Annual Report
Maryland 319 Nonpoint Source Program
State Fiscal Year 2015

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the Environment

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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 FFY2015 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

Maryland's 2015-2019 Nonpoint Source Management Plan (State NPS Plan), generated by the Maryland Department of the Environment (MDE) and partner agencies, was approved by the US Environmental Protection Agency (EPA) in January 2015. The document's vision, mission, goals are shown on the right. The completed document raft 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.

The State NPS Plan is designed to meet requirements of the Federal Clean Water Act Section 319 and to be consistent with Maryland commitments and responsibilities in the Chesapeake Bay Agreement, the Chesapeake TMDL, and Maryland's Chesapeake Bay Watershed Implementation Plan (WIP).

To realize the visions in these documents, 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 role in helping to protect and improve of Maryland's water quality. The NPS Program promotes and funds State and local watershed planning/implementation efforts, water quality monitoring to evaluate progress, governmental partnership/cooperation and education/outreach. 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 the Federal Clean Water Act Section 319, this report documents the activities and accomplishments by the State of Maryland 319 NPS Program. MDE is the lead agency for administering Section 319, including the 319(h) Grant. 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 $54.7 million through the 319(h) Grant to support the Maryland's NPS management program including on-the-ground implementation of best management practices (BMPs).

This annual report is Maryland's first based on state fiscal year 2015 (SFY15, July 2014 thru June 2015). This important change from prior years that used calendar year, allows synchronization of reporting to meet requirements under CWA Section 319(h) and under the EPA Chesapeake Bay Program (CBP). This change also allows the Maryland Departments of the Environment (MDE) and Agriculture (MDA) to more thoroughly report BMP implementation using a unified data reporting and tracking process than was possible in prior annual reporting. All lead agencies implementing watershed plans in the 319 priority watersheds welcomed this change in timeframe for reporting.

This Annual Report is the first to include implementation progress reporting of milestones in *Maryland's 2015-2019 Nonpoint Source Management Plan* (State Plan):

- In 319 priority watersheds, overall reported reductions of nitrogen, phosphorus, and sediment during SFY15 are significantly greater than the SFY15 goals in the State Plan. In these watersheds, sediment reductions achieved by 319-funded projects accounted for about one percent of the total but where three times greater than the State Plan goal.
- Statewide implementation of cover crops, agriculture nutrient management plans, and upgrades to septic systems to reduce nitrogen for SFY15 was significantly greater than State Plan goals. For the same period, reported statewide implementation of agricultural Soil Conservation and Water Quality Plans and estimated nitrogen reduction associated with urban stormwater retrofits were less than the State Plan goals.
- In the 10 Maryland 319 priority watersheds, significant SFY15 pollutant load reductions were reported for nonpoint source implementation (all funding sources), particularly when annual practices like cover crops included:
    - Nitrogen 552,125 lb/yr for all BMPs (38,145 excluding annual agricultural BMPs);
    - Phosphorus 6,701 lb/yr for all BMPs (3,663 excluding annual agricultural BMPs), and;
    - Sediment 3,994 tons/yr for all BMPs (1,633 excluding annual agricultural BMPs).

Overall reported funding of NPS implementation in priority watersheds reached $8.67M from the Federal 319(h) Grant and $7.38M from State funding thru the end of SFY15. (excluding match for the 319 Grant)

One 319-funded project completed during SFY15 reported implementing best management practices. The project's estimated pollutant load reductions were: nitrogen 34.2 lbs/yr, phosphorus 10.3 lbs/year and sediment 16.75 tons/year.

Three Maryland State agencies reported expending over $47 million for nonpoint source programs and implementation during SFY15. (Departments of Agriculture, Environment and Natural Resources only)

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 mostly designed to reduce nitrogen, phosphorus and sediment pollutant loads.
- Maryland's Coastal Bays receives runoff from Maryland's eastern-most coastal plain in Worcester County. During State Fiscal Year 2015 (SFY15), 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. Total Nitrogen Sources in Maryland SFY 2015

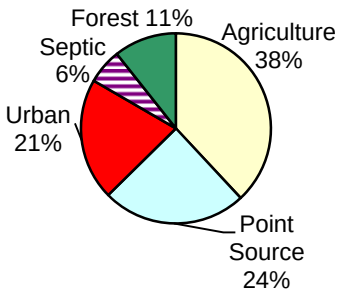
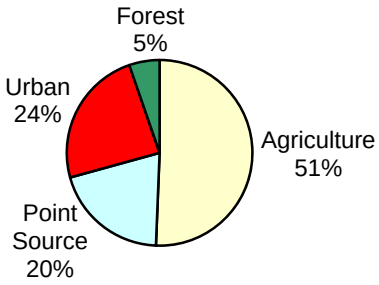


Figure 2. Total Phosphorus Sources in Maryland SFY 2015



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 (Chesapeake Bay Model 2015 progress run V8N022516). 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.

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 SFY15 for Maryland is in **Appendix – Financial Information**.

Chapter IV of the Annual Report provides brief summaries of grant-funded NPS Program activities during SFY15 in 319 priority watersheds. More detailed information supporting Chapter IV is in **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 SFY15 success story is based on MDE analysis of monitoring data from Big Laurel 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. (see **Appendix – Success Story**).

IV. Major Accomplishments, Successes and Progress

A. Statewide

1. Overall Progress

With EPA's approval of *Maryland's 2015-2019 Nonpoint Source Management Plan* in January 2015, this annual report is the first to report progress based on the new milestones and to use state fiscal year instead of calendar year as the reporting period. Another change is more complete implementation progress reporting in 319 priority watersheds (see Figure 3). Now, in addition to local input, MDE is also using data reported for use in the Chesapeake Bay Model. 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.

2. NPS Management Program Milestones

Maryland's 2015-2019 Nonpoint Source Management Plan includes specific categories of objectives designed to focus effort on reducing and preventing NPS pollution: 1- Regional Coverage, 2- Multiple Scales, 3- Pollutants and Stressors, 4- Pollutant Sources, 5- Types of Waterbodies, 6- Protection and Restoration, 7- Priority Setting, and 8- Program Management and Evaluation. Under these categories are specific objectives with milestones to gage progress. The table below summarizes SFY15 progress for selected milestones.

Table 1. Milestones SFY15 Progress

Obj. #	**Objective Name** (abbreviated)	Goal 2015	Report 2015
3	Annual nitrogen NPS Loads to Bay	report progress	36,180,015
	Nitrogen: overall reduction in 319 priority watersheds (lb/yr)	50,000	552,125.0
	Annual phosphorus NPS Loads to Bay	report progress	2,289,574
	Phosphorus: overall reduction in 319 priority watersheds (lb/yr)	1,000	6,701.3
	Sediment: 319-funded projects annual reductions (tons/yr)	5	16.75
	Sediment: overall reduction in 319 priority watersheds (tons/yr)	200	1,632.56
4	Cover crop acreage	386,000	457,522
	Nutrient Management Plan acreage (report includes all 3 Tiers)	448,570	877,015
	Soil Conservation and Water Quality Plan acreage	926,000	888,252
	Septic system upgrades to remove nitrogen (count) (1)	1,200	1,731
	Stormwater retrofits (nitrogen reduction lb/yr) (2)	18,000	8,218
	Local stormwater WLA implementation plans reviewed	4	4
5	319 priority watersheds: implement watershed plans	report progress	See section IV.B in this document

(1) Annual average of 2014 and 2015 total. (2) Underestimate of actual due to complexity of calculating estimate. See Appendix Milestones for a complete listing of milestones and progress for this state fiscal year.

