmental organization activities.

6. Lower Monocacy River

Location

The Lower Monocacy River watershed encompasses 194,700 acres (304 mi^2) that drains portions of Frederick County (87%), Montgomery County (10%) and Carroll County (3%). The mainstem of the Monocacy River is 58 miles long. The Monocacy River drains into the tidal Potomac River and then the Chesapeake Bay. Overall impervious cover is 4% but it is concentrated in two subwatersheds: Carroll Creek (18.6%) and Ballenger Creek (13.4%). Land use in the watershed is:

- 47% Agricultural
- 30% Forest
- 22% Developed land uses

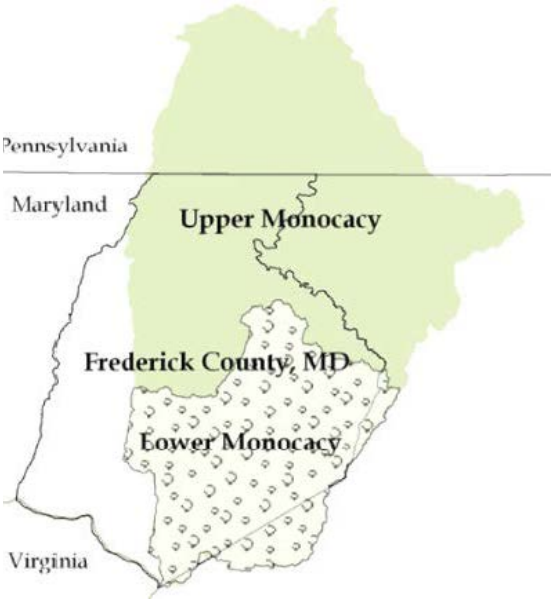


Figure 13. Monocacy River Watershed.

Goals and Implementation

Frederick County's 2004 Lower Monocacy River Watershed Restoration Action Plan addresses 168,960 acres (264 mi^2) within the County. The County's 2008 plan supplement incorporated goals from the Lake Linganore sediment TMDL, which is based on data collected in 2002 and earlier.

Figure 14. During 2014, Frederick County invested some of their current 319(h) Grant (FFY13 #7) to assist local communities with on-site implementation of NPS management like rain gardens and tree planting. In the Peter Pan Run watershed, in the Villages of Urbana community, some of the results include newly planted native tree species like the black gum (left) and hornbeam (right). (Map and photos are courtesy of Frederick County.)

Implementation Status – Lower Monocacy River Watershed Plan

Numerous NPS implementation projects are currently active in the Lower Monocacy River watershed including one $97,000 319(h) grant project and over $312,000 in state grants from the Chesapeake and Atlantic Coastal Bays Trust Fund. These projects were scheduled to be completed in 2015 or thereafter. No grant projects were identified that ended during 2014. (see Appendix – Watersheds for details)

Available information on NPS pollutant loads reductions during 2014 and prior years is summarized in the table below.

Table 12. Lower Monocacy River Watershed Plan 2014 Implementation Progress Summary (1)

Lower Monocacy Goals				Lower Monocacy Implementation Progress (2)			
Parameter		**Unit**	**Goal**	**2014**	**2006-2013**	**Cumulative Total**	**Goal % Achieved**
Nitrogen	Agriculture	lbs/yr	582,949	0	0	0	0%
	Urban	lbs/yr	67,049	23.14	2,330.9	2,354.0	3.5%
Phosphorus	Agriculture	lbs/yr	57,337	0	0	0	0%
	Urban	lbs/yr	11,615	1.57	182.9	184.4	1.6%
Sediment	Agriculture	lbs/yr	18,342,280	0	0	0	0%
	Urban	lbs/yr	2,348,084	526.49	52,603.0	53,129.5	2.3%
Lake Linganore Goals				**Lake Linganore Implementation Progress (2)**			
Phosphorus	Agricultural	lbs/yr	601,489.60	0	0	0	0%
	Urban	lbs/yr	92,106.30	0	61.6	61.6	0.07%
	Forest	lbs/yr	4,186.70	0	0	0	0%
Sediment	Agricultural	tons/yr	38,401	0	0	0	0%
	Urban	tons/yr	3,615	0	10.8	10.8	0.30%
	Forest	tons/yr	1,033	0	0	0	0%

