

Maryland's 2015-2019 Nonpoint Source Management Plan



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TABLE OF CONTENTS ----- see first page(s) of each chapter for subheadings

- Executive Summary
- Chapter 1 – Introduction
- Chapter 2 – Objectives and Milestones
- Chapter 3 – Resource Assessment and Monitoring Programs
- Chapter 4 – Maryland NPS Programs and Initiatives
- Chapter 5 – Watershed Management to Achieve NPS Goals
- Chapter 6 – Public Education, Outreach and Financial Assistance

APPENDICES

- Abbreviations
- Maryland’s Chesapeake Bay Two-Year Milestones
- Components of Maryland’s 2015-2019 Nonpoint Source Management Plan
 - o (Documents designated as integral parts of Maryland’s NPS management plan)
- Internet Sources
- Milestones for Tracking Progress

2016 UPDATE LISTING

- Cover – date of update added
- Page iii – revised listing of Appendices and added 2016 Update Listing
- Pages 6-36 and 6-67 -- Section 6.C.2.i updated
- Appendix: Maryland’s Chesapeake Bay Two-Year Milestones – 2016-2017 added
- Appendix: Internet Sources – updated links and deleted nonfunctional links

EXECUTIVE SUMMARY

Motivation and Scope

Maryland's 2015-2019 Nonpoint Source Management Plan (Plan) is drafted to address two federal requirements: 1) The Federal Clean Water Act Section 319(b) requires preparation of a state nonpoint source management program plan for approval by the US Environmental Protection Agency (EPA). EPA most recently approved Maryland's program in 1999. 2) EPA adopted new guidelines in 2013 that require states to update or revise their nonpoint source (NPS) management program at least every five years.

The 319 Nonpoint Source Program, responsible for this document, is housed in the Maryland Department of Environment's Science Services Administration. With an annual budget of \$2 million/year, this Program is a relatively small in comparison to the much larger array of State nonpoint source management activities, which had documented State expenditures of more than \$54 million in SFY 2014. EPA requires this Plan to serve as an umbrella document that references the many diverse NPS management components that are led by various State programs in Maryland.

This document, which covers the years 2015 – 2019, will be updated or revised at least every five years to meet EPA requirements. During intervening years, program documents that are identified as Components of the Maryland Nonpoint Source Management Program may be updated or revised independently of this document. In addition, the table of milestones identified in the appendix of this document will be updated annually to gauge progress of selected programs and to support EPA oversight.

Organizing Principles, Objectives, Milestones and General Strategies

This Plan is founded on several organizing principles that align with the technical nature of nonpoint source pollution management including types of pollutants, pollutant sources, geographies and types of water bodies. In addition, the Plan is closely aligned with the eight key elements of an effective NPS Program identified in EPA guidance. With these in mind, the Plan identifies eight objectives, outlined below.

- **Objective 1 – Regional Coverage:** Ensure that the Program addresses the three broad geographic regions of the State: The central Chesapeake Bay drainage, the far western drainage in the Casselman and Youghiogheny Rivers, and the coastal bays and Atlantic Ocean drainage.
- **Objective 2 – Multiple Scales:** Ensure that the Program is attentive to multiple scales of geography at which different NPS issues are managed.
- **Objective 3 – Pollutants and Stressors:** Ensure that the Program is comprehensive with regard to addressing the many types of nonpoint source pollutants and stressors.
- **Objective 4 - Pollutant Sources:** Ensure that the Program is comprehensive with regard to addressing the wide range of pollutant sources.

- **Objective 5 – Types of Waterbodies:** Ensure that the Program is comprehensive with regard to addressing the various types of waterbodies impaired by nonpoint source pollution.
- **Objective 6 – Protection and Restoration:** Ensure that the Program balances protection and restoration needs.
- **Objective 7 – Priority Setting:** Ensure that the Program has explicit means of setting priorities to ensure that NPS problems are addressed in a timely, efficient and effective manner.
- **Objective 8 – Program Management and Evaluation:** Ensure that the Program has procedures to promote efficient fiscal and functional management and metrics by which these can be evaluated.

The Plan identifies milestones, which represent specific, near-term metrics for the objectives. The milestones address both technical aspects of the State’s nonpoint source management activities and administrative aspects of the 319 NPS Program administered by the Maryland Department of Environment’s Science Services Administration (MDE SSA). The milestones set annual commitments for the five-year period 2015-2019. To the degree possible the milestones are organized in groups for each objective outlined above for the Statewide Milestones. However, Objective 1 (Regional Coverage) is addressed within the Watershed Milestones and Objective 2 (Multiple Scales) is addressed implicitly, for example, by having statewide programs, watershed scale initiatives and on-the-ground projects. The following is a summary of the Milestones:

- **Milestones for Objective 3 – Pollutants and Stressors**
 - Milestones are identified for particular pollutants including nitrogen, phosphorus, sediment, bacteria, chloride, PCBs, mercury
- **Milestones for Objective 4 - Pollutant Sources**
 - Specific sources of NPS pollution are listed with the milestones associated with them including agriculture, on-site disposal systems, urban/suburban stormwater and erosion & sediment control, forestry, resource extraction, and hydromodifications.
- **Milestones for Objective 5 – Types of Waterbodies**
 - Phase I MS4 jurisdiction stormwater waste allocation (WLA) implementation plans for reservoir TMDLs.
 - Annual reports for major drinking water reservoir technical advisory groups.
 - Milestones for watersheds with EPA-accepted plans that are eligible for 319(h) Grant implementation funding are organized by major drainage area with milestones listed for each watershed.
 - Chesapeake Bay watersheds: Antietam Creek, Back River (tidal and non-tidal waters), Choptank River (upper), Corsica River, Gwynns Falls (middle), Jones Falls (lower), Monocacy River (lower), and the Sassafras River.
 - Western Maryland – Casselman River and Youghiogheny River: Casselman River.
- **Milestones for Objective 6 – Protection and Restoration**

- Focus areas with milestones listed included antidegradation programs and projects, 303(d) Program vision, and reviews of proposed projects thru the State Clearinghouse.
- **Milestones for Objective 7 – Priority Setting**
 - Priorities milestones identified include geographic area selection for biological monitoring, priorities for Maryland’s 319(h) Grant funds, 303(d) Program vision priorities and alternatives.
- **Milestones for Objective 8 – Program Management and Evaluation**
 - Particular areas identified include: NPS impairments and Maryland’s Integrated Report, NPS BMPs (implementation progress and verification protocols), 319 Annual Report and milestone progress reporting, tracking implementation of EPA-accepted watershed plans, findings from targeted watershed monitoring, success story reporting, Chesapeake Bay two-year milestone (progress reporting and adoption of new milestones), investment for NPS programs and implementation, updating components of Maryland’s 2014-2019 NPS Management Plan (Continuing Planning Process and State Monitoring Strategy).

Although the organizing principles and objectives of the Plan are driven strongly by technical factors, the strategies for achieving the objectives reflect the more subjective context in which the Program functions. These are identified as “General Strategies” in the Plan and include:

- **Clean Water Act Section 303(d)**, which defines a structured management framework that includes:
 - Setting water quality standards
 - Monitoring the water according to those standards
 - Evaluating the monitoring data according to those standards to identify waters that are not meeting standards
 - Determining pollutant limits in the form of total maximum daily loads (TMDLs)
 - Implementing pollution reduction actions to restore water quality
- **The Chesapeake Bay TMDLs and Watershed Implementation Plans**, which provides valuable infrastructure that the Maryland’s Nonpoint Source Program can build upon.
- **Protection via the Clean Water Act Antidegradation Requirements**, which because of its legal foundation, can be parlayed into a valuable tool of Maryland’s Nonpoint Source Program.
- **Partnerships**, of which many are unique to Maryland.

Assessment and Monitoring

Chapter 3 of the Plan addresses water resource assessment and monitoring. Assessing the current health of Maryland’s water resources relies on a variety of monitoring activities including ambient monitoring of long-term fixed stations in free-flowing rivers and tidal water bodies, sampling of benthic and fish species in small streams, and assessment of fish tissue that indicate bio-accumulation of toxins. Understanding the causes of water resource degradation and quantifying the sources of pollution depends on yet different kinds of monitoring. Guiding management actions and determining whether those actions are improving water quality requires additional kinds of monitoring.

Maryland's Nonpoint Source Program is a beneficiary of all of these types of existing monitoring activities. In addition, the Program helps to steer State monitoring policy and practices through *Maryland's Comprehensive Water Monitoring Strategy*, the monitoring of selected projects funded by the 319(h) grant, various targeted watershed monitoring initiatives, participation in the National Water Quality Initiative to target agricultural implementation, participation in the National Nonpoint Source Monitoring Program via the Corsica River restoration initiative, and in various regional and national monitoring forums. In addition to guiding policies and practices, many of these monitoring functions serve the important role of demonstrating observable progress in restoring water quality and biological integrity.

The NPS Program also, on occasion, conducts monitoring activities in support of TMDL development projects. This function will likely take on additional importance as Maryland engages in EPA's 303(d) Long-Term Vision framework.

The 2015-2019 Plan places a greater emphasis on water quality protection. As part of this, the NPS Program plays an important role in providing capacity to conduct biological monitoring of high quality waters that are experiencing development pressure.

The NPS Program also recognizes the importance of atmospheric sources of pollution. The Program is integrated with the monitoring of pollutants affecting the acidity of non-tidal streams and the nutrient loads to the Chesapeake Bay.

Statewide Partnerships and Programs

Chapter 4 of the Plan addresses the statewide perspective of the NPS Program. Given the strategic role that partnerships play in the NPS Management Program, institutional relationships are vital. The three State departments of Environment (MDE), Natural Resources (DNR) and Agriculture (MDA) have lead roles in Maryland's NPS Program. The Departments of Health and Mental Hygiene (DHMH), Transportation (MDOT) and Planning (MDP), the latter of which is responsible for State land use management policy, also have important functions that are integrated into the State's NPS Management Program.

A number of programs that are closely related to NPS control and watershed management are also integrated with the overall functioning of Maryland's NPS Management Program. These include the Clean Water Act Section 303(d) Program, which provides the framework for water quality based management; the Animal Feeding Operations (AFO) Program, which manages agricultural animal waste; the Antidegradation Program, focused on protecting high quality waters; the Clean Lakes Program under the federal Clean Water Act; the Coastal NPS Management Program under the federal National Oceanic and Atmospheric Administration, which includes the exercising of state federal consistency determination authority; the Clean Marina's Program; mining programs that address active and abandoned mines of various types; the Source Water Protection Program programs under the Safe Drinking Water Act and other groundwater management programs; Stormwater and Erosion Control programs; air pollution control programs; climate change programs and associated strategic plans; Maryland's Critical Areas Program; and Wetland protection programs. In addition, Maryland NPS management agencies coordinate with various federal programs managed by the US Forest Service, the US Department of Agriculture, the National Park Service, the Army Corps of Engineers, the Federal

Energy Regulatory Commission and the National Estuary Program within the US Environmental Protection Agency.

The many institutions and programs utilize a variety of management measures and approaches to prevent and solve nonpoint source problems. A common foundation that integrates these is a watershed-based approach, which utilizes an iterative process of planning that includes prediction of beneficial outcomes, directs implementation of best management practices, requires evaluation of individual practices and the effects of cumulative practices relative to the predicted outcomes and makes adjustments based on those evaluations. Within that broad planning context numerous nonpoint source management practices are available for the wide variety of program areas identified above.

Financial resources are a vital element of Maryland's NPS Management Program, which further highlights the strategic importance of partnerships. Maryland's core Section 319 NPS Program, responsible for this plan, is small relative to the many other entities across the State that have roles in NPS pollution management. Consequently, the Section 319 Program invests some of its \$2 million/year budget in developing and maintaining the partnerships that are necessary to better coordinate the distributed resources.

Although Maryland invests significant financial and institutional resources each year toward nonpoint source pollution controls and water resource protection, those resources are finite, which motivates the need to set priorities. Priority setting occurs in a variety of ways within the context of the NPS Program from broad strategic levels down to selecting among particular best management practices on the basis of cost-effectiveness and other practical considerations.

At a strategic level, Maryland's Nonpoint Source Program has focused primarily on restoration of polluted water bodies in the past. The current Plan signals a shift toward greater investment of resources toward the protection of high quality waters. This is reflected, in part, through greater integration with the Clean Water Act Antidegradation program, including 319(h) grant funding, to support monitoring associated with that program. It is also reflected in the strategic coordination with the 303(d) Vision framework, which explicitly incorporates protection as an element of the framework. Another strategic priority is to invest NPS Program resources broadly across the State, represented by three geographic regions of western Maryland, the central Chesapeake Bay region and the Atlantic Ocean and coastal bays region.

At the level of administering the 319(h) grant, priorities are reflected in grant selection criteria. These criteria prioritize investments toward implementing Total Maximum Daily Loads (TMDLs), adherence to priorities expressed in watershed-based plans that meet EPA guidelines, and cost-effectiveness in terms of pollutant loads reduced. More generally, within the context of water quality restoration, priority-setting recognizes two legitimate, yet competing, objectives. The first is to restore impaired waters to meet water quality standards. The second is to demonstrate measurable improvement in water quality short of full restoration. These objectives compete with each other in the sense that the first case tends to steer resources to waters that are marginally impaired, thus most likely to be fully restored. The second case tends to steer resources to waters that are severely polluted and thus more likely to show measurable improvement in response to a limited investment.

Other factors that affect priorities of the Program include the protection of human health, which motivates investments in addressing bacteria and toxic substances, addressing problems for which solutions are more certain, which has motivated investments in restoring waters impacted by abandoned mine drainage, consideration of ecosystem value of a watershed, and practical considerations such as landowner willingness and readiness to proceed with implementation.

Given the many situations and factors in which priority-setting can arise, the NPS Management Program operates under the principal that the criteria for decision-making should be transparent and explicit for each situation. Specific examples of applying technical priority-setting methodologies include the targeting of non-tidal streams for restoration via a Biological Restoration Initiative, bacteria impairment restoration targeting, source identification related to PCBs (Polychlorinated Biphenyls) and project selection under the Chesapeake and Coastal Bays Trust Fund.

Technical assistance and the use of technology transfer to foster NPS management among local partners is another important statewide function of the Program. One example is the Watershed Assistance Collaborative, designed by Maryland DNR, to unify project-level expertise, manpower and financial assistance available from a number of organizations under a single umbrella. Another example is assistance in developing watershed plans. Plans developed under Maryland's past Watershed Restoration Action Strategy Program continue to guide implementation. Watershed-based planning assistance has since evolved in alignment with the EPA Section 319 guidance requirements. Another means of delivering technical assistance is Maryland's TMDL Data Center, which consolidates tools, guidance and other resources with a focus on urban stormwater control.

A particular technology that is transferred via the TMDL Data Center is Maryland's Assessment Scenario Tool (MAST), which is, in essence, a simplified version of the Chesapeake Bay watershed model. This on-line tool allows users to develop BMP implementation scenarios that closely match the load reduction results of the full-blown Bay model. It allows multiple users, e.g., all of Maryland's counties, to share results with the State, which can be integrated and output into the special format that may be input into the full Bay watershed model.

Another noteworthy means of technology transfer and avenue of technical assistance is the Watershed Stewards Academy. The Academy delivers a rigorous curricula and hands-on training to develop Master Watershed Stewards, who represent increasing social capital with the capacity to accelerate NPS implementation in Maryland.

With so much nonpoint source management activity occurring in Maryland, the task of accounting for it all is a huge challenge. MDE's 319 NPS Program plays a central role in guiding the reporting of NPS implementation from a wide variety of sources to the State as it relates to Chesapeake Bay restoration. Yet BMP tracking is only one measure of progress. Maryland's NPS Program also strives to integrate the tracking of pollution load reductions, various water quality parameters at a variety of geographic scales including the assessment of continued maintenance of high quality waters.

Watershed Management to Achieve NPS Goals

As noted in the discussions about organizing principles and priorities, Maryland's NPS Management Program makes an explicit commitment to the western region outside of the Chesapeake basin, the Central/Chesapeake region and the Atlantic and Coastal Bays region, which are defined by watershed boundaries. A related organizing principle, which derives from both physical and practical bases, is the notion of nested watershed management. For example, NPS nutrients and sediment management goals, and implementation plans, are set at different watershed scales, with increasing detail, nested within each other:

- Chesapeake Bay TMDLs limits nitrogen, phosphorus and sediment. The State Watershed Implementation Plan (WIP), composed of local-scale WIPs, represents a very broad strategy for addressing the TMDLs.
 - o Baltimore Harbor TMDL limits phosphorus
 - Gwynns Falls, within the Baltimore Harbor TMDL, has a TMDL that limits sediment. The local jurisdiction's watershed plan describes how the nutrient and sediment TMDLs will be achieved.
 - Scotts Level Run within the Gwynns Falls watershed is targeted by the local jurisdiction for neighborhood watershed scale implementation and assessment.

Although this ideal of nested watershed planning and implementation is not replicated everywhere throughout Maryland, a very large number of such plans do exist, so many so that itemizing them all is beyond the scope of this Plan. The Plan does, however, highlight several representative examples organized by the three regions.

In Western Maryland areas draining to the Chesapeake Bay, the Casselman River and the Youghiogheny River, acidification and associated metals leaching caused by abandoned mines continues to impact water quality. Maryland has developed total maximum daily loads (TMDLs) for these impaired waters and has subsequently established watershed-based plans that have been accepted by EPA Region 3's Section 319 NPS Program. Within this context Maryland has successfully restored the pH in Aaron Run, leading to its removal from the State's 303(d) list of impaired waters for pH. Maryland continues to invest in restoring tributaries of the Casselman River that have similar pH impairments.

Deep Creek Lake, a prominent reservoir in Maryland's western region outside of the Chesapeake Bay watershed, is another point of attention. At the time of writing this 5-year NPS management plan, Maryland DNR is on the cusp of completing a watershed management plan. The Deep Creek Lake watershed plan will guide important milestones to address governance, funding and technical issues during the period covered by this NPS Management Plan.

Both localized and regional NPS management issues are addressed in the Chesapeake Bay basin of Maryland. In many cases, the restoration actions of most interest to local stakeholders, which provide benefits like improved micro-climates through shade-trees, reduced local flooding, improved aesthetics and property values, provide mutual benefits for the down-stream water resources including the Chesapeake Bay.

Beginning in the early 1980s, a management infrastructure has been developed to address over enrichment of the Chesapeake Bay by nutrients. It is natural for Maryland's Nonpoint Source Program to take advantage of this infrastructure.

The opportunities created by this infrastructure include a nearly statewide nonpoint source watershed modeling system, an implementation tracking system and a robust monitoring system. Watershed-based restoration planning, conducted since the late 1980s, has served as a training ground for many individuals and institutions involved in Maryland's NPS management. Most recently, this has taken the form of the 2010 Chesapeake Bay TMDL, which sets nutrient and sediment pollution load limits, and Maryland's Bay Watershed Implementation Plan (WIP), a broad plan for reducing pollution to meet those limits by 2025. The Bay TMDL and WIP are part of a federal accountability framework. This framework includes a process of setting 2-year Milestone commitments intended to promote near-term, incremental progress.

Another management framework in the Bay watershed is a partnership between the US Department of Agriculture (USDA) and the US Environmental Protection Agency (EPA) and the states called the National Water Quality Initiative (NWQI). The purpose of this cooperative effort is to target a portion of USDA funding to implement conservation practices in targeted watersheds. Through a prioritization analysis, Maryland and the USDA Natural Resource Conservation Service (NRCS) jointly selected the Catoctin Creek as a targeted watershed. This watershed is now the focus of agricultural management activities, which are being closely monitored by State NPS Program staff.

Maryland's Corsica River has been the focus of targeted restoration and monitoring under a State initiative started in 2005, which was founded on prior State-led watershed planning. The initiative has succeeded in its design to spin off the governance and funding to local partner leadership. The intensive monitoring of this watershed has earned it recognition among a select group of 28 National Nonpoint Source Monitoring Program projects. Of particular note, monitoring has shown statistically significant reductions in nitrogen and phosphorus concentrations in two of three tributaries to the main tidal river.

Maryland's Coastal Bays and Atlantic Ocean represent the third and final geographic region to which the NPS Management Plan gives explicit attention. Maryland's Coastal Bays are part of the Clean Water Act National Estuaries Program. NPS watershed planning and implementation is conducted thru cooperation facilitated by the Maryland Coastal Bays Program, which is a nonprofit organization. In August 2014, nutrient TMDLs for the entire Maryland Coastal Bays system were approved EPA. These TMDLs help to guide NPS management by identifying baseline pollutant loadings, pollutant sources and by setting pollutant reduction targets. In January 2014, Maryland's Coastal Bays Program released a draft update of the *Comprehensive Conservation Management Plan for Maryland's Coastal Bays (CCMP)*. The CCMP will guide important milestones to address governance, funding and technical issues for the period covered by this NPS Management Plan.

Public Education, Outreach and Financial Assistance

Maryland's leadership in public education relating to NPS management is exemplified by the State requirement that all public school students must complete an environmental literacy program that is locally designed to meet standards adopted by the Maryland State Board of Education. With so many education efforts going on throughout the State of Maryland, it is impossible to list them all; however, the periodic NPS Management Plan update process provides a means of maintaining a fairly comprehensive and fresh directory.

In addition to entities that provide education and outreach services, the Plan identifies institutional means by which Maryland citizens may participate in, and influence, public policy related to nonpoint source management. The Plan identifies key advisory, oversight, and coordinating bodies for the three departments of Agriculture, Environment and Natural Resources.

Another important resource included in the Plan is an extensive listing of financial assistance programs and individual grants. The financial assistance programs include over fifteen programs managed by the Department of Agriculture, about ten programs managed by the Department of Environment, about ten programs managed by the Department of Natural Resources, over ten programs managed directly by the federal government, and over ten programs managed by private and quasi-State programs. These financial support programs address manure management, wetlands creation, land conservation, research, mine lands reclamation, septic systems, green infrastructure, education, pollution prevention, forest management, coastal management, watershed planning, implementation design and many other nonpoint source management related subjects.

Plan Accountability and Maintenance

In accordance with EPA's 2013 Nonpoint Source Program Guidance, the State of Maryland intends to review and update this plan on a five-year cycle. During intervening years, the table of Milestones will be updated to reflect the status of commitments. In several cases, the Milestone table indicates that new commitments will be adopted during the five-year period as new information becomes available. However, to ensure the integrity of the original Plan, the original table of Milestone commitments will also be maintained in its original form as a reference.

For the most current information about Maryland's Nonpoint Source Management Program See: <http://www.mde.state.md.us/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319NPS/index.aspx>

Chapter 1 – INTRODUCTION

Contents

- 1.A Vision
- 1.B Mission
- 1.C Goals
- 1.D Purpose
- 1.E Document Overview
 - o 1.E.1 Document Structure
 - o 1.E.2 Document Timeframe
 - o 1.E.3 Using this Document
- 1.F Process for Drafting, Review and Approval

1.A Vision

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

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

1.B Mission

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

1.C Goals

The Program has the following seven broad goals to advance its mission and vision:

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

The objectives and milestones that guide and measure progress toward these broad goals are presented in the next chapter – Objectives & Milestones. They replace the 1999 *Maryland Nonpoint Source Management Plan* goals and milestones. They are intended to align with, or

drive refinements to, other strategic documents such as Maryland's Continuing Planning Process (2007), the State of Maryland's Comprehensive Water Monitoring Strategy (2009) and Maryland's Phase II Watershed Implementation Plan for the Chesapeake Bay TMDL (2012). Many of the Program objectives and milestones were developed and approved in cooperation with EPA's Chesapeake Bay Program and other partners.

1.D Purpose

The updated Maryland Nonpoint Source Management Program Plan (the Plan) is drafted to address two federal requirements: 1) The Federal Clean Water Act Section 319(b) requires preparation of a State nonpoint source management program plan for approval by the US Environmental Protection Agency (EPA). EPA most recently approved Maryland's program plan in 1999. 2) EPA adopted new guidelines in 2013 that require states to update or revise their nonpoint source (NPS) management program plan at least every five years.

The 319 Nonpoint Source Program, responsible for this document, is housed in the Maryland Department of Environment's Science Services Administration. With an annual budget of \$2 million/year, this Program is a relatively small in comparison to the much larger array of State nonpoint source management activities, which had documented expenditures of more than \$54 million in expenditures for SFY 2014¹. EPA requires this Plan to serve as an umbrella document that references the many diverse NPS management components that are led by various State and local government agencies.

The Plan provides explanations of many, but not necessarily all, NPS management programs in the State. It presents goals, objectives and milestones for some aspects of NPS management in Maryland, which are intended to serve as benchmarks for gauging progress by selected programs toward NPS pollution reduction and water quality improvement, and to support review and approval by EPA. The document does not anticipate all future revisions that may be instituted by the various lead State and local government agencies from time to time.

1.E Document Overview

The Maryland NPS Management Program Plan was developed in part as a response to the 1987 amendments to the Federal Clean Water Act, Section 319 ("Section 319") provisions to address problems caused by pollution from nonpoint sources (NPS). Unlike point source pollution, which generally comes from a pipe, NPS pollution comes from dispersed sources generally associated with stormwater that runs off the land or infiltrates thru the ground. The two most pervasive sources of NPS pollution known in Maryland are agriculture and urban runoff. Other sources of NPS pollution in Maryland include acid mine drainage, construction activities, on-site sewage systems (septics), hydromodification and silviculture (forestry). Atmospheric pollutants from a variety of sources, which are deposited to the ground and surface waters, also warrant attention.

¹ Nonpoint Source Maintenance of Effort for Maryland, State Fiscal Year 2014. Correspondence from D. Lee Currey, Director, MDE Science Services Administration to Kathleen M. Blinebury, EPA Region III, September 9, 2014.

Since the inception of the Federal Section 319 program, Maryland has received nearly \$50.6 million in 319(h) Grants (FFY1990 thru FFY2013). These funds have been used to help build Maryland's NPS Management Program, implement various NPS programs, and implement practices to reduce nonpoint source pollution.

Section 319(b) requires each state to produce a plan to manage NPS pollution.

(b) State management programs

(1) In general

The Governor of each State, for that State or in combination with adjacent States, shall, after notice and opportunity for public comment, prepare and submit to the Administrator for approval a management program which such State proposes to implement in the first four fiscal years beginning after the date of submission of such management program for controlling pollution added from nonpoint sources to the navigable waters within the State and improving the quality of such waters.

The December 1999 document, *Maryland Nonpoint Source Management Plan*, was an umbrella for many NPS efforts, programs and projects in Maryland. During the next thirteen years, Maryland nonpoint sources programs were updated and revised numerous times including many changes that occurred in partnership with the EPA Chesapeake Bay Program. During this time, 1999 Plan document was not formally revised to reflect these changes.

In November 2012, EPA issued *Section 319 Program Guidance: Key Components of an Effective Nonpoint Source Management Program*. In addition, in April 2013 EPA issued *Nonpoint Source Program and Grants Guidelines for States and Territories*. Together, the new guidance presented new EPA expectations for the contents of states' NPS management programs and required states to update their NPS program at least every five years.

This document is designed to update and revise the 1999 Plan to reflect current program status and direction while also meeting EPA's new requirements in compliance with Section 319(b). It continues to be an umbrella document that touches on many of the diverse NPS effort and programs in Maryland. This document also expands and enhances the 1999 Plan by addressing variety of regulatory, nonregulatory, financial and technical assistance programs needed to improve and maintain surface and groundwater quality.

1.E.1 Document Structure

This document is an update and revision to the 1999 *Maryland Nonpoint Source Management Plan*. This document also designates other specifically named programs, plans and documents that are "components" of the Maryland NPS Management Program Plan. These components, such as the Chesapeake Bay Watershed Implementation Plan, are fully integrated into the Maryland NPS Management Program Plan and revisions to these components are, therefore, also revisions to this document. Additionally, these components are also necessarily managed and revised to meet divergent schedules and requirements that differ from the annual milestone and five-year update requirements applied to this document. To promote access to revisions of the Maryland NPS Management Program Plan components, an appendix lists these components and Internet links to the latest revisions.

1.E.2 Document Timeframe

This document will be updated or revised at least every five years to meet EPA requirements. During intervening years, program documents that are identified as Components of the Maryland Nonpoint Source Management Program may be updated or revised independently of this document. For example, in accordance with EPA's Chesapeake Bay Program requirements, Chesapeake Bay milestones are updated on a two-year cycle. Therefore, this document may be updated as necessary so that it reflects significant changes in NPS watershed planning and implementation policies and priorities that rise.

1.E.3 Using this Document

- Abbreviations. Technical and programmatic content is frequently referenced by acronyms. An appendix is provided to assist public interpretation.
- Components of the Plan. The NPS Program encompasses an array of programs that generally have independent mandates and schedules for action and update. Therefore, this document frequently identifies components and provides Internet links to find them in the *Appendix Components of Maryland's 2015-2019 Nonpoint Source Management Plan*.
- Internet Sources. The *Appendix Internet Sources for the Maryland NPS Management Plan* lists many of the programs and projects referenced in this document with Internet links for them. Whenever the text mentions public availability via the Internet, additional information is commonly listed in this appendix.

1.F Process for Drafting, Review and Approval

Creation of the public review draft plan occurred over several years. Updating and revising the plan began with a cooperative effort in 2011-2012 between MDE and the University of Maryland Sea Grant to identify relevant nonpoint source public education and outreach, standing public input mechanisms and financial assistance opportunities. State agency program input and review was conducted from late 2012 thru 2014. EPA guidance and review of early document drafts was conducted from the last half of 2013 thru 2014. Input from local government agencies that were active participants in the State 319 NPS Program was solicited during the second half of 2014. Input and review comments from all of these sources were used for the draft plan released for public review.

The public review period for the draft *Maryland's 2015-2019 Nonpoint Source Management Plan* was open 10/31/14 thru 12/1/14. Public notice appeared in the Maryland Register on 10/31/14. Comments received during the public review period were incorporated with the draft document to generate the final document for EPA review.

In accordance with the Federal Clean Water Act Section 319(b) and recent EPA guidance, the final *Maryland's 2015-2019 Nonpoint Source Management Plan* is submitted to EPA for approval.

Chapter 2 - OBJECTIVES and MILESTONES

Contents

- 2.A Organizing Principles
- 2.B Objectives
 - 1- Regional Coverage
 - 2- Multiple Scales
 - 3- Pollutants and Stressors
 - 4- Pollutant Sources
 - 5- Types of Waterbodies
 - 6- Protection and Restoration
 - 7- Priority Setting
 - 8- Program Management and Evaluation
- 2.C Milestones For Objectives
- 2.D General Strategies
 - 2.D.1 Clean Water Act Section 303(d)
 - 2.D.2 Chesapeake Bay TMDLs and Watershed Implementation Plans
 - 2.D.3 Protection via Clean Water Act Antidegradation Requirements
 - 2.D.4 Partnerships
 - 2.D.5 Other Strategic Frameworks

2.A Organizing Principles

The complexities of nonpoint source pollution explain a great deal about why this class of pollution persists. This Plan deals with that complexity by adopting several organizing principles that naturally align with the Program objectives and advance the Program towards its broader goals laid out in Chapter 1. The objectives in turn drive the organization of the Program milestones, which serve as tangible outcomes and metrics by which the Program's success can be measured. This chapter concludes with a presentation of several key general strategies through which the NPS Program will strive to meet the objectives and milestones. Some of these strategies constitute other programs into which the NPS Program strives to be well-integrated.

To a large degree, the organizing principles, and closely associated objectives, derive from a technical foundation. Specifically, the subject matter is organized to address various functional elements:

- *pollutants,*
- *pollutant sources,*
- *geographies,* and
- *types of water bodies.*

The Program objectives and milestones follow these technically based organizing principles. Most notably, the milestones are grouped into two broad geographic categories: *statewide* and *watersheds*. Similarly, many of the statewide milestones are organized by pollutant sources, like *agricultural, urban/suburban, and silvicultural (forestry) stormwater runoff*. Aligning the objectives and milestones to this technical foundation not only brings organizational structure to this complex subject, it helps to ensure the Program is comprehensive.

Another organizing principle of this Plan is to address the eight key elements of a dynamic and effective Nonpoint Source Program set forth by EPA. These are summarized below.

Eight Key Elements of an Effective NPS Program¹:

1. Goals, objectives, strategies
2. Partnerships: Strengthen partnerships including federal, interstate, local entities.
3. Programs: Integration with other programs. Statewide & on-the-ground initiatives.
4. Protection & Restoration
5. Identify and prioritize via watershed-based process in support of #4
6. Seven program components pursuant to Section 319(b) that identify:
 - a. BMPs (systems of management measures)
 - b. Programs (regulatory and non-regulatory)
 - c. Processes & coordination
 - d. Schedule (legal authorities, resources, institutional relations)
 - e. Funding other than the 319(h) Grant
 - f. Federal program coordination
 - g. Evaluation and Monitoring to determine program effectiveness
7. Efficient program management including financial aspects
8. Program Review and Evaluation

2.B Objectives

The objectives outlined below address both technical aspects of the State’s nonpoint source management activities and administrative aspects of the 319 NPS Program. Because EPA requires that this Management Plan provide a comprehensive description of the State’s nonpoint source pollution management, some of the functions are beyond the direct control of the 319 Program administered by the Maryland Department of Environment’s Science Services Administration (MDE SSA). Nevertheless, the 319 Program in MDE SSA strives to be aware of and integrated with the comprehensive set of programs through partnership building and maintenance.

Although the following objectives are not intended to be a one-to-one correspondence with the eight key elements of an NPS program, they are developed with those key elements in mind. Finally, the objectives are intended to reflect general near-term commitments; specific near-term that reflect these objectives are identified in the next section, entitled “Milestones”.

Objective 1 – Regional Coverage

Ensure that the Program addresses the three broad geographic regions of the State:

- Western Region² (Casselman River and Youghiogheny River outside of the Chesapeake Bay drainage), broadly characterized by fresh, cold water fisheries

¹ For a full recitation of the eight key elements of an effective NPS Program see (PDF): http://water.epa.gov/polwaste/nps/upload/key_components_2012.pdf

² This Plan acknowledges, and is sensitive to, other definitions of “Western” Maryland, which include more geographic area than the watersheds that are outside of the Chesapeake Bay drainage.

- Central Region (the Chesapeake Bay and its tidal and nontidal tributaries), broadly characterized by warmer fresh waters,
- Coastal Region (Coastal Bays outside of the Chesapeake Bay drainage), broadly characterized by Maryland's coastal bays and Atlantic Ocean

Relation of this Objective to the Eight Key Components of an Effective Program:

#2 (Partnerships) This objective nurtures partnerships in the three key regions of the State. For example, a [Maryland Department of Agriculture Gypsy Moth program](#), in coordination with the US Department of Agriculture Forest Service, is responsible for the [Gypsy Moth Cooperative Suppression Program](#) in Western Maryland. This program is critical to protecting vast areas of forest cover, the loss of which would generate massive loads of sediment and nutrient pollution.

#3 (Programs) This objective promotes integration with programs that are unique to different regions of the State.

#4 (Protection & Restoration) This objective is supported by the integration of the NPS Program with the antidegradation program, under Section 303 of the Clean Water Act, to ensure protection in the three key regions of the State.

#5 (Priorities) This objective represents a prioritization criterion that gives weight to directing resources to on-the-ground projects are considered in all three regions.

#6 (7 Program elements) The implementation of these seven key elements benefit from the objective of ensuring that the NPS Program gives attention to the State's three key regions.

#7 (Efficient & Effective Program Management) This objective promotes Program effectiveness by ensuring comprehensive geographic coverage. Attentiveness to the three key regions also helps ensure awareness of opportunities to leverage funds and technical assistance that are unique to these regions, like the Eastern Brook Trout Joint Venture in Western Maryland and the National Estuaries Program in Maryland's Coastal Bays.

#8 (Program Review and Evaluation) Having the explicit objective of comprehensive regional coverage ensures that this important criterion is included in evaluating the Program's effectiveness, including the reporting of implementation progress.

Objective 2 – Multiple Scales:

Ensure that the Program is attentive to multiple scales of geography at which different NPS issues are managed:

- Global, which can, for example, be a scale at which atmospheric deposition of mercury might need to be addressed.
- National, which can, for example, be a scale at which policies are necessary to address certain types of nonpoint source problems.
- Interstate, which can, for example, be of critical importance in addressing upstream and down stream watershed management.
- State, a management scale at which many significant regulatory and non-regulatory programs are often defined.
- Watershed, the natural scale at which environmental systems function, but which can range widely in size due to the nesting of small watersheds within larger ones.
- County, the scale at which a great degree of management activities for both local government and agricultural are organized.

- Municipal, another important management scale, which correlates strongly with urban stormwater management activities and within which is a wide range of scale from small towns to large cities.
- Site Scale, which is often the ultimate scale at which decisions must be made regarding specific on-the-ground restoration actions.

Relation of this Objective to the Eight Key Components of an Effective Program:

- #2 (Partnerships) This objective promotes a more comprehensive view of the geographic scope that should be addressed by Maryland's NPS Program. For example, pollution from distant atmospheric emission, like mercury, necessitates regional and even international responses. At the other end of the scale, the identification of highly localized sources of PCBs entails strategies that telescope in to specific sites. The investigation and cleanup of sites that are contaminated by toxic substances involves a partnership with MDE's Land Management Administration and special laboratories capable of analyzing samples for PCBs. (See Objective 4 for further discussion of PCBs).
- #3 (Programs) This objective motivates the establishment and maintenance of a wide variety of partnerships necessary to span the wide range of scales.
- #4 (Protection & Restoration) This objective, which is intended to ensure protection of high-quality waters receives its share of resources, entails strategies and regulations developed at the state scale and operations that function at the site scale.
- #5 (Priorities) This objective recognizes that decisions and priorities regarding nonpoint source management must consider multiple geographic scales.
- #6 (7 Program elements) The implementation of these seven key elements benefit from the objective of ensuring that the NPS Program calls for addressing problems across a wide range of scales.
- #7 (Efficient & Effective Program Management) The effectiveness of the Program is enhanced by developing and operating nonpoint source management at the necessary geographic scales.
- #8 (Program Review and Evaluation) Because NPS pollution problems necessitate management solutions at varying scales, this objective motivates Program reviews and evaluations at varying scales.

Objective 3 – Pollutants and Stressors

Ensure that the Program is comprehensive with regard to addressing the many types of pollutants and stressors:

- 303(d) List of Impaired Waters: Integration of the NPS Program with the Clean Water Act 303(d) Program will help to ensure comprehensive attention to a wide variety of pollutants. These include nutrients, sediments, pH, bacteria, thermal impacts, physical degradation of streams, chlorides and various toxic substances.

Relation of this Objective to the Eight Key Components of an Effective Program:

- #2 (Partnerships) This objective promotes integration with programs that are have a unique role in addressing different kinds of pollutants, such as the Maryland Department of Agriculture, which has key responsibilities regarding the proper handling and use of pesticides.
- #3 (Programs) This objective ensures that Maryland's NPS Program addresses a wide array of pollution, not just nutrients and sediments, which is a dominant issue in the Chesapeake Bay

region. For example, the management of road salt deserves increasing attention like that given by the Maryland State Highway Administration [Statewide Salt Management Plan](#).

- #4 (Protection & Restoration) This objective helps to ensure that the NPS Program focuses attention on pollutants and stressors that are most important for the protection of high quality waters. Often, these are stressors like change in hydrology and temperature rather than pollutants that typically receive more attention.
- #5 (Priorities) This objective will promote a balancing of priorities and resources to ensure that all pollutants receive some level of attention. For example, although the manufacture of carcinogenic PCBs was banned in 1979 this pollutant is very long-lived and likely persists in high concentrations in localized areas (hot spots). Because a small amount of PCBs can bioaccumulate in the tissue of fish, creating a risk to human health and wildlife, Maryland's NPS Program recognizes that a modest field monitoring effort to identify hot spots is a priority.
- #6 (7 Program elements) The implementation of these seven key elements benefit from the objective of ensuring that the NPS Program gives attention to the full range of pollutants.
- #7 (Efficient & Effective Program Management) The effectiveness of the Program is enhanced by ensuring that the full range of pollutants and stressors are given due attention.
- #8 (Program Review and Evaluation) This objective helps promote the transparent expectation of Program evaluations that are comprehensive with regard to a wide variety of pollutants. Linkage to Maryland's biennial Integrated Water Quality Monitoring and Assessment Report, which includes the 303(d) list, is in and of itself an evaluation tool to this end.

Objective 4 - Pollutant Sources

Ensure that the Program is comprehensive with regard to addressing the wide range of pollutant sources including:

- Agriculture,
- Urban/Suburban stormwater,
- Forest (silviculture and harvesting),
- Septic Systems,
- Industrial,
- Upland pollutant sources,
- Atmospheric,
- Stream and shoreline degradation (hydromodification),
- Marinas/Boatyards.

Relation of this Objective to the Eight Key Components of an Effective Program:

- #2 (Partnerships) The Plan's commitment to address a wide variety of pollutant sources will necessitate the development and maintenance of partnerships. For example, although greenhouse gas strategies are often associated with the management of atmospheric sources, significant mutually beneficial partnership opportunities lie within the forestland and farm animal management sectors.
- #3 (Programs) Many, if not most, existing environmental programs are defined relative to pollutant source sectors. The objective of ensuring that the NPS Program gives due attention to all pollutant source sectors naturally promotes alignment with most other relevant programs.
- #4 (Protection & Restoration) Although we think that we understand the cause and effect relationship with stressors and impacts on high-quality waters, the ensuring attention is given

to all pollutant source sectors will help ensure that a relevant pollutant source is not overlooked.

- #5 (Priorities) This objective is a necessary ingredient to ensure that a comprehensive universe of potential NPS pollution sources is considered when establishing management priorities.
- #6 (7 Program elements) The implementation of these seven key elements benefit from the objective of ensuring that the NPS Program gives attention to the full range of pollutant sources.
- #7 (Efficient & Effective Program Management) Committing to being knowledgeable about multiple source sectors is an integral NPS Program process that ensures a wide range of opportunities are considered in regard to NPS management options. This, in turn, promotes effective management solutions.
- #8 (Program Review and Evaluation) This objective promotes the tracking of progress comprehensively among source sectors.

Objective 5 – Types of Waterbodies

Ensure that the Program is comprehensive with regard to addressing the various types of waterbodies impaired by NPS pollution including:

- Streams
- Rivers (tidal and nontidal)
- Wetlands
- Lakes/Impoundments
- Bays
- Atlantic Ocean
- Groundwater

Relation of this Objective to the Eight Key Components of an Effective Program:

- #2 (Partnerships) Because some entities identify with particular water body types, this objective promotes the development of diverse partnerships that align with the physical environment as defined by differing water body types. Examples include the relationships with State and local lake/reservoir managers, people with expertise in the biological monitoring of non-tidal streams, and very notably the relationship with people that have expertise or advocacy interests concerning the Chesapeake Bay.
- #3 (Programs) Similar to partnerships, this objective promotes integration with programs that identify with specific types of waterbodies. Examples include the Maryland Coastal Bays Program (part of EPA's National Estuaries Program), the Susquehanna and Potomac River Basin Commissions, and MDE's Waterways and Wetlands Program.
- #4 (Protection & Restoration) Admittedly, Maryland's antidegradation program is currently focused on high-quality non-tidal streams. This is due in part to the prevalent metrics currently used (non-tidal biological stream data) and the physical reality that non-tidal streams are some of the only remaining high-quality waters. This objective, by highlighting this observation, reveals a potential opportunity for the NPS Program to give this greater attention within the institutional structure of Maryland's antidegradation program.
- #5 (Priorities) This objective engenders attentiveness to the full spectrum of water body types. This is important in a state like Maryland where so much attention is directed to the Chesapeake Bay at the risk of other waters not being given due attention. An example is the need to protect drinking water supplies that include reservoirs, groundwater and some rivers.

- #6 (7 Program elements) The implementation of these seven key elements benefit from the objective of ensuring that the NPS Program addresses the full range of water body types.
- #7 (Efficient & Effective Program Management) The effectiveness of the Program is enhanced by explicit attention to varying types of waterbodies promoted by this objective.
- #8 (Program Review and Evaluation) This objective commits the NPS Program to review and evaluation across the varying types of water bodies.

Objective 6 – Protection and Restoration

Ensure that the Program balances protection and restoration needs

Relation of this Objective to the Eight Key Components of an Effective Program:

- #2 (Partnerships) This objective promotes the strengthening of the NPS Program partnership with the MDE’s Environmental Assessment and Standards Program, responsible for the State’s [Antidegradation Program](#) and the Department of Natural Resources’ Monitoring and Non-Tidal Assessment (MANTA) Division Maryland DNR is responsible for the [Maryland Biological Stream Survey](#) (MBSS) Program, a foundation for Maryland’s Antidegradation program, and the [Stronghold Watersheds Program](#) (PDF).
- #3 (Programs) See Partnerships.
- #4 (Protection & Restoration) Maryland’s NPS Program objective of “Protection and Restoration” is directly aligned with this Key Component of an effective State NPS Program.
- #5 (Priorities) This objective makes protection an explicit priority of Maryland’s Nonpoint Source Program. This will help ensure that Program resources are devoted to this function in addition to the traditional focus on water quality restoration. For example, the NPS Program, in collaboration with Maryland’s antidegradation program, prioritizes the monitoring of waters near which significant development activities are being considered.
- #6 (7 Program elements) Adopting “Protection” as an objective of Maryland’s NPS Program helps to promote alignment of the seven program elements under 319(b) with both protection and restoration in mind.
- #7 (Efficient & Effective Program Management) Adopting “protection” as an explicit objective raises its profile. This will help direct more time and resources toward protection relative to restoration thereby making the NPS Program effective on more fronts. Attention to protection also helps promote awareness of opportunities to leverage funds and technical assistance that are available for this function. Another example of the enhancement of program effectiveness promoted by a focus on protection is the strengthening that it promotes the maintenance of a watershed’s resilience to extreme climatic events. This has a significant effect on nonpoint source pollution. Because the frequency of extreme weather events is predicted as a result of global climate change, greater attention to
- #8 (Program Review and Evaluation) Having the explicit objective of protection ensures that this important criterion is included in evaluating the Program, including the reporting of success in protecting Maryland’s high-quality waters.

Objective 7 – Priority Setting

Ensure that the Program has explicit means of setting priorities to ensure that NPS problems are addressed in a timely, efficient and effective manner. Examples of these include:

- Human Health Protection
- Drinking Water Supply Protection

- Transparent Methodologies for Targeting Restoration (See Chapter 4 *Priorities for Protection, Restoration, Watershed Planning and Implementation*)
- Transparent criteria for awarding grant funding

Relation of this Objective to the Eight Key Components of an Effective Program:

- #2 (Partnerships) Part of a healthy process of setting priorities involves the consideration of varying viewpoints and expertise of partners. An example might be the insight gained from State Highway Administration partners who must consider risks associated with highway accidents caused by icy roads as it relates to salt management, or risks associated with collisions with trees when considering opportunities for reforestation.
- #3 (Programs) The integration with other programs promotes more informed and nuanced priority setting. An example is the Maryland's Chesapeake and Coastal Bays Trust Fund, which provides major grants each year for nonpoint source controls. By legislation, their priority is to target grants that have the greatest nutrient reduction per dollar expended. This priority tends to direct resources to severely polluted areas for which there might be little likelihood of removal from Maryland's list of impaired waters (303(d) list). This is a very worthy priority; however, it must be balanced with the legitimate priority of seeking to remove waters from the 303(d) list, which tends to direct waters to places that have greater potential for recovery.
- #4 (Protection & Restoration) This objective recognizes the importance of priority-setting. Given very limited resources for the traditional priority of restoration, the protection of high-quality waters is at risk of being given no attention. This objective, which promotes robust priority-setting, is a reflection of how Maryland's NPS Program has come to shift more resources to protection.
- #5 (Priorities) This objective directly aligns with this Key Component of an effective NPS Program.
- #6 (7 Program elements) Explicit priority-setting is essential to establishing a strategic approach for any program. It promotes structured criteria, which can form the basis for adaptive management and are the stepping off point for review and upgrades to the program.
- #7 (Efficient & Effective Program Management) To the degree that strong priority-setting is an element of program effectiveness, this objective helps to ensure that end.
- #8 (Program Review and Evaluation) The objective of priority-setting promotes the establishment of transparent, quantified decision making processes and associated metrics. This greatly enhances the ability to review and evaluate the Program.

Objective 8 – Program Management and Evaluation

Ensure that the Program has procedures to promote efficient fiscal and functional management and metrics by which these can be evaluated. Examples of these include:

- 319 Program Annual Report
- 319 Grant Reporting and Tracking System (GRTS)
- Annual Maintenance of Effort reporting: Ensuring that existing levels of state funding is not withdrawn in response to the receipt of federal funds
- 319 Program Milestones (See next section)
- BMP Implementation Reporting
- Annual Success Stories
- Implementation Monitoring: Maintain robust implementation monitoring projects that demonstrate observable progress in reducing pollution.

Relation of this Objective to the Eight Key Components of an Effective Program:

- #2 (Partnerships) In a program that spans many activities that are not under the direct control of MDE's core 319 Program, healthy partnerships determine the breadth of what can be reasonably evaluated. For example, these partnerships determine, in part, what level of commitment can be made in setting milestones that are critical to gauging success.
- #3 (Programs) The cooperation of other programs that influence nonpoint source pollution is critical to instituting meaningful systems to evaluate Maryland's Nonpoint Source Program as a whole. This objective recognizes and focuses attention on that need.
- #4 (Protection & Restoration) This objective aligns with the protection and restoration components through explicit metrics for both that are included in Maryland's Nonpoint Source Program milestones.
- #5 (Priorities) This objective promotes the establishment of transparent, quantified decision making processes and associated metrics that are the hallmark of managing priorities. This greatly enhances the ability to review and evaluate the Program.
- #6 (7 Program elements) This objective provides a framework for ensuring attention to the seven program elements are given appropriate attention.
- #7 (Efficient & Effective Program Management) This Program Management and Evaluation objective is directly aligned with the management aspect of this Key Component of an Effective NPS Program.
- #8 (Program Review and Evaluation) This Program Management and Evaluation objective is directly aligned with the evaluation aspect of this Key Component of an Effective NPS Program.

2.C Milestones for Objectives

The 319 Program Milestones outlined below represent specific, near-term metrics for the objectives outlined in the previous section. The milestones address both technical aspects of the State's nonpoint source management activities and administrative aspects of the 319 NPS Program administered by the Maryland Department of Environment's Science Services Administration (MDE SSA).

The Milestones set annual commitments for the five-year period 2015-2019. It is broadly organized in two groups: Statewide Milestones and Watershed Milestones. To the degree possible the milestones are organized in groups for each objective outlined above for the Statewide Milestones. However, Objective 1 (Regional Coverage) is addressed within the Watershed Milestones and Objective 2 (Multiple Scales) is addressed implicitly, for example, by having statewide programs, watershed scale initiatives and on-the-ground projects.

The following is a narrative summary of Maryland's NPS Program milestones that are fully presented in *Appendix Milestones for Tracking Progress – Maryland's 2015-2019 Nonpoint Source Management Plan*. The objectives outlined below are described in the previous section. For reasons discussed immediately above, the summary begins with Objective 3.

- **Milestones for Objective 3 – Pollutants and Stressors**
 - Milestones associated with particular pollutants including nitrogen, phosphorus, sediment, bacteria, chloride, PCBs, mercury
- **Milestones for Objective 4 - Pollutant Sources**
 - Specific sources of NPS pollution are listed with the milestones associated with them including agriculture, on-site disposal systems, urban/suburban stormwater and erosion & sediment control, forestry, resource extraction, and hydromodifications.
- **Milestones for Objective 5 – Types of Waterbodies**
 - Phase III WIP for the Chesapeake Bay TMDL
 - Phase I MS4 jurisdiction stormwater waste allocation (WLA) implementation plans for reservoir TMDLs.
 - Annual reports for major drinking water reservoir technical advisory groups.
 - Milestones for watersheds with EPA-accepted plans that are eligible for 319(h) Grant implementation funding are organized by major drainage area with milestones listed for each watershed.
 - Chesapeake Bay watersheds: Antietam Creek, Back River (tidal and non-tidal waters), Choptank River, Corsica River, Gwynns Falls, Jones Falls, Monocacy River, Sassafras River.
 - Western Maryland – Casselman River and Youghiogheny River: Casselman River.
- **Milestones for Objective 6 – Protection and Restoration**
 - Focus areas with milestones listed included antidegradation programs and projects, 303(d) Program vision, and reviews of proposed projects thru the State Clearinghouse.
- **Milestones for Objective 7 – Priority Setting**
 - Priorities milestones identified include geographic area selection for biological monitoring, priorities for Maryland’s 319(h) Grant funds, 303(d) Program vision priorities and alternatives.
- **Milestones for Objective 8 – Program Management and Evaluation**
 - Particular areas identified include: Chesapeake Bay Two-Year Milestones, NPS impairments and Maryland’s Integrated Report, NPS BMPs (implementation progress and verification protocols), 319 Annual Report and milestone progress reporting, tracking implementation of EPA-accepted watershed plans, finding from targeted watershed monitoring, success story reporting, Chesapeake Bay two-year milestone (progress reporting and adoption of new milestones), investment for NPS programs and implementation, updating components of Maryland’s 2014-2019 NPS Management Plan (Continuing Planning Process and State Monitoring Strategy).

2.D General Strategies

Several broad strategies provide frameworks via which Maryland’s 319 Nonpoint Source Program can achieve many of its objectives. Being integrated with these broader strategies leverages their institutional capacity to the benefit of the NPS Program. It also promotes

partnerships, which are vital to the effectiveness of non-regulatory programs like the 319 NPS Program.

Although strategies should be driven by the objectives, they tend to be more subjective and dependent on particular institutions. For example, because we live in the United States our nonpoint source management strategies are embedded in the institutional framework of the federal Clean Water Act. The general strategies adopted by Maryland's Program are further influenced by the context of the Chesapeake Bay and associated Bay Program partnership.

2.D.1 Clean Water Act Section 303(d)

Maryland's Nonpoint Source Management Program is strongly focused on the water quality based management framework, which is codified in Section 303 of the federal Clean Water Act. This logical framework aligns well with the technical foundation that drives the Nonpoint Source Program's objectives. It also imposes accountability and promotes programmatic evaluation and adaptive management. Key features of the water quality based management framework include:

- Setting water quality standards
- Monitoring the water according to those standards
- Evaluating the monitoring data according to those standards to identify waters that are not meeting standards
- Determining pollutant limits in the form of total maximum daily loads (TMDLs)
- Implementing pollution reduction actions to restore water quality

These activities are conducted in a cyclic manner so that lessons learned at each step of this framework inform the other steps. This results in continual refinement of each element.

During the late 1990s and first decade of the 2000s, significant resources were devoted to developing TMDLs. The result of that was the establishment of many pollution limits and associated reduction goals. The US Environmental Protection Agency (EPA) has recently begun to urge more attention and resources be focused on pollution reduction planning and action to achieve the goals established by TMDLs. The strategic vehicle for this is the EPA 303(d) Long-Term Vision framework.

In December of 2013, EPA finalized its documentation of a Long-Term Vision for Assessment, Restoration, and Protection under the CWA Section 303(d) program (the 'New Vision'), with a focus on demonstrable improvement in water quality for watersheds prioritized by States. The vision goals incorporate the concept of adaptive management, placing an emphasis on the need for States to set their own priorities and pace, and allowing flexibility for States to make decisions regarding their waters' protection efforts.

The New Vision consists of six elements or goals, which, along with their expected timelines for adoption by the States, are specified by EPA. The elements are enhanced *Engagement* (beginning 2014); watershed *Prioritization* (2016); *Protection* (2016); programmatic *Integration* (2016); incorporation of TMDL *Alternatives* (2018), and *Assessment* (2020). Overall evaluation will take place in 2022. Details of the New Vision, and full descriptions of these elements, are available from EPA at <http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/programvision.cfm>.

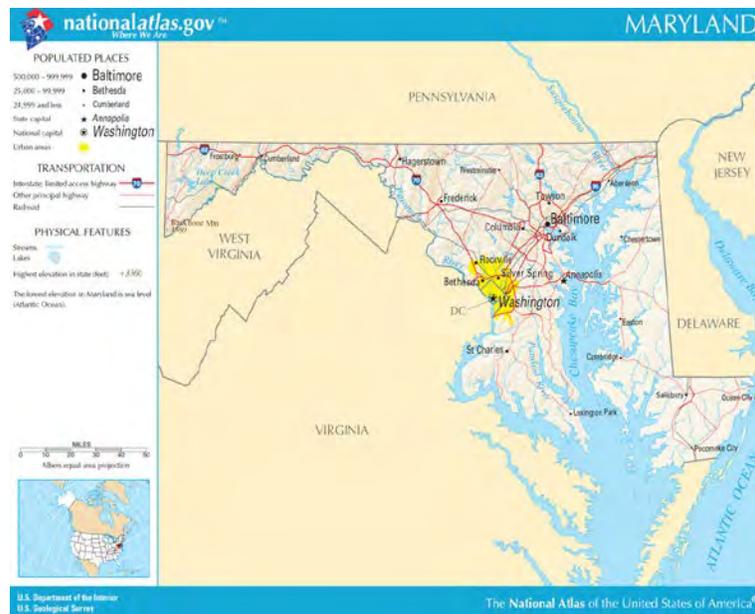
The Prioritization goal, as the foundation to guide planning and implementation of the other goals, requires that by 2016, States review, prioritize, and report priority watersheds or waters for restoration and protection. To that end, Maryland is establishing methodology to prioritize the State's watersheds for TMDL development, TMDL revision and, where appropriate, alternative means of protection and restoration. In keeping with the Engagement goal, MDE is developing this methodology in a transparent manner, and it will be documented in the 2014-2015 Annual Report and Workplan that MDE will submit to EPA in October 2014 as established in the 2012 Memorandum of Understanding between Maryland and EPA (MOU). By 2016, MDE will set a pace for development of these TMDLs for the period spanning 2016-2022, when states will evaluate accomplishments. MDE will maintain its commitments and responsibilities to address impaired waters as outlined in the 2012 MOU.

To achieve this vision, EPA is strongly promoting the integration of state programs that implement Section 303(d) and Section 319 of the Clean Water Act. Relative to other states in which these two programs reside in separate units of government, Maryland is well positioned, because both of these programs reside within the Science Services Administration of the Maryland Department of Environment.

2.D.2 Chesapeake Bay TMDLs and Watershed Implementation Plans

The Chesapeake Bay is integral to the State of Maryland, both physically and culturally. As the largest estuary in the United States, it has served as a national laboratory for developing and testing methods of regional water quality management. Beginning in the early 1980s, a management infrastructure has been developed to address over enrichment of the Bay by nutrients. It is natural for Maryland's Nonpoint Source Program to take advantage of this infrastructure.

The opportunities created by this infrastructure include a nearly statewide nonpoint source watershed modeling system, an implementation tracking system and a robust monitoring system. Watershed-based restoration planning, conducted since the late 1980s, has served as a training ground for many individuals and institutions involved in Maryland's NPS management. Most recently, this has taken the form of the 2010 Chesapeake Bay TMDL, which sets nutrient and sediment pollution load limits, and Maryland's Bay Watershed Implementation Plan (WIP), which is a broad plan for reducing pollution to meet those limits by 2025. The Bay TMDL and WIP are part of a federal accountability framework. This framework includes a process of setting 2-year Milestone commitments intended to promote near-term, incremental progress.



Although Chesapeake Bay restoration is a high priority, Maryland's NPS Program is acutely aware that other NPS pollution issues deserve adequate attention. As a general strategy, Maryland's NPS Program uses the Bay restoration infrastructure to support other NPS pollution issues. This strategy recognizes that local water quality benefits are of most interest to local partners; however, local restoration activities also have downstream benefits. Similarly, this strategy recognizes that restoration actions intended to address concerns of local interest, such as stream restoration or bacteria, can also address concerns of the Chesapeake Bay, particularly nutrients.

2.D.3 Protection via the Clean Water Act Antidegradation Requirements

Maryland's 319 Program recognizes the value of protecting high-quality waters as a general strategy that guides priorities and activities. Protection is part of the 303(d) Long-term Vision framework, but worth expanding upon here. Because the Anti-degradation Policy is part of the Clean Water Act mandate, integral to water quality standards, it carries significant weight from a legal and regulatory perspective. Thus, any NPS Program objective or strategy that can be linked to this legal framework has a greater chance of making an impact.

Investing in protection also makes technical and logical sense. Avoiding impairments is less costly, particularly to tax payers, than restoring impaired waters. Further, the track record for restoring impaired waters is not very good due, not only to the costs, but the technical challenges. High-quality waters also have benefits beyond those inherent in the waters themselves. They buffer water quality degradation in their proximity, along the lines of 'dilution being the solution to pollution'. Similarly, high-quality waters also increase the resilience of watersheds to extreme weather events that are predicted as a result of climate change. For these and other reasons, Maryland's NPS Program is placing more emphasis on protection than has been the case traditionally.

2.D.4 Partnerships

Because the 319 NPS Program generally depends on non-regulatory tools the development and maintenance of cooperative partnerships is an essential general strategy.

Maintaining partnerships takes time and the investment of time is often not fully appreciated by the authorities that fund the 319 NPS Program. However, implementation actions typically involve a variety of partners meeting regularly to work out many details of projects like those reflected in [319 Nonpoint Source Success Stories](#). In addition to the role of partnerships in specific restoration projects, they increase the efficiency of operations among many entities that have similar goals. Partnerships also accelerate technology transfer (knowledge and methods) among parties with similar responsibilities, for example among local governments.

It is also becoming increasingly clear that environmental restoration is going to necessitate behavior change down to the individual homeowner level. Recycling is a good example. Thirty years ago recycling was a relatively foreign concept to many homeowners, whereas it is now widely accepted as a routine behavior. Urban stormwater management at the homeowner level is starting on a similar path; partnerships will be a key part of the education and outreach needed for homeowners throughout entire communities to adopt the use of rain barrels, rain gardens,

pervious pavers, and more natural vegetation. A small amount of additional stormwater management for each house in a subdivision can add up to a large benefit.

Maryland's NPS Program is integrated with a wide array of federal, state and local programs through partnership. Although many partnerships are referenced throughout this Plan, Section 6 on *Public Outreach, Education and Funding* provides a single location that identifies many of Maryland's key partnerships.

A key NPS Program partnership in Maryland involves close cooperation between two federally mandated NPS programs: the MDE-administered State NPS Program under Section 319 of the Clean Water Act and the Maryland DNR-administered Coastal Nonpoint Source Pollution Control Program under the Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA). These two agencies cooperate at many levels of NPS management as described in Chapter 4 section 4.J. The Coastal NPS Program focuses on issues in the coastal zone but much of the legal and regulatory framework (enforceable policies) that supports the program applies statewide.

2.D.5 Other Strategic Frameworks

Maryland's Nonpoint Source Management Program also strives to integrate with other relevant programs to restore and protect water quality as applicable. These programs are identified in Component #3 of EPA's Section 319 Program Guidance: [Key Components of an Effective State Nonpoint Source Management Program](#) (PDF - November 2012).

Chapter 3 – RESOURCE ASSESSMENT AND MONITORING PROGRAMS

Contents

- 3.A Water Monitoring and Evaluation Strategy
 - o 3.A.1 Maryland Comprehensive Water Monitoring Strategy
 - o 3.A.2 Chesapeake Bay Monitoring Program
 - o 3.A.3 Shellfish Harvesting Waters and Beaches
 - o 3.A.4 Fish Tissue Monitoring
 - Fish Consumption Advisories
 - PCBs
 - o 3.A.5 NPS Implementation
 - o 3.A.6 Supporting TMDL Development
- 3.B Water Quality Impairment and Improvement Tracking
- 3.C Processes and Priorities for Detailed Assessments
 - o 3.C.1 Overall Priorities
 - o 3.C.2 Biological Impairments
 - o 3.C.3 High Quality Waters
- 3.D Water Quality Pollutant Load Reduction Tracking
- 3.E Atmospheric Deposition
 - o 3.E.1 Assessment
 - o 3.E.2 Monitoring
 - o 3.E.3 Atmospheric Acid Deposition Relation to Biological Impairment

3.A Water Monitoring and Evaluation Strategy

3.A.1 Maryland Comprehensive Water Monitoring Strategy

The 2009 *State of Maryland's Comprehensive Water Monitoring Strategy* document provides a thorough overview of the strategy, objectives, programs, and evaluation methods that are components of Maryland's NPS management program. In addition to the detailed information in the monitoring strategy document, the following subsections highlight some monitoring and evaluation elements that help to measure long and short term effectiveness of the State NPS management program. MDE will be updating the strategy as described in Chapter 2. (see Appendix Components)

Long-term and short-term monitoring station data collected in Chesapeake Bay waters is used to assess effectiveness of NPS (and point source) implementation progress and effectiveness. Much of this information is available on the Internet thru State portals like BayStat, Eyes on the Bay, StormwaterPrint, Stream Health and others. (see Appendix Internet Sources)

3.A.2 Chesapeake Bay Monitoring Program

Maryland conducts long term water quality monitoring in the Chesapeake Bay and the streams that flow to the bay. The State contributes the data collected to the federal Chesapeake Bay Program (CBP). The CBP is a cooperative effort involving Federal agencies, Washington DC and the States within the Chesapeake Bay drainage area that collects and shares water quality data. The Bay Program partners who contribute monitoring data and assessment helps them to detect changes and trends that may occur, to model past changes and future scenarios, and to better understand conditions so that informed management decisions can be made.

The CBP also conducts a Resource Lands Assessment, which is a multi-state regional perspective on the resource lands that remain in the Chesapeake Bay watershed. The Bay Program partners use the CBP GIS models and expert understanding to consider resource land values to help inform decisions, strategies and cooperation between jurisdictions and other cooperators like land trusts.

Additionally, the CBP maintains a Quality Assurance Program that helps to ensure that the information contributed by more than 40 agencies and research institutions are scientifically valid and comparable among the researchers across the drainage area. This consensus on quality assurance protocols allows Maryland and the other Bay Partners to generate data that is useful and understandable by all.

3.A.3 Shellfish Harvesting Waters and Beaches

Monitoring in shellfish harvesting waters is conducted in accordance with the National Shellfish Sanitation Program (NSSP), which is a federal/state cooperative program recognized by the U. S. Food and Drug Administration (FDA) and the Interstate Shellfish Sanitation Conference (ISSC) for the sanitary control of shellfish produced and sold for human consumption. Sometimes unacceptable bacteria levels are found. In these cases, the monitoring is expanded to include targeted intensive monitoring called a Pollution Source Survey (Sanitary Survey) to locate sources of fecal pollution. When MDE's monitoring identifies a source of indicator bacteria, MDE contacts the local health department to request follow-up to correct the problem.

Beaches used for water contact recreation are subject to water quality monitoring in accordance with Code of Maryland Regulations (COMAR) 26.08.09. Local Health Departments are required to assess their beaches for potential sources of pollution at the beginning of the beach season using sanitary surveys. MDE works with local health departments to enhance beach water quality monitoring and maintain the beach water quality public notification process in Maryland. Water quality assessment begins prior to the beach season when local health departments collect water samples from beaches and perform beach Pollution Source Surveys to ensure that there are no nearby pollution sources that may adversely impact water quality. MDE provides local health departments with a recently developed technology-based data collection system to conduct beach Sanitary Surveys.

MDE uses NOAA National Weather Service precipitation reports to track the amount of precipitation affecting Conditional Shellfish Harvesting Areas and beaches. MDE has established that rainfall levels, greater than or equal to 1 inch in 24 hours, may result in an adverse pollution conditions based on an investigation and extensive data analysis done for shellfish harvesting waters in 1987.

If greater than an inch of rain over 24 hours falls in a conditional shellfish harvesting area, that area is closed to harvesting for three days. This information is reported on a telephone hotline and posted on MDE's Conditional Shellfish Harvesting Map webpage. The objective of this effort is to help prevent food borne illness related to NPS pollutants.

During swimming beach season, a precipitation amount for each beach is posted daily on Maryland's Healthy Beaches website under the Current Conditions section. This website and many local health department beach websites discourage the public from bathing at beaches following a significant rain event because of the deterioration of water quality due to storm

water. The objective of this effort is to rapidly provide local health departments and bathers with information on potential precipitation-related water quality conditions at the beach. This is important because water quality tests used at beaches require a 24-hour analysis time before information can be distributed.

3.A.4 Fish Tissue Monitoring

Fish tissue monitoring commonly measures mercury and PCBs that generally arise from NPS.

Fish Consumption Advisories. Evaluations are used to generate fish consumption advisories for the public via the Internet. (see Appendix Internet Sources) Nearly all the mercury (in the form of methylmercury) found in fish tissue ultimately derives from atmospheric deposition of various forms of mercury originating from combustion, especially electrical generating units. MDE and Maryland DNR co-fund annual Young-of-Year Fish Surveys that contribute to fish tissue analysis for mercury and PCBs. MDE and DNR share field work and laboratory expense, with the analytical work done at the University of Maryland (UMCES/HPL). UMCES and Smithsonian Environment Research Center staff are leads on reporting and documentation. Additionally, Maryland DNR works with NOAA and others to periodically model atmospheric deposition of many constituents, including mercury. The output of these models is used by MDE for TMDL development scenarios, such as baseline, post-implementation, and conditions under projected future federal regulations. This allows MDE to estimate the reduction needed and the effectiveness of programmatic measures, facilitating a reasonable assurance of implementation.

Polychlorinated Biphenyls (PCBs). To help identify water bodies that are impaired by PCBs, MDE's monitoring program includes targeted intensive studies. This monitoring uses caged Asiatic clams as indicator organisms because their filter-feeding leads to accumulation of PCBs in their tissues. Monitoring results support decisions on listing impairments, consumption advisories, and on additional monitoring in specific water bodies to progressively improve identification of PCB contamination sources. The end goal is to identify and mitigate PCB sources so that edible fish tissue will have lower PCB concentrations.

3.A.5 NPS Implementation Monitoring

Monitoring funded by the 319(h) Grant is targeted to watersheds where significant 319-funded NPS implementation is occurring. This monitoring is designed to demonstrate observable improved water quality in response to implementation actions. Emphasis is on impaired water bodies with TMDLs and the support of local efforts to address implementation goals.

A notable example of this is the long-term monitoring of the Corsica River, which has been selected as one of EPA's 28 National Water Quality Monitoring Program (NWQMP) Projects. The Corsica River is a tributary to the Chester River on Maryland's Eastern Shore in Queen Anne's County and encompasses the town of Centreville. The objectives of the NWQMP are 1) to scientifically evaluate the effectiveness of watershed technologies designed to control nonpoint source pollution; and 2) to improve our understanding of nonpoint source pollution¹. Through well-designed, long-term monitoring and statistical analyses, Maryland's NPS Program

¹ D.E. Line, D.L. Osmond, and G.D. Jennings. 2000. *Section 319 Nonpoint Source National Monitoring Program Successes and Recommendations*. NCSU Water Quality Group, Biological and Agricultural Engineering Department, NC State University, Raleigh, North Carolina., http://www.bae.ncsu.edu/programs/extension/wqg/319monitoring/doc/nmp_successes.pdf

has been able to document observable reductions of nitrogen and phosphorus concentrations at a subwatershed scale.

The National Water Quality Initiative (NWQI), initiated jointly by the US Department of Agriculture Natural Resource Conservation Service (NRCS) and EPA in 2010, is a similar targeted watershed restoration initiative. In this case, monitoring funded by the NRCS and the 319(h) Grant is targeted to Catoctin Creek, which encompasses Maryland's three NWQI watersheds where federal funding is focused on agricultural BMP implementation. In both cases, evaluation of water quality and biological data is used to gauge project outcomes.

Monitoring and evaluation funded by NPS implementation partners (not 319-funded) has successfully measured environmental improvements generated by NPS implementation in half of success stories reported by Maryland to EPA's 319 program. This type of on-going monitoring is encouraged by MDE and is one of the criteria used to help select NPS implementation projects for 319(h) Grant funding.

3.A.6 Supporting TMDL Development

Monitoring targeted to support TMDL development is an essential step in establishing load allocations for NPS pollutants. In watersheds with documented biological impairments, monitoring and evaluation aimed at biological stressor assessment is conducted to determine the relative contribution of the nonpoint sources present. The results are used to help draft TMDLs and to target NPS implementation. (see PCBs above)

3.B Water Quality Impairment and Improvement Tracking

The sources of most water quality impairments in Maryland are nonpoint sources (NPS). The component of Maryland's NPS Management Program that tracks and reports on impairment and water quality improvement statewide is *Maryland's Integrated Report of Surface Water Quality* (Integrated Report). This program gathers and assesses water quality data on Maryland surface waters at least every other year. It also reports on documented impairments, completion of Total Maximum Daily Load documents approved to address impairments, and change in impairments that may lead to their elimination.

Sources of surface water impairment, and risks and threats to water quality and aquatic habitat, are identified by Biological Stressor Assessments conducted by MDE. Methodologies for these assessments are posted by MDE on the Internet. (see Appendix Internet Sources)

General categories of impairment tracked in the Integrated Report include: bacteria, ions (such as chlorides, sulfates), oxygen demand (BOD, COD, NBOD), nutrients (nitrogen and phosphorus), pH, sediments, toxic substances (such as metals, polychlorinated biphenyls (PCBs) and pesticides), and trash.

The Integrated Report, and a searchable database that is the basis for the impairments listings in the report, is posted on the Internet. (see Appendix Internet Sources)

Reduction of NPS impairment is also reported in success stories for local areas where sufficient documentation is available to measure changes before and after NPS implementation. Success

story reporting has proven to be difficult because monitoring needed to accumulate enough data to support analysis is frequently nonexistent and/or expensive. Even so, success story reporting is an important component of Maryland's NPS Management Program.

3.C Processes and Priorities for Detailed Assessments

3.C.1 Overall Priorities

Water body impairments listed in Maryland's Integrated Report are categorized according to the next steps that the State will take to address the impairment such as additional assessment to better determine the source of the impairment and/or drafting a TMDL. These categories are identified and described in the report's Part A Introduction. In general, individual circumstances that cause an area to be prioritized for detailed assessment include the factors listed below. Each of the categories of priorities above has its own internal processes and methods for prioritization:

- Human health protection requiring better understanding of water quality problems, particularly relating to shellfish or fish consumption, bathing beaches and episodic problems like fish kills and significant algae blooms;
- The Integrated Report listing indicates that insufficient data is available;
- Biological impairment needs additional assessment to support the Integrated Report;
- Modeling to develop a TMDL requires additional data;
- Watershed plan implementation outcome assessment, particularly if a measurable result is anticipated;
- Watershed planning needs, such as clarifying impairment spatial or temporal distribution;
- Special projects aimed at program effectiveness enhancement, innovation, and efficiency. Examples include Hart Miller Island monitoring (harbor & shipping lane dredge disposal).
- Emerging water quality pollutants of concern such as chlorides, pesticides, and other pollutants that may be having significant effects on aquatic life and/or human health.

3.C.2 Biological Impairments

Biological impairments were initially listed in Maryland's 2002 Integrated Report. Much of the monitoring analysis that identified these impairments was collected by the Maryland Department of Natural Resources Maryland Biological Stream Survey (MBSS) in monitoring cycles ("rounds") conducted during 1995-1997, 2000-2004, and 2007-2009. A fourth sampling round was initiated in 2014 and expected to be completed in 2014. One goal of the current (Round 4) MBSS monitoring effort is to sample sites visited in Round 1 (1995-1997) to assess changes/trends over the last 20-year period. These MBSS efforts focus on statewide probability-based or random stratified stream sampling efforts designed to provide an unbiased statistically rigorous representation of Maryland's non-tidal stream conditions.

For many construction/restoration projects, some counties and state agencies now require watershed stream biota assessments using Maryland Biological Stream Survey (MBSS) sampling and analysis protocols. To meet the need for individuals trained and qualified in these methods, DNR's Monitoring and Non-Tidal Assessment program conducts annual MBSS Training and Certification programs for State and local agency staff, consultants and individuals on MBSS stream sampling/analysis protocols. Certifications offered include benthic macroinvertebrate sampling, benthic macroinvertebrate laboratory processing and subsampling, fish sampling, fish crew leader, and fish taxonomy (<http://www.dnr.state.md.us/streams/MBSSTraining.asp>).

3.C.3 High Quality Waters

Monitoring and assessment of high quality waters (Tier II) is prioritized in three ways:

- If State review of a proposed project finds that a significant potential for degradation may arise, then the stream area is prioritized for focused monitoring/assessment.
- Existing Tier II waters are considered for ongoing monitoring to gauge their continuing health conditions.
- Potential Tier II candidates, are identified for monitoring/assessment to quantify existing conditions.

3.D Water Quality Pollutant Load Reduction Tracking

Every year, the State of Maryland collects reports from local governments and State agencies on NPS BMP implementation progress. The reports are gathered by MDE and the collected data is submitted to the EPA Chesapeake Bay Program. Summary information on the numbers of NPS BMPs implemented and estimated pollutant load reductions for nitrogen and phosphorus is presented in an appendix of the *Maryland 319 Nonpoint Source Program Annual Report*. The EPA Chesapeake Bay Program gathers similar NPS BMP implementation progress reporting from all the states in the Chesapeake Bay drainage and uses it for new runs of the Chesapeake Bay Model. Summary results of the most recent model run, are posted on the Internet. (The data file posted for download shows reported and projected pollutant loads for nitrogen, phosphorus and sediment for each of the Chesapeake Bay States including Maryland.) (see Appendix Internet Sources)

Additionally, local watershed plans for that are accepted by EPA as eligible for 319(h) Grant implementation funding must meet EPA's expectation that NPS implementation progress will be reported at least annually. Each of these watersheds is identified in the *Maryland 319 Nonpoint Source Program Annual Report* and progress is reported each year in that report.

3.E Atmospheric Deposition

Air pollution is an important environmental concern for both Maryland water quality and for the Chesapeake Bay. Pollutants in the air can move to the earth's surface, a process collectively called atmospheric deposition, in precipitation (rain, snow, fog), particles, aerosols, and gases. Air pollutants reaching the earth through precipitation or as dry deposition originate from various sources and can be harmful to the environment and public health.

3.E.1 Assessment of Atmospheric Deposition

Forms of air pollution that have significant impacts on Maryland water quality are most commonly associated with burning of fuels for generating electricity, industrial operations, or operating motors for transportation or other purposes. Exhaust and stack emissions to the air from industries and electric utilities as well as from cars, trucks, boats, trains and airplanes are sources of air pollution that contribute to degradation of Maryland streams, rivers, lakes and

bays. Air pollution that does not fall directly on open water can be transported from land to streams by storm water runoff or through groundwater flow. Some air pollution is carried by wind over great distances before it reaches Maryland waterways.

While there are many air pollutants that can affect water quality, there are three that have the most significant water quality affects in Maryland. All three of these air pollutants originate from sources both inside and outside of the State:

- Nitrogen oxides (NO_x) are mostly from burning coal (electric utilities) and petroleum (transportation sources). The Chesapeake Bay's "airshed" for NO_x extends from Tennessee to Ontario and encompasses an area over 5.5 times larger than the Bay's watershed. Atmospheric deposition of NO_x contributes more than one quarter of the excessive nitrogen levels and eutrophication in the Chesapeake Bay. This eutrophication underlies reduced dissolved oxygen levels, nuisance algal blooms, dieback of underwater plants (due to reduced light penetration), and reduced populations of fish and shellfish. TMDLs for large water bodies, like the Chesapeake Bay, directly address atmospheric deposition of NO_x. In general, NO_x from utility emissions affecting Maryland frequently arise from states west of the Chesapeake watershed. Mobile source emissions concentrate along the East Coast, particularly in the population corridor between Washington, D.C. and Baltimore. As expected, utility sources account for much of the nitrogen deposition in the western portion of the Chesapeake watershed. Alternately, mobile sources account for most of the nitrogen deposition to the Chesapeake Bay, lower portions of western shore tributaries, and the Delmarva Peninsula;
- Sulfur dioxide (SO₂) emissions are mostly from burning coal (electric utilities). Atmospheric deposition of SO₂ causes increasing acidity in streams (in the form of sulfuric acid). Streams in Maryland that are most sensitive to increasing acidity are concentrated in the southern Coastal Plain (74% of the streams in the region) and the Appalachian Plateau (52% of the streams in the region). Most SO₂ air pollution in Maryland originates outside of the State;
- Mercury emissions are mostly from burning coal (electric utilities) but also from cement kilns and incinerators. Atmospheric deposition of mercury is the primary source of this pollutant in water bodies. Once in the aquatic environment, mercury accumulates in the food chain and tends to concentrate in fish that may be consumed by people. Water quality impairments and Fish Consumption Advisories associated with mercury are frequently believed to be results of atmospheric deposition.

3.E.2 Monitoring Associated with Atmospheric Deposition

In Maryland, MDE (Air and Radiation Management Administration) operates 22 air monitoring stations and two haze cameras. As required by the Clean Air Act, MDE's annual Ambient Air Monitoring Network Plan details the network's operation. In summary, the air monitoring stations measure ground-level concentrations of pollutants subject to national standards and air toxics. They also take meteorological and other research-oriented measurements. Although monitoring takes place statewide, most of the stations are concentrated in the urban/industrial areas that have the highest population and greater numbers of pollutant sources. One of Maryland's air monitoring stations near Frostburg, Maryland is located at 2,563 feet elevation to help measure ambient air quality and interstate pollutant transport. In January 2010, EPA strengthened the health-based National Ambient Air Quality Standard for nitrogen dioxide (NO₂) by setting a new 1-hour 100 ppb standard. To comply with associated new requirements, MDE installed a new near-road NO₂ monitor.

3.E.3 Atmospheric Acid Deposition Relation to Biological Impairment

Maryland's biological stressor identification program has found that atmospheric deposition of acidity is the likely source of low pH contributing to biological impairment in some watersheds with naturally low acid neutralizing capacity. In the watersheds listed below, biological impairments associated at least in part with low pH have been identified where the only known sources of acidity are natural conditions and atmospheric deposition.

- Mattawoman Creek watershed exhibits inherently poor buffering capacity and natural sources of organic acidity. Nontidal streams here are extremely susceptible to acidification from atmospheric deposition.
- Little Tonoloway Creek watershed has localized biological impairment related to pH in areas where the geology has little buffering capacity partly because of local siliciclastic bedrock such as sandstone.
- Licking Creek watershed includes areas with very low buffering capacity associated with siliciclastic bedrock types (such as sandstone). Atmospheric deposition is the probable source of acidity that exceeds the natural acid neutralizing capacity. All impaired stream areas in this watershed occur on one unnamed tributary draining an area with sandstone geology that is largely undeveloped and nearly 100% forested. Furthermore, this area is largely public land that includes the Indian Spring Wildlife Management Area.
- St. Mary's River watershed has geology with inherently poor buffering capacity as well as natural sources of organic acidity. The nontidal streams in the watershed are extremely susceptible to acidification from atmospheric deposition.

MDE anticipates that the pH-related biological impairments in these watersheds will be reduced or eliminated as a result of continuing implementation of clean air regulations and more stringent emission reduction standards under the Federal Clean Air Act Amendments of 1990 and the Maryland Healthy Air Act.

Chapter 4 – MARYLAND NPS PROGRAMS AND INITIATIVES

Contents

- 4.A Introduction
- 4.B Institutional Relationships
- 4.C Program Integration
 - o 4.C.1 Integration Among State Programs
 - o 4.C.2 Integration With Federal Programs
- 4.D Management Measures
- 4.E Approaches to Solving NPS Problems
 - o 4.E.1 Watershed and Water Quality Approaches to Meet Standards Directly
 - o 4.E.2 Iterative Technology-Based Approaches
- 4.F Resources Available
- 4.G Agricultural Programs
- 4.H Antidegradation and Healthy Waters
- 4.I Atmospheric Deposition
 - o 4.I.1 Federal
 - o 4.I.2 State
 - o 4.I.3 Program Integration – Mercury Example
- 4.J Coastal NPS Management Program
 - o 4.J.1 Federal Consistency
 - o 4.J.2 Strengthening and Expanding Maryland’s Use of Federal Consistency
 - o 4.J.3 Future Directions
- 4.K NPS Management Measures
 - o 4.K.1 Inventory of Management Measures
 - o 4.K.2 Nutrient Management
 - o 4.K.3 Confined Animal Facilities
 - o 4.K.4 Pesticide Management
 - o 4.K.5 Grazing Management
 - o 4.K.6 On-Site Sewage Disposal Systems
 - o 4.K.7 Marinas Program
 - o 4.K.8 Other Highlights
- 4.L Climate Change
- 4.M Critical Area Commission for the Chesapeake and Atlantic Coastal Bays
- 4.N Demonstration Projects
- 4.O Groundwater Management Programs
- 4.P Mining Programs for Coal
 - o 4.P.1 Surface Mining Control and Reclamation Act
 - o 4.P.2 Federal Clean Water Act
 - o 4.P.3 State Management of Active Coal Mines
 - o 4.P.4 State Management of Abandoned Coal Mines
- 4.Q Mining Programs for Non-Coal
- 4.R Priorities for Protection, Restoration, Watershed Planning and Implementation
 - o 4.R.1 Priorities for Investing 319(h) NPS Grant Funds or NPS Program Resources
 - o 4.R.2 Additional Factors for Directing Financial Resources
 - o 4.R.3 Technical Rationales for Restoration Priorities
 - o 4.R.4 Applications of Prioritization Rationales
- 4.S Technical Assistance
 - o 4.S.1 Watershed Assistance Collaborative
 - o 4.S.2 Watershed Restoration Action Strategy Program
 - o 4.S.3 TMDL Data Center
- 4.T Technology Transfer
 - o 4.T.1 Maryland Assessment Scenario Tool (MAST)
 - o 4.T.2 Stormwater Management and Restoration Tracking (SMART) Tool
- 4.U Tracking Implementation
- 4.V TMDLs

- 4.V.1 Overall
- 4.V.2 Chlorides
- 4.V.3 PCBs
- 4.V.4 Temperature
- 4.W Training
 - 4.W.1 Coastal Training Program
 - 4.W.2 Watershed Stewards Academy

4.A Introduction

NPS programs and initiatives that apply across the State of Maryland, or in at least two of Maryland's three major drainage areas, are considered statewide programs.

4.B Institutional Relationships

In Maryland, three State agencies have key institutional lead roles for the State NPS Management Program (see Appendix Internet Sources):

- Maryland Department of Agriculture (MDA):
 - o Agriculture, fertilizer management, pesticides regulatory & non regulatory program, technical assistance (see Appendix Internet Sources)
 - o State financial assistance for agricultural BMP implementation
- Maryland Department of Natural Resources (MDNR):
 - o Ambient, biological, and Chesapeake Bay monitoring and analysis
 - o Coastal nonpoint source program
 - o Forest management
 - o State financial assistance for urban NPS implementation
- Maryland Department of the Environment (MDE):
 - o 319(h) Grant management with associated Federal financial NPS implementation funding.
 - o Regulatory controls for sediment & erosion control, waterway construction, stormwater management, concentrated animal feeding operations, discharge permits, drinking water protection, wetland permits (tidal and nontidal), withdrawals from groundwater and surface water
 - o Nonregulatory programs for NPS watershed planning.
 - o NPS implementation tracking

Additionally, State and local health and environmental agencies are responsible for essential components of the State NPS management program. The Maryland Dept. of Health and Mental Hygiene (DHMH) is the primary State agency responsible for managing public health programs and services in Maryland. DHMH's functions are related to essential elements of the state NPS management program, such as water quality protection, fish/shellfish consumption advisories, and shellfish. DHMH and MDE both work closely with, and also delegate some authorities to, County agencies responsible for public health and environmental programs such as those associated with bathing beaches, private drinking water wells, and onsite sewage disposal systems. DHMH, MDE and collective representatives of the local agencies maintain a memorandum of understanding that identifies the many interrelated responsibilities, working relationships and cooperative arrangements that affect the agencies. For example within the memorandum, a county health departments monitor water quality at bathing beaches, MDE conducts a sanitary survey if certain chronic problems are found, and samples from both sources undergo DHMH lab analysis for fecal bacteria indicators.

These lead State and local agencies work together and cooperate at many levels to coordinate activities, particularly regarding Chesapeake Bay programs. Additionally, they have close working relationships with other State and regional entities to facilitate NPS management within particular issue or geographic areas:

- Baltimore Regional Metropolitan Council: Baltimore reservoir watersheds.
- Interstate Commission on the Potomac River: Potomac River watershed, technical expertise, interstate cooperation.
- Maryland Dept. of Transportation State Highway Administration: roadway NPS
- Maryland Environmental Service: technical expertise.
- Susquehanna River Basin Commission: technical expertise, interstate cooperation.
- Washington Suburban Sanitary Commission: Washington DC reservoir watersheds.
- Washington Metropolitan Council of Governments: Anacostia River watershed.

Lastly, the Maryland Department of Planning (MDP) assists in preventing future NPS through policy and program implementation related to smart growth and local comprehensive planning. Maryland's smart growth policies and programs work to ensure that a higher percentage of future population and job growth in Maryland (about 1 million new residents and 600,000 new jobs by 2035) occur in higher-density areas with public sewer. By achieving higher-density development and avoiding new septic tank installation, smart growth results in lower per household NPS loads than development outside of Maryland's growth areas. In addition, MDP provides guidance to more than 100 counties and municipalities with land use planning responsibility to ensure that state requirements for comprehensive plans are implemented. State requirements for comprehensive plans include the development of a Water Resources Element, which can be used to ensure that proposed land use plans and amendments have the least NPS impact possible. (see Appendix Internet Sources under MDP and Plan Maryland)

4.C Program Integration

4.C.1 Integration Among State Programs

In addition to the integration among agencies in the Maryland that have direct responsibility for NPS management programs, there are a number of other programs that are closely related to NPS control and watershed management that are also integrated with the overall functioning of Maryland's NPS Management Program:

- **303(d) Program** – EPA has led the development of a 303(d) Program Vision, which is a strategic plan for carrying out water quality based management under the federal Clean Water Act. In addition to redirecting the focus of programs responsible for developing Total Maximum Daily Loads, this initiative promotes the integration of the Clean Water Act Section 303(d) and 319 Programs. (See Chapter 2)
- **Animal Feeding Operations Program** – In 2009-2010, key components of Maryland's regulatory program were put in place and hundreds of operations required review, inspection and potentially permits. To help expedite this work, MDE's NPS Management Program contributed a technical staff position to the new program. MDE's AFO Program works closely with MDA throughout the registration process for AFOs and during compliance activities, in which both agencies have particular responsibilities. MDE also works with the US Department of Agriculture's Natural Resources Conservation Service (NRCS) and the Soil Conservation Districts. The AFO Program has much interaction with non-governmental organizations including the Maryland Farm Bureau and the University of Maryland Extension. In 2014, MDE is working to develop a new general permits and to complete permits for operations required to have them. (see Appendix Internet Sources)
- **Antidegradation Program** – Protection of high quality waters is recognized as a vital function of the State NPS Program. (See Antidegradation and Healthy Waters).

- **Clean Lakes Program** – In Maryland, Federal CWA requirements for Clean Lakes programs are integrated into the State’s water quality management programs. For the public water supply reservoirs, routine monitoring is conducted to address Safe Drinking Water Act requirements. Additionally, public water supply reservoirs serving Baltimore and Washington DC have long-standing coordinating bodies that include all State and local agencies with NPS management responsibilities and other key stakeholders to ensure that all needs are addressed. Special projects focusing on lakes are conducted during TMDL development, watershed planning/management (Deep Creek Lake, Urieville Lake and others) and in support of the National Lakes Assessment.
- **Coastal Protection Programs** (see coastal NPS management program)
- **Construction** – Maryland’s sediment control regulatory program that began in 1970 requires construction activities to control runoff and sediment movement. MDE administers the State program and sometimes delegates local operation of the program to a local government agency, including permitting and inspections. MDE periodically reviews the locally-run programs.
- **Marinas** – A suite of regulatory requirements and nonregulatory incentives in Maryland are integrated to address marinas, including NPS associated with them. Critical Area requirements and MDE regulatory programs to protect wetlands, to meet stormwater management, and to control sediment, erosion and oil, all dovetail to set minimum requirements for marina development, expansion and operation. Additionally, the Clean Marinas Program and Boat Sewage Pumpout Grant Program in MDNR are offered to encourage and support marina operators by promoting voluntary adoption of good stewardship practices. (see Marinas Program)
- **Mines that are inactive or abandoned** – MDE administers the State program to meet requirements of the Federal Surface Mining Control and Reclamation Act of 1977. Maryland’s permits for active mines require reclamation of coal and noncoal mines. For abandoned coal mines, MDE’s program integrates Federal and State funding to complete land reclamation and acid mine drainage mitigation projects on impacted lands. (see Mining Programs)
- **Monitoring programs** – The two lead State agencies responsible for ambient monitoring, MDE and MDNR, coordinate their programs and operations to ensure that this work is accomplished effectively and efficiently. Additionally, the Chesapeake Bay Program and the Maryland Coastal Bays Program both provide interagency forums that contribute to coordination among Federal, State and local agencies. (see Chapter 3)
- **Source Water Protection** – MDE administers the State program, cooperates with EPA to meet Safe Drinking Water Act programmatic requirements, and works closely with local government and private operators to effectively meet Act requirements. For wellhead protection, MDE partners with well owners to develop/update protection plans. MDE’s Water Supply Information and Permitting System (WSIPS), which will be fully functional during summer of 2014, will enable online permit applications and online submittal of compliance data and documentation. (see Groundwater Management Programs)
- **Urban Runoff** – Maryland’s “Stormwater Management Act” became effective in late 2007. MDE is responsible for implementing the Act, improving stormwater management in Maryland and issuing permits to local governments. Environmental Site Design requirements aimed at avoiding increased stormwater impacts apply to new development and significant redevelopment. Maryland maintains the StormwaterPrint Internet portal to distribute information. Beginning in 2013, Maryland law required that the large local

jurisdictions permitted for stormwater discharge (Phase I MS4 permits) adopt a funding mechanism to pay for local programs such as construction and maintenance of stormwater facilities. (see Appendix Internet Sources)

- **Watershed planning programs** – In Maryland, MDE cooperated closely with EPA in response to the Chesapeake Bay TMDL to develop the State’s Watershed Implementation Plan (WIP) and cooperatively assisted local governments in developing their own WIP to meet the TMDL. Most other watershed planning in Maryland is generally led by local government programs. MDNR offers technical and financial assistance to local government and nonprofit organizations in watershed-based NPS planning thru the Watershed Assistance Collaborative. For jurisdictions seeking eligibility for 319(h) Grant implementation funding, MDE offers technical and/or financial assistance.
- **Wetlands Protection Programs including CWA Section 404** – MDE regulates activities tidal and nontidal wetlands, waterways, and their 100-year floodplain. Many provisions are consistent with or exceed federal Clean Water Act requirements. As a result of Maryland’s requirements and cooperative processing and review of applications, the U.S. Army Corps of Engineers has issued a State Programmatic General Permit for numerous minor activities, provided that MDE issues an authorization. Maryland has a statewide wetland conservation plan and a mandate to achieve a no net loss of wetland acreage and function, and to strive for a overall resource gain. MDE encourages sound wetland creation, restoration, and enhancement projects, and the Wetlands and Waterways Program reviews and authorizes many projects identified in MS-4 permits. Additional coordination occurs within MDE to review guidance related to nonpoint source management.

4.C.2 Integration With Federal Programs

Additionally, Maryland NPS management agencies coordinate with Federal programs:

- Land Management
 - o **U.S. Forest Service** – Maryland DNR and local agencies and academic and research institutions are collaborating with the USDA Forest Service Northern Research Station on the Baltimore Cooperating Experimental Forest, which is the focus of the Baltimore Ecosystem Study. This long term study focusing partially urbanized areas, particularly in the Gwynns Falls Watershed, has potential to explore the relationships between long term landscape management and NPS water quality outcomes.
 - o **National Park Service** – In the Coastal Bays (Assateague National Sea Shore) and in the Chesapeake Bay (Blackwater National Wildlife Refuge, Antietam National Battlefield, and others), the National Park Service is an important partner in protecting water quality and managing shore erosion. Additionally, the National Park Service is one of the Federal agencies cooperating with Maryland thru the Chesapeake Bay Program focusing on water access and recreation.
- Water Management
 - o **Corps of Engineers** – Maryland State and county agencies cooperate with the Corps’ missions to conduct environmental cleanup, restore ecosystems and participate in the Chesapeake Bay Program. This cooperation is particularly beneficial in the context of projects protecting and restoring areas potentially affected by NPS such as ecosystem restoration, floodplain management, shoreline erosion, watershed assessment & planning and beneficial use of dredged material.

- **Federal Energy Regulatory Commission (FERC)** – Maryland State agencies are working with FERC and others to consider effective management approaches regarding sediment and nutrients that periodically collects behind dams, such as in the Susquehanna River upstream of the Conowingo Dam.
- **National Estuary Program** – The Maryland Coastal Bays are part of this EPA program. Under the Federal CWA Section 320, a Comprehensive Conservation and Management Plan for the Maryland Coastal Bays was adopted in 1999 and is currently being revised. Additionally, State agencies and nonprofit organizations have cooperated with the program to implement numerous local protection and restoration projects including: Atlantic white cedar restoration, beach restoration, conservation easements, forest and forested wetlands restoration, and marsh/shoreline restoration. (see Chapter 3 and Appendix Internet Sources)

4.D Management Measures

Maryland actively cooperates with the EPA Chesapeake Bay Program and the other states in the Chesapeake Bay drainage to review potential management measures and best management practices (BMPs) and to determine which are most effective in achieving and maintaining water quality standards potentially affected by NPS nutrient and sediment. Consistent with the consensus developed by EPA and the Chesapeake Bay states, Maryland tracked and reported implementation progress for 27 approved BMP categories listed in the *Maryland 319 Nonpoint Source Program 2013 Annual Report*, Appendix C (see Appendix Internet Sources). The implementation progress reporting data is tracked by local jurisdictions and State agencies, gathered by MDE where quality assurance and assembly occurs before it is reported to EPA.

Management measures that are anticipated to contribute significantly to attaining goals in a watershed-based plan are identified in the plan as a prerequisite for becoming eligible for 319(h) Grant funding for implementation. In general, nutrient and sediment watershed-level management measures are generally a subset of the statewide consensus list. For other 319-eligible plans that are designed to address impairments like bacteria or pH, the watershed plan list of management measures are consistent with EPA expectations. These plans are listed in the MDE's 319 NPS Annual Report along with Internet links.

4.E Approaches to Solving NPS Problems

In an effort to solve NPS water quality problems in the most feasible and efficient ways available, Maryland's NPS Management Program works diverse related programs and with partners and stakeholders to select and apply the best tool for the job. Several examples summarized below to illustrate the range of approaches that are being used.

4.E.1 Watershed and Water Quality-based Approaches to Meet Standards Directly

In Western Maryland, in-stream water quality is impaired by low pH caused acid mine drainage from abandoned coal mines. To meet water quality standards, MDE's Abandoned Mine Land Division evaluates conditions, devises solutions and implements mitigation practices stream-by-stream using a watershed-scale approach. Success has been demonstrated in numerous areas of the North Branch Potomac River. The most recent example is the mainstem of Aaron Run,

which is a direct tributary to Savage River. To meet the goal of attaining the State water quality standard for pH, planning encompassed the watershed and implementation measures were implemented to meet and maintain the pH standard all along the mainstem. A parallel approach is currently being implemented in the Casselman River watershed.

In other parts of the State, local governments have volunteered to plan and implement NPS best management practices to reduce NPS nitrogen, phosphorus and sediment. These jurisdictions crafted watershed-based plans to address local water quality restoration goals in ways that will also benefit the Chesapeake Bay. A list of these plans and summaries of progress toward meeting their goals is presented annually in Maryland's NPS Program Annual Report.

4.E.2 Iterative Technology-Based Approaches

An example of a technology-based approach employed in Maryland to address NPS water quality problems is the State program to upgrade septic systems with Best Available Technology (BAT) on-site sewage disposal systems that reduce nitrogen discharged to groundwater. This program is funded by the State's Bay Restoration Fund to provide grants to property owners who volunteer for the upgrade. MDE's list of BAT systems that are eligible for grant reimbursement is updated as new BAT systems are certified and under-performing systems are dropped from the list. Funding priorities are targeted to areas that are likely to provide the earliest benefit the Chesapeake Bay.

4.F Resources Available

Maryland's NPS management programs rely on diverse resources to work toward achieving the programs' goals and objectives. An important element of the Federal Clean Water Act's 1987 amendments was creation of the Federal nonpoint source grant project under Section 319(h). Maryland uses 319(h) Grant funds to help pay for selected portions of the State NPS Management Program and to provide financial assistance to local jurisdictions to help manage NPS issues and to help pay for NPS implementation. To encourage NPS implementation, Maryland periodically issues requests for proposals (RFP) for grant funding assistance. In recent years, the opportunity to complete for 319(h) Grant funds has been offered directly by MDE thru an independent RFP or in cooperation with the Maryland DNR thru an RFP for the State's Chesapeake and Atlantic Coastal Bays 2010 Trust Fund. (See Chapter 6 for more information and additional sources of financial assistance.)

An additional measure the resources invested in NPS management and implementation is reported at least annually to EPA. This reporting is submitted to meet a requirement in the Federal Clean Water Act's 1987 amendments called maintenance of effort. To ensure that States use Federal 319(h) Grant funds to augment existing State resources rather than displace them, the dollar value of resource expenditure by each state prior to the federal grant was determined and set as a minimum for future year expenditure. Each year the states verify that their minimum resource expenditure threshold is surpassed as a prerequisite for receiving the next 319(h) Grant. Maryland's report of resource expenditure in state fiscal year 2014 was over \$54M, which is more than six times the required threshold. A summary of this information is in Maryland's Annual Report (see Appendix Internet Sources). This resource expenditure report is limited to selected state agency programs, which represents a fraction of all the resources that are available and/or expended. Resources associated with local government and private entity programs and

implementation than contribute to NPS management are not tracked for maintenance of effort reporting.

4.G Agricultural Programs

Maryland integrates delivery of many agricultural programs thru local Soil Conservation Districts (SCDs). Thru the SCDs, personnel and operating support from Maryland Department of Agriculture, USDA Natural Resources Conservation Service (NRCS) and county governments are all provided to farmers. Farmers have a one-stop shop for learning and applying for programs and financial assistance and securing technical assistance to evaluate resource concerns on their farmland and develop best management practices (BMPs) to address potential water quality problems. All local SCD offices offer financial assistance and technical personnel assistance funded by Maryland Department of Agriculture and the Federal NRCS programs. Some local SCD offices also have locally-funded support personnel. Examples of programs delivered through soil conservation districts include the USDA NRCS Environmental Quality Incentive Program (EQIP) and Conservation Reserve Enhancement Program (CREP), Maryland Agricultural Water Quality Cost Share Program (MACS) and Maryland Cover Crop Program and local sediment and erosion control programs and stormwater protection programs.

SCDs have sponsored forums for assessing agricultural resource concerns and necessary measures or BMPs to include in Maryland's Watershed Implementation Plan to address TMDLs. Stakeholders include representatives from county resource agencies, USDA: NRCS and FSA, farm bureau, Maryland Department of Agriculture, University of Maryland .Extension, watershed groups, farmers and others.

Policy and program development are coordinated through the State Soil Conservation Committee. Established by law, this committee is comprised of state and federal agricultural and natural resource agencies as well as regional representatives of soil conservation districts. The committee is a forum for collaborative efforts directed at water quality improvement and other resource concerns on agricultural land.

4.H Antidegradation and Healthy Waters

Existing uses of water bodies are protected under the [State anti-degradation policy](#) in Maryland regulation ([COMAR 26.08.02.04-1](#)). Waters exhibiting significantly higher quality than the minimum standards receive additional protection under State regulation. These high quality streams (Tier II waters) are identified using biological and other data. They are listed in the State regulations and maps showing their locations are publicly available via MDE's Water Quality Mapping Center (see Appendix Internet Sources).

In Maryland, proposed projects that are reviewed by State agencies are screened by MDE to determine if they could potentially affect high quality streams (Tier II waters). MDE's screening includes proposed discharge permits, county Water and Sewer Plan amendments and Water Quality Certifications (Section 401) anywhere in the entire watershed upstream of Tier II waters. If MDE determines that a proposed project may cause degradation, MDE can call for more

stringent management practices, permit conditions, project redesign, and/or restoration projects. In cases that protection cannot be reasonably ensured, State approvals/permits have been denied.

Maryland's NPS Program helps to assure that priority threats to high quality waters are addressed affectively and expeditiously. It does this by funding monitoring of Tier II waters in which significant development projects are proposed. This monitoring serves several purposes: It verifies the water are high-quality, refines knowledge about the geographic extent of the high-quality waters, improves robustness of water quality measurement, provides a baseline for evaluating potential impact of any approved development. The baseline data could be valuable for refining the antidegradation policies in the future by providing evidence that current protection practices are not sufficiently protective.

Maryland's NPS Program in general, and the antidegradation program in particular, are integrated with other programs, partners and strategic frameworks. Several examples are provided below:

- The programs will help meet the 2014 Chesapeake Bay Agreement, which calls for sustaining high quality and/or high ecological values and maintaining healthy conditions in all state-identified healthy waters and watersheds. Maryland's Department of Natural Resources is a key partner in this initiative.
- The programs play a role in the State's Climate Change Action Plan by helping to maintain the resilience of watersheds to resist impacts of extreme weather events. Also, by planting and maintaining vegetative buffers, the programs sequester more greenhouse gases. The Maryland Department of Environment's Air Management Administration is a key partner in this initiative.
- Maryland's 2009 Comprehensive Water Monitoring Strategy reflects an explicit shift in priority to ensure that more resources be devoted to both the evaluation of nonpoint source implementation and protection of high quality waters.
- The programs are reflected in Maryland's StatStat, the set of performance measurement and management tools of the Governor's Office. The Smart, Green and Growing Atlas includes the "StreamHealth" map that documents the current health streams.
- The programs are also integrated with EPA's 303(d) Program Vision initiative, which places a greater emphasis on protection of waters.

4.I Atmospheric Deposition

Maryland has been very aggressive in controlling air pollution generated within the State's borders:

- Most point sources emitting 25 tons per year of nitrous oxides (NOx) to the atmosphere are controlled by regulations;
- Numerous Maryland regulations control NOx from diverse sources including consumer products, industry, electricity generation and fuels.

Robust regional and national programs are needed to support Maryland's efforts.

4.I.1 Federal

The *Federal Clean Air Act* requires the EPA to set National Ambient Air Quality Standards (NAAQS, 40 CFR Part 50) for pollutants considered harmful to public health and the

environment. EPA must designate areas as meeting (attainment) or not meeting (nonattainment) the NAAQS. The *Clean Air Act* also requires states to develop a general plan to attain and maintain the NAAQS and specific plans to attain the standards for each designated nonattainment area. The specific plans, known as State Implementation Plans (SIPs), are prepared by state and local air quality management agencies and submitted to EPA for approval. Currently, parts of Maryland are designated as nonattainment. There are persistent problems largely caused by emissions generated in upwind states. EPA has established health-based standards for six common air pollutants including two that are relevant to NPS water pollution management: nitrogen dioxide and sulfur dioxide.

4.I.2 State

Several State laws and programs are highlighted because they have significant connection to State NPS management.

- Maryland Healthy Air Act of 2006 (Annotated Code of Maryland Environment Title 2 Ambient Air Quality Control Subtitle 10 Healthy Air Act Sections 2-1001 – 2-1005)
 - o This State law was enacted to reduce emissions for nitrogen oxides (NO_x), sulfur dioxide (SO₂), and mercury from the largest coal-burning electric power plants. It also initiated Maryland's move to an integrated multi-pollutant approach for managing air pollutants. The pollutants addressed by the Act are all relevant to NPS water quality management:
 - NO_x reductions are required. (Atmospheric deposition of nitrogen is a significant percentage of the total nitrogen pollutant load to the Chesapeake Bay and other water bodies. The Chesapeake Bay TMDL accounts for this nitrogen source and reductions in atmospheric deposition of nitrogen are needed to meet the TMDL.)
 - The Act required 70% reduction of NO_x by 2010 compared to 2002. Emissions monitoring demonstrate that this goal has been met.
 - The Act also requires a Phase 2 emissions reduction of 75% for NO_x by 2013 compared to 2002.
 - o SO₂ reductions are required. (Atmospheric deposition of SO₂, a constituent of acid rain, is a secondary contributor of acidity in streams impacted by acid mine drainage. Reduction of atmospheric deposition of SO₂ can help meet current TMDLs for pH.)
 - The Act required 80% reduction of SO₂ by 2010 compared to 2002. Emissions monitoring demonstrate that 93% reduction for SO₂ was achieved.
 - The Act also requires a Phase 2 reduction of 85% for SO₂ by 2013 compared to 2002. This goal is already surpassed.
 - o Mercury emissions controls are required. (Atmospheric deposition of mercury is a significant contributor to elevated mercury levels in fish. Various water bodies in Maryland are currently subject to mercury TMDLs and/or to Fish Consumption Advisories that MDE issues to protect human health. Reduction of atmospheric mercury deposition can help to meet the TMDLs and to reduce the need for the Advisories. Milestones for mercury are in Appendix Milestones.)
 - The Act required that 80% of mercury emissions to be controlled by 2010.
 - The Act also requires that 90% of mercury emissions be controlled by 2013.

- Greenhouse gases controls are required. (Increasing levels of atmospheric carbon dioxide have been linked to increasing acidity in some marine waters. However, this water quality impact has not been identified in Maryland waters.)
- Maryland Clean Cars Act of 2007
 - Beginning with the 2011 model year, the Act requires that California vehicle emission standards be met by new cars and light duty trucks sold in Maryland.
 - By 2020, the affect of the Act combined with other related transportation program could be up to about 9.48 million tons NO_x reduction by 2020. By 2027, nitrogen pollution could be reduced by 2027 tons/day.
 - Other California standards continue to apply in Maryland:
 - Requires increasing percentage of zero emissions vehicles in overall new vehicle sales, and
 - Requires more stringent NO_x standards for 2015-2025 automotive model years.
- State Implementation Plan
 - To meet Federal Clean Air Act requirements, Maryland's revised State Implementation Plan will be due in either 2013 or 2014. This plan will flesh out more details on reducing atmospheric pollutants relevant that are likely to support NPS water quality management.

4.I.3 Program Integration – Mercury Example

Nearly all the mercury found in fish tissue (in the form of methylmercury) can be traced to atmospheric deposition of various forms of mercury originating from combustion, especially by electrical generating units. To protect human health, State and Federal agencies collaborate to maximize efficiency in addressing mercury impairments.

Data from atmospheric deposition monitoring sites for many constituents including mercury is periodically used in modeling by Maryland DNR's Power Plant Research Program, working with NOAA, to estimate deposition across Maryland's land/water surface. Deposition data and model output is used by MDE's TMDL Program to generate scenarios of baseline conditions, potential results of implementing source controls or future Clean Air Act regulations. These outputs allow MDE to estimate the mercury load reduction needed and the effectiveness of programmatic measures, facilitating a reasonable assurance of implementation.

To measure the levels of mercury in fish, fish tissue collected during an annual young-of-year fish survey and other fish surveys, particularly in lakes, for analysis. MDE and Maryland DNR share expenses field and laboratory work. Tissue analysis is conducted by the University of Maryland (UMCES/HPL). UMCES and Smithsonian Environmental Resource Center staff lead reporting and documentation. Analytical findings are the basis for issuing public fish consumption advisories and for identifying surface waters with mercury impairments. The impaired water bodies are listed in Maryland's Integrated Report each even calendar year and they are prioritized for new TMDLs. Milestones for mercury are in Appendix Milestones.

4.J Coastal NPS Management Program

Maryland's Coastal Nonpoint Source Pollution Control Program operates as a net-worked program that interfaces with state and local authorities in Maryland's coastal zone, which

includes the Atlantic shore, the coastal bays, the Chesapeake Bay and its tributaries, as well as, the towns, cities and counties which contain and help govern the coastline.

In the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA), Section 6217 called on states "to develop and implement management measures for nonpoint source pollution to restore and protect coastal waters." In December 1999, the US National Oceanic and Atmospheric Administration (NOAA) and US Environmental Protection Agency (EPA) approved Maryland's Coastal Nonpoint Pollution Control Program. At about the same time, the state NPS Program (CWA Section 319) and the Coastal NPS Program (CZARA Section 6217) were merged together in the 1999 Maryland Nonpoint Source Management Plan, which EPA approved in 2000. From the late 1990s thru 2004, both the state and coastal NPS programs were managed in the Maryland DNR. Beginning in 2005 when the state 319 NPS Program was transferred from DNR to MDE, the two agencies have cooperated very closely in statewide and coastal NPS efforts to maximize appropriately consistent and integrated NPS management. Examples of forums that facilitate this cooperation include:

- Maryland's Chesapeake Bay Cabinet (Secretaries of State agencies);
- Chesapeake Bay Program meetings (including State agencies leadership & staff);
- Chesapeake Bay Watershed Implementation Plan (coordination meetings);
- Formal watershed management forums such as the Patuxent River Commission and the Maryland Coastal Bays Program.

4.J.1 Federal Consistency

Federal Consistency, a key provision of the national Coastal Zone Management Act (CZMA), can be a potent management tool to advance State-Federal coordination to minimize or avoid impacts to coastal resources while balancing multiple coastal uses. It is designed to foster early consultation, cooperation and coordination to ensure that State policies and priorities are considered with Federal actions such as direct federal activities and development projects, federal permits and licensing and federal assistance to State and local governments. As a management tool, Federal consistency supports implementation the Coastal NPS Management Program by ensuring that federal actions are consistent with Critical Area, water and air quality, sediment and erosion control, stormwater management, tidal and nontidal wetlands, forest, development, agricultural and other relevant policies.

Under the CZMA Federal agency activities that have coastal effects must be consistent to the maximum extent practicable with federally approved [enforceable policies](#) of a state's Coastal Management Program (CMP). In addition, the statute requires non-federal applicants for federal authorizations and funding to be fully consistent with approved enforceable policies of state CMPs. Federal Consistency is best applied as a proactive tool for engaging agencies, developers and applicants early in the project lifecycle to help high-priority projects align with enforceable policies, proceed in a timely manner and gain broad public support.

Maryland's enforceable policies serve as project evaluation standards during the Federal Consistency Review process, and in doing so, help implement Maryland's statewide NPS Management Program. With the exception of the enforceable policies that are explicitly limited to the coastal zone or other limited geographic area, all of the listed Maryland enforceable policies are appropriately applied statewide. In this sense, while the policies support Federal Consistency Review implementation, they can also support State Consistency Review which is implemented through interagency review networks such as MDP's Maryland Clearinghouse,

Maryland DNR's Power Plant Research Program and Maryland State Highway interagency review.

4.J.2 Stengthening and Expanding Maryland's Use of Federal Consistency

In an ongoing effort to strengthen and expand Maryland's use of Federal Consistency, Maryland DNR (Chesapeake and Coastal Service, CCS) has been applying the following 5-step, iterative process to guide its work:

1. Clarify, update and make publicly accessible the enforceable policies of the Maryland Coastal Program.
2. Evaluate and improve the Federal Consistency Review process to make it more effective in shaping federal actions and more accessible and understandable for stakeholders (including federal agencies, applicants, Maryland leaders, and Coastal Program partners).
3. Engage stakeholders such as senior State leadership and the public to solicit input on when and how to apply Federal Consistency to advance State priorities and how to measure success.
4. Make necessary Program Changes to strengthen and expand Maryland's use of Federal Consistency (e.g. expand list of federal activities, receive approval for interstate Federal Consistency review, update policies to incorporate legislative and regulatory changes).
5. Monitor and evaluate Maryland's use of Federal Consistency with respect to enhanced State-Federal coordination and advancing State priorities (e.g., to what extent does Coastal Consistency review process modify projects to achieve key State and Federal goals such as habitat restoration , Bay clean up and balancing multiple coastal uses such as navigation, fishing, and combat readiness training).

Maryland continues to implement five-step process described above. In support of Step 1 above, Maryland received NOAA's approved for its *Enforceable Coastal Policies* on April 8, 2011. As a condition of this approval, Maryland and Department of Defense developed and signed the *Maryland-Department of Defense Coastal Zone Management Act Memorandum of Understanding* on May 8, 2013. This historic MOU, the first of its kind in the Nation, outlines how DoD facilities and projects will meet the federal law requirements of the Coastal Zone Management Act to ensure that their actions affecting these resources are consistent with State policies.

Maryland's Coastal Program is a networked program that includes several State Agencies including Maryland DNR, MDE, MDA, MDP, Maryland Department of Transportation (MDOT) and Maryland Historic Trust (MHT). With Maryland DNR (CCS) as the administrator of the Program, Maryland's Federal Consistency Coordinator resides in MDE (Water Management Administration). Federal Consistency Review generally involves considerable intra-agency and interagency coordination to ensure that all appropriate enforceable policies are considered in reviewing federal actions that have reasonably foreseeable coastal effects (i.e. coastal resource impacts or coastal use conflicts). Importantly, since Federal Consistency Review is a networked process, it mirrors and supports the State-wide NPS Management Program.

To support more effective, timely, and comprehensive Federal Consistency Reviews, Maryland DNR (CCS) is currently developing an online interactive educational, communication and application portal called the [MD Coastal Pilot - Your Guide for Navigating Federal Consistency and Keeping Your Project Consistent with Maryland's Coastal Policies](#). Like a ship's pilot, the

Coastal Pilot online tool would help those subject to Maryland's Federal Consistency program successfully navigate and align with Maryland's enforceable coastal policies. The Coastal Pilot is currently anticipated to include three modules:

Module 1: Understanding Federal Consistency and How It Works in Maryland. This module will integrate the existing materials from Maryland, other Coastal States, and NOAA to provide a graphical, easy-to-navigate hypertext online tool to explain Federal Consistency, why it is important, how it may affect them, how the process works, and where to go for more information.

Module 2: Is My Project Subject to Federal Consistency? This module will be a self assessment tool used by federal agencies, developers, applicants and other stakeholder to help them determine whether their project is subject to Maryland's Federal Consistency program.

Module 3: MD Coastal Consistency Online Application. Once a federal agency, developer or applicant determines that their project is may be subject to Maryland's Federal Consistency Program, this module will help them provide the necessary information and facilitate early coordination and consultation to promote the timely review while ensuring projects are consistent with Maryland's enforceable policies.

4.J.3 Future Directions

The Coastal NPS Management Program's primary goal is to implement, as appropriate, all of the management measures in Maryland's coastal zone. A fifteen-year strategy has been developed that will guide the Program toward this goal. On a five-year cycle, action plans will be drafted that include detailed objectives and milestones. The five-year action plan for the period 1998 - 2002 is contained in Chapter IV - Maryland's NPS Programs and Initiatives. To achieve full implementation of the management measures, the Program will continue to work with federal, state and local partners to improve the efficiency and effectiveness of our existing programs, provide technical and financial assistance and conduct outreach activities. In the short term, Maryland's Coastal NPS Program will coordinate with the statewide NPS Program to focus technical and financial assistance in priority watersheds identified pursuant to the Maryland Clean Water Action Plan. The Program will track the implementation of management measures and will attempt to evaluate their effectiveness through water quality monitoring and other appropriate techniques. Where management measures have shown to be ineffective over time, the Program will seek out and promote additional management measures (e.g., emerging technologies such as floating wetlands).

4.K NPS Management Measures

The backbone of the program is the application of management measurements, developed by EPA and NOAA. Management measures are defined as economically achievable measures to control the addition of nonpoint pollution to coastal waters. However, the majority of these measures are applied statewide. These measures reflect the greatest degree of pollution reduction achievable using the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. Management measures focus on five major categories of nonpoint source pollution:

- Agricultural runoff

- Urban runoff
- Silvicultural (forestry) runoff
- Marinas and recreational boating
- Stream channelization, channel modification, dams, streambank & shoreline erosion.

The State has also developed management measures for wetlands, riparian areas, and vegetated treatment systems that apply generally to various categories of nonpoint source pollution.

The federal program requires that each state program have enforceable policies and mechanisms for most of the management measures, this insures the authority to implement the Best Management Practices (BMPs). The state is also required to track the program's implementation and effectiveness.

The following list identifies the NPS pollution management measures that the state is required to implement on all applicable land uses within the coastal boundary. Each management measure has associated enforceable policies and mechanisms (or backup authority) to insure implementation. If these original management measures fail to produce the necessary water quality improvements, the state then must implement additional management measures to address remaining water quality problems. For a complete definition of each of the management measures please see the Management Measures descriptions that follow.

4.K.1 Inventory of Management Measures

AGRICULTURE

1. Erosion and Sediment Control
2. Confined Animal Facility (Large Units)
3. Confined Animal Facility (Small Units)
4. Nutrient Management
5. Pesticide Management
6. Grazing Management
7. Irrigation Water Management

FORESTRY

8. Forestry Preharvest Planning
9. Streamside Management Areas
10. Road Construction / Reconstruction
11. Road Management
12. Timber Harvesting
13. Site Preparation and Forest Regeneration
14. Fire Management
15. Revegetation of Disturbed Areas
16. Forest Chemical Management
17. Wetlands Forest Management

URBAN

- Urban Runoff in Developing Areas
18. New Development
 19. Watershed Protection

- 20. Site Development
 - Construction Activities
 - 21. Construction Erosion and Sediment Control
 - 22. Construction Site Chemical Control
 - Existing Development
 - 23. Existing Development
 - Onsite Disposal systems
 - 24. New Onsite Disposal System
 - 25. Operating Onsite Disposal Systems
 - Pollution Prevention
 - 26. Pollution Prevention
 - Roads, Highways and Bridges
 - 27. Planning, Siting and Developing Roads and Highways
 - 28. Bridges
 - 29. Construction Projects
 - 30. Construction Site Chemical Control
 - 31. Operation and Maintenance
 - 32. Road, Highway, and Bridge Runoff Systems

MARINAS

- Siting and Design
 - 33. Marina Flushing
 - 34. Water Quality Assessment
 - 35. Habitat Assessment
 - 36. Shoreline Stabilization
 - 37. Stormwater Runoff
 - 38. Fuel Station Design
 - 39. Sewage Facility
- Marina and Boat Operation and Maintenance
 - 40. Soil Waste Management
 - 41. Fish Waste Management
 - 42. Liquid Material Management
 - 43. Petroleum Control
 - 44. Boat Cleaning
 - 45. Public Education
 - 46. Sewage Facilities Maintenance
 - 47. Boat Operation

HYDROMODIFICATION

- Channelization and Channel Modification
 - 48. Physical and Chemical Characteristics of Surface Waters
 - 49. Instream and Riparian Habitat Restoration
- Dams and Levees
 - 50. Erosion and Sediment Control
 - 51. Chemical and Pollutant Control
 - 52. Protection of Surface Water and Instream and Riparian Habitat
- Shoreline Erosion
 - 53. Streambank and Shoreline Erosion

Wetlands

- 54. Protection of Wetlands and Riparian Areas
- 55. Restoration of Wetlands and Riparian Areas
- 56. Vegetated Treatment Systems

4.K.2 Nutrient Management

In 2001, regulations implementing Maryland's Water Quality Improvement Act of 1998 required farmers across the State to implement approved, comprehensive and enforceable nutrient management plans for all agricultural lands. The law applies to all agricultural operations with annual gross incomes in excess of \$2,500, or more than eight animal units (one animal unit equals 1,000 pounds live animal weight) and requires that operators must implement a nutrient management plan. Requirements also include additional nutrient management requirements for commercial fertilizer applicators servicing both agricultural and non-agricultural land.

Applicators applying fertilizers to ten or more acres of agricultural land they own or manage will be required to complete a nutrient management education program once every three years. This authority provides Maryland with the ability to ensure implementation of the management measure for nutrient management.

4.K.3 Confined Animal Facilities

The Water Quality Improvement Act has been recognized as enhancing existing efforts to ensure the proper management of animal waste. Farmers will be required to develop nutrient management plans that address proper utilization of animal waste as it is applied to the land. In addition, the law establishes an Animal Waste Technology Fund to encourage the development and implementation of economically feasible technologies that help protect the public health and the environment by reducing the amount of nutrients from animal waste that are released to state waters.

4.K.4 Pesticide Management

The State developed its Integrated Pest Management (IPM) Program to implement the pesticide management measure, specifically by conducting training efforts for both professional crop consultants as well as gardeners. This program continues to be offered through the Maryland Cooperative Extension Service and publications are available to the public from their website.

In January 2014, the Pesticide Reporting and Information Work group issued a report of its findings and recommendations. The report called for the MDA to contract with USDA's National Agricultural Statistics Service (NASS) to develop and implement a statewide survey of pesticide use for the years 2014 and 2015. The report also recommended that MDA convene an advisory group to inform survey design. The Workgroup was created in response to 2013 State legislation (HB775/SB675). It reviewed issues associated with pesticide use, tracking and reporting. It was chaired by elected State legislators and it included representatives from State agencies (MDA, MDE, DHMH, MD DNR), agricultural industry, environmental advocates, pesticide industry, the public and environmental health experts.

4.K.5 Grazing Management

The state has developed a number of programs to ensure that grazing activities are managed to protect sensitive areas such as streambanks, wetlands, estuaries, ponds, lake shores, and riparian areas. In 2011, the Maryland Agricultural Cost Share program added pasture development or renovation to its list of BMPs eligible for State financial assistance. The implementation of these

programs has been reliant on landowner incentives based programs. Through application of the Conservation Reserve Enhancement Program (CREP), substantial progress has been made in the implementation of practices such as grass buffers, riparian forest buffers, wetland restoration, and the retirement of highly erodible land.

Finally, the state's Agricultural Sediment Control Law and regulations prohibit agricultural operations from introducing soil or sediment into waters of the state. This authority can be used to address several erosion problems caused by improper grazing practices.

4.K.6 Onsite Sewage Disposal Systems (OSDS)

Maryland met this condition by undertaking a number of activities to further develop management measures for new and operating onsite disposal systems, including the protection of nitrogen-limited surface waters and inspection and maintenance of existing OSDS.

Nitrogen Limited Surface Waters. Maryland is in the process of identifying nitrogen limited surface waters which may be adversely affected by excess nitrogen loadings from ground water associated with OSDS through a new program to delineate Areas of Special Concern (ASC). Localities may petition the Maryland Department of the Environment (MDE) to have an area designated as an ASC. Once areas are identified and receive formal designation, a management plan for septic systems is developed jointly by the state and the local authority. The plan addresses design, inspection (including enforcement), operation and maintenance, and also provides for homeowner education. Thus far, Worcester County has petitioned MDE to designate the Maryland Coastal Bays area as an ASC and the formal designation by MDE is in process. The ASC plan will likely require new development of existing lots and all replacement systems that do not meet current standards for a conventional system to use alternative technologies, establish a public outreach program, and develop a tracking program for septic system maintenance and septage disposal.

Maintenance of Existing OSDS. Maryland developed a white paper that lead to the drafting of new regulations that specify new standards and criteria for the installation of septic systems. These regulations are still in development; they currently propose a number of provisions including a requirement that new permits for OSDS include a statement indicating that septic tanks should be pumped once every three years and the development of a system of tracking and enforcement for OSDS advanced treatment units to ensure that such units function properly. Finally, Maryland conducts a biennial needs survey of local governments to identify areas with failing OSDS. Where extensive areas of OSDS failure are identified, projects are funded to provide connections to central sewer systems. Through the Water Quality Financing Administration Linked Deposit Program, financing is available for projects that repair or replace failing or failed OSDS. Under this program, private property owners may borrow funds from private lending institutions located in their neighborhoods to finance projects to control NPS pollution. These loans may be used for design and construction of a wide variety of water quality improvements to protect groundwater and surface water from NPS pollution, including leaking underground storage tanks and failing septic systems. For a complete description of the Linked Deposit Program see Chapter 6 - Public Outreach and Assistance Programs.

4.K.7 Marinas Program

State law requires that all new or expanding marinas of more than 10 slips that are capable of berthing vessels 22 feet or greater to install a pumpout facility, and after 1997, all marinas that

have 50 or more slips and can berth any vessel greater than 22 feet to install a pumpout. In addition, Maryland DNR's Clean Marina Program began in the 1990s in response to marina nonpoint source pollution issues identified through the Coastal NPS Pollution Control Program. The program aims to increase voluntary use of pollution prevention practices by marinas and recreational boaters, and to build market demand for environmentally responsible marinas. Maryland's program offers a combination of incentives, practical common sense advice and public relations including:

- Clean Marinas Guidebook provides information for operators: best management practices; marina siting, design, operations; state and private resources, and; laws and regulations that apply to marinas.
- Clean Marina Awards is an incentive program that recognizes a marina as a Clean Marina when a significant portion of the Guidebook's recommendations are applied to marina operations. Winners within several categories are announced annually.
- Clean Marinas are marinas, boatyards or yacht clubs that voluntarily conduct operational practices consistent with program expectations. Close to 25% of the estimated 600 marinas in Maryland are certified as Clean Marinas and are listed on Maryland DNR Internet pages where boaters are encouraged to patronize them.
- Clean Marina Partners are boating facilities like public boat ramps, private community piers, and charter boat liveries that apply Clean Marina practices consistent with program expectations. They are listed on Maryland DNR Internet pages.
- Clean Marina Pledges are operations working to meet program expectations within a year. They are listed on Maryland DNR Internet pages.
- Clean Boater Pledge Program and other resources for boaters, professional divers, and boating instructors are designed to promote practices environmentally responsible behavior.
- Boat Sewage Pumpout Program promotes the installation of sewage pumpout stations in Maryland through a grant program. These grants reimburse up to \$12,500 of pumpout station installation cost at any public or private marina where the marina owner agrees to operate and maintain the system for a minimum of ten years and to limit fees to not more than \$5 per pumpout. The pumpout system must be able to accept waste from portable toilets as well as from holding tanks and must be available to the general public during reasonable business hours.

4.K.8 Other Highlights

Under the Statewide and the Coastal NPS Pollution Control Program, Maryland has undertaken a number of activities to improve the management of polluted runoff:

- Funded a project that produced a survey of livestock operations in the coastal zone management area. This product helped the state target needs for management of livestock and will help in tracking agricultural BMPs.
- Funded a project to assist MDE in discussing and setting a protocol for declaring nitrogen sensitive areas as Areas of Special Concern (ASC) for septic systems. Three counties have investigated this designation in 1998 and 1999. The new regulations that MDE is proposing will most likely solidify components of ASC (requiring nitrogen monitoring in some septic systems).
- Held a roundtable discussion on septic systems and alternative technologies. This effort aided in the formation of a statewide Septics Task Force which is currently reviewing new regulations proposed by MDE.

4.L Climate Change

Maryland's 2009 Greenhouse Gas Emissions Reduction Act requires the State to develop and implement a plan to reduce greenhouse gases 25% by 2020 and simultaneously have a positive impact on job creation and economic growth.

The Climate Change and CoastSmart Construction Executive Order signed by Governor O'Malley requires that all new and reconstructed state structures and other infrastructure improvements be planned and constructed to avoid or minimize flood damage.

Maryland's Climate Action Plan guides state-level adaptation planning with two climate adaptation strategies: addressing sea level rise and coastal storms, and addresses changes in precipitation and temperature. The Plan's strategies generally include:

- Reduce greenhouse gas emissions will also reduce Maryland's nitrogen oxide emissions, which will reduce NPS nitrogen pollution loads to surface waters.
- Slowing the rate of sea level rise that can help reduce sediment loads (associated with shoreline erosion) and improving habitat quality.

The Climate Action Plan includes a section on future steps and direction implementation guidance that includes many recommendations for addressing climate change that relate to NPS management interests including:

- Agriculture
 - o Intensify water management and conservation through research, funding, and incentives.
 - o Evaluate the effectiveness of BMPs under future climate change scenarios.
- Forest and Terrestrial Ecosystems
 - o Strengthen State and local programs to slow the loss and fragmentation of forest and terrestrial ecosystems to new development.
 - o Review and revise forestry best management practices.
 - o Develop new conservation easement mechanisms...
- Bay and Aquatic Ecosystems
 - o Amend legal mechanisms to designate and protect temperature-sensitive streams.
 - o Increase on-the-ground implementation of existing stream restoration practices.
 - o Reduce impervious surface cover.
 - o Adjust bay and watershed restoration priorities in light of a changing climate.
- Water Resources
 - o Assess, target, and protect high quality water recharge areas.
 - o Prevent inundation and overflow of on-site disposal systems (OSDS).
 - o Revise Clean Water Revolving Fund criteria to require environmental site design.
- Population Growth and Infrastructure
 - o Reduce regional air quality impacts in Maryland.
 - o Accelerate use of improved stormwater management strategies and environmental site design (ESD).
 - o Increase urban tree canopy.

4.M Critical Area Commission for the Chesapeake and Atlantic Coastal Bays

All land within 1,000 feet of the Mean High Water Line of tidal waters or the landward edge of tidal wetlands or tributary streams, the tidal waters themselves, and the land under those waters, are all within Maryland's Critical Area. The Critical Area currently encompasses about 10% of the land in Maryland and is implemented cooperatively by the State and 64 local governments.

Beginning in 1984, this program was limited to the Chesapeake Bay drainage. In 2002, passage of Maryland's Atlantic Coastal Bays Protection Act expanded the Critical Area to encompass all Maryland lands within 1000 feet of tidal areas, including areas draining toward the Coastal Bays. Then in 2008, additional State legislation clarified the intent of the program mostly regarding enforcement, shore erosion control, mapping the Critical Area, future growth and managing development activity. The 2008 legislation gave the Critical Area Commission the authority to promulgate regulations.

Overall, the Critical Area Commission established criteria and oversees their application as a framework for zoning, land use and development regulations to be used by counties and municipalities their own local Critical Area. The law calls for each local jurisdiction to develop and implement its own Critical Area program that would be sufficiently comprehensive to accomplish overall State goals:

- Minimize adverse impacts on water quality that result from pollutants that are discharged from structures or conveyances or that have run off from surrounding lands;
- Conserve fish, wildlife, and plant habitat in the Critical Area; and
- Establish land use policies for development in the Critical Area which accommodate growth and also address the fact that even if pollution is controlled, the number, movement, and activities of persons in an area can create adverse environmental impacts.

Enforcement of Critical Area regulations is primarily a local government responsibility with State oversight. However, the Critical Area Commission exercises authority over projects on State land. Additionally, enforcement of regulations for nontidal wetlands and waterways is assigned to the Maryland Department of the Environment.

The Critical Area Law requires local governments to comprehensively review their Critical Area programs every six years to ensure that local programs are up to date and that requirements are incorporated into local codes and ordinances. Local Critical Area maps must be reviewed, updated and approved by the Critical Area Commission at least once every 12 years.

The Critical Area Program includes provisions that apply either throughout the Critical Area or specifically to a particular land category:

- Throughout the Critical Area, protection is required for a naturally vegetated buffer extending from tidal areas a minimum of 100 feet, or more under particular circumstances. Habitat protection areas are designated to protect and maintain areas like buffers, nontidal wetlands, colonial water bird nesting areas, historic waterfowl staging concentration areas, riparian forests 300 feet in width, forest interior dwelling species habitat, designated Natural Heritage Areas, anadromous fish spawning areas, and habitats of species that are designated endangered, threatened or in need of conservation. Growth allocation is established as a regulatory tool designed to limit expansion of the developed

area land categories. Development and operation of water dependent facilities are managed to avoid adverse effects on water quality or ecosystems. Shore erosion control that best conserves fish, wildlife and plant habitat is encouraged. Timber harvesting generally must be consistent with a Forest Management Plan and an Erosion and Sedimentation Control Plan. Farmers are mandated to work cooperatively with Soil Conservation Districts to develop and implement Soil Conservation and Water Quality Plans. Agricultural activity is allowed within the 100-foot buffer, but clearing of natural vegetation in the buffer is not allowed and a minimum 25-foot wide vegetated filter strip must be maintained adjacent to tidal waters, tidal wetlands and tributary streams.

- In Intensely Developed Areas, developed land use is predominant and there is relatively little or no natural habitat. In these areas, Critical Area regulations focus on improving water quality thru stormwater management, use of permeable surfaces and preservation of existing natural forest vegetation. New development must result in a 10% reduction in stormwater pollution. (MD. REGS. CODE tit.27 §27.01.02.03D(3))
- In Limited Development Areas, both low/moderate intensity development and natural habitat exists. In these areas, Critical Area requirements address maintaining the quality of runoff and groundwater, maintaining forest cover and habitat functionality, limiting lot coverage (impervious area) and minimizing negative environmental affects of development changes.
- In Resource Conservation Areas (RCA), nature-dominated environments (wetlands, woodland) and resource utilization areas (agriculture, forestry) are key attributes. In these areas, Critical Area policies and standards focus on maintaining ecological values and limiting conversion to developed land uses. In the RCA beginning in 2008, a 200 foot buffer is called for on specified types of land use change and development.

4.N Demonstration Projects

Implementation projects funded by the 319(h) Grant frequently serve as demonstration projects when they are located on publicly accessible public land. In many cases, interpretive signs accompany the project to enhance the on-site demonstration opportunity. As reported in the Maryland 319 Nonpoint Source Program Annual Report, some of these projects are in frequently visited locations and/or have become reoccurring demonstrations. Some of the most recent examples are highlighted in the 2014 Annual Report:

- Centreville's historic train station in the town business district: bioretention / rain garden.
- Frederick County's Urbana Community Park: bioretention / rain garden retrofit.
- Kent County's Galena Elementary School: bioretention / rain garden retrofit that involve students planting and monitoring the site.
- Queen Anne's County Board of Education administrative offices in Centreville: bioretention / rain garden at the front entry to the building.
- Washington County's Devils Backbone Park: watershed outreach kiosk & pet waste management station.

4.O Groundwater Management Programs

Three State agencies have responsibility for statewide management of groundwater in Maryland:

- Maryland Department of the Environment (MDE, lead agency) regulates potential pollution sources and water use, partners with State and local agencies to implement protection programs, and partners with the State agencies and the US Geological Survey to conduct technical projects on groundwater quality and resource availability. MDE also uses Clean Water Act Section 106 funding to assist coordination of groundwater protection activities.
- Maryland Department of Natural Resources (DNR) Maryland Geological Survey (MGS) conducts assessments of water supplies and groundwater resources including ongoing statewide monitoring of groundwater quality and levels.
- Maryland Department of Agriculture (MDA) Regulates controls and BMPs for pesticide storage and application to help minimize contamination of surface and groundwater. Nutrient management plans establish short and long-term strategies for reducing nutrient levels in groundwater and surface waters.

Maryland has had an active program to protect drinking water sources since the Maryland Wellhead Protection Program was approved in 1991. To meet requirements of the 1996 Safe Drinking Water Act, Maryland in 1999 began conducting source water assessments that delineated the land surfaces that could impact a well or surface water intake, identified potential contaminant sources (including nonpoint sources), and assessed the vulnerability of the water supply to those contaminants. By 2006 these assessments had been conducted for all of the more than 3600 public water systems in Maryland. The program strategy is to protect water sources used for public drinking water by managing the land surface around the well(s) or intake(s), including preventing contamination from nonpoint sources. MDE works with local governments to help them develop and implement protection plans.

There are no federal or State requirements for implementing source water protection programs, although many local communities in Maryland have taken steps to protect their drinking water sources. Maryland law requires that all counties and municipalities that exercise planning and zoning authority adopt a water resources element (WRE) in their comprehensive plans and that the WRE must identify drinking water and other water resources that will be adequate for the needs of existing and future development proposed in the comprehensive plan. These local jurisdictions may address groundwater recharge or zones of significant groundwater/surface water interaction. To support this consideration, the Maryland Geological Survey has published groundwater recharge area / aquifer outcrop maps, aquifer analysis, and other technical materials.

Onsite sewage disposal systems (OSDS) serve about 420,000 Maryland homes. Conventional OSDS designs discharge nitrogen into the groundwater that eventually reaches surface water contributing to water quality problems, particularly in tidal surface water. To reduce nitrogen discharges from OSDS, Maryland's Bay Restoration Fund (BRF) was established to provide funding for OSDS upgrades to best available technology. Thru June 2012, at least 3,732 upgrades were funded by the program, which reduced nitrogen discharged to groundwater by 86,582 pounds per year.

Administration of the BRF program for OSDS upgrades is delegated to either a County agency or to the county office of the Maryland Department of Health & Mental Hygiene. The local agency or office priorities distribution of funding based on a number of factors such as proximity to tidal waters (Chesapeake Bay Critical Area), to streams, or to other areas that are identified as needing particular protective effect.

Large onsite sewage disposal systems discharging more than 5000 gallons per day may be required to obtain a permit from MDE authorizing the discharge. Permit limits for the quantity of effluent discharged, as well as for common wastewater constituents that may impact groundwater quality, are set in the discharge permit. The amount of nitrogen allowed to be discharged may be reduced below normal permit limits depending upon a site's proximity to well head protection areas.

4.P Mining Programs for Coal

Coal mines operated without any reclamation laws until 1955, when minimal standards were enacted. In 1967 and 1969, major changes to Maryland's Strip Mining Law required more adequate standards to address environmental impacts. Further amendments were enacted in 1972 and annually since 1974, as Maryland's reclamation requirements began to resemble the current regulatory program standards promulgated under the SMCRA in 1977. In 1972, Section 319 of the Clean Water Act identified acid mine drainage as a nonpoint source pollution problem. In 1977, the Federal Surface Mining Control and Reclamation Act (SMCRA) mandated minimum requirements for surface mining operations in all coal-producing states.

The federal Abandoned Mine Reclamation Program was created under SMCRA to repair the environmental damages of mines inadequately restored or abandoned before the passage of the act. The law was intended give each state the primary role in implementing its own regulatory and AML programs. Maryland gained primacy in 1982. The 1995 amendments to SMCRA and the Appalachian Clean Streams Initiative, which was funded from 1992 through 2008 (when it was eliminated), elevated the significance of abandoned mines as a water quality problem as well as a human welfare and safety problem. Currently, the Federal government through the U.S. Office of Interior continues to fund the Abandoned Mine Reclamation Fund from taxes on the active coal mine industry to help pay for acid mine drainage (AMD) mitigation. There have been several Congressional reauthorizations since 1977 to SMCRA which each time has changed the original SMCRA law to some degree. The latest, as of the date of this document, is the passage of the Tax Relief and Health Care Act of 2006 Pub. L. No. 109- 432 which included the Surface Control and Reclamation Act (SMCRA) Amendments of 2006 (hereinafter referred to as AML Reauthorization of 2006).

4.P.1 Surface Mining Control and Reclamation Act

Title IV of the Surface Mining Control and Reclamation Act (SMCRA) requires that an Abandoned Mine Reclamation Fund pay for the reclamation of abandoned coal mines using fees assessed on active mining operations. SMCRA requires that 50% percent of the reclamation fees collected in each state (referred to as State-Share) with an approved reclamation program be allocated to that state for use in its approved reclamation program. Additional funds are allocated to states based on the amount of historical (pre-1977) coal production. The statutory minimum amount of funding a state can receive is \$3 million. These states are referred to as "Minimum

Program States”, which includes Maryland. SMCRA requires that money in the reclamation fund be directed only to projects in the following order of priority:

- 1) Protection of public health, safety, general welfare, and property from extreme danger of the adverse effects of coal mining practices;
- 2) Protection of public health, safety, and general welfare from the adverse effects of coal mining practices;
- 3) Restoration of land and water resources and the environment previously degraded by the adverse effects of coal mining practices including measures for the conservation and development of soil, water, woodland, fish and wildlife, recreation resources, and agricultural productivity;

The most recent amendments to SMCRA allow enhanced focus on NPS management issues:

- 1987 amendments authorized states to set aside up to 10% of the state-share portion of their annual abandoned mine land reclamation grants for acid mine drainage protection activities on eligible sites;
- 1990 amendments specified adverse economic impacts on local communities as a reason to give higher priority to AMD problems.
- 2006 amendments extend federal AML fee collection authority to 2021 at reduced rates and address a host of other provisions to the AML program. Changes in federal law resulted in substantial increases in AML funding to states and tribes and focuses AML reclamation on projects that benefit public health and safety. Other notable changes made by the 2006 Amendments include: 1) Acid Mine Drainage Abatement Set-aside allotment increased from 10% to 30% of State-Share, 2) the 30% cap on waterline allotment lifted, 3) Lien provisions streamlined, and 4) redefined priorities for AML funding, reducing the number to only three priorities (Priorities 1, 2, and 3).

Maryland employs the 30% Acid Mine Drainage Account (30% set aside) to help fund the operation and maintenance of AMD mitigation efforts.

4.P.2 Federal Clean Water Act

The 1972 Clean Water Act (CWA) contains several provisions that apply to the control of mine drainage to meet water quality standards including NPDES permitting for active mining. CWA 1987 Amendments Section 319 identified AMD as a NPS pollution problem. States are encouraged to address AMD in their Statewide Nonpoint Source Management program and to use Section 319(h) Grant funding to address AMD issues. MDE administers NPDES permits for mining, which include comprehensive requirements including reclamation to the extent required under COMAR 26.20 for active coal mines.

4.P.3 State Management of Active Coal Mines

MDE regulates active coal mining. Modern mining permits are written and enforced so that active mines contribute relatively little to the acid mine drainage problem. Although active mining is treated from a regulatory perspective as point source pollution, EPA recognizes AMD from abandoned mines which are often “remined” under the current regulatory standards, as a nonpoint source pollution problem.

Below is a description of the various control and treatment technologies used to prevent acid mine drainage from current mining.

- Backfilling and Grading. Mine operators are required to restore all disturbed mining areas to their approximate original topography. All spoil shall be transported, backfilled, compacted, and graded to eliminate highwalls, spoil piles, and depressions. Coal operators shall either cover or treat all exposed coal seams after mining and all acid-forming, toxic-forming, combustible, or any other hazardous materials. Backfill shall be selectively hauled or conveyed and compacted, when necessary, to prevent leaching of acid-forming and toxic-forming materials into surface and groundwater;
- Revegetation. Mine operators are required to plant vegetation on regraded and disturbed mining areas to stabilize the soil, minimize sediment and water runoff, and establish a permanent vegetative cover compatible with approved post-mining land-use. The newly planted area shall:
 - o be compatible with the approved post-mining land use;
 - o have the same seasonal characteristics of growth as the original vegetation;
 - o be capable of regeneration and plant succession;
 - o be compatible with the plant and animal species of the area, and;
 - o meet the requirements of applicable state and federal seed, poisonous and noxious plant, and introduced species laws and regulations.
- Waste Handling. All mine waste shall be disposed of properly. Coal mine waste is managed to: 1) minimize the adverse effects of leachate and surface water runoff; 2) ensure mass stability and prevent mass movement during and after construction; 3) ensure that the final disposal facility is suitable for reclamation and revegetation compatible with natural surroundings and the approved postmining land use; 4) create no public hazard; and 5) prevent combustion.
- Disposal of Excess Spoil. Excess spoil shall be placed in designated, permitted disposal areas in a controlled manner. These disposal areas should minimize the adverse effects of leachate and surface water runoff on surface and groundwater, ensure mass stability, and prevent mass movement during and after construction. The final fill must be suitable for reclamation and the vegetation compatible with natural surroundings and the approved post-mining land use.

4.P.4 State Management of Abandoned Coal Mines

MDE also mitigates legacy water quality problems by reclaiming AMD-impacted areas. The objectives of this work relating to NPS management include restoring the eligible land, water, and environment degraded by coal mining so that: public health and safety are protected; water impairments are mitigated, and uses of the land and water meet expectations.

There are several basic approaches to prevent or mitigate the detrimental impact of legacy AMD on streams: prevention/control; active treatment, and passive treatment. Treatment options need to be operated in perpetuity for as long as mine drainage is generated. For this reason, treatment options can be expensive. While control options are more permanent solutions, they are often difficult to execute and the technologies have been slow to develop. Assessing AMD sites for possible use of a control/treatment technology involves analyzing four basic criteria: water chemistry, flow rate, available land, and level of funding.

Prevention/Control Technologies during reclamation of abandoned coal mine sites aim to prevent the formation of contaminated drainage at abandoned mine sites using methods which

eliminate or slow the interaction of water and/or air with coal. The following techniques have been used to prevent the formation of AMD:

- Diversions - Structures are installed to divert surface water runoff away from abandoned mine openings and spoil areas preventing infiltration into the mine;
- Backfilling - This method entails injecting a fluid-cementing substance into underground mines that seal the mine from oxygen and water thus preventing AMD;
- Regrading and Capping - This method is used to reclaim surface mines by regrading and revegetating the disturbed mine area and capping the site with a low-permeability material aimed at reducing surface water infiltration into the acid-producing spoil.
- Mine Seals - Mine seals are used to exclude the passage of oxygen (air) to the acid-producing environment of underground workings. The seals may be either wet or dry and are used for sealing all mine entries, shafts, and boreholes open to mine workings. Seals should be air-tight to be effective.

Active treatment systems are used at abandoned coal mine sites to treat AMD by adding chemical reagents to contaminated water that add alkalinity (counteracting acidity) and facilitate the removal of metals. Dosers downstream of AMD sites are typically employed to introduce these chemicals to the streams. Six chemical reagents are typically used: limestone (calcium carbonate); hydrated lime (calcium hydroxide); pebble quick lime (calcium oxide); soda ash briquettes (sodium carbonate); caustic soda (sodium hydroxide), and ammonia (anhydrous ammonia).

Passive treatment systems are another treatment method that directs the contaminated water to constructed natural or engineered systems designed to remove or neutralize pollutants by exposing them to air, limestone, pond vegetation, neutralizing ditches, buried channels, or wetlands. Compared to active treatment methods, passive methods generally require more land area but may utilize less costly reagents and require less operational attention and maintenance. The most commonly used passive systems are listed below:

- Aerobic Wetlands are used for low-acid AMD to collect flows, settle out sediments, and increase residence time so that metals in the water can precipitate;
- Anaerobic Wetlands are used for highly acidic AMD. They are commonly underlain with and organic muck (substrate) and a layer of limestone;
- Anoxic Limestone Drains used to help neutralize acidic water. They are buried channels where AMD is directed thru crushed limestone;
- Alkalinity Producing Systems combine the technology of anoxic limestone drains and anaerobic wetlands;
- Limestone Ponds are ponds constructed over an acidic seep or other acidic discharge to promote neutralization;
- Reverse Alkalinity Producing Systems combine alkalinity producing systems and limestone pond systems for use on seeps/discharges that are not anoxic;
- Open Limestone Channels are long channels lined with limestone that neutralize water and precipitate metals in the channel before the water reaches a stream.

4.Q Mining Programs for Non-Coal

An operator must obtain a permit from the Maryland MDE Mining Program to conduct surface mining for sand, gravel, clay, limestone, granite, shale, and dimension stone. As with coal mining, the operator must reclaim and restore the mined land and use performance standards as required under the law. Code of Maryland Regulations 26.21.01

The State Mining Act of 1975 was enacted to mitigate the effects of land disturbance, to eliminate public safety hazards, to prevent the waste of state resources and to establish the Surface Mining and Reclamation Fund. A surface mining operator's license and surface mine permit must be obtained for each site from the MDE's Minerals, Oil, and Gas Division. Applications for a surface mining permit must be accompanied by a reclamation fee (\$30 per acre). In addition, the applicant must submit a mining and reclamation plan detailing the mining operation, the means for minimizing environmental effects, and the method of site reclamation. A permit will be granted after establishing that no environmental or safety hazards will be created by the mine operators and all permits and licenses are obtained.

Mining operators who abandon their facilities without adequate land reclamation are subject to bond forfeiture and legal proceedings by MDE to force compliance with the surface mining permit (non-coal) provisions. As a whole, however, the industry is operating in compliance with reclamation laws.

MDE administers the Surface Mine Land Reclamation Fund to provide money for reclamation of non-coal surface mines that were not reclaimed prior to passage of the Surface Mining Act. The fund receives money from license and permit fees, bond forfeitures, fines from violations, and reclamation fees.

4.R Priorities for Protection, Restoration, Watershed Planning and Implementation

Maryland has several important programs that focus on protecting natural or rural landscape attributes that also tend to protect water quality, including Program Open Space, the Rural Legacy Program and the Maryland Agricultural Land Preservation Fund. In some cases, these programs have worked for decades to protect river corridors in places like the Gunpowder River State Park, the Patapsco River State Park and Zekiah Swamp Natural Environment Area. Because these protection programs have much greater funds than the 319(h) Grant, 319 funds for watershed planning and implementation are primarily targeted to restoration. The exception is that a small percentage of 319 funds in past years have been used for water quality monitoring in areas of healthy waters designated as Tier II.

4.R.1 Priorities for Investing 319(h) NPS Grant Funds or NPS Program Resources

Priorities for investing 319(h) NPS grant funds or NPS program resources in watershed planning and implementation are generally based on needs, requirements and implementer interest:

- Effective Appropriate use of Federal CWA Section 319(h) funds. Consistent with legal obligations, Section 319(h) Funds will be efficiently used to generally maximize water quality benefits.
- NPS impairment is documented and a TMDL has set the pollutant load reduction. Local governments are encouraged to adopt locally-developed WIPs designed to meet pollutant reductions associated with the State Phase II WIP and to implement their local WIPs consistent with locally-developed milestones. Implementation is driven by local priorities and interests.
- Willing Local Implementer. Local governments and nongovernmental organizations have independently created scores of watershed-based plans to meet local priorities that frequently include goals related to NPS management and waters quality projection. Most

commonly, local implementers drive planning, prioritization and on-the-ground implementation. In many cases, State agencies have regulatory roles that affect plan implementation but they frequently do not directly participate in the implementation. A fraction of these plans are designed to support obtaining 319(h) Grant funding for implementation. After EPA accepts a watershed plan for 319(h) Grant project implementation funding, then MDE cooperates with the local plan sponsor(s) to assist in reporting implementation progress thru the Maryland 319 NPS Program Annual Report. Implementation is driven by local priorities and interests.

- Permit Requirement. Stormwater discharge permits have requirements that tend to parallel NPS watershed plan implementation except that the runoff is collected in and discharged from a Municipal Separate Storm Sewer System (MS4). All of Maryland's Phase I MS4 permits are located in the Chesapeake Bay drainage. These permit holders are required various types of measures to reduce urban stormwater runoff, including reduction of impervious land cover. Implementation is driven by permit requirements.
- Source Water Protection. In the Chesapeake Bay drainage, five large surface water impoundments owned by Baltimore City and the Washington Suburban Sanitary Commission serve millions of Marylanders. Protection of these reservoirs is guided by a watershed-based plan in partnership and cooperation with other governmental jurisdictions within the reservoir watershed. Implementation of these plans is driven by the need to maintain water quality for public consumption. There is no current intent to seek 319(h) implementation funding.
- Antidegradation. Protection of high quality waters is a priority (See Antidegradation and Healthy Waters in this Chapter).
- Geographic Representation. Attention to the major geographic parts of Maryland is a priority (See Chapter 2).
- Pollutant Representation. Given Maryland's proximity to the Chesapeake Bay, and the dominance of nutrient pollution as a problem, the Program is sensitive ensuring that other types of nonpoint source pollution are given attention, including bacteria, toxic substances, thermal/heat, chlorides, pH, and hydro-modification.

4.R.2 Additional Factors for Directing Financial Resources

Additional factors that are considered when directing financial resources to implement restoration projects include, are not limited to, the following:

- Human health (particularly regarding source water and/or bacteria impairment).
- Impairment causes and solutions are understood (particularly when stressor analysis identified impairment source and/or a good track record achieving solutions is demonstrated).
- Value of the watershed (particularly associated with willing implementers and/or public water supply)
- Likelihood of achieving demonstrable environmental results (particularly associated with active monitoring programs and likelihood of documenting success stories).
- TMDL has defined NPS reductions necessary.
- Readiness to proceed is a necessary factor in project proposal selection.

In addition to the priorities and factors considered above, State-administered grant programs that fund NPS implementation projects use eligibility requirements and selection goals/criteria to help ensure that funds are efficiently invested. Examples are listed in Chapter 6 for the Section 319(h) Grant and for Maryland's Chesapeake and Atlantic Coastal Bays Trust Fund.

4.R.3 Technical Rationales for Restoration Priorities

Finally, the NPS Program continues to promote technical rationales for setting restoration priorities. The following is a brief outline of these.

- **Rationales for Targeting Restoration:** Maryland's 319 NPS Program has developed and communicated three broad rationales for targeting restoration. The rationales reflect multiple objectives, which lead to the adoption of multiple strategies. Although these strategies compete for resources, similar to the way protection and restoration objectives compete, they are recognized as legitimate objectives.
 - **Removal from the 303(d) list of impaired waters.** This is the ultimate objective for restoration within the context of the federal Clean Water Act. This objective tends to steer resources to waters that are not extensively impaired under the logic that it is easier to restore a waterbody that is only slightly impaired. However, it remains very difficult to restore any waterbody to a condition of meeting water quality standards. Consequently, demonstrating progress via this objective, even when targeting the least impaired waters, is a long-term proposition.
 - **Incremental Local Water Quality Improvement.** This objective seeks to show measurable local water quality improvement, which is difficult due to natural variability¹. This objective tends to steer resources to waters that are extensively polluted. The logic is that a significant of change can be achieved via less effort and expense, because the causes are egregious. The classic example is livestock in the stream, whereby exclusion of the animals will produce notable, rapid results. Admittedly, highly urbanized areas are an exception to this.
 - **Maximum Pollutant Load Reduction.** This objective strives for cost-effective pollution reduction to benefit downstream water quality problems, like excess nutrient enrichment of the Chesapeake Bay. This objective overlaps significantly with the objective of seeking incremental local water quality improvement.

4.R.4 Applications of Prioritization Rationales

These prioritization rationales have been used in a variety of ways outlined below, which also provide examples of links to other programs and efforts.

- **Biological Restoration Initiative:** Maryland uses benthic and fish indices of biological integrity to determine whether non-tidal streams are impaired. This information generates a continuum of results ranging from streams that are extremely impaired to those that are of near-pristine quality (actually applied at a watershed scale). Somewhere along that continuum is the threshold at which the watershed is determined to be sufficiently degraded to warrant inclusion on Maryland's list of impaired waters (303(d) List). Impaired waters near the threshold are potential candidates for targeting implementation resources for removal from the 303(d) list. Those streams at the extremely degraded end of the range are candidates for targeting implementation to show incremental improvement. Incidentally, the unimpaired waters near the threshold are good candidates for additional protection efforts to ensure they do not drop into the

¹ As a rule of thumb, a 30% reduction of nonpoint source pollution is needed in order to measure a statistically significant reduction in pollution. Source: Dr. Jean Spooner, NC State University.

“impaired” category. (This is an example of links to the 303(d) TMDL program).

- **Bacteria Restoration Targeting:** Waters impaired by bacteria fall into three broad categories: Beaches, shellfish waters and other waters (typically non-tidal streams). In addition to the rationales for targeting laid out above, human health concerns also motivate the targeting of resources to these waters. However, at least two factors confound restoration efforts. First, bacteria is known to regenerate in the natural environment, which implies that simply controlling the sources might not be sufficient. Second, wildlife can be a significant contributor of bacteria pollution. Maryland has invested significant resources into bacteria source identification studies. As the technologies for doing this improve and the costs decrease, Maryland will continue to focus efforts on targeting implementation to reduce bacteria. (This is an example of links to the Beaches Program and Shellfish Program).
- **PCBs (polychlorinated Biphenyls):** For PCBs, Maryland has adopted the targeting principle of focusing on the maximum pollution load reduction. Several rationales drive this targeting approach. First, a primary concern with PCBs is that they bioaccumulate in fish resulting in human health risks. This motivates the desire to reduce the maximum amount of the source. Second, PCBs that are widely disbursed in the environment are difficult to control, aside from what is trapped incidentally by urban stormwater devices and other places that tend to trap sediments. This motivates a strategy to seek out any “hot spot” sources that might be amenable to direct remediation. To this end, Maryland conducts source identification monitoring as a follow-up to statewide screening monitoring studies conducted in 2005 and 2007. The screening monitoring was designed in response to fish tissue monitoring that indicated areas of bioaccumulation.
- **Chesapeake and Coastal Bays Trust Fund:** This funding source, which focuses on nonpoint source controls, is targeted by State statute on maximum pollution load reduction to the Chesapeake and Coastal Bays. The logic is that the State seeks to maximize the reduction of nonpoint source pollution reaching the Bay per dollar invested. In addition to coordination on targeting, the 319 NPS grant has links with the Trust Fund grant via joint RFPs when possible, grant proposal review committee participation, implementation tracking and resource leveraging.

4.S Technical Assistance

4.S.1 Watershed Assistance Collaborative

This program was initiated in 2008 to provide services and technical assistance to local government and other local entities that are interested in advancing NPS water quality restoration and protection activities, planning and implementation projects. The Collaborative is a partnership of Maryland’s State agencies, the Chesapeake Bay Trust, the University of Maryland Sea Grant Extension Program, the University of Maryland Environmental Finance Center, NOAA and EPA. The Collaborative offers tools, resources and outreach needed to work toward large NPS pollution implementation and restoration efforts. Five Regional Watershed Restoration Specialists, provided by the Sea Grant Extension Program, conduct the on-the-ground services to local cooperators. Overall coordination for the Collaborative is provided by Maryland DNR. (see Appendix Internet Sources)

Connection with State NPS Program: Because not all communities have the capacity to

successfully undertake and carry out NPS planning and implementation, this program actively provides critical technical assistance and related support for local communities to work toward attaining a locally-driven capability to conduct NPS restoration and protection work. An example of the Collaborative's success is the Sassafas River Watershed Plan, which is eligible for 319(h) Grant implementation funding. Several NPS implementation projects have been successfully completed as reported in Maryland 319 NPS Annual Report.

4.S.2 Watershed Restoration Action Strategy Program

This program was initiated in 2000 by Maryland DNR to provide technical assistance to local governments interested in NPS planning and implementation at the local watershed scale. The program concluded in 2006 following a State agency reorganization and shift to purely financial assistance for NPS watershed planning through the 319(h) Grant. During the program's operation, about 20 watershed plans were completed by local governments who accepted technical and funding assistance through Maryland DNR and MDE using funds from the 319(h) Grant (EPA) and Coastal Zone (NOAA). (see Appendix Internet Sources)

Connection with State NPS Program: Two local watershed plans initially completed through this technical assistance program are currently eligible for 319(h) Grant implementation funding and continue to use that fund source to conduct NPS implementation: Corsica River (Town of Centreville) and Lower Monocacy River (Frederick County). Other local jurisdictions with NPS watershed-based plans developed with this program's technical assistance continue to implement their plans using other funding sources: Anacostia River (Prince George's County), Bush River and Deer Creek (Harford County), Pretty Boy Reservoir (Baltimore County), and others. (Also see Watershed Assistance Grant Program.)

4.S.3 TMDL Data Center

Maryland's TMDL Data Center is a web-based resource that consolidates valuable technical assistance information designed to support nonpoint source implementation planning. It includes maps and a database of key information about Maryland's TMDLs and associated allocations, which can be accessed in a variety of ways. A number of guidance documents are assembled that address general NPS implementation information as well as pollutant-specific suggestions and references to further more detailed sources. The Data Center also provides detailed technical methods of developing quantified reduction strategies in the face of changing watershed models and base data such as land cover and BMP inventories and treatment efficiencies.

Connection with State NPS Program: Because TMDLs can be fairly technical and are intended to bring quantitative accountability to the subject of water quality restoration, this Data Center is a valuable pathway for providing technical assistance to partners involved in NPS management. It was launched in 2014 as a technical assistance delivery system to support local governments that are required to develop watershed-based plans to meet stormwater waste load allocations (WLAs) pursuant to Phase I MS4 permits. Although WLAs are classified as point sources within the context of TMDLs, many of the technical approaches to managing urban stormwater pollutants align directly with nonpoint source management.

4.T Technology Transfer

4.T.1 Maryland Assessment Scenario Tool (MAST)

The Maryland Assessment Scenario Tool (MAST) was first developed in June 2011 with a combination of state and federal grant (CBRAP) funding at the Maryland Department of the Environment. The immediate need was to provide local jurisdictions, such as counties, with a tool to provide input into the Chesapeake Bay TMDL watershed implementation plan (WIP) process. With continued funding from the U.S. EPA, the tool was expanded in 2012 and applied to Virginia (the tool was titled VAST) and then to the entire Chesapeake Bay watershed (titled CAST). The functionality of the CAST family of tools has been expanded further in 2013 and 2014 to enable local jurisdictions and states develop Phase II WIPs, 2013 and 2015 Milestones and local TMDLs.

MAST is a web-based nitrogen, phosphorus and sediment load estimator tool that streamlines environmental planning. Users specify a geographical area, and then select best management practices (BMPs) to apply on that area. MAST builds the scenario and provides estimates of nitrogen, phosphorus, and sediment load reductions. The cost of a scenario is also provided so that users may select the most cost-effective practices to reduce pollutant loads.

Any user may see the source of the data that was used in developing the TMDL and the state's most recent annual progress scenario, Milestone and WIP. This allows and supports involvement of the counties and other local planners in the Bay TMDL. MAST is easily accessible on-line with no need to install specific databases or software. All requests for a login password are granted. (see Appendix Internet Sources: MAST)

4.T.2 Stormwater Management and Restoration Tracking (SMART) Tool

The Stormwater Management and Restoration Tracking (SMART) Tool is an interactive Internet GIS method for property owner/managers to voluntarily report implementation of twenty types of urban stormwater management BMPs. The tool is a non-regulatory product of the University of Maryland Extension and the Maryland Sea Grant Program. The tool involves on-site certification of BMPs by independent specialists and was pilot tested in several Maryland counties in early 2014 and is anticipated to be available in other counties after June 2014. (see Appendix Internet Sources)

4.U Tracking Implementation

Maryland's 319 NPS Program is integrated into the State's tracking of nonpoint source implementation progress (See Chapter 3 – Tracking of Water Quality Impairments and Improvement). Assessing this progress takes several forms, which entail tracking and evaluation of information:

- **BMP implementation:** Evaluating the level of BMP implementation is an indirect measure of water quality improvement, because BMPs are presumed to have water quality benefits. Maryland's 319 Program is directly responsible for tracking all NPS BMP implementation in the Chesapeake Bay watershed, which makes up the vast majority of land area of the State. This tracking also identifies BMPs that benefit local water quality improvement initiatives.
- **Pollution Load Reductions:** Tracking pollution load reductions is hugely challenging. However, we in the Chesapeake Bay region are fortunate that the EPA Chesapeake Bay Program maintains a watershed model that is used to estimate nutrient and sediment load

reductions. As noted above, Maryland's 319 Program tracks BMP implementation. This data is reported to the Bay Program to support annual progress evaluations that are expressed in terms of pollution load reductions.

- **Localized Restoration:** Localized improvement in water quality, resulting from specific projects and targeted watershed initiatives, helps to demonstrate incremental progress. Maryland's 319 Program invests a significant fraction of its budget tracking the effect of localized restoration efforts. The Program also solicits other examples of localized restoration to help EPA document the benefits of nonpoint source management. Some of the more notable examples are documented as formal [success stories](#). One of the more noteworthy success stories is the [Corsica River initiative](#), which has shown significant nitrogen and phosphorus reductions at a watershed scale. (See Chapter 5 (Watersheds))
- **Protection:** Localized impacts on high quality waters can result from new development despite antidegradation policies. Maryland's 319 Program tracks development activities near high-quality waters and targets monitoring to potentially effected waters. (See "Antidegradation and Healthy Waters" in this Chapter).

4.V TMDLs

4.V.1 Overall

In December of 2013, EPA finalized its documentation of a Long-Term Vision for Assessment, Restoration, and Protection under the CWA Section 303(d) program (the 'New Vision'), with a focus on demonstrable improvement in water quality for watersheds prioritized by States. The vision goals incorporate the concept of adaptive management, placing an emphasis on the need for States to set their own priorities and pace, and allowing flexibility for States to make decisions regarding their waters' protection efforts.

The New Vision consists of six elements or goals, which, along with their expected timelines for adoption by the States, are specified by EPA. The elements are enhanced *Engagement* (beginning 2014); watershed *Prioritization* (2016); *Protection* (2016); programmatic *Integration* (2016); incorporation of TMDL *Alternatives* (2018), and *Assessment* (2020). Overall evaluation will take place in 2022. Details of the New Vision, and full descriptions of these elements, are available from EPA. (see Appendix Internet Sources: TMDL New Vision)

The Prioritization goal, as the foundation to guide planning and implementation of the other goals, requires that by 2016, States review, prioritize, and report priority watersheds or waters for restoration and protection. To that end, Maryland is establishing methodology to prioritize the State's watersheds for TMDL development, TMDL revision and, where appropriate, alternative means of protection and restoration. In keeping with the Engagement goal, MDE is developing this methodology in a transparent manner, and it will be documented in the 2014-2015 Annual Report and Workplan that MDE will submit to EPA in October 2014 as established in the 2012 Memorandum of Understanding between Maryland and EPA (MOU).

4.V.2 Chlorides

An example of an emerging pollutant of concern that has a high priority in Maryland is chloride. Biological stressor analysis has identified chloride as the probable cause of biological impairment in numerous watersheds throughout the State. MDE has developed a chloride monitoring network to determine the spatial and temporal extent of chloride loadings that led to

the biological impairments. In 2010, MDE began listing chloride as a pollutant in the Integrated Report. Currently, more than 20 watersheds are listed for chloride impairment needing a TMDL or other acceptable pollution abatement initiative (Integrated Report Category 5). Additionally, MDE will also be adopting acute and chronic criteria for chloride. Pilot studies for the development of chloride TMDLs have been done for the non-tidal portions of two Baltimore-area watersheds. Once the chloride criteria are finalized and adopted, MDE will use the experience gained from the development, review and approval process of these pilot TMDLs as the basis for developing additional chloride TMDLs. It is anticipated that a significant component of chloride TMDLs will be managing application of deicing road salts on transportation corridors. To help address this issue, the Maryland State Highway Administration has developed a Statewide Salt Management Plan, which includes a goal to reduce the adverse environmental impacts associated with road salt storage, application and disposal on Maryland's water and land resources while maintaining public safety. The plan details steps for reducing road-salt usage. Milestones for chlorides are Appendix Milestones.

4.V.3 Polychlorinated Biphenyls

Between 2007 and the end of 2014, MDE developed 13 TMDLs to address PCB impairments in Maryland waters. MDE has scheduled 14 additional PCB TMDLs for completion for the years 2015 thru 2019. Milestones for PCBs are in Appendix Milestones.

4.V.4 Temperature

MDE has been working over the past years reviewing and updating the water body use classification (e.g. Use Class III). MDE has also developed a new assessment methodology that determines which water bodies have temperature impairment. As a result of this effort, it is anticipated that the Maryland 2014 Integrated Report, following review by the public and EPA, will include many new temperature impairment listings. After the 2014 Integrated Report is finalized, MDE will include these new temperature listings in its prioritization framework to establish a timeline to address these listings through the TMDL process.

4.W Training

4.W.1 Coastal Training Program

The Chesapeake Bay National Estuarine Research Reserve (CBNERR) promotes educational opportunities and scientific study of the Bay to better inform restoration efforts. Through the Coastal Training Program, CBNERR hosts professional training programs to provide accurate scientific information about coastal resources to decision makers in the watershed. The Coastal Training Program targets a diverse group of decision-makers: state, county and local government; academic institutions; the agricultural community; watershed and environmental groups; industry and private businesses; developers; and citizens and many others.

Individual trainings range from seminars to hands-on skill training, participatory workshops, lectures and technology demonstrations. Participants benefit from opportunities to share experiences and network in a multidisciplinary setting, often with a reserve-based field activity. CBNERR works in partnership with many organizations in the Bay region to deliver these professional training programs. Since 1994, National Estuarine Research Reserve workshops and seminars across the country have reached over 13,000 coastal decision-makers. These programs have resulted in better-informed decision-making around coastal resource issues and

improved coastal stewardship at local and regional levels. (see Appendix Internet Sources)

Connection with State NPS Program: The Maryland Coastal Training program focuses on issues related to managing development along the shoreline, watershed management and sustainability, coastal hazards and resiliency and climate change. NPS skill-based training and information is provided to local decision-makers thru Maryland's Watershed Assistance Collaborative with the intent of accelerating on the ground implementation of BMPs.

4.W.2 Watershed Stewards Academy

The training offered by the Watershed Stewards Academy is designed to empower residents to improve water quality in local streams. The Academy provides training, shares resources, assists in forming partnerships and coordinating efforts. It works with a consortium of support professionals, Master Watershed Stewards and their communities to reduce pollutants, infiltrate stormwater and restore natural systems. Trainees receive knowledge from lecturers, training in using watershed assessment tools for analyzing stormwater runoff, and hands-on experience leading stormwater management and behavior change projects. There are currently four Academy locations: Anne Arundel County, Cecil County, Howard County and the National Capital region. Trainees pay a fee to cover costs of materials/activities. (see Appendix Internet Sources)

Connection with the State NPS Management Program: The Watershed Stewards Academy is a key on-going NPS management program to build grassroots understanding and participation by training interested individuals who want to actively improve their ability to protect and restore water quality. Trainees who become Master Stewards also magnify program results by involving others in their community.

Chapter 5 – WATERSHED MANAGEMENT TO ACHIEVE NPS GOