# SFY 2019

# Maryland's 319 Nonpoint Source Program Annual Report

*Summer evening on Glebe Bay | Image courtesy of Michael Miles*

Maryland
Department of
the Environment

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# Acknowledgements

This report was written, published, and distributed by Maryland Department of the Environment's Integrated Water Planning Program.

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# Program Highlights | Maryland's Statewide NPS Management Program

## Overview: Maryland's Clean Water Act Section 319 Nonpoint Source Management

Maryland's Nonpoint Source Management Program is required by the Federal Clean Water Act, Section 319, to protect the State's waterways from nonpoint source (NPS) pollution. Maryland has aligned this program with its commitments and responsibilities in the Chesapeake Bay Agreement[1], the Chesapeake Bay Total Maximum Daily Load (TMDL)[2], and Maryland's Phase III Chesapeake Bay Watershed Implementation Plan (WIP)[3].

### *Project Selection*

To receive 319(h) Grant funding, applicants must be within a 319 Priority Watershed (Figure 1) that has an A-I Watershed Plan approved by the U.S. Environmental Protection Agency (EPA). A-I plans are submitted to EPA by any combination of Maryland State Agencies, local governments, and non-government organizations.

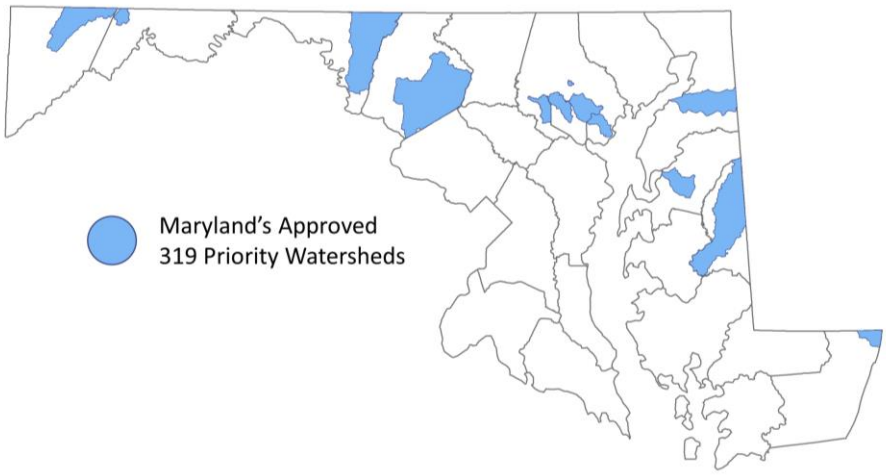



***Figure 1**: Maryland's 319 Priority Watersheds*

### *Program Administration*

Maryland's 319 NPS Management Program, including the 319(h) Grant Program, is administered by Maryland Department of the Environment (MDE) with the assistance of other state agencies, including

[1] Chesapeake Bay Agreement: https://www.chesapeakebay.net/what/what_guides_us/watershed_agreement
[2] Chesapeake Bay TMDL: https://www.epa.gov/chesapeake-bay-tmdl/chesapeake-bay-tmdl-document
[3] MD P3 WIP: https://mde.maryland.gov/programs/Water/TMDL/TMDLImplementation/Pages/Phase3WIP.aspx

Maryland Departments of Agriculture and Natural Resources. Implementation is carried out by Maryland's local governments. MDE coordinates with these valued local partners to provide grant funding for in-ground projects and report annual progress to EPA.

### *Annual Reporting for Maryland's 319 Program*

EPA requires MDE to produce annual reports demonstrating progress of Maryland's 319 NPS Management Program that show how the State meets 319(h) Grant conditions while maintaining consistency with EPAs three essential elements:

1. EPA Strategic Plan Goal 2: *Protecting America's Waterways*
2. EPA Strategic Plan Objective 2.2: *Protect and Restore Watersheds and Aquatic Ecosystems*
3. Work plan commitments and time frame

### *Nonpoint Source Pollution Threatens Maryland's Waterways*

Water is inextricably tied to Maryland's national identity and culture. The State is traversed by innumerable rivers and streams that provide residents with drinking water, places for recreation, and critically important habitat for Maryland's abundant wildlife. Chesapeake Bay, Maryland's national treasure, supports a vibrant fishing industry that is valued at nearly $600 million per year and provides over one third of the annual United States blue crab harvest.

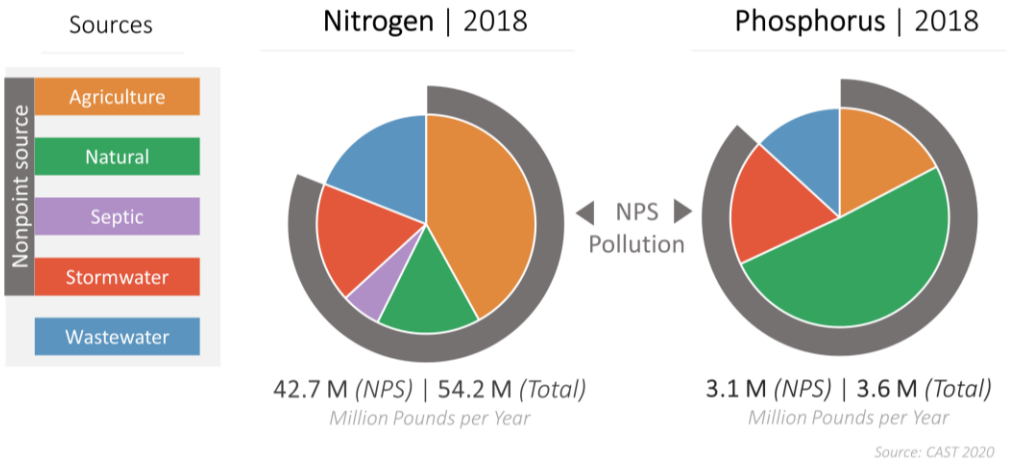



***Figure 2:*** *Maryland's nitrogen and phosphorus loads delivered to Chesapeake Bay in 2018*

NPS pollution threatens the health of Maryland's waterways and comes from both agricultural and urban sources (Figure 2). Natural loads include anthropogenic impacts on the natural sector as well as true natural sources of nitrogen and phosphorus, such as forests, wetlands, and stream bed and bank.

While the primary NPS pollution harming Maryland's waters are nitrogen, phosphorus, and sediment, some watersheds are also impaired by other NPS pollution, such as acid mine drainage and toxic contaminates.

NPS pollution is costly to manage because it originates from diffuse sources across wide areas. The high cost and difficulty of managing this pollution is challenging for less affluent local governments that must balance local budgetary needs with protecting and restoring aquatic resources.

Reducing NPS pollution is accomplished through implementing best management practices (BMPs). This generic name for pollution reduction practices covers a collection of actions, policies, and physical structures that are used to reduce pollution entering waterways[4]. Funding for BMPs comes from State, Federal, and NGO funding sources, including the 319(h) Grant.

## Overall Progress: Maryland's 319 NPS Management Program | SFY 2019

### *Funding: Federal and State Contributions*

Maryland has received about $38.5 million dollars through the 319(h) Grant over the past 16 years [5] with about $6.9 million of those dollars funding in the ground projects (Figure 3). While the 319(h) Grant is a small part of Maryland's total spending on NPS pollution (Figure 3), it helps local governments with few resources leverage limited funds. Helping local governments maximize their potential resources is a core component of Maryland's Phase III WIP, which is designed to be locally driven and achievable. For detailed funding information, see Appendix A.

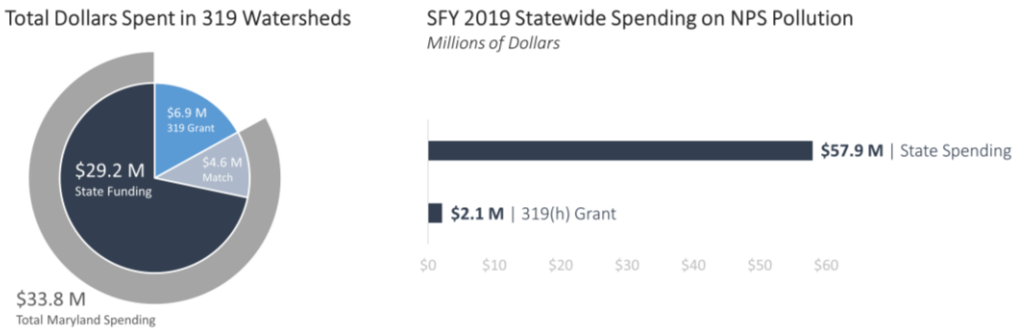



***Figure 3:*** *319(h) Grant spending vs Maryland State spending on NPS pollution*

### *Overall Load Reductions for Nitrogen, Phosphorus, and Sediment*

The State's 319 Priority Watersheds continue to make steady progress in reducing nitrogen, phosphorus, and sediment (Table 1) (*page 4*). All NPS pollution is tracked in greater detail in Appendix B. When evaluating overall progress for 319 Priority Watersheds, some watersheds are farther along towards their goals while others have just started. For detailed information on individual watershed progress, please see the *Priority Watersheds* section of this report (*page 8*).

[4] Examples of BMPs – Maryland's Chesapeake Cleanup Center: https://mde.maryland.gov/programs/Water/TMDL/TMDLImplementation/Pages/pollution-in-the-chesapeake.aspx

[5] Maryland's first A-I Plan (*Corsica River)* was approved in 2004.

***Table 1:*** *Overall NPS pollution reductions in 319 Priority Watersheds (Million Pounds/Year)*

| | Target Reduction | Current Reduction | Percent Progress |
|---|---|---|---|
| Nitrogen | 1.39 M | 0.23 M | 17% |
| Phosphorus | 0.89 M | 0.02 M | 27% |
| Sediment | 206 M | 14.2 M | 7% |

Source: CAST 2020

State-wide, Maryland's combined NPS nitrogen, phosphorus, and sediment loads reaching local waterways has decreased by 1.7 million pounds per year (N), 0.3 million pounds per year (P), and 0.1 billion pounds per year (S) since 2010 (Figure 4). Maryland tracks nutrient and sediment reductions since 2010 to align with the start of the Chesapeake Bay Cleanup Plan. These decreases in nitrogen, phosphorus, and sediment loads can be attributed to land use changes and the implementation of BMPs, including BMPs funded by the 319(h) Grant.

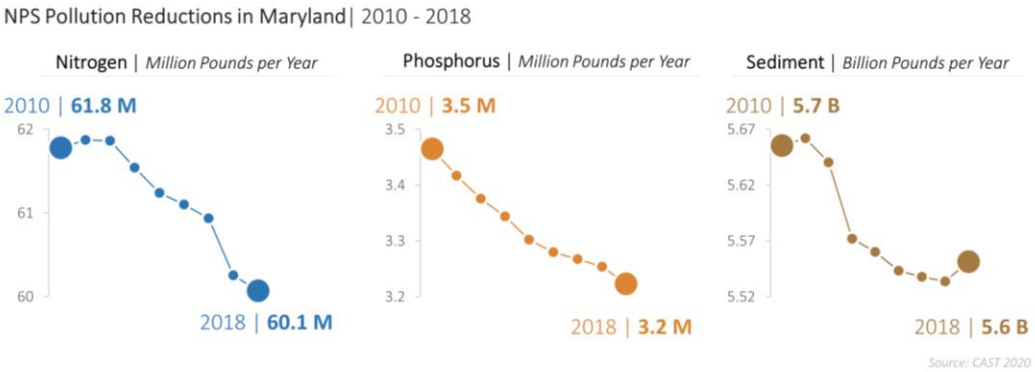



***Figure 4:*** *Maryland's statewide nitrogen, phosphorus, and sediment NPS reductions*

## Summary

Maryland's 319 NPS Management Program is a core component of the State's watershed restoration and protection strategy. This program is designed to align with Maryland's Phase III WIP, the Chesapeake Bay TMDL, and Chesapeake Watershed Agreement. Future iterations of Maryland's NPS Management Plan and subsequent annual reports will align more closely with Phase III WIP goals to better reflect Maryland's state-wide watershed restoration strategies.

The 319(h) Grant is a small but important portion of Maryland's spending on NPS pollution programs and BMPs. These grant funds are critical in supporting local governments with few resources by giving them the financial leverage to protect local aquatic resources while also fulfilling the needs of residents.

Reductions in nutrient and sediment NPS pollution are a priority for Maryland, as detailed in the State's NPS Management Plan and Phase III WIP. Maryland has made significant strides in reducing NPS pollution from agricultural and urban sources. Under Maryland's Phase III WIP and 319 NPS Management Plan, the State will continue reducing NPS pollution to meet its 2025 Chesapeake Bay TMDL targets, protect and restore local waters, and sustain these precious aquatic resources for future generations to treasure.

# Progress | Maryland's 319 NPS Management Program

## *How Maryland Tracks Progress for its NPS Management Program*

Maryland tracks its NPS Management Plan progress based on the funding allocated to NPS pollution programs, BMP implementation, and NPS pollution reductions. As of this report, Maryland tracks BMP implementation by comparing current implementation levels to Maryland's Phase III WIP goals (Table 2). This realignment of Maryland's 319 NPS Management Program represents an effort to streamline reporting and reflect the State's current NPS pollution management strategy in the Phase III WIP.

***Table 2**: Percent progress towards Maryland's Phase III WIP Goals*

| Sector | Phase III WIP BMP | Percent Progress *Towards Annual Load Reduction* | |
|---|---|---|---|
| | | Nitrogen | Phosphorus |
| Agriculture | Conservation Technical Assistance **1 million acres** | **100%** | **100%** |
| | Nutrient Management Compliance | **100%** | **100%** |
| | Cover Crops **470,000 acres / year** | **97%** | **100%** |
| | Future Agricultural Practices | **8%** | **12%** |
| Natural | Wetland Restoration **175 acres** | **100%** | **100%** |
| | Shoreline Management **0.6 miles** | **100%** | **100%** |
| | Oyster Aquaculture **350,000 bushels** | **0%** | **0%** |
| | Oyster Reef Restoration **876 acres** | **0%** | **0%** |
| Septic | Best Available Technology Upgrades **6,440 systems** | **10%** | - |
| | Connections to Wastewater Plants **1,600 connections** | **2%** | - |
| | Septic Pumping ***Not available until 2021*** | **0%** | - |
| Stormwater | Current Phase I MS4 Restoration **20,000 impervious acres** | **0%** | **1%** |
| | New Phase I MS4 Restoration **17,500 impervious acres** | **0%** | **0%** |
| | Current Phase II MS4 Restoration **3,000 impervious acres** | **5%** | **10%** |
| | Non-MS4 Restoration **400 impervious acres** | **91%** | **100%** |

### *BMP Implementation*

The State tracks progress towards its Phase III WIP BMP implementation goals for NPS pollution using Chesapeake Assessment Scenario Tool (CAST), the online version of the Bay model. Using CAST, MDE measures new BMP implementation and evaluates the associated nitrogen and phosphorus load reductions.

Phase III WIP BMP goals represent how many pounds of nitrogen and phosphorus per year a given BMP will reduce. These reductions only account for BMP performance and do not account for other changes in loads, such as increased nutrients due to development. Maryland measures progress towards these goals by evaluating how many new BMPs have been implemented in CAST since 2017. Load reductions for these BMPs are estimated in CAST and compared to the Phase III WIP goals. A summary of Maryland's progress towards different BMP groups is provided in Table 2 (*page 5*). For a more detailed report that includes current reductions and goals in pounds per year, see Appendix C.

The Maryland Coastal Bays Program is currently working on developing a BMP tracking system. It is anticipated that this system will align with the watershed model developed for the Assawoman Bay Watershed Plan, and progress load reductions from new BMPs will be accounted for, similar to the way CAST tracks progress towards load reduction goals in the Chesapeake Bay watershed. In the Casselman River, restoration efforts to remediate low pH impairment listings are reported by MDE's Abandoned Mines Program in an annual report.

### *Other Progress Metrics*

Other progress metrics, including tracking 319(h) Grant expenditures, is another way in which Maryland tracks NPS pollution reduction progress. You can find detailed information for individual watersheds in the *Priority Watersheds* section of this report (*page 9*). For more detailed information on statewide 319(h) Grant spending, please see Appendix A. For detailed information on individual 319(h) Grant funded projects in Priority Watersheds, see Appendix D.

### *319 Success Story*

Each year, Maryland is required to demonstrate a successful watershed restoration project. This year's success story will be posted, once available, on MDE's 319 website[6].

## Additional Funding | Maryland's 319 NPS Management Program

In addition to 319(h) Grant funds, Maryland supplies significant State resources to finance programs and projects designed to reduce NPS pollution. In particular, Maryland's Chesapeake and Atlantic Coastal Bays Trust Fund (Trust Fund) is one of the State's primary funding sources for reducing NPS pollution.

[6] MDE's 319 Website: https://mde.maryland.gov/programs/water/319nonpointsource/pages/index.aspx

Maryland's Trust fund provides grant money to local governments and Non-profit Organizations for implementing NPS pollution water quality restoration projects.

Maryland's Trust Fund targets the most efficient and cost-effective nonpoint source projects. To date, the Trust Fund has provided more than $664 million for 2,600 projects that have resulted in nitrogen, phosphorus, and sediment reductions of 2.4 million pounds per year (N), 260,000 pounds per year (P), and 398 million pounds per year (S). For further information, see the Chesapeake and Atlantic Costal Bays Trust Fund website[7].

## National Water Quality Initiative | Maryland's 319 NPS Management Program

The National Water Quality Initiative (NWQI) is run by the U.S. Department of Agriculture - National Resources Conservation Services (USDA - NRCS). The NWQI helps farmers and forest landowners voluntarily improve water quality and aquatic habitat by focusing on watersheds with impaired streams. Maryland currently has two watersheds that are primarily agricultural with NWQI status: Catoctin Creek in Frederick County, and Prettyboy Reservoir in Baltimore and Carroll Counties. Surface waters in Catoctin Creek are impaired by sediments, nutrients, impacts to biological communities, and fecal coliform. Prettyboy Reservoir is impaired by mercury and phosphorus, while the streams draining to Prettyboy reservoir are impaired by fecal coliform and temperature.

Maryland was among the first States in 2012 to create a cooperative monitoring agreement to support the NWQI effort. MDE collaborated with NRCS to conduct in-stream monitoring in the Catoctin Creek watershed from 2013 through 2018. The State performed synoptic monitoring from 2013 through 2015 to determine which watersheds had the highest nutrient loadings. From 2016 through 2018, the State conducted bi-weekly ambient surface water monitoring at 25 stations throughout the watershed in order to assess the effectiveness of agricultural BMP implementation. Station locations were identified based on the results of the prior synoptic monitoring and where agricultural BMPs were implemented.

During SFY 2019, the bi-weekly sampling continued at the 25 stations throughout the watershed. Sampling concluded in December 2018. Results from the study can be found in Catoctin Creek Water Quality Monitoring Report, NWQI (MDE 2019). Study results indicate that nutrient loadings may have decreased at some stations downstream of implemented BMPs. However, based on a power analyses conducted to determine the minimum number of required samples to detect a change, two more years of data are needed to reach a statistically significant conclusion.

MDE and NRCS are currently discussing the possibility of establishing a new agreement to perform monitoring in the Prettyboy Reservoir watershed to further assess the effectiveness of agricultural BMP implementation. The agencies are also discussing the potential for submitting a third watershed to NRCS main offices to obtain NWQI status.

[7] Trust Fund Website: https://dnr.maryland.gov/ccs/Pages/funding/trust-fund.aspx

# Maryland's Priority Watersheds | 319 Priority Watersheds

## *Current Status of Maryland's 319 Priority Watersheds*

Maryland tracks progress for 319(h) Grant implementation funding and NPS pollution reductions in its 319 Priority Watersheds (Table 3). As of SFY 2019, ten watersheds had approved A-I Watershed Plans and were eligible for 319(h) Grant funding. An additional four watersheds are developing A-I plans to be eligible for future funding through the 319(h) Grant Program.

For detailed funding information, see Appendix A. MDE tracks nitrogen, phosphorus, and sediment reductions for all watersheds regardless of the watershed plan specifications; for all NPS pollution tracking and detailed nitrogen, phosphorus, and sediment loads tracking, see Appendix B. For detailed watershed 319(h) Grant funded project load reductions, see Appendix D.