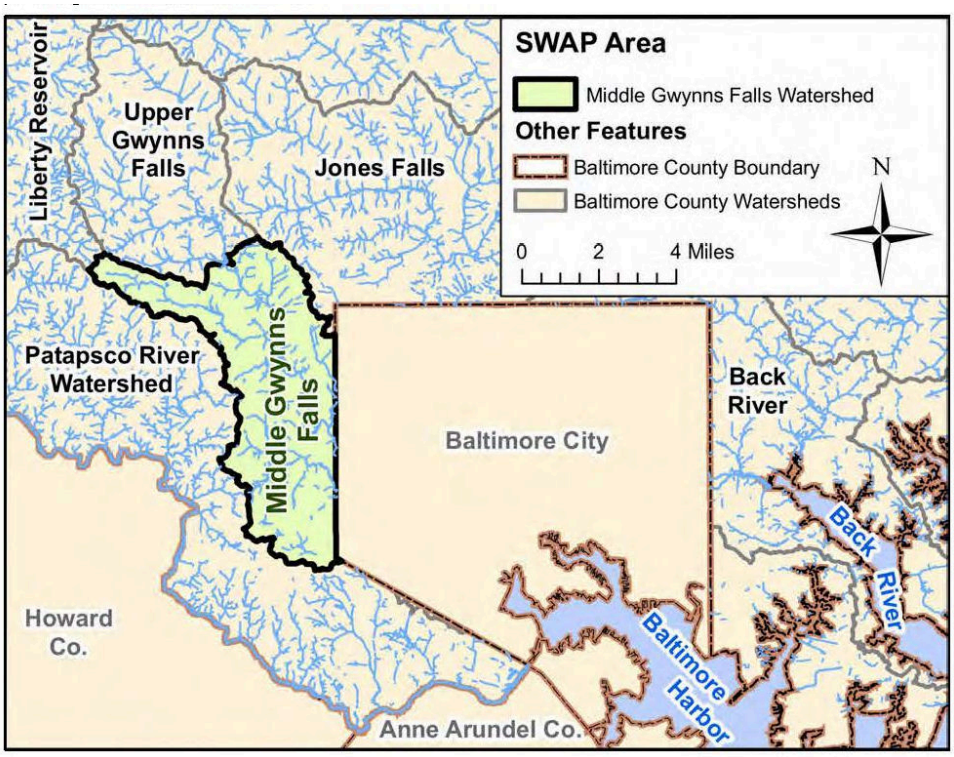
(1) 2014 is Calendar year. Frederick County is the lead plan implementer/reporter. Other entities may not be reporting implementation accomplishments. Grey shaded boxes indicate that reporting is not available.

(2) Lake Linganore is a Lower Monocacy subwatershed that has its own TMDL for phosphorus and sediment. Results reported to Lake Linganore are also included in reporting for the Lower Monocacy River watershed.

7. Middle Gwynns Falls 2014 Implementation Status

Location

Figure 15. Gwynns Falls watershed in Baltimore County



The Middle Gwynns Falls watershed encompasses 14,881 acres (23.25 mi^2) in Baltimore County (Baltimore City portion of watershed in not addressed in the watershed plan). About 77.9 miles of streams in the watershed flow into the tidal Patapsco River and then the Chesapeake Bay. Land use in the watershed is 60.9% residential (0.6% low density, 42.5% mid density and 15.2% high density). Various other developed land uses cover 21.1% of the watershed (8.3% commercial, 3.5% industrial, 6.4% institutional and 2.9 transportation). Open land uses account for the remaining 17.9% of the watershed area (5.2% open urban, 12.5% forest and 0.2% agriculture). Overall, impervious surfaces cover 28.9% of the watershed.

Goals

The Middle Gwynns Falls Watershed Small Watershed Action Plan was developed by Baltimore County in 2013-2014. In 2014, EPA accepted the plan, which makes this watershed eligible to 319(h) Grant implementation funding. The plan's many goals and objectives include improving water quality by reducing several NPS pollutants by 2025:

- Nitrogen: 29% reduction (reduce annual loads by 50,442 pounds per year)
- Phosphorus: 45.1% reduction (reduce annual loads by 4,086 pounds per year)
- Sediment: 75% reduction (reduce annual loads by 2,179 tons per year)
- Bacteria: Annual reduction goals vary for different subwatersheds. For example, at monitoring station GWN0115, the goal is a 32% reduction for human sources. At monitoring station GWN0015, the goal is over 99% reduction for human, pet and wildlife sources.
- Chloride: The plan has a general goal to reduce in-stream chloride levels.