3. Success Stories

During SFY15, MDE reported a success story on improvements in Big Laurel Run, which is a tributary to the Casselman River in Garrett County, Maryland. MDE planned and implemented the work necessary to eliminate the low pH impairment to the stream caused by acid mine drainage. MDE also conducted the before and after water quality monitoring and analysis that was necessary to document the in-stream improvements. See Appendix – Success Story.

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. Since that time, MDE has collaborated with the United States Department of Agriculture/National Resources Conservation Services (USDA/NRCS) three subwatersheds (Upper, Middle, and Lower) of the Catoctin Creek eight-digit watershed were selected for participation in the National Water Quality Initiative. A combination of nutrient synoptic surveys and surface water bi-weekly monitoring was conducted from the spring of 2013 until December 2015. Nutrient synoptic surveys included eight sampling events, once in spring and fall, at eighty-two sites within the subwatersheds from 2012 through 2015. Bi-weekly surface water monitoring for nutrients and monthly sampling for Enterococci was conducted at fifteen sites in the Middle and Lower subwatersheds from 2013 through 2015.

Synoptic survey results determined excessive concentrations of total phosphorus (TP) present in all three subwatersheds of Catoctin Creek. To a lesser extent, concentrations of orthophosphate (PO_4) were elevated in predominately the middle and lower subwatersheds. Nitrate-nitrite (NO_{23})

and total nitrogen (TN) exceedances were almost exclusively found in the middle and lower subwatersheds.

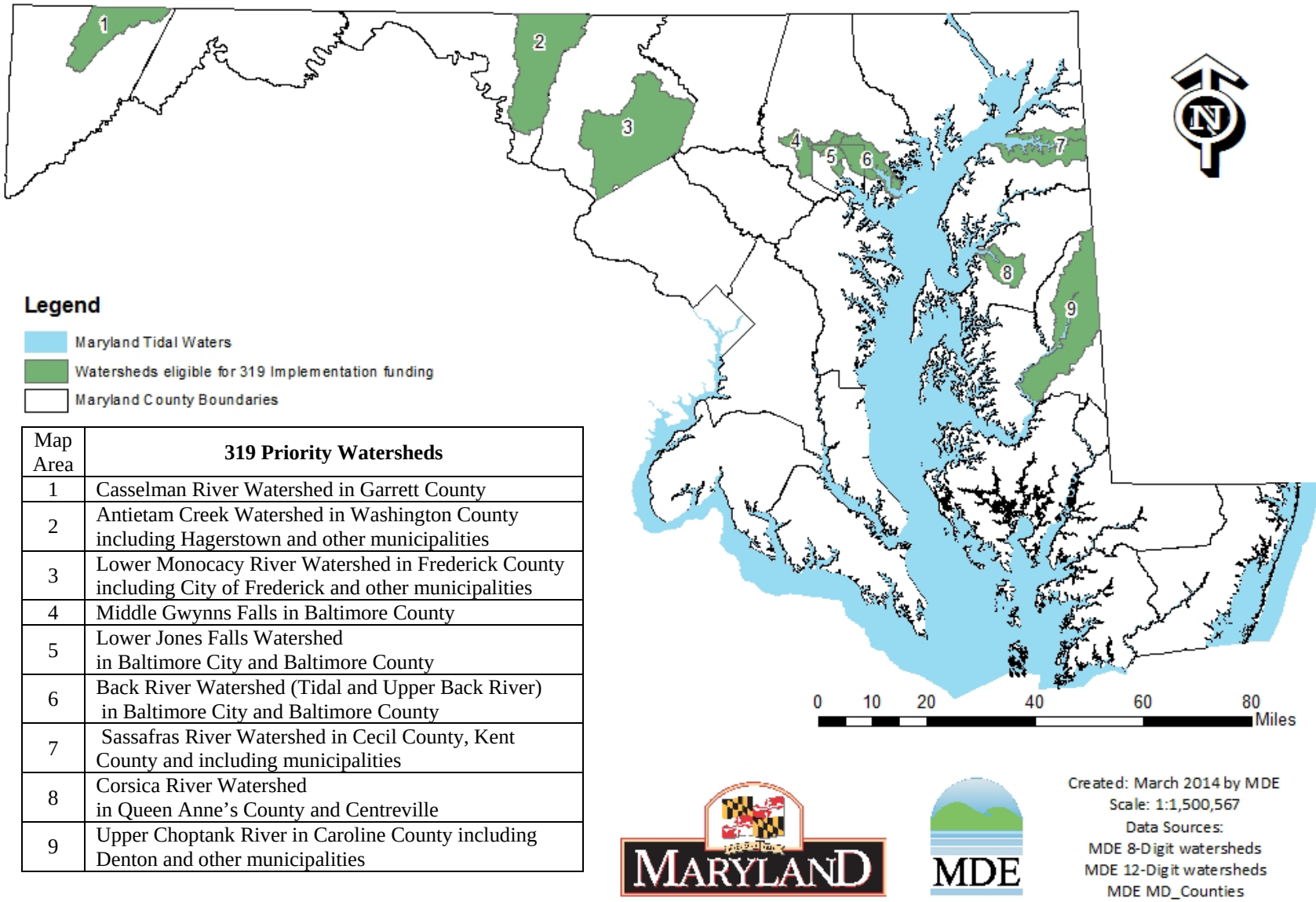
Overall, the nutrients synoptic surveys identified the majority of elevated nutrient loading "hotspots" were located in the middle and lower Catoctin Creek sub-watersheds. The concentrations of nutrients in these hotspots were fairly consistent in each synoptic survey. Thus, the in-stream bi-weekly surface water monitoring was focused in the two lower sub-watersheds. Two particular in-stream monitoring stations were found to have elevated or excessive concentrations of all measured nutrient parameters during all sampling events. A third in-stream station was found to have elevated or excessive concentrations of all parameters except for NH_4. Consistent with results from the synoptic surveys TP and PO_4 loadings were the highest of all measured nutrient parameters.

Enterococci bacteriological samples were collected monthly at fifteen of the in-stream bi-weekly surface water monitoring sites. Results from the enterococci sampling indicated elevated concentrations during the majority of the sampling events at all fifteen of the in-stream surface monitoring sites. Starting in November 2013 and continuing through December 2014, MDE submitted bacteriological samples to the Department of Biological Sciences at the University of Salisbury for Microbial Source Tracking (MST). During phase I of the project, fourteen samples collected from four sites on the Catoctin River were analyzed for the presence of the cow genetic marker M2. The four sites were consistently contaminated with cow fecal material. In phase II of this project, four of the Catoctin River samples (collected after the rain event of November 17, 2014) were analyzed for the presence of the human marker HF183. None of the four samples showed any level of contamination by human fecal material.

MDE sampled four stations quarterly for Nitrogen isotope monitoring. The purpose of this monitoring was to help identify biological versus other (e.g., crop) sources of Nitrogen (N). Data from one of the monitoring stations suggested nitrogen was associated with soils. Nitrogen at the other three sites appeared to be associated with soils as well as septic and/or manure.

During every sampling event in-situ water quality measurements of temperature, pH, conductivity, turbidity, and dissolved oxygen were recorded for each site. In-situ measurements found occasional pH anomalies scattered across various stations during different sampling events. Elevated pH was not found consistently at any station or consecutive sampling events.

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

During SFY15, ten priority watersheds in Maryland are eligible for 319(h) Grant implementation funding. Additionally one watershed plan completed implementation and one watershed plan is being drafted in an effort to seek eligibility. The table below summarizes watershed planning status in each area. The locations of the priority watersheds are mapped in Figure 3. (also see Appendix – Financial Information)

Table 2. 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/
Coastal Bays	Coastal Bays	TBD	Planning	Worcester County	*TBD*	TBD	Not posted
Ohio River Basin	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

During SFY15 1n the 319 priority watersheds, there were six 319(h) Grant-funded implementation projects working. In addition, one project was completed during that time as listed in Table 2. Additional information on all of these projects is provided in the following sections of this report and in Appendix - Watersheds.