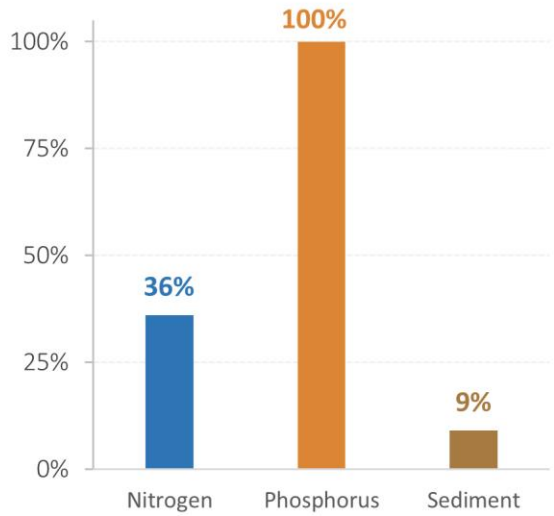
***Table 3:*** *Summary of Maryland's 319 Priority Watersheds*

| Priority Watershed | Plan Date \| Status | **Funding** *(Total)* State \| 319 \| Total | **Reductions** *(lbs/yr)* TN \| TP \| TSS |
|---|---|---|---|
| **Antietam Creek** | 2012 \| Implementing | $1.5 M \| $1.7 M \| **$3.2 M** | 53.2 K \| 5.2 K \| 6.0 M |
| **Assawoman Bay** | 2020\| Implementing | - | - |
| **Back River** - *Tidal* | 2010\| Implementing | $9.1 M \| $1.4 M \| **$10.6M** | -0.5 K \| 0.6 K \| -1.4 M |
| - *Upper* | 2008 \| Implementing | | 1.6 K \| 1.2 K \| 0.0 M |
| **Cambridge Creek** | Drafting | - | - |
| **Casselman River** | 2011 \| Implementing | $0.0 M \| $0.1 M \| **$0.1 M** | 7.0 K \| 0.2 K \| 0.2 M |
| **Choptank River** - *Upper* | 2010 \| Implementing | $0.5 M \| $0.5 M \| **$1.0 M** | 28.4 K \| 2.7 K \| 4.1 M |
| **Corsica River** | 2004 \| Implementing | $1.9 M \| $1.9 M \| **$3.8 M** | 38.1 K \| 4.0 K \| 0.1 M |
| **Coastal Bays** | Drafting | - | - |
| **Gwynns Falls** - *Middle* | 2014 \| Implementing | $2.6 M \| $0.5 M \| **$3.1 M** | 0.6 K \| 0.0 K \| -0.4 M |
| - *Upper* | EPA Review | | - |
| **Hunting Creek** | Drafting | - | - |
| **Jennings Run** - *Upper* | 2019 \| Implementing | - | - |
| **Jones Falls** - *Lower* | 2008 \| Implementing | $7.3 M \| $0.0 M \| **$7.3 M** | 3.4 K \| 1.1 K \| 0.5 M |
| **Monocacy River** - *Lower* | 2008 \| Implementing | $1.7 M \| $0.8 M \| **$2.5 M** | 69.1 K \| 7.7 K \| 3.0 M |
| **Sassafras River** | 2009 \| Implementing | $4.6 M \| $0.1 M \| **$4.6 M** | 33.2 K \| 1.5 K \| 2.1 M |
| **Williston Lake** | Drafting | - | - |
| **Watershed Totals** | | **$29.2 M \| $6.9 M \|$36.1 M** | **234 K \| 24.2 K \| 14.2 M** |

## Antietam Creek – Plan Approved 2012 | 319 Priority Watersheds

### Percent Progress Towards Target*

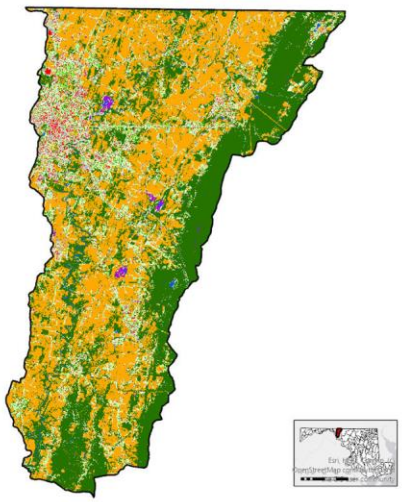
*Nitrogen, Phosphorus, Sediment*




*Watershed plan includes bacteria – See Appendix B

### Watershed Map

*Antietam Creek*



### 2018 Land Use

Total Acres | **119K**

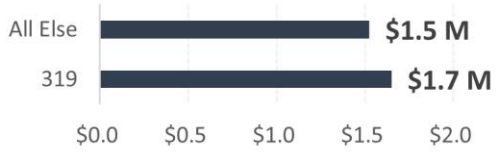
Agriculture | **40%**

Developed | **22%**

Natural | **38%**

### Watershed Funding | SFY12 – SFY19

*Millions of Dollars*




**NPS Reduction Progress**

From 2012 to 2018, Antietam Creek is 36% towards its 148K lbs/yr nitrogen reduction goal, 100% towards its 5K lbs/yr phosphorous reduction goal, and 9% towards its 70.2 M lbs/yr sediment reduction goal.

**Funding**

Antietam Creek has received a total of $3.2 million from state and federal sources from SFY 2012 to SFY 2019. About $1.5 million came from state sources while $1.7 million came from the 319(h) grant.

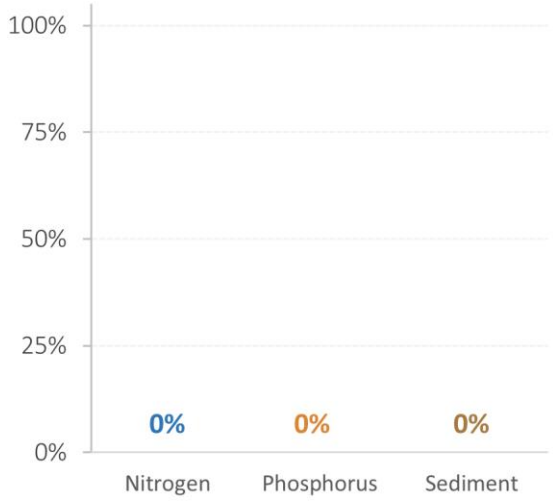
### Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

| Funding Source | Funds | Nitrogen \| lbs/yr | Phosphorus \| lbs/yr | Sediment \| lbs/yr |
|---|---|---|---|---|
| All Else | $1.5 M | 52.4 K | 4.9 K | 3.7 M |
| 319(h) Grant | $1.7 M | 0.8 K | 0.3 K | 2.3 M |
| **Total** | **$3.2 M** | **53.2 K** | **5.2 K** | **6.0 M** |

## Assawoman Bay – Plan Approved 2020 | 319 Priority Watersheds

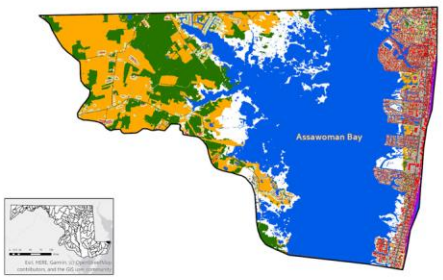
### Percent Progress Towards Target

*Nitrogen, Phosphorus, Sediment*




### Watershed Map

*Assawoman Bay*




**NPS Reduction Progress**

There is no progress completed for Assawoman Bay as the watershed plan was approved in 2020.

### 2018 Land Use

Total Acres | **6K**

Agriculture | **22%**

Developed | **34%**

Natural | **45%**

**Funding**

Assawoman Bay has not been funded as of SFY 2019.

### Watershed Funding | SFY19

*Millions of Dollars*

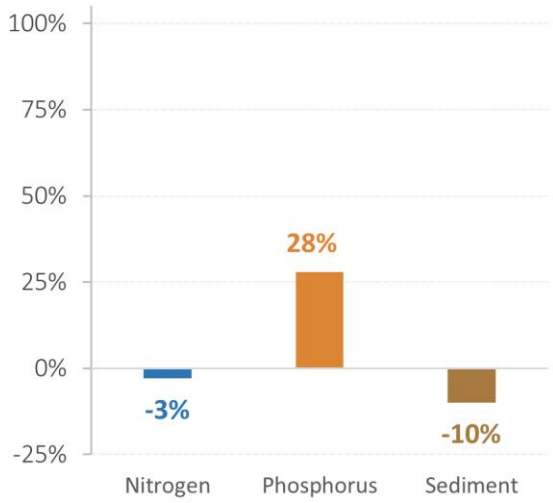

### Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

| Funding Source | Funds | Nitrogen \| lbs/yr | Phosphorus \| lbs/yr | Sediment \| lbs/yr |
|---|---|---|---|---|
| All Else | $0 | - | - | - |
| 319(h) Grant | $0 | - | - | - |
| **Total** | **$0** | **-** | **-** | **-** |

## Back River: Tidal – Plan Approved 2010 | 319 Priority Watersheds

### Percent Progress Towards Target

*Nitrogen, Phosphorus, Sediment*




### Watershed Map

*Back River: Tidal*

**NPS Reduction Progress**

From 2010 to 2018, Back River: Tidal is -3% towards its 15K lbs/yr nitrogen reduction goal, 28% towards its 2K lbs/yr phosphorous reduction goal, and -10% towards its 13.3 M lbs/yr sediment reduction goal.

### 2018 Land Use

Total Acres | **20K**

Agriculture | **0%**

Developed | **85%**

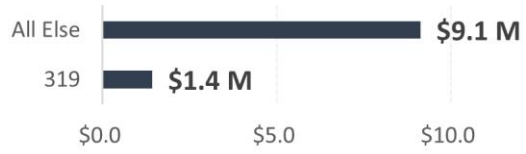
Natural | **15%**

**Funding**

The entire Back River watershed has received a total of $10.6 million from state and federal sources from SFY 2008 to SFY 2019. About $9.1 million came from state sources while $1.4 million came from the 319(h) grant.

### Watershed Funding | SFY08 - SFY19

*Millions of Dollars – Total Back River Funding*



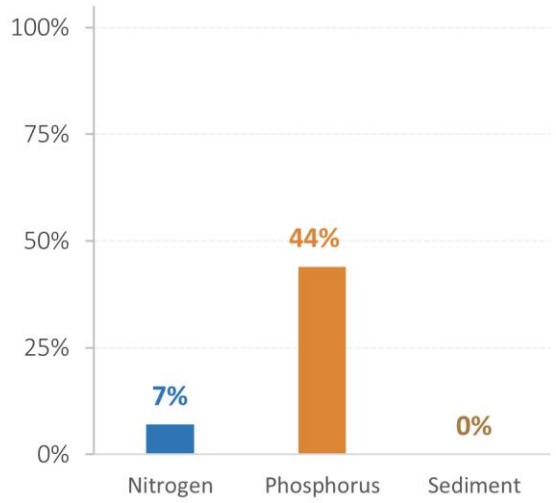

### Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

| Funding Source | Funds | Nitrogen \| lbs/yr | Phosphorus \| lbs/yr | Sediment \| lbs/yr |
|---|---|---|---|---|
| All Else | $ 9.1 M | -0.8 K | 0.5 K | -1.8 M |
| 319(h) Grant | $ 1.4 M | 0.3 K | 0.1 K | 0.4 M |
| **Total** | **$10.6 M** | **-0.5 K** | **0.6 K** | **-1.4 M** |

## Back River: Upper – Plan Approved 2008 | 319 Priority Watersheds

### Percent Progress Towards Target

*Nitrogen, Phosphorus, Sediment*




### Watershed Map

*Back River: Upper*

**NPS Reduction Progress**

From 2008 to 2018, Back River: Upper is 7% towards its 24K lbs/yr nitrogen reduction goal, 44% towards its 3K lbs/yr phosphorous reduction goal, and 0% towards its 32.6 M lbs/yr sediment reduction goal.

### 2018 Land Use

Total Acres | **16K**

Agriculture | **2%**

Developed | **64%**

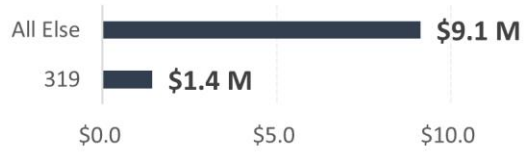
Natural | **33%**

**Funding**

The entire Back River watershed has received a total of $10.6 million from state and federal sources from SFY 2008 to SFY 2019. About $9.1 million came from state sources while $1.4 million came from the 319(h) grant.

### Watershed Funding | SFY08 - SFY19

*Millions of Dollars – Total Back River Funding*



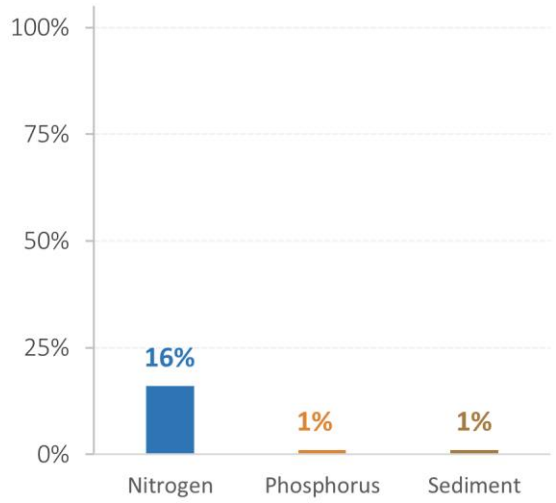

### Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

| Funding Source | Funds | Nitrogen \| lbs/yr | Phosphorus \| lbs/yr | Sediment \| lbs/yr |
|---|---|---|---|---|
| All Else | $ 9.1 M | 0.7 K | 0.9 K | -0.2 M |
| 319(h) Grant | $ 1.4 M | 1.0 K | 0.3 K | 0.2 M |
| **Total** | **$10.6 M** | **1.6 K** | **1.2 K** | **0.0 M** |

## Casselman River – Plan Approved 2011 | 319 Priority Watersheds

### Percent Progress Towards Target*

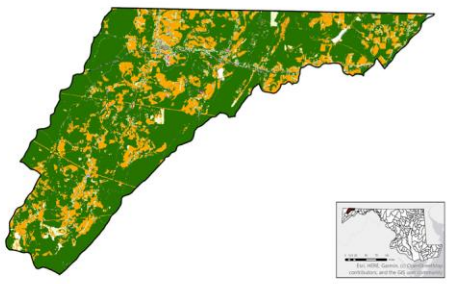
*Nitrogen, Phosphorus, Sediment*




*Watershed plan is for pH – See Appendix B

### Watershed Map

*Casselman River*



### 2018 Land Use

Total Acres | **59K**

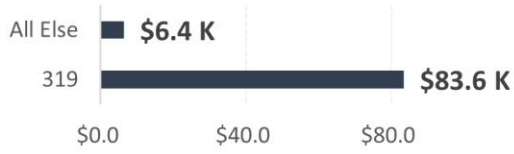
Agriculture | **18%**

Developed | **9%**

Natural | **74%**

### Watershed Funding | SFY11 - SFY19

*Thousands of Dollars*




**NPS Reduction Progress**

From 2011 to 2018, Casselman River is 16% towards its 44K lbs/yr nitrogen reduction goal, 1% towards its 13K lbs/yr phosphorous reduction goal, and 1% towards its 22.5 M lbs/yr sediment reduction goal.

**Funding**

Casselman River has received a total of $90 thousand from state and federal sources from SFY 2011 to SFY 2019. About $6 thousand came from state sources while $84 thousand came from the 319(h) grant.

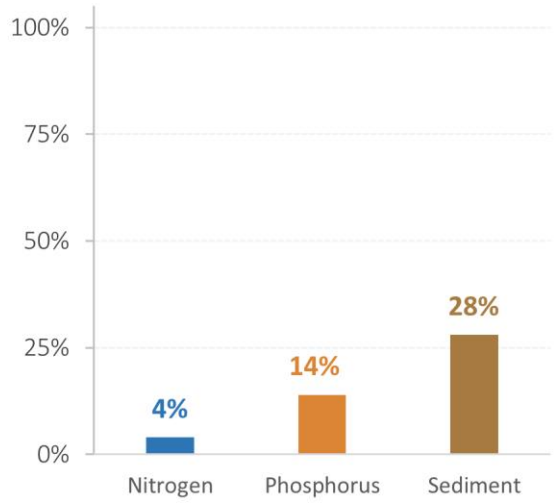
### Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

| Funding Source | Funds | Nitrogen \| lbs/yr | Phosphorus \| lbs/yr | Sediment \| lbs/yr |
|---|---|---|---|---|
| All Else | $ 6.4 K | 7.0 K | 0.2 K | 0.2 M |
| 319(h) Grant | $83.6 K | 0.0 K | 0.0 K | 0.0 M |
| **Total** | **$90.1 K** | **7.0 K** | **0.2 K** | **0.2 M** |

## Choptank River: Upper – Plan Approved 2010 | 319 Priority Watersheds

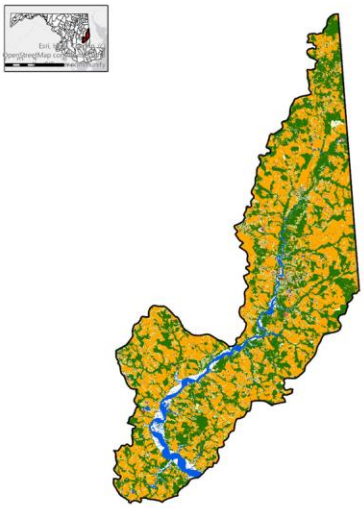
### Percent Progress Towards Target

*Nitrogen, Phosphorus, Sediment*




### Watershed Map

*Choptank River: Upper*



**NPS Reduction Progress**

From 2010 to 2018, Choptank River: Upper is 4% towards its 681K lbs/yr nitrogen reduction goal, 14% towards its 19K lbs/yr phosphorous reduction goal, and 28% towards its 14.4 M lbs/yr sediment reduction goal.

### 2018 Land Use

Total Acres | **98K**

Agriculture | **50%**

Developed | **12%**

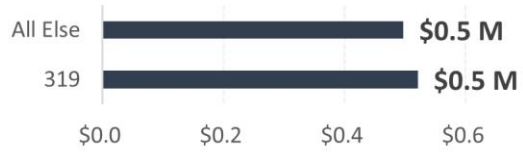
Natural | **38%**

**Funding**

The entire Choptank River watershed has received a total of $1 million from state and federal sources from SFY 2010 to SFY 2019. About $0.5 million came from state sources while $0.5 million came from the 319(h) grant.

### Watershed Funding | SFY10 - SFY19

*Millions of Dollars*



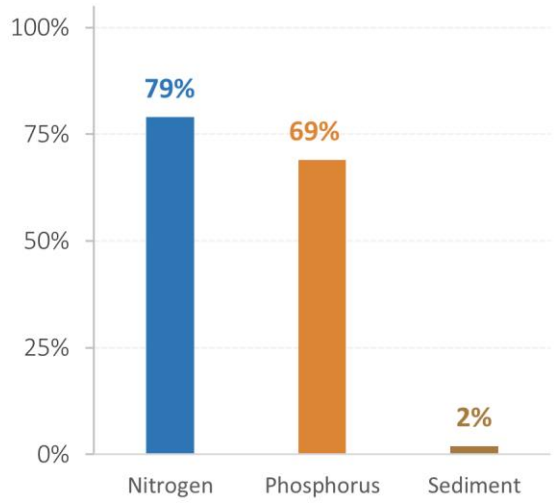

### Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

| Funding Source | Funds | Nitrogen \| lbs/yr | Phosphorus \| lbs/yr | Sediment \| lbs/yr |
|---|---|---|---|---|
| All Else | $0.5 M | 27.9 K | 2.4 K | 3.1 M |
| 319(h) Grant | $0.5 M | 0.5 K | 0.3 K | 0.9 M |
| **Total** | **$1.0 M** | **28.4 K** | **2.7 K** | **4.1 M** |

## Corsica River – Plan Approved 2004 | 319 Priority Watersheds

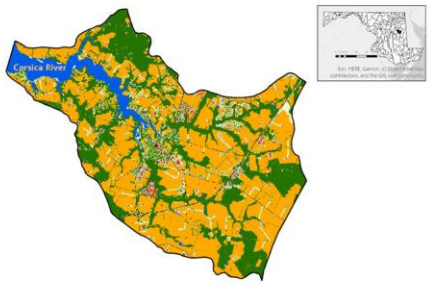
### Percent Progress Towards Target

*Nitrogen, Phosphorus, Sediment*




### Watershed Map

*Corsica River*




**NPS Reduction Progress**

From 2004 to 2018, Corsica River is 79% towards its 48K lbs/yr nitrogen reduction goal, 69% towards its 6K lbs/yr phosphorous reduction goal, and 2% towards its 2.1 M lbs/yr sediment reduction goal.

**Funding**

Corsica River has received a total of $3.8 million from state and federal sources from SFY 2004 to SFY 2019. About $1.9 million came from state sources while $1.9 million came from the 319(h) grant.

### 2018 Land Use

Total Acres | **23K**

Agriculture | **53%**

Developed | **13%**

Natural | **35%**

### Watershed Funding | SFY04 - SFY19

*Millions of Dollars*

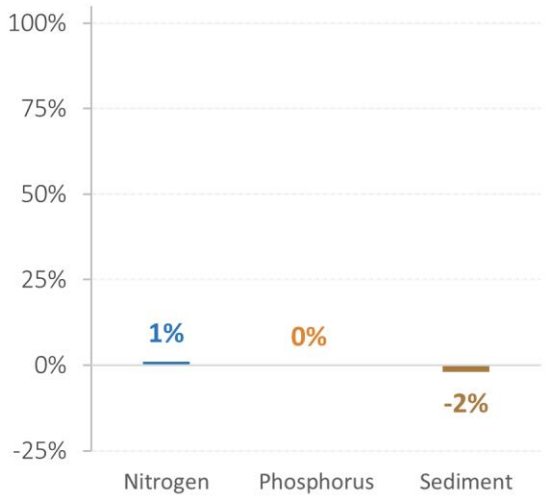

### Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

| Funding Source | Funds | Nitrogen \| lbs/yr | Phosphorus \| lbs/yr | Sediment \| lbs/yr |
|---|---|---|---|---|
| All Else | $1.9 M | 33.2 K | 3.4 K | 39.4 K |
| 319(h) Grant | $1.9 M | 4.9 K | 0.5 K | 10.7 K |
| **Total** | **$3.8 M** | **38.1 K** | **4.0 K** | **50.0 K** |

## Gwynns Falls: Middle – Plan Approved 2014 | 319 Priority Watersheds

### Percent Progress Towards Target

*Nitrogen, Phosphorus, Sediment*




### Watershed Map

*Gwynns Falls: Middle*

**NPS Reduction Progress**

From 2014 to 2018, Gwynns Falls: Middle is 1% towards its 89K lbs/yr nitrogen reduction goal, 0% towards its 12K lbs/yr phosphorous reduction goal, and -2% towards its 23.5 M lbs/yr sediment reduction goal.

### 2018 Land Use

Total Acres | **31K**

Agriculture | **0%**

Developed | **77%**

Natural | **23%**

**Funding**

The entire Gwynns Falls watershed has received a total of $3.1 million from sources from SFY 2014 to SFY 2019. About $2.6 million came from state sources while $0.5 million came from the 319(h) grant.

### Watershed Funding | SFY14 - SFY19

*Millions of Dollars – Total Gwynns Falls Funding*

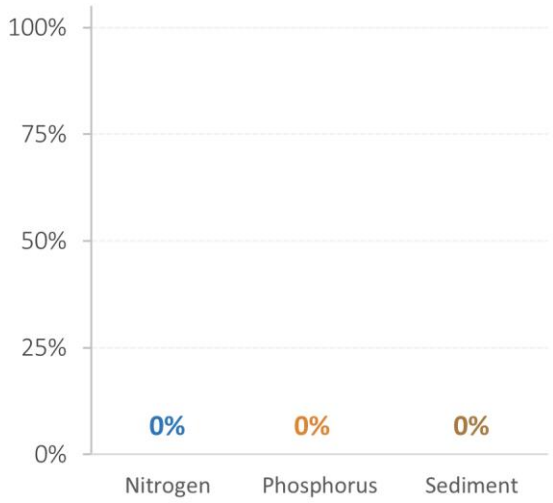

### Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

| Funding Source | Funds | Nitrogen \| lbs/yr | Phosphorus \| lbs/yr | Sediment \| lbs/yr |
|---|---|---|---|---|
| All Else | $2.6 M | -1.2 K | -0.8 K | -1.9 M |
| 319(h) Grant | $0.5 M | 1.8 K | 0.8 K | 1.6 M |
| **Total** | **$3.1 M** | **0.6 K** | **0.0 K** | **-0.4 M** |

## Jennings Run: Upper – Plan Approved 2019 | 319 Priority Watersheds

### Percent Progress Towards Target*

*Nitrogen, Phosphorus, Sediment*



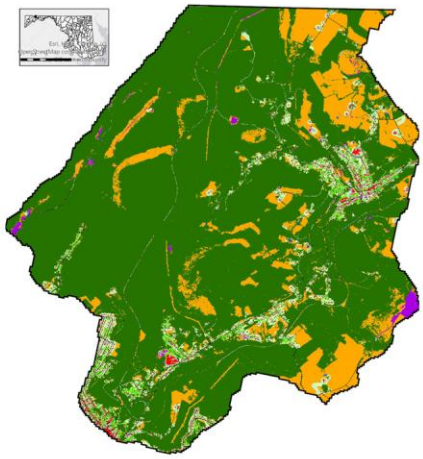

*Watershed plan is for pH – See Appendix B

**NPS Reduction Progress**

There is no progress completed for Jennings Run: Upper as the watershed plan was approved in 2019.

### Watershed Map

*Jennings Run: Upper*



### 2018 Land Use

Total Acres | **19K**

Agriculture | **8%**

Developed | **12%**

Natural | **80%**

**Funding**

Jennings Run has not been funded as of SFY 2019.

### Watershed Funding | SFY19

*Millions of Dollars*

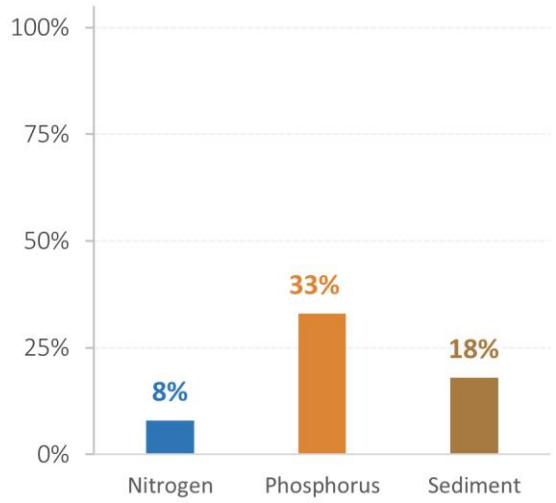

### Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

| Funding Source | Funds | Nitrogen \| lbs/yr | Phosphorus \| lbs/yr | Sediment \| lbs/yr |
|---|---|---|---|---|
| All Else | $0 | - | - | - |
| 319(h) Grant | $0 | - | - | - |
| **Total** | **$0** | **-** | **-** | **-** |

## Jones Falls: Lower – Plan Approved 2008 | 319 Priority Watersheds

### Percent Progress Towards Target*

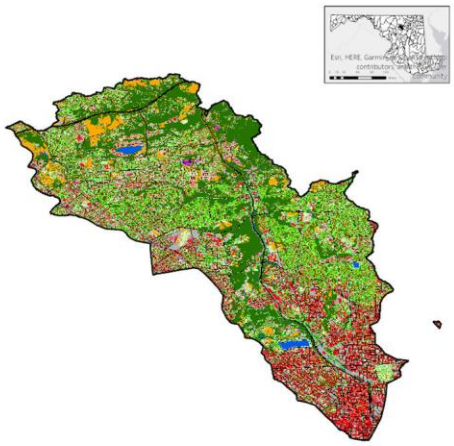
*Nitrogen, Phosphorus, Sediment*




*Watershed plan includes bacteria – See Appendix B

### Watershed Map

*Jones Falls: Lower*



**NPS Reduction Progress**

From 2008 to 2018, Jones Falls: Lower is 8% towards its 42K lbs/yr nitrogen reduction goal, 33% towards its 3K lbs/yr phosphorous reduction goal, and 18% towards its 2.5 M lbs/yr sediment reduction goal.

**Funding**

The entire Jones Falls watershed has received a total of $7.3 million from state sources from SFY 2008 to SFY 2019.

### 2018 Land Use

Total Acres | **17K**

Agriculture | **3%**

Developed | **67%**

Natural | **30%**

### Watershed Funding | SFY08 - SFY19

*Millions of Dollars – Total Jones Falls Watershed*

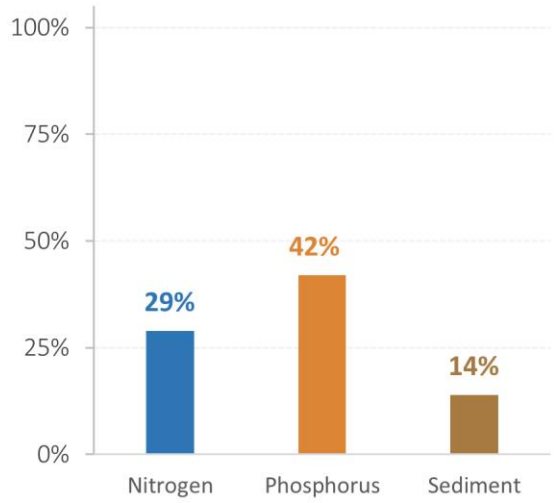

### Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

| Funding Source | Funds | Nitrogen \| lbs/yr | Phosphorus \| lbs/yr | Sediment \| lbs/yr |
|---|---|---|---|---|
| All Else | $7.3 M | 3.4 K | 1.1 K | 0.5 M |
| 319(h) Grant | $0.0 M | 0.0 K | 0.0 K | 0.0 M |
| **Total** | **$7.3 M** | **3.4 K** | **1.1 K** | **0.5 M** |

## Monocacy River: Lower – Plan Approved 2008 | 319 Priority Watersheds

### Percent Progress Towards Target

*Nitrogen, Phosphorus, Sediment*




### Watershed Map

*Monocacy River: Lower*

**NPS Reduction Progress**

From 2008 to 2018, Monocacy River: Lower is 29% towards its 237K lbs/yr nitrogen reduction goal, 42% towards its 18K lbs/yr phosphorous reduction goal, and 14% towards its 21.0 M lbs/yr sediment reduction goal.

**Funding**

The entire Monocacy watershed has received a total of $2.5 million from state and federal sources from SFY 2008 to SFY 2019. About $1.7 million came from state sources while $0.8 million came from the 319(h) grant.

### 2018 Land Use

Total Acres | **99K**

Agriculture | **31%**

Developed | **26%**

Natural | **43%**

### Watershed Funding | SFY08 - SFY19

*Millions of Dollars – Total Monocacy Watershed*

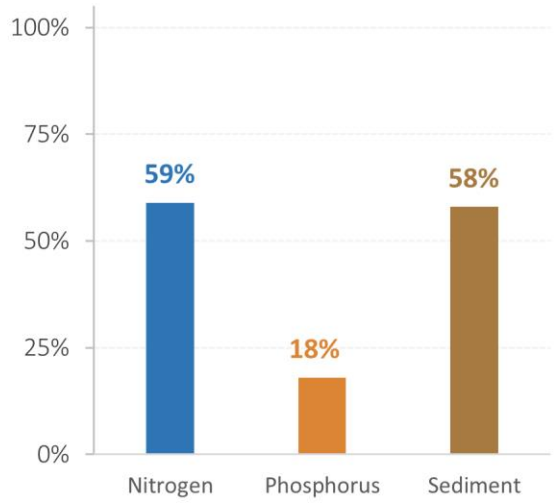

### Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

| Funding Source | Funds | Nitrogen \| lbs/yr | Phosphorus \| lbs/yr | Sediment \| lbs/yr |
|---|---|---|---|---|
| All Else | $1.7 M | 68.5 K | 7.6 K | 3.0 M |
| 319(h) Grant | $0.8 M | 0.6 K | 0.1 K | 0.0 M |
| **Total** | **$2.5 M** | **69.1 K** | **7.7 K** | **3.0 M** |

## Sassafras River – Plan Approved 2009 | 319 Priority Watersheds

### Percent Progress Towards Target

*Nitrogen, Phosphorus, Sediment*




### Watershed Map

*Sassafras River*


**NPS Reduction Progress**

From 2009 to 2018, Sassafras River is 59% towards its 57K lbs/yr nitrogen reduction goal, 18% towards its 9K lbs/yr phosphorous reduction goal, and 58% towards its 3.7 M lbs/yr sediment reduction goal.

### 2018 Land Use

Total Acres | **47K**

Agriculture | **58%**

Developed | **11%**

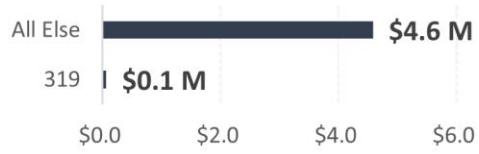
Natural | **31%**

**Funding**

Sassafras River has received a total of $4.6 million from state and federal sources from SFY 2009 to SFY 2019. About $4.6 million came from state sources while $64 thousand came from the 319(h) grant.

### Watershed Funding | SFY09 - SFY19

*Millions of Dollars*




### Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

| Funding Source | Funds | Nitrogen \| lbs/yr | Phosphorus \| lbs/yr | Sediment \| lbs/yr |
|---|---|---|---|---|
| All Else | $4.6 M | 33.1 K | 1.5 K | 2.1 M |
| 319(h) Grant | $0.1 M | 0.1 K | 0.0 K | 0.0 M |
| **Total** | **$4.6 M** | **33.2 K** | **1.5 K** | **2.1 M** |

# Appendix A | Financial Information

## *319(h) Grant Funding*

Maryland tracks annual 319(h) Grant federal vs state contributions since 1990 (Table A - 1). However, tracking Priority Watershed progress did not begin until the first watershed plan for Corsica River was approved in 2004.

***Table A - 1:** 319(h) Grant funding by State Fiscal Year*

| State Fiscal Year | 319(h) Grant | Non-Federal Match | Total State and Federal Funds |
|---|---|---|---|
| 1990* | $447,771 | $298,514 | $746,285 |
| 1991* | $890,039 | $593,359 | $1,483,398 |
| 1992* | $939,298 | $626,199 | $1,565,497 |
| 1993* | $877,070 | $584,713 | $1,461,783 |
| 1994* | $1,494,413 | $996,275 | $2,490,688 |
| 1995* | $1,755,964 | $1,170,643 | $2,926,607 |
| 1996* | $1,541,980 | $1,027,987 | $2,569,967 |
| 1997* | $1,327,699 | $885,133 | $2,212,832 |
| 1998* | $1,327,699 | $885,133 | $2,212,832 |
| 1999* | $2,708,298 | $1,805,532 | $4,513,830 |
| 2000* | $2,467,576 | $1,645,051 | $4,112,627 |
| 2001* | $2,958,486 | $1,972,324 | $4,930,810 |
| 2002* | $3,035,576 | $2,023,717 | $5,059,293 |
| 2003* | $3,104,500 | $2,069,667 | $5,174,167 |
| 2004 | $3,369,190 | $2,246,127 | $5,615,317 |
| 2005 | $2,675,598 | $1,783,732 | $4,459,330 |
| 2006 | $2,666,655 | $1,777,770 | $4,444,425 |
| 2007 | $2,551,736 | $1,701,157 | $4,252,893 |
| 2008 | $2,653,500 | $1,769,000 | $4,422,500 |
| 2009 | $2,575,782 | $1,717,188 | $4,292,970 |
| 2010 | $2,860,785 | $1,907,190 | $4,767,975 |
| 2011 | $2,283,639 | $1,522,426 | $3,806,065 |
| 2012 | $2,091,000 | $1,394,000 | $3,485,000 |
| 2013 | $1,990,999 | $1,327,333 | $3,318,332 |
| 2014 | $2,119,118 | $1,412,745 | $3,531,863 |
| 2015 | $2,084,277 | $1,389,518 | $3,473,795 |
| 2016 | $2,109,728 | $1,406,485 | $3,516,213 |
| 2017 | $2,236,500 | $1,491,000 | $3,727,500 |
| 2018 | $2,129,000 | $1,419,333 | $3,548,333 |
| 2019 | $2,129,000 | $1,419,335 | $3,548,335 |
| **Totals (Post 2004):** | **$38,526,507** | **$25,684,339** | **$64,210,846** |

*Funding predating the first approved Priority Watershed Plan.

## *Maintenance of Effort (MOE) vs Federal 319(h) Grant Funds*

Each year, Maryland spends significantly more of its own money than 319(h) Grant funding on NPS pollution programs and reductions practices (Figure A - 1).

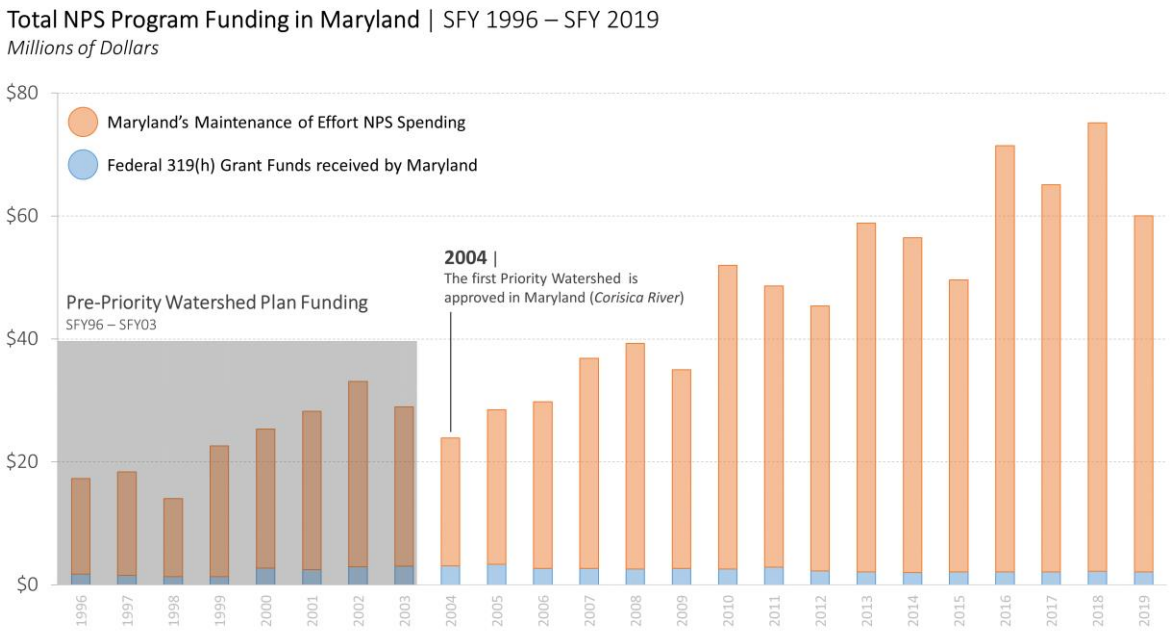



***Figure A - 1:*** *Maryland's Maintenance of Effort funds (MOE) vs. Federal 319(h) Grant dollars received*

Most recently, in SFY 2019, Maryland spent a combined $57,933,737 of state dollars on NPS programs. Comparatively, the $2,129,000 federal 319(h) Grant dollars during the same period account for about 4 percent of the State's total spending on NPS pollution (Table A - 2).

***Table A - 1:*** *MOE vs Federal 319(h) Grant dollars received by State Fiscal Year (Millions of Dollars)*

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319(h) Federal Spending | $3.10 | $3.37 | $2.68 | $2.67 | $2.55 | $2.65 | $2.58 | $2.86 | $2.28 | $2.09 | $1.99 | $2.12 | $2.08 | $2.11 | $2.24 | $2.13 |
| MOE | $20.82 | $25.13 | $27.10 | $34.20 | $36.74 | $32.36 | $49.43 | $45.78 | $43.08 | $56.74 | $54.48 | $47.46 | $69.36 | $62.97 | $72.95 | $57.93 |

### *Chesapeake and Atlantic Costal Bays Trust Fund*

Since its inception in SFY 2009, the Chesapeake and Atlantic Costal Bays Trust Fund (Trust Fund) has contributed $353 million to Maryland NPS programs and pollution reduction practices (Figure A - 2). The Trust Fund is a major source of funding for NPS programs and pollution reduction practices within the State and has contributed over three times the total lifetime funding as the 319(h) Grant, including state match.

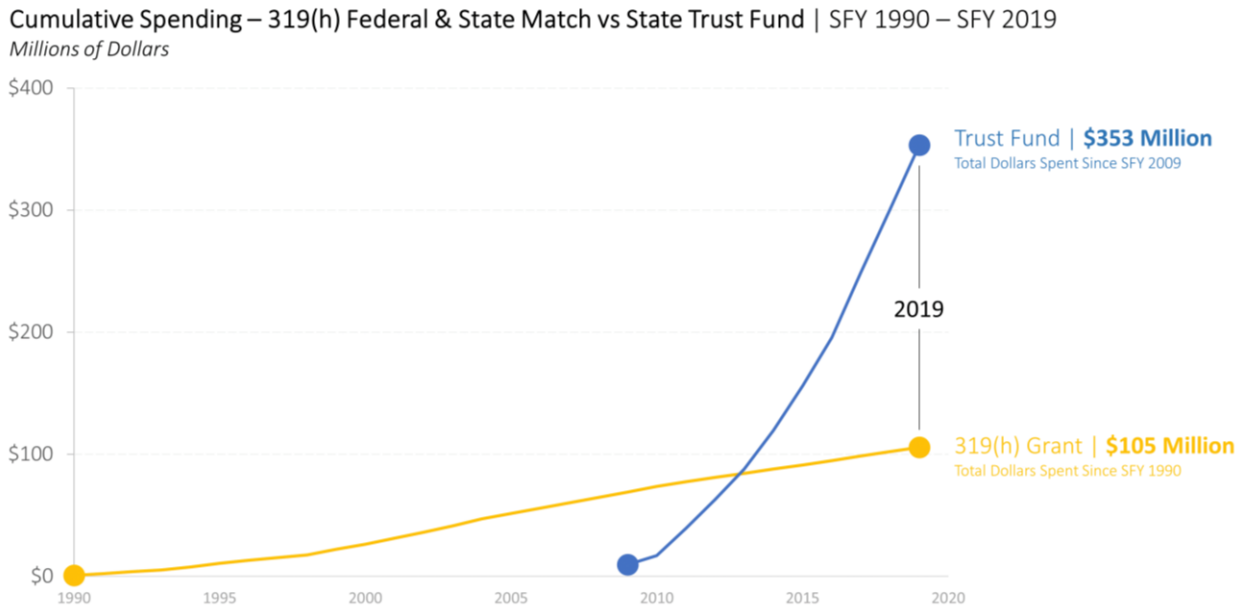



***Figure A - 2:*** *Cumulative spending for 319(h) Grant (including State Match) and Trust Fund*

Initially, the Trust Fund was roughly twice the size of the total 319(h) Grant funding. Yet, since about SFY 2017, the Trust Fund has increased substantially with the latest years funding being about fifteen times greater than the same years 319(h) Grant dollars (Table A - 3).