Figure 16. Scotts Level Branch between Allenswood and McDonogh Roads had significant stream bank erosion and there was little connection to the floodplain (photos left and right). Baltimore County's watershed plan targeted this area for restoration, which was completed in 2014. (Photos courtesy of Baltimore County)

Implementation Status – Middle Gwynns Falls Watershed Plan

Table 13. Summary of Grant Projects Completed in 2014 - Middle Gwynns Falls Watershed							
Area/Lead	**Name/Description**	**End Date**	**Grant Funding Source**	**Grant Funds**		**Match**	**Total**
				Federal	**State**		
Baltimore County	Scotts Level McDonogh Road Watershed Restoration Project	2014	319 FFY12 #5	$320,004		$213,336	$1,213,340
			Trust Fund SFY13		$680,000		

Estimated Pollutant Load Reduction			
Nitrogen (lb/yr)	**Phosphorus (lb/yr)**	**Sediment (ton/yr)**	**Bacteria (MPN)**
415.20	136.4	306.2	0

During 2014, one grant-funded NPS implementation project was completed in the Middle Gwynns Falls watershed. As summarized in the table above, Baltimore County leveraged Federal, State and local funds in this section of Scotts Level Branch. The project combined stream restoration, floodplain reconnection, stormwater management and wetland creation to generate the pollutant reductions listed in the second half of the table (above right).

Table 14. Middle Gwynns Falls Watershed Estimated Pollutant Reduction Progress	Nitrogen lb/yr	Phosphorus lb/yr	Sediment tons/yr
Completed Measures before 2014 (Plan Table 3-24 page 42)	1,295.0	440.0	1,003.6
SFY 2014 Total	0.00	0.00	0.00
Total Estimated Pollutant Reduction	1,295.0	440.0	1,003.6
Goals for 2025 (Watershed Plan Table 3-3, page 23)	50,442	4,086	
Goals 2025 (Watershed Plan Addendum A Tables A-6, A-12)			9,482
Percent of Goal Achieved	2.6%	10.8%	10.6%

Following one year of implementation to help meet watershed plan goals, some progress is already reported for pollution reduction (table on left, also see Appendix – Watersheds for details)

Figure 17. The completed Scotts Level stream restoration project eliminated the eroding stream banks, reconnected the stream to its floodplain and created wetlands. (far right). In November 2014, Baltimore County hosted EPA and MDE representatives at the project site. In the center-right picture, they are inspecting one of the created wetlands. (MDE photos)

8. Sassafras River Watershed

The Sassafras River watershed encompasses 62,000 acres (96.9 mi^2) that drains portions Kent County, MD (57%), Cecil County, MD (28%) and New Castle County, DE (8%) with 13% of the watershed being surface water. The 20.6 mile-long Sassafras River mainstem flows into the Chesapeake Bay. Impervious area covers 2.2% of the watershed. Land use in the watershed is: 57% agricultural; 24% forest; 4% developed; 14% water, and; 1% wetland.

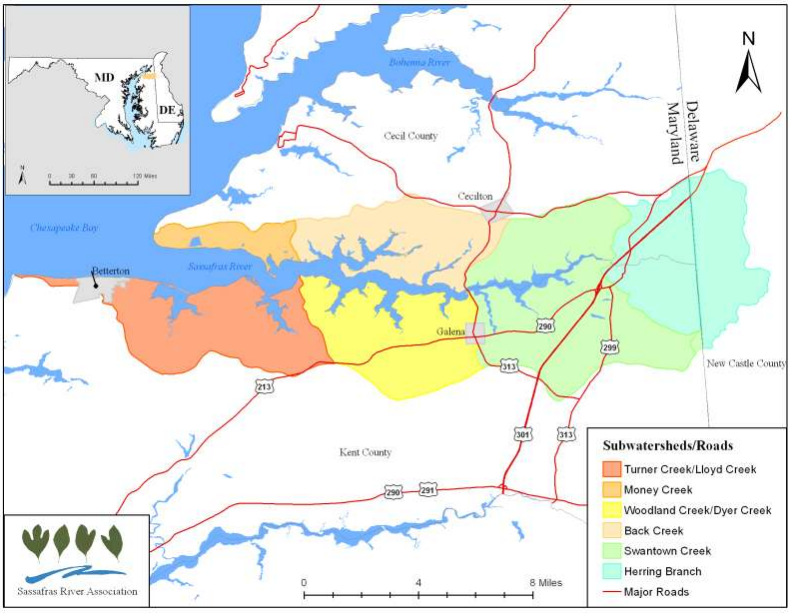


Figure 18. Sassafras River watershed map

Goals

The 2009 Sassafras River Watershed Action Plan (SWAP) was developed by the Sassafras River Association (SRA), a private nonprofit organization. The Plan lists numerous goals to be achieved within 10 years that are in part intended to meet the average annual phosphorus TMDL approved in 2002, which is based on 1999 water quality monitoring. The table on the next page lists some of these goals that are being tracked for implementation progress. The SRA is the lead plan implementer and reporter.

One goal of the Sassafras River watershed plan is to implement innovative approaches to use nutrients more effectively and efficiently. One example of progress toward meeting this goal is operating at a local 1200-head dairy farm where manure is chemically treated to reduce phosphorus and to produce manure with nutrient content that matches field/crop needs. This effort at the farm began in 2011. The technology was obtained from a west coast company, consultants provided guidance in using the system, and the Sassafras River Association partnered with the farmer. Initially a demonstration scale fluvial struvite phosphorus removal system was used. Since then, the system has been successfully scaled up to better meet farms needs. To showcase results, an on-site tour was conducted in November 2014.

Implementation Status – Sassafras River Watershed Plan

During 2014, Federal and State grants had over $1.3 million budgeted for NPS implementation projects that were not yet completed in the Sassafras River watershed. For the same period, no grant-funded projects were completed. (See Appendix – Watersheds for details)

Following five years of implementation to help meet watershed plan goals, significant progress is reported for several goals as summarized in the table below.

Table 15. Sassafras River Watershed Action Plan - 2014 Implementation Progress Summary

Goals			Progress (2)						
Goal Number and Name (1)	Unit	Units Needed	Goal Implementation Progress				Total Pollutant Reduction Reported		
			2014	Previous Years (2009-2013)	Total	Percent of Goal Achieved	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)	Sediment (tons/yr)
#1 Road retrofit, stream restored	project	3	0	0	0	0%	0	0	0
#2 Stormwater retrofits	project	4	0	1	1	25%	0	0	0
#5 Septic system upgrades	project	150	0	0	0	0%	0	0	0
#12 Stabilize eroding ravines	miles	1	0	0.3	0.3	30%	0	90	21.1
#13 Stabilize eroding shoreline	miles	0.5	0	0	0	0%	0	0	0
#14 Increase buffers (stream/shore)	miles	3	0	0	0	0%	0	0	0
#17 Agricultural cover crops (3)	acres/yr	5,000	0		0	0%	0	0	0
#20 Innovative ways of more efficient and effective use of nutrients	acres/yr	100	0	20	20	20%	0	0	0
#21 Wetland creation	projects	5	0	2	2	40%	1.4	0.2	0.05
#22 Agricultural BMPs	acres	500	0	0	0	0%	0	0	0

1. Categories for watershed plan goals tracked by EPA for progress.
2. 2014 is calendar year. Sassafras River Association is lead implementer. All 319(h) Grant-funded implementation is reported. Zero means no progress or not reported. Grey shading means not applicable.
3. Accomplishments for cover crops transfer are annual practices. This table includes the most recent calendar year only.

Figure 19. In April 2014, students from the Cecilton and Galena Elementary Schools helped to plant close to 500 trees at the Budds Landing Ravine Restoration Project in cooperation with the Sassafras River Association. They participated in a hands-on learning experience focused on how to plant a tree properly and the value of native vegetation. Additionally, the students toured the ravine restoration project (completed in late 2013) and learned about reducing sediment and nutrient pollution in Coppin Creek and the Sassafras River. (photos courtesy of the Sassafras River Association)

9. Upper Choptank River

Location

The Upper Choptank River watershed encompasses 163,458 acres (255 mi^2) and drains parts of three Maryland counties (Caroline, Talbot and Queen Anne's) and parts of Delaware. It flows into the Chesapeake Bay. Impervious area covers 2.2% of the watershed. Land use in the watershed is: 58% agricultural; 31% forest; 8% developed and; 3% water.

Goal

In the 2010, Caroline County developed the Upper Choptank River watershed plan based on Tributary Strategy NPS goals and EPA's Chesapeake Bay Program 2002 pollutant load estimates for the Upper Choptank River watershed. The Plan's NPS pollutant load goals are:

- Total nitrogen reduction: 704,000 lbs/year
- Total phosphorus reduction: 34,500 lbs/year.

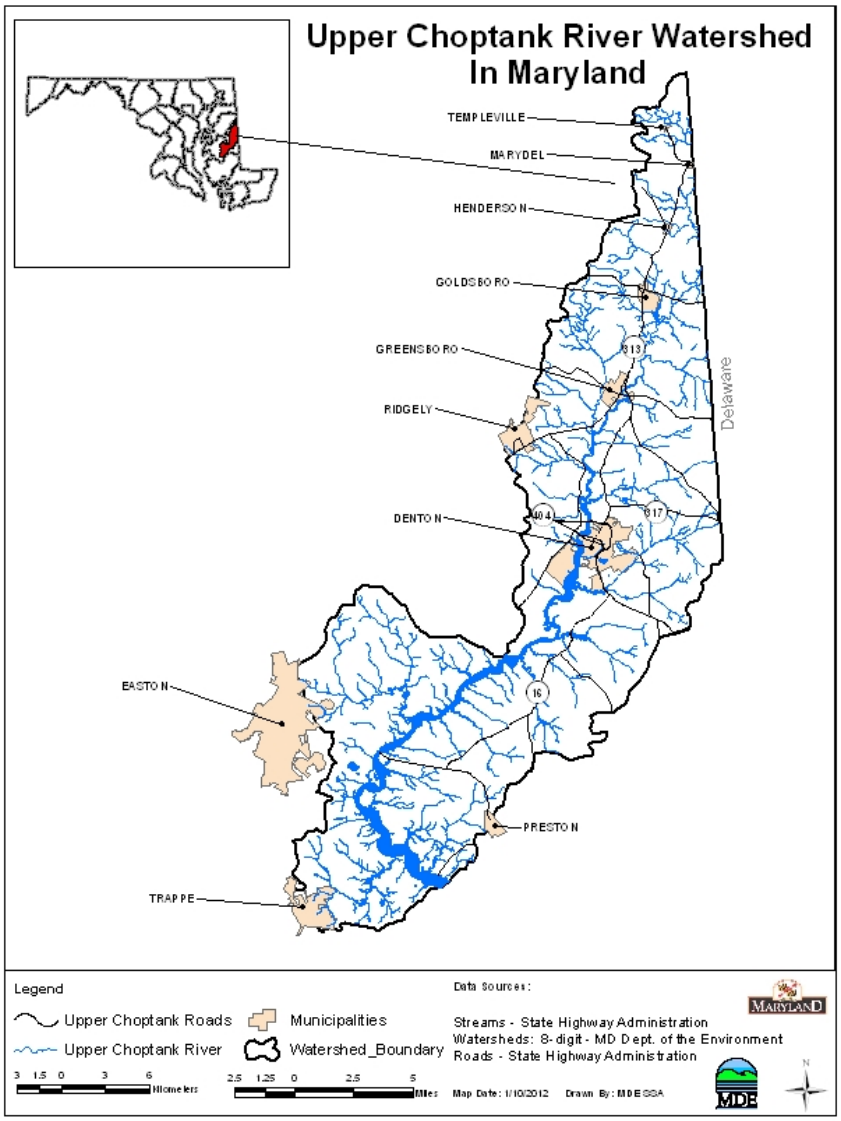


Figure 20. (above) Upper Choptank River Watershed.

Figure 21. On a chilly day in late 2014, a local paving contractor pours water on the porous asphalt parking lot that her company recently completed for Caroline County's new emergency services facility. This project was funded by the FFY2014 319(h) Grant to help implement the County's Upper Choptank River watershed plan. The demonstration of water infiltration thru the parking lot surface attracted several representatives of Caroline County (standing on left) and the National Asphalt Pavement Association (standing on right). (Photo courtesy of Caroline County Planning & Codes Administration)

Implementation Status – Upper Choptank River Watershed Plan

Table 16. Summary of Grant Projects Completed in 2014 - Upper Choptank River Watershed							
Project Summary			**Project Funding**				
Lead	**Name/Description**	**End Date**	**Grant Funding Source**	**Grant Funds**		**Non Federal Match**	**Total**
				Federal	**State**		
Caroline County	Upper Choptank Watershed Restoration	2014	319 FFY12 #6	$130,781.17	$0	$87,187.45	$217,968.62
	Upper Choptank Watershed Restoration	2014	319 FFY13 #6	$138,378.63	$0	$92,252.42	$230,631.05

