LIST OF APPENDICES

Name	General Description of Contents
BMP Implementation Progress	Aggregated statewide reported BMPs implemented
Financial Information	319(h) Grant and Maintenance of Effort summaries
Integrated Report	Draft 2016 Integrated Report Executive Summary
Milestones	Maryland 2015-2019 NPS Management Plan - Milestone implementation progress
Success Story	Little Laurel Run
Watershed: - Antietam Creek - Back River, Tidal and Upper - Casselman River - Corsica River - Lower Jones Falls - Lower Monocacy River - Middle Gwynns Falls - Sassafras River - Upper Choptank River	Each watershed listed is eligible for 319(h) Grant implementation funding. The appendix addresses several topics: - Introduction: Watershed plan context and goals, watershed-specific milestones from Maryland's 2015-2019 NPS Management Plan Objective 5, water quality status summary - Grant-funded implementation projects summary for the 319(h) Grant, State Revolving Fund, and the Chesapeake and Atlantic Coastal Bays Trust Fund. - BMP implementation reported with estimated pollution load reductions.

Appendix – BMP Progress – State Fiscal Year 2016
BMP Implementation Progress In Maryland (1)

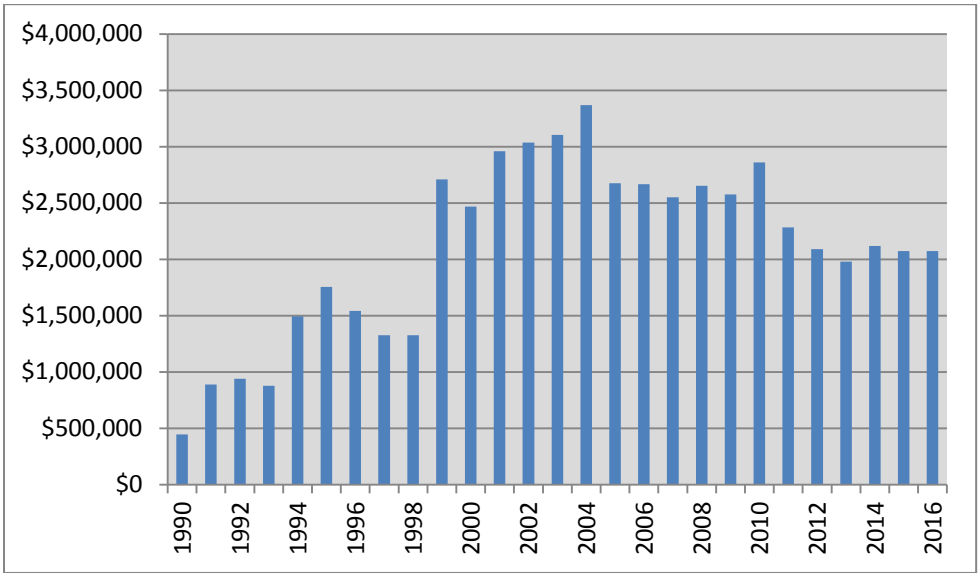
Type of Practice	Statewide Total	Nitrogen Reduction Approx. (lb/yr)	Phosphorus Reduction Approx. (lb/yr)
Animal Composters on Ag Lands	35	315	8
Animal Waste Management Systems-Livestock	859	1,034,497	117,137
Animal Waste Management Systems-Poultry	722	162,302	18,378
Cover Crops	485,143	875,328	40,002
Dry Detention Ponds and Hydro Structures	53,185	19,420	2,404
Dry Extended Detention Ponds	30,345	44,320	2,743
Filtering Practices	7,235	21,134	1,962
Forest Conservation	115,909	1,587	21
Forest Harvesting Practices	13,873	9,496	148
Grassed Buffers	52,703	405,064	46,399
Infiltration Practices	16,110	94,118	6,189
Nutrient Management Plan Implementation	851,672	1,551,130	227,670
Retirement Of Highly Erodible Lands	27,877	131,790	1,383
Riparian Forest Buffers on Ag Lands	23,050	253,509	20,293
Riparian Forest Buffers on Urban Lands	977	1,152	333
Runoff Control	1,460	2,132	132
Septic Connections to Sewers	2,016	14,722	0
Septic Denirification	10,573	48,636	0
Soil Conservation Water Quality Plans	897,600	1,021,736	179,961
Stream Protection w/Fencing	730	9,971	976
Stream Protection w/o Fencing	58,224	66,276	10,376
Stream Restoration	232,959	3,978	353
Tree Planting on Agricultural Lands	27,877	323,670	39,745
Water Control Structures	2,949	22,155	0
Wet Ponds	63,538	92,801	12,922
Wetland Restoration on Ag Lands	13,752	52,440	9,858

(1) From MDE's Analyzing and Tracking Nonpoint Source Data Project, FFY16 319(h) Grant, Robin Pellicano, April 2017.

Appendix – Financial Information

Contents

Federal 319(h) Grant Funds Awarded To Maryland By Federal Fiscal Year Appropriated 1990 thru SFY 2016



Grant funding from the Federal Clean Water Act Section 319(h) was first awarded to the State of Maryland in 1990. The graph above shows the Federal funds in each grant award. As the graph shows, grant awards received by Maryland from FFY2014 thru FFY2016 have been similar funding levels. The allocation to Maryland is based on a national formula for distribution of 319 (h) Grant funds among the States, which has remained unchanged since the early 1990s.

The table on the next page lists the award amounts and the amount of nonfederal match for each award. The year shown for each grant award is the Federal Fiscal Year (FFY) that the federal funds were appropriated. Upon award, each grant has a maximum life of five years.

Appendix – Financial Information

Award Amounts for Federal 319(h) Grant Funds Awarded To Maryland

Since 1990, about $56.8 million in Federal 319(h) Grant funds have been awarded to Maryland as shown in the table below.

Federal 319(h) Grant Funds Awarded To Maryland By Federal Fiscal Year Appropriated

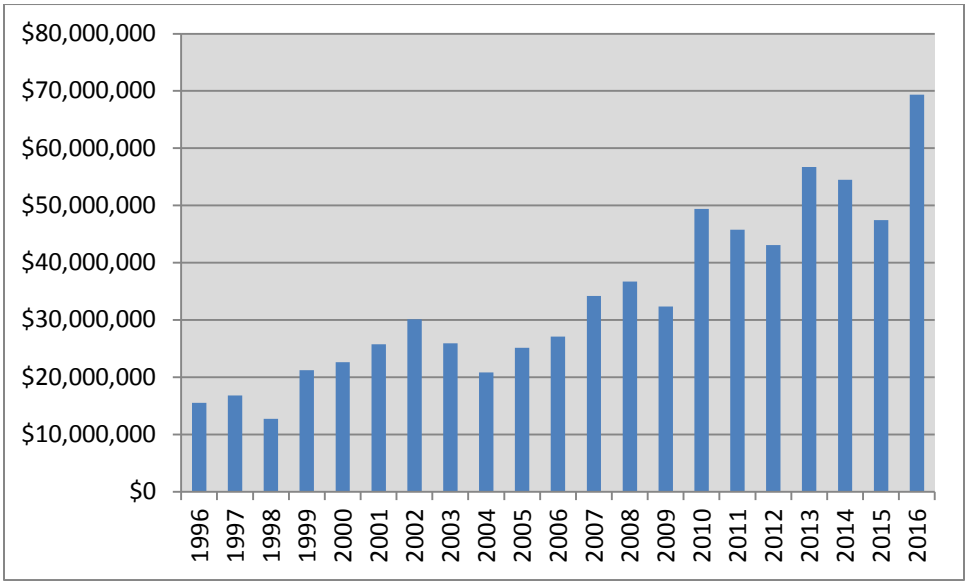
Federal Fiscal Year (1)	National Budget 319(h) Grant (millions)	319(h) Grant Allocated to Maryland (2)	Non-Federal Match By Maryland (3)	Total Grant + Match In Maryland
1990	$38.0	$447,771	$298,514	$746,285
1991	$51.0	$890,039	$593,359	$1,483,398
1992	$52.5	$939,298	$626,199	$1,565,497
1993	$50.0	$877,070	$584,713	$1,461,783
1994	$80.0	$1,494,413	$996,275	$2,490,688
1995	$100.0	$1,755,964	$1,170,643	$2,926,607
1996	$100.0	$1,541,980	$1,027,987	$2,569,967
1997	$100.0	$1,327,699	$885,133	$2,212,832
1998	$105.0	$1,327,699	$885,133	$2,212,832
1999	$200.0	$2,708,298	$1,805,532	$4,513,830
2000	$200.0	$2,467,576	$1,645,051	$4,112,627
2001	$237.5	$2,958,486	$1,972,324	$4,930,810
2002	$237.5	$3,035,576	$2,023,717	$5,059,293
2003	$238.5	$3,104,500	$2,069,667	$5,174,167
2004	$237.0	$3,369,190	$2,246,127	$5,615,317
2005	$207.3	$2,675,598	$1,783,732	$4,459,330
2006	$204.3	$2,666,655	$1,777,770	$4,444,425
2007	$199.3	$2,551,736	$1,701,157	$4,252,893
2008	$200.9	$2,653,500	$1,769,000	$4,422,500
2009	$200.9	$2,575,782	$1,717,188	$4,292,970
2010	$200.9	$2,860,785	$1,907,190	$4,767,975
2011	$175.5	$2,283,639	$1,522,426	$3,806,065
2012	$164.5	$2,091,000	$1,394,000	$3,485,000
2013	$155.9	$1,981,000	$1,320,667	$3,301,667
2014	$159.3	$2,119,118	$1,412,745	$3,531,863
2015	$159	$2,074,277	$1,382,851	$3,457,128
2016	$164.92	$2,073,000	$1,382,000	$3,455,000
Total	$4,219.7	$56,851,649	$37,901,099	$94,752,748

1) Federal Fiscal Year is the year of appropriation. Shaded rows are grant years that have closed in Maryland. Other years shown are active grant years in Maryland.
2) Federal grant amount awarded to Maryland by Federal Fiscal Year. Excludes carry-over.
3) Matching funds required for each grant award (40%) from nonfederal sources.

Appendix – Financial Information

Expenditures Reported By The State Of Maryland
For NPS Programs and Projects Excluding 319(h) Grant & Match

Summary State Fiscal Year 1996 thru 2016



The Federal Clean Water Act's 1987 Amendments include provisions to ensure that the States do not use Section 319(h) Grants to replace State expenditures that already were occurring. This Maintenance Of Effort (MOE) requirement ensures that each State's NPS expenditures are at least equal to or greater than the baseline level set in the 1990s. Maryland's minimum Maintenance Of Effort is $8,447,270 annually.

As a prerequisite for receiving the next 319(h) Grant award, each State is required to document that their nonfederal expenditures for NPS programs and projects in the previous year, not counting match, meet their MOE. MOE expenditures reported by Maryland are cumulative expenditures in a single State fiscal year (July 1 through June 30) by three State agencies: Maryland Department of Agriculture (MDA); Maryland Department of the Environment, and Maryland Department of Natural Resources (DNR).

The graph above shows that Maryland consistently surpasses its MOE. Beginning in 2013, NPS expenditures by DNR's Chesapeake and Atlantic Coastal Bays Trust Fund were included in the MOE. Expenditures for nonpoint programs and projects by other State agencies, local governments, private organizations or other entities have not been included in Maryland's MOE reporting to EPA. Therefore, it is likely that the total annual expenditure for nonpoint source programs and projects in Maryland is significantly greater than the dollar amount reported to meet MOE requirements.

Appendix – Financial Information

319(h) Grant Implementation Funding Distribution 2002 thru SFY2016

The following table summarizes 319(h) Grant budget allocations of Federal funds for implementation by watershed, county and region of Maryland. This view is an indicator of efforts by State grant managers, with the essential cooperation of local implementers, to direct Federal 319(h) Grant funds to watersheds that are eligible for the funds. The table does not address actual expenditures of either Federal or nonfederal funds associated with the projects. Additional context for table and the following analysis includes:

- Implementation Funding in the table includes expenditures for entire completed implementation projects, which may include design, construction, staff (project management) and related supplies, travel, etc.
- Expenditures for 319 implementation funding included:
    - Watersheds currently eligible for 319 implementation funding.
- Expenditures implementation funding not included:
    - Watershed plan areas where implementation is complete and no longer eligible.
    - Watersheds that received 319 implementation funding in 2002 or later but are not currently eligible.
- State Targeting Priorities (see below)
- Local Priorities for Seeking 319(h) Grant Funds (see below)

State Targeting Priorities

- Agricultural Technical Assistance. MDE and the Maryland Dept. of Agriculture (MDA) cooperated in the 1990s and early 2000s to prioritize watersheds for 319 funding to support technical staff in Soil Conservation District Offices who facilitated implementation of BMPs. This targeting included Antietam Creek and Upper Choptank River.
- Success Story Targeting. In approximately 2009, MDE assessed types of impairment and geographic areas to find combinations that were most likely to be correctable in the near term. Based on the assessment, MDE determined that acid mine drainage (AMD) tended to be a discrete impairment that could be mitigated within several years of monitoring and implementation so that success could be demonstrated. Then considering additional AMD prioritization assessments by technical experts in MDE and the existing ability for MDE to carry out watershed planning and impairment mitigation, two areas in Garrett County were selected for implementation: Aaron Run and Casselman River watersheds.
- Local Cooperation. With the exception of AMD mitigation (above), MDE relies on local jurisdiction willingness and interest to: 1) conduct watershed planning that leads to eligibility for 319(h) Grant implementation funding and 2) assume responsibility to implement the watershed plan and compete for 319 implementation project funding. MDE encourages local jurisdictions in this regard by offering technical assistance and 319 grant funding opportunities (within the limits of available resources). Baltimore County had the greatest interest in achieving watershed plan eligibility of any jurisdiction in Maryland. Additionally, several jurisdictions have competed for implementation funding most frequently and successfully: Baltimore County, Caroline County, Centreville/Queen Anne's County, and Washington County Soil Conservation District.

Appendix – Financial Information

Watershed Planning Efforts to Seek Eligibility for 319(h) Grant Implementation Funding

Beginning in 2005, fifteen watershed planning efforts focused on meeting eligibility requirements for Federal 319(h) Grant implementation funding. The list below summarizes the current status of those efforts. Numerous watershed planning efforts by jurisdictions and agencies during the same time period that did not involve seeking 319-eligibility are not listed.

List of Watershed Planning Efforts Focused On Eligibility for 319(h) Grant Implementation Funding 2005 thru State Fiscal Year 2016			
Watershed Plan Responsible Entity	**# of Plans**	**Significant Contributor**	**Status June 2016**
Baltimore County	1	na	implemented
	4	na	eligible
Calvert County	1	na	not eligible
Caroline County	1	MDE	eligible
Centreville / Queen Anne's County	1	DNR	eligible
Frederick County	1	na	eligible
MDE	1	MDE	eligible
	1	MDE	drafting
Prince George's County	1	na	not eligible
Sassafras River Association	1	na	eligible
Washington County Soil Conservation District	1	MDE	eligible
Worcester County	1	MDE	not eligible
	1	na	drafting

319(h) Grant Implementation Budget Funding Distribution 2002 thru SFY2016

Based on Completed Implementation Projects Total Expenditures*

Expenditures within a Local Jurisdiction				Chesapeake Bay		Coastal Bays		Ohio River Basin	
Name	# of Eligible Watershed Plans	Federal Grant Budget $	%	Eligible Watershed	Federal Grant $	Eligible Watershed	Federal Grant $	Eligible Watershed	Federal Grant $
Allegany	0	0							
Anne Arundel	0	0							
Baltimore City	2	139,000	1%	Back River - Upper	0				
				Jones Falls - Lower	139,000				
Baltimore County	4	1,520,831	15%	Back River - Tidal	556,443				
				Back River - Upper	644,384				
				Gwynns Falls - Middle	320,004				
				Jone Falls - Lower	0				
Calvert	0	0							
Caroline	1	1,174,095	11%	Choptank River - Upper	1,174,095				
Carroll	0	0							
Cecil	1	0		Sassafras River	0				
Charles	0	0							
Dorcester	0	0							
Frederick	1	1,387,103	13%	Monocacy River - Lower	1,387,103				
Garrett	1	1,635,115	16%	Aaron Run	936,000			Casselman River	699,115
Harford	0	0							
Howard	0	0							
Kent	1	64,000	1%	Sassafras River	64,000				
Montgomery	0	0							
Prince George's	0	0							
Queen Anne's	1	1,919,132	18%	Corsica River	1,919,132				
Somerset	0	0							
St Mary's	0	0							
Talbot	0	0							
Washington	1	2,621,346	25%	Antietam Creek	2,621,346				
Wicomico	0	0							
Worcester	0	0				Coastal Bays	0		
	Overall TOTAL	10,460,622	100%	Drainage Area Total $	9,761,507		0		699,115
				Percent of Total $	93%		0%		7%

Region	Count	Total $	%
Central Md	4	1,659,831	16%
Eastern Shore	3	3,157,227	30%
Southern Md	0	0	0%
Western Md	3	5,643,564	54%
Maryland TOTAL	10	10,460,622	100%

* Note: Table includes only watersheds that are currently eligible for Federal Clean Water Act Section 319(h). Other watersheds that previously received 319 implementation funds (Deer Creek, St. Clements Bay, etc.) are not included.)

Appendix –Integrated Report

This appendix contains the cover page and executive summary from *Maryland's Draft 2016 Integrated Report of Surface Water Quality*.

The complete document is available on the following MDE web page (link verified January 2017):
http://mde.maryland.gov/programs/Water/TMDL/Integrated303dReports/Pages/Programs/WaterPrograms/TMDL/Maryland%20303%20dlist/index.aspx

Additionally, MDE posts water quality assessment maps on the Internet to assist users in visualizing the locations of impairments for categories like bacteria and nutrients (link verified January 2017):
http://www.mde.state.md.us/programs/Water/TMDL/Integrated303dReports/Pages/WaterQualityMappingCenter.aspx

Maryland's Draft 2016 Integrated Report of Surface Water Quality

Submitted in Accordance with Sections 303(d), 305(b), and 314 of the Clean Water Act

Maryland
Department of
the Environment

Larry Hogan, Governor
Boyd Rutherford, Lt. Governor

Ben Grumbles, Secretary

Submittal Date:
EPA Approval Date:

EXECUTIVE SUMMARY

Maryland's 2016 Integrated Report (IR) is submitted in compliance with sections 303(d), 305(b) and 314 of the federal Clean Water Act (CWA). This biennial report describes ongoing efforts to monitor, assess, track and restore the chemical, physical and biological integrity of Maryland waters. This report also presents the current status of water quality in Maryland by placing all waters of the State into one of five categories.[1] In addition, the report provides information about the progress on addressing impaired waters (Categories 4 & 5) by documenting:

- Completed Total Maximum Daily Loads (TMDLs), which re-categorize impairments from Category 5 (impaired and needs a TMDL: the "list of impaired waters") to Category 4a (TMDL completed, but still impaired).
- Analyses of new water quality data that shows areas previously identified as impaired that are attaining standards. This can result from remediation, changes in water quality standards, or improved monitoring and/or data analysis.
- Assessment methodologies and watershed segmentation that enhance the use of available data and provide consistency with management and implementation strategies.
- Statewide water quality statistics for Maryland's surface waters.
- Maryland's prioritization of impairments for TMDL development.

The 2016 IR incorporates several changes this year which include the implementation of revised assessment methodologies for bacteria and toxics data. In addition, the Department has expanded its trend analysis section with the intention of describing the incremental changes to pollutant concentrations in waters throughout the state. Continuing with this IR, Maryland has made significant efforts to incorporate non-state government data in ways that increase the resolution of the state's water quality assessments. Datasets used included those collected by federal agencies, county governments, water utility agencies, and non-profit watershed organizations. As with previously submitted Integrated Reports (IR), the 2016 IR will include a GIS submittal that provides coverages for streams, impoundments, and estuarine waters which depict assessment information at appropriate scales. MDE also continues to make Integrated Reporting data available to the public in several user-friendly formats. Through the use of MDE's searchable IR database and the interactive online pollutant maps, users can query IR information and explore water quality information in a graphic format. The searchable IR database and clickable map application are available online at http://www.mde.maryland.gov/programs/water/tmdl/integrated303dreports/pages/303d.aspx and the interactive pollutant maps can be found at http://www.mde.state.md.us/programs/Water/TMDL/Integrated303dReports/Pages/ImpairmentMaps.aspx. Please note that these applications will be updated with information from the 2016 IR once the IR has gone through public review and comment and been approved by the Environmental Protection Agency.

[1] The Integrated Report places all waters of the State into one of five "categories": Category 1 indicates that a water body is meeting all standards, Category 2 means it is meeting some but not all standards, Category 3 indicates that there is insufficient data to determine whether standards are being met, Category 4 means that water quality standards are not being met but a TMDL is not needed, either because it has already been completed, other more immediate fixes are available, or the impairment is not load related, and finally, Category 5 indicates that a water body is impaired and a TMDL is needed.

Maryland's Water Quality Highlights

Trend monitoring data continues to document significant long-term improvement in nitrogen, phosphorus, and sediment levels at many stations throughout Maryland and the Chesapeake Bay watershed. Even though many waters are still impaired for these pollutants, these trends suggest that the substantial nutrient and sediment reduction efforts undertaken by the state have been making a difference. With year-to-year variability in precipitation and ongoing changes to landuse, it can often be difficult to observe temporal patterns in pollutant levels. The fact that these improving trends in nitrogen, phosphorus, and sediment are evident in the water quality data underscores the immense efforts going into reducing these pollutants and emphasize the large effort still needed in order to meet our ultimate water quality goals. The continued collection and analysis of this data will be important for measuring progress as Maryland continues to implement the Chesapeake Bay TMDLs and other TMDLs.

Trend analysis has also highlighted two environmental challenges. For example, trend analyses for conductivity in Maryland's non-tidal streams increasingly show more stations with degrading or worsening (greater conductivities) conditions. Several recent water quality symposia in Maryland (e.g. Maryland Water Quality Monitoring Conference, Road Salt Usage and Environmental Impacts Workshop, and Groundwater Symposium) have featured speakers on this trend, suggesting that the primary causes of increasing conductivity are the widespread use of road salt deicers combined with increasing road and parking areas. Consistent with this trend, Maryland has increasingly documented the impairment of state streams due to elevated chloride levels, an important determinant of high conductivity measurements. Worth noting, increasing chloride and conductivity levels have also been measured at many of the state's drinking water sources raising concern for the management of these critical resources. Another water quality trend has been documented in the case of stream temperatures. Separate studies by USGS and DNR have revealed long-term increases in temperature at many stations throughout Maryland and the Chesapeake Bay watershed. Maryland's coldwater streams are particularly susceptible to chronic increases in stream temperature. Potential sources for this trend are climate change, stormwater runoff from development, dams, and other sources of thermal pollution.

Maryland has established 553 TMDLs out of a total of 816 water body-pollutant impairments. The water body size addressed by TMDLs for each major pollutant-type is shown in the figures below. As is evident from these figures, some pollutants have been almost completely addressed by TMDLs while others have not (e.g. chlorides, sulfates, stream temperature). For chlorides and stream temperature, the state is in the process of developing new water quality modeling methodologies for estimating loads and impacts. Another important development for water quality is the documentation of Maryland's prioritization of impairments for TMDL development. This documentation, included as Part G of this report, not only covers TMDL development priorities but also discusses Maryland's continuing work on the Chesapeake Bay and Tidal Tributary TMDLs and Watershed Implementation Plans (WIP). In conjunction with the public review period associated with this Integrated Report, the Department seeks the public's review and comment on this prioritization methodology. Another important TMDL priority is the Chesapeake Bay TMDLs 2017 Midpoint Assessment. The Midpoint Assessment will evaluate progress, take stock of the current science and update the Watershed Implementation Plans to ensure that the State meets the Bay TMDLs by 2025.

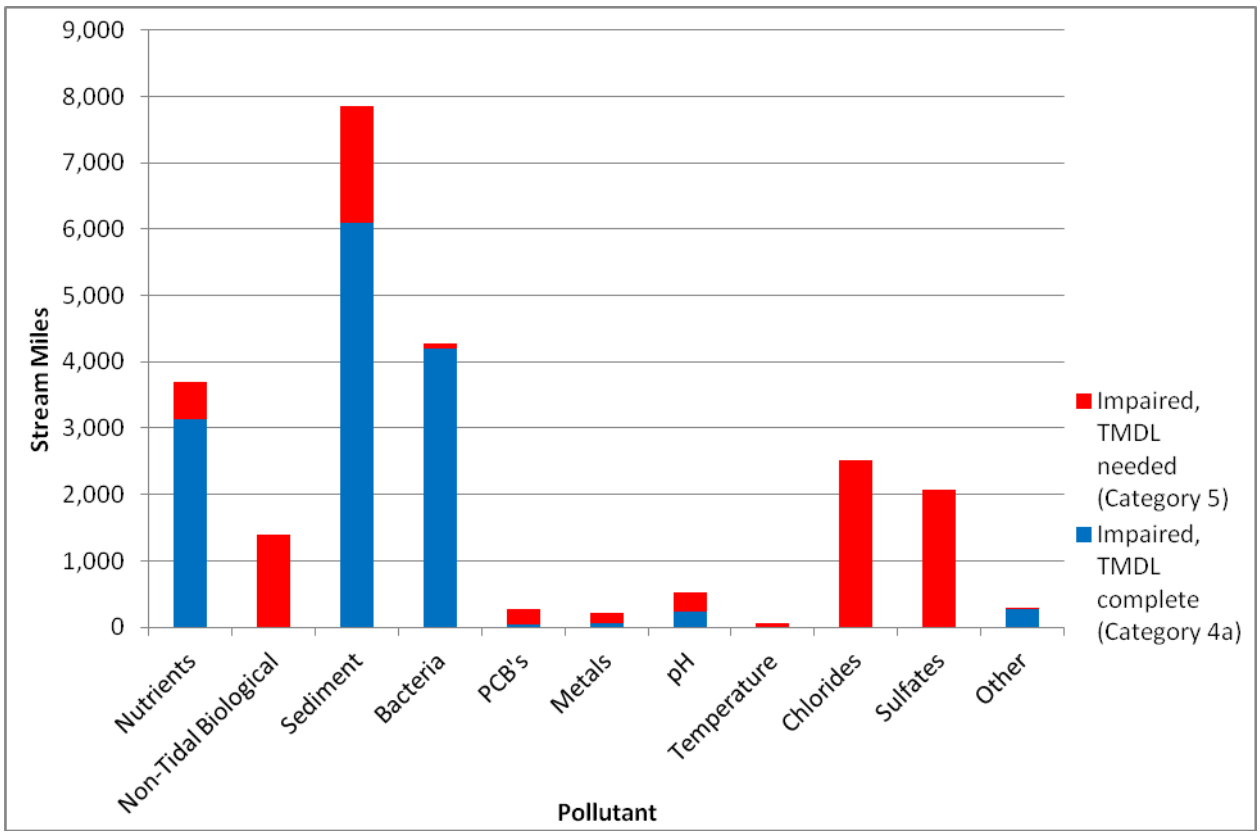


Figure 1: Stream miles impaired by various pollutants. Colors denote the stream miles currently addressed by TMDLs (blue) and those that still require TMDLs (red).

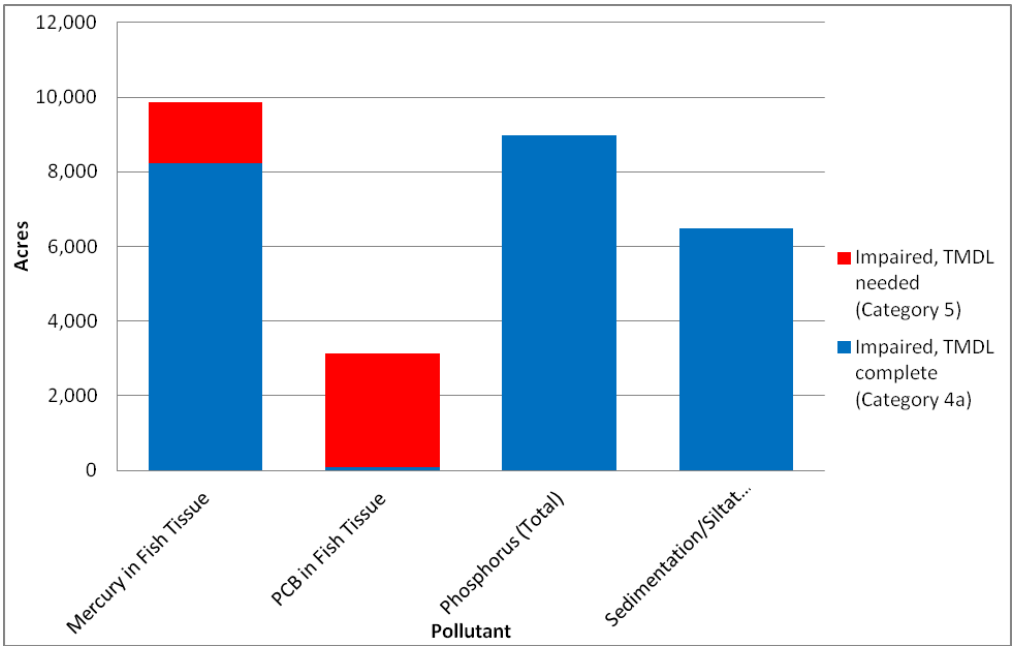


Figure 2: Impoundment size impaired by various pollutants. Colors denote the impoundment acres currently addressed by TMDLs (blue) and those that still require TMDLs (red).

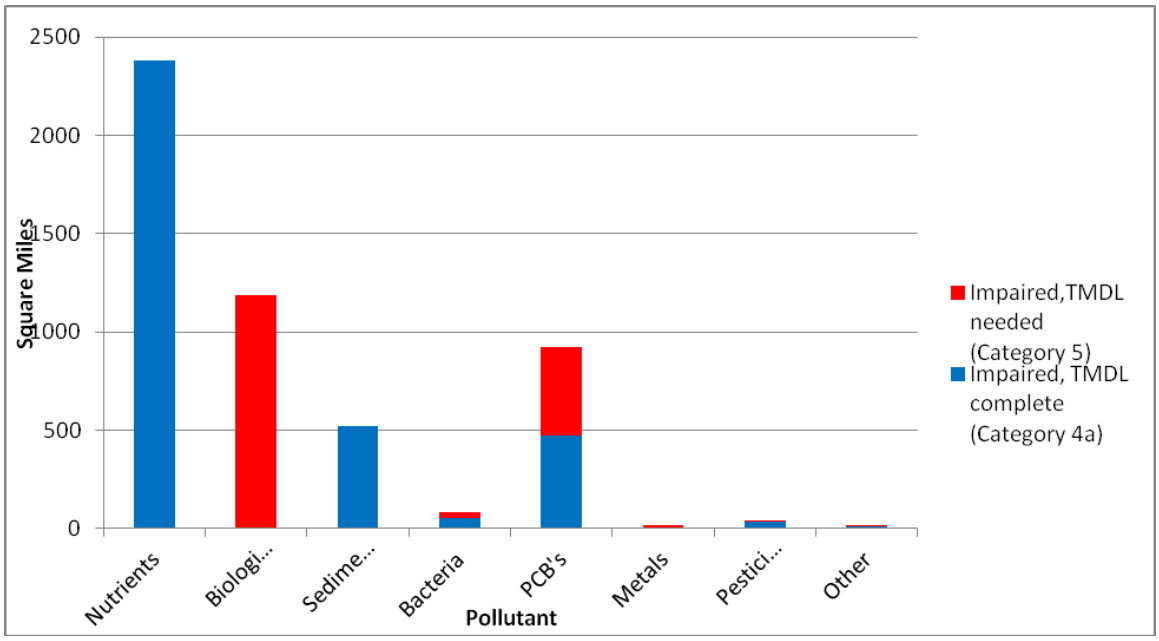


Figure 3: Size of estuarine waters impaired by various pollutants. Colors denote the square mileage of estuarine waters currently addressed by TMDLs (blue) and those that still require TMDLs (red).

Maryland also continues to administer various programs to fund and implement water quality restoration projects. Now in its 13th year, the Bay Restoration Fund (BRF) has financed the installation of enhanced nutrient removal technology at 48 out of 67 major (>500,000 gallons/day) wastewater treatment plants in the state and will ultimately reduce nitrogen loadings by 7.5 million pounds per year and phosphorus by 0.22 million pounds per year. The Chesapeake and Coastal Bays Trust Fund has leveraged state and local funding to achieve 34% of the urban nitrogen and 29% of the agricultural phosphorus goals as of December 2015. In addition, a variety of agricultural cost-share programs have also helped to reforest riparian buffers, build manure storage areas, and plant cover crops. As of August 2016, Maryland farmers committed a state-record, 691,743 acres of land to cover crops. Still, much work remains as the state looks to develop rules for nutrient trading and a growth policy to offset new and/or increased pollutant loads. In addition, stormwater runoff pollution from older developments remains a significant challenge both in financing and implementation. Maryland currently has ten Phase I MS4 permits that require both TMDL implementation plans and financial assurance plans and issue new Phase II General permits by March 2017.

Changes in the 2016 Integrated Report

There are a total of 16 additions to the list of Category 5 (impaired, TMDL needed) waters in 2016. Nine of the new Category 5 waterbody-pollutant combinations (also referred to as listings or assessment records) resulted from MDE's Biological Stressor Identification Analyses. Of these 9 new 'biostressor' listings, four are for total suspended solids, three are for sulfates, and two are for chlorides. In addition, there are four new PCB listings and three new fecal coliform listings in shellfish harvesting waters. One new Category 5 listing, not counted as part of the other 16, resulted from the spatial splitting of a previous listing for the Lower Patuxent River for PCBs. So although this new listing didn't result in any new waters being determined as impaired, this action (splitting) caused what was one listing in 2014 to become two listings in 2016.

Table 1: Changes to Category 5 Listings from 2014 to 2016

Integrated Report Year/Status	Category 5 Listings
2014 Total Category 5 Listings	**262**
2016 New Category 5 Listings	16
2016 New listing resulting from the splitting of previous impairment listing	1
2016 New Delistings (Category 5 to Category 2 or 3) *(See Table 2)*	-11
Approved TMDLs (since the 2014 IR)	-5
2016 Grand Total Category 5 Listings	**263**

Eleven waterbody-pollutant combinations were removed from Category 5 (impaired, TMDL needed) in 2016. Four biological listings without a specified impairing substance have been replaced by specific pollutant listings enumerated by the Biological Stressor Identification analyses (BSID). Another four (of the 11) listings, for fecal coliform in shellfish harvesting areas, were removed from Category 5 because new data showed that water quality standards were either being met (2) or that assessments were inappropriate in those waters (2). Two more listings, one for mercury in fish tissue and another for low pH, were moved to Category 2 because new data demonstrated that these waters were now meeting water quality criteria for these parameters. The remaining delisting (moved from Category 5 to Category 3, insufficient information) occurred as a result of a correction to a PCB in fish tissue listing.

Some of these listings were originally based on limited data. In these cases, it is not possible to attribute these waters now meeting standards to a particular restoration action. It is possible that the extensive restoration practices that have been applied statewide might be playing a contributory role but it may also be true that these listings were made based upon insufficient data. Table 2 shows the general water body-pollutant combinations that have been delisted from Category 5.

Table 2: 2016 Delistings (water body-pollutant combinations removed from Category 5 (impaired, TMDL needed) and placed in Category 2 or 3 (non-impaired).

Type of Impairment Listing	Number of Listings Removed from Category 5
Generic Biological Listings – specific pollutant now specified (BSID process)	4
Fecal Coliform – meeting water quality criteria for the shellfish harvesting use	2
Fecal Coliform – removed from the IR completely, inappropriate listings for administratively closed shellfish areas	2
Hg - fish tissue concentrations now meeting fishing designated use	1
pH – water quality criteria now met	1
PCBs in fish tissue – moved to Category 3 – correction to historical data and recent levels are low	1
2016 Total Number of Delistings	**11**

In addition, there were other water quality listings removed from the impaired part of the IR but which were not counted in Table 2 because they were previously in Categories 4a (impaired, TMDL approved) and 4b (impaired, technical fix implemented). For instance, the tidal fresh portion of the Chester River was previously impaired and had a TMDL for total suspended solids (TSS). Recent data now demonstrates that this segment meets water quality standards for TSS (Category 2). In another

case, a portion of the San Domingo Creek in Talbot County had a TMDL (Category 4a, impaired, TMDL completed) completed for a bacteria impairment but also now meets water quality criteria. In a third instance, a Category 4b (impaired, technological fix) copper listing in the Patapsco River, associated with an industrial point source, was removed from the impaired part of the list based on recent discharge monitoring report (DMR) data and ambient water quality monitoring data. These data demonstrated that effluent limits were being met and that nearfield water met ambient water quality criteria. For more details on the Category 4b delistings in PATMH please see Section C.3.

Another particularly noteworthy assessment captured on the 2016 IR and which was not counted in Table 2, was the removal of the low pH impairment to Big Laurel Run in the Casselman River watershed in Garrett County, MD. Although Big Laurel Run was never previously listed as impaired on Maryland's IR (no data had been available for previous reporting), it was anecdotally known to be impacted by acidic mine drainage from an abandoned mine. Here, using Clean Water Act Section 319(h) funding, MDE's Bureau of Mines Division coordinated the construction of an acid mine drainage treatment system designed to increase stream pH to levels within Maryland's pH criteria range (6.5 – 8.5). State staff collected water quality data from both before and after treatment system construction which demonstrated the success of this project and resulted in a Category 2 (meeting some water quality criteria) listing on the 2016 IR. This is the second recent instance where a specific restoration project, undertaken by the State, has been directly linked to attainment of water quality criteria.

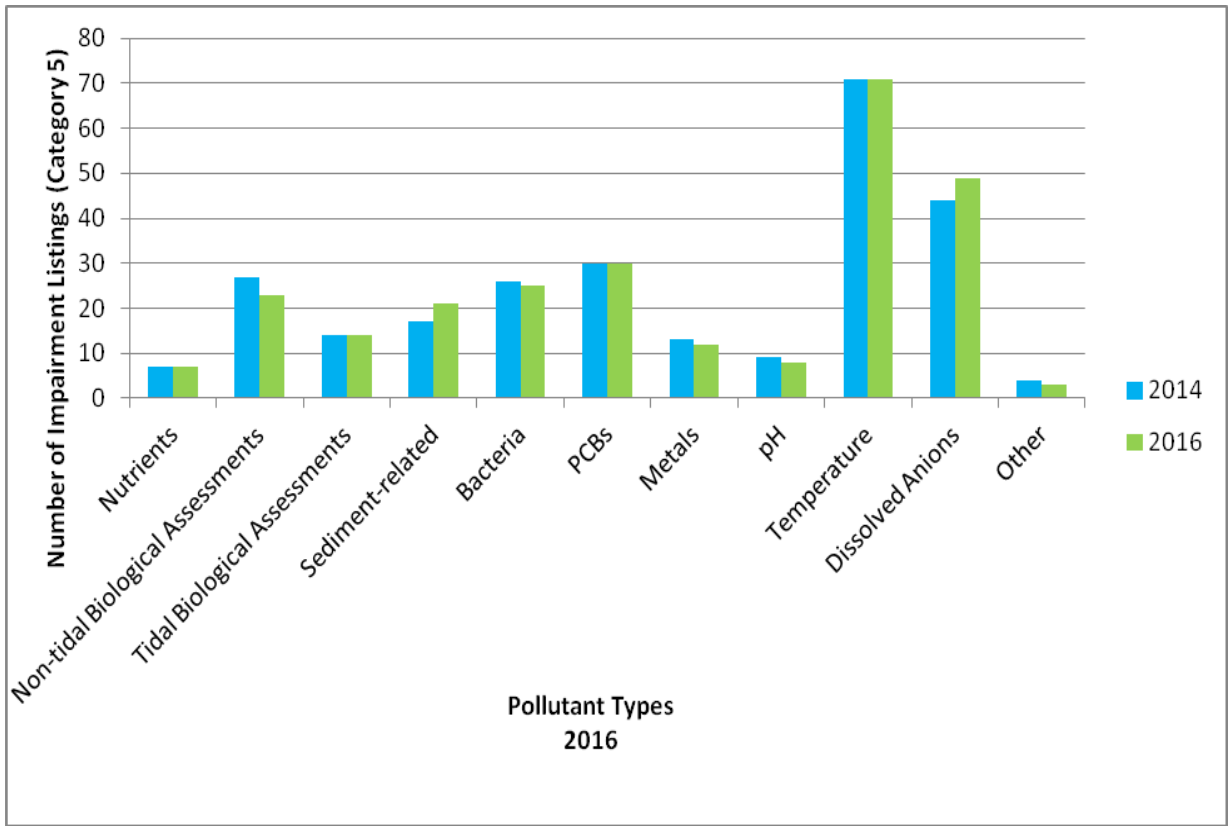


Figure 4: Comparison of the Number of Category 5 (impaired, TMDL not yet completed) Listings Between the 2014 and 2016 Integrated Reporting Cycles per Pollutant Group.

Since the 2014 IR, Maryland has continued to make progress in addressing impaired waters having completed a total of five TMDLs, one Water Quality Analyses and four Biostressor Identification

Analyses in 2015 and 2016. Most notably, one of the TMDLs Maryland completed was one developed for trash in the Baltimore Harbor area. This is the second trash TMDL completed in Maryland and marks an important step forward in the effort to clean up the Baltimore Harbor. Another important development in Maryland's implementation of Clean Water Act Section 303(d) is the documentation of Maryland's prioritization of impairments for TMDL development. This documentation, included as Part G of this report, not only covers TMDL development priorities but also discusses Maryland's continuing work on the Chesapeake Bay and Tidal Tributary TMDLs and Watershed Implementation Plans (WIP). In addition, Part G provides summary information on the Chesapeake Bay TMDL 2017 Midpoint Assessment. In conjunction with the public review period associated with this Integrated Report, the Department seeks the public's review and comment on this prioritization methodology.

Other notable new actions taken by the State include:

- The formation of the Water Quality Trading Advisory Committee (WQTAC) to guide and support the development of a nutrient trading framework that will help the state meet the nutrient reduction goals under the Chesapeake Bay TMDLs. The committee met regularly between January and May of 2016 with the goal of developing Maryland's Water Quality Trading and Offset Policy and Guidance Manual.
- Passage of the Phosphorus Management Tool regulations in 2015. These new regulations describe how the state will use soil test information with the latest scientific findings on phosphorus transport to identify the potential risk of phosphorus loss from farm fields and to prevent the additional buildup of phosphorus in soils that are already saturated.
- An increase in the level of funding for the Chesapeake and Coastal Bays Trust Fund which finances projects that support Maryland's Watershed Implementation Plan by reducing nonpoint source pollution.
- Passage of House Bill 462, which returns $60 million over the next two fiscal years to Program Open Space including increasing the funding to Baltimore City to $6 million per year.
- The allocation of $16.4 million for an Energy-Water Infrastructure Program designed to increase energy efficiency at wastewater treatment plants through combined heat and power projects and energy-related upgrades. An example of one such upgrade includes using digester gas for generating electricity onsite.

Maryland continues to work closely with EPA's Chesapeake Bay Program (CBP) and other state partners (VA, PA, D.C., NY, and DE) on the assessment process for the Chesapeake Bay water quality criteria. Maryland has adopted an assessment process that was created and agreed to by the partner states and the CBP. This assessment process split the Chesapeake Bay into 53 segments (in the Maryland portion) based on the salinity regime. The current Chesapeake Bay assessments will continue to evolve as new assessment methodologies are developed and as additional data are collected and incorporated from a variety of partners. More details on the Chesapeake Bay assessments can be found at: http://www.chesapeakebay.net/about/programs/monitoring.

Finally, in February 2016, in what represents a major victory for Maryland's water quality and specifically that of the Chesapeake Bay, the U.S. Supreme Court decided not to review a lower court's affirmation of the Chesapeake Bay TMDLs. Five years earlier, the American Farm Bureau Federation filed suit challenging the establishment of the Chesapeake Bay TMDLs for nitrogen, phosphorus, and

sediment. Upholding the Chesapeake Bay TMDLs allows Maryland to continue to work together with EPA and the partner Bay states to make progress in reducing these pollutants in the most cost-effective manner and supports the science and process used to develop these TMDLs.

Appendix – Milestones
NPS Management Plan Tracking in the Annual Report

Maryland's 2015-2019 NPS Management Plan that was approved by EPA in January 2015 included included many new NPS milestones to track progress associated with the:

Chesapeake Bay TMDL
Chesapeake Bay Agreement
NPS Management statewide

Progress tracking is generally based on the state fiscal year July thru June.

SFY 2016 Milestones Progress Summary

- 2-Year Milestones: Maryland agencies and jurisdictions are working to meet BMP and Programmatic milestones for 2016-2017. Results might be available for SFY17.
- Maryland 2015-2019 NPS Program – Statewide Milestones. These milestones are designed to help meet a series of objectives named on the State NPS management plan. Progress thru SFY16 for the following objectives is presented in this appendix:
    - Objective 3: Pollutants and Stressors
    - Objective 4: Pollutant Sources
    - Objective 5: Types of Waterbodies
    - Objective 6: Protection and Restoration
    - Objective 7: Priority Setting
    - Objective 8: Program Management and Evaluation

Maryland 2015-2019 NPS Program – Statewide Milestones Objective 3: Pollutants & Stressors	Lead	Goal 2015	Report 2015	Goal 2016	Report 2016	Annual Publication link to
Annual Nitrogen Nonpoint Source Loads to Bay: Used to show progress on nutrient load reductions. (reported for state fiscal year)	MDE	report progress	36,180,015	report progress	36,180,015	
Nitrogen: For all watersheds with EPA-accepted plans, overall total annual reduction by NPS implementation completed during the past year. (Cumulative lbs/yr nitrogen starting 2015 excluding annual practices)	MDE	50,000	552,125.0	100,000	511,650.9	
Annual Phosphorus Nonpoint Source Loads to Bay: Used to show progress on nutrient load reductions. (reported for state fiscal year)	MDE	report progress	2,289,574	report progress	2,289,574	
Phosphorus: For all watersheds with EPA-accepted plans, overall total annual reduction by NPS implementation completed during the past year. (Cumulative lbs/yr nitrogen starting 2015 excluding annual practices)	MDE	1,000	6,701.3	2,000	6,076.3	
Sediment: 319-funded projects estimated annual reductions... (Cumulative starting in 2015 tons/yr)	MDE	5	16.75	10	12.93	
Sediment: For all watersheds with EPA-accepted plans, overall total annual reduction by NPS implementation… (Cumulative tons/yr sediment starting 2015 excluding annual practices.)	MDE	200	1,632.56	400	3,260.90	
Bacteria: Annual Report on Monitoring Results for Maryland Beaches	MDE	report findings	see report (web link)	report findings	see report (web link)	http://www.mde.maryland.gov/programs/water/beaches/pages/beacheshome.aspx
Bacteria: Conduct Annual Meeting of County Beach Management Programs	MDE	report findings	conducted 3/2015	report findings	conducted 7/2015	http://www.mde.maryland.gov/programs/water/beaches/pages/beacheshome.aspx
Bacteria: Conduct Shoreline Field Surveys near Shellfish Waters to identify potential pollutant sources of concern (part of a 7-year cycle).	MDE	report findings	posted on Internet	report findings	posted on Internet	http://mde.maryland.gov/programs/Marylander/CitizensInfoCenterHome/Pages/citizensinfocenter/fishandshellfish/pop_up/shellfishmaps.aspx
Bacteria: Conduct Sanitary Surveys of relevant data for all shellfish growning areas	MDE	report findings	posted on Internet	report findings	posted on Internet	http://mde.maryland.gov/programs/Marylander/CitizensInfoCenterHome/Pages/citizensinfocenter/fishandshellfish/pop_up/shellfishmaps.aspx
Chloride: Number of water bodies that have a detailed watershed assessment based on monitoring data. (Cumulative starting in 2015)	MDE	2	3 in progress	3	3	
Chloride: TMDL development (Cumulative # of new TMDLs starting 2015)	MDE	2	0		0	
Chloride: Annual Road Salt Application Management Training by State Highway Administration.	MDE	report result		report result		
PCBs: TMDL development (Cumulative # of new TMDLs starting 2015)	MDE	6	3	8	7	
PCBs: Conduct monitoring in an attempt to locate upland sites contaminated by high concentrations of PCBs. Annually report monitoring plans and findings.	MDE	report status	being conducted	report status	being conducted	
Mercury: Update Maryland's 319 Program webpage to summarize Maryland's existing mercury mitigation activities.	MDE	report status	not initated		not initated	
Mercury: Update Maryland's 319 Program webpage to summarize regional, national and international initiatives designed to reduce mercury.	MDE	NA	future	report status	future	
Mercury Gap Analysis: Based on findings and refinement of previous two years research in support of webpage enhancements identify any gaps, which might reflect recommendations of other's studies of opportunities to further reduce existing sources of mercury. Report summary findings in an Annual Report appendix.	MDE	NA	future		future	
Mercury in Fish Tissue: Report Median statewide mercury concentration in black bass (including largemouth and smallmouth) for the previous 5 years. The fish tissue contaminant concentration is a quantitative measure of the average contaminant level for the compounds most responsible for fish consumption advisories in waters of the State of Maryland to protect human health.	MDE	report findings		report findings	trending lower	

Maryland 2015-2019 NPS Program – Statewide Milestones Objective 4: Pollutant Sources	Lead	Goal 2016	Report 2016	Annual Publication link to
Agricultural Milestones				
Maintain Annual Cover Crop Implementation Acreage Levels	MDA	386,000	485,143	
Maintain Annual Nutrient Management Plan Acreage Levels	MDA	565,408	823,598	
Maintain Annual Soil Conservation and Water Quality Plan Acreage Levels (acres)	MDA	926,000	897,600	
Maintain Annual Manure Transported out of Chesapeake Bay watershed (tons)	MDA	44,000		
Maintain Annual Conservation Tillage Acreage Levels	MDA	765,000		
Plant Riparian Forest Buffers (Acres/year)	MDA	472		
Wetland Restoration (Acres treated/year)	MDA	1,032		
Phosphorus Management Tool regulation adoption	MDA			
On-site Disposal Systems				
Upgrade septic systems to nitrogen removal technology (systems/year)	MDE	1,200	1,976	http://mde.maryland.gov/programs/Water/BayRestorationFund/AnnualReports/Pages/Water/CBWRF/annualreports/index.aspx
Refine septic system nitrogen reduction strategy for the Chesapeake Bay	MDE			
Adopt online system for reporting installation of Best Available Technology OSDSs.	MDE			
Facilitate refinement of septic system information and submit it to the EPA Chesapeake Bay Program (numbers, locations and types of systems)	MDE			
Urban/Suburban Stormwater and Erosion & Sediment Control				
Stormwater retrofits of land without sufficient controls (pounds nitrogen reduced/year)	MDE	20,000	8,367	
Refine stormwater nitrogen and phosphorus reduction strategies for the Chesapeake Bay	MDE			
Complete the development of an MS4 geodatabase that will aid MDE in the assessment of management programs and improve current Phase I data tracking, collection and validation of BMPs:	MDE			
Online BMP Reporting Tool for Non-MS4 local governments:	MDE			
Outreach to non-MS4 jurisdictions on reporting stormwater controls on new development and retrofitting development with insufficient controls.	MDE			
Historical BMP Cleanup as part of the Chesapeake Bay Midpoint Assessment	MDE			
SMART Homeowner BMP Tracking Tool: Make the tool available to users.	UME			http://extension.umd.edu/watershed/smart-tool
Online BMP Reporting Tools for MS4 and Non-MS4 local governments: Make the tool available to users.	MDE			
Issue tentative determination for Phase II MS4 permits.	MDE			
Local Stormwater WLA Implementation Plans: Review Plans submitted as part of Phase I MS4 requirements. (Number of jurisdictions, which may include multiple plans for each jurisdiction)	MDE	5	5	
Erosion and Sediment site “inspection coverage rate” conducted by MDE (Source: Annual Enforcement & Compliance Report)	MDE	report rate		http://www.mde.state.md.us/AboutMDE/DepartmentalReports/Pages/AboutMDE/enfcomp.aspx

Maryland 2015-2019 NPS Program – Statewide Milestones Objective 4: Pollutant Sources	Lead	Goal 2016	Report 2016	Annual Publication link to
Forestry				
Develop Lawn-to-Woodland Program, Program rules and partners in place	DNR			
Update Maryland's 5-year Forest State Assessment & Strategy	DNR			
Planting Forests on 43,960 acres by 2020 from 2006 baseline as part of Maryland's Greenhouse Gas Reduction Act (GGRA) plan goals.	DNR	report acres		
Bay WIP Targets: Add Phase III Watershed Implementation Plan targets to this table of Milestones in 2019 and track in future 319 NPS Management Plan milestones. The GGRA metric will be used as the common measure between now and 2019.	DNR			
Resource Extraction				
Coal Mining site "inspection coverage rate" conducted by MDE	MDE	report rate		http://www.mde.state.md.us/AboutMDE/DepartmentalReports/Pages/AboutMDE/enfcomp.
Non-Coal Mining site "inspection coverage rate" conducted by MDE	MDE	report rate		http://www.mde.state.md.us/AboutMDE/DepartmentalReports/Pages/AboutMDE/enfcomp.
Hydromodifications				
Non-tidal wetlands and floodplains permit site "inspection coverage rate"	MDE	report rate		http://www.mde.state.md.us/AboutMDE/DepartmentalReports/Pages/AboutMDE/enfcomp.
Tidal wetlands permit site "inspection coverage rate"	MDE	report rate		http://www.mde.state.md.us/AboutMDE/DepartmentalReports/Pages/AboutMDE/enfcomp.

Maryland 2015-2019 NPS Program – Statewide Milestones Objective 5: Types of Waterbodies	Lead	Goal 2016	Report 2016	Link to publications
Statewide Lakes and Reservoirs				
Lakes/Reservoirs: Local Phase I MS4 jurisdiction stormwater waste load allocation (WLA) implementation plans for reservoir TMDLs developed and reviewed by MDE. (Report the plans submitted and reviewed).	MDE	report results	Nine (9) received and reviewed	
Patuxent Reservoirs Annual Report of the Technical Advisory Committee	WSSC	report	no report done in SFY16	
Central Maryland - Chesapeake Bay Drainage				
Antietam Creek Watershed	Plan is eligible for 319(h) Grant implementation funding.			http://mde.maryland.gov/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319nps/factsheet.aspx
Watershed plan milestones: Report progress in the 319 Annual Report.	WCSCD	report	see Annual Report	
Assess Implementation Progress toward sediment and bacteria reduction watershed plan milestones and update the plan if needed.			future	
Back River - Tidal Watershed	Plan is eligible for 319(h) Grant implementation funding.			http://mde.maryland.gov/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319nps/factsheet.aspx
Watershed plan milestones: Report progress in the 319 Annual Report.	Baltimore County	report	see Annual Report	
Assess action items progress: #2 lawn fertilizer, #3 bayscape education, #34 outfall inspections, #53 outfall inspections, and #60 incentives.			NA	
Assess action item progress: #37 hot spots		assess	report not received	
Assess action item progress: #10 stormwater retrofits			future	
Assess action item progress: #31 wetland plantings			future	
Back River - Upper Watershed	Plan is eligible for 319(h) Grant implementation funding.			http://mde.maryland.gov/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319nps/factsheet.aspx
Watershed plan milestones: Report progress in the 319 Annual Report.	Baltimore County	report	see Annual Report	
Assess plan implementation progress, particularly: open space tree planting, impervious area removal on institution land.			future	
Assess hotspot investigation and follow-up			future	
Choptank River - Upper Watershed	Plan is eligible for 319(h) Grant implementation funding.			http://mde.maryland.gov/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319nps/factsheet.aspx
Watershed plan milestones: Report progress in the 319 Annual Report.	Caroline County	report	see Annual Report	
Assess plan implementation progress and update plan if needed.		assess	report: no update needed	
Corsica River Watershed	Plan is eligible for 319(h) Grant implementation funding.			http://mde.maryland.gov/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319nps/factsheet.aspx
Watershed plan milestones: Report progress in the 319 Annual Report.	Caroline County	report	see Annual Report	
Assess plan implementation progress and update plan if needed.		assess	future	
Gwynns Falls - Middle Watershed	Plan is eligible for 319(h) Grant implementation funding.			http://mde.maryland.gov/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319nps/factsheet.aspx
Report implementation progress in the 319 Annual Report.	Baltimore County	report	see Annual Report	
Jones Falls - Lower Watershed	Plan is eligible for 319(h) Grant implementation funding.			http://mde.maryland.gov/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319nps/factsheet.aspx
Watershed plan milestones: Report progress in the 319 Annual Report.	Baltimore County	report	see Annual Report	

Maryland 2015-2019 NPS Program – Statewide Milestones Objective 5: Types of Waterbodies	Lead	Goal 2016	Report 2016	Link to publications
Monocacy River - Lower Watershed	Plan is eligible for 319(h) Grant implementation funding.			http://mde.maryland.gov/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319nps/factsheet.aspx
Watershed plan milestones: Report progress in the 319 Annual Report.	Frederick County	report	see Annual Report	
Assess plan implementation progress and update plan if needed.			future	
Sassafras River Watershed	Plan is eligible for 319(h) Grant implementation funding.			http://mde.maryland.gov/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319nps/factsheet.aspx
Watershed plan milestones: Report progress in the 319 Annual Report.	SR Assoc.	report	see Annual Report	
Central Maryland - Chesapeake Bay Drainage	Plans not designed to			
Phase III Watershed Implementation Plan for the Chesapeake Bay TMDL: Develop and submit draft and final versions of Maryland's Phase III WIP to EPA. Includes the 2017 Interim Strategy for pollutant load reductions to be achieved for particular nonpoint sources of nitrogen, phosphorus and sediment. Progress will be assessed and findings will be provided in a report.	MDE			
Western Maryland - Casselman River and Youghiogeny River				
Casselman River Watershed	Plan is eligible for 319(h) Grant implementation funding.			http://mde.maryland.gov/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319nps/factsheet.aspx
Watershed plan milestones: Report progress in the 319 Annual Report, including, number/percentage of pH impaired stream segments, NPS Program Success Stories and implementation progress.	MDE	report	see Annual Report	
Percentage of impaired stream segments in watershed that are remediated and meet the State water quality standard for pH.			0%	
Report 303(d) stream segments that achieve pH criteria via Maryland's Integrated Report.		report	NA	
Deep Creek Lake Watershed Plan	Plan not designed to seek 319(h) Grant implementation funding.			
Plan completion anticipated in 2014. Potential milestones TBD.	DNR	NA	no milestones in plan	http://www.dnr.state.md.us/ccs/dcl_wmp.asp
Coastal Region - Coastal Bays and Atlantic Ocean				
Coastal Bays Conservation and Management Plan	Plan not designed to seek 319(h) Grant implementation funding.			
Plan completion anticipated in 2014-2015. Potential milestones TBD.	MCBP	NA	milestones TBD	http://www.mdcoastalbays.org/

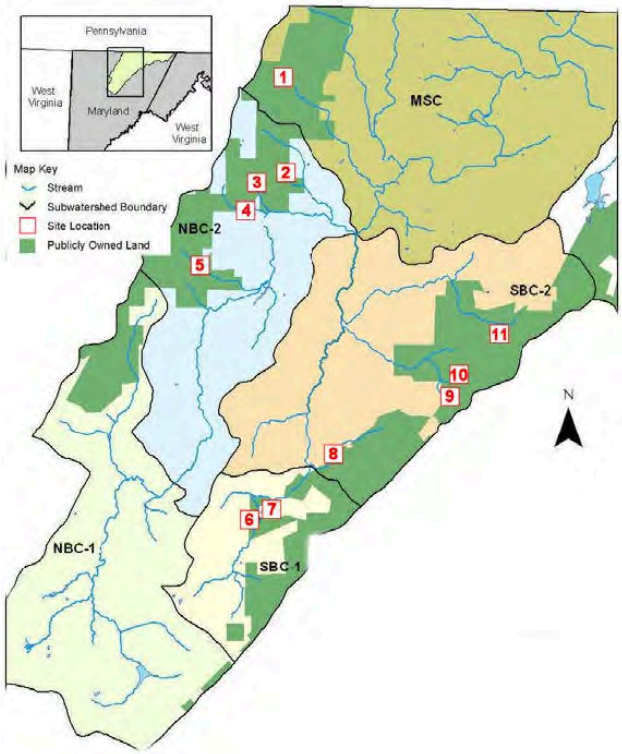
Maryland 2015-2019 NPS Program – Statewide Milestones Objective 6: Protection and Restoration	Lead	Goal 2016	Report 2016	Annual Publication link to
Conduct biological monitoring of approximately 30 sites annually to support implementation of Maryland's Antidegradation Policy in areas with pending significant development projects. Produce a report of results annually.	MDE	monitor & report	18 sites (319 FFY15 project #5)	https://iaspub.epa.gov/apex/grts/f?p=GRTS:199
303(d) Program Vision: For the 2016 reporting cycle and beyond, in addition to the traditional TMDL development priorities and schedules for waters in need of restoration, Maryland will identify protection planning priorities and approaches along with schedules to help prevent impairments in healthy waters, in a manner consistent with each State's systematic prioritization. (see Objective 7, Priorities, for a related objective)	MDE	report results	Report 2016: Maryland identified Tier II high quality streams as the priority for state protection efforts and further refined this prioritization with a preliminary vulnerability analysis of Tier II waters	

Maryland 2015-2019 NPS Program – Statewide Milestones Objective 7: Priority Setting	Lead	Goal 2016	Report 2016	Annual Publication link to
Biological monitoring to support implementation of Maryland's Antidegradation Policy in areas with pending significant development projects. Produce a list of about 30 high-priority monitoring sites annually.	MDE	list & report		
Award 319(h) Grant funding annually according to prioritization criteria. Provide scopes of work for each seleced project.	MDE	report		
303(d) Program Vision: Priorites - For the 2016 integrated reporting cycle and beyond, Maryland will review, systematically prioritize, and report priority watersheds or waters for restoration and protection in the biennial integrated reports to facilitiate State strategic planning for acheiving water quality goals.	MDE	report	Report 2016: Maryland's 2016 IR included the State "Vision" for reviewing and prioritizing impaired waters for TMDL development. This plan has completed public review and the final 2016 IR will be submitted to EPA in early 2017.	
303(d) Program Vision: Alternatives - By 2018, Maryland will use alternative approaches, in addition to TMDLs, that incorporate adaptive management and are tailored to specific circumstances where such approaches are better suited to implement priority watershed or water actions that acheive the water quality goals, including identifying and reducing nonpoint sources of pollution. (Assess alternatives to influence priorities)	MDE		Report 2016: Maryland has continued to explore the feasibility of a range of alternative approaches that could be initiated in Maryland. Worth noting, Maryland applied a straight-to-implementation approach in addressing a pH impairment to Big Laurel Run which resulted in a Category 2 assessment for Big Laurel Run (pH) on the 2016 Integrated Report.	

Maryland 2015-2019 NPS Program – Statewide Milestones Objective 8: Program Management and Evaluation	Lead	Goal 2016	Report 2016	Annual Publication link to
Chesapeake Bay Two-Year Milestones: Maryland has set benchmarks to gauge BMP implementation and programmatic progress for 2014-2015… For future two-year periods, including the 2017 Mid-Point Assessment, progress compared to the milestones will be assessed and reported. Based on the findings, milestones will be updated for the following two-year period. (2017 Interim loading target has already been set)	MDE	update milestones	see SFY16 Annual Report, Appendix - Milestones	
Produce Maryland's Integrated Water Quality Monitoring and Assessment Report every even calendar year (Integrated Report). Post the report on the Internet following EPA approval.	MDE	report	2016 Draft is in review process	http://mde.maryland.gov/programs/Water/TMDL/Integrated303dReports/Pages/Programs/WaterPrograms/TMDL/Maryland%20303%20dlist/index.aspx
Number of water bodies identified in Integrated Report as being primarily NPS impaired that are particially or fully restored: Partially or fully restore water bodies identified in state's Integrated Report primarily impaired by NPS. Partially restored means at least one water quality criterion is achieved in cases where the waterbody has multiple water quality criteria violations. (Cumulative starting in 2015)	MDE	1	One (1) according to 2016 Draft Report Executive Summary Table 2 Page 13	
Report NPS BMP implementation progress annually	MDE	report	see SFY16 Annual Rpt	
BMP Implementation Verification Protocols: Draft documentation due to EPA Chesapeake Bay Program	MDE		Completed. Gaps will be addressed in future	
Produce Maryland's 319 NPS Program Annual Report (319 Annual Report). Annually reort if findings necessitate a future NPS Management Program Plan update. Post the report on the Internet following EPA review.	MDE	report	Final is posted each year following EPA review.	http://mde.maryland.gov/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319NPS/index.aspx
Report progress achieved toward goals for 319-eligible water plans in Maryland's 319 Annual Report.	MDE	report	see SFY16 Annual Rpt	
Report significant findings from targeted watershed monitoring plan in Maryland's 319 Annual Report.	MDE	report	available upon request	
Report at least one success story documenting water quality and/or ecological improvement annually. If none can be documented during a given year, then report at least two programmatic success stories for that time period.	MDE	report	see Annual Report Appendix - Success Story	
Evaluate progress on each of these 319 Program milestones and report the status in Maryland's NPS Program Annual Report.	MDE	report	see Annual Rpt Appendix - Milestones	
Evaluate Local Chesapeake Bay 2014-2015 2-year Milestones for Bay Restoration (post local milestones and State evaluation to MDE webpage)	MDE	report	see link to web page	http://mde.maryland.gov/programs/Water/TMDL/ChesapeakeBayTMDL/Pages/programs/waterprograms/tmdl/cb_tmdl/index.aspx
Adopt State Chesapeake Bay 2016-2017 2-Year Milestones as 319 Plan Milestones by reference (Document via 319 Annual Report)	MDE	report	complete	
Evaluate Local Chesapeake Bay 2016-2017 2-year Milestones for Bay Restoration (post local milestones and State evaluation to MDE webpage)	MDE		future	
Adopt State Chesapeake Bay 2018-2019 2-Year Milestones as 319 Plan Milestones by reference (Document via 319 Annual Report)	MDE		future	
Maintain/increase State agency investment in NPS programs and implementation. Report status by state fiscal year. (See Annual Report Appendix A)	MDE	report	Annual Report Appendix - Financial Information	
303(d) Program Vision: Integration - By 2016, in cooperation with EPA, identify and coordinate implementation of key point source and nonpoint source control actions that foster effective integration across CWA programs, other statutory programs (e.g. CERCLA, RCRA, SDWA, CAA), and the water quality efforts of other Federal departments and agencies (e.g. Agriculture, Interior, Commerce) to achieve Maryland's water quality goals.	MDE	integrate & report	future	
Continuing Planning Process (CPP) update for consistency with this NPS Program Management Strategy	MDE	update & report	future	
State Monitoring Strategy Update	MDE		future	
See Objective 4 (Pollutants and Stressors) for additional evaluation milestones				
See Objective 3 (Pollutant Sources) for additional evaluation milestones				

Appendix – Success Story (Draft under EPA review)

Little Laurel Run pH Impairment Remedied by Successful Acid Mine Drainage Treatment



Waterbody Improved

Maryland's Little Laurel Run, a tributary to Casselman River in Garrett County, was impaired by low pH associated with acid mine drainage (AMD). An assessment of an AMD seep impacting the headwaters of Little Laurel Run ranked this stream as the number priority for mitigation in the Casselman River watershed. Successful implementation of two AMD mitigation measures brought the stream into compliance with the State water quality standard for pH. The Maryland Department of the Environment will pursue delisting Little Laurel Run for pH impairment in Maryland's 2018 Integrated Report.

Problem

Western Maryland's Casselman River watershed drains to Pennsylvania toward the Ohio River. Prior to WWII, the River and its tributaries were commonly high quality waterways that supported native brook trout. During several following decades, coal mining changed local hydrology resulting in acid mine drainage (AMD) that caused pH declines in numerous streams. One of the affected streams is Little Laurel Run. Its headwaters are located in a part of Maryland's Savage River State Forest in an area affected by acid mine drainage from abandoned deep coal mines. Little Laurel Run is a tributary to the Casselman River's South Branch, which supports a healthy brook trout population and is designated as a high quality Tier II waterway in Maryland regulation.

The Casselman River watershed was listed for pH impairment in 1996. In 2005, water quality monitoring to support pH TMDL development found that Little Laurel Run was intermittently below the Maryland water quality standard for pH 6.5-8.5. In 2008 EPA approved the pH TMDL for Little Laurel Run and other pH-impaired streams in Western Maryland.

Water quality monitoring in 2010-2013 showed that in-stream pH continued to frequently fall below Maryland's water quality pH standard of 6.5 to 8.0.

Maryland's 2014 Integrated Report clarified the pH conditions in the Casselman River watershed by separately listing each stream segment that has pH impairment and a pH TMDL, which includes Little Laurel Run.

Project Highlights

An assessment of Maryland's Casselman River tributaries conducted in 2004-2006 ranked Little Laurel Run as the highest priority for AMD mitigation.

In late 2008, the Maryland Department of the Environment (MDE) initiated watershed planning to make the Casselman River watershed eligible for 319(h) Grant implementation funds. The planning process included assessment of potential AMD mitigation sites, which included Little Laurel Run a high priority for action. The plan also analyzed AMD mitigation technologies. One of the technologies recommended to hold down capital, operation and maintenance costs was limestone sand application, sometimes called a limestone "sand dump". This technique involves constructing a driveway for a dump truck to pull up adjacent to the stream so that measured quantities of limestone sand can be delivered directly to stream edge. Then, natural variation in stream flow distributes the particles of limestone downstream. The limestone sand particles in the stream tend to raise in-stream pH and increase acid neutralizing capacity. The amount and timing of limestone sand application at each site is determined by periodic monitoring of in-stream pH.

In early 2011, EPA accepted the *Casselman River Watershed Plan for pH Remediation* and 319(h) Grant funds for implementation were approved for a project to mitigate AMD-impacted areas in the Casselman River watershed. Little Laurel Run was selected to be one of eleven Phase I projects for construction because the land was publicly owned, the site was accessible and permit requirements were attainable. (see map)

In mid 2013 two limestone sand application sites were constructed – one on each of the two branches of Little Laurel Run that form its headwaters. (see photos)

Results

Following installation the limestone sand application sites, MDE's Abandoned Mine Land Division (AMLD) periodically monitored the pH at Little Laurel Run and scheduled delivery of limestone sand to the application sites as needed. Following a period of adjustment in late 2013 and 2014, water quality data collected in Little Laurel Run throughout 2015 demonstrated that in-stream pH consistently met Maryland's water quality standard.

After the limestone sand applications were conducted, the adult brook trout numbers in Little Laurel Run showed a 2-fold increase. Reproductive success also improved, showing a three-fold increase in young of year trout numbers compared to pre-limestone application surveys. As a result in these water quality improvements, brook trout populations appear to have responded favorably by showing an increase in total numbers of adult trout, standing crops, and reproductive success. Additionally, improvements in the Casselman River Watershed brook trout population will create additional recreational opportunities for anglers to enjoy.

Partners and Funding

MDE's Abandoned Mine Land Division (AMLD) and MDE's Water Quality Protection and Restoration Program cooperated to write the *Casselman River Watershed Plan for pH Remediation*. AMLD used $55,000 from the FFY2008 319(h) Grant for part of this effort.

Implementation of the eleven Phase 1 Casselman River watershed AMD mitigation sites was led by AMLD using $644,115 from the FFY2009 319(h) Grant. The Garrett Soil Conservation Dist. was hired to oversee contractor hiring, construction management and inspection of projects. Capital cost of the 319 project included funds for the two limestone sand dumps at Little Laurel Run: $45,000 to construct Casselman Phase I implementation Site 9 at "West Shale Road South" and $6,500 to construct Casselman Phase I implementation Site 10 at "West Shale Road North".

Other partners contributed work at no cost to the project. Watershed plan drafting by MDE WQPR staff was funded by the 319(h) Grant through ongoing projects that support the State NPS management program. Also, before/after water quality monitoring by MDE's Field Services Program were funded by separate on-going 319(h) Grant projects. The Maryland Fisheries Service assessment and analysis was independently funded by the State.

For additional information contact:
Connie Loucks, Maryland Department of the Environment, Abandoned Mine Land Division, 301-689-1461 or connie.loucks@maryland.gov
Ken Shanks, Maryland Department of the Environment, Watershed Protection and Restoration Program, 410-537-4216 or kenneth.shanks@maryland.gov

Appendix – Watersheds

Watershed Name	General Description of Contents
- Antietam Creek - Back River Tidal - Back River Upper - Casselman River - Corsica River - Lower Jones Falls - Lower Monocacy River - Middle Gwynns Falls - Sassafras River - Upper Choptank River	Each watershed listed is eligible for 319(h) Grant implementation funding. The appendix addresses several topics: - Introduction: Watershed plan context and goals, watershed-specific milestones from Maryland's 2015-2019 NPS Management Plan Objective 5. - Grant-funded Implementation Projects summary for the 319(h) Grant, State Revolving Fund, and Chesapeake and Atlantic Coastal Bays Trust Fund - BMP implementation reported with estimated pollution load reductions

Appendix
Watershed Eligible for 319(h) Grant Implementation Funding

Antietam Creek in Washington County, Maryland

Contents

Introduction

The *Antietam Creek Watershed Restoration Plan* was completed by the Washington County Soil Conservation District, with technical assistance by MDE, in September 2012. EPA accepted the plan in September 2012. The watershed covered by the Antietam Creek watershed plan is the drainage in Maryland only. In Maryland, the Antietam Creek watershed is entirely within Washington County. Pennsylvania is not addressed in the watershed plan.

Sediment reduction goal is 12,923 tons (Antietam Creek watershed plan Table 8, page 27).

Bacteria reduction goal is 5,411,472 billion E. Coli bacteria MPN/year (Antietam Creek watershed plan Table 10, page 34). (MPN is most probable number)

Base Year for watershed plan implementation is 2012. The watershed plan accounts for pollutant reductions and BMP implementation prior to that year in setting the watershed plan goals. Pollutant load reductions and BMP implementation reported beginning 2012 can be counted toward meeting watershed plan goals.

Milestones

Maryland's 2015-2019 NPS Management Plan Objective 5 includes two milestones for this watershed:

- Annually: Report progress in the 319 Annual Report, and
- 2017: Assess implementation progress toward sediment and bacteria reduction watershed plan milestones and update the plan if needed. (This reiterates a pre-existing milestone in the watershed plan.)

Water Quality Monitoring Activity, Overall Condition, Trends

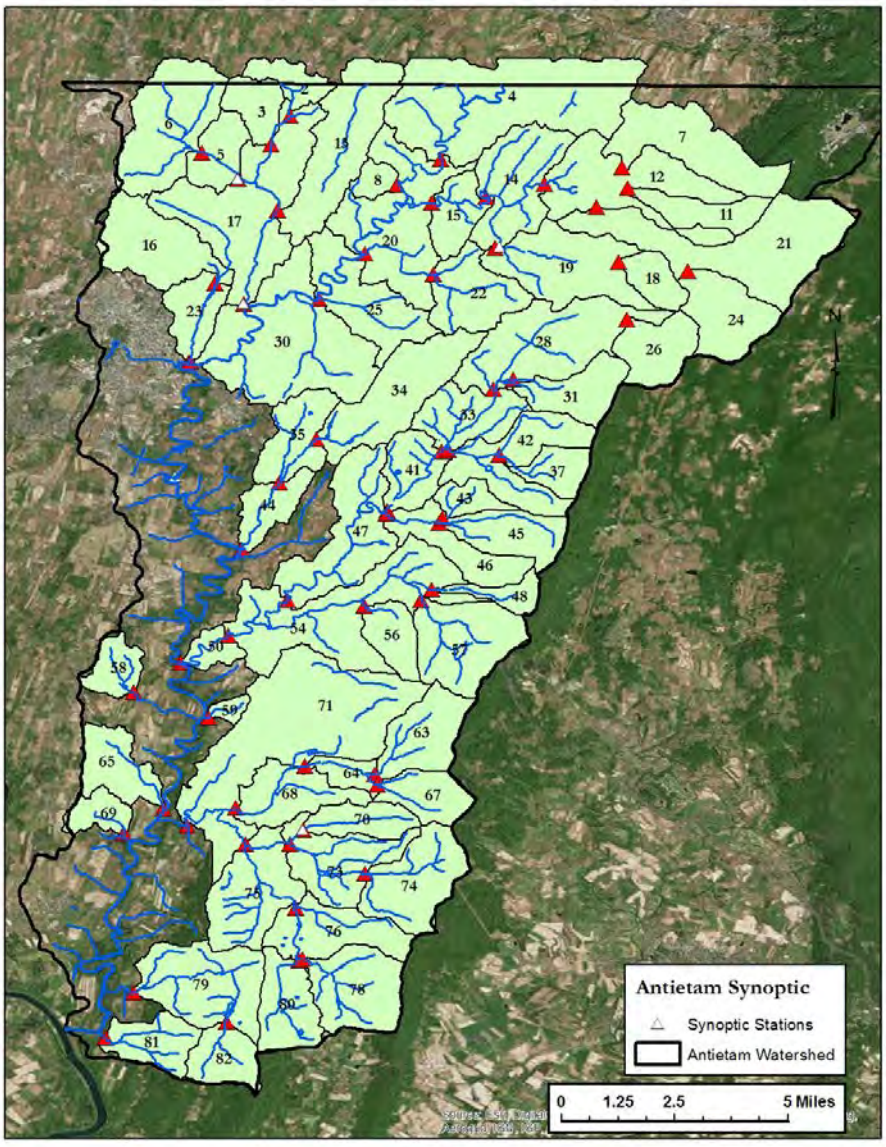
Over the period from 1999 thru 2014, Maryland DNR analysis of data from three long term nontidal monitoring stations, not considering flow data, indicate that there have been an trends toward decreasing phosphorus and sediment but an insignificant trend toward increasing nitrogen. [1] This most recent analysis is consistent with the analysis in Maryland DNR's report for 2011-2013 (see the 2014 Annual Report). This trend analysis includes mostly years that predate the 2012 watershed plan. However, 319(h) Grant funds investment to support implementation of agricultural NPS BMPs in the Antietam Creek watershed encompass 1994 thru the present. It is possible that 319(h) Grant investment may have contributed to these trends but the scale of the water quality monitoring is was insufficient to establish a causal relationship.

MDE's Targeted Watershed project has been monitoring in-stream water quality in the Antietam Creek watershed from mid 2011 thru late 2014.

During SFY16, MDE's Targeted Watershed project did not collect monitoring samples in the Antietam Creek watershed because the project leader in 2015 determined that: 1) sufficient data had been collected to characterize conditions "before implementation", 2) annual prioritization of monitoring among 319 priority watersheds will revisit these prioritization.

The final report dated May 16, 2016 for the FFY15 319-funded project included:

- Map of 58 synoptic survey sites that were sampled in Fall 2014 (pages 16-17);
- Data summary (pages 47-48.)
- Explanation of the purposes and uses of the sampling (page 20) follows:



[1] Maryland Department of Natural Resources. *Potomac River Water Quality and Habitat Assessment Overall Condition 2012-2014*. Pages 3 and 5.

"The synoptic data for the Antietam watershed is being used to focus implementation efforts by county, state, and federal governments, as well as, local watershed associations. Specifically, the synoptic data in the Antietam watershed is being used to focus on potential nutrient "hot spots" associated with first and second order streams. This data has been analyzed using GIS software with land use information and high resolution satellite imagery to get a better idea of what may be influencing the elevated nutrient levels in specific areas of the watersheds.

The nutrient synoptic data for the Antietam watershed has been provided to another project which is focusing resources on identifying the best place to plant trees. The project involves the Department of Natural Resources (DNR), the Nature Conservancy, and the University of Maryland Appalachian Laboratory. With limited funding for implementation, this data has provided detailed geographic information that may be helpful in focusing on the specific problems and then possibly match specific types of implementation in order to achieve the best results."

Antietam Creek Watershed

1994-SFY16 Completed NPS Implementation Projects - 319(h) Grant

Project Summary			Project Expenditures					Reported Pollutant Load Reduction			
Area/Lead	Name/Dsescription	End Date	Grant Funding Source	Grant Funds		Non Federal $ Match	Total $	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)	Bacteria (billion/yr)
				Federal $	State $						
Md Dept of Agriculture (MDA) with Washington County Soil Conservation District (SCD)	Antietam Creek Watershed Project		319 FFY1994 #6								
		1996	319 FFY1995 #13	112,821.00		Federal grant budget for project is presented. Expenditure data is unavailable.		Projects and pollutant load reduction from projects reported prior to 2012 (shaded grey in table) were accounted for in the watershed plan. Therefore, these reductions are not counted toward implementing the watershed plan. However, available pollutant load reduction data is presented.			
		1998	319 FFY1996 #15	52,774.00							
		1998	319 FFY1997 #16	91,531.00							
		1999	319 FFY1998 #17	105,337.00							
		2000	319 FFY1999 #12	120,360.00							
		2001	319 FFY2000 #8	99,733.00							
		2002	319 FFY2001 #9	125,859.00							
		2003	319 FFY2002 #6	134,423.00							
		2004	319 FFY2003 #7	124,859.00							
		2005	319 FFY2004 #11	106,189.90		70,793.27	176,983.17				
		2007	319 FFY2004 #27	129,225.23		86,150.15	215,375.38	77,692	5,686	0	0
		2006	319 FFY2005 #5	119,446.79		79,631.19	199,077.98	4,718	720	0	0
		2008	319 FFY2007 #5	139,258.68		92,839.12	232,097.80	65,216	5,862	81.2	0
		2010	319 FFY2008 #6	155,838.12		103,892.08	259,730.20	71,239	5,553	0	0
	MDA Antietam Creek Watershed Proj	2010	319 FFY2009 #3	151,110.82		100,740.55	251,851.37	64,590	5,067	0	0
Washington Co. SCD	Antietam Creek Watershed Plan	2012	319 FFY2008 #20	29,264.39		19,509.59	48,773.98	0	0	0	0
	Barr Property Stream Restoration Ph1	SFY16	319 FFY13 #10	148,930.00		99,287.00	248,217.00	23.75	4.95	2.76	0
	Kiwanis Park Stream Stabilization Ph1	SFY15	319 FFY2014 #7	124,340.97		82,893.98	207,234.95	34.2	10.3	16.75	0
	Kiwanis Park Stream Stabilization Ph2	SFY16	319 FFY12 #13	39,147.90		26,098.60	65,246.50	17.1	5.15	4.15	0
	Shank/Anderson Project Phase 2 of 3	SFY16	319 FFY11 #13	64,253.43		42,835.62	107,089.05	27.85	2.85	3,567.0	166.0
Washington County	Lehmans Mill Rd Stream Stabilization	2012	SRF Grant	0.00	191,700.00	0.00	191,700.00	101	5.35	0	0
	Burnside Bridge Rd Stream Stabilization	2012	SRF Grant	0.00	232,900.00	0.00	232,900.00	101	5.35	0	0
	Greensburg Rd Little Antietam Creek Restoration	2014	319 FFY2012 #11	229,555.73		153,037.15	382,592.88	110	37.4	85.25	0
	Devils Backbone Park Stream Restoration	SFY16	319 FFY11 #15	95,051.72		63,367.81	361,812.58	300.0	102.0	232.50	0
		SFY16	319 FFY14 #8	122,035.83		81,357.22					
			TOTAL overall	2,621,346.51	424,600.00	1,102,433.34	3,180,682.85	284,169.9	23,061.4	3,989.61	166
			TOTALS for projects counted toward watershed plan implementation.	852,579.97	424,600.00	568,386.98	1,845,566.95	714.9	173.4	3,908.41	166

For sediment and bacteria pollutant loads, BMPs installed 2012 and later can be counted toward watershed plan implemetation.

SFY16 NPS Implementation Projects In Progress - 319(h) Grant - Antietam Creek Watershed

Project Summary			Project Funding					Future Pollutant Load Reduction			
Area/Lead	Name/Dsescription	End Date	Grant Funding Source	Grant Budgeted		Non Federal $ Match	Total $ Budgeted	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)	Bacteria (MPN/yr)
				Federal $	State $						
Hagerstown	Hamilton Run at Northern Ave. Stream Restoration	TBD	319 FFY16 #9	613,940		409,294	1,023,234	67.5	61.2	12.1	0
Washington County	no projects now working										
Washington County SCD	Barr Property Stream Restoration Ph2	TBD	319 FFY15 #6	139,257		92,838	232,095	23.75	4.95	2.76	0
	Shank/Anderson Project Phase 3 of 3	TBD	319 FFY15 #7	448,365		298,910	747,275	157.7	56.7	795	0
	Winder Property Phase 2 of 3	TBD	319 FFY16 #8	39,480		26,320	65,800	126.4	17.15	1,662.5	271.4 billion
			TOTALS	1,241,042	0	827,362	2,068,404	375.4	140.0	2,472.4	271.4 billion

Antietam Creek Watershed
Chesapeake and Atlantic Coastal Bays Trust Fund
SFY 2016 NPS Implementation Project Status (1)

Year Funded	PartnerCD	ProjectTitle	ProjectType	County	Trust Fund Dollars	Status	BMP Units	BMPs Reported	Annual LbsN	Annual LbsP	Annual TonsTSS
SFY13	Chesapeake Bay Foundation	Maryland Watershed Restoration Project: Hidden Hollow Farm	Tree Planting Projects	Washington	1,485.00	Complete	acres	3	111.8	10.7	4.65
SFY13	Town of Boonsboro	Boonsboro Community Tree Planting In The Park Project	Tree Planting Projects	Washington	15,000.00	Complete	acres	3.6	80.4	5.4	0.95
SFY14	Chesapeake Bay Trust	Hagertown's Tree Planting and Memorial Blvd Greening	Tree Planting Projects	Washington	65,850.00	Complete					
SFY14	Chesapeake Bay Trust	Hagertown's Tree Planting and Memorial Blvd Greening	Tree Planting Projects	Washington	104,150.00	Complete			11.8	0.5	0.04
SFY14	City of Hagerstown	Bioretention Facility near Clean Water Circle (site A)	Stormwater Management	Washington	455,000.00	Complete			100.5	20.9	5.80
SFY14	City of Hagerstown	Wet Swales near Hagerstown Light Dept. (Site B)	Stormwater Management	Washington	45,000.00	Complete			36.9	9.3	2.70
SFY14	Washington County	Fountaindale Elementary (Washington County Board of Education Riparian Buffers)	Tree Planting Projects	Washington	625.50	Complete	acres	0.2	5.9	0.2	0.05
SFY14	Washington County	Northern Middle School (Washington County Board of Education Riparian Buffers)	Tree Planting Projects	Washington	780.62	Complete	acres	1.2	35.4	1.5	0.27
SFY14	Washington County	Smithsburg Middle/High School Complex (Washington County Board of Education Riparian Buffers)	Tree Planting Projects	Washington	2,341.87	Complete	acres	1.5	44.3	1.8	0.34
	(1) Maryland DNR provided this data 2/21/17 and indicated it is the full extent available.			TOTALS	690,232.99				426.88	50.31	14.80
SFY15	Md Forestry Board Foundation	Klein Reforestation	Tree Planting Projects	Washington	6,539.00	On-going	acres	2	0.0	1.0	0.29
	(1) Maryland DNR provided this data 2/21/17 and indicated it is the full extent available.			TOTALS	6,539.00				0.00	1.00	0.29

Antietam Creek Watershed
In Washington County, Maryland
SFY16 Agricultural BMP Implementation

Agricultural Best Management Practices (1)	Unit	BMPs Reported	Estimated Pollutant Load Reduction: Nitrogen Total (lbs)	Phosphorus Total (lbs)	Sediment Total (tons)	E. coli billion/yr
Annual Practices						
Cover Crops	acres	6,090	69,088.80	501.10	394.02	
Multi-Year Practices						
Alternative Crops	acres	0				
Amendments for the Treatment of Ag Waste	AU	0				
Animal Mortality Facility	count	0				
Conservation Cover	acres	0				
Conservation Plans/SCWQP	acres	3,441	5291.7	580	460.14	
Critical Area Planting	acres	0				
Dead Bird Composting Facility	count	0				
Fencing	feet	21,691	3124.2	222.0	52.75	
Field Border	acres	0				
Filter Strip	acres	0.7	5.0	0.3	0.48	
Grassed Waterway	acres	0.63	18.7	0.6	0.43	
Horse Pasture Management	acres	0				
Loafing Lot Management System	acres	0.54	65.7	9.1	0.45	
Pasture & Hay Planting	acres	0				
Prescribed Grazing	acres	14.5	19.4	5.8	1.87	
P-sorbing Materials	acres	0				
Riparian Forest Buffer	acres	11.17	503.2	15.3	8.68	
Riparian Herbaceous Cover	acres	0.59	18.5	0.6	0.42	
Roof Runoff Structure	count	13	1611	224	10.80	
Stream Restoration Ag	feet	325	56.6	39.1	6.32	
Tree/Shrub Establishment	acres	0				
Waste Storage Facility	count	7				
Wastewater Treatment Strip	acres	0				
Water Control Structure	count	0				
Watering Facility	count	5	36.7	6.7	2.15	
Wetland Creation	acres	0				
Wetland Restoration	acres	0				
Windbreak/Shelterbelt Establishment	feet	0				
Total Annual Practices (2)			69,088.8	501.1	394.0	0.0
Total Multi-year Practices			10,750.7	1,103.5	544.5	0.0
Total Pollutant Load Reduction			79,839.5	1,604.6	938.5	0.0

(1) "SFY16 Total" column is 12/##/15 MDA data.

(2) Annual Practices: cover crops, nutrient mgmt, manure transport, conservation tillage & high residue tillage.

Antietam Creek Watershed Plan
Agricultural BMP Implementation Goals

Management Practice	Sediment Goal Table 14	Bacteria Goal Table 18	Units	Progress: SFY16	Progress: 2012 thru SFY16
Cover Crops	4,000		acres/yr	6,090	
Soil Conservation WQ Plans	3,050	15,460	acres	3,441	13,300
Stream Protection Fenced	780 ac	780 ac	feet	21,691	36,756
Grass Buffers	295	35	acres	0	3
			acres	0.7	0.8
			acres	0.63	1.63
Riparian Forest Buffers		260	acres	11	70.5
			acres	0.59	7.9
Runoff Control Systems		12	count	13	22
Stream Restoration			feet	325	325
Animal Waste Mgmt Systems		26	count	7	17
			count	5	18
Conservation Tillage	6,200		acres		
Erodible Land Retirement	130		acres		0
Livestock Stream Crossing		17	count		0
No-Till	4,800		acres		0
Stream protection no fence	1,300	1,300	acres		40

Prior Years Progress Toward Watershed Plan Goals

Data reported by locals: 2013 Annual Report	Extracted from State Data reported by MDE to EPA Bay Program: SFY14	SFY15		Units
3,956.9	2,887.0	3,015.0		acres
	8,905.0	6,160.0		feet
2.5	0	0		acres
0	0.1	0.0		acres
0	1.0	0.0		acres
56.8	2.5	0.0		acres
0	7.3	0.0		acres
4	2	3		count
0	0	0		feet
2	4	4		count
0	5	8		count
0	0	0		acres
0	0	0		count
0	0	0		acres
40.0	0	0		acres

Antietam Creek Watershed
In Washington County, Maryland
SFY2016 Urban BMP Implementation

Urban Best Management Practice	Unit	BMPs Reported	Estimated Pollutant Load Reduction			
			Nitrogen lb/yr	Phosphorus lb/yr	Sediment tons/yr	Bacteria billion/yr
Bioretention	acres	0.64	9.98	0.19	0.19	
Bioswale	acres	0				
Disconnection of Rofftop Runoff	acres	0				
Dry Detention Ponds & Hydro Structures	acres	0				
Dry Extended Detention Ponds	acres	0				
Dry Well	acres	0				
Filtering Practices	acres	0				
Forest Conservation	acres	0				
Forest Harvesting Practices	acres	0				
Infiltration Practices	acres	0				
Permeable Pavement	acres	1.56	14.82	0.16	0.36	
Rain Garden	acres	0				
Reduction of Impervious Surface	acres					
Riparian Forest Buffers on Urban Lands	acres					
Septics Connections to Sewers	count					
Septics Denitrification Critical Area	count					
Septic Denitrification outside of 1000 ft	count	14	46.2			
Septic Denitrification within 1000 ft	count	21	115.5			
Stream Restoration Urban	feet					
Street Sweeping	acres					
Tree Planting	acres					
Urban Forest Buffer	acres	0				
Wet Extended Detention	acres	0				
Wet Ponds & Wetlands	acres	0				
TOTAL Pollutant Load Reduction			186.50	0.35	0.55	0.00

(1) "BMPs Reported" column is 12/5/16 MDE data. Bacteria load reduction was not reported.
(2) Load reductions are edge of stream estimates calculated by MDE using MAST.

Antietam Creek Watershed Plan
Urban BMP Implementation Goals

Urban Best Management Practice	Sediment Goal Table 14	Bacteria Goal Table 18	Units	Progress		Prior Years Progress Toward Watershed Plan Goals				
				SFY16	2012-SFY16	Data reported by locals	Extracted from State Data reported by MDE to EPA Bay Program			
						2012-2013	SFY14	SFY15		Units
Forest Harvest Practices	250		acres	0.00	798.0	722.0	0.0	76.0		acres
Septic System Upgrades		645	count	35	122	26	10	30		count
							17	4		

Appendix
Watersheds Eligible for 319(h) Grant Implementation Funding

Tidal Back River in Baltimore County, Maryland
And
Upper Back River in Baltimore County and Baltimore City, Maryland

Contents

Back River Small Area Watershed Plans Summary	
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%

Tidal Back River SWAP Overview

The *Tidal Back River Small Watershed Action Plan* (SWAP) was completed by Baltimore County in February 2010 and was accept by EPA in August 2010. The watershed is entirely within Baltimore County, Maryland.

Base Year for watershed plan implementation is 1998. Pollutant load reductions reported beginning that year can be counted toward meeting watershed plan goals. The watershed plan (EPA accepted 2010) in Section 1.3 pages 3 and 4 indicate that the plan's nutrient goals are from the TMDL for nitrogen and phosphorus (EPA approved 2005). The TMDL is based on water quality data collected 1992-1997. (See TMDL Section 4.1 page 18, and also Section 2.6 pages 6-17.)

Tidal Back River SWAP pollutant reduction goals (Table 3-2 on page 23) are:

- Nitrogen reduction goal is 6,498 pounds per year.
- Phosphorus reduction goal is 679 pounds per year.

Tidal Back River SWAP implementation goals (Appendix A, Table A-1) are for urban BMPs. Of these, the measurable goals are numbered: 6, 10, 12, 16, 17, 18, 19, 20, and 36. Some goals have milestone dates for reporting or progress achievement, which were reiterated in *Maryland's 2015-2019 NPS Management Plan* under Objective 5:

- Annually: Report progress in the 319 Annual Report
- Assess progress for several action items
    - 2016: #37 hot spots
    - 2018: #10 stormwater retrofits
    - 2019: #31 wetland plantings.

Upper Back River SWAP Overview

The Upper Back River Small Watershed Action Plan was completed by Baltimore County in November 2008 and was accept by EPA in January 2009. The watershed covered is in Baltimore City and Baltimore County, Maryland.

Pollutant reduction goals from the watershed plan Table 3-2 on page 3-8:

- Nitrogen reduction goal is 48,190 pounds per year.
- Phosphorus reduction goal is 6,056 pounds per year.

BMP implementation goals in the Upper Back River watershed plan are in two different places:

- Table 3-4 and Table 3-5 on pages 3-11 and 3-12.
- Appendix A Table A-2.

Base Year for watershed plan implementation is 1998. Pollutant load reductions reported beginning that year can be counted toward meeting watershed plan goals. The watershed plan (EPA accepted 2010) in Section 1.3 pages 3 and 4 indicate that the plan's nutrient goals are from the TMDL for nitrogen and phosphorus (EPA approved 2005). The TMDL is based on water quality data collected 1992-1997. (See TMDL Section 4.1 page 18, and also Section 2.6 pages 6-17.)

Maryland's 2015-2019 NPS Management Plan Objective 3 milestones for this watershed:

- Annually: Report progress in the 319 Annual Report,
- Assess progress for several action items in future years:
    - 2018: plan implementation progress particularly for open space tree planting, and impervious area removal on institutional land.
    - 2019: hotspot investigation and follow-up.

BMP tracking/reporting

Urban BMPs tracking and progress reporting for the *Tidal Back River Small Watershed Action Plan* is conducted by Baltimore County. The data for watershed implementation progress and estimated pollution load reductions used in this annual report were supplied by Baltimore County. The County uses its own methods for estimating pollutant load reductions associated with the management practices that were implemented. Baltimore County's documentation on their pollutant load reduction estimation methods appears at the end of this appendix. Additional questions on the County's estimates should be directed to the County's Department of Environmental Protection & Sustainability, Watershed Management and Monitoring Section, Nathan Forand at nforand@baltimorecountymd.gov

Agricultural BMP tracking and progress reporting for the State of Maryland is conducted by the Maryland Department of Agriculture. No agricultural BMP implementation was reported during the period state fiscal year 2014 thru 2016.

Water Quality Monitoring Activity, Overall Condition, Trends

Tidal Back River

The most recent assessments of water quality conditions and trends are identified in the table. Some additional information is in the form of data summaries from two monitoring stations operated by Maryland DNR in Back River tidal waters are presented on following pages. No more recent information is available.

Water Quality Monitoring/Trends Annual Report Sources Tidal Back River				
Report Year	**Appendix Page**	**Report 1**	**Report 2**	**Report 3**
SFY15	3 thru 5	DNR, Patapsco and Back Rivers WQ and Habitat Assessment, Nov 2012	DNR, Patapsco River and Back River WQ and Habitat Overall Condition 2012-2014	2015 fish kills
2014	1 thru 3	DNR, Patapsco & Back Rivers Overall Condition 2011-2013	DNR, Patapsco & Back River WQ & Habitat Assessment	

Upper Back River

Water quality monitoring is being conducted by Baltimore County as described in the 2014 Annual Report. However, analysis was not available for SFY16 Annual Report or earlier annual reports.

Back River

Riverside Marina (XIF7918)

Dissolved Oxygen	2014	2015	**AVG**
Less than 5 mg/L	3%	2%	**2.5%**
Less than 3.2 mg/L	< 1%	< 1%	**< 1%**

Chlorophyll	2014	2015	**AVG**
Greater than 15 ug/L	95%	99%	**97%**
Greater than 50 ug/L	66%	83%	**75%**

Turbidity	2014	2015	**AVG**
Greater than 7 NTU	100%	> 99%	**> 99%**

Back River

Lynch Point (XIF4935)

Dissolved Oxygen	2014	2015	**AVG**
Less than 5 mg/L	6%	8%	**7%**
Less than 3.2 mg/L	< 1%	1%	**< 1%**

Chlorophyll	2014	2015	**AVG**
Greater than 15 ug/L	97%	99%	**98%**
Greater than 50 ug/L	20%	38%	**29%**

Turbidity	2014	2015	**AVG**
Greater than 7 NTU	> 99%	97%	**99%**

2012-SFY16 Completed NPS Implementation Projects -- Back River Tidal Watershed
319(h) Grant

Project Summary			Project Expenditures					Reported Pollutant Load Reduction		
Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Match $	Total $	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)
				Federal $	State $					
Baltimore County	Bread & Cheese Creek stream restoration & stormwater control	2013	319 FFY2010 #11	556,443	0	370,962	1,000,000	280.07	94.19	214
TOTAL reported for completed projects				556,443	0	370,962	1,000,000	280	94.2	214

SFY 2016 319(h) Grant Activity for NPS Implementation Projects - Back River Tidal Watershed

Project Summary			Project Funding					Future Pollutant Load Reduction		
Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)
				Federal	State					
Baltimore County	No 319 projects working during SFY16									

2012-SFY16 Completed NPS Implementation Projects -- Back River Tidal Watershed
State Revolving Fund (SRF)

Project Summary			Project Expenditures					Reported Pollutant Load Reduction		
Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Match $	Total $	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)
				Federal $	State $					
Baltimore County	Pleasure Island Beach Shoreline (1)	2012	SRF Grant	$0	$2,717,100	$0	$4,285,123	1,010	53.5	0
	Tidal Back River Greening (2)		SRF Grant	0	385,000	0	1,500,000	441	113	24
TOTAL reported for completed projects				0	3,102,100	0	5,785,123	1,451	166.5	24

SFY16 SRF Activity for NPS Implementation Projects - Back River Tidal Watershed

Project Summary			Project Funding					Future Pollutant Load Reduction		
Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)
				Federal	State					
Baltimore County	No SRF projects working during SFY16									

Footnotes:

(1) SRF records indicate this project is “a shoreline erosion control project utilizing dredged material; included maintenance dredging of the 5,000 ft long channel adjacent to the island to create the beach and to stabilize 3,100 linear feet of shoreline using a combination of stone structures and beach fill with wetland vegetation.”

(2) The project involved 7 schools, 1 park & ride, 1 community center. SRF records also indicate "consists of stormwater improvements, including impervious surface removal, bioretention BMPs, reforestation, and shoreline enhancement w/wetland buffer". Total overall project cost was recalculated during design according to SRF records.

Back River Upper Watershed
2001-SFY16 Completed 319(h) Grant NPS Implementation Projects

Project Summary			Project Expenditures					Pollutant Load Reduction		
Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Non Federal Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)
				Federal	State					
Baltimore County	Redhouse Run/Overlea stream restoration & stormwater control	2001	319 FFY2000 #16	$130,000.00		$86,667	$530,000.00	52	9.46	2.67
			Other		$228,899.00					
	Redhouse Run/St. Patricks stream restoration	2011	319 FFY2007 #18	$418,500.00		$279,000	$883,016.00	609	32.1	5.37
	Upper Back River Stormwater conversions	2012	319 FFY2008 #21	$95,883.81		$63,923	$159,806.35	51.7	11.5	2.06
TOTAL reported for completed projects				$644,383.81	$228,899.00	$429,589.21	$1,572,822.35	712.7	53.1	10.1

For nitrogen and phosphorus pollutant loads, BMPs installed 1998 or later can be counted toward watershed plan implementation.

SFY16 319(h) Grant Project Activity - Back River Upper Watershed

Project Summary			Project Funding					Projected Pollutant Load Reduction		
Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Non Federal Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)
				Federal	State					
Baltimore County	Herring Run/Overlook Park stream restoration & buffer planting	TBD	319 FFY2014 #9	$358,032		$238,688	TBD	200.5	29.6	6.75
Baltimore City	No SRF projects working during SFY16									

Back River Watershed (Tidal and Upper combined)
Chesapeake and Atlantic Coastal Bays Trust Fund
SFY 2016 NPS Implementation Project Status (1)

Year Funded	PartnerCD	ProjectTitle	ProjectType	County	Trust Fund Dollars	Status	BMP Units	BMPs Reported	Annual LbsN	Annual LbsP	Annual TonsTSS
FY10	Baltimore County DEPS	Red House Run Stream Restoration	Stream Restoration	Baltimore	186,121.00	Complete			606.0	32.0	0.00
FY12	Baltimore County	Herring Run at Overlook Park Stream Restoration and Buffer Planting	Stream Restoration	Baltimore	385,735.55	Complete			65.0	11.0	3.92
		Bread and Cheese Creek Water Quality Enhancement and Stream Restoration	Stream Restoration	Baltimore	193,557.00	Complete			200.0	30.0	6.75
		Monitoring Water Quality Improvements at Bread and Cheese Creek	Monitoring	Baltimore	5,400.00	Complete			0.0	0.0	0.00
		Upland Tree Plantings - BWB	Tree Planting Projects	Baltimore	35,000.00	Complete			11.9	2.3	0.15
		Tree Planting - BRRC	Tree Planting Projects	Baltimore	10,000.00	Complete			5.8	1.1	0.07
SFY13	Alliance for the Chesapeake Bay	Trees and Environmental Education: Chinquapin Run Park	Tree Planting Projects	Baltimore City	8,065.31	Complete	acres	1.91	8.6	0.6	0.09
		Trees and Environmental Education: Northwood & Kelway	Tree Planting Projects	Baltimore City	8,065.32	Complete	acres	1.5	8.0	0.6	0.90
	Baltimore County	Bread & Cheese Creek Stream Restoration	Stream Restoration	Baltimore	250,000.00	Complete			346.2	116.0	0.13
		Conversion of 5 SW/M ponds in Upper Back River	Stormwater Management	Baltimore	175,000.00	Complete			371.5	56.0	11.00
		Tidal Back River Greening Project	Stormwater Management	Baltimore	787,388.00	Complete			441.0	113.0	24.00
	Parks and People Foundation	Green Space Creation at Moravia Park Elementary (Remove Impervious 5)	Stormwater Management	Baltimore City	370,000.00	Complete			8.9	1.1	0.44
		Students Restoring Urban Stream: Herring Run Park	Tree Planting Projects	Baltimore City	16,305.00	Complete	acres	1.15	6.6	0.4	0.07
SFY14	Alliance for the Chesapeake Bay	Gallery Church Baltimore	Tree Planting Projects	Baltimore	1,890.58	Complete	acres	0.28	1.3	0.1	0.00
		St. Matthew's Catholic	Tree Planting Projects	Baltimore City	2,014.63	Complete	acres	0.19	0.9	0.0	0.00
		Faith Presbyterian, Baltimore	Tree Planting Projects	Baltimore City	2,975.52	Complete	acres	0.3	1.4	0.1	0.00
	Baltimore City Recreation and Parks	Chinquapin Run Park @ Kitmore	Tree Planting Projects	Baltimore City	6,739.07	Complete	acres	0.6	3.4	0.2	0.04
		Armistead Gardens ES/MS	Tree Planting Projects	Baltimore City	2,994.02	Complete	acres	0.25	1.2	0.1	0.01
		Baltimore IT Academy	Tree Planting Projects	Baltimore City	2,994.02	Complete	acres	0.24	1.1	0.0	0.01
		Moravia Park ES	Tree Planting Projects	Baltimore City	16,847.67	Complete	acres	1.5	7.1	0.3	0.05
		NACA Freedom and Democracy Academy	Tree Planting Projects	Baltimore City	8,423.84	Complete	acres	0.9	4.2	0.2	0.03
		Patterson HS	Tree Planting Projects	Baltimore City	1,682.77	Complete	acres	0.15	0.8	0.0	0.01
		Vanguard Collegiate/Maritime Academy	Tree Planting Projects	Baltimore City	5,615.89	Complete	acres	0.5	2.4	0.1	0.02
		Hazelwood EMS	Tree Planting Projects	Baltimore City	8,985.42	Complete	acres	0.8	3.8	0.2	0.03
		Herring Run Park @ Armistead Gardens	Tree Planting Projects	Baltimore City	7,300.66	Complete	acres	0.65	3.7	0.3	0.04
		Herring Run Park @ Shannon & Lyndale	Tree Planting Projects	Baltimore City	8,199.20	Complete	acres	0.73	4.2	0.3	0.05
	Baltimore County	Victory Villa ES	Tree Planting Projects	Baltimore	4,640.13	Complete	acres	0.8	4.6	0.3	0.05
		Villa Cresta ES	Tree Planting Projects	Baltimore	2,552.07	Complete	acres	0.44	2.5	0.2	0.03
	(1) Maryland DNR provided this data 2/21/17 and indicated it is the full extent available.			TOTALS	2,514,492.67				2,122.0	366.3	47.88

FY14	Chesapeake Bay Trust	Greening Watershed Neighborhoods	Tree Planting Projects	Baltimore	114,342.00	Construction			42.4	1.7	0.14
FY15	Blue Water Baltimore	Baltimore International Academy	Stormwater Management	Baltimore City	202,262.84	Construction			6.0	1.4	0.43
FY14	Baltimore County	Herring Run at Overlook Park Stream Restoration and Buffer Planting Phase II	Stream Restoration	Baltimore	1,471,368.00	Design/Planning			786.6	267.4	106.68
FY15	Blue Water Baltimore	St. Matthews Church	Stormwater Management	Baltimore City	327,322.72	Design/Planning			2.0	0.3	0.09
FY15	Blue Water Baltimore	St. Anthony of Padua	Stormwater Management	Baltimore City	143,160.90	Design/Planning			1.7	0.3	0.10
FY15	Blue Water Baltimore	Natural History Society of Maryland	Stormwater Management	Baltimore	317,309.72	Permit			1.5	0.4	0.11
FY15	Blue Water Baltimore	St. Pius X	Stormwater Management	Baltimore	127,845.90	Permit			3.8	0.6	0.17
	(1) Maryland DNR provided this data 2/21/17 and indicated it is the full extent available.			TOTALS	2,703,612.08				843.9	272.2	107.72

Appendix
Watershed Eligible for 319(h) Grant Implementation Funding

Casselman River Watershed in Garrett County, Maryland

Contents

Introduction

The *Casselman River Watershed Based Plan for pH Remediation* was completed by MDE in January 2011, MDE revised the plan in March 2011, and EPA accepted the plan in March 2011. The part of the watershed encompassed by the watershed plan is in Garrett County, Maryland:

- Pollution reduction goals for pH are in watershed plan Chapter 3 Section 3.2 on page 11.
- BMP implementation goals for pH are in watershed plan Chapter 5 Table 9 on page 35.
- The plan does not address nutrients or sediment. Also, The downstream portion of the Casselman River watershed in Pennsylvania is not addressed in the MDE plan.

Base Year for watershed plan implementation is 2006. Pollutant load reductions that year and thereafter can be counted toward meeting watershed plan goals. The watershed plan in Section 3.1 Section 10 indicates the plan's goal is from the pH TMDL and the TMDL model run used data thru 2005. The TMDL document also indicates that data thru 2005 was used in the TMDL model. (see TMDL Table 2-4 page 15 and Section 2.2.1 page 25.)

Responsibility to implement the plan rests with MDE's Abandoned Mine Land Division (AMLD). To help meet this responsibility, they have worked with the Maryland Department of Natural Resources, the Garrett Soil Conservation District and private property owners.

Maryland's 2015-2019 NPS Management Plan Objective 5 includes several milestones for this watershed:

- Report Annually: Report progress in the 319 Annual Report including number/percentage of pH impaired stream segments, NPS Program Success Stories and implementation progress.
- 2015 Goal is 50% for percentage of impaired stream segments in watershed that are remediated and meet the State water quality standard for pH.
- Report 303(d) stream segments that achieve pH criteria via Maryland's Integrated Report.

Water Quality Monitoring Activity, Overall Condition, Trends

Complete listing of all available monitoring activity information reported by MDE's Targeted Watershed project during SFY16 is presented below. No information on overall condition or trends is available:

- 2015 July-September
  - Phase 1 sites: 51 samples
  - Phase 2 sites: 30 samples
- 2015 October-December
  - Phase 1 sites: 51 samples
  - Phase 2 sites: 30 samples
- 2016 January-March
  - Phase 1 sites: 0 samples
  - Phase 2 sites: 0 samples
- 2016 April-June
  - Phase 1 sites: 18 samples
  - Phase 2 sites: 45 samples

Grant-Funded Implementation Projects

319(h) Grant

Funding for Phase 1 implementation is completed and Phase 2 continued thru SFY16 as summarized below based on quarterly project progress reports. The following pages show the status of 319 grants in this watershed and the status of implementation site construction.

- Phase 2 implementation of the Casselman River watershed plan focused on implementing limestone sand application sites on private property.
- By the end of 2015, fourteen completed/operational treatment sites (Phase 1 and 2 sites) received 1090 tons of limestone sands at a cost of $47,498. The amount of limestone sand and time between limestone sand dumping varied for each site and the amount of previous precipitation, i.e., sand left from last dump, size and flow of the stream, etc.
- During July, September, and November 2015, after-construction monitoring was conducted.
- During summer/fall 2015, AMLD completed reconnaissance for additional Phase 2 sites.
- AMLD developed the plans for four sand application sites. Water quality monitoring to document conditions at these sites prior to construction was initiated.
- Construction slated for calendar year 2016 was delayed until the 319 FFY13 Grant end date was amended from 6/30/16 to 6/30/18. The Grant amendment was received 7/11/16.
- In early SFY17 (Autumn 2016), four additional limestone sand application areas were constructed. SFY17 construction depends on landowner permission, final permits and bid schedules for construction. Each site was/will be bid out as a separate project. During 2016, an additional 387 tons of limestone sand doses were added to Phase 1 and 2 sites at a cost of $18,461.

Maryland's Chesapeake and Atlantic Coastal Bays Trust Fund Grant: This grant had very little activity in this watershed that did not contribute to implementation the Casselman River plan.

State Revolving Fund: There is no record of any project in the Casselman River watershed.

Casselman River Watershed
2006-SFY16 Completed 319(h) Grant NPS Implementation Projects

Project Summary			Project Expenditures					Pollutant Load Reduction			
Area/Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Non Federal Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)	pH
				Federal	State						
MDE	Casselman Watershed pH Plan	2011	FFY2008	$55,000.00		$36,666.67	$91,666.67				
	AMD pH Remediation Phase 1	2014	319 FFY09 #6	$644,115		$429,410	$1,073,525	0	0	0	
	AMD pH Remediation GIS Tool	SFY16	319 FFY11#14	$83,619		$55,746	$139,365				
			TOTALS	$782,734.00	$0.00	$521,822.67	$1,304,556.67	0.00	0.00	0.00	

SFY16 319(h) Grant NPS Implementation Project Activity - Casselman River Watershed

Project Summary			Project Funding					Pollutant Load Reduction			
Area/Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Non Federal Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)	pH
				Federal	State						
MDE	AMD pH Remediation Phase 2	TBD	319 FFY13 #5	$401,307		$267,538	$668,845	0	0	0	

Current Casselman pH Impairment List and Mitigation Status								
Plan	Maryland Integrated Report			BMPs SFY16				
Shed (2)	Name	8-Digit Segment	Impairmt	Site Name	Type	Phase	Comlpete	BMP cost
NBC-1	North Branch Casselman River	MD-050202040030	4a - pH	Bowser Foxtown Road	Limestone sand	2	2014	$11,810
				Bowser Dung Hill Road	Limestone sand	2	2016	$11,256
				Jones	Not going forward with project at this time			
				Redmond	Not going forward with project at this time			
NBC-2	North Branch Casselman River	MD-050202040032	4a - pH	Amish Rd North	Leach bed and Sand	1	2013	$69,119
				Amish Rd South	Limestone sand	1	2013	$18,460
				Synder - Dung Hill Rd	Limestone sand	2	2014	$12,630
	Alexander Run	MD-050202040032	4a - pH	Amish Rd - Alexander Run	Limestone sand	1	2013	$9,605
	Tarkiln Run	MD-050202040032	4a - pH	Tarkin Run	Limestone sand	1	2013	$8,868
MSC	Spiker Run	MD-050202040034	4a - pH	Spiker Run	Leach bed & sand	1	2013	$70,327
	Little Shade Run	MD-050202040034	4a - pH	Yoder Posey Row Road	Limestone Sand	2	2016	$11,071
SBC-1	South Branch Casselman River	MD-050202040031	4a - pH	Bear Hill Road	Leach bed	1	2013	$78,274
				Maynardier Ridge Rd W of Bear Hill	Limestone sand	1	2013	$8,506
				Koch - Frank Brenneman Rd	Limestone sand	2	2014	$8,800
				Windy Ridge	Limestone sand	2	2016	$10,400
SBC-2	Little Laurel Run	MD-050202040033	4a - pH	Maynardier Ridge Rd	Limestone sand	1	2013	$9,765
				West Shale Rd South	Limestone sand	1	2013	$8,526
				West Shale Rd North	Limestone sand	1	2013	$10,294
				Savage State Forest -West Shale Rd	Limestone sand	2	2016	$11,410
				Beeman (Planning but not likely to build)	Leach bed	2		
	Big Laurel Run	MD-050202040033	not listed	Big Laurel Run West Shale Road (add)	Limestone sand	1	2013	$11,124
				Big Laurel Run West Shale Road Siphon	Leach bed and sand	1	2013	$111,019
CEP	Meadow Run	MD-050202040035	4a - pH					

(1) Draft 2016 Integrated Report 4a - impaired, TMDL completed.
(2) Watershed Plan subwatershed designations:
NBC-1 North Branch Casselman River headwaters
NBC-2 North Branch Casselman River lower reaches
SBC-1 South Branch Casselman River headwaters
SBC-2 South Branch Casselman River lower reaches
MSC Mainstem Casselman River
CEP Casselman River eastern portion

Appendix
Watershed Eligible for 319(h) Grant Implementation Funding
Corsica River Watershed in Centreville and Queen Anne's County, Maryland

Contents

Introduction

Centreville developed the *Corsica River Watershed Restoration Action Strategy* in 2005 with input from Queen Anne's County, Queen Anne's Soil Conservation District and others. The watershed plan (action strategy) encompasses the entire Corsica River watershed including the Town of Centreville and in Queen Anne's County.

The watershed plan's pollutant reduction goals (pages 23-24) refer to the TMDL for nitrogen and phosphorus approved 5/9/2000. The TMDL document indicates that the Corsica River watershed ambient NPS nutrient loads already met the TMDL load allocation as summarized below. Therefore, the nitrogen and phosphorus TMDLs are benchmarks to prevent water quality degradation.

268,211 lb/yr = Total NPS nitrogen load, TMDL page 4
268,211 lb/yr = nitrogen TMDL load allocation, TMDL page 22
0 lb/yr = NPS nitrogen reduction goal based on TMDL

19,380 lb/yr = Total NPS phosphorus load, TMDL page 4
19,380 lb/yr = phosphorus TMDL load allocation, TMDL page 22
0 lb/yr = NPS phosphorus reduction goal based on TMDL

Current BMP implementation goals are in the *Corsica River Targeted Initiative Progress Report*: 2005-2011 on pages 16-17. On these pages, the table "Comprehensive Implementation Strategies for the Corsica River: 2012 to 2016" sets BMPs implementation goals that replace the goals in the 2005 watershed plan. The progress report also summarizes watershed plan implementation status thru 2011. The report is available: http://www.townofcentreville.org/departments/environment.asp

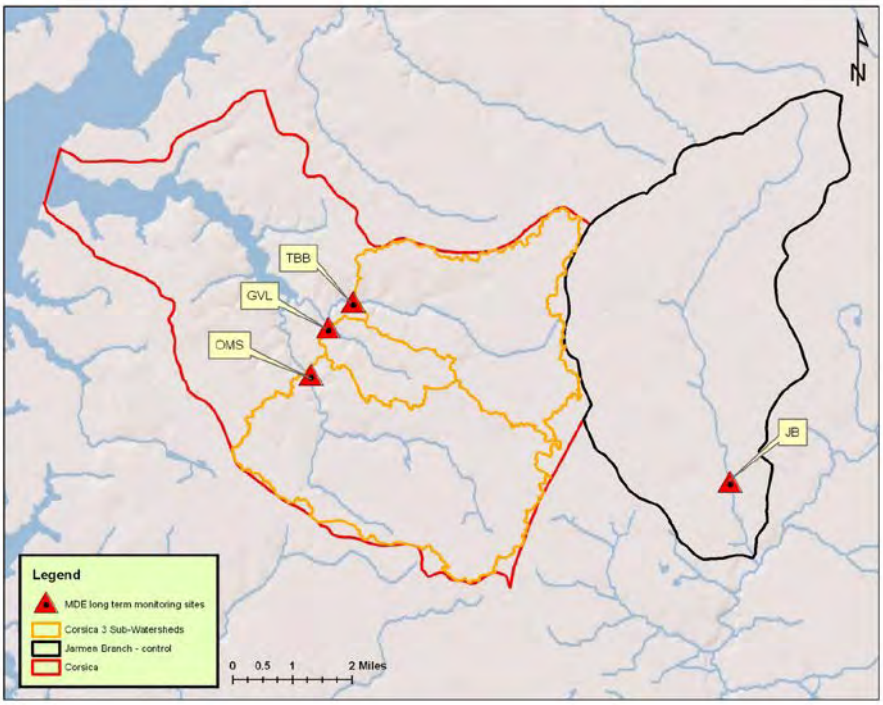
Base Year for watershed plan implementation is 2005. All stakeholders agreed that the baseline year is 2005. Also, the Corsica nutrient TMDL approved in 2000 was based on 1997 water quality data. (See TMDL Section 2.2 pages 5-9, and see the 2005 watershed plan pages 23-24.)

Milestones

Maryland's 2015-2019 NPS Management Plan Objective 5 includes two milestones for this watershed:

- Annually: Report progress in the 319 Annual Report, and
- In 2016 assess plan implementation progress and in 2017 update plan if needed.

Water Quality Monitoring Activity, Overall Condition, Trends



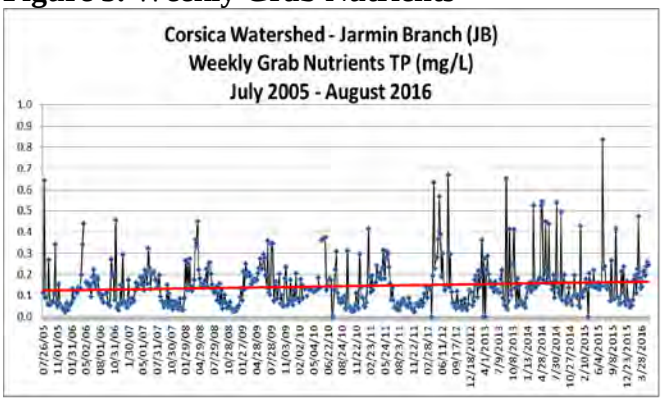
Nontidal
The Maryland Department of the Environment conducts a nontidal water quality monitoring program in the Corsica River watershed. For July 2015 thru June 2016, information presented here was extracted from MDE's 319-funded Targeted Watershed Project final report for the 319(h) FFY15 Grant. The table below and the map (right) identify the stations and number of samples collected during SFY16.

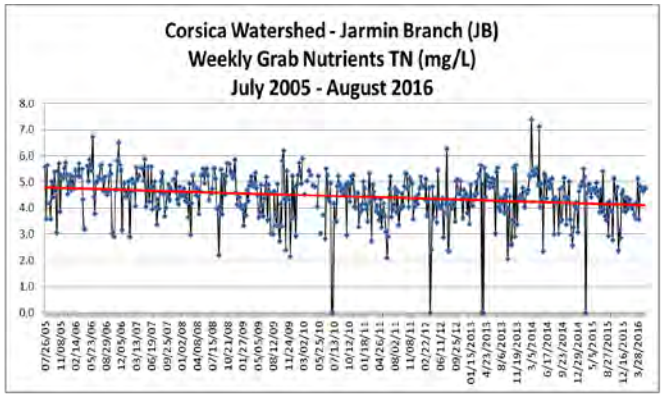
The following pages present nontidal data graphs (also from the 319 project final report) that suggest a there may be a continuing long term trend toward decreasing nitrogen and phosphorus concentrations. However, analysis has not been conducted for this time period to determine if these findings are statistically significant or if this translates to statistically significant trends toward decreasing nutrient loads.

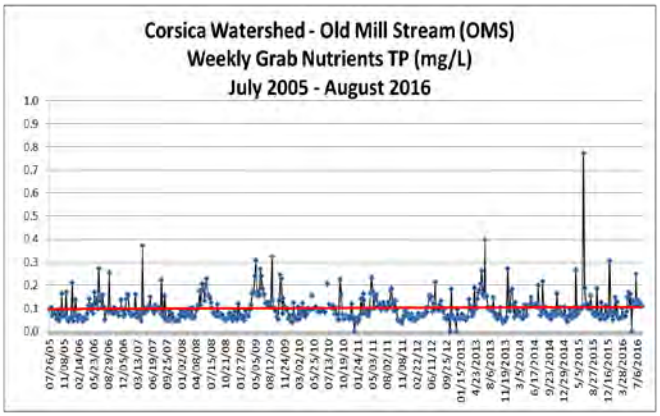
Corsica River Watershed Nontidal Water Quality Monitoring 7/1/15 thru 6/30/16			
Stations	Weekly Grab Samples		Weekly Composite Samples
	Whole	Filtered	
Old Mill Stream Branch (OMS)	50	50	44
Gravel Branch (GVL)	46	46	11
Three Bridges Branch (TBB)	49	49	42

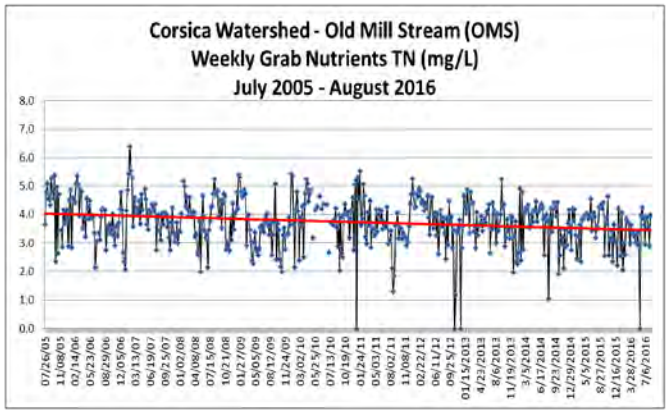
Tidal
The Maryland Department of Natural Resources (DNR) conducts a tidal water quality monitoring program in the Corsica River. Maryland DNR's "Corsica River 2015 Water Quality Report" is the most recent analysis of water quality conditions and trends is included in this appendix.

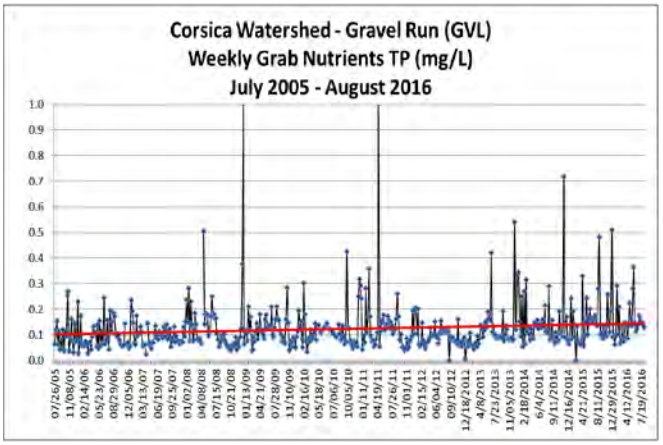
Figure 5. Weekly Grab Nutrients

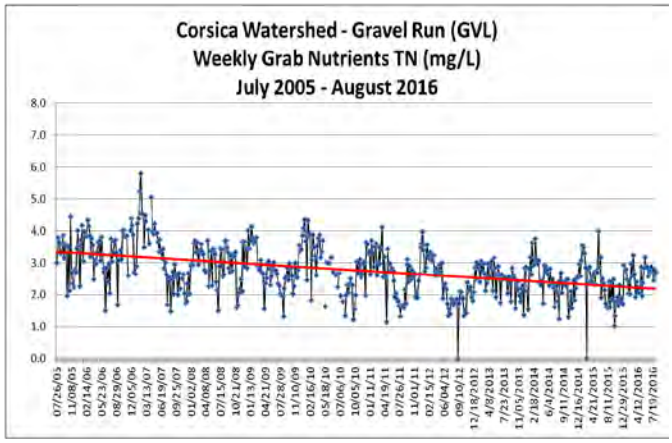


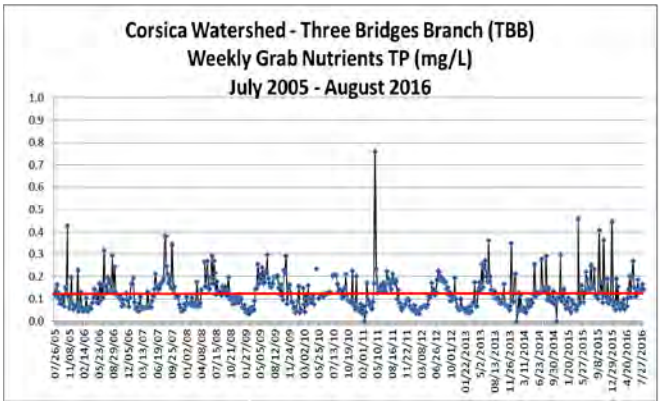












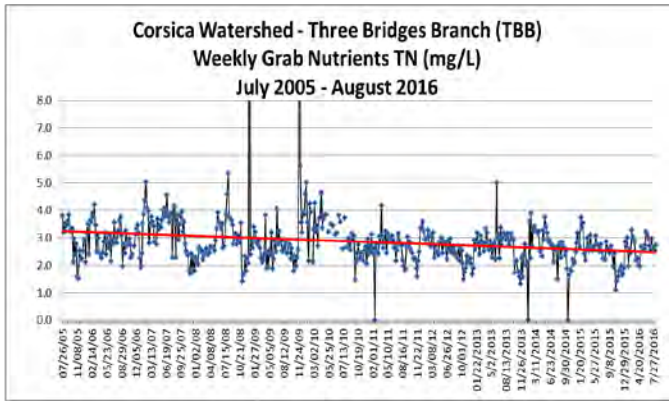
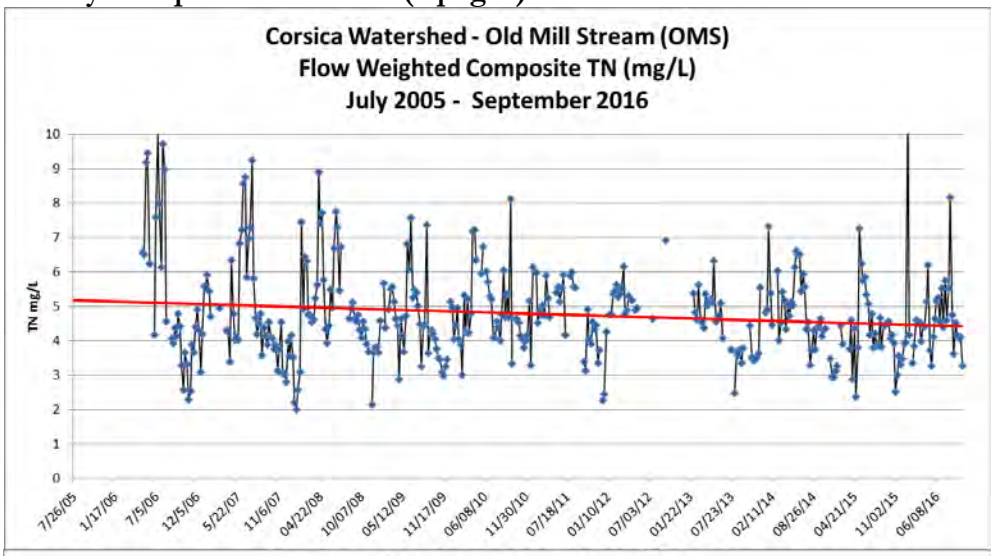
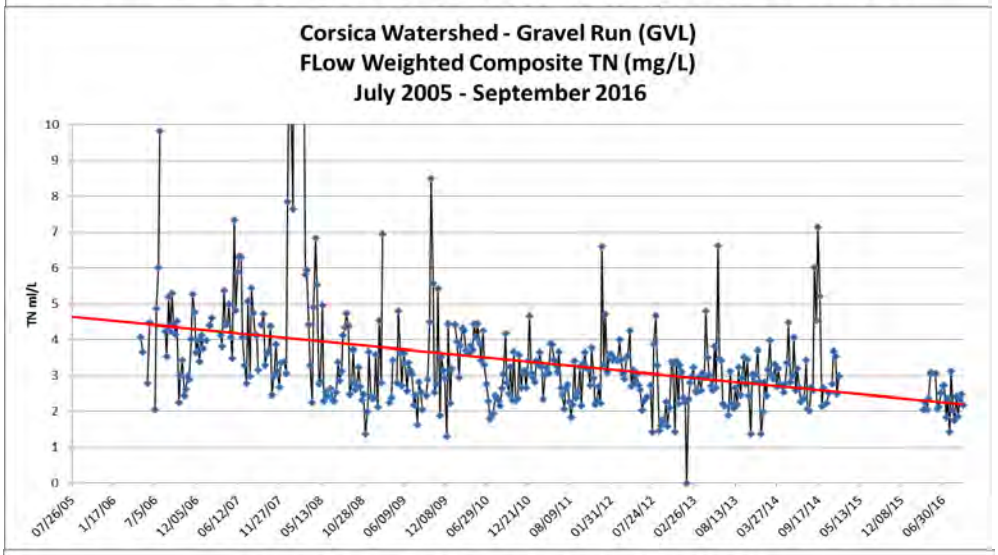
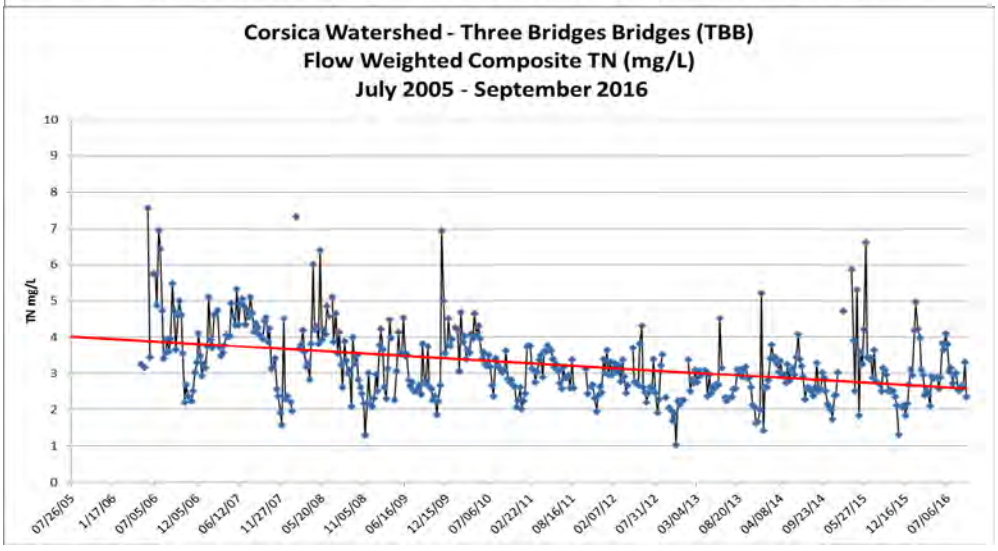
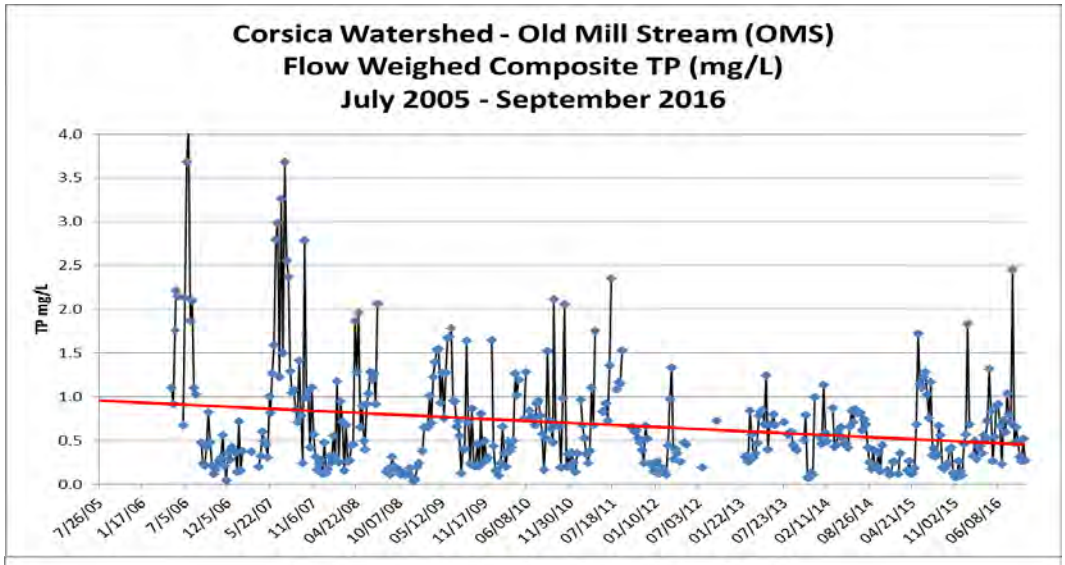


Figure 6. Weekly Composite Nutrients (2 pages)








Corsica Watershed - Old Mill Stream (OMS)
Flow Weighed Composite TP (mg/L)
July 2005 - September 2016
TP mg/L
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
7/26/05
1/17/06
7/5/06
12/5/06
5/22/07
11/6/07
04/22/08
10/07/08
05/12/09
11/17/09
06/08/10
11/30/10
07/18/11
01/10/12
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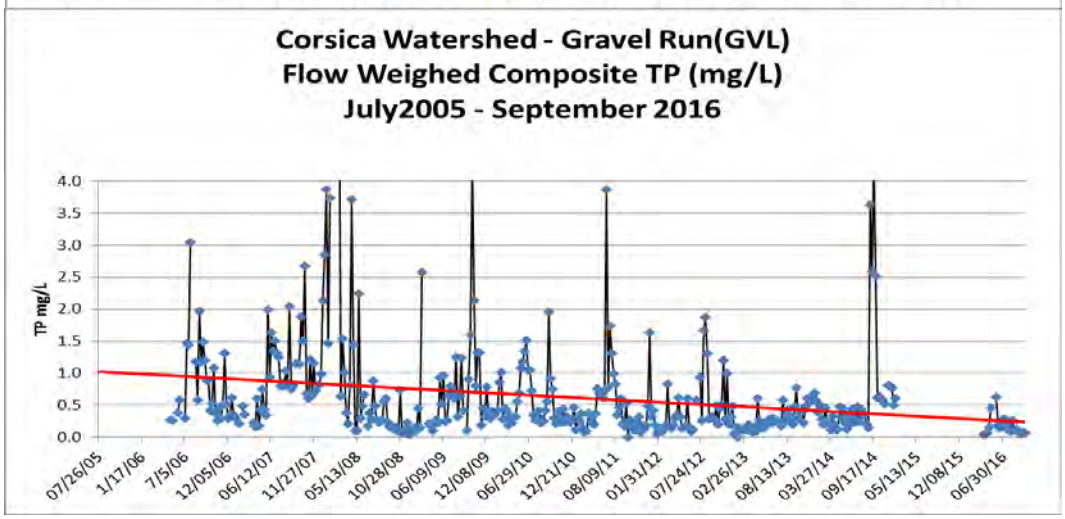
04/21/15
11/02/15
06/08/16


Corsica Watershed - Gravel Run(GVL)
Flow Weighed Composite TP (mg/L)
July2005 - September 2016
TP mg/L
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
07/26/05
1/17/06
7/5/06
12/05/06
06/12/07
11/27/07
05/13/08
10/28/08
06/09/09
12/08/09
06/29/10
12/21/10
08/09/11
01/31/12
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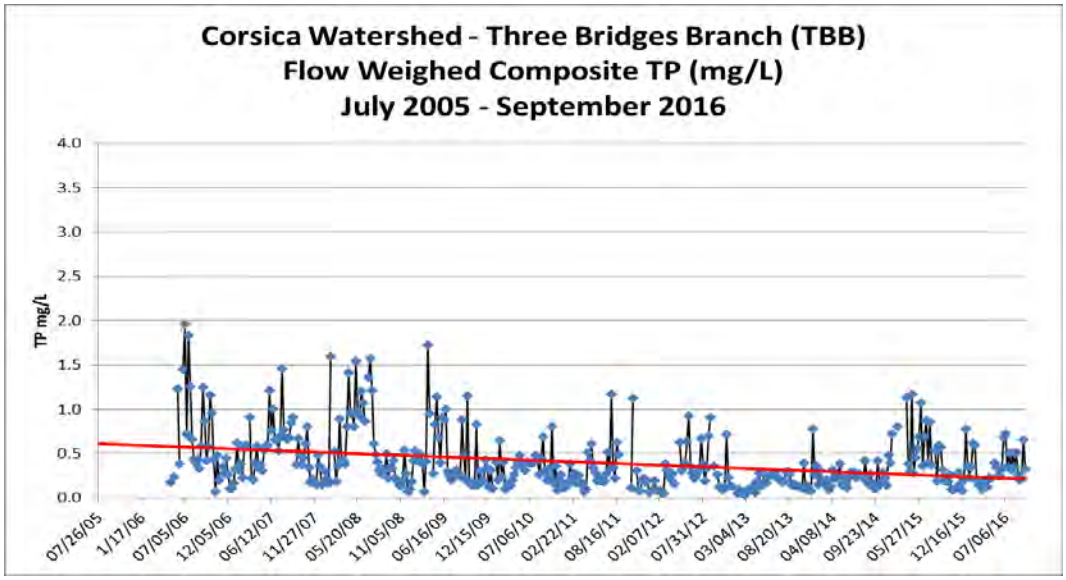
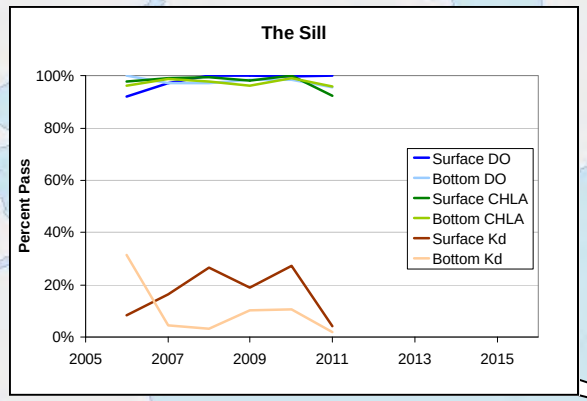
09/17/14
05/13/15
12/08/15
06/30/16


Corsica Watershed - Three Bridges Branch (TBB)
Flow Weighed Composite TP (mg/L)
July 2005 - September 2016
TP mg/L
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
07/26/05
1/17/06
07/05/06
12/05/06
06/12/07
11/27/07
05/20/08
11/05/08
06/16/09
12/15/09
07/06/10
02/22/11
08/16/11
02/07/12
07/31/12
03/04/13
08/20/13
04/08/14
09/23/14
05/27/15
12/16/15
07/06/16

Corsica River
2015 Water Quality Report

Mark Trice, mark.trice@maryland.gov
Tidewater Ecosystem Assessment
580 Taylor Avenue D-2, Annapolis, MD 21401
(410) 260-8630

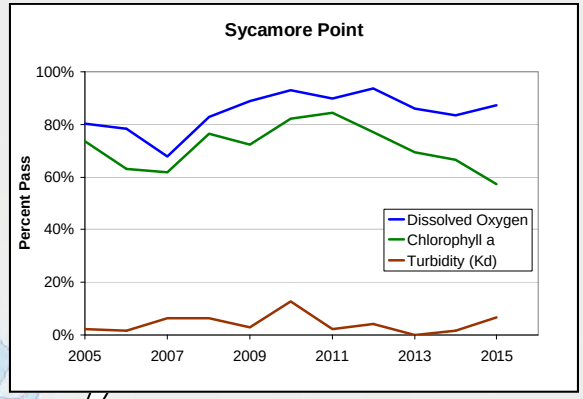
The Corsica River Targeted Watershed Project was implemented in 2005. Maryland DNR's Tidewater Ecosystem Assessment division is responsible for the water quality monitoring and habitat assessments that support the management actions of the project. As part of this effort, five continuous monitors have been maintained at three locations*, and monthly water quality mapping cruises are performed April - October. The continuous monitors collect data every 15 minutes on dissolved oxygen, chlorophyll, turbidity, water temperature, salinity and pH. These data help to guide future actions within the watershed by providing managers with insight into the effects of current efforts to reduce nutrient and sediment pollution.



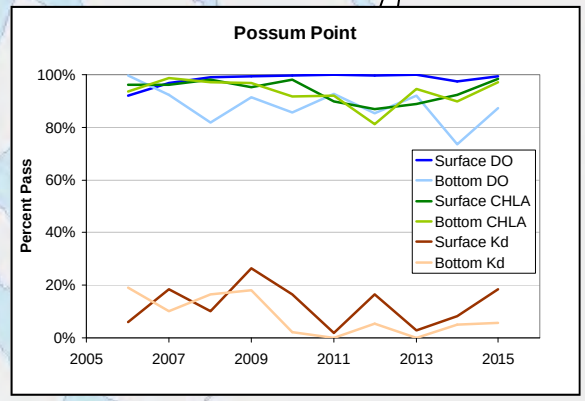
*The Sill was not deployed after 2011

These graphs represent percent attainment over time of three key continuous monitoring water quality parameters in the Corsica River: Dissolved Oxygen (DO), Chlorophyll (CHLA), and Water Clarity (Kd). The dissolved oxygen threshold represents levels harmful to aquatic animals and the chlorophyll threshold indicates concentrations which are indicative of significant algal blooms. The water clarity threshold is based upon a calculation of light attenuation, Kd, which utilizes salinity, chlorophyll, and turbidity measurements. The Kd threshold represents conditions that would allow sunlight to reach the bottom in 1 meter of water and thus promote the growth of underwater grasses.

Parameter	Time Period Examined Each Year	Threshold
DO	June - September	3.2 mg/l
CHLA	April – October (Underwater grass growing season)	50 ug/l
Kd	April – October (Underwater grass growing season)	1.5



The station furthest upstream, Sycamore Point, experienced significant low oxygen conditions in 2007 with less than 70% of the readings meeting the dissolved oxygen threshold. After 2007, the number of dissolved oxygen readings greater than 3.2 mg/l generally increased at Sycamore Point and peaked at 94% in 2012. In 2015, 87% of dissolved oxygen readings at Sycamore Point met the dissolved oxygen threshold (a slight increase from the previous year). Dissolved oxygen levels at the downstream stations, The Sill and Possum Point, have generally exceeded the dissolved oxygen threshold over 90% of the time during each year since monitoring began in 2006. At Possum Point in 2015, 99% of dissolved oxygen readings in the surface waters and 87% of dissolved oxygen readings in the bottom waters exceeded the threshold.



For more information, please visit:
www.eyesonthebay.net

Of the three stations, Sycamore Point generally experiences the most frequent and intense algal blooms with less than 58% of the readings meeting the chlorophyll threshold in 2015. Similarly, Sycamore Point generally has the worst water clarity conditions, with less than 7% of Kd values meeting the threshold in 2015. Although water clarity at all stations improved slightly in 2015, overall water clarity in the Corsica River can be characterized as poor. This lack of clear waters has prevented the growth of underwater grasses within the Corsica River.

Corsica River Watershed

2005-SFY16 Completed 319(h) and State Revolving Fund Grant NPS Implementation Projects

Project Summary			Project Expenditures					Overall Pollutant Load Reduction			Pollutant Load Reduction Prior to 2014					
				Grant Funds							Cover Crops			Multi-Year BMPs		
Area/Lead	Name/Description	End Date	Grant Funding Source	Federal	State	Non Federal Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)
Centreville	Watershed Restoration	2006	319 FFY05 #2	$232,666.15		$155,110.77	$387,776.92	0	0	0				0	0	0
	Watershed Restoration	2009	319 FFY06 #3	$241,974.82		$161,316.55	$403,291.37	62	6	0				62	6	0
	Watershed Restoration	2012	319 FFY09 #1	$270,427.25		$180,284.83	$520,712.08	5.33	1.05	0.29				5.33	1.05	0.29
	Stormwater Retrofit near WWTP		General Funds		$60,000.00											
	Banjo Lane Coastal Plain Outfall		General Funds		$10,000.00											
	Watershed Restoration	SFY16	319 FFY11 #8	278,237.30		185,491.53	463,728.83	57.93	5.29	1.11				57.93	5.29	1.11
	Watershed Restoration	SFY16	319 FFY12 #7	81,674.57		54,449.71	136,124.28	7.2	0.5	0.09				7.2	0.5	0.1
MDA / Queen Anne's Soil Conservation District	Agricultural Technical Assistance	2006	319 FFY04 #18	$32,379.50		$21,586.33	$53,965.83	4,847	114	0	4,847.0	114.0	0	0.0	0.0	0
		2008	319 FFY05 #12	$145,554.24		$97,036.16	$242,590.40	767	79	463	0.0	0.0	0	767.0	79.0	0
		2008	319 FFY06 #9	$14,272.71		$9,515.14	$23,787.85	2,413	233	0	0.0	0.0	0	2,413.0	233.0	0
		2008	319 FFY07 #6	$22,187.16		$14,791.44	$36,978.60	286	10	755	0.0	0.0	0	286.0	10.0	0
		2009	319 FFY08 #7	$50,780.00		$33,853.33	$84,633.33	46	3	62	0.0	0.0	0	46.0	3.0	0
		2010	319 FFY09 #4	$58,539.00		$39,026.00	$97,565.00	19,740	6,664	33	19,591.4	6,654.5	0	148.6	9.5	0
		2011	319 FFY10 #10	$61,590.00		$41,060.00	$102,650.00	53,259	802	0	52,372.3	718.2	0	886.7	83.8	0
		2012	319 FFY11 #10	$66,700.59		$44,467.06	$111,167.65	45,703	642	492	45,576.0	625.0	0	127.0	17.0	0
		2013	319 FFY12 #9	$50,999.97		$33,999.98	$50,000.00	55,822	828	108.6	55,821.8	748.3	0	0.0	80.1	0
		2014	319 FFY13 #9	$47,810.49		$31,873.66	$79,684.15	32,831	4,394	38.28	32,830.9	4,392.8	0	0.1	1.2	0
Queen Anne's County	Corsica and Beyond	2008	319 FFY06 #13	$124,281.44		$82,854.29	$207,135.73	0	0.34	0				0	0.34	0
	Bioretention Swale	2011	319 FFY08 #19	$50,000.00		$33,333.33	$83,333.33	0.22	0.35	0.739				0.22	0.35	0.739
	Board of Education Bioretention	2013	319 FFY11 #11	$22,431.94		$14,954.63	$37,386.57	5.16	0.36	0.066				5.16	0.36	0.066
	Board of Ed. Phase 2: Kramer Center	2014	319 FFY12 #10	$66,624.98		$44,416.65	$111,041.63	60.7	7.6	3.03				60.7	7.6	3.03
	Bloomfield Park N. Bldg. Permeable Paving	2012	State Revolving Fund		$200,000.00		$250,000.00	864	173	0				864	173	0
319 Projects Total Completed				$1,919,132.11		$1,279,421.41	$3,233,553.56	215,912.4	13,790.9	1,957.18						
SRF Projects Total Completed					$200,000.00		$250,000.00	864	173	0						
TOTAL 319 & SRF Projects Completed				$1,919,132.11	$270,000.00	$1,279,421.41	$3,483,553.56	216,776.4	13,963.9	1,957.18	211,039.4	13,252.8	0	5,736.98	711.11	5.33

SFY16 NPS Implementation Projects In Progress - 319(h) Grant and State Revolving Fund - Corsica River Watershed

Project Summary			Project Funding					Projected Pollutant Load Reduction		
				Grant Funds						
Area/Lead	Name/Description	End Date	Grant Funding Source	Federal	State	Non Federal Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)
	No 319 project working during SFY16									
	No SRF project working during SFY16									