***Table A - 2:*** *319(h) Grant dollars vs Trust Fund spending by State Fiscal Year (Millions of Dollars)*

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 319(h) Grant | $4.29 | $4.77 | $3.81 | $3.49 | $3.32 | $3.53 | $3.47 | $3.52 | $3.73 | $3.55 | $3.55 |
| Trust Fund | $9.60 | $7.30 | $22.64 | $23.58 | $24.80 | $31.50 | $36.80 | $39.40 | $53.47 | $51.31 | $52.93 |

### *Spending Breakdown by Priority Watershed*

Maryland spends significantly more state dollars in its priority watersheds than federal dollars from the 319(h) Grant (Table A - 4). As of SFY 2019, Maryland has spent $29.2 million on in the ground projects in priority watersheds. Comparatively, the 319(h) Grant, not including state match, has accounted for $6.9 million in project spending.

***Table A - 3:** Spending by Priority Watershed by funding source*

| Priority Watershed | Plan Start Date | Chesapeake and Atlantic Bays Trust Fund | State Revolving Fund | Total Non-319 Funds | 319(h) Grant | Total Funds |
|---|---|---|---|---|---|---|
| Antietam Creek | 2012 | $701,484 | $824,600 | $1,526,084 | $1,652,008 | $3,578,092 |
| Assawoman Bay | 2020 | - | - | - | - | - |
| Back River: Tidal | 2010 | $6,031,605 | $3,102,100 | $9,133,705 | $1,428,859 | $10,562,564 |
| Back River: Upper | 2008 | | | | | |
| Casselman River | 2011 | $6,440 | $0 | $6,440 | $83,619 | $90,059 |
| Choptank River: Upper | 2010 | $496,895 | $0 | $496,895 | $520,736 | $1,017,631 |
| Corsica River | 2004 | $1,659,485 | $200,000 | $1,859,485 | $1,919,132 | $3,778,617 |
| Gwynns Falls: Middle | 2014 | $2,621,164 | $0 | $2,621,164 | $450,000 | $3,071,164 |
| Jennings Run: Upper | 2019 | - | - | - | - | - |
| Jones Falls: Lower | 2008 | $6,730,213 | $562,973 | $7,293,186 | $0 | $7,755,495 |
| Monocacy River: Lower | 2008 | $1,682,018 | $0 | $1,682,018 | $798,940 | $2,480,959 |
| Sassafras River | 2009 | $4,584,724 | $0 | $4,584,724 | $64,000 | $4,648,724 |
| **Watershed Totals** | | **$24,514,029** | **$4,689,673** | **$29,203,702** | **$6,917,295** | **$36,120,996** |

# Appendix B | NPS Load Tracking

## *Nutrient and Sediment Tracking*

Maryland tracks nutrient and sediment reductions for 319 Priority Watersheds using Chesapeake Assessment Scenario Tool (CAST). In the following tables (*B - 1 to B - 3*), *Reduction Source Document* refers to how the *Percent Reduction Required* (PRR) was determined. All loads are reported as Edge of Stream: the nutrient and sediment entering directly into local waterbodies from the adjoining land.

The percent reduction for *Watershed Plan* was taken from the approved watershed plan. If no such number was given, PRR was calculated as the percent reduction of the watershed's Plan Start Date (PSD) NPS load necessary to achieve the watershed's TMDL for nitrogen, phosphorus, or sediment. If no TMDL was available, or the TMDL was exceeded, PRR was calculated as the percent reduction required of the watershed's PSD NPS load to achieve the watershed's Phase III WIP nutrient or sediment goals.

Baseline loads were extracted directly from CAST and represent the load during a watershed's PSD. Target loads were calculated as *((1 – PRR) * Baseline Loads)*. Current Loads represent 2018 Progress loads in CAST for each watershed.

319 Reductions come from the individual project calculations provided to MDE in the watershed work plans; Appendix D contains the source documentation for these reductions. Non-319 Reductions are calculated as *((PSD - Current Loads) - 319 Reductions)*.

***Table B - 1:*** *Nitrogen tracking (Edge of Stream loads – Pounds / Year)*

| Priority Watershed | Plan Start Date | Reduction Source Document | Percent Reduction Required | Baseline Loads | Target Loads | Current Loads (2018) | 319 Reductions | Non-319 Reductions | Total Reductions | Target Reductions | Percent Progress |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antietam Creek | 2012 | Phase III WIP | 11% | 1,345,783 | 1,197,747 | 1,292,561 | 837 | 52,385 | 53,222 | 148,036 | 36% |
| Assawoman Bay | 2020 | - | - | - | - | - | - | - | - | - | - |
| Back River: Tidal | 2010 | Watershed Plan | 15% | 98,974 | 84,128 | 99,484 | 280 | -790 | -510 | 14,846 | -3% |
| Back River: Upper | 2008 | Watershed Plan | 15% | 162,862 | 138,433 | 161,231 | 974 | 656 | 1,631 | 24,429 | 7% |
| Casselman River | 2011 | Phase III WIP | 13% | 341,340 | 296,966 | 334,359 | 0 | 6,981 | 6,981 | 44,374 | 16% |
| Choptank River: Upper | 2010 | Watershed Plan | 39% | 1,746,440 | 1,065,328 | 1,718,043 | 451 | 27,946 | 28,397 | 681,112 | 4% |
| Corsica River | 2004 | Local TMDL | 15% | 321,817 | 273,544 | 283,717 | 4,873 | 33,226 | 38,099 | 48,272 | 79% |
| Gwynns Falls: Middle | 2014 | Watershed Plan | 29% | 307,333 | 218,207 | 306,758 | 1,795 | -1,220 | 575 | 89,127 | 1% |
| Jennings Run: Upper | 2019 | - | - | - | - | - | - | - | - | - | - |
| Jones Falls: Lower | 2008 | Watershed Plan | 22% | 186,631 | 144,826 | 183,249 | 0 | 3,382 | 3,382 | 41,805 | 8% |
| Monocacy River: Lower | 2008 | Phase III WIP | 15% | 1,579,744 | 1,342,782 | 1,510,635 | 632 | 68,477 | 69,109 | 236,962 | 29% |
| Sassafras River | 2009 | Watershed Plan | 9% | 622,993 | 566,301 | 589,768 | 101 | 33,124 | 33,225 | 56,692 | 59% |
| **Watershed Totals** *(Nitrogen)* | | | **21%** | **6,713,917** | **5,328,261** | **6,479,806** | **9,944** | **224,166** | **234,110** | **1,385,656** | **17%** |

***Table B - 2:*** *Phosphorus tracking (Edge of Stream loads – Pounds / Year)*

| Priority Watershed | Plan Start Date | Reduction Source Document | Percent Reduction Required | Baseline Loads | Target Loads | Current Loads (2018) | 319 Reductions | Non-319 Reductions | Total Reductions | Target Reductions | Percent Progress |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antietam Creek | 2012 | Local TMDL | 7% | 72,907 | 67,803 | 67,703 | 298 | 4,906 | 5,204 | 5,103 | 102% |
| Assawoman Bay | 2020 | - | - | - | - | - | - | - | - | - | - |
| Back River: Tidal | 2010 | Watershed Plan | 15% | 13,241 | 11,255 | 12,684 | 94 | 463 | 557 | 1,986 | 28% |
| Back River: Upper | 2008 | Watershed Plan | 15% | 18,281 | 15,539 | 17,065 | 328 | 889 | 1,217 | 2,742 | 44% |
| Casselman River | 2011 | Phase III WIP | 37% | 33,788 | 21,287 | 33,608 | 0 | 180 | 180 | 12,502 | 1% |
| Choptank River: Upper | 2010 | Watershed Plan | 28% | 66,783 | 48,084 | 64,100 | 274 | 2,409 | 2,683 | 18,699 | 14% |
| Corsica River | 2004 | Phase III WIP* | 42% | 13,759 | 7,980 | 9,777 | 538 | 3,443 | 3,981 | 5,779 | 69% |
| Gwynns Falls: Middle | 2014 | Watershed Plan | 45% | 26,394 | 14,490 | 26,347 | 826 | -779 | 47 | 11,904 | 0% |
| Jennings Run: Upper | 2019 | - | - | - | - | - | - | - | - | - | - |
| Jones Falls: Lower | 2008 | Watershed Plan | 30% | 11,351 | 8,002 | 10,241 | 0 | 1,110 | 1,110 | 3,349 | 33% |
| Monocacy River: Lower | 2008 | Phase III WIP | 33% | 55,484 | 37,174 | 47,829 | 84 | 7,570 | 7,655 | 18,310 | 42% |
| Sassafras River | 2009 | Watershed Plan | 34% | 26,036 | 17,210 | 24,490 | 20 | 1,526 | 1,546 | 8,826 | 18% |
| **Watershed Totals** *(Phosphorus)* | | | **26%** | **338,025** | **248,825** | **313,844** | **2,463** | **21,717** | **24,180** | **89,200** | **27%** |

***Table B - 3:*** *Sediment tracking (Edge of Stream loads – Millions of Pounds / Year)*

| Priority Watershed | Plan Start Date | Reduction Source Document | Percent Reduction Required | Baseline Loads | Target Loads | Current Loads (2018) | 319 Reductions | Non-319 Reductions | Total Reductions | Target Reductions | Percent Progress |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antietam Creek | 2012 | Watershed Plan | 52% | 135.00 | 64.80 | 129.00 | 2.32 | 3.68 | 6.00 | 70.20 | 9% |
| Assawoman Bay | 2020 | - | - | - | - | - | - | - | - | - | - |
| Back River: Tidal | 2010 | Local TMDL | 68% | 19.48 | 6.23 | 20.86 | 0.43 | -1.80 | -1.38 | 13.25 | -10% |
| Back River: Upper | 2008 | Local TMDL | 68% | 47.99 | 15.36 | 47.95 | 0.20 | -0.16 | 0.04 | 32.63 | 0% |
| Casselman River | 2011 | Phase III WIP | 24% | 93.79 | 71.28 | 93.57 | 0.00 | 0.22 | 0.22 | 22.51 | 1% |
| Choptank River: Upper | 2010 | Phase III WIP | 33% | 43.75 | 29.31 | 39.68 | 0.94 | 3.12 | 4.07 | 14.44 | 28% |
| Corsica River | 2004 | Phase III WIP | 20% | 10.49 | 8.39 | 10.44 | 0.01 | 0.04 | 0.05 | 2.10 | 2% |
| Gwynns Falls: Middle | 2014 | Local TMDL | 37% | 63.54 | 40.03 | 63.89 | 1.57 | -1.93 | -0.36 | 23.51 | -2% |
| Jennings Run: Upper | 2019 | - | - | - | - | - | - | - | - | - | - |
| Jones Falls: Lower | 2008 | Watershed Plan | 8% | 30.92 | 28.39 | 30.46 | 0.00 | 0.46 | 0.46 | 2.54 | 18% |
| Monocacy River: Lower | 2008 | Phase III WIP | 16% | 131.00 | 110.04 | 128.00 | 0.02 | 2.98 | 3.00 | 20.96 | 14% |
| Sassafras River | 2009 | Watershed Plan | 15% | 24.83 | 21.15 | 22.69 | 0.01 | 2.13 | 2.14 | 3.67 | 58% |
| **Watershed Totals** *(Sediment)* | | | **34%** | **600.78** | **394.98** | **586.53** | **5.50** | **8.74** | **14.24** | **205.80** | **7%** |

### *Other NPS Pollution – Bacteria*

MDE does not currently have a system for tracking bacteria reductions within priority watersheds. Bacteria concentrations and loads tend to be highly variable and difficult to track, particularly when assessing the effectiveness of restoration. The State will continue to evaluate new tools, technologies, and monitoring designs to track progress towards applicable bacteria TMDLs in the future. This largely applies to the Antietam Creek priority watershed plan, which addresses the Bacteria TMDL for the watershed.

### *Other NPS Pollution – pH Impairments*

The Casselman River priority watershed plan was developed to address the low pH impairment listings due to acid mine drainage. Rather than directly tracking pH, Maryland tracks pH remediation by evaluating how many watersheds have been successfully delisted for a pH impairment (Table B - 4)., based on pre and post BMP implementation monitoring. Currently, four water quality segments within the Casselman River watershed have been delisted for pH.

***Table B - 4:*** *Casselman River sub-watersheds delisted for pH impairments*

| Casselman River \| pH Delistings | | | |
|---|---|---|---|
| **River Name** | **HUC-12 Watershed** | **Impairment** | **Listing Category** |
| Alexander Run | 050202040032 | pH, Low | 2 – Meets water quality criteria for the specified pollutant |
| Big Laurel Run | 050202040033 | pH, Low | 2 – Meets water quality criteria for the specified pollutant |
| Spiker Run | 050202040034 | pH, Low | 2 – Meets water quality criteria for the specified pollutant |
| Tarkiln Run | 050202040032 | pH, Low | 2 – Meets water quality criteria for the specified pollutant |

### *Tracking Historical Projects*

This report only tracks projects that were funded after the watershed plan approval date. However, many of the priority watersheds received funding and completed projects before any watershed plan was approved. MDE is developing a website to track historical 319(h) Grant funded projects. Future iterations will link to this website, once available.

# Appendix C | Milestones and BMP Goals

Starting 2019, Maryland aligned its NPS Management Program Milestones (Table C - 1) and 319 Annual report with its Phase III WIP to streamline reporting and more closely reflect the State's overarching NPS pollution reduction strategy.

Phase III WIP BMP reductions are calculated as the pounds of nitrogen (Table C - 2) (*page C - 2)* or phosphrous (Table C - 3) (*page C - 3)* a given amount of BMP implementation reduces. These reductions only represent the pollution reduction from BMPs and do not factor in growth. The Phase III WIP was built on 2017 BMPs; thus, to determine progress MDE caculated new BMPs implemented between 2017 and the latest available CAST progress year (2018 Progress). Load reductions for the new BMPs were caculated and compared to the required reduction in the Phase III WIP. In the instance of Annual BMPs, such as cover crops, the WIP goal is to maintain the stated level of implementation.

In this report, stormwater BMPs were calculated using the above procedure. However, this proved to be less effective for tracking stormwater BMPs than for BMPs in other sectors. Tracking stormwater progress through expected nutrient reductions is ineffective due to BMP verification issues, low nutrient reductions, and differences between modeled BMPs and actual BMPs implemented by counties. Thus, MDE will update its stormwater reporting for future itterations of this report to reflect Impervious Acre Equivilants of BMPs implemented towards the required acres instead of tracking nutrient reductions.

***Table C - 1:*** *Maryland's Nonpoint Source Management Program interim milestones*

| Sector | Milestones for 2020 |
|---|---|
| **Agriculture** | Conservation Technical Assistance \| 1,000,000 acres plans & design |
| | Cover Crops \| 430,000 acres/year |
| | Manure Transport \| 100,000 tons/year |
| **Conservation Practices** | Land Conservation; Local and State-level land conservation and land use programs and policies that prevent nutrient pollution |
| **Natural Filters on Public Lands** | Upland Tree Planting and Streamside Forest Buffers \| 230 acres |
| | Wetland Restoration \| 35 acres |
| | Stream Restoration \| 1.25 miles |
| | Shoreline Management (Living Shoreline Technique) \| 0.6 miles |
| | Oyster Aquaculture \| 70,000 bushels |
| | Oyster Reef Restoration \| 173 acres |
| **Septic** | Best Available Technology(BAT) Upgrades \| 288 systems |
| | Connection to Wastewater Treatment Plants (WWTP) \| 320 connections |
| **Stormwater** | Create training program for reduced road salt application<br>Develop regulations for salt applicator certification<br>Create training tracking tools for programs |
| | Complete current Phase 1 Municipal Separate Storm Sewer (MS4) permits restoration requirement \| 20,000 impervious acres through implementation or Water Quality Trading |
| | Miscellaneous implementation on non-MS4 counties (e.g. trading, trust fund) \| 80 impervious acres |

***Table C - 2:*** *Nitrogen progress towards Phase III WIP Goals*

| Sector | Phase III WIP BMP | Target Reduction | **Current Reduction** Nitrogen \| 2018 | Percent Progress |
|---|---|---|---|---|
| Agriculture | Conservation Technical Assistance **1 million acres** | **1,100,000** | **1,551,550** | **100%** |
| | Nutrient Management Compliance | **1,600,000** | **2,133,665** | **100%** |
| | Cover Crops **470,000 acres / year** | **2,300,000** | **2,229,371** | **97%** |
| | Future Agricultural Practices | **739,500** | **61,776** | **8%** |
| Natural | Wetland Restoration **175 acres** | **600** | **600** | **100%** |
| | Shoreline Management **0.6 miles** | **150** | **2,279** | **100%** |
| | Oyster Aquaculture **350,000 bushels** | **0** | **0** | **0%** |
| | Oyster Reef Restoration **876 acres** | **0** | **0** | **0%** |
| Septic | Best Available Technology Upgrades **6,440 systems** | **40,000** | **3,854** | **10%** |
| | Connections to Wastewater Plants **1,600 connections** | **16,800** | **390** | **2%** |
| | Septic Pumping ***Not available until 2021*** | - | - | **0%** |
| Stormwater | Current Phase I MS4 Restoration **20,000 impervious acres** | **85,000** | **-336** | **0%** |
| | New Phase I MS4 Restoration **17,500 impervious acres** | - | - | **0%** |
| | Current Phase II MS4 Restoration **3,000 impervious acres** | **15,000** | **820** | **5%** |
| | Non-MS4 Restoration **400 impervious acres** | **3,000** | **2,726** | **91%** |

***Table C - 3:*** *Phosphorus progress towards Phase III WIP Goals*

| Sector | Phase III WIP BMP | Target Reduction | **Current Reduction** Nitrogen \| 2018 | Percent Progress |
|---|---|---|---|---|
| Agriculture | Conservation Technical Assistance **1 million acres** | **53,000** | **108,655** | **100%** |
| | Nutrient Management Compliance | **76,000** | **150,875** | **100%** |
| | Cover Crops **470,000 acres / year** | **2,000** | **3,136** | **100%** |
| | Future Agricultural Practices | **12,100** | **1,507** | **12%** |
| Natural | Wetland Restoration **175 acres** | **50** | **50** | **100%** |
| | Shoreline Management **0.6 miles** | **100** | **1,611** | **100%** |
| | Oyster Aquaculture **350,000 bushels** | - | - | **0%** |
| | Oyster Reef Restoration **876 acres** | - | - | **0%** |
| Septic | Best Available Technology Upgrades **6,440 systems** | - | - | - |
| | Connections to Wastewater Plants **1,600 connections** | - | - | - |
| | Septic Pumping ***Not available until 2021*** | - | - | - |
| Stormwater | Current Phase I MS4 Restoration **20,000 impervious acres** | **43,000** | **526** | **1%** |
| | New Phase I MS4 Restoration **17,500 impervious acres** | - | - | **0%** |
| | Current Phase II MS4 Restoration **3,000 impervious acres** | **6,000** | **584** | **10%** |
| | Non-MS4 Restoration **400 impervious acres** | **400** | **545** | **100%** |

# Appendix D | Priority Watershed Details

This appendix provides full resolution GIS maps of watershed land use (*pages D - 2 to D - 13*) and details for projects funding by the 319(h) Grant (*pages D - 14 to D - 17*). Table D - 1 (*Table 3 in the main report*) provides a summary of the 319 Priority Watershed status.

For details on total spending by priority watershed, see Appendix A; for details on total NPS reduction by watershed, see Appendix B. All projects are complete unless specified otherwise. Projects generally take two years to complete from the initial funding date.

***Table D - 1:*** *Summary of Maryland's 319 Priority Watersheds*

| Priority Watershed | Plan Date \| Status | **Funding** *(Total)* State \| 319 \| Total | **Reductions** *(lbs/yr)* TN \| TP \| TSS |
|---|---|---|---|
| **Antietam Creek** | 2012 \| Implementing | $1.5 M \| $1.7 M \| **$3.2 M** | 53.2 K \| 5.2 K \| 6.0 M |
| **Assawoman Bay** | 2020\| Implementing | - | - |
| **Back River** - *Tidal* | 2010\| Implementing | $9.1 M \| $1.4 M \| **$10.6M** | -0.5 K \| 0.6 K \| -1.4 M |
| - *Upper* | 2008 \| Implementing | | 1.6 K \| 1.2 K \| 0.0 M |
| **Cambridge Creek** | Drafting | - | - |
| **Casselman River** | 2011 \| Implementing | $0.0 M \| $0.1 M \| **$0.1 M** | 7.0 K \| 0.2 K \| 0.2 M |
| **Choptank River** - *Upper* | 2010 \| Implementing | $0.5 M \| $0.5 M \| **$1.0 M** | 28.4 K \| 2.7 K \| 4.1 M |
| **Corsica River** | 2004 \| Implementing | $1.9 M \| $1.9 M \| **$3.8 M** | 38.1 K \| 4.0 K \| 0.1 M |
| **Coastal Bays** | Drafting | - | - |
| **Gwynns Falls** - *Middle* | 2014 \| Implementing | $2.6 M \| $0.5 M \| **$3.1 M** | 0.6 K \| 0.0 K \| -0.4 M |
| - *Upper* | EPA Review | | - |
| **Hunting Creek** | Drafting | - | - |
| **Jennings Run** - *Upper* | 2019 \| Implementing | - | - |
| **Jones Falls** - *Lower* | 2008 \| Implementing | $7.3 M \| $0.0 M \| **$7.3 M** | 3.4 K \| 1.1 K \| 0.5 M |
| **Monocacy River** - *Lower* | 2008 \| Implementing | $1.7 M \| $0.8 M \| **$2.5 M** | 69.1 K \| 7.7 K \| 3.0 M |
| **Sassafras River** | 2009 \| Implementing | $4.6 M \| $0.1 M \| **$4.6 M** | 33.2 K \| 1.5 K \| 2.1 M |
| **Williston Lake** | Drafting | - | - |
| **Watershed Totals** | | **$29.2 M \| $6.9 M \|$36.1 M** | **234 K \| 24.2 K \| 14.2 M** |

## Antietam Creek | 319 Priority Watershed Maps

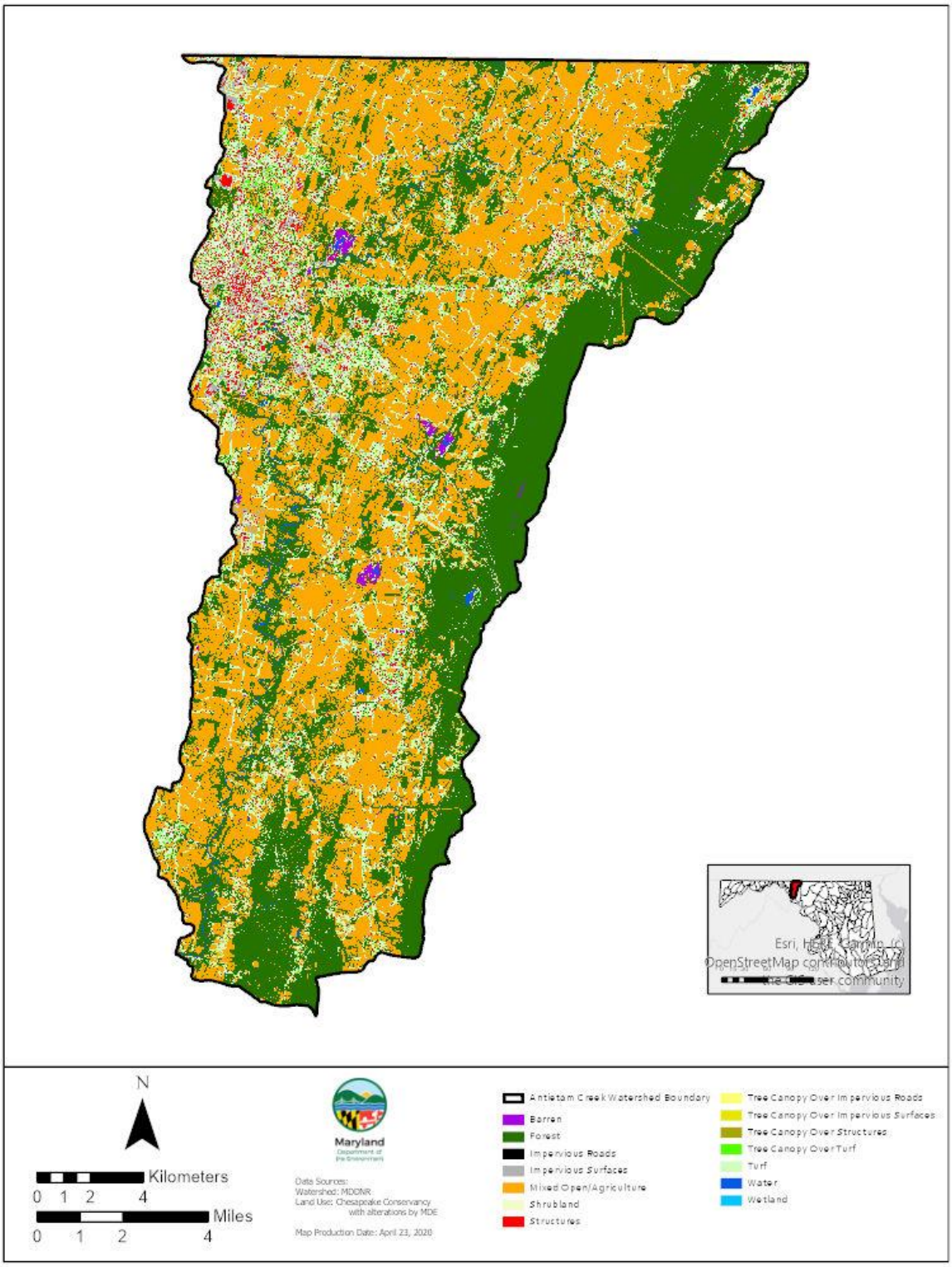



***Figure D - 1:*** *Antietam Creek - watershed map*

## Assawoman Bay | 319 Priority Watershed Maps

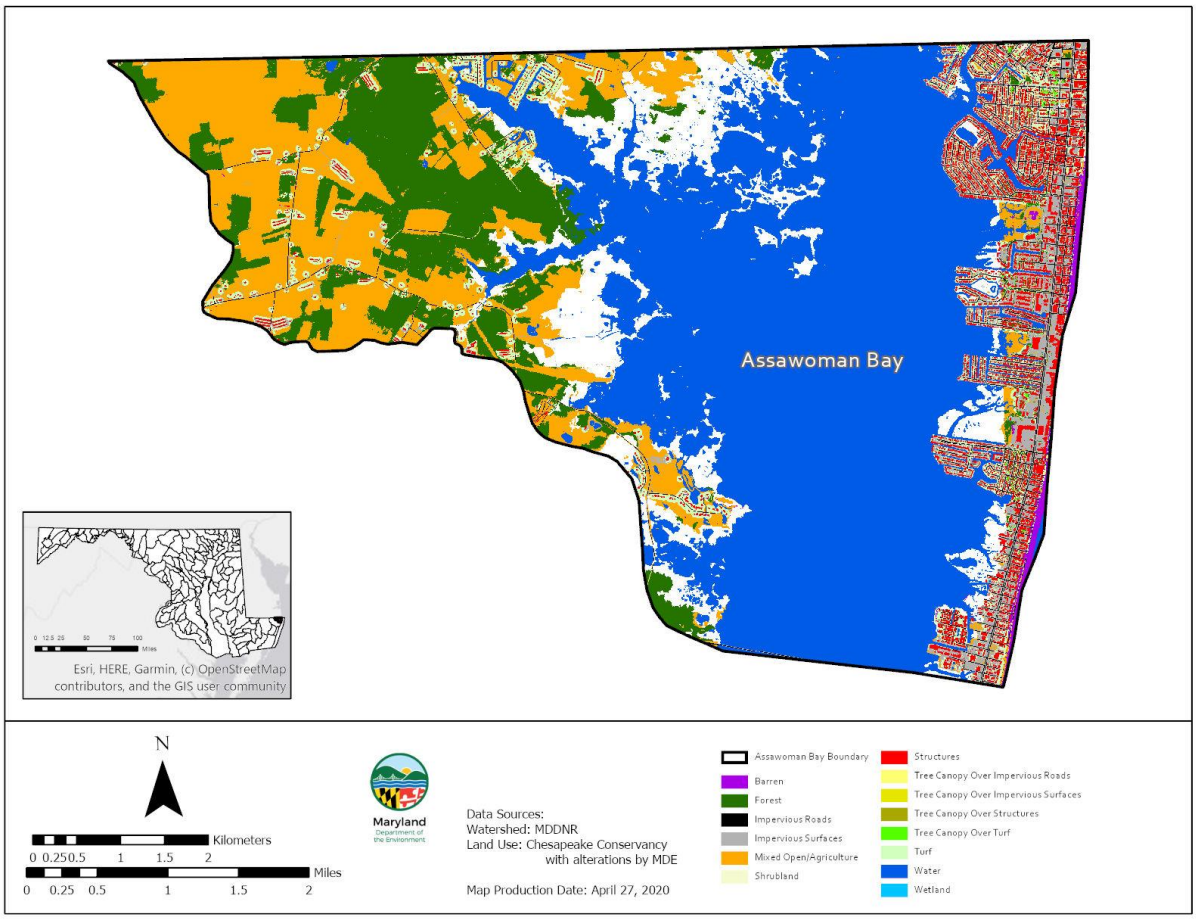



***Figure D - 2:*** *Assawoman Bay - watershed map*

## Back River: Tidal | 319 Priority Watershed Maps

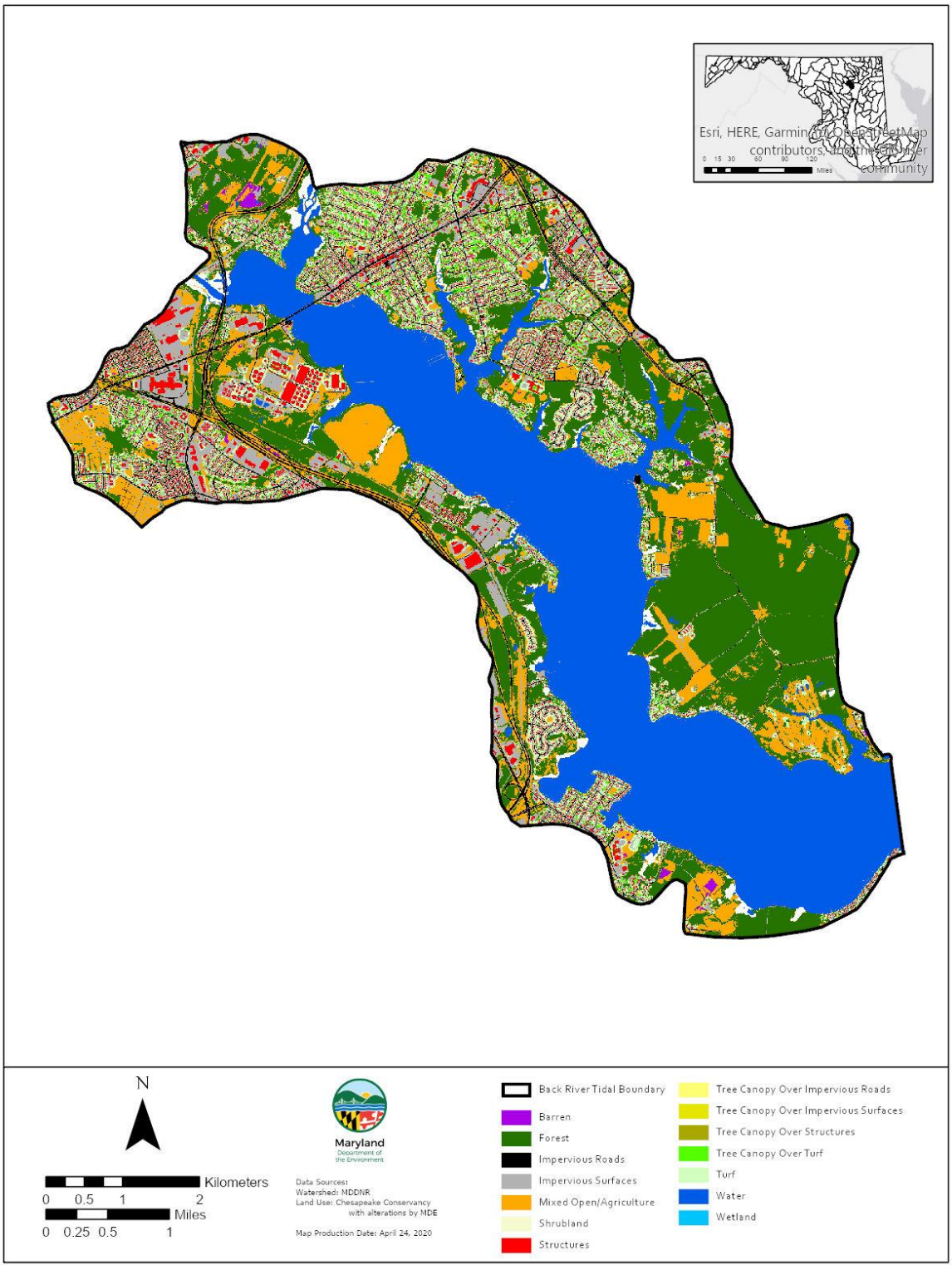



***Figure D - 3:*** *Back River: Tidal - watershed map*

## Back River: Upper | 319 Priority Watershed Maps

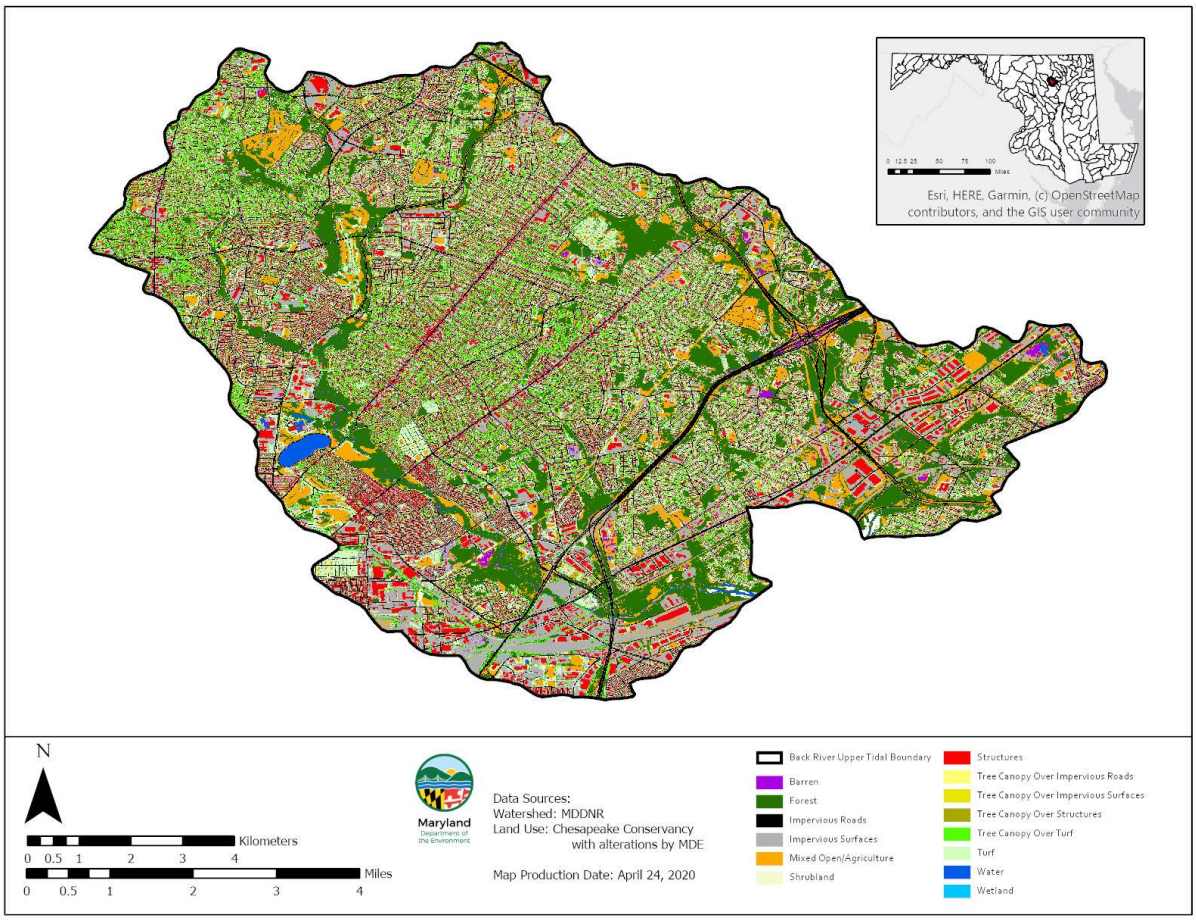



***Figure D - 4:*** *Back River: Upper - watershed map*

## Casselman River | 319 Priority Watershed Maps

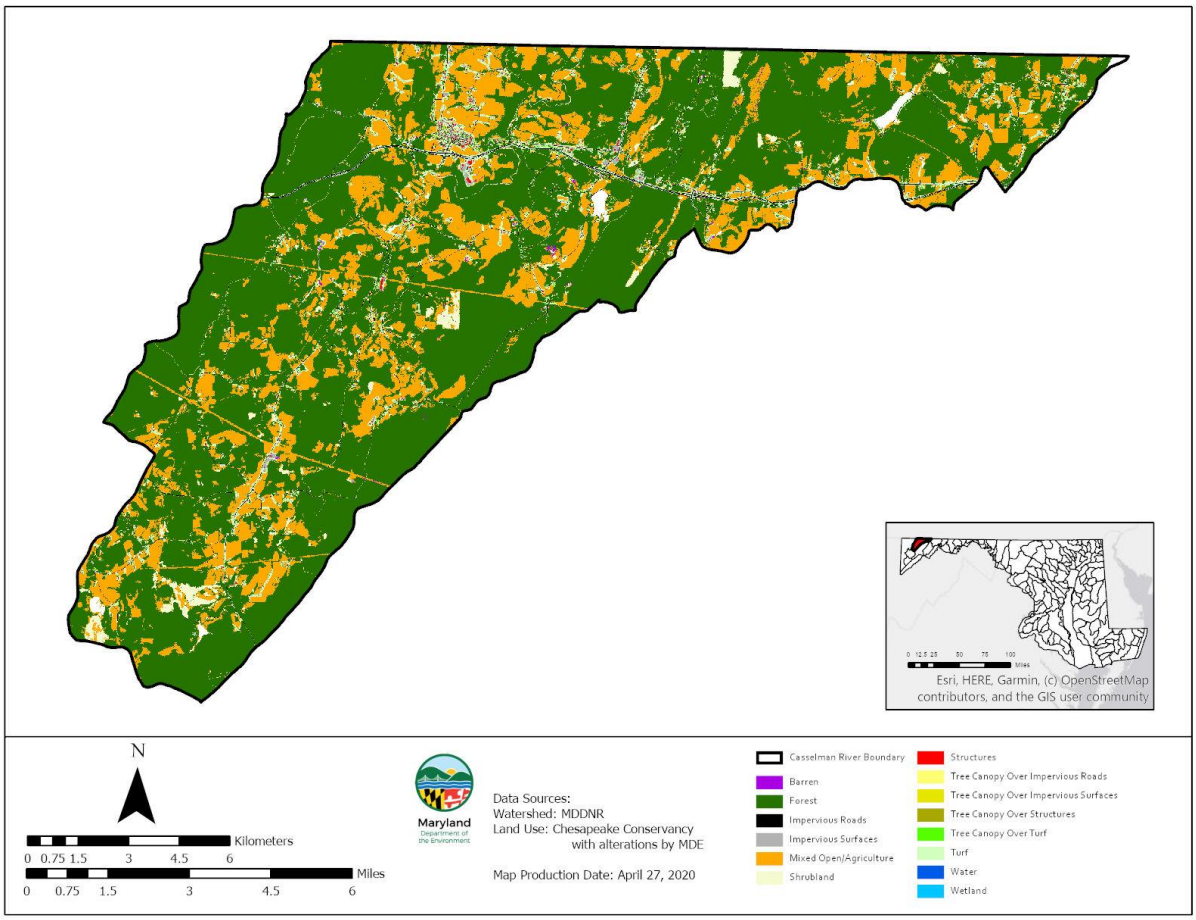



***Figure D - 5:*** *Casselman River - watershed map*

## Choptank River: Upper | 319 Priority Watershed Maps

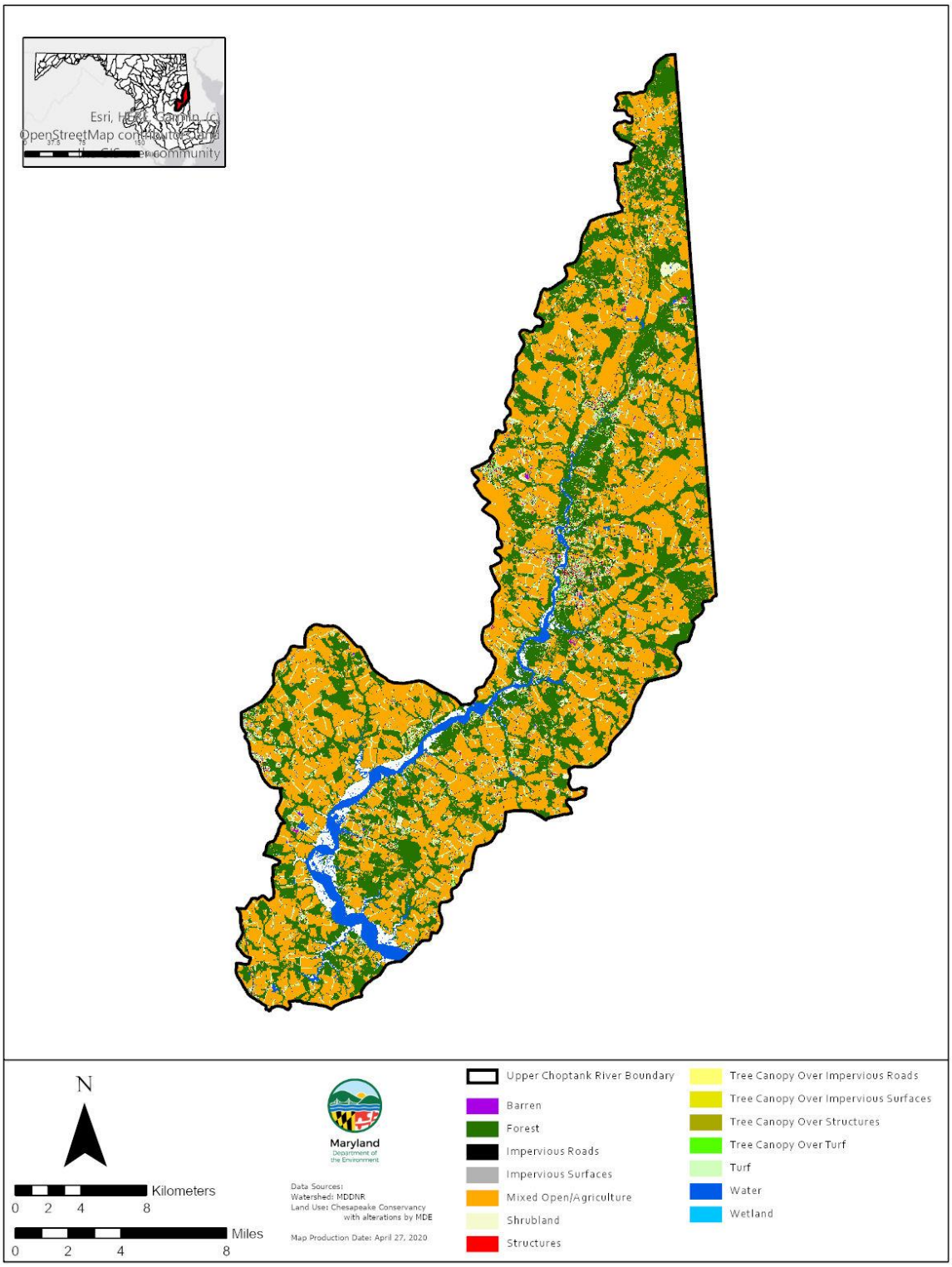



***Figure D - 6:*** *Choptank River: Upper - watershed map*

## Corsica River | 319 Priority Watershed Maps

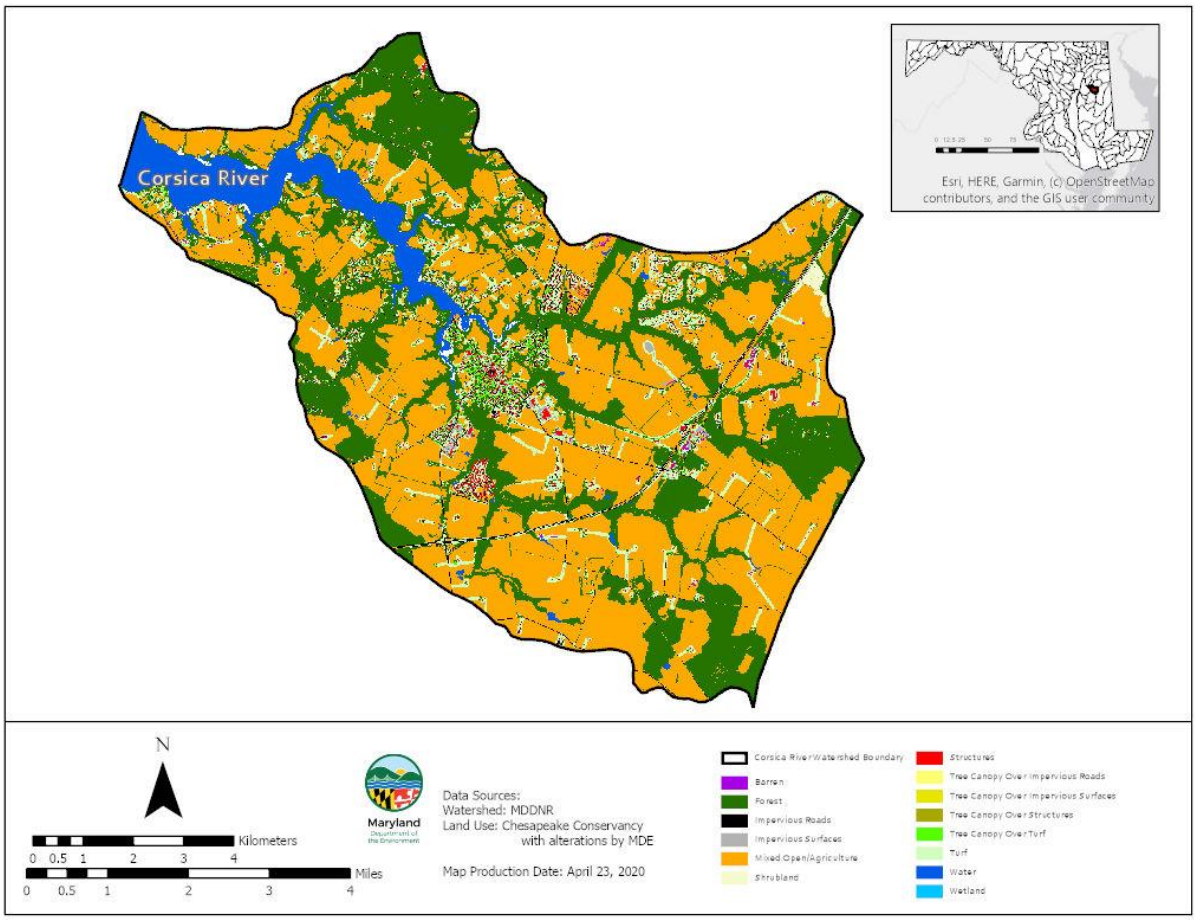



***Figure D - 7:*** *Corsica River - watershed map*

## Gwynns Falls: Middle | 319 Priority Watershed Maps

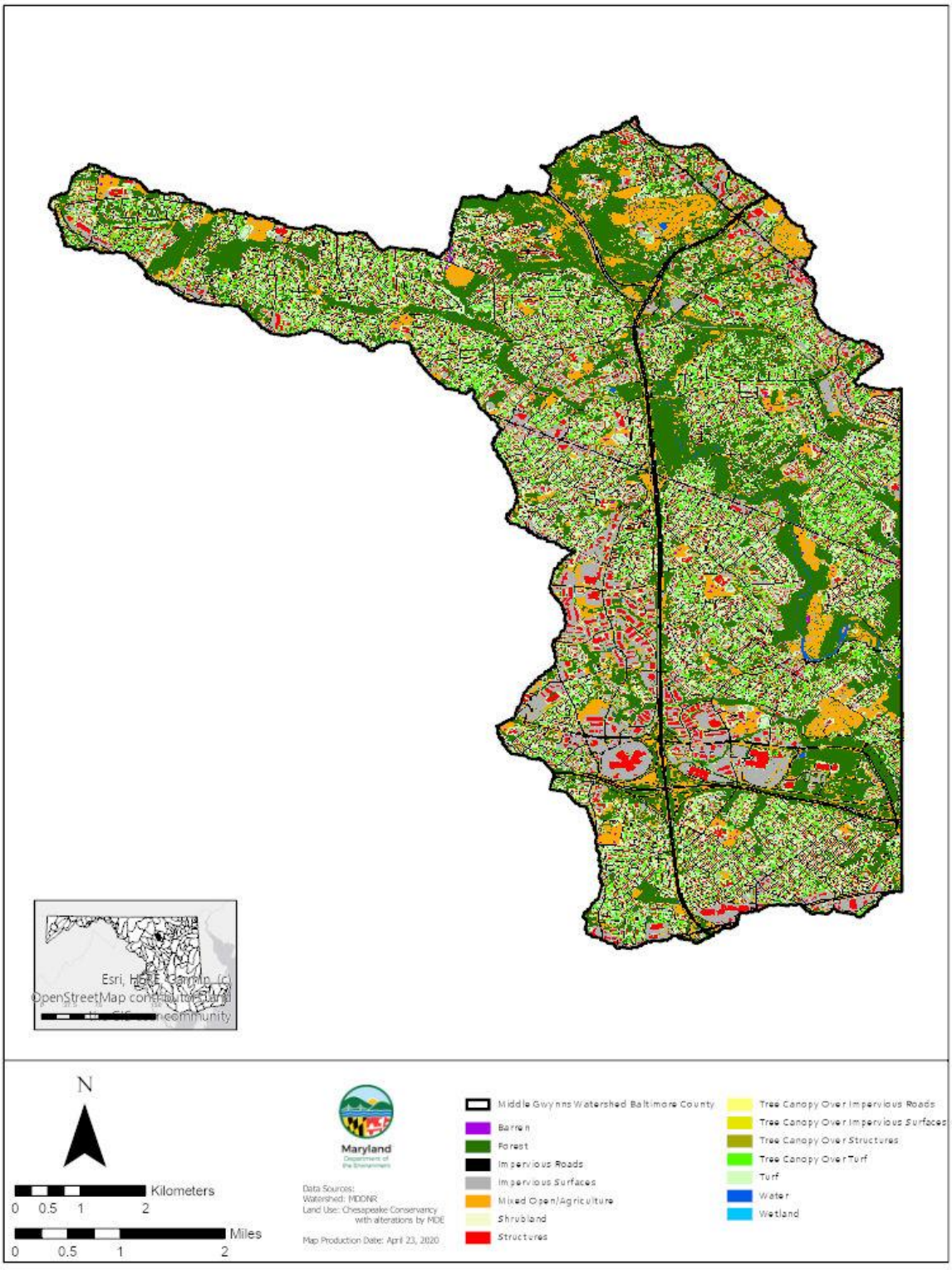



***Figure D - 8:*** *Gwynns Falls: Middle - watershed map*

## Jennings Run: Upper | 319 Priority Watershed Maps

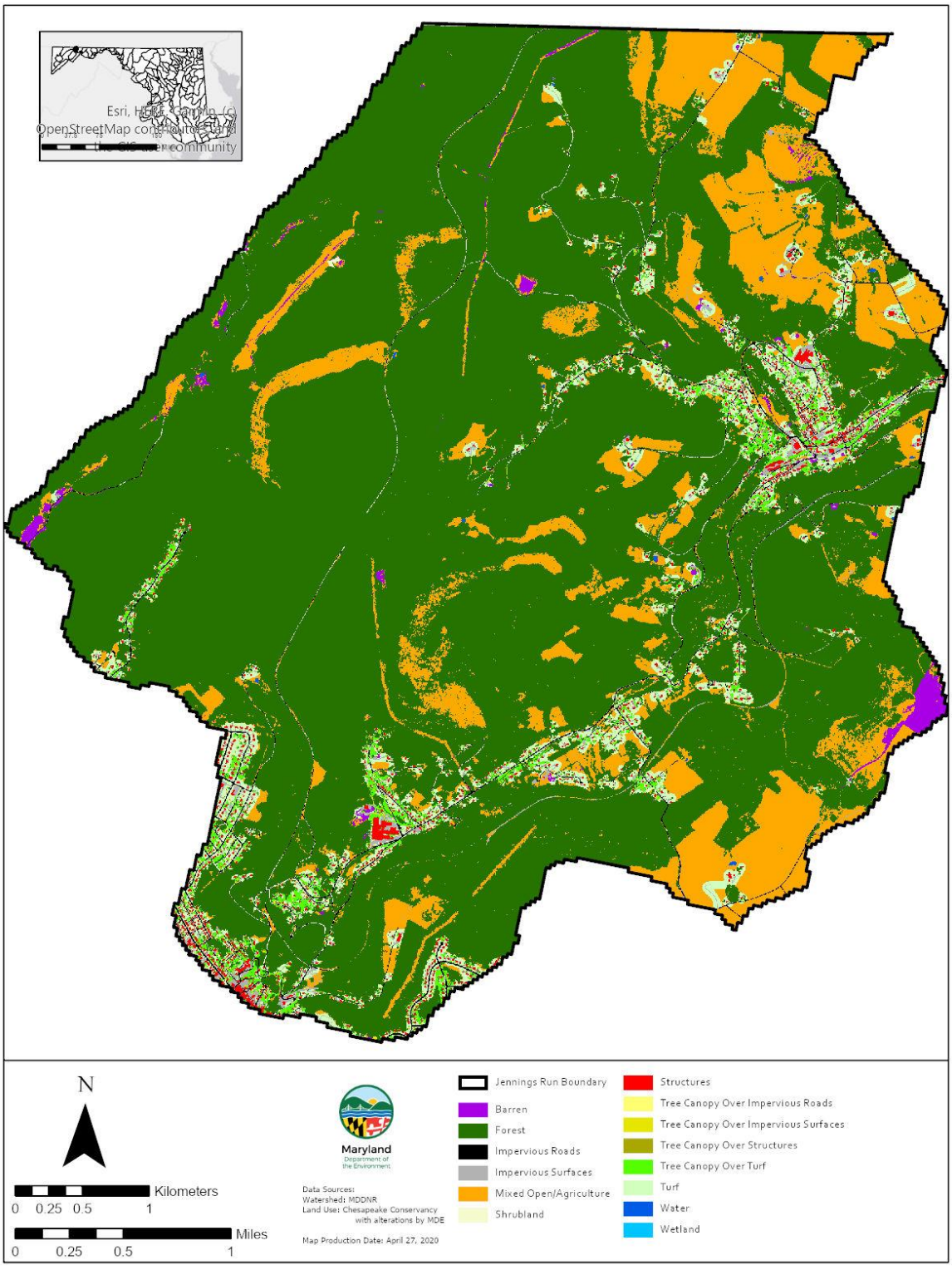



***Figure D - 9:*** *Jennings Run: Upper - watershed map*

## Jones Falls: Lower | 319 Priority Watershed Maps

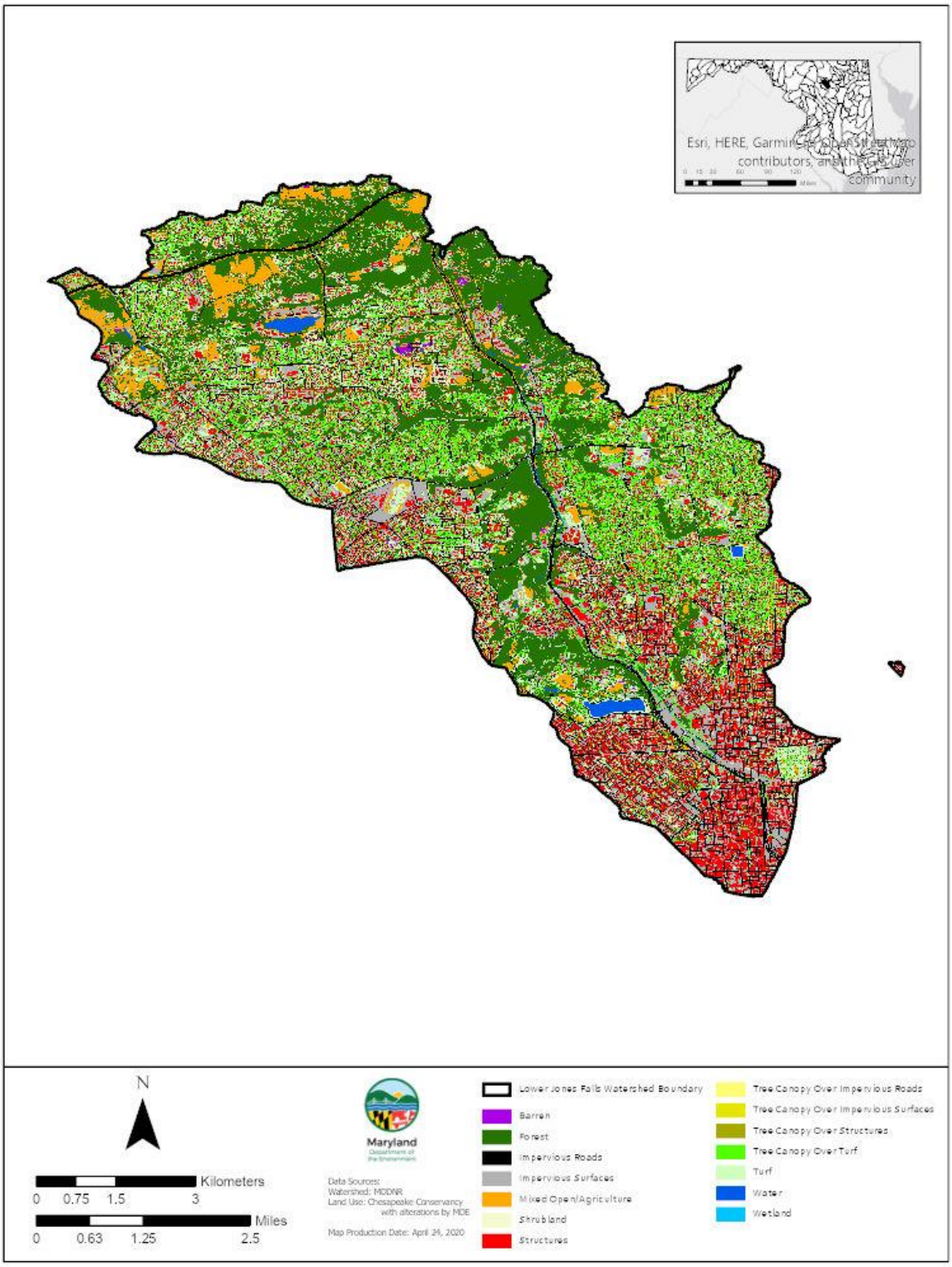



***Figure D - 10:*** *Jones Falls: Lower - watershed map*

## Monocacy River: Lower | 319 Priority Watershed Maps

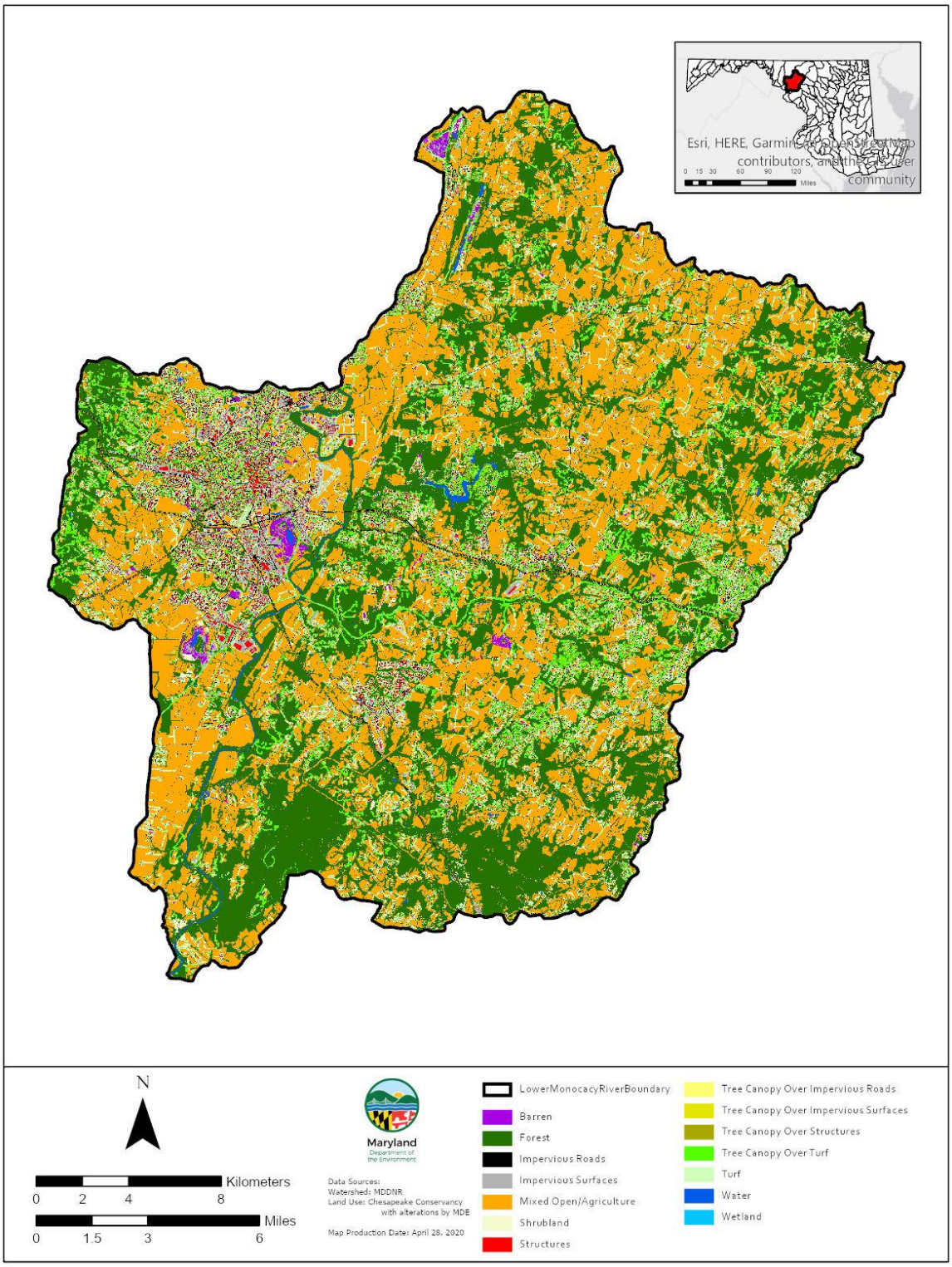



***Figure D - 11:*** *Monocacy River: Lower - watershed map*

## Sassafras River | 319 Priority Watershed Maps

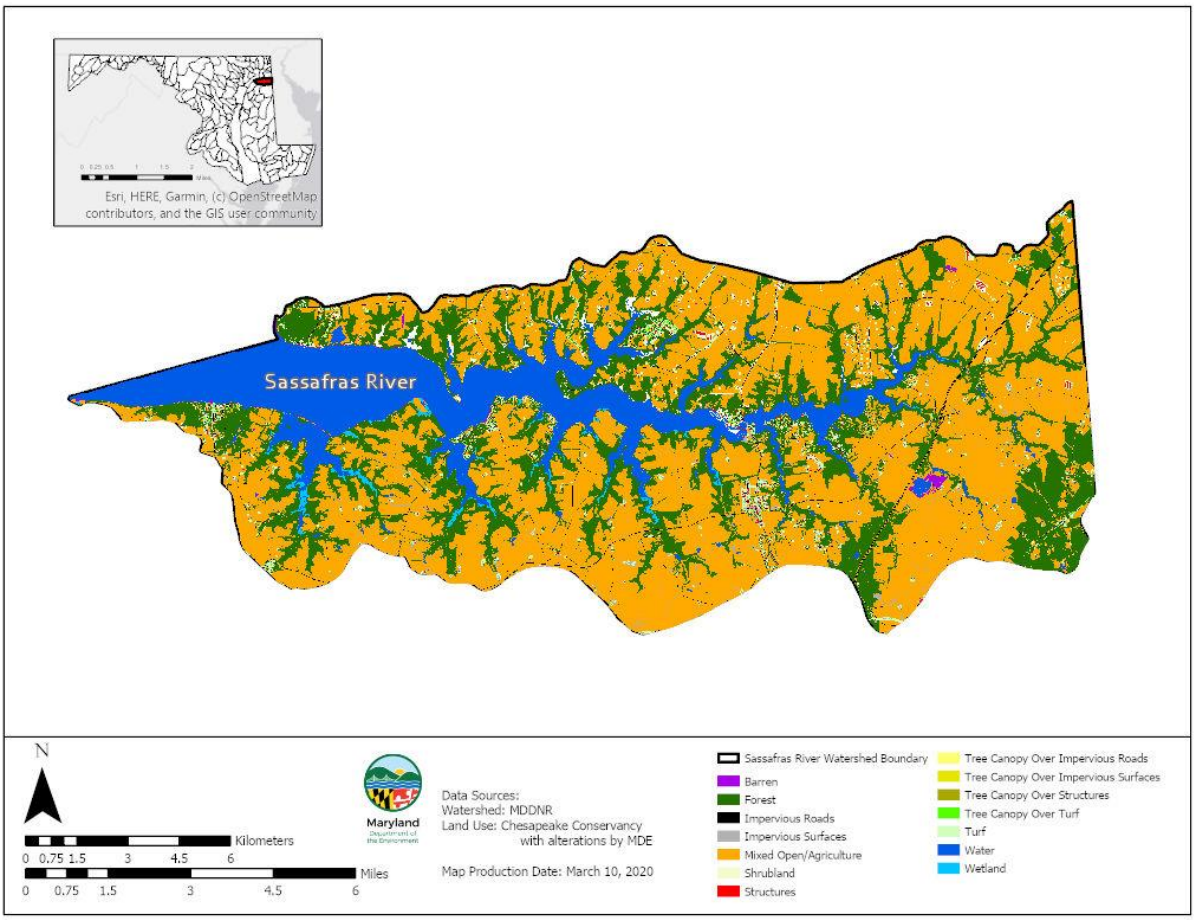



***Figure D - 12:*** *Sassafras River - watershed map*

## Project Details | 319(h) Grant Funded Projects

The following tables (*D - 2 to D - 13)* provide detailed project information for different 319(h) Grant funded projects occurring between the watershed plan approval date and SFY 2019. Estimated load reductions come from the approved watershed plans.

***Table D - 2:*** *Antietam Creek 319(h) Grant funded projects*

| Antietam Creek \| Watershed Plan Approved 2012 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project** | **State Fiscal Year** | **Grant Funding Source** | **319(h) Grant** | **Nitrogen (lbs/yr)** | **Phosphorus (lbs/yr)** | **Sediment (Thousand lbs/yr)** | **Bacteria (Billion/yr)** |
| Shank/Anderson Project Phase 2 | 2012 | 319 FFY11 | $64,253 | 79 | 28 | 795 | 0 |
| Devils Backbone Park Stream Restoration | 2012 | 319 FFY11 | $95,052 | 150 | 51 | 233 | 0 |
| Kiwanis Park Stream Stabilization Phase 2 | 2013 | 319 FFY12 | $39,148 | 17 | 5 | 8 | 0 |
| Greensburg Rd Little Antietam Creek Restoration | 2013 | 319 FFY12 | $229,556 | 110 | 37 | 171 | 0 |
| Barr Property Stream Restoration Phase 1 | 2014 | 319 FFY13 | $148,930 | 12 | 2 | 3 | 0 |
| Kiwanis Park Stream Stabilization Phase 1 | 2015 | 319 FFY14 | $124,341 | 34 | 10 | 34 | 0 |
| Devils Backbone Park Stream Restoration | 2015 | 319 FFY14 | $122,036 | 150 | 51 | 233 | 0 |
| Barr Property Stream Restoration Phase 2 | 2016 | 319 FFY15 | $106,565 | 12 | 2 | 3 | 0 |
| Shank/Anderson Project Phase 3 | 2016 | 319 FFY15 | $448,365 | 79 | 28 | 795 | 0 |
| Little Grove Creek Stream Restoration | 2019 – In Progress | 319 FFY18 | $221,178 | 71 | 65 | 42 | 0 |
| Winders Property Phase 2 | 2019 | 319 FFY18 | $52,585 | 123 | 17 | 2 | 105 |
| **Watershed Totals** | | | **$1,652,008** | **837** | **298** | **2,316** | **105** |

***Table D - 3:*** *Assawoman Bay 319(h) Grant funded projects*

| Assawoman Bay \| Watershed Plan Approved 2020 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project** | **State Fiscal Year** | **Grant Funding Source** | **319(h) Grant** | **Nitrogen (lbs/yr)** | **Phosphorus (lbs/yr)** | **Sediment (Thousand lbs/yr)** | **Bacteria (Billion/yr)** |
| No 319(h) Projects as of SFY 2019 | | | | | | | |
| **Watershed Totals** | | | - | - | - | - | - |

***Table D - 4:*** *Back River: Tidal 319(h) Grant funded projects*

| Back River: Tidal \| Watershed Plan Approved 2010 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project** | **State Fiscal Year** | **Grant Funding Source** | **319(h) Grant** | **Nitrogen (lbs/yr)** | **Phosphorus (lbs/yr)** | **Sediment (Thousand lbs/yr)** | **Bacteria (Billion/yr)** |
| Cheese Creek Stream Restoration | 2011 | 319 FFY10 | $556,443 | 280 | 94 | 428 | 0 |
| **Watershed Totals** | | | **$556,443** | **280** | **94** | **428** | **0** |

***Table D - 5:*** *Back River: Upper 319(h) Grant funded projects*

| Back River: Upper \| Watershed Plan Approved 2008 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project** | **State Fiscal Year** | **Grant Funding Source** | **319(h) Grant** | **Nitrogen** (lbs/yr) | **Phosphorus** (lbs/yr) | **Sediment** (Thousand lbs/yr) | **Bacteria** (Billion/yr) |
| Redhouse Run/St. Patrick's Stream Restoration | 2008 | 319 FFY07 | $418,500 | 609 | 32 | 11 | 0 |
| Upper Back River Stormwater Conversions | 2009 | 319 FFY08 | $95,884 | 52 | 12 | 4 | 0 |
| Herring Run/Overlook Park Stream Restoration | 2015 | 319 FFY14 | $358,032 | 314 | 284 | 188 | 0 |
| **Watershed Totals** | | | **$872,416** | **974** | **328** | **203** | **0** |

***Table D - 6:*** *Casselman River 319(h) Grant funded projects*

| Casselman River \| Watershed Plan Approved 2012 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project** | **State Fiscal Year** | **Grant Funding Source** | **319(h) Grant** | **Nitrogen** (lbs/yr) | **Phosphorus** (lbs/yr) | **Sediment** (Thousand lbs/yr) | **Bacteria** (Billion/yr) |
| AMD pH Remediation GIS Tool | 2012 | 319 FFY11 | $83,619 | 0 | 0 | 0 | 0 |
| **Watershed Totals** | | | **$83,619** | **0** | **0** | **0** | **0** |

***Table D - 7:*** *Choptank River: Upper 319(h) Grant funded projects*

| Choptank River: Upper \| Watershed Plan Approved 2010 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project** | **State Fiscal Year** | **Grant Funding Source** | **319(h) Grant** | **Nitrogen** (lbs/yr) | **Phosphorus** (lbs/yr) | **Sediment** (Thousand lbs/yr) | **Bacteria** (Billion/yr) |
| DPW Stormwater Retrofits | 2011 | 319 FFY10 | $46,213 | 11 | 8 | 2 | 0 |
| Upper Choptank Watershed Restoration | 2013 | 319 FFY12 | $130,781 | 8 | 1 | 0 | 0 |
| Volunteer Fire Comp. SWM Upgrades | 2013 | 319 FFY12 | $37,834 | 4 | 1 | 0 | 0 |
| Upper Choptank Watershed Restoration | 2014 | 319 FFY13 | $138,379 | 16 | 3 | 0 | 0 |
| Dept. Emergency Services Porous Parking | 2015 | 319 FFY14 | $137,449 | 2 | 0 | 0 | 0 |
| North County Park Design | 2019 | 319 FFY18 | $30,080 | 409 | 262 | 942 | 0 |
| **Watershed Totals** | | | **$520,736** | **451** | **274** | **944** | **0** |

***Table D - 8:*** *Corsica River 319(h) Grant funded projects*

| Corsica River \| Watershed Plan Approved 2004 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Project | State Fiscal Year | Grant Funding Source | 319(h) Grant | Nitrogen (lbs/yr) | Phosphorus (lbs/yr) | Sediment (Thousand lbs/yr) | Bacteria (Billion/yr) |
| Agricultural Technical Assistance | 2005 | 319 FFY04 | 32,380 | 0 | 0 | 0 | 0 |
| Watershed Restoration | 2006 | 319 FFY05 | 232,666 | 0 | 0 | 0 | 0 |
| Agricultural Technical Assistance | 2006 | 319 FFY05 | 145,554 | 767 | 79 | 0 | 0 |
| Watershed Restoration | 2007 | 319 FFY06 | 241,975 | 62 | 6 | 0 | 0 |
| Agricultural Technical Assistance | 2007 | 319 FFY06 | 14,273 | 2,413 | 233 | 0 | 0 |
| Corsica and Beyond | 2007 | 319 FFY06 | 124,281 | 0 | 0 | 0 | 0 |
| Agricultural Technical Assistance | 2008 | 319 FFY07 | 22,187 | 286 | 10 | 0 | 0 |
| Agricultural Technical Assistance | 2009 | 319 FFY08 | 50,780 | 46 | 3 | 0 | 0 |
| Bioretention Swale | 2009 | 319 FFY08 | 50,000 | 0 | 0 | 1 | 0 |
| Watershed Restoration | 2010 | 319 FFY09 | 270,427 | 5 | 1 | 1 | 0 |
| Agricultural Technical Assistance | 2010 | 319 FFY09 | 58,539 | 149 | 10 | 0 | 0 |
| Agricultural Technical Assistance | 2011 | 319 FFY10 | 61,590 | 887 | 84 | 0 | 0 |
| Watershed Restoration | 2012 | 319 FFY11 | 278,237 | 58 | 5 | 2 | 0 |
| Agricultural Technical Assistance | 2012 | 319 FFY11 | 66,701 | 127 | 17 | 0 | 0 |
| Board of Education Bioretention | 2012 | 319 FFY11 | 22,432 | 5 | 0 | 0 | 0 |
| Watershed Restoration | 2013 | 319 FFY12 | 81,675 | 7 | 1 | 0 | 0 |
| Agricultural Technical Assistance | 2013 | 319 FFY12 | 51,000 | 0 | 80 | 0 | 0 |
| Board of Ed. Phase 2: Kramer Center | 2013 | 319 FFY12 | 66,625 | 61 | 8 | 6 | 0 |
| Agricultural Technical Assistance | 2014 | 319 FFY13 | 47,810 | 0 | 1 | 0 | 0 |
| **Watershed Totals** | | | **$1,919,132** | **4,873** | **538** | **11** | **0** |

***Table D - 9:*** *Gwynns Falls: Middle 319(h) Grant funded projects*

| Gwynns Falls: Middle \| Watershed Plan Approved 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Project | State Fiscal Year | Grant Funding Source | 319(h) Grant | Nitrogen (lbs/yr) | Phosphorus (lbs/yr) | Sediment (Thousand lbs/yr) | Bacteria (Billion/yr) |
| Scotts Level Upper Scotts Level Park Stream Restoration | 2019 – In Progress | 319 FFY18 | $450,000 | 1,795 | 826 | 1,574 | 0 |
| **Watershed Totals** | | | **$450,000** | **1,795** | **826** | **1,574** | **0** |

***Table D - 10:*** *Jennings Run: Upper 319(h) Grant funded projects*

| Jennings Run: Upper \| Watershed Plan Approved 2019 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project** | **State Fiscal Year** | **Grant Funding Source** | **319(h) Grant** | **Nitrogen (lbs/yr)** | **Phosphorus (lbs/yr)** | **Sediment (Thousand lbs/yr)** | **Bacteria (Billion/yr)** |
| No 319(h) Grant Projects as of SFY 2019. | | | | | | | |
| **Watershed Totals** | | | - | - | - | - | - |

***Table D - 11:*** *Jones Falls: Lower 319(h) Grant funded projects*

| Jones Falls: Lower \| Watershed Plan Approved 2008 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project** | **State Fiscal Year** | **Grant Funding Source** | **319(h) Grant** | **Nitrogen (lbs/yr)** | **Phosphorus (lbs/yr)** | **Sediment (Thousand lbs/yr)** | **Bacteria (Billion/yr)** |
| No 319(h) Grant Projects between SFY 2008 and SFY 2019. | | | | | | | |
| **Watershed Totals** | | | - | - | - | - | - |

***Table D - 12:*** *Monocacy River: Lower 319(h) Grant funded projects*

| Monocacy River: Lower \| Watershed Plan Approved 2008 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project** | **State Fiscal Year** | **Grant Funding Source** | **319(h) Grant** | **Nitrogen (lbs/yr)** | **Phosphorus (lbs/yr)** | **Sediment (Thousand lbs/yr)** | **Bacteria (Billion/yr)** |
| Urban Wetlands, Bennett Creek Pilot | 2008 | 319 FFY07 | $196,733 | 101 | 19 | 3 | 0 |
| Urban Wetlands, Bennett Creek Pilot | 2009 | 319 FFY08 | $228,361 | 150 | 31 | 6 | 0 |
| Green Infrastructure | 2011 | 319 FFY10 | $284,739 | 351 | 34 | 8 | 0 |
| Neighborhood Green Infrastructure | 2014 | 319 FFY13 | $89,107 | 30 | 0 | 2 | 0 |
| **Watershed Totals** | | | **$798,940** | **632** | **84** | **19** | **0** |

***Table D - 13:*** *Sassafras River 319(h) Grant funded projects*

| Sassafras River \| Watershed Plan Approved 2009 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project** | **State Fiscal Year** | **Grant Funding Source** | **319(h) Grant** | **Nitrogen (lbs/yr)** | **Phosphorus (lbs/yr)** | **Sediment (Thousand lbs/yr)** | **Bacteria (Billion/yr)** |
| Galena Elementary School Stormwater Wetland | 2013 | 319 FFY12 | $14,000 | 1 | 0 | 0 | 0 |
| Phipps Treatment Wetlands & Sediment Traps | 2014 | 319 FFY13 | $50,000 | 99 | 20 | 5 | 0 |
| **Watershed Totals** | | | **$64,000** | **101** | **20** | **5** | **0** |

# Appendix E | Priority Watershed Monitoring

Each year, Maryland conducts water quality monitoring in 319 Priority Watersheds. During this reporting period (*SFY18 - SFY19*), MDE performed watershed monitoring for Casselman River and Corsica River. MDE is currently working on a water quality monitoring web page to show past monitoring. Future reports will link to this website, once available.

## Casselman River | pH Impairment Monitoring

Casselman River has a pH TMDL and has 319(h) Grant funded BMPs to remediate pH impairments. Pre-BMP implementation monitoring was concluded and BMPs were installed in 2016. Phase II of the watershed monitoring is currently ongoing and will establish post-BMP implementation water quality changes. In 2018, 14 Phase II stations were monitored (Figure E - 1).

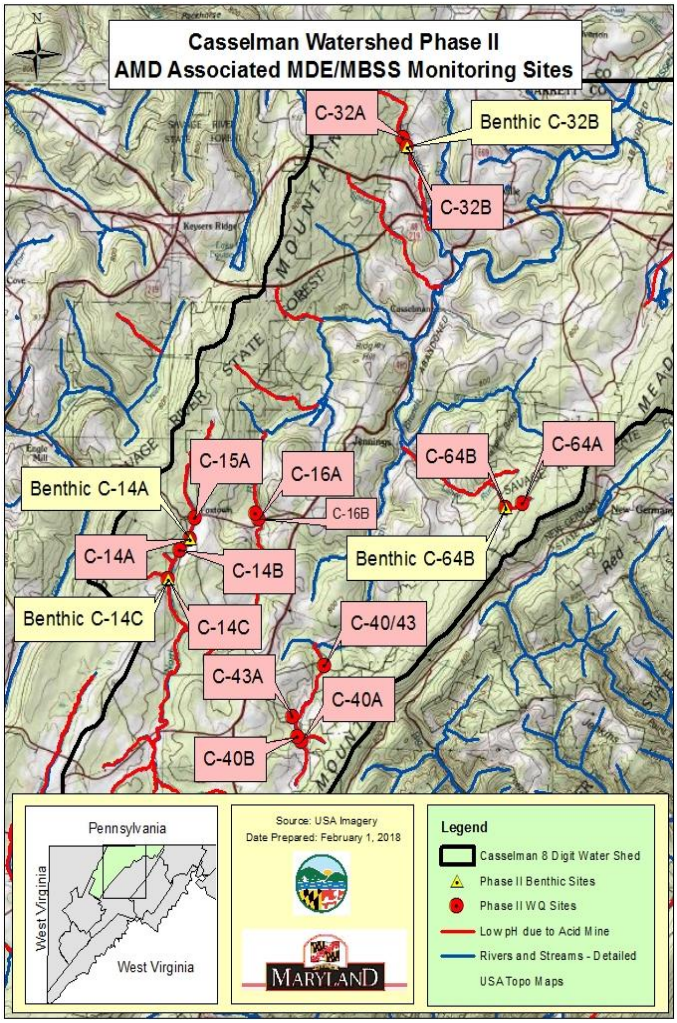



***Figure E - 1:*** *Casselman River watershed Phase II sampling stations*

## Corsica River | Nutrient and Sediment Impairment Monitoring

Corsica River is impaired by nutrient and sediment pollution and is an EPA National Non-Point Source Monitoring Project. The project's goal is to evaluate the effectiveness of the Corsica River Watershed Management Plan, progress towards satisfying the river's TMDL and, and, ultimately removing Corsica River from the list of impaired waters.

### *Long Term Monitoring | Corsica River*

During 2018, weekly quality grab samples and weekly flow weighted composite samples were collected from three main Corsica River tributaries (*Old Mill Stream Branch (OMS), Gravel Branch (GVL), and Three Bridges Branch (TBB));* grab samples were collected from an adjoining control site (*Jarman Branch (JB))* (Figure E - 2).

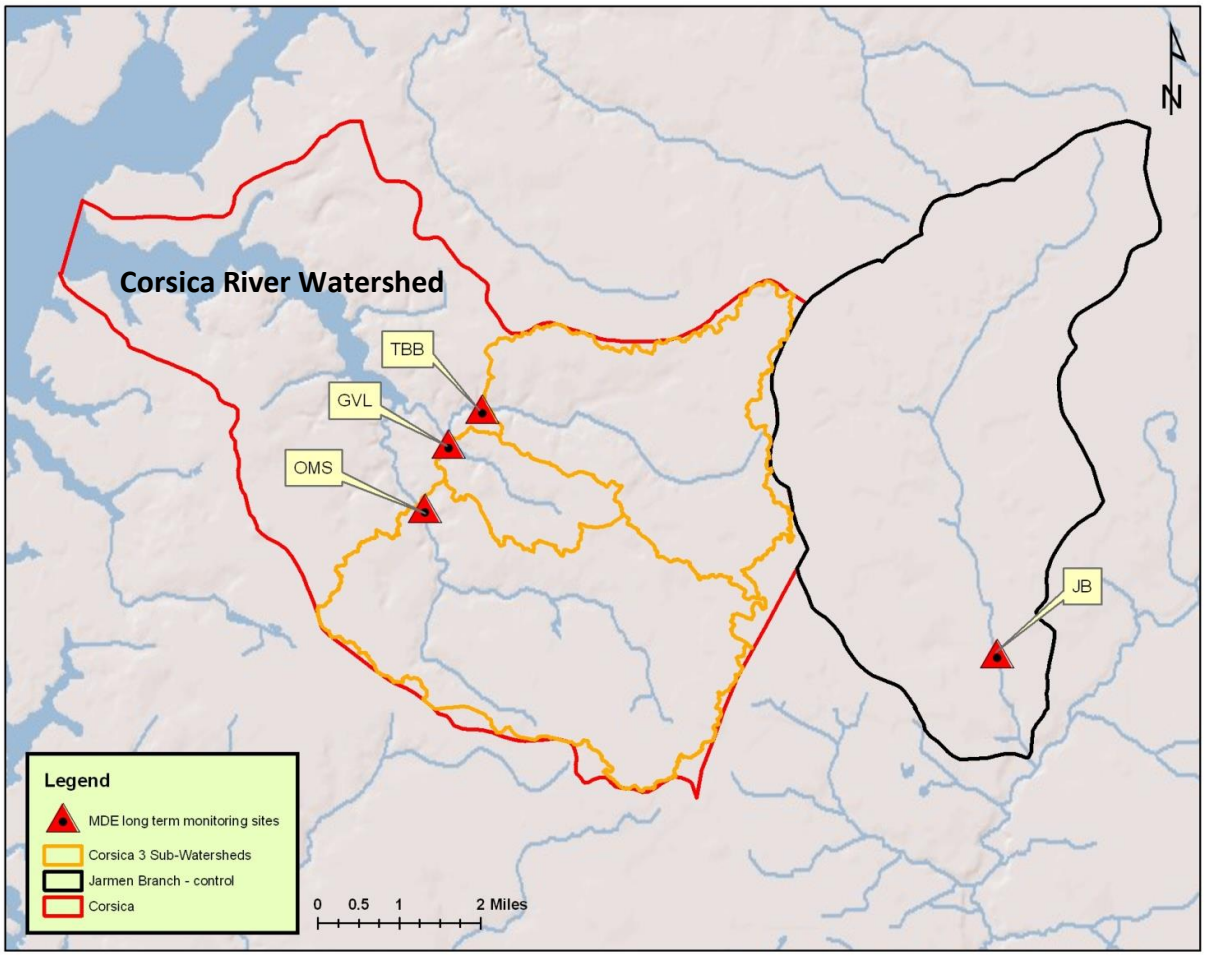



***Figure E - 2:*** *Long term sampling sites in Corsica River and Jarman Branch watersheds*

During SFY18, 208 weekly grab samples (Table E - 1) and 113 weekly composite samples (Table E - 2) were collected from the Corsica River tributaries. The resulting data from the grab samples shows a small but steady decline in both nitrogen and phosphorus (Figure E - 3) (*page E - 4).* The composite sample shows a small reduction in Phosphate (Figure E - 4) (p*age E - 5).*

***Table E - 1:*** *Corsica River watershed weekly grab samples*

| Station | Whole | Filtered |
|---|---|---|
| Gravel Branch | 52 | 52 |
| Old Mill Stream | 52 | 52 |
| Three Bridges Branch | 52 | 52 |
| Jarman Branch *(Control)* | 52 | 52 |
| **Total** | **208** | **208** |

***Table E - 2:*** *Corsica River watershed weekly composite samples*

| Station | Composite |
|---|---|
| Gravel Branch | 17 |
| Old Mill Stream | 51 |
| Three Bridges Branch | 45 |
| Jarman Branch *(Control)* | 52 |
| **Total** | **113** |

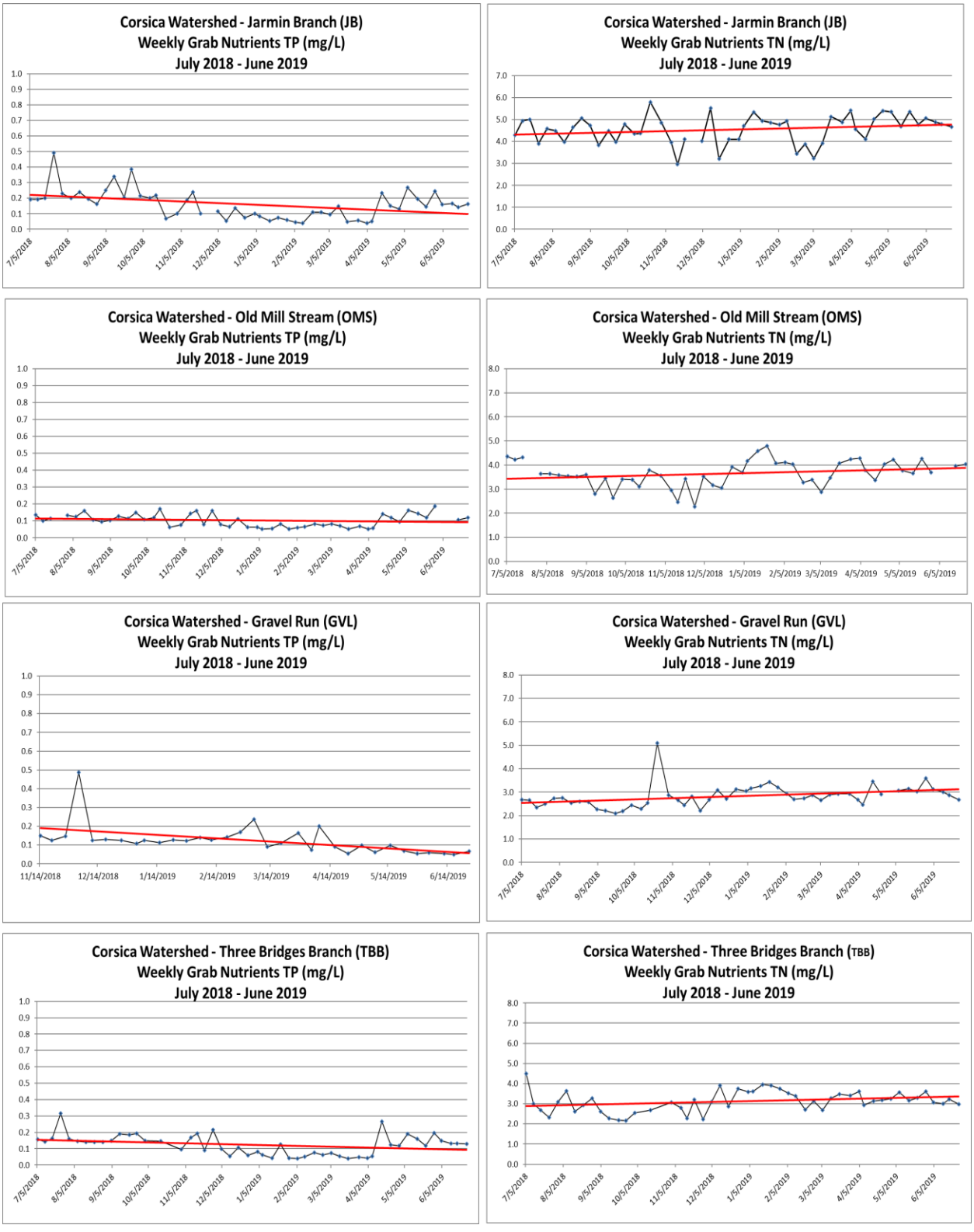



***Figure E - 3:*** *Weekly grab sample nutrient loads*

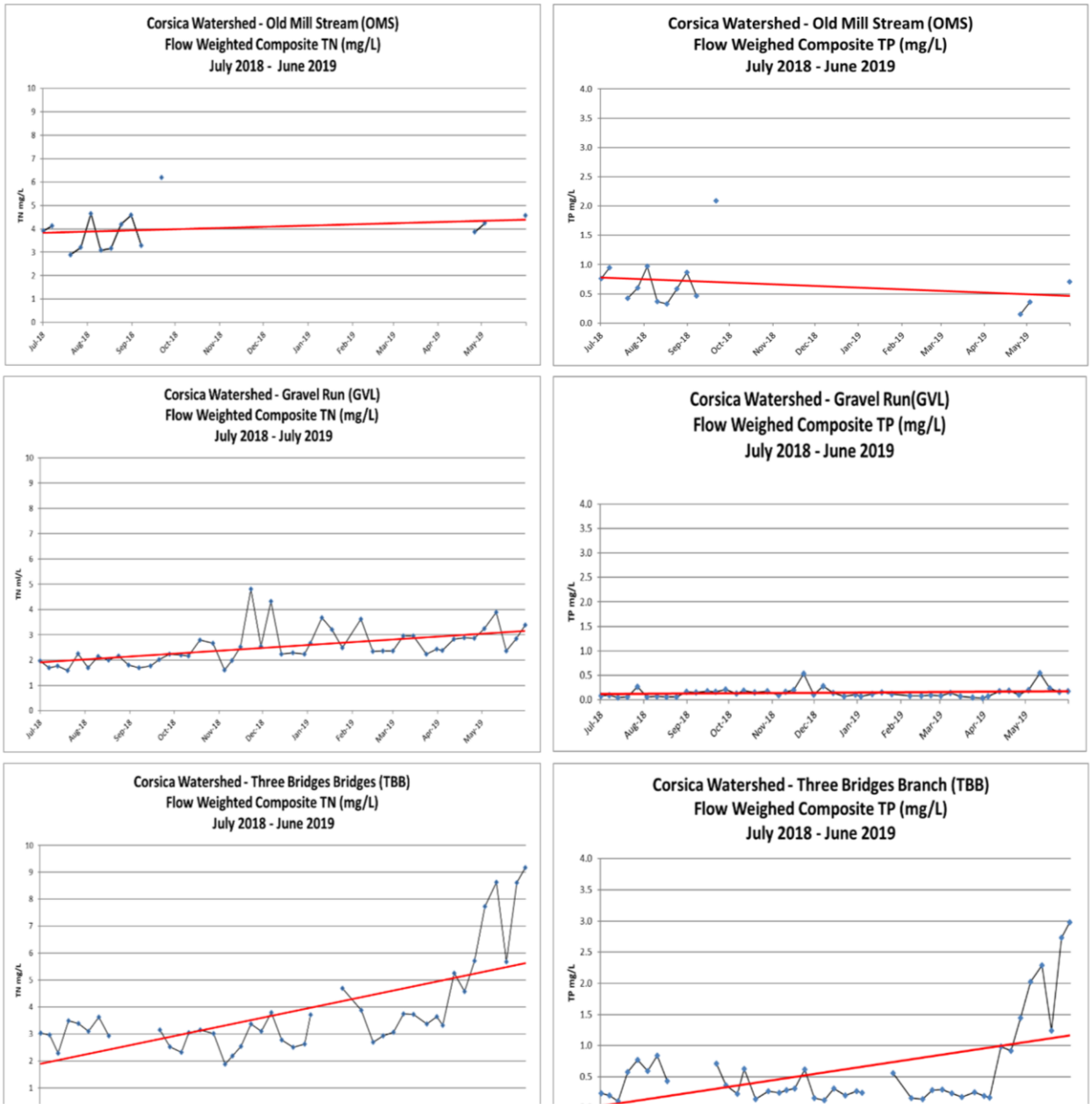



***Figure E - 4:*** *Weekly composite sample nutrient loads*

## *Synoptic Surveys | Corsica River*

Maryland conducts synoptic surveys in the Corsica River watershed to highlight seasonal differences in nutrient concentrations and identify nutrient "hot spots." Identified hot spots can be subjected to more focused water quality monitoring to determine the source of excessive pollution (Figure E - 5). Once the pollution source is known, BMPs can be targeted to directly mitigate the pollution source and remediate the hot spot.

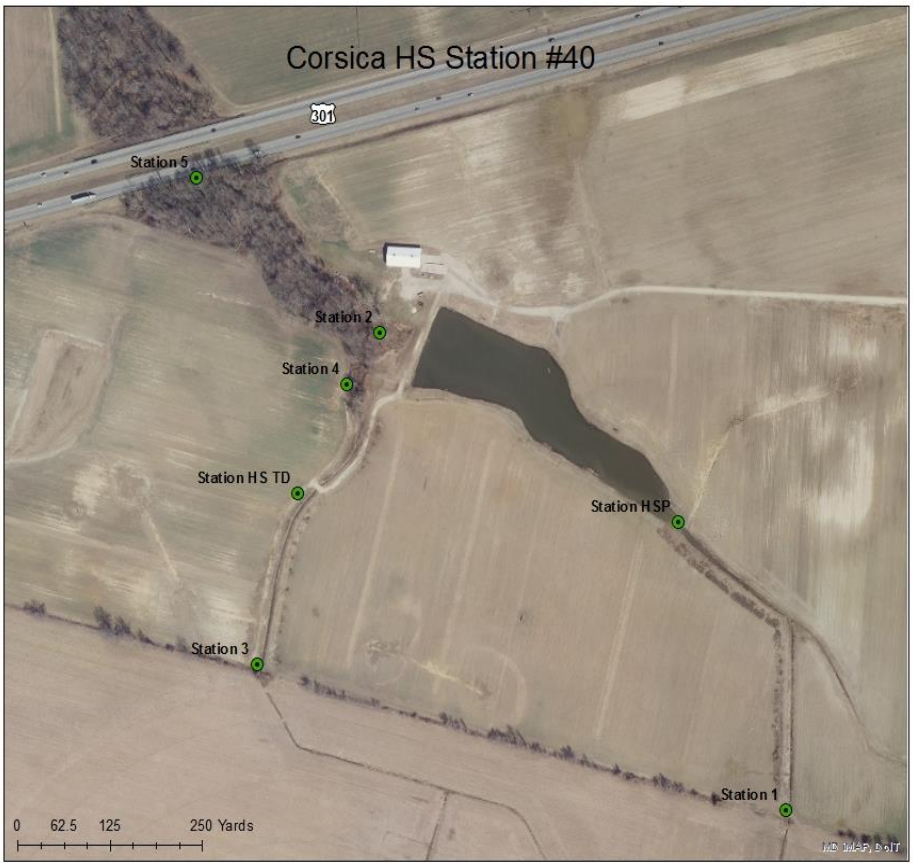



***Figure E - 5:*** *Hot Spot stations in the Corsica River watershed*

During this reporting cycle, 69 synoptic survey samples were collected, and 39 hots spot survey samples were collected (Table E - 3); stations are shown in Figure E - 6 (*page E - 7)*.

***Table E - 3:*** *Corsica River watershed synoptic survey samples collected*

| Station | Whole | Filtered |
|---|---|---|
| Fall 2018 | 33 | 33 |
| Spring 2018 | 36 | 36 |
| **Synoptic Total** | **69** | **69** |
| Hot Spot | 39 | 39 |
| **Synoptic and Hot Spot Total** | **108** | **108** |

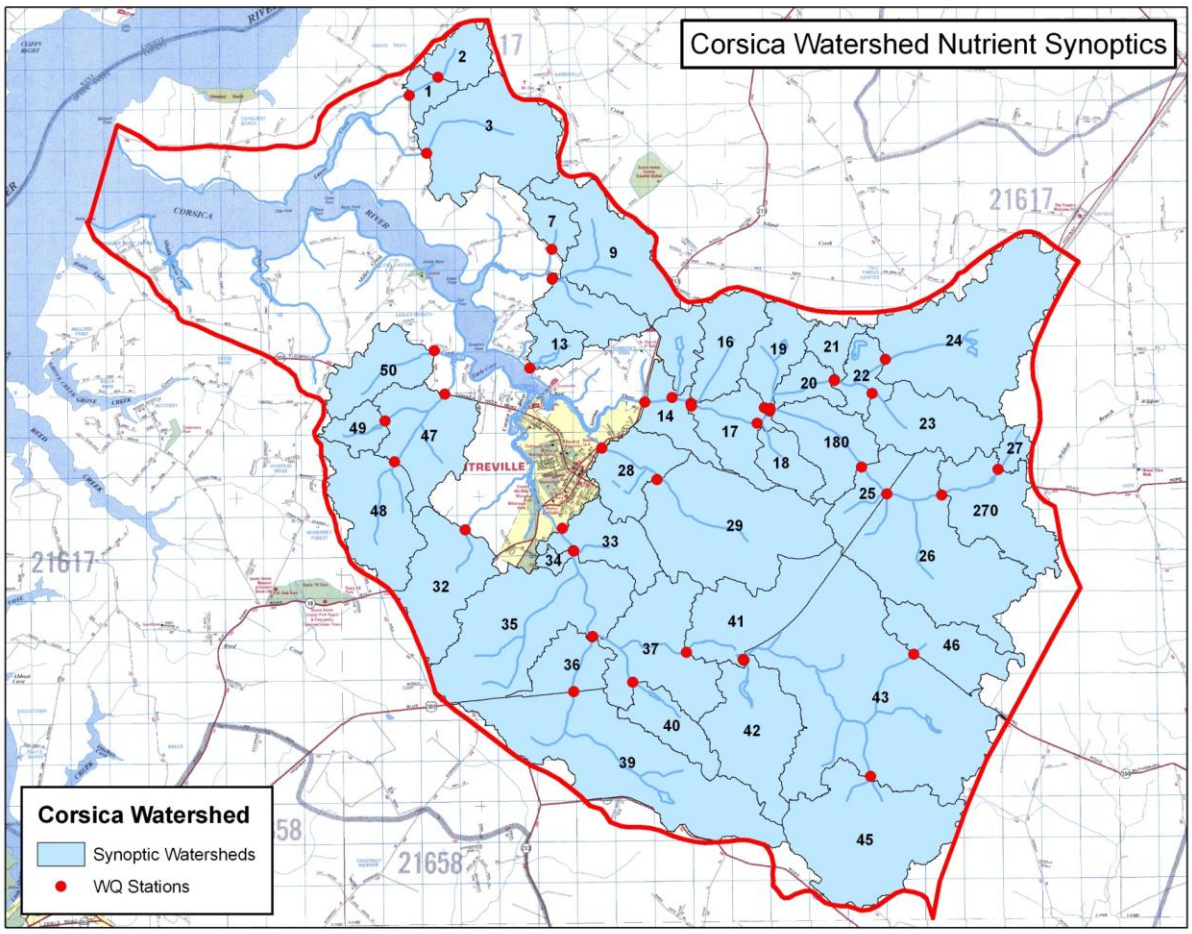



***Figure E - 6:*** *Corsica River watershed synoptic survey locations*