During 2014, two grant funded NPS implementation projects were completed as summarized in the table above. The 319 FFY12 #6 project reported pollutant load reductions: 8.01 lb/yr nitrogen and 0.85 lb/yr phosphorus. In addition, the FFY12 grant funded a study of water quality impacts from County-owned unpaved roads, including a detailed inventory of 36 miles of dirt and gravel roads, priority needs and strategies, and recommendations for drainage and surface best management practices. The County will use the results of this study to guide implementation efforts, beginning in 2015 with funding proposals for design and engineering stormwater management retrofit projects for 10 priority road segments. For the 319 FFY13 #6 project, reported pollution load reductions resulting from the project at 16.06 lbs/yr nitrogen, 2.69 lbs/yr phosphorus, and 0.23 tons/yr sediment. Additionally, several other grant projects were active with more than $529,000 in Federal and State grant funds budgeted. (see Appendix – Watersheds for additional details)

Also during 2014, Caroline reported additional NPS implementation progress (see Appendix – Watersheds for additional details):

- Buffers (urban/developed lands riparian tree plantings: 30 acres
- Erosion and sediment control for unpaved roads including 319-funded: 29 acres
- Septic tank upgrades to reduce nitrogen: 154
- Septic tanks eliminated by hooking up to a waste water treatment plant: 125
- Stormwater management projects including 319-funded: 3 acres

Figure 22. Caroline County used 319 Grant funds (FFY12 #6) to help complete construction of several projects to manage stormwater runoff in the Town of Greensboro during 2014. In June, plantings were being installed in a new stormwater infiltration area serving the Town Hall parking lot (left). In July, installation of a similar area was completed next to the Town's Public Works Dept. garage (center). On November 13, 2014, Caroline County hosted EPA and MDE representatives who conducted on-site reviews of all the 319 grant-funds projects in Greenboro including the recently completed stormwater infiltration area serving the public library (right). (photos courtesy of Caroline County and MDE).

V. Areas of Concern/Recommendations/Future Actions

Key challenges addressed by the 319 NPS Program, in collaboration with other state efforts, include increasing NPS pollution in some areas, resource constraints versus measureable environmental results, and reporting NPS Implementation Progress. These issues were thoroughly presented in the 2013 Annual Report in chapter V, which can serve as a baseline. The 2014 updates that follow below are limited to new analyses or changes. The 2013 Annual Report is available on MDE's web page at http://www.mde.state.md.us/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319NPS/index.aspx

A. Resource Constraints versus Measurable Environmental Results

As stated in the 2013 Annual Report, documenting success stories presents a challenge because it is difficult: to implement at a scale and level of NPS management improvement to produce measurable environmental change; to identify partners willing to invest sufficient time/effort in targeted NPS implementation and monitoring, and; to collect sufficient monitoring data/analysis documenting improvement. To help address these issues in recent years, MDE was able to focus on 319(h) Grant-funded projects for watershed plan implementation and for monitoring of before/after conditions to develop success stories.

The 2013 and 2014 success stories submitted to EPA (Corsica River and Aaron Run respectively), and anticipated success stories in the Casselman River watershed, have together depended on significant investment of 319(h) Grant funds as summarized in the following table. The expenditures and additional budget together total over $4M, which encompasses about 18% of the entire Federal 319(h) Grant allocation to Maryland for grant years FFY05 thru FFY13. Additionally, monitoring costs for success stories alone is not independently tracked but probably represents most of the budget for the 319-funded Targeted Watershed project. This project is budgeted for about $450,000 annually, which typically represents around 22% of the entire Federal 319(h) Grant allocation to Maryland each year. Overall, experience in Maryland in recent years suggests that success story development may represent about two fifths of Maryland's annual 319(h) Grant allocation.