Corsica River Watershed
Chesapeake and Atlantic Coastal Bays Trust Fund
SFY16 NPS Implementation Project Status (1)

Year Funded	PartnerCD	ProjectTitle	ProjectType	County	TrustFund Dollars	Status	BMP Units	BMPs Reported	Annual LbsN	Annual LbsP	Annual TonsTSS
FY11	Corsica River Conservancy	Education & Outreach	Education & Outreach	Queen Anne's	15,709.62	Complete			0.0	0.0	0
FY11	Corsica River Conservancy	Symphony Village Bioswale	Stormwater Management	Queen Anne's	17,000.00	Complete			0.4	0.0	0
FY11	Corsica River Conservancy	Residential Soil Tests: 64 sites	Education & Outreach	Queen Anne's	481.16	Complete			0.0	0.0	0
FY11	Corsica River Conservancy	Volunteer Water-Quality Program	Education & Outreach	Queen Anne's	1,213.29	Complete			0.0	0.0	0
FY11	Corsica River Conservancy	Corsica Watershed Rain Garden Initiative: 73 sites	Stormwater Management	Queen Anne's	144,027.03	Complete			0.0	0.0	0
FY11	Queen Annes County	Bloomfied Park Permable Paving	Stormwater Management	Queen Anne's	50,000.00	Complete			4.0	0.7	8E-05
FY11	Queen Annes County	QAC Office Building Stormwater Management	Stormwater Management	Queen Anne's	200,000.00	Complete			12.0	2.0	0.00023
FY11	Queen Annes County	Centreville WWTP Outfall Design and Permitting	Stormwater Management	Queen Anne's	30,000.00	Complete			0.0	0.0	0
FY11	Queen Annes County	Banjo Lane Coastal Plain Outfall	Stormwater Management	Queen Anne's	30,000.00	Complete			0.0	0.0	0
FY11	Queen Annes County	Rain Barrel Giveaway Program: 118 barrels	Stormwater Management	Queen Anne's	5,782.00	Complete			0.0	0.0	0
FY11	Queen Annes County	Mill Stream Park Buffer - Phase II	Tree Planting Projects	Queen Anne's	52,470.80	Complete	acres	7.3	209.7	14.2	2.56
FY11	Queen Annes County	Providence Area Planting	Tree Planting Projects	Queen Anne's	23,000.90	Complete	acres	3.2	91.9	6.2	1.12
FY11	Queen Annes County	Conquest Beach Planting	Tree Planting Projects	Queen Anne's	4,528.30	Complete	acres	0.63	18.1	1.2	0.22
FY11	Queen Annes County	Mill Stream Park Buffer Plantings (Phase I)	Tree Planting Projects	Queen Anne's	20,000.00	Complete	acres	0.7	57.4	3.9	0.7
FY12	Corsica River Conservancy	Corsica River Rain Gardens	Stormwater Management	Queen Anne's	10,000.00	Complete			215.4	14.6	2.6
FY12	Town of Centreville	Outfall Rehabilitation	Stream Restoration	Queen Anne's	250,000.00	Complete			10.0	2.0	0.6375
FY13	Queen Annes County	Centreville Elementary School Bioretention	Stormwater Management	Queen Anne's	50,000.00	Complete			0.0	0.0	0
FY13	Queen Annes County	Board of Education Bioretention	Stormwater Management	Queen Anne's	62,132.00	Complete			0.0	0.0	0
FY13	Town of Centreville	Pennsylvania Ave Bioswale	Stormwater Management	Queen Anne's	50,000.00	Complete			12.4	1.0	0
FY14	Queen Annes County	Kennard School Planting	Tree Planting Projects	Queen Anne's	4,800.00	Complete	acres	5	29.9	2.0	0.35
FY15	Delmarva RC & D Council	Centreville High School Stormwater Wetland	Stormwater Management	Queen Anne's	44,467.50	Complete			8.3	0.7	0.05
FY16	Delmarva RC & D Council	Conquest Wetland Restoration	Wetland Restoration	Queen Anne's	112,515.00	Complete			0.0	0.0	0
	(1) Maryland DNR provided this data 2/21/17 and indicated it is the full extent available.			TOTALS	1,178,127.60				669.5	48.5	8.24

	no projects now working										
	(1) Maryland DNR provided this data 2/21/17 and indicated it is the full extent available.			TOTALS	0				0	0	0

SFY2016 Agricultural BMP Implementation						**Corsica River Watershed Plan**					**Prior Years Progress Toward Watershed Plan Goals**				
Corsica River Watershed			Estimated Pollutant Load Reduction			**2011 Progress Report Table 1**			**Progress**		2005-2013 2013 Annual Report	Extracted from State Data reported by MDE to EPA Bay			
BMP Type	**Unit**	SFY16 Total	Nitrogen Total (lbs)	Phosphorus Total (lbs)	Sediment Total (tons)	**Management Measure**	**Goal**	**Units**	**SFY14-SFY16**	**Units**		SFY14	SFY15		**Units**
Annual Practices															
Cover Crops	acres	6,415	24,022.9	71.6	20.40	2. Agricultural Cover Crops	5500 acre/yr	acres							
Multi-Year Practices															
Alternative Crops	acres	0							0	acres		0	0		acres
Amendments for the Treatment of Ag Waste	AU	0							0	AU		0	0		AU
Animal Mortality Facility	count	0							0	count		0	0		count
Conservation Cover	acres	0							1.2	acres		1.2	0		acres
Conservation Plans/SCWQP	acres	1,422	796.7	75.2	18.62				5,193	acres		1,773	1,998		acres
Critical Area Planting	acres	0							0	acres		0	0		acres
Dead Bird Composting Facility	count	0							0	count		0	0		count
Fencing	feet	0							0	feet		0	0		feet
Field Border	acres	0							0	acres		0	0		acres
Filter Strip	acres	0							0	acres		0	0		acres
Grassed Waterway	acres	0							0.1	acres		0.1	0		acres
Horse Pasture Management	acres	0							0	acres		0	0		acres
Loafing Lot Management System	acres	0							0	acres		0	0		acres
Pasture & Hay Planting	acres	0							0	acres		0	0		acres
Prescribed Grazing	acres	0							0	acres		0	0		acres
P-sorbing Materials	acres	0							0	acres		0	0		acres
Riparian Forest Buffer	acres	4.39	160.9	2.8	0.51	1. Agricultural Buffers	150	acres	4.39	acres	94.3	0	0		acres
Riparian Herbaceous Cover	acres	0							0.4	acres		0.4	0		acres
Roof Runoff Structure	count	0							0	count		0	0		count
Stream Restoration Ag	feet	0							0	feet		0	0		feet
Tree/Shrub Establishment	acres	0							0	acres		0	0		acres
Waste Storage Facility	count	0							0	count		0	0		count
Wastewater Treatment Strip	acres	0							0	acres		0	0		acres
Water Control Structure	count	0							1	count		0	1		count
Watering Facility	count	0							0	count		0	0		count
Wetland Creation	acres	0							0	acres		0	0		acres
Wetland Restoration	acres	0				6. Wetland Creation (all types)	20	acres	0	acres	88.3	0	0		acres
Windbreak/Shelterbelt Establishment	feet	0							0	feet		0	0		feet
						3. Nutrient Mgmt Horse Farms	5	projects							
						4. Agricultural BMPs (all types)	50	count			11				count
						5. Catalog all BMPs on farms	125	parcels							
						10. Easements, Land Acquisition	200	acres							
Total Annual Practices (2)			24,022.9	71.6	20.40										
Total Multi-year Practices			957.6	78.0	19.1										
Total Pollutant Load Reduction			24,980.5	149.6	39.5										

(1) "SFY16 Total" column date is MDA ##. MDE used MAST to estimate pollution load reductions.

(2) The Maryland Departmant of Agriculture (MDA) defines annual practices as cover crops, nutrient mgmt, manure transport, conservation tillage & high residue tillage.

SFY2016 Urban BMP Implementation
Corsica River Watershed

Urban Management Practice	Unit	BMPs Reported	Estimated Pollutant Load Reduction		
			Nitrogen lb/yr	Phosphorus lb/yr	Sediment tons/yr
Bioretention (13)	acres	3.8	21.66	1.14	0.25
Bioswale (13)	acres	0			
Cisterns & Rain Barrels	acres	0			
Disconnection of Rooftop Runoff (13)	acres	0			
Dry Detention Ponds & Hydro Structures (13)	acres	0			
Dry Extended Detention Ponds (13)	acres	0			
Dry Swale (13)	acres	1.35	12.02	0.68	0.16
Filtering Practices (13)	acres	0			
Forest Conservation	acres	0			
Forest Harvesting Practices	acres	0			
Infiltration Practices (13)	acres	0			
Permeable Pavement (13)	acres	0			
Rain Garden	acres	0			
Reduction of Impervious Surface (13)	acres	0			
Riparian Forest Buffers on Urban Lands (13)	acres	0			
Septics Connections to Sewers	count	0			
Septic Denitrification Critical Area	count	1	11.80		
Septic Denitrification outside of 1000 feet	count	0			
Septic Denitrification within 1000 feet	count	2	7.60		
Septic Tank Pumpout	count	0			
Stream Restoration Urban	feet	0			
Street Sweeping	acres	0			
Tree Planting	acres	0			
Urban Forest Buffer (13)	acres	0			
Wet Extended Detention	acres	0			
Wet Ponds & Wetlands (13)	acres	0			
TOTAL Urban BMPs Pollutant Load Reduction			53.08	1.82	0.41

(1) "BMPs Reported" column data is MDE dated 12/5/16. MDE uses MAST to estimate pollutant load reducti
(2) Pollutant load reduction is estimated by MDE using MAST.

Corsica River Watershed Plan

2011 Progress Report Table 1			Progress		
Urban Management Practice	Goal	Units	SFY16	SFY14-SFY16	Units
				3.8	acres
				0.0	acres
9. LID Projects -- rain barrels	40	count		0.0	acres
				0.0	acres
				0.0	acres
				0.0	acres
				1.4	acres
				0.0	acres
				0.0	acres
				0.0	acres
				0.0	acres
				0.0	acres
9. LID Projects -- rain gardens	100	count		0.0	acres
				0.0	acres
				0.0	acres
				0.0	count
7. Retrofit Septic Systems	14	count		2.0	count
				1.0	count
				11.0	count
				0.0	count
15. Stream Restoration	0.5	miles		300.0	feet
Street Sweeping (no goal number)	50	acres		0.0	acres
				0.0	acres
				0.0	acres
				0.0	acres
				0.0	acres
13. Stormwater Retrofits *	187.46	acres	5.2	5.2	acres

Watershed Plan Goal #13 "Stormwater Retrofits" aggregates urban BMPs footnoted (13).
Units of measure shaded red differ from State reporting units.

Prior Years Progress Toward Watershed Plan Goals (Progress Report 2005-2011)

Data Reported by Locals		Extracted from State Data reported by MDE to the EPA Bay Program			
2012 (count)	2013 (count)	SFY14	SFY15		Units
4	0	0	0		acres
		0	0		acres
65	0	0	0		acres
		0	0		acres
		0	0		acres
		0	0		acres
		0	0		acres
		0	0		acres
		0	0		acres
		0	0		acres
		0	0		acres
		0	0		acres
		0	0		acres
		0	0		acres
		0	0		count
		0	1		count
		0	1		count
		8	1		count
		0	0		count
		0	300		feet
		0	0		acres
		0	0		acres
		0	0		acres
		0	0		acres
		0	0		acres

Appendix
Watershed Eligible for 319(h) Grant Implementation Funding

Lower Jones Falls in Baltimore City and Baltimore County, Maryland

Contents

Lower Jones Falls SWAP Overview

Baltimore County completed the *Lower Jones Falls Small Watershed Action Plan* (SWAP) was in October 2008 and EPA accepted it in January 2009. The upstream portion of the watershed is in Baltimore County and the downstream portion of the watershed is in Baltimore City.

Pollutant reduction goals from the watershed plan in two locations: in the Executive Summary Table E-4 on page 9, which is essentially duplicated in Table 5.4 on page 85:

- Nitrogen: 6,498 pounds per year.
- Phosphorus: 679 pounds per year.
- Total Suspended Solids: 204.9 tons per year.
- Fecal Coliform Bacteria: 4,679,348 billion per year.

Watershed plan BMP implementation goals are in Chapter 5, in Tables 5.1 and 5-3. There are two different base years for tracking watershed plan implementation:

- 2008 for nitrogen, phosphorus and sediment. Pollutant load reductions reported that year and thereafter can be counted toward meeting watershed plan goals. The watershed plan Section 5.2 page 83 indicates that the reduction goals are based on anticipated results of the management strategy presented in the plan. Monitoring for these pollutants is not referenced as a basis for the plan and TMDLs for these pollutants were not available when the plan was written.
- 2005 for bacteria. Pollutant load reductions reported that year and thereafter can be counted toward meeting watershed plan goals. The watershed plan Section 5.2 page 83 indicates that the bacteria reduction goal is based on the TMDL. The Fecal Bacteria TMDL Section 2.2 pages 11-12 indicate that the TMDL is based on monitoring conducted 2003 and earlier.

Maryland's 2015-2019 NPS Management Plan Objective 5 lists one milestone for this watershed: annually report progress in the 319 Annual Report.

Urban BMP tracking and reporting

Lower Jones Falls SWAP (Baltimore County Portion)						
Goal and Implementation Progress						
Management Practice	**SWAP Goal**	**Units**	**FY09-FY14 Progress**	**FY15 Activity**	**FY16 Activity**	**Total Progress**
Convert Dry Ponds	NA	NA	0	0	0	**0**
Stormwater Retrofits	100	Impervious acres	1.3	0	0	**1.3**
Downspout Disconnection	250	acres	0.3	0.1	0.0	**0.4**
Street Trees	1,000	trees	0	0	0	**0**
Reforestation	25	acres	4.6	0.1	0.3	**5.0**
Stream Restoration	20,000	ft	0	0	0	**0**
Redevelopment	100	acres	0	0	0	**0**

The table above presents urban BMP implementation progress by the Baltimore County Department of Environmental Protection & Sustainability, Watershed Management and Monitoring Section. Additionally, the County also used their own methods for estimating pollutant load reduction that are reported elsewhere in the SFY2016 Annual Report.

Agricultural BMP tracking and reporting

About one percent of the Lower Jones Falls watershed has agricultural activity. The *Lower Jones Falls Small Watershed Action Plan* does not include agricultural BMP implementation goals. According to the Maryland Department of Agriculture that tracks agricultural BMP implementation statewide, no implementation of agricultural BMPs was reported in the Lower Jones Falls watershed for the period state fiscal year 2014 thru 2016.

Water Quality Monitoring Activity, Overall Condition, Trends

Baltimore County collects water quality samples at monitoring stations in the in the County's portion of the Lower Jones Falls watershed, which is entirely nontidal. However, analysis has not been available for the Annual Report.

The State of Maryland monitors water quality in the tidal waters of the Patapsco River, where both the Jones Falls and the Gwynns Falls drain. The most recent information for Pataspco River tidal waters was summarized in the 2014 Annual Report in Appendix Watersheds in the Middle Gwynns Falls section.

Lower Jones Falls Watershed
2006-SFY16 Completed NPS Implementation Projects - 319(h) Grant and State Revolving Fund

Project Summary			Project Expenditures					Pollutant Load Reduction			
Area/Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)	Bacteria (MPN)
				Federal	State						
Baltimore City	Stony Run Stream Restoration Northern Parkway to Wyndhurst Av	2006	319 FFY03 #17	$139,000.00	$0	$92,667	$231,666.67	0	299	360	0
Baltimore County	no 319 or SRF funded projects recorded										
			TOTAL for completed projects	$139,000.00	$0	$92,666.67	$231,666.67	0	299	360	0

For nitrogen, phosphorus and sediment pollutant loads, BMPs installed 2008 and later can be counted toward watershed plan implementation.

For bacteria pollutant loads, BMPs installed 2005 and later can be counted toward watershed plan implementation.

SFY2016 NPS Implementation Projects In Progress - 319(h) Grant and State Revolving Fund - Lower Jones Falls Watershed

Project Summary			Project Funding					Projected Pollutant Load Reduction			
Area/Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)	Bacteria (MPN)
				Federal	State						
Baltimore City	No 319 projects working during SFY16										
	No SRF projects working during SFY16										
Baltimore County	No 319 projects working during SFY16										
	No SRF projects working during SFY16										

Lower Jones Falls Watershed
Chesapeake and Atlantic Coastal Bays Trust Fund
SFY 2016 NPS Implementation Project Status (1)

Year Funded	PartnerCD	ProjectTitle	ProjectType	County	TrustFund Dollars	Status	BMP Units	BMPs Reported	Annual LbsN	Annual LbsP	Annual TonsTSS
FY13	Parks and People Foundation	Druid Hill Park Bio-Filter Installation (Remove Impervious 9)	Stormwater Management	Baltimore City	113,000.00	Complete			29.6	2.4	0.98
FY13	Parks and People Foundation	Phase I: Samuel Coleridge-Taylor 507 Preston Street Green Space Creation	Tree Planting Projects	Baltimore City	50,000.00	Complete			0.0	0.0	0
FY13	Parks and People Foundation	Howard Dog Park	Stormwater Management	Baltimore City	51,000.00	Complete			1.0	0.2	0.061
FY14	Alliance for the Chesapeake Bay	Saints Philip and James Parish	Tree Planting Projects	Baltimore City	810.25	Complete	acres	0.12	0.6	0.0	0.001
FY14	Alliance for the Chesapeake Bay	Union Baptist Church	Tree Planting Projects	Baltimore City	337.60	Complete	acres	0.05	0.2	0.0	0.0007
FY14	Alliance for the Chesapeake Bay	Baltimore Hebrew Congregation	Tree Planting Projects	Baltimore City	540.17	Complete	acres	0.08	0.4	0.0	0.001
FY14	Alliance for the Chesapeake Bay	Chizuk Amuno	Tree Planting Projects	Baltimore	1,688.02	Complete	acres	0.25	1.2	0.0	0.003875
FY14	Alliance for the Chesapeake Bay	Woodbrook Baptist Church	Tree Planting Projects	Baltimore	877.77	Complete	acres	0.13	0.6	0.0	0.002015
FY14	Alliance for the Chesapeake Bay	Benedictine Sisters of Baltimore Emmanuel Monastery	Tree Planting Projects	Baltimore	1,688.02	Complete	acres	0.25	1.4	0.1	0.016
FY14	Alliance for the Chesapeake Bay	Bnos Yisroel	Tree Planting Projects	Baltimore City	4,051.24	Complete	acres	0.06	2.8	0.1	0.0093
FY14	Alliance for the Chesapeake Bay	Grace United Methodist Church	Tree Planting Projects	Baltimore City	2,975.52	Complete	acres	0.16	0.8	0.0	0.0031
FY14	Baltimore City Recreation and Parks	Baltimore Polytechnic Institute	Tree Planting Projects	Baltimore City	2,036.27	Complete	acres	0.21	1.0	0.0	0.007
FY14	Baltimore City Recreation and Parks	Northwestern HS	Tree Planting Projects	Baltimore City	4,043.44	Complete	acres	0.36	1.7	0.1	0.012
FY14	Chesapeake Bay Trust	Mount Vernon-Belvedere Tree Pit Creation and Expansion Project	Tree Planting Projects	Baltimore City	10,000.00	Complete			188.0	0.1	12.4
FY15	Blue Water Baltimore	Guilford Elementary Middle School	Stormwater Management	Baltimore City	53,243.70	Complete			0.2	0.1	0.12
	(1) Maryland DNR provided this data 2/21/17 and indicated it is the full extent available.			TOTALS	296,292.00				229.5	3.2	13.62

FY14	Chesapeake Bay Trust	Improving Tree Health and Canopy in CREATES Neighborhoods	Tree Planting Projects	Baltimore City	40,000.00	Construction					
FY14	Chesapeake Bay Trust	Reservoir Hill Tree Canopy Project	Tree Planting Projects	Baltimore City	58,010.00	Construction			74.7	9.2	2.6
FY14	Chesapeake Bay Trust	Improving Tree Health and Canopy in CREATES Neighborhoods	Tree Planting Projects	Baltimore City	184,535.00	Construction			28.0	1.9	0.3
FY14	Parks and People Foundation	Phase II: 507 W Preston St, Samuel Coleridge Taylor Elem	Stormwater Management	Baltimore City	428,926.40	Construction			1.8	0.1	0.145
FY15	Blue Water Baltimore	Baltimore Hebrew Congregation	Stormwater Management	Baltimore City	153,845.90	Construction			1.1	0.1	0.24
FY16	Blue Water Baltimore	Jones Falls Stream Restoration at Falls Road	Stream Restoration	Baltimore	600,000.00	Construction			112.0	38.1	15.19
FY13	Baltimore County	Towson Run at Cloisters Stream Restoration	Stream Restoration	Baltimore	875,000.00	Design/Planning			819.0	268.0	0.304
FY15	Blue Water Baltimore	Shrine of the Sacred Heart	Stormwater Management	Baltimore City	46,298.90	Design/Planning			0.4	0.0	0.058
FY13	Maryland Forestry Board Foundation	Irvine Nature Center Tree Planting	Tree Planting Projects	Baltimore	31,000.00	On-going	acres	16.8	177.0	9.0	1.44
FY13	Trout Unlimited	Jones Falls Stream Restoration	Stream Restoration	Baltimore	425,000.00	Permit					
FY15	Blue Water Baltimore	Chizuk Amuno Synagogue	Stormwater Management	Baltimore	233,771.22	Permit			6.9	0.8	1.42
	(1) Maryland DNR provided this data 2/21/17 and indicated it is the full extent available.			TOTALS	3,076,387.42				1,220.8	327.2	21.70

Appendix
Watershed Eligible for 319(h) Grant Implementation Funding

Lower Monocacy River Watershed in Frederick County, Maryland

Contents

Introduction

The *Lower Monocacy River Watershed Restoration Action Strategy Supplement* was completed by Frederick County in July 2008 and EPA accepted the plan 7/30/2008. The part of the watershed encompassed by the watershed plan is the Frederick County portion of the watershed. (Small upstream portions of the watershed are in Carroll and Montgomery Counties, Maryland.)

Pollutant reduction goals are listed on watershed plan page 11:

- Table J: 25-year for agricultural BMP implementation
- Table K: 25-year goal for urban BMP implementation
- Overall pollutant load reduction goals are summarized in the sentence immediately following the tables.

BMP implementation goals:

- Agricultural BMPs: Table R on page 22.
- Urban BMPs: Table T on page 25.

Base Year for watershed plan implementation is 2003. Pollutant load reductions that year and thereafter can be counted toward meeting watershed plan goals. The TMDL for Lake Linganore phosphorus and sediment in Section 2.2 page 5 indicates that monitoring data used for the TMDL was collected in 2002. The 2008 Lower Monocacy watershed plan goals for nitrogen, phosphorus and sediment reduction are based on Tributary Strategy goals and County calculations. The 2008 plan does not address more recent TMDLs.

Milestones

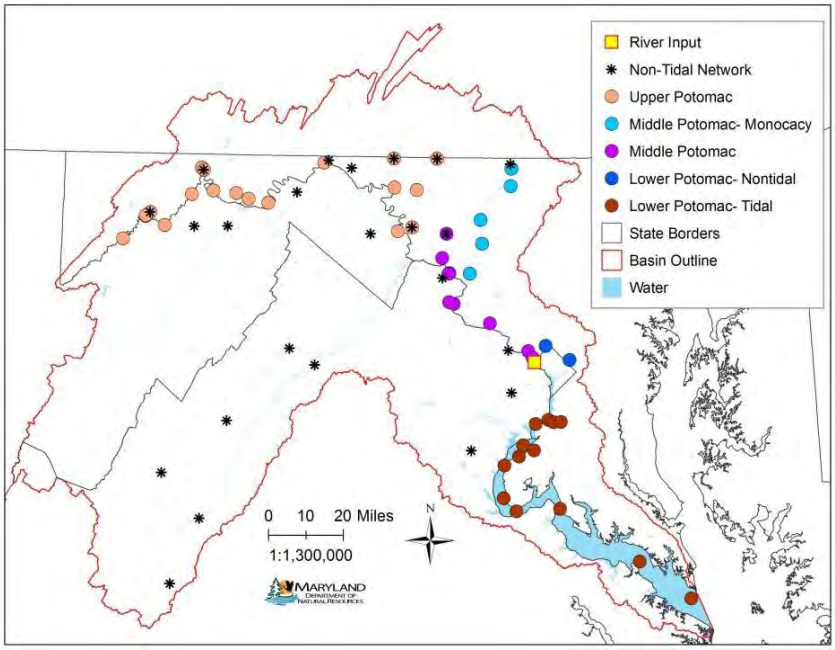
Maryland's 2015-2019 NPS Management Plan Obj. 5 has two milestones for this watershed:

- Annually: Report progress in the 319 Annual Report, and
- In 2018 assess plan implementation progress and in 2019 update plan if needed.

Water Quality Monitoring Activity, Overall Condition, Trends

Over the period from 1999 thru 2014, Maryland DNR analysis of data from long term nontidal monitoring stations (right), not considering flow data, indicate several Monocacy River findings (below, extracted directly from the report): [1]

- Nitrogen: a trend toward decrease
- Phosphorus: insignificant trend toward decrease
- Sediment: no trend



Trends for nitrogen (N), phosphorus (P) and sediment (Sed). Trends at MD DNR long-term non-tidal monitoring stations (columns labeled 'MDDNR') are determined for 1999-2014; analysis does not include use of flow data. Trends at Non-tidal Network stations (columns labeled 'USGS') are determined by USGS for 2005-2014 (at some stations there is no 2005 data); analysis includes use of flow data.[4] Non-tidal Network stations include the corresponding USGS gage number and the state responsible for collecting the data. Stations in bold typeface are MD DNR long-term non-tidal monitoring stations that are also part of the Non-tidal Network. The River Input Station at Chain Bridge (fall-line station) is highlighted in yellow. Decreasing trends ('Dec') are improving trends and shown with green typeface. Increasing trends ('Inc') are degrading trends and shown with red typeface. Blanks indicate no significant trend. Grey shading indicates that the station does not have data for that parameter. Stations are ordered roughly from upstream to downstream.

					MDDNR 1999-2014 (without flow)			USGS 2005*-2014 (with flow)		
Watershed	USGS Gage #	State	MD DNR Station	River/Creek	N	P	Sed	N	P	Sed
Middle Potomac	01637500	MD	CAC0148	Catoctin Creek		Dec		Dec		
			CAC0031	Catoctin Creek		Dec				
	01638480	VA		Catoctin Creek						
			POT1596	Potomac River (VA Side)	Dec	Dec				
			POT1595	Potomac River (MD Side)		Dec				
Monocacy River	01639000	MD	MON0546	Monocacy River						
			MON0528	Monocacy River	Dec	Dec				
			BPC0035	Big Pipe Creek		Dec				
			MON0269	Monocacy River		Dec				
			MON0155	Monocacy River	Dec	Dec				
			MON0020	Monocacy River	Dec	Dec				
			POT1472	Potomac River		Dec				
			POT1471	Potomac River		Dec				
			SEN0008	Seneca Creek	Dec	Dec				
	01646000	VA		Difficult Run						
			CJB0005	Cabin John Creek						
			POT1184	Potomac River		Dec				
Lower Potomac	01646580	MD		Potomac R-Chain Bridge				Dec		
	01654000	VA		Accotink Creek				Dec		
			RCM0111	Rock Creek						
			ANA0082	Anacostia River		Inc	Inc			
	01658500	VA		South Fork Quantico Creek				Inc		

[1] Maryland Department of Natural Resources. *Potomac River Water Quality and Habitat Assessment Overall Condition 2012-2014*. Pages 4 and 6.

Lower Monocacy River Watershed
1992-SFY16 Completed NPS Implementation Projects - 319(h) Grant

Project Summary			Project Expenditures					Pollutant Load Reduction		
Area/Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Non Federal Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)
				Federal	State					
MDA with Frederick SCD	Monocacy Agri Enforcement		319 FFY1992 #4	$55,530	Grant budget amount is shown. Expenditure data is not available.			Completed projects shaded grey predate the baseline year for the watershed plan and are not counted toward implementation progress reporting. Blank spaces indicate that information was not available.		
	Moncacy Eng Tech / SCS		319 FFY1992 #5	$52,000						
	Monocacy Demo Monitor/Model		319 FFY1992 #9	$71,438						
	Engineering Support - Monocacy	1994	319 FFY1993 #6							
	Monocacy Watershed Initiative		319 FFY1994 #2							
	Monocacy Watershed	1996	319 FFY1995 #14	$83,190						
	Agricultural Implementation	2006	319 FFY04 #23	$74,767.61		$49,845.07	$124,612.68	1,296.3	171.6	4.7
	Agricultural Implementation	2008	319 FFY04 #39	$35,000.00		$23,333.33	$58,333.33	609.64	118.36	10
Frederick County	Watershed Restoration	2008	319 FFY05 #17	$216,237.00		$144,158.00	$360,395.00	615.9	43.9	8.2
	Urban Wetlands, Bennett Creek Pilot	2011	319 FFY07 #4	$196,732.92		$131,155.28	$327,888.20	101.3	18.5	1.6
		2012	319 FFY08 #4	$228,361.26		$152,240.84	$380,602.10	149.9	31.4	2.782
	Green Infrastructure	2013	319 FFY10 #9	$284,739.42		$189,826.28	$572,971.98	350.94	34.13	4.07
	Neighborhood Green Infrastructure	SFY16	319 FFY13 #7	$89,106.78		$59,404.52	$148,511.30	30.3	0.43	0.93
			TOTAL for completed projects	$1,387,102.99	$0.00	$749,963.33	$1,973,314.60	3,154.3	418.3	32.28

For nitrogen, phosphorus and sediment, BMPs installed 2003 and later can be counted toward watershed plan implementation.