Table 3. Pollutant Load Reductions Reported by 319 Projects Completed in SFY15

319 Priority Watershed	319(h) Grant Implementation Project Completed or SFY15 Project Status	Nitrogen lbs/yr	Phosphorus lbs/yr	Sediment ton/yr
Antietam Creek	Kiwanis Park Phase 1	34.2	10.3	16.75
Back River - Tidal	no projects active or completed	0	0	0
Back River - Upper	no projects active or completed	0	0	0
Casselman River	1 active project, none completed	0	0	0
Corsica River	2 active projects, none completed	0	0	0
Lower Jones Falls	no projects active or completed	0	0	0
Lower Monocacy River	1 active project, none completed	0	0	0
Middle Gwynns Falls	no projects active or completed	0	0	0
Sassafras River	no projects active or completed	0	0	0
Upper Choptank River	2 active projects, none completed	0	0	0
TOTAL		34.2	10.3	16.75

Also, in 319 priority watersheds, implementation progress was accomplished using funding from sources other than the 319(h) Grant. Table 4 summarizes the aggregate pollutant load reduction reported by projects regardless of funding source. Additional details are summarized in the following sections for these watersheds and in Appendix - Watershed.

Table 4. SFY15 Pollutant Load Reductions in Priority Watersheds (revised 6/29/16)

319 Priority Watershed	Sub Watershed	Nitrogen lbs/yr	Phosphorus lbs/yr	Sediment ton/yr
Antietam Creek	All in Maryland	70,160.4	1,305.2	1,007.20
Back River	Tidal (entire County subwatershed)	24.6	2.8	731.30
	Upper (Baltimore City and County)	108.8	19.3	2.10
Casselman River	All in Maryland	0	0	0
Corsica River	All	25,218.1	206.1	51.10
Lower Jones Falls	All (Baltimore City and County)	0.9	0.1	0
Lower Monocacy River	All incl. Lake Linganore, Frederick Co. only	205,668.3	2,256.2	1,674.90
Middle Gwynns Falls	All in Baltimore County only	91.1	0.4	0.20
Sassafras River	All in Maryland only	66,820.9	660.6	359.20
Spring Branch (ended 2009)	All in Baltimore County only	521.0	32.0	5.20
Upper Choptank River	All in Caroline County only	184,031.9	2,250.6	168.40
TOTAL		552,646.0	6,733.3	3,999.60

Tables 4 and 5 include the Spring Branch watershed but other parts of the Annual Report do not address this watershed. The Spring Branch watershed plan was fully implemented in 2009 and it is not currently eligible for 319(h) Grant funding unless Baltimore County elects to significantly revise the plan and EPA accepts the revised plan.

Table 4a summarizes the overall NPS project funding from the 319(h) Grant and from reported State funding sources (State Revolving Fund and the Chesapeake and Atlantic Coastal Bays Trust Fund. Additional details are summarized in the following sections for these watersheds and in Appendix - Watershed. (Table added to report 7/7/16)

Table 4a. Overall 319(h) Grant and State Funding Reported in Priority Watersheds

319 Priority Watershed	Federal 319(h) Grant Funds Total $	State Funds Total $ (excludes match for 319)
Antietam Creek	2,151,927.63	429,832.99
Back River - Tidal	556,443.00	3,552,820.16
Back River - Upper	644,383.81	538,844.67
Casselman River	699,115.00	6,440.19
Corsica River	1,559,220.24	947,147.61
Lower Jones Falls	139,000.00	168,474.54
Lower Monocacy River	1,297,996.21	160,373.15
Middle Gwynns Falls	320,004.00	680,000.00
Sassafras River	64,000.00	680,303.30
Spring Branch (ended 2009)	240,000.00	0.00
Upper Choptank River	998,812.42	213,320.60
TOTAL	8,670,902.31	7,377,557.21

Includes all 319(h) Grant NPS implementation projects and all reported State-funded implementation projects before and after the watershed plan.

Match for 319(h) Grant NPS implementation projects is excluded in this table because it frequently is not associated with the in-the-ground project.

1. Antietam Creek Watershed

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, Milestones and Progress

The State NPS Management Plan Objective 5 lists two milestones for Antietam Creek:

1) Annual implementation progress reporting for goals in the 2012 watershed plan by the Washington County SCD (see next page and Appendix Watersheds), and
2) A 2017 assessment of progress and potential watershed plan update.

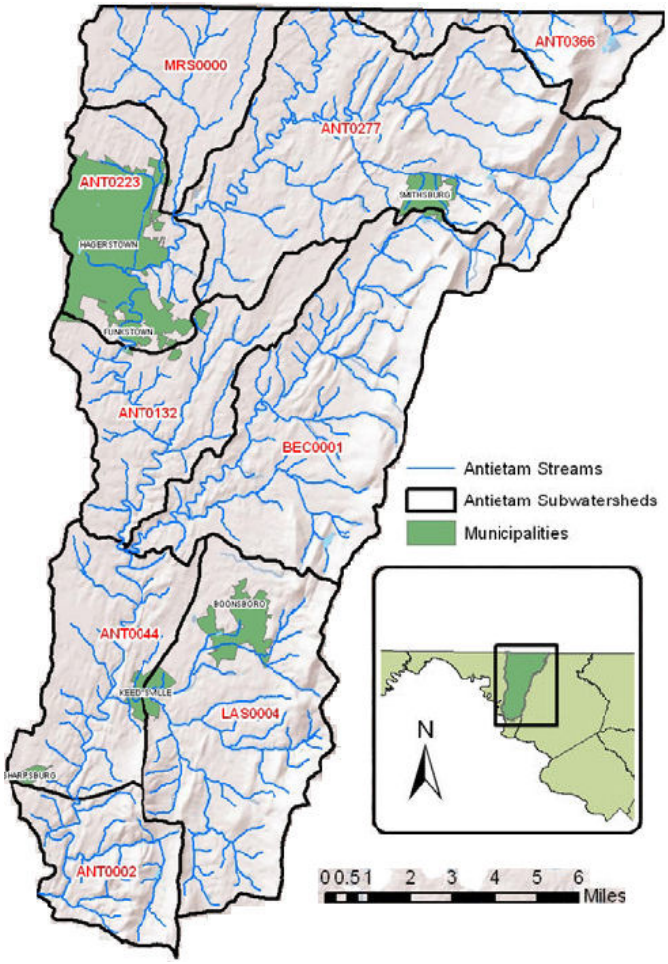


Figure 4. Antietam Creek Watershed.

Figure 5. Before the Phase 1 stream restoration on the Barr property on Little Antietam Creek, there was significant stream bank erosion (below left, Washington County SCD photo). Immediately after construction in October 2015 the eroding banks are gone. (below right, 319(h) Grant FFY13 project 10, MDE photo)

Implementation Status Antietam Creek Watershed Plan

Between 2012 and June 2015, over $1 million has been invested in completed projects to help implement the Antietam Creek Watershed Plan as the table (right) summarizes.

Table 5: Grant Expenditures Summary 2012 to June 2015
Antietam Creek Watershed Plan Implementation

	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 tons/yr**	**E. coli billion/yr**
319(h) Grant	383,161.09	0.00	255,440.73	638,601.82	144.2	47.7	102.0	0
State Revolving Fund	0.00	424,600.00	0.00	424,600.00	202.0	10.7	0.0	0
Chesapeake & Atlantic Coastal Bays Trust Fund	0.00	5,232.99	0.00	5,232.99	197.3	14.2	5.3	0
TOTAL	383,161.09	429,832.99	255,440.73	1,068,434.81	543.5	72.6	107.3	0

Table 6: Pollution Load Reduction Progress

Antietam Creek Watershed	**Nitrogen lb/yr**	**Phosphorus lb/yr**	**Sediment tons/yr**	**E. coli billion/yr**
Prior to 2014	0	0	0	0
State Fiscal Year 2014	14,051.2	559.9	328.24	0
State Fiscal Year 2015	70,126.2	1,294.9	990.43	0
Total Pollutant Reduction	84,177.4	1,854.7	1,318.67	0
Watershed Plan Goals			12,923	5,411,472
Percent of Goal Achieved			10.2%	0.0%

All funding sources. Annual BMPs are included SFY15 only. Also Appendix Watershed.

During the same 3-year period, pollutant load reductions from all sources are beginning to accumulate as shown in the next table (left). One of the projects contributing to this progress is featured in the photos on this page.

Figure 6. Along the Little Antietam Creek in Hagerstown's Kiwanis Park, the Washington County Soil Conservation District (WCSCD) worked with the City using multiple funding sources to eliminate soil erosion along the steep bank (top photo). The completed project placed large rock and cut back the slope in different areas. (Top and left photos are by WCSCD. Right photo is by MDE during a site review by MDE and EPA conducted Oct. 15, 2015.)

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, funded thru three Federal and State grant/loan sources, are summarized on the next page. The pollutant removal goals in both the Tidal Back River and the Upper Back River watershed plans are drawn from the same nutrient TMDL. However, the BMP implementation goals in the two plans differ in order to serve the different needs of the tidal and upper watersheds.

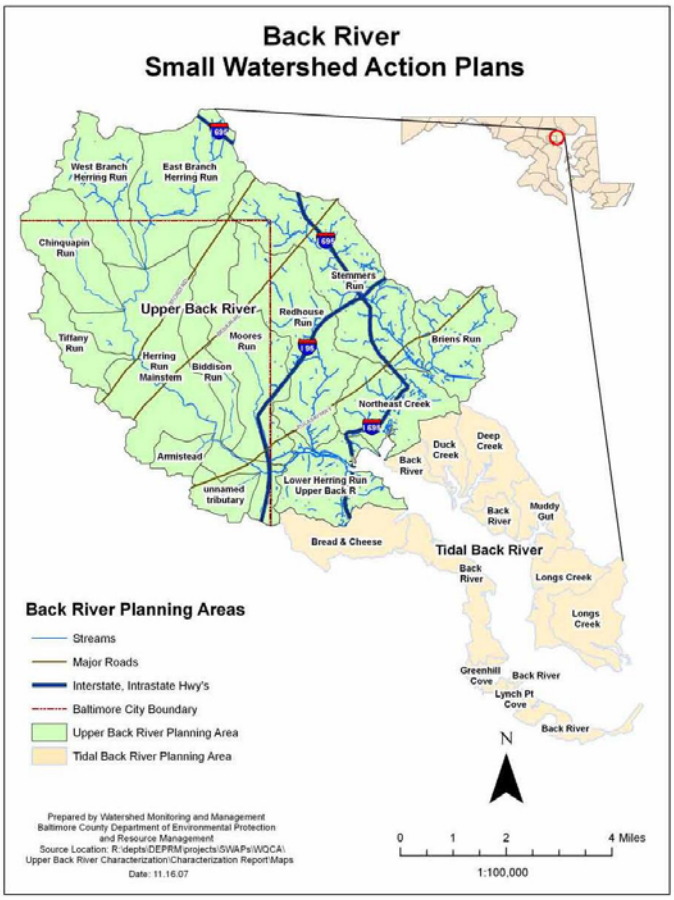


Figure 7. Back River Watersheds.

Figure 8. In the Tidal Back River watershed, a portion of the Bread and Cheese Creek on the Berkshire Elementary School property was part of stream restoration project. Work completed in 2013 is shown in the top photo by MDE. About two years later, the same bend in the stream is showing improved vegetative stabilization (right). This part of the project was 319(h) Grant-funded in the FFY2010 project 11. The 2015 photo was taken by Baltimore County during their post construction project monitoring.

Implementation Status – Tidal and Upper Back River Watershed Plans

Table 7: Grant Expenditures Summary Tidal Back River Watershed Plan Implementation							
Grant Project Expenditures					**Pollutant Load Reduction**		
Grant Name	**Federal Grants $**	**State Grants $**	**Non Federal Match $**	**Total $ Expenditures**	**Nitrogen lb/yr**	**Phosphorus lb/yr**	**Sediment tons/yr**
319(h) Grant	556,443.00		370,962.00	1,000,000.00	280.1	94.2	214.0
State Revolving Fund		3,102,100.00		5,785,123.00	1,451.0	166.5	24.0
Chesapeake & Atlantic Coastal Bays Trust Fund		450,720.16		450,720.16	547.5	146.1	6.9
TOTAL	556,443.00	3,552,820.16	370,962.00	7,235,843.16	2,278.6	406.8	244.9
MDE and DNR data. See Appendix Watershed.							

Table 8: Pollution Load Reduction Progress			
Tidal Back River Watershed	**Nitrogen lbs/yr**	**Phosphorus lbs/yr**	**Sediment tons/yr**
2010-SFY14	865.7	508.4	831.4
SFY15	24.6	2.8	731.3
Total Estimated Pollutant Reductions 2010-SFY15	890.3	511.2	831.8
Watershed Plan Goals	6,498	679	
Percent of Goal Achieved	13.7%	75.3%	
Baltimore County estimates. See Appendix Watershed.			

Table 9: Grant Expenditures Summary Upper Back River Watershed Plan Implementation							
Grant Project Expenditures					**Pollutant Load Reduction**		
Grant Name	**Federal Grants $**	**State Grants $**	**Non Federal Match $**	**Total $ Expenditures**	**Nitrogen lb/yr**	**Phosphorus lb/yr**	**Sediment tons/yr**
319(h) Grant	644,383.81	228,899.00	429,589.21	1,572,822.35	712.7	53.1	10.1
State Revolving Fund	0	0	0	0	0	0	0
Chesapeake & Atlantic Coastal Bays Trust Fund		309,945.67		309,945.67	669.5	35.8	1.4
TOTAL	644,383.81	538,844.67	429,589.21	1,882,768.02	1,382.2	88.8	11.5
MDE and DNR data. See Appendix Watershed.							

Table 10: Pollution Load Reduction Progress			
Upper Back River Watershed	**Nitrogen lbs/yr**	**Phosphorus lbs/yr**	**Sediment tons/yr**
2008-SFY14	264.6	145.3	46.1
SFY15	108.8	19.3	2.1
Total Estimated Pollutant Reductions 2010-SFY15	373.4	164.6	48.2
Watershed Plan Goals	48,189.6	6,055.8	
Percent of Goal Achieved	0.8%	2.7%	
Baltimore County estimates. See Appendix Watershed.			

3. Casselman River Watershed

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%).

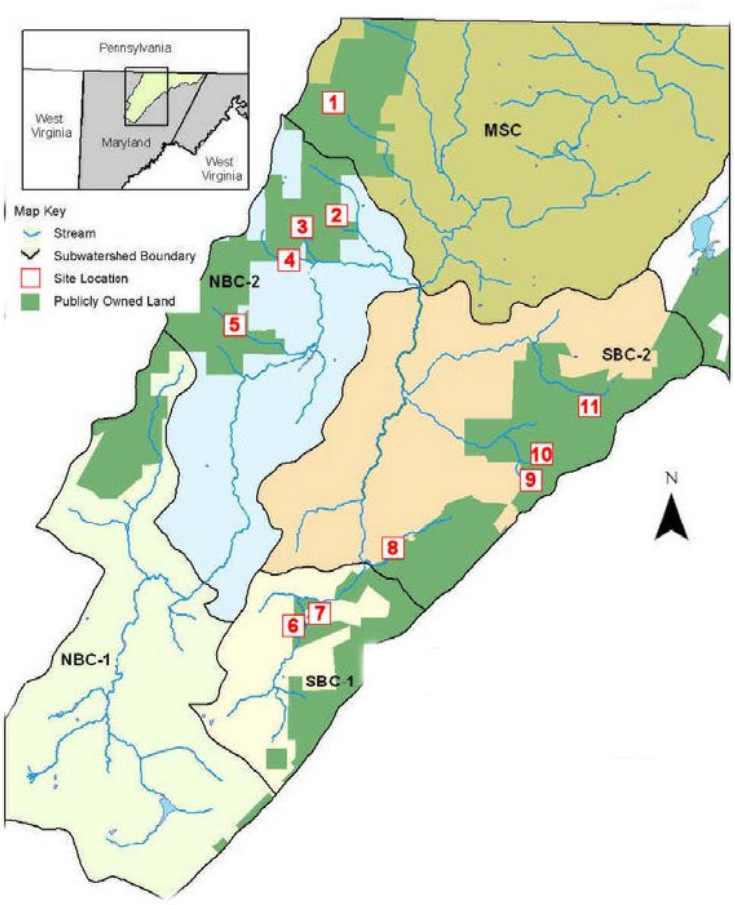


Figure 9. Casselman River watershed Phase 1 AMD mitigation sites.

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 2 implementation is underway installing BMPs to mitigate acid mine drainage in streams flowing thru private property. For more information see Appendix – Watersheds.

Figure 10. The site pictured (left) was installed on private land in 2015 to allow a delivery truck to backup adjacent to the stream and dump limestone "sand" stream at the stream edge. The limestone, which was crushed to the approximate sixe of sand particles, is allowed to wash downstream. In the stream, the limestone particles balance the low pH acid mine drainage water and to add buffering capacity in the stream. (photo by MDE Land Management Administration, Abandoned Mine Land Division.)

4. Corsica River Watershed

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.

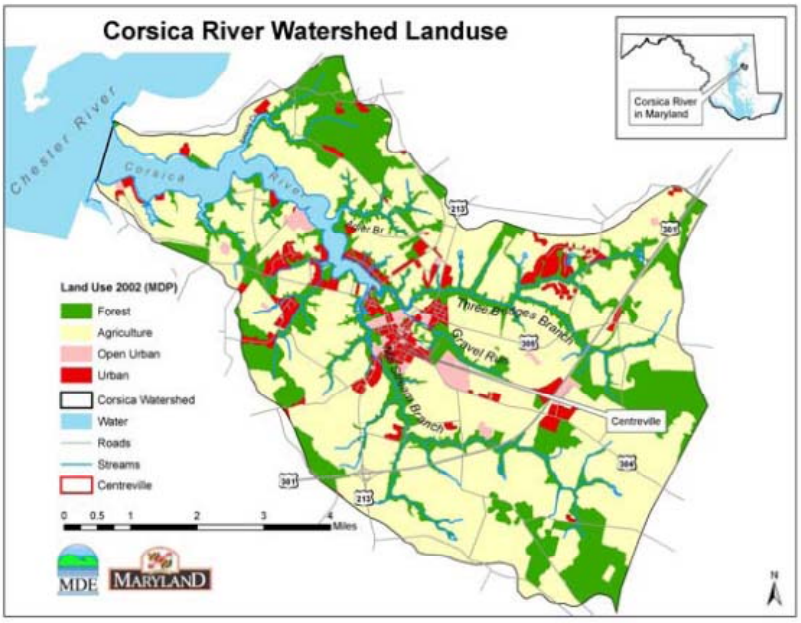


Figure 11. Corsica River Watershed

Goals

Table 11: Pollution Load Reduction Progress			
Corsica River Watershed	**Nitrogen lb/yr**	**Phosphorus lb/yr**	**Sediment tons/yr**
Prior to 2014	33,795.3	4,483.5	863.3
State Fiscal Year 2014	2,839.2	171.4	152.2
State Fiscal Year 2015	25,218.1	206.1	51.1
Total Estimated Pollutant Reduction 2008 thru 2014	61,852.5	4,860.9	1,066.6
Watershed Plan Goals (1)	NA	NA	NA
Percent of Goal Achieved	NA	NA	NA
All funding sources. Annual BMPs in SFY15 only. See Appendix Watershed.			

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 goal of the watershed plan is to continue meeting the nutrient TMDL. Since the plan was completed, significant pollutant reduction has been accomplished (table on left) primarily thru investment of several million dollars of public funding (table below). 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

Table 12: Grant Expenditures Summary - Corsica River Watershed Plan Implementation							
	Grant Project Expenditures				**Pollutant Load Reduction**		
Grant Name	**Federal Grants $**	**State Grants $**	**Non Federal Match $**	**Total $ Expenditures**	**Nitrogen lb/yr**	**Phosphorus lb/yr**	**Sediment tons/yr**
319(h) Grant	1,559,220.24	70,000.00	1,039,480.16	2,633,700.45	215,847.2	13,785.1	1,956.0
State Revolving Fund		200,000.00		250,000.00	864.0	173.0	
Chesapeake & Atlantic Coastal Bays Trust Fund		677,147.61		677,147.61	395.5	28.2	4.6
TOTAL	1,559,220.24	947,147.61	1,039,480.16	3,560,848.06	217,106.7	13,986.2	1,960.6

5. Lower Jones Falls Watershed

The Lower Jones Falls watershed encompasses 16,550 acres (25.9 mi^2) in Baltimore County (30.09%) and Baltimore City (69.91%). About 54 miles of streams in the watershed flow into the tidal Patapsco River and 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%.

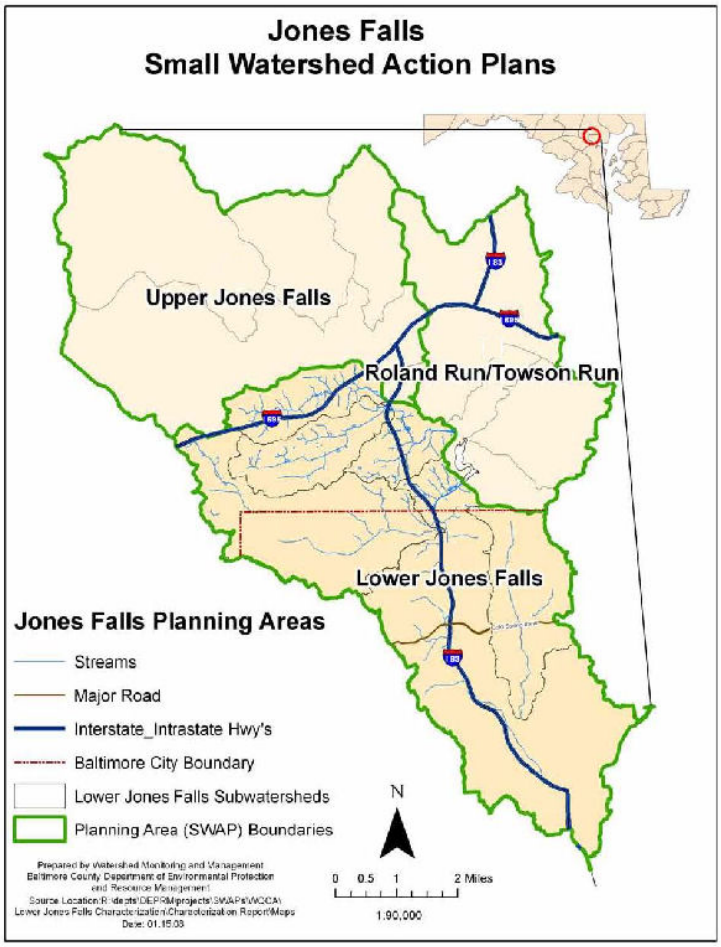


Figure 12. Jones Falls Watershed

Implementation Status – Lower Jones Falls Watershed Plan

Table 13: Grant Expenditures Summary - Lower Jones Falls Watershed Plan Implementation								
Grant Project Expenditures					Pollutant Load Reduction			
Grant Name	Federal Grants $	State Grants $	Non Federal Match $	Total $ Expenditures	Nitrogen lb/yr	Phosphorus lb/yr	Sediment tons/yr	Bacteria billions/yr
319(h) Grant	139,000.00		92,666.67	231,666.67				
State Revolving Fund		0.00		0.00				
Chesapeake & Atlantic Coastal Bays Trust Fund		67,810.54		67,810.54	9.4	0.5	0.06	
TOTAL	139,000.00	67,810.54	92,666.67	299,477.21	9.4	0.5	0.1	0.0

Table 14: Pollution Load Reduction Progress				
Lower Jones Falls Watershed	Nitrogen lb/yr	Phosphorus lb/yr	Sediment tons/yr	Fecal Coliform billions/yr
2008 thru SFY2014	52.0	2.5	0.7	
State Fiscal Year 2015	0.9	0.1	0.0	
Total Estimated Pollutant Reduction	52.8	2.6	0.8	
Watershed Plan Goals (1)	23,146	3,887	204.9	4,679,348
Percent of Goal Achieved	0.2%	0%	0%	0%
Baltimore County estimates. See Appendix Watershed.				

6. Lower Monocacy River Watershed

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

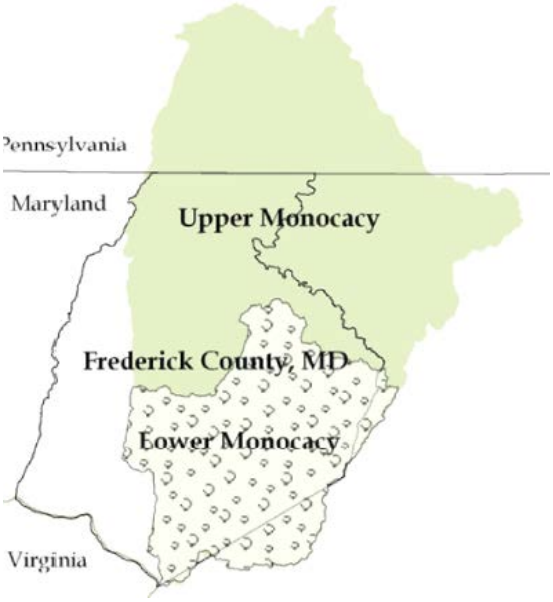


Figure 13. Monocacy River Watershed.

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. This summer at Frederick County's Urbana Elementary School, the bioswale presented maintenance issues common for some designs for this BMP. Invasive plant seeds are frequently entering the BMP and have the capability to overwhelm the native plantings in this type of design (left). After weeding (right) the extent of area needing intensive management is readily visible. This example helps illustrate how design selection determines long term maintenance needs and operational costs. (Map and photos are courtesy of Frederick County. Capital funding included 319 FFY08 project 4 completed 2012)

Implementation Status – Lower Monocacy River Watershed Plan

Table 15: Grant Expenditures Summary Lower Monocacy River Watershed Plan Implementation							
Grant Project Expenditures					**Pollutant Load Reduction**		
Grant Name	**Federal Grants $**	**State Grants $**	**Non Federal Match $**	**Total $ Expenditures**	**Nitrogen lb/yr**	**Phosphorus lb/yr**	**Sediment tons/yr**
319(h) Grant	1,297,996.21		690,558.81	1,824,803.30	3,124.0	417.9	31.4
State Revolving Fund		0		0	0	0	0
Chesapeake & Atlantic Coastal Bays Trust Fund		160,373.15		160,373.15	711.4	47.3	8.3
TOTAL	1,297,996.21	160,373.15	690,558.81	1,985,176.45	3,835.4	465.2	39.7

Table 16: Pollution Reduction Progress Reported			
Lower Monocacy River Watershed	**Nitrogen lb/yr**	**Phosphorus lb/yr**	**Sediment tons/yr**
2013 Annual Report	2,330.9	182.9	26.3
State Fiscal Year 2014	12,948.3	1,257.1	401.5
State Fiscal Year 2015	205,668.3	2,256.2	1,674.9
Total Estimated Pollutant Reduction 2008 thru 2014	220,947.5	3,696.2	2,102.7
Watershed Plan Goals (1)	649,998	68,952	10,345
Percent of Goal Achieved	34.0%	5.4%	20.3%
Notes: SFY2015 includes annual agricultural BMPs but prior years do not. Also see Annual Report Appendix Watershed.			

7. Middle Gwynns Falls Watershed

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. The tables below show watershed plan implementation activity.

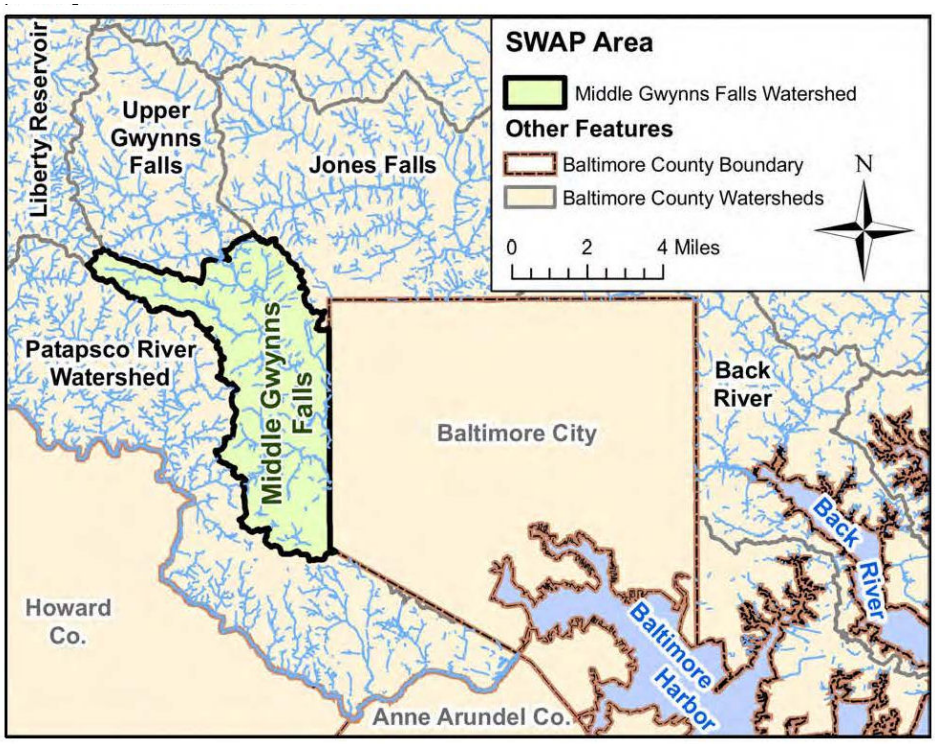


Figure 15. Gwynns Falls watershed in Baltimore County

Table 17: Grant Expenditures Summary - Middle Gwynns Falls Watershed Plan Implementation								
Grant Project Expenditures					Pollutant Load Reduction			
Grant Name	Federal Grants $	State Grants $	Non Federal Match $	Total $ Expenditures	Nitrogen lb/yr	Phosphorus lb/yr	Sediment tons/yr	Bacteria MPN/yr
319(h) Grant	320,004.00		213,336.00	533,340.00	415.2	136.4	306.2	0
State Revolving Fund		0		0	0	0	0	0
Chesapeake & Atlantic Coastal Bays Trust Fund		680,000.00		680,000.00	418.7	134.0	0.2	0
TOTAL	320,004.00	680,000.00	213,336.00	1,213,340.00	833.9	270.4	306.4	0

Table 18: Pollution Load Reduction Progress				
Middle Gwynns Falls Watershed	Nitrogen lb/yr	Phosphorus lb/yr	Sediment tons/yr	Bacteria MPN/yr
Urban Sept. 2013-SFY14	150.0	134.3	0.1	
Agriculture SFY14	0.0			
Urban SFY15	12.9	0.4	0.2	15% reduction
Agriculture SFY15	78.2			
Total Pollutant Reduction	241.1	134.7	438.7	
Watershed Plan Goals	50,442.0	4,086.0	2,179.0	99.99%
Percent of Goal Achieved	0.5%	3.3%	0.01%	15%
Baltimore County estimates. Bacteria reduction is based on in-stream monitoring data from calendar Year 2014 only. See Appendix Watershed.				

8. Sassafras River Watershed Plan

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.

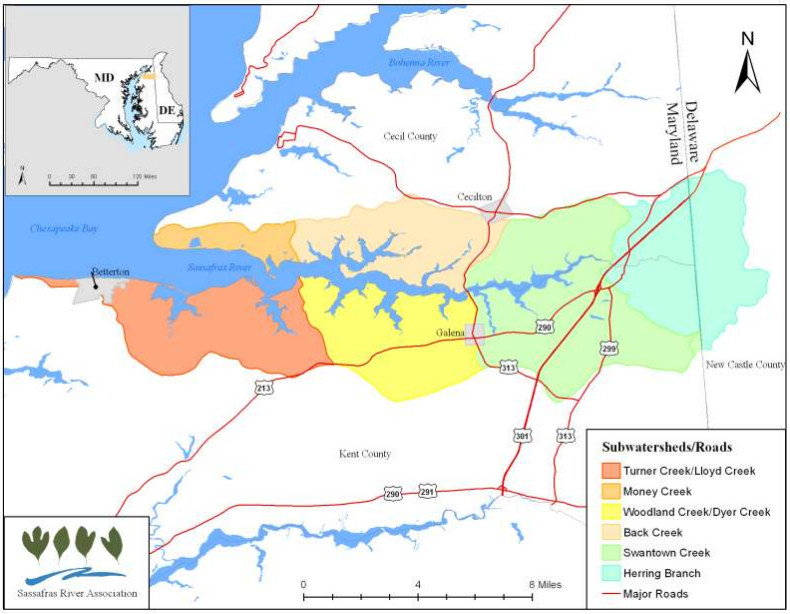


Figure 16. Sassafras River watershed map

Plan Implementation Progress

The 2009 Sassafras River Watershed Action Plan (SWAP) was developed by the Sassafras River Association (SRA), a private nonprofit organization. The SRA is the lead plan implementer. Plan implementation progress is summarized on the next page and details are in Appendix Watershed.

Figure 17. In mid October 2015 at the Phipps dairy farm in Kent County, Maryland, representatives of the Sassafras River Association and Kent Soil Conservation District are explaining the design of recently installed treatment wetlands to visiting MDE and EPA representatives. At this site, stormwater from the dairy's heavy use area flows across a concrete apron and over an area stabilized by riprap before entering the constructed wetlands. After passing thru three treatment cells, stormwater exits at the tree line. In the wooded area, the project also helped to stabilize a pre-existing 30-foot deep ravine. (photos by MDE. Federal funds: 319 FFY13 project 8. State funds: Chesapeake and Atlantic Coastal Bays Trust Fund.)

Implementation Status – Sassafras River Watershed Plan

Table 19: Grant Expenditures Summary - Sassafras River Watershed Plan Implementation							
Grant Project Expenditures					Pollutant Load Reduction		
Grant Name	Federal Grants $	State Grants $	Non Federal Match $	Total $ Expenditures	Nitrogen lb/yr	Phosphorus lb/yr	Sediment tons/yr
319(h) Grant	64,000.00		42,666.67	108,333.33	100.7	20.2	2.6
State Revolving Fund		0		0	0	0	0
Chesapeake & Atlantic Coastal Bays Trust Fund		680,303.30		680,303.30	3,630.5	1,019.1	109.50
TOTAL	64,000.00	680,303.30	42,666.67	788,636.63	3,731.2	1,039.3	112.1

Table 20: Pollution Load Reduction Progress			
Sassafras River Watershed	Nitrogen lb/yr	Phosphorus lb/yr	Sediment tons/yr
2013 Annual Report	1.4	90.2	21.15
State Fiscal Year 2014	5,424.5	347.0	147.9
State Fiscal Year 2015	66,820.9	660.6	359.2
Total Estimated Pollutant Reduction	72,246.8	1,097.8	528.3
Watershed Plan Goals (1)	46,475	6,458	721.9
Percent of Goal Achieved	155.5%	17.0%	73.2%
All funding sources. Annual BMPs in SFY15 only. See Appendix Watershed.			

The Sassafras River Association (SRA) emails a newsletter that includes information on watershed plan implementation and other SRA activities. The following are two examples adapted from their newsletter.

The Swantown Creek Ravine Restoration project has been on the radar of staff members at SRA since 2009, when residents of Swantown Creek pointed out a sediment delta at the mouth of a perennial stream fed by a large ravine system on a waterfront farm. Given the relatively steep topography surrounding streams and the sandy loam soils common to the Sassafras watershed west of Highway 301, it is no surprise that one of the largest sources of sediment to the river is the erosion of forested ravine systems and streams. In 2014, property owners gave permission to conduct an assessment of the ravine and associated streams. The SRA developed a conceptual plan to utilize rock weir grade control structures within the incised stream channel to bring the system back up to the floodplain. A combination of hydraulic and mechanical dredging will be utilized to restore the historical channel contours in Swantown Creek, and that material will be utilized to backfill behind the structural weirs. Bioretention will be utilized at the head of the ravine to infiltrate stormwater and reduce energy within the stream channel. The project is projected to eliminate massive erosion within the stream system. Restoring the hydrology of the floodplain will support isolated wetlands and promote nutrient cycling while supporting improved habitat for several rare, threatened, and endangered species. The project is projected to cost $1.1 million and construction will begin in 2016 pending completion of the design and funding availability.

Stream clean-ups are one of ways that the SRA involves volunteers. For example in April 2015, fifty-two volunteers combed the river's edge and roadsides of the Sassafras watershed in an activity known as Project Clean Stream. This hearty group of river-lovers filled 179 garbage bags with trash from the marshes, riverbanks, and roads – a total of 4,100 pounds of trash! And as if that weren't enough, they also collected 695 recyclable bottles and cans, 31 automobile tires, two lawn chairs, two 55 gallon plastic drums, a highway reflective barrel, a dog bowl and a broken canoe! Eleven of the volunteers were from Washington College, who traveled from Chestertown to the shores of Mt. Harmon Plantation on the north side of the river.

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.

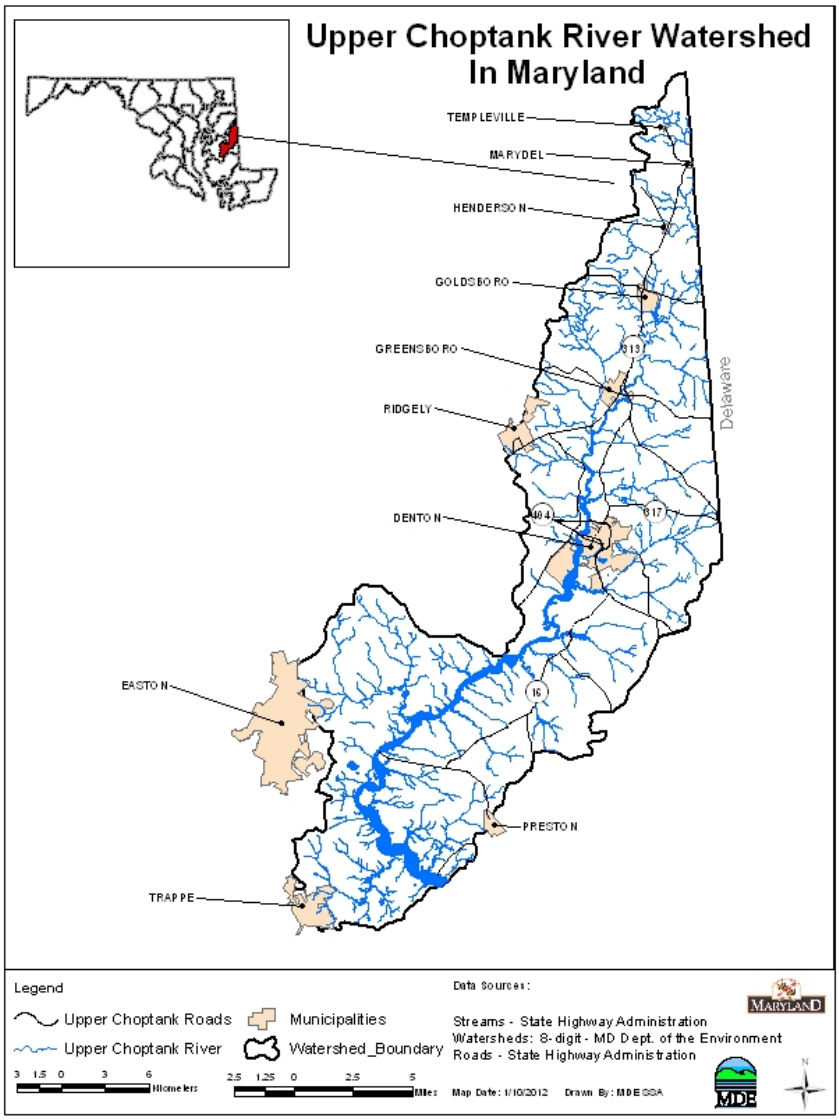


Figure 18. (above) Upper Choptank River Watershed.

Figure 19. In November 2014, the proposed site of a stormwater infiltration retrofit BMP adjacent to Caroline County's DPW employee parking lot was included in EPA annual review of Maryland's 319 NPS Program (below left). Almost exactly one year later during the 2015 EPA annual review, the completed site was again on the agenda. County representatives reported that the BMP was functioning as designed although plantings at one end of the BMP was requiring additional effort to establish. (Photos by MDE, funding from 319 FFY13 project 6)

Implementation Status – Upper Choptank River Watershed Plan

Table 21: Grant Expenditures Summary – Upper Choptank River Watershed Plan Implementation							
Grant Project Expenditures					**Pollutant Load Reduction**		
Grant Name	**Federal Grants $**	**State Grants $**	**Non Federal Match $**	**Total $ Expenditures**	**Nitrogen lb/yr**	**Phosphorus lb/yr**	**Sediment tons/yr**
319(h) Grant	998,812.42		665,874.95	1,664,687.37	220,884.7	13,091.7	1,128.9
State Revolving Fund		0		0	0	0	0
Chesapeake & Atlantic Coastal Bays Trust Fund		213,320.06		213,320.06	3,686.9	23.5	4.12
TOTAL	998,812.42	213,320.06	665,874.95	1,878,007.43	224,571.6	13,115.1	1,133.1

Table 22: Pollution Load Reduction Progress			
Upper Choptank River Watershed	**Nitrogen lb/yr**	**Phosphorus lb/yr**	**Sediment tons/yr**
Prior to 2014	169,237.2	14,671.3	793.91
State Fiscal Year 2014	9,656.5	1,343.8	70.39
State Fiscal Year 2015	184,031.9	2,250.6	168.43
Total Estimated Pollutant Reduction	362,925.6	18,265.7	1,032.73
Watershed Plan Goals (1)	704,000	34,500	
Percent of Goal Achieved	51.6%	52.9%	
All funding sources. Annual BMPs in SFY15 only. See Appendix Watershed.			

Figure 20. In the Town of Greensboro in Caroline County, a grassy slope adjacent to the Town Hall parking was identified in 2013 as a future bioretention site (top left). By June 2014, the installation of the project was just recently completed (bottom left). Then in October 2015 when EPA and MDE representatives visited the site the vegetation had filled in and the site was functioning as designed to capture and infiltrate parking lot stormwater runoff (bottom right). This project was one of several in Greensboro that used FFY2012 319(h) Grant funds to help implementation the Upper Choptank River Watershed Plan. (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 presented in the 2013 and 2014 Annual Reports, which are available on MDE's web page at http://www.mde.state.md.us/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319NPS/index.aspx Several additional issues relating to timeframe, estimating pollutant load reduction and limitations of the 319(h) Grant are noted below.

A. Timeframe

This annual report focuses on state fiscal year 2015 (SFY15, July 2014 thru June 2015), which for the first time synchronizes reporting to meet requirements under CWA Section 319(h) and under the EPA Chesapeake Bay Program (CBP). This allows the Maryland Departments of the Environment (MDE) and Agriculture (MDA) to more thoroughly report BMP implementation using a unified data reporting and tracking process than was possible in prior annual reporting. However, there are two issues that users of this report should take into account:

- In January 2016, Baltimore County elected to use their own tracking and reporting for the 319 priority watersheds rather than accepting the estimates generated by MDE (in part using input from the Maryland Department of the Agriculture).
- The 2014 Annual Report and prior years used calendar year timeframes. To help address this disparity, Baltimore elected to generate data based on state fiscal year for all four of their 319 priority watershed plans (Back River Tidal and Upper, Lower Jones Falls and Middle Gwynns Falls). For the other 319 priority watersheds, the SFY15 Annual Report also includes SFY14 BMP implementation data. Additionally, MDE and MDA will try to report BMP data for selected prior state fiscal years so that progress toward watershed plan implementation can be more thoroughly and consistently assessed.

B. Incomplete BMP implementation data reporting

In prior years, calendar year reporting for 2014 and previous years, local lead implementers responsible to reporting progress toward watershed plan goals frequently lacked access to agricultural data and sometimes implementation by NGOs. For SFY14, SFY15 and future years, the unified data streams managed by MDE and MDA for reporting and tracking BMPs should help minimize this problem.

C. Estimating pollutant load reductions for nutrients and sediment

In this annual report, Baltimore County requested that their estimates be used in the annual report for watershed plan progress tracking within their jurisdiction. For all other 319 priority watersheds and for the overall state milestones, MDE used the Maryland Assessment and Scenario Tool (MAST) to estimate BMP pollutant load reductions for nitrogen, phosphorus and sediment. In future annual reports, it can be anticipated that local jurisdictions may continue to prefer using their own estimates.

D. 319-Funded Implementation Limitations for Producing Pollutant Load Reductions

As reported in the 2014 Annual Report, implementation projects funded by the 319(h) Grant are few and they generate a small number BMPs with an overall small total amount of pollutant load reduction. SFY15 continues the trend. As the SFY15 Annual Report indicates, the majority of

NPS BMP implementation in the 319 priority watersheds tends to be accomplished by other funding sources. This trend is anticipated to continue in future years because funding sources like the State's Chesapeake and Atlantic Coastal Bays Trust Fund and the Maryland Agricultural Cost Share program have significantly more dollars to invest and offer broader eligibility with less burdensome requirements than the 319(h) Grant.