Table 17
Success Storys' Implementation-Related Investment
From 319(h) Grant Funds

Name/Watershed	319(h) Grants	Expenditures (1)	Additional Budget (1)
Aaron Run	FFY05 thru FFY07	$855,428	$0
Casselman River	FFY08 thru FFY13	$699,115	$484,926
Corsica River	FFY05 thru FFY13	$1,559,220	$414,000
	Total	$3,113,763	$898,926

(1) Expenditures listed are for fully completed grant projects. Expenditures by grant projects that are incomplete are listed under additional budget. No FFY14 319(h) Grant funds are allocated in these watersheds. The table does not include nonfederal match or leveraged funding.

B. Reporting NPS Implementation Progress

1. BMP and Pollutant Load Reduction Reporting

As indicated in the 2013 Annual Report, annual reporting of NPS implementation progress and pollution load reductions in Maryland has been hampered by issues relating to timing and incomplete implementer participation in reporting (among other issues). The Annual Report's reliance on calendar year reporting is not synchronized with State and local reporting by state fiscal year for the EPA Chesapeake Bay Program. Many NPS implementers who are active in 319 priority watersheds have decided to concentrate their reporting energy on tracking implementation of their Watershed Implementation Plan (WIP) to meet the Chesapeake Bay TMDL, which is reported by state fiscal year. As a consequence, Annual Report data on BMPs implemented and pollutant load reductions have frequently been significantly incomplete.

During 2014, MDE began drafting a process that would realign the Annual Report so that it would o report BMPs and pollutant load reduction by state fiscal year. This change has the potential to significantly improve tracking/reporting efficiency and to help ensure that the Annual Report captures a more complete data set. The change in process and methods requires review by and buy-in from implementers reporting for 319 priority watersheds before it can be implemented. Concurrence by EPA Region 3 will also be requested.

As of January 30, 2015, MDE's draft process for state fiscal year-based reporting is incomplete and is not yet ready for review. However, if review of the draft can be fully conducted between January 30 and the time that the 2014 Annual Report is finalized, MDE will consult with implementers and EPA to determine if the results of the process should be included in the 2014 Annual Report.

2. Pollutant Load Reduction by 319-Funded Implementation

During the most recent seven years, Annual Reports have included total pollutant load reductions reported by 319(h) Grant-funded projects that were completed each calendar year. During those seven years, there has been a trend toward smaller reported reductions in pollutant loads as shown in the following table.

Table 18
Pollutant Load Reductions Reported in Annual Reports
For 319(h) Grant Projects Completed Each Calendar Year

Annual Rpt Year	Nitrogen lbs/yr	Phosphorus lbs/yr	Sediment ton/yr
2008	100,000	8,500	844
2009	131,804	10,998	403
2010	171,728	22,293	264
2011	53,970	853	8
2012	46,293	749	509
2013	56,459	957	327
2014	33,381	4,572	524

This trend is related to the number of agricultural assistance projects funded by the 319(h) Grant. These grant projects primarily funded technical assistance personnel in Soil Conservation District (SCD) offices thru the Maryland Department of Agriculture. The grant-funded SCD personnel frequently helped facilitate implementation of a large number of agricultural BMPs, including crops. Consequently, these projects were able to report large numbers of BMPs implemented along with the associated estimated pollutant load reductions even though the actual BMPs where usually not funded by the 319(h) Grant. All other 319-funded implementation projects

during the same seven year period have been associated with urban BMP implementation. The urban projects generally pay directly for implementation of specific BMPs. Therefore, the urban projects are able to report far fewer BMPs completed and significantly less pollutant load reduction, which tends to cost more for each pound of pollutant reduced.

During the years 2008 thru 2014, all of the agricultural assistance projects eligible to work in 319 priority watersheds have elected to use State grant funding rather than the 319(h) Grant. The last agricultural assistance project funded by Maryland's 319(h) Grant used FFY2013 funds was in the Corsica River watershed and its final pollutant load reductions are reported in this document.

This shift has occurred in part because State grant funding sources, like the Maryland Agricultural Cost Share (MACS) Program and Maryland's Chesapeake and Atlantic Coastal Bays Trust Fund, have relatively large levels of flexible funding available. (see Appendix – Financial Information, last page, for the most recent expenditures reporting)

Currently, it seems unlikely that the 319(h) Grant will fund agricultural assistance projects in the near future unless local preferences change. It is anticipated that the next Annual Report and those that follow will report significantly less overall pollutant load reduction by 319-funded implementation projects. However, it is also anticipated that the total pollutant load reduction reported for some 319 priority watersheds will increase significantly pending successful launch of the new BMP and pollutant load reduction reporting process described in the preceding section.