SFY 2016 NPS Implementation Project In Progress - 319(h) Grant - Lower Monocacy River Watershed

Project Summary			Project Funding					Projected Pollutant Load Reduction		
Area/Lead	Name/Dsescription	End Date	Grant Funding Source	Grant Funds		Non Federal Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)
				Federal	State					
Frederick County	No 319 projects working during SFY16									

Lower Monocacy River Watershed
2011-2015 Completed State Revolving Fund NPS Implementation Projects

Project Summary			Project Expenditures					Pollutant Load Reduction		
Area/Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Match $	Total $	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)	Bacteria (MPN)
				Federal $	State $						
	no completed SRF-funded projects										
TOTAL for completed projects				$0.00	$0	$0.00	$0.00	0	0	0	0

Summary of State Revolving Fund Projects Activity in 2015 - Lower Monocacy River Watershed

Project Summary			Project Funding					Projected Pollutant Load Reduction			
Area/Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Match $	Total $	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)	Bacteria (MPN)
				Federal $	State $						
NGO (1)	Villages of Lake Linganore Stormwater Project	TBD	SRF loan and other sources		$6,346,142	$7,800,000	$14,146,142	TBD	TBD	TBD	TBD
Frederick County	No SRF projects working during SFY16										
City of Frederick	No SRF projects working during SFY16										

(1) NGO: Lake Linganore Conservation Society. Other funds shown in match column may not be formally defined as match.

Lower Monocacy River Falls Watershed
Chesapeake and Atlantic Coastal Bays Trust Fund
SFY 2016 NPS Implementation Project Status (1)

Year Funded	PartnerCD	ProjectTitle	ProjectType	County	TrustFund Dollars	Status	BMP Units	BMPs Reported	Annual LbsN	Annual LbsP	Annual TonsTSS
SFY14	Center for Watershed Protection	Hood College, Whitaker Parking lot / Rosenstock Hall	Stormwater Management	Frederick	36,923.00	Complete			3.5	0.4	509
		Hood College, North of Coffman Chapel	Stormwater Management	Frederick	56,550.00	Complete			26.4	1.9	1733
	City of Frederick	Walnut Ridge (City Stream Restoration and Educational Projects)	Tree Planting Projects	Frederick	19,484.40	Complete	acres	4	114.9	7.7	1.36
		Waterford Park (City Stream Restoration and Educational Projects)	Tree Planting Projects	Frederick	52,607.88	Complete	acres	10.8	310.2	20.7	3.67
		Carroll Creek/Baker Park (I) (City Stream Restoration and Educational Projects)	Tree Planting Projects	Frederick	12,664.86	Complete	acres	2.6	74.7	5.0	0.88
		Carroll Creek/Baker Park (II)	Tree Planting Projects	Frederick	10,716.42	Complete	acres	2.2	63.2	4.2	0.75
		Carroll Creek/Baker Park (III) (City Stream Restoration and Educational Projects)	Tree Planting Projects	Frederick	34,097.70	Complete	acres	7	201.0	13.4	2.38
		Old Camp Park (City Stream Restoration and Educational Projects)	Tree Planting Projects	Frederick	1,948.44	Complete	acres	0.4	11.5	0.8	0.14
		Rivermist, City Parkland (City Stream Restoration and Educational Projects)	Tree Planting Projects	Frederick	2,435.55	Complete	acres	0.5	14.4	1.0	0.17
		Career & Technology Center (City Stream Restoration and Educational Projects)	Education & Outreach	Frederick	19,877.00	Complete	acres	0.9	0.0	0.0	0
		Fredericktowne Village Park (City Stream Restoration and Educational Projects)	Tree Planting Projects	Frederick	23,868.39	Complete	acres	4.9	104.7	9.4	1.67
	Frederick County	Crestwood Middle School (County Riparian Buffers Streams - Student & Community Collaborative Service)	Tree Planting Projects	Frederick	6,168.65	Complete	acres	2	11.5	0.8	0.126
	Frederick County	Mountain Village HOA (County Riparian Buffers Streams - Student & Community Collaborative Service)	Tree Planting Projects	Frederick	9,107.80	Complete	acres	2.5	14.3	1.0	0.1575
	Land and Cultural Preservation Fund	Dearbought Park	Tree Planting Projects	Frederick	2,721.65	Complete	acres	0.33	9.7	0.4	0.07
	Potomac Conservancy	Schipper - Buffer	Agricultural Practices	Frederick	11,215.00	Complete			289.0	12.0	2.22
	Potomac Conservancy	Glick - fencing & grassed waterway	Agricultural Practices	Frederick	11,298.23	Complete			11.7	0.0	6087.6
	Potomac Conservancy	Wetzel	Agricultural Practices	Frederick	2,018.00	Complete			118.0	4.2	0.92
	Potomac Conservancy	Trimmer	Agricultural Practices		12,300.00	Complete			177.0	7.3	1.359
SFY15	Delmarva RC & D Council	Cassis	Wetland Restoration	Frederick	2,460.00	Complete			2.2	0.2	0.01
	(1) Maryland DNR provided this data 2/21/17 and indicated it is the full extent available.			TOTALS	328,462.97				1,557.9	90.3	8,345.48

SFY15	Maryland Forestry Board Foundation	Reid Reforestation	Tree Planting Projects	Frederick	5,231.00	On-going	acres	1.6	0.0	1.0	0.23
SFY15		Friends Meeting School Reforestation	Tree Planting Projects	Frederick	9,808.00	On-going	acres	3	1.0	1.0	0.43
SFY15		Stoneking Reforestation	Tree Planting Projects	Frederick	6,539.00	On-going	acres	2	0.0	1.0	0.28
	(1) Maryland DNR provided this data 2/21/17 and indicated it is the full extent available.			TOTALS	21,578.00				1.0	3.0	0.94

SFY2016 Agricultural BMP Implementation
Lower Monocacy River Watershed
In Frederick County, Maryland

Lower Monocacy River Watershed Plan
Agricultural BMP Implementation Goals

Prior Years Progress Toward Watershed Plan Goals

Extracted from State Data reported by MDE to EPA Bay Program

Agricultural Best Management Practice	Unit	SFY16 Total	Estimated Pollutant Load Reduction: Nitrogen Total (lbs)	Phosphorus Total (lbs)	Sediment Total (tons)	Management Practice Plan	Table R	Goal	Unit	Progress: SFY16 Progress	Progress: SFY14 thru SFY16	Prior Years Progress: SFY14	Prior Years Progress: SFY15	Units
Annual Practices														
Cover Crops	acres	14,123	181,770.3	1,108.9	950.24	Cover Crops		25,111	acres/yr	14,123				
Multi-Year Practices														
Alternative Crops	acres	0									0	0	0	acres
Amendments for the Treatment of Ag Waste	AU	0									0	0	0	AU
Animal Mortality Facility	count	0									0	0	0	count
Conservation Cover	acres	0									26.3	19	7.1	acres
Conservation Plans/SCWQP	acres	3,718	6,595.6	599.3	448.03	Soil Conservation & Water Quality Plans		58,292	acres	3,718	8233	2,048	2,467.0	acres
Critical Area Planting	acres	0									14.2	9.6	4.6	acres
Dead Bird Composting Facility	count	0									0	0	0	count
Fencing	feet	2,591	253.8	22.3	5.96						35024	1147	31,286.0	feet
Field Border	acres	0				Buffers Grass - Agriculture		789	acres	0	0	0	0	acres
Filter Strip	acres	0									0	0	0	acres
Grassed Waterway	acres	2.1	98.5	3.0	1.56						7.38	0.41	4.87	acres
Horse Pasture Management	acres	0									0	0	0	acres
Loafing Lot Management System	acres	0.1	6.0	0.9	0.07						1.2	0.56	0.54	acres
Pasture & Hay Planting	acres	37.1									46.1	0	9	acres
Prescribed Grazing	acres	45.8	0	19.4	3.73						213.8	3.8	164.2	acres
P-sorbing Materials	acres	0									0	0	0	acres
Riparian Forest Buffer	acres	0				Buffers Forested - Agriculture		2,233	acres	0	13.8	0	13.8	acres
Riparian Herbaceous Cover	acres	0									2	0	2	acres
Roof Runoff Structure	count	5	304.9	50.0	3.70						9	3	1	count
Stream Restoration Ag	feet	0									0	0	0	feet
Tree/Shrub Establishment	acres	0				Tree Planting - Agriculture		444	acres	0	0.3	0.3	0	acres
Waste Storage Facility	count	2				Animal Waste Mgmt - Livestock		165	count	2	9	3	4	count
						Animal Waste Mgmt - Poultry		3						
Wastewater Treatment Strip	acres	0									0	0	0	acres
Water Control Structure	count	0									1	1	0	count
Watering Facility	count	11	0	15.5	2.99						24	3	10	count
Wetland Creation	acres	0				Wetland - Agriculture		376	acres	0	0	0	0	acres
Wetland Restoration	acres	0									0	0	0	acres
Windbreak/Shelterbelt Establishment	feet	0									0	0	0	feet
						Conservation Tillage		24,032	acres/yr					
						Nutrient Management		47,897	acres					
						Retirement of Highly Erodible Land		2,185	acres					
						Stream Protection with Fencing		1,471	acres					
						Stream Protection without Fencing		207	acres					
Total Annual Practices			181,770.3	1,108.9	950.24									
Total Multi-year Practices			7,258.8	710.4	466.04									
Total Pollutant Load Reduction			189,029.1	1,819.3	1,416.28									

"SFY16 Total" column is MDA data. MDE used MAST to estimate pollutant load reductions.

The Maryland Department of Agriculture (MDA) defines annual practices as cover crops, nutrient mgmt, manure transport, conservation tillage & high residue tillage.

SFY2016 Urban BMP Implementation
Lower Monocacy River Watershed In Frederick County, Maryland

Urban Management Practice	Unit	BMPs Reported	Estimated Pollutant Load Reductio		
			Nitrogen lb/yr	Phosphorus lb/yr	Sediment tons/yr
Bioretention (A)	acres	0			
Bioswale (A)	acres	0			
Cisterns & Rain Barrels (A)	acres	0			
Disconnection of Rooftop Runoff (A)	acres	0			
Dry Detention Ponds & Hydro Structures (A)	acres	0			
Dry Extended Detention Ponds (A)	acres	0			
Dry Well (A)	acres	0			
Filtering Practices (A)	acres	0			
Forest Conservation	acres	0			
Forest Harvesting Practices	acres	0			
Infiltration Practices (A)	acres	0			
Permeable Pavement (A)	acres	0			
Rain Garden (A)	acres	0			
Reduction of Impervious Surface (A)	acres	0			
Riparian Forest Buffers on Urban Lands (B)	acres	0			
Septics Connections to Sewers	count	0			
Septic Denitrification Critical Area	count	0			
Septic Denitrification outside of 1000 feet	count	43	154.8		
Septic Denitrification within 1000 feet	count	35	210.0		
Septic Tank Pumpout	count	0			
Stream Restoration Urban	feet	0			
Street Sweeping (A)	acres	0			
Tree Planting	acres	0			
Urban Forest Buffer (B)	acres	0			
Wet Extended Detention (A)	acres	0			
Wet Ponds and Wetlands (A)	acres	0			
Urban TOTAL Pollutant Load Reduction			364.8	0.0	0.00

"BMPs Reported" column is MDE data 12/5/16.
Pollution load reduction is estimated by MDE using MAST.

Lower Monocacy River Watershed Plan
Urban BMP Implementation Goals

Plan Page 25	Urban Management Practice	Goal	Unit	Progress	
				SFY16	SFY14-SFY16
					7.92
					0
					0.78
					0
					0
					5.32
					0
					0
					0
					0
					4.74
					0.59
					0.23
					0
					46.51
Table T	Septic Denitrification (upgrade & connection to sewer)	17,784	count	78	180
					0
Table T	Stream Restoration, Urban	956	feet	0	0
					0
Table T	Tree Planting (urban)	20	acres	0	0
					8.15
					0
					0
Table T	Nutrient Management mixed	18,461	acres		0
Table T	Nutrient Management urban	17,427	acres		0
Table T	Sediment & Erosion Control	1,460	acres		0
Table T	Buffers Forested, Urban (B)	73	acres	0	54.66
Table T	Stormwater Management (A)	6,780	acres	0	19.58

(A) Watershed plan goal "Stormwater Management" progress aggregates reporting for BMPs footnoted (A).

(B) Watershed plan goal "Buffers Forested, Urban" aggregates reporting for BMPs footnoted (B).

Prior Years Progress Toward Watershed Plan Goals

Prior to SFY14	Extracted from State Data reported by MDE to the EPA Bay Program			
	SFY14	SFY15		Units
Data by locals in annual reports is not compatible with this reporting methodology.	0.32	7.60		acres
	0	0		acres
	0	0.78		acres
	0	0		acres
	0	0		acres
	0	5.32		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	4.74		acres
	0	0.59		acres
	0	0.23		acres
	0	0		acres
	44.91	1.60		acres
	0	0		count
	0	0		count
	11	65		count
	16	10		count
	0	0		count
	0	0		feet
	0	0		acres
	0	0		acres
	7.15	1.00		acres
	0	0		acres
	0	0		acres

Appendix
Watershed Eligible for 319(h) Grant Implementation Funding

Middle Gwynns Falls in Baltimore City and Baltimore County, Maryland

Contents

Middle Gwynns Falls SWAP Overview

The *Middle Gywnns Falls Small Watershed Action Plan* (SWAP) was completed by Baltimore County in September 2013, an addendum was completed in April 2014, and the overall plan was accepted by EPA in April 2014. The part of the watershed encompassed by the watershed plan is the Baltimore County portion of the watershed. Land use in Baltimore County's Middle Gwynns Falls 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.

Pollutant reduction goals by 2025 (and location within the watershed plan):

- Nitrogen: 50,442 pounds per year (Table 3-3 on page 23).
- Phosphorus: 4,086 pounds per year (Table 3-3 on page 23).
- Sediment: 4,357,308 pounds per year, i.e. 2,179 tons per year (Addendum A Table A-5).
- Fecal Bacteria: varies by monitoring station (Addendum A Table A-12).
- Chloride: The plan has a general goal to reduce in-stream chloride levels.

BMP implementation goals:

- Nitrogen and phosphorus: Appendix A Table A-2.
- Sediment: Addendum A Table A-6.
- Bacteria: Addendum A Section A.3.2

There are three different base years for tracking watershed plan implementation:

- Nitrogen and phosphorus base year is 2011. Pollutant load reductions reported that year and thereafter can be counted toward meeting watershed plan goals. The watershed plan Section 2.2 pages 12-15 indicates that the goal is to help meet the "bay-wide Chesapeake Bay TMDL" completed in 2010. Watershed plan Section 3.4.1.1 page 22 indicates that the baseline NPS load estimates in the plan were derived from 2010 land use data.
- Sediment base year is 2008. Pollutant load reductions reported that year and thereafter can be counted toward meeting watershed plan goals. The watershed plan Addendum A.2.1 indicates that the sediment reduction goal is based land use data from 2007 aerial imagery. The Bay TMDL is based on Chesapeake Bay Program P5 model land uses

(pages 5-7) and the edge-of-field target erosion rated (pages 8-12).

- Bacteria base year is 2004. Pollutant load reductions reported that year and thereafter can be counted toward meeting watershed plan goals. The watershed plan Addendum A Section A.3 indicates that the bacteria reduction goal is based on the Gwynns Falls Bacteria TMDL approved by EPA in 2007. The Bacteria TMDL Section 2.2 pages 10-12 indicate that the TMDL is based on monitoring conducted 2003 and earlier.

Maryland's 2015-2019 NPS Management Plan Objective 5 lists one milestone for this watershed: annually report progress in the 319 Annual Report.

Urban BMP tracking/reporting

Middle Gwynns Falls SWAP Goal and Implementation Progress						
Management Practices Listed by SWAP Action Number	**SWAP Goal**	**Units**	**2013-FY14 Progress**	**FY15 Activity**	**FY16 Activity**	**Total Progress**
2. Street Sweeping *	76	miles	?	?	?	?
3. SW Conversions	10	ponds	0	1	5	6
6. Stormwater Retrofits	20	projects	0	5	0	5
7. Imp Removal	2.8	acres	0	0	0	0
8. Downspout Disconnection	89	rooftop acres	0.10	0.09	0.11	0.30
9. Wetland creation (urban)	1	project	0	0	0	0
13. Riparian Buffer Trees	127	acres	0.01	0	3.18	3.19
14. Street and Shade Trees	28.8	Acres	0.06	1.4	0.31	1.77
15. Institutional Trees	46.7	acres	0.09	1.03	0.35	1.47
33. Stream Restoration	32,432	Linear ft	1,973	0	0	1,973
Redevelopment	897	acres	0.4	1.6	0	2.0

* The SWAP goal (miles) is not consistent with the metric used in the County's records. Therefore, the street sweeping goal is not trackable.

The table above presents Baltimore County tracking of watershed plan implementation progress by the Department of Environmental Protection & Sustainability, Watershed Management and Monitoring Section. Additionally, the County also used their own methods for estimating pollutant load reduction that are reported here and elsewhere in the SFY2016 Annual Report.

Agricultural BMP tracking/reporting

The Middle Gwynns Falls watershed has less than one percent area with agricultural activity. SWAP does not have agricultural BMP implementation goals. The Maryland Department of Agriculture tracks agricultural BMP implementation statewide. They report that no agricultural BMPs were reported in SFY16 but there were small acreages of cover crops reported in both SFY14 and SFY15.

Water Quality Monitoring Activity, Overall Condition, Trends

Baltimore County collects water quality samples at monitoring stations in the in the County's portion of the Middle Gwynns Falls watershed, which is entirely nontidal. However, analysis has not been available for the Annual Report.

Water Quality Monitoring/Trends Annual Report Sources Middle Gwynns Falls				
Report Year	**Appendix Page**	**Report 1**	**Report 2**	**Report 3**
SFY16	3rd page	no new report		
SFY15	1st page	no WQ report		
2014	1 thru 4	DNR, Patapsco and Back Rivers WQ and Habitat Assessment		

The State of Maryland monitors water quality in the tidal waters of the Patapsco River, where both the Jones Falls and the Gwynns Falls drain. The most recent information for Pataspco River tidal waters was summarized in the 2014 Annual Report in Appendix Watersheds in the Middle Gwynns Falls section.

Middle Gwynns Falls (In Baltimore County only)
2011-SFY16 Completed NPS Implementation Projects - 319(h) Grant and State Revolving Fund

Project Summary			Project Expenditures					Pollutant Load Reduction			
Area/Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Match $	Total $ (1)	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)	Bacteria (MPN)
				Federal $	State $						
Baltimore County	Scotts Level McDonogh Road Watershed Restoration Project	2014	319 FFY12 #5	$320,004		$213,336	$533,340	415.20	136.4	306.2	0
	no SRF funded projects reported										
			TOTAL for completed projects	$320,004.00	$0	$213,336.00	$533,340.00	415	136	306	0

For nitrogen and phosphorus pollutant loads, BMPs installed 2011 and later can be counted toward watershed plan implementation.
For sediment pollutant loads, BMPs installed 2011 and later can be counted toward watershed plan implementation.

SFY16 NPS Implementation Projects In Progress - 319(h) Grant and State Revolving Fund - Middle Gwynns Falls Watershed

Project Summary			Project Funding					Projected Pollutant Load Reduction			
Area/Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Match $	Total $	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)	Bacteria (MPN)
				Federal $	State $						
Baltimore	No 319 projects working during SFY16										

Middle Gwynns Falls Watershed
Chesapeake and Atlantic Coastal Bays Trust Fund
SFY 2016 NPS Implementation Project Status (1)

Year Funded	Partner	ProjectTitle	ProjectType	County	TrustFund Dollars	Status	BMP Units	BMPs Reported	Annual LbsN	Annual LbsP	Annual TonsTSS
FY13	Baltimore County	Scotts Level Branch at McDonough Retrofit, Stream Restoration, and Buffer	Stream Restoration	Baltimore	680,000.00	Complete			418.7	134.0	0.153
FY14	Alliance for the Chesapeake Bay	Temple Emanuel of Baltimore	Tree Planting Projects	Baltimore	4,861.50	Complete	acres	0.8	3.8	0.2	0.0124
		Christ the King Church	Tree Planting Projects	Baltimore	2,975.52	Complete	acres	0.5	2.3	0.1	0.008
	Baltimore County	Woodlawn HS	Tree Planting Projects	Baltimore	12,528.36	Complete	acres	2.16	12.4	0.8	0.14
		Powhatan ES	Tree Planting Projects	Baltimore	6,380.18	Complete	acres	1.1	6.3	0.4	0.07
	(1) Maryland DNR provided this data 2/21/17 and indicated it is the full extent available.			TOTALS	706,745.56				443.5	135.5	0.38

FY14	Baltimore County	Dead Run at Westview Park Stream Restoration	Stream Restoration	Baltimore	1,225,312.00	Permit			510.0	173.4	69.17
	(1) Maryland DNR provided this data 2/21/17 and indicated it is the full extent available.			TOTALS	1,225,312.00				510.0	173.4	69.17

Appendix
Watershed Eligible for 319(h) Grant Implementation Funding

Sassafras River Watershed in Cecil and Kent Counties, Maryland

Contents

Introduction

The *Sassafras Watershed Action Plan* was completed by the Sassafras River Association, a private nonprofit organization, in December 2009. EPA accepted the plan in January 2010. The watershed plan encompasses the portion of the watershed is in Cecil and Kent Counties, Maryland. The upstream portion of the watershed in Delaware is not included in the watershed plan.

Pollutant reduction goals are in watershed plan Executive Summary Table E.5 and are reiterated in Table 5.4 on page 108. The phosphorus load reduction goal equals the TMDL limit for NPS phosphorus. The implementation measures that the plan proposes to meet the phosphorus goal will also reduce nitrogen and sediment loads. The estimates of the load reductions for nitrogen and sediment associated with these implementation measures are the basis for the plans reduction goals for nitrogen and sediment. (see watershed plan section E6.0, paragraph 1, on page xxv.)

BMP implementation goals are in the watershed plan Executive Summary Table E.4 on pages xxv thru xxviii and are reiterated in Table 5.3 on pages 105 thru 108.

Base Year for watershed plan implementation is 1999. Pollutant load reductions that year and thereafter can be counted toward meeting watershed plan goals. The Sassafras River phosphorus TMDL Section 2.2 on page 6 indicates that monitoring data used to create the TMDL was collected in 1999.

Milestones

Maryland's 2015-2019 NPS Management Plan Objective 5 lists one milestone for this watershed: annually report progress in the 319 Annual Report.

Water Quality Monitoring Activity, Overall Condition, Trends

The Sassafras River Association conducts its own water quality monitoring program. Their 2016 Sassafras River Report Card is included among the following pages.

The Maryland Department of Natural Resource assessment of the Sassafras River tidal waters was reported in the appendix for the *Annual Report Maryland 319 Nonpoint Source Program State Fiscal Year 2015*. The table provides a complete listing of past Annual Report information sources for water quality conditions and trends.

Water Quality Monitoring/Trends Annual Report Sources Sassafras River				
Report Year	**Appendix Page**	**Report 1**	**Report 2**	**Report 3**
SFY15	page 2	TIDAL: DNR, Upper Eastern Shore Overall Condition 2012-2014		
14	1 thru 2	TIDAL: DNR, Upper Eastern Shore Overall Condition 2011-2013	TIDAL: DNR 2012, Upper Eastern Shore WQ & Habitat Assessment	

Sassafras River Watershed

2009-SFY16 Completed 319(h) NPS Implementation Projects - 319(h) Grant and State Revolving Fund

Project Summary			Project Expenditures					Pollutant Load Reduction		
Area/Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Non Federal Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)
				Federal	State					
SRA	Galena Elementary School stormwater	2013	319 FFY12 #8	$14,000.00		$9,333.33	$25,000.00	1.38	0.24	0.05
SRA	Phipps Treatment Wetlands & sediment traps	SFY15	319 FFY13 #8	$50,000		$33,333	$83,333	99.3	19.9	2.6
	No 319 project completed in SFY15 thru SFY16							0.0	0.0	0
	No SRF project completed in SFY15 thru SFY16							0.0	0.0	0
			TOTAL	$64,000.00	$0.00	$42,666.67	$108,333.33	100.7	20.2	2.65

SRA: Sassafras River Association, a private nonprofit organization.
For phosphorus pollutant load reduction, BMPs installed 1999 and later can be counted toward watershed plan implementation.

SFY16 NPS Implementation Projects In Progress - 319(h) Grant and State Revolving Fund - Sassafras River Watershed

Project Summary			Project Expenditures					Pollutant Load Reduction		
Area/Lead	Name/Dsescription	End Date	Grant Funding Source	Grant Funds		Non Federal Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)
				Federal	State					
	No 319 or SRF projects were working during SFY16									

Sassafras River Watershed
Chesapeake and Atlantic Coastal Bays Trust Fund
SFY16 NPS Implementation Project Status (1)

Year Funded	PartnerCD	ProjectTitle	ProjectType	County	TrustFund Dollars	Status	BMP Units	BMPs Reported	Annual LbsN	Annual LbsP	Annual TonsTSS
FY12	Md Dept of Agriculture	Poultry Manure Subsurfer	Agricultural Practices	Cecil	65,628.00	Complete			7,800.0	7,500.0	0
FY12	Sassafras River Association	Phipps Dairy Farm Vertical Flow Treatment Wetland	Wetland Restoration	Kent	224,350.00	Complete			75.0	7.0	0.00155
FY13	Kent County Public Schools	Sassafras Natural Resource Management Area Waterway and Drainage Buffer Restoration and Enhancement Project	Tree Planting Projects	Kent	29,988.80	Complete	acres	15	442.5	18.3	3.4
	Sassafras River Association	Budds Landing	Stream Restoration	Cecil	170,864.00	Complete			0.0	90.0	1.1
		Crawford Treatment Wetland	Stormwater Management	Cecil	165,100.50	Complete			2,993.0	863.0	12
		Salfner Farm Stream Restoration	Stream Restoration	Cecil	90,000.00	Complete			120.0	40.8	93
FY14	Kent County Public Schools	Sassafras Natural Resource Management Area Site II	Tree Planting Projects	Kent	16,865.00	Complete	acres	3.65	162.3	6.7	1.24575
	Sassafras River Association	Turners Creek Natural Resource Area Ravine Restoration	Stream Restoration	Kent	121,643.80	Complete			0.0	0.0	0
FY16	Washington College	Leigh	Agricultural Practices	Kent	14,102.05	Complete			133.0	7.9	3.6
	(1) Maryland DNR provided this data 2/21/17 and indicated it is the full extent available.			TOTALS	898,542.15				11,725.7	8,533.7	114.35

FY13	Sassafras River Association	Rt 301 Stormwater Conveyance	Stream Restoration	Cecil	440,000.00	Construction			35.0	465.0	0.053
FY15		Swantown Creek Stream Restoration	Stream Restoration	Kent	1,198,922.00	Design/Planning			307.5	278.8	31
FY16	Ridge to Reefs	Harbor View Farm Project 1 - Multi-celled Treatment Wetland	Agricultural Practices	Kent	85,000.00	Design/Planning			112.0	11.0	1.1715
		Harbor View Farm Project 2 - Forebay and Bioretention	Agricultural Practices	Kent	23,000.00	Design/Planning			359.0	29.0	5.081
		Harbor View Farm Project 3 - Woodchip Infiltration Trench	Agricultural Practices	Kent	25,000.00	Design/Planning			53.0	0.0	0
		Colchester Farm Project 1 - Multi-celled Treatment Wetland	Agricultural Practices	Kent	44,000.00	Design/Planning			94.0	10.2	1.264
		Colchester Farm Project 2 - Woodchip Infiltration Trench	Agricultural Practices	Kent	23,000.00	Design/Planning			51.0	0.0	0
FY16	Town of Betterton	Main St. Outfall	Stormwater Management	Kent	187,775.00	Design/Planning			44.1	13.9	5.511
		Betterton Beach Parking Lot	Stormwater Management	Kent	304,500.00	Design/Planning			1.0	0.7	0.185
FY14	Chesapeake Bay Trust	Greener Wheeler Avenue Project, Phase 1	Stormwater Management	Kent	2,000.00	Construction					
		Greener Wheeler Avenue Project, Phase 1	Stormwater Management	Kent	89,045.00	Construction			0.0	0.0	4.2
	(1) Maryland DNR provided this data 2/21/17 and indicated it is the full extent available.			TOTALS	2,331,197.00				1,056.6	808.6	48.47

SFY2016 Agricultural BMP Implementation Sassafras River Watershed In Cecil County and Kent County, MD			Estimated Pollutant Load Reduction		
Agricultural BMP	Unit	SFY16 Total	Nitrogen Total (lbs)	Phosphorus Total (lbs)	Sediment Total (tons)
Annual Practices					
Cover Crops	acres	15,660	67,572.8	355.5	188.46
Multi-Year Practices					
Alternative Crops	acres	0			
Amendments for Treatment of Ag Waste	AU	0			
Animal Mortality Facility	count	0			
Conservation Cover	acres	25.6			
Conservation Plans/SCWQP	acres	2,327	1,842.7	151.4	78.41
Critical Area Planting	acres	0			
Dead Bird Composting Facility	acres	0			
Fencing	feet	0			
Field Border	acres	0			
Filter Strip	acres	0			
Grassed Waterway	acres	1.2	34.4	0.7	0.27
Horse Pasture Management	acres	0			
Loafing Lot Management System	acres	0			
Pasture & Hay Planting	acres	0			
Prescribed Grazing	acres	0			
P-sorbing Materials	acres	0			
Riparian Forest Buffer	acres	0			
Riparian Herbaceous Cover	acres	0			
Roof Runoff Structure	count	0			
Stream Restoration Ag	feet	0			
Tree/Shrub Establishment	acres	0			
Waste Storage Facility	count	0			
Wastewater Treatment Strip	acres	0			
Water Control Structure	count	0			
Watering Facility	count	0			
Wetland Creation	acres	0			
Wetland Restoration	acres	0			
Windbreak/Shelterbelt Establishment	feet	0			
Total Annual Practices (2)			67,572.8	355.5	188.46
Total Multi-year Practices			1,877.1	152.1	78.7
Total Pollutant Load Reduction			69,449.9	507.6	267.1

"SFY16 Total" column data is MDA 1/4/16. MDE used MAST to estimate pollutant load reduction.

The Maryland Department of Agriculture defines annual practices as cover crops, nutrient mgmt, manure transport, conservation tillage & high residue tillage.

Sassafras River Watershed Plan				
Management Measures			Progress	
Watershed Plan Table 5.1	Goal	Units	SFY14-SFY16	Units
Cover Crops (#17, 19)	5000	acres/yr		
			0	acres
			0	AU
			0	count
			42.9	acres
			9,663	acres
			0.5	acres
			0	acres
			0	feet
			0	acres
			1.2	acres
			6.44	acres
			0	acres
			1.1	acres
			0	acres
			0	acres
			0	acres
#15 Stream Buffers	2	miles	0	acres
			24.8	acres
			2	count
			720	feet
			0.25	acres
			2	count
			0	acres
			6	count
			0	count
#21 Wetland Creation	5	count	0.5	acres
			0	acres
			0	feet

Prior Years' Progress Toward Watershed Plan Goals				
Prior to SFY14	Extracted from State Data reported by MDE to EPA Bay Program			
	SFY14	**SFY15**		**Units**
Data by locals in annual reports is not compatible with this reporting methodology.	0	0		acres
	0	0		AU
	0	0		count
	0	17.3		acres
	3,512	3,824		acres
	0.5	0		acres
	0	0		acres
	0	0		feet
	0	0		acres
	1.2	0		acres
	5	0.24		acres
	0	0		acres
	1	0.1		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	24.8	0		acres
	2	0		count
	0	720		feet
	0	0.25		acres
	2	0		count
	0	0		acres
	2	4		count
	0	0		count
	0	0.5		acres
	0	0		acres
	0	0		feet

SFY16 Urban BMPs Implemented
Sassafras River Watershed
In Cecil County and Kent County, Maryland

Urban Management Practices	Unit	BMPs Reported	Estimated Pollutant Load Reduction		
			Nitrogen lb/yr	Phosphorus lb/yr	Sediment lb/yr
Bioretention	acres	0			
Cisterns and Rain Barrels	acres	0			
Bioswale	acres	0			
Disconnection of Rooftop Runoff	acres	0			
Dry Detention Ponds & Hydro Structures	acres	0			
Dry Extended Detention Ponds	acres	0			
Dry Well	acres	0			
Filtering Practices	acres	0			
Forest Conservation	acres	0			
Forest Harvesting Practices	acres	0			
Infiltration Practices	acres	0			
Permeable Pavement	acres	0			
Rain Garden	acres	0			
Reduction of Impervious Surface	acres	0			
Riparian Forest Buffers on Urban Lands	acres	0			
Septics Connections to Sewers	count	0			
Septic Denitrification Critical Area	count	3	23.40		
Septic Denitrification outside of 1000 feet	count	2	6.20		
Septic Denitrification within 1000 feet	count	1	5.60		
Septic Tank Pumpout	count	0			
Stream Restoration Urban	feet	0			
Street Sweeping	acres	0			
Tree Planting	acres	0			
Urban Forest Buffer	acres	0			
Wet Extended Detention	acres	0			
Wet Ponds & Wetlands	acres	0			
Urban BMPs Total Pollutant Load Reduction			35.20	0	0

(1) "BMPs Reported" is MDe data 12/5/16. MDE used MAST to estimate polutant load reduction.

Sassafras River Watershed Plan

Urban Management Measures Watershed Plan Table 5.1	GOAL	Units	Progress		
			SFY16	SFY14-SFY16	Units
					acres
					acres
					acres
					acres
					acres
					acres
					acres
					acres
					acres
					acres
					acres
					acres
					acres
					acres
					acres
					count
#5, #6, #10 Septic system upgrades	150	count	6	6	count
				3	count
				10	count
					count
					feet
					acres
					acres
					acres
					acres
					acres
#1 Road retrofit & stream restore	3	count			
#12 Stabilize eroding ravines	1	miles			
#13 Stabilize eroding shoreline	0.5	miles			

Note: The watershed plan goals tracked in this table are consistent with units of measure used for State reporting. All other watershed plan goals differ and are not tracked in this table.

Prior Years' Progress Toward Watershed Plan Goals

Data reported by locals	Extracted from State Data reported by MDE to EPA Bay			
	SFY14	SFY15		Units
Data by locals in annual reports is not compatible with this reporting methodology.	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		count
	0	3		count
	0	1		count
	0	9		count
	0	0		count
	0	0		feet
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres

Saving the Sassafras

YOUR SASSAFRAS RIVER ASSOCIATION HAS BEEN ACTIVE .. from previous page

With funding from Maryland DNR and Chesapeake Bay Trust, and tree planting help from students from Galena and Cecilton Elementary Schools, the Budd's Landing restoration project reduces annual loading of 105 tons of sediment, 35 pounds of nitrogen, and 465 pounds of phosphorus into the creek and river. Project costs were $225,000.

SALFNER FARM STREAM RESTORATION (See star #3) restored a 600-foot stretch of a headwaters stream of the Sassafras River receiving storm water from State and County highways. The $90,000 project was funded by Maryland DNR. Completed in spring of 2015, the estimated annual benefits are a reduction of 93 tons of sediment, 120 pounds of nitrogen, and 40 pounds of phosphorus. See photo at left below.

PHIPPS DAIRY FARM TREATMENT WETLAND (See star #4), was also completed in 2015. This project addresses sediment and nutrient runoff from a dairy and crop facility in Kent County. The $150,000 project was funded by a MDE 319 Grant and Maryland DNR. The estimated benefits are an annual reduction of 8 tons of sediment, 2,285 pounds of nitrogen and 687 pounds of phosphorus. See photo at right below.

HIGHWAY 301 RAVINE RESTORATION (see star #5) We are in the final stages prior to construction of an $880,000 project in partnership with Cecil County and funded by Maryland DNR, the Natural Resources Conservation Service, and the Maryland State Highway Administration.

TURNERS CREEK TREATMENT WETLAND (see star # 6), under construction as this is written in May 2016, a $120,000 project funded by Maryland DNR which captures agricultural runoff and reduces sediment and nutrients, in a series of stages including slag, bioretention pits, and rock step pools.

* Your SRA has other projects in various stages of planning or permitting, and will keep you informed as we continue working to bring cleaner water to the Sassafras River.

CLEAN RIVERS AND PUBLIC HEALTH

As the residents of Flint, Michigan have sadly discovered, unhealthy river water can be a serious hazard to public health. Even with extensive treatment, Flint drinking water is unsafe for several reasons – the most notable being lead contamination. The sources of the lead are old pipes that have been in place for many decades, and the catalyst for the lead leaching into the water is the high acidity level of the Flint River itself.

The situation has become a local tragedy, a national news story, and now a scandal, as a result of the poor condition of the Flint River. The contamination didn't happen overnight. The solution to pollution never was dilution, but that's what many people believed for too long. The current danger to the citizens of Flint resulted from that kind of thinking.

The Sassafras does not have high acidity levels like the Flint, but it no longer meets EPA clean water standards. In many ways, including restoration projects that reduce pollution, your SRA is working hard to clean up the Sassafras and avoid situations where public health is threatened by the waters of the Sassafras River watershed.

SRA IS A MEMBER OF WATERKEEPER® ALLIANCE, WATERKEEPERS CHESAPEAKE, and a number of other organizations in order to network, communicate issues, and share initiatives. We are active in the Cecil County Watershed Implementation Plan (WIP) Advisory Committee and the Kent County WIP Committee. We also participate in the Upper Shore WIP and the Eastern Shore WIP groups.

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Sassafras River Association
P.O. Box 333
Georgetown, MD 21930

SASSAFRAS RIVER ASSOCIATION

SASSAFRAS RIVER
Report Card 2016

Become Involved

YES! I would like to:
__ join SRA
__renew my membership
__act to "Save the Sassafras"

Sassafras River Association is a 501(c)(3) organization

Visit www.sassafrasriver.org for pledges and online payment options. Thank you!

Enclosed please find my tax-deductible contribution payable to Sassafras River Association.
____ $ Other gift

Membership Levels
____ $1000 River Steward
____ $500 Creek Champion
____ $250 Inlet Protector
____ $100 Stream Supporter
____ $50 Family
____ $35 Individual
____ $5 Student

Name: _____
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Cut along the blue line and mail this card to:
Sassafras River Association
P.O. Box 333 Georgetown, MD 21930

Contact the Sassafras River Association:
410.275.1400
riverkeeper@sassafrasriver.org

SASSAFRASRIVER.ORG

- **Science-based**
- **Advocacy**
- **Restoration**
- **Outreach**

Restoring the health of the Sassafras River

YOUR SASSAFRAS RIVER ASSOCIATION HAS BEEN ACTIVE

SINCE OUR BEGINNING, the Sassafras River Association has been busy building a healthy, sustainable organization. Our founders held many citizen meetings, pulling people together who were like-minded about looking into the possible steps that could be taken to deal with the massive algae blooms in the Sassafras. They knew the algae was indicative of an unhealthy river, and they believed something could be done to bring it back to a condition where boaters, swimmers, and fishermen could enjoy the water again. SRA has been active in advocating for clean water by lobbying for new waste water treatment plants (WWTP) in Galena and Betterton, extension of the Galena WWTP to Georgetown, for the restoration of original compliance in a campground, and against a proposed rubble dump in our watershed. We communicate with U.S. Congressmen and Senators in favor of fully funding Chesapeake Bay programs. In addition, SRA educates students and adults about the pollutants in our watershed, and ways to mitigate the pollutants.

We have been conducting science-based water quality sampling and analysis since our beginning, and have identified "hot spots" in the watershed where the highest amounts of pollutants exist. These areas of lower water quality guide our efforts to reduce the amount of sediment, nitrogen, and phosphorus from entering the river during storm events.

In the summer of 2013, SRA broke ground on our first restoration project, the CRAWFORD WETLANDS. (See star #1) Storm water had created a gully through farmland draining 90 acres including a 16-acre poultry operation into Duffy Creek. Seen at the left below, it includes a sediment pond, and 3 treatment wetland cells. The project prevents 12.5 tons of sediment, 2993 pounds of nitrogen, and 863 pounds of phosphorus from entering the river annually. The $359,000 project was funded by Maryland DNR, Chesapeake Bay Trust, and the National Fish & Wildlife Foundation. Below right, is our BUDD'S LANDING RAVINE RESTORATION. (See star #2) Draining 148 acres, a 1,400 linear foot gully had badly eroded the stream bed, causing major pollution in Coppin Creek and the Sassafras river. (Continued on back page)

SCIENCE-BASED WATER QUALITY SAMPLING:

THIS ANNUAL SASSAFRAS RIVER REPORT CARD is primarily a report on the water quality of the tidal and non-tidal segments of our watershed. Water samples are taken and analyzed either with our own scientific equipment or at the University of Delaware. SRA uses protocols and standard operating procedures established by the Mid-Atlantic Tributary Assessment Coalition.

TIDAL: Eight sites on the Sassafras River are sampled by boat for water quality indicators – dissolved oxygen, specific conductivity, temperature, total nitrogen, total phosphorus, salinity, turbidity, pH, and chlorophyll-a. Our RIVERKEEPER™ samples seven sites weekly from April through October, and one site is electronically monitored by the Maryland Department of Natural Resources for the same indictors every 15 minutes throughout the year. The grading includes SAV (submerged aquatic vegetation), which is measured in acres by the Virginia Institute of Marine Science.

NON-TIDAL: The Sassafras River Association is fortunate to have 30 trained - and periodically re-trained - volunteers who work together to conduct water quality monitoring at 16 sites on the non-tidal streams that run into the Sassafras River. Year round, regardless of the weather, they go out on the second weekend of each month in teams to do their work. We proudly call our volunteers the "Sassafras Samplers."

Watershed Health Scale

Very poor — Very good

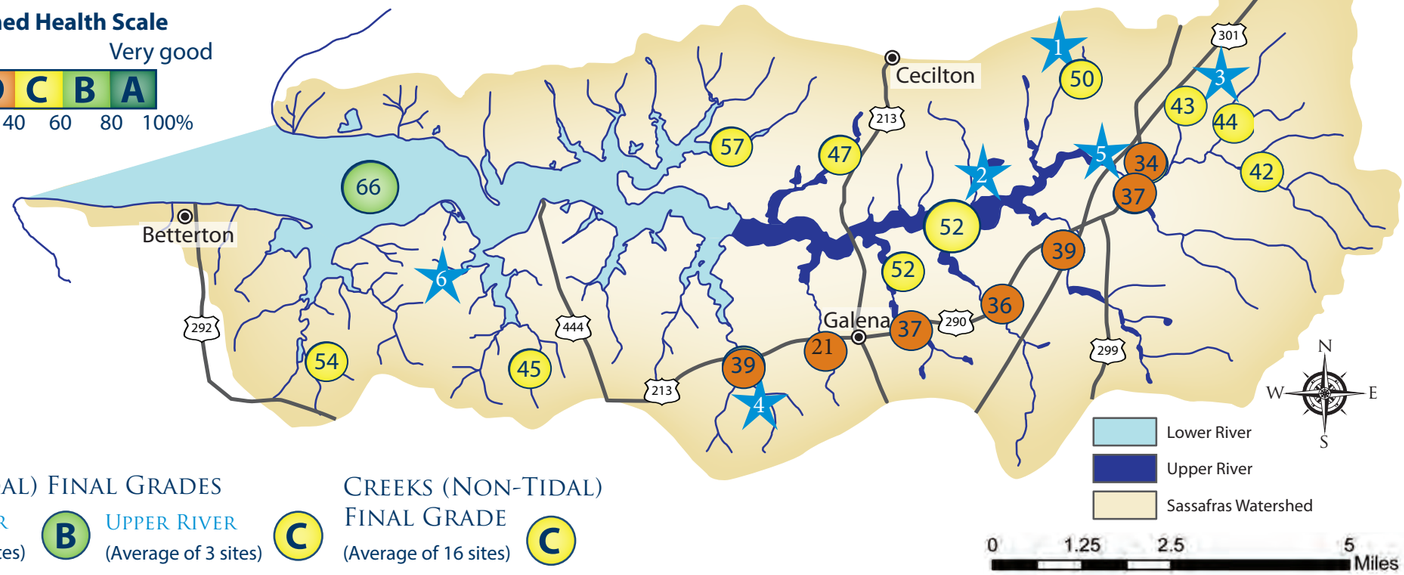
F D C B A

0 20 40 60 80 100%

OUR MISSION:

THE SASSAFRAS RIVER ASSOCIATION is dedicated to promoting and monitoring clean water, a balance among recreation, wildlife and economic activity, and an educated community that acts to protect and restore the health of the watershed.

DATA USED FOR THE 2016 REPORT CARD were collected in 2015 by the Sassafras Samplers, Sassafras RIVERKEEPER®, the Maryland Department of Natural Resources and the Virginia Institute of Marine Science. SRA especially would like to thank the Sassafras Samplers who volunteer their time throughout the year monitoring creeks to help produce this publication.



RIVER (TIDAL) FINAL GRADES

LOWER RIVER (Average of 5 sites) **B**

UPPER RIVER (Average of 3 sites) **C**

CREEKS (NON-TIDAL) FINAL GRADE (Average of 16 sites) **C**

What do grades mean?

- **A** All water quality and biological health indicators meet desired levels (80-100%). Quality of water in the locations tends to be very good, most often leading to very good habitat conditions for fish and shellfish.
- **B** Most water quality and biological health indicators meet desired levels (60-79%). Quality of water in these locations tends to be good, often leading to good habitat conditions for fish and shellfish.
- **C** There is a mix of good and poor levels of water quality and biological health indicators (40-59%). Quality of water in these locations tends to be fair, leading to fair habitat conditions for fish and shellfish.
- **D** Some or few water quality and biological health indicators meet desired levels (20-39%). Quality of water in these locations tends to be poor, often leading to poor habitat conditions for fish and shellfish.
- **F** Very few or no water quality and biological health indicators meet desired levels (0-19%). Quality of water in these locations tends to be very poor, most often leading to very poor habitat conditions for fish and shellfish.

RIVER (TIDAL) HEALTH INDICATORS

		LOWER RIVER	UPPER RIVER
Dissolved Oxygen		A	A
Water Clarity		C	D
Chlorophyll-*a*		B	D
Aquatic Vegetation		F	F
Nutrients	Total Nitrogen	A	C
	Total Phosphorus	A	C

CREEK (NON-TIDAL) HEALTH INDICATORS

Dissolved Oxygen	A
Turbidity	F

Total Nitrogen	D
Total Phosphorus	A
Creek Bed Organisms	F

Appendix
Watershed Eligible for 319(h) Grant Implementation Funding

Upper Choptank River Watershed in Caroline County, Maryland

Contents

Introduction

The *Upper Choptank River Watershed Based Plan* was completed by Caroline County in November 2010 and EPA accepted the plan in December 2010. The part of the watershed encompassed by the watershed plan is in Caroline County, Maryland. Two parts of the Choptank River watershed are not included in the plan: 1) the upstream portion of the watershed in Delaware and a very small area of Queen Anne's County, and 2) the downstream portion of the watershed in the State 8-digit watershed designated 02130404 in Talbot County and further downstream.

Pollutant reduction goals are in watershed plan Table 3 on page 13.

BMP implementation goals are in three parts of the plan:

- Agricultural BMPs in Table 4 on page 15
- Urban BMPs in Table 5 on page 18
- Septic system upgrades or connection to treatment plants in Table 6 on page 20.

Base Year for watershed plan implementation is 2002. Pollutant load reductions that year and thereafter are counted toward meeting watershed plan goals. The baseline year and plan goals are derived from Maryland Tributary Team work for the Choptank River Basin. No TMDL for nutrients and/or sediment applied to the watershed at the time the watershed plan was written.

Milestones

Maryland's 2015-2019 NPS Management Plan Objective 5 includes two milestones for this watershed:

- Annually: Report progress in the 319 Annual Report, and
- 2015: Assess implementation progress and update the plan if needed. Caroline County completed review and determined that an update was not necessary.

Water Quality Monitoring Activity, Overall Condition, Trends

The most recent assessments of water quality conditions and trends are identified in the table. More recent information is not available for SFY16.

Water Quality Monitoring/Trends Annual Report Sources Upper Choptank River				
Report Year	**Appendix Page**	**Report 1**	**Report 2**	**Report 3**
15	2 thru 4	DNR, Choptank & Little Choptank WQ & Habitat Overall Condition 2012-2014		
14	1 thru 5	DNR, Choptank & Little Choptank WQ & Habitat Overall Condition 2011-2013	DNR, Choptank & Little Choptank WQ & Habitat Assessmt, Nov 2012	DNR, 1986 - 2010

Upper Choptank River Watershed
2004-SFY16 Completed NPS Implementation Grant Projects - 319(h) Grant and State Revolving Fund

Project Summary			Project Expenditures					Pollutant Load Reduction		
Area/Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)
				Federal	State					
MDA / Caroline Soil Conservation District (SCD)	Upper Choptank Cover Crop Demo	2004	319 FFY03 #12	$48,161.00		$32,107.33	$80,268.33	0	0	461.8
	Upper Choptank Cover Crop Demo	2005	319 FFY03 #21	$114,000.00		$76,000.00	$190,000.00	23,097	642	0
	Agricultural Technical Assistance	2005	319 FFY04 #13	$49,949.00		$33,299.33	$83,248.33	0	0	393.1
	Upper Choptank Cover Crop Demo	2006	319 FFY04 #20	$150,000.00		$100,000.00	$250,000.00	19,465	458	0
	Agricultural Technical Assistance	2007	319 FFY04 #32	$55,990.64		$37,327.09	$93,317.73	20,646.14	1,979.37	99.89
	Agricultural Technical Assistance	2006	319 FFY05 #9	$39,167.70		$26,111.80	$65,279.50	9,139.8	1,461.3	23.84
	Upper Choptank Cover Crop Demo	2007	319 FFY05 #18	$121,600.00		$81,066.67	$202,666.67	33,192	0	0
Caroline SCD	Agricultural Technical Assistance	2010	319 FFY07 #21	$56,256.00		$37,504.00	$93,760.00	33,169.01	5,832.24	107.97
	Agricultural Technical Assistance	2009	319 FFY08 #2	$48,314.98		$32,209.99	$80,524.97	82,140.24	2,707.31	41.2
Caroline Co.	DPW Stormwater Retrofits	2012	319 FFY10 #7	$46,213.30		$30,808.87	$77,022.17	11.39	7.89	0.91
	U. Choptank Watershed Restoration	2014	319 FFY12 #6	$130,781.17		$87,187.45	$217,968.62	8.01	0.85	0
	U. Choptank Watershed Restoration	2014	319 FFY13 #6	$138,378.63		$92,252.42	$230,631.05	16.06	2.69	0.23
	Volunteer Fire Comp. SWM upgrades	SFY16	319 FFY12 #14	$37,834.00		$25,222.67	$63,056.67	4.29	0.75	0.12
	Dept. Emergency Services Porous Parking	SFY16	319 FFY14 #6	$137,449.01		$91,632.67	$229,081.68	2.37	0.17	0.01
TOTAL for completed projects				$1,174,095.43	$0.00	$782,730.29	$1,956,825.72	220,891.3	13,092.6	1,129.07
TOTAL Pollutant Load Reduction for Multi-Year Projects excluding cover crop projects (grey shaded)								145,137.3	11,988.1	666.91

SFY16 NPS Implementation Projects in Progress - 319(h) Grant and State Revolving Fund - Upper Choptank River Watershed

Project Summary			Project Funding					Future Pollutant Load Reduction		
Lead	Name/Description	End Date	Grant Funding Source	Grant Funds		Non Federal Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)
				Federal	State					
	No 319 or SRF projects were working during SFY16									

Upper Choptank River Watershed
Chesapeake and Atlantic Coastal Bays Trust Fund
SFY 2016 NPS Implementation Project Status (1)

Year Funded	PartnerCD	ProjectTitle	ProjectType	County	TrustFund Dollars	Status	BMP Units	BMPs Reported	Annual LbsN	Annual LbsP	Annual TonsTSS
FY14	Caroline County	Ober Community Park (Greensboro)	Tree Planting Projects	Caroline	3,771.09	Complete	acres	1.25	5.9	0.3	0.04
FY14	Caroline County	Ganey's Wharf Public Landing (west of Harmony)	Tree Planting Projects	Caroline	2,285.76	Complete	acres	0.5	2.9	0.2	0.03
FY14	Caroline County	Marydel Community Park (Marydel)	Tree Planting Projects	Caroline	14,072.00	Complete	acres	9.38	148.2	6.4	1.29
FY14	Caroline County	Town of Denton (Sharp Road)	Tree Planting Projects	Caroline	10,592.00	Complete	acres	1.5	8.6	0.6	0.09
FY14	Caroline County	Caroline County Dept. of Emergency Services Facility	Tree Planting Projects	Caroline	11,946.00	Complete	acres	3	17.2	1.2	0.189
FY14	Town of Greensboro	Greensboro Stream Restoration Project	Stream Restoration	Caroline	99,696.00	Complete			0.0	0.0	0
FY15	Delmarva RC & D Council	Street #1	Wetland Restoration	Caroline	2,201.40	Complete			15.6	1.4	417
FY15	Delmarva RC & D Council	Street #2	Wetland Restoration	Caroline	2,931.10	Complete			33.3	2.9	194
FY15	Delmarva RC & D Council	Street #3	Wetland Restoration	Caroline	1,842.80	Complete			15.6	1.4	194
FY15	Midshore Riverkeeper Conserva	Voorhees	Agricultural Practices	Caroline	17,638.00	Complete			1,609.0	0.0	0
	(1) Maryland DNR provided this data 2/21/17 and indicated it is the full extent available.			TOTALS	166,976.15				1,856.2	14.3	806.64

	No project now working										
	(1) Maryland DNR provided this data 2/21/17 and indicated it is the full extent available.			TOTALS	0				0	0	0

SFY2016 Agricultural BMP Implementation **Upper Choptank River Watershed** **In Caroline County, Maryland**			Estimated Pollutant Load Reduction			**Upper Choptank River Watershed Plan** Agricultural BMP Implementation Goals				**Prior Years' Progress Toward Watershed Plan Goals**				
										2003-2013 2013 Annual Report	Extracted from State Data reported by MDE to EPA Bay Program			
Agricultural Best Management Practice	**Unit**	SFY2016 Total	Total Nitrogen (lbs)	Total Phosphorus (lbs)	Total Sediment (tons)	Management Practice Watershed Plan Table 4	Goal	Units	Progress 2003 thru SFY2016		SFY14	SFY15		**Units**
Annual Practices														
Cover Crops	acres	39,223	138150.2	794.6	66.27	Cover Crops	50,000	acres/yr	39,223					
						Commodity Cover Crops	15,000	acres/yr						
Multi-Year Practices														
Alternative Crops	acres	0							0		0	0		acres
Amendments for Treatment of Ag Waste	AU	820							1,000		180	0		AU
Animal Mortality Facility	count	4	15.90	2.30					4		0	0		count
Conservation Cover	acres	39.9							40		0	0		acres
Conservation Plans/SCWQP	acres	11,317	6676.2	873.5	67.86	Soil Conservation WQ Plans	66,000	acres	33,210	4,699.9	8,401	8,792		acres
Critical Area Planting	acres	0.3							5		0.3	3.95		acres
Dead Bird Composting Facility	count	0							7		5	2		count
Fencing	feet	0				Stream protection with fencing	130	acres	0	0 acres	0	0		feet
Field Border	acres	0							2.1		0.5	1.61		acres
Filter Strip	acres	0							0		0	0		acres
Grassed Waterway	acres	0							1.2		1.2	0		acres
Horse Pasture Management	acres	19.1		1.0	0.01				19		0	0		acres
Loafing Lot Management System	acres	0.1	69.4	11.8	0.00				3.3		1.6	1.56		acres
Pasture & Hay Planting	acres	0							0		0	0		acres
Prescribed Grazing	acres	33.2		2.1	0.02				33		0	0		acres
P-sorbing Materials	acres	0							0		0	0		acres
Riparian Forest Buffer	acres	0				Buffers Forested - Agriculture	1,000	acres	0	0	0	0		acres
Riparian Herbaceous Cover	acres	2.33	37.7	2.0	0.12	Buffers Grassed - Agriculture	5,500	acres	89.7	64.2	14.1	9.06		acres
Roof Runoff Structure	count	1	699.3	118.3	0.01	Runoff Control	8	count	4	2	1	0		count
Stream Restoration Ag	feet	50							1,045		0	995		feet
Tree/Shrub Establishment	acres	95.7			0.03	Tree Planting - Agriculture	100	acres	96	0	0	0		acres
Waste Storage Facility	count	4				Animal Waste Mgmt - Livestock	2	count	27	1	4	3		count
						Animal Waste Mgmt - Poultry	4			15				
Wastewater Treatment Strip	acres	0									0	0		acres
Water Control Structure	count	1	48.6			Drainage Control Structures	65	count	7	no report	1	5		count
Watering Facility	count	0									0	0		count
Wetland Creation	acres	0				Wetland - Agriculture	1,200	acres	209.8	12.1	1.5	0		acres
Wetland Restoration	acres	194.3	645.7	99.0	1.25						0	1.9		acres
Windbreak/Shelterbelt Establishment	feet	0							2,206		0	2,206		feet
						Conservation Tillage	20,000	acres/yr	0					
						Nutrient Management	48,000	acres	0					
						Precision Agriculture	25,000	acres	0					
						Retirement of Highly Erodible Land	500	acres						
						Stream protection with no fencing	32	acres						
Total Annual Practices (2)			138,150.2	794.6	66.3									
Total Multi-year Practices			8,192.8	1,110.0	69.3									
Total Pollutant Load Reduction			146,343.0	1,904.6	135.6									

(1) "SFY16 Total" column is Maryland Dept. of Agriculture 12/??/16 data.

(2) Annual Practices: cover crops, nutrient mgmt, manure transport, conservation tillage & high residue tillage.

SFY2016 Urban BMP Implementation
Upper Choptank River Watershed
In Caroline County, Maryland

Management Practice	Unit	BMPs Reported	Estimated Pollutant Load Reduction		
			Nitrogen lb/yr	Phosphorus lb/yr	Sediment tons/yr
Bioretention (1)	acres	0			
Cisterns and Rain Barrels (1)	acres	0			
Bioswale (1)	acres	0			
Disconnection of Rooftop Runoff (1)	acres	0			
Dry Detention Ponds & Hydro Structures (1)	acres	0			
Dry Extended Detention Ponds (1)	acres	0			
Dry Well (1)	acres	0			
Filtering Practices (1)	acres	0			
Forest Conservation	acres	0			
Forest Harvesting Practices	acres	0			
Infiltration Practices (1)	acres	0			
Permeable Pavement (1)	acres	0			
Rain Garden (1)	acres	0			
Reduction of Impervious Surface (1)	acres	0			
Riparian Forest Buffers on Urban Lands (2)	acres	0			
Septics Connections to Sewers	count	0			
Septic Denitrification critical area	count	12	117.60		
Septic Denitrification outside of 1000 feet	count	21	71.40		
Septic Denitrification within 1000 feet	count	4	22.00		
Septic Tank Pumpout	count	0			
Stream Restoration Urban	feet	0			
Street Sweeping (1)	acres	0			
Tree Planting	acres	0			
Urban Forest Buffer (2)	acres	0			
Wet Extended Detention (1)	acres	0			
Wet Ponds & Wetlands (1)	acres	0			
Urban BMPs TOTAL			211.00	0.00	0

(3) "BMPs Reported" column is draft data 12/5/2016.

Upper Choptank River Watershed Plan
Urban BMP Implementation Goals

	Management Practice	Goal	Units	Progress SFY14 thru SFY16
			acres	0
			acres	0
			acres	0
			acres	0
			acres	0
			acres	0
			acres	0
			acres	0
			acres	0
			acres	0
			acres	0
			acres	0.5
			acres	0
			acres	0
			acres	0
Table 6	Septic Connections to WWTP	750	count	0
Table 6	Enhanced Septic Denitrification	5,051	count	107
			count	0
			feet	0
			acres	0
			acres	0
			acres	0
			acres	0
			acres	0
Table 5	Buffers Forested, Urban (2)	60	acres	0
Table 5	Erosion and Sediment Control	895	acres/yr	
Table 5	Nutrient Management, Urban	12,000	acres	0
Table 5	Stormwater Management (1)	8,400	acres	7.4

Prior Years' Progress Toward Watershed Plan Goals

Local Data 2003-2013 in 2013 Annual Report	Extracted from State Data reported by MDE to EPA Bay Program			
	SFY14	SFY15		Units
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0.5		acres
	0	0		acres
	0	0		acres
	0	0		acres
no report	0	0		count
no report	15	7		count
no report	8	14		count
no report	21	5		count
	0	0		count
	0	0		feet
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
	0	0		acres
0				
0				
6.9				

(1) Watershed plan goal "stormwater management" aggregates reporting for BMPs footnoted (1).

(2) Watershed plan goal "buffers forested, urban" aggregates reporting for BMPs footnoted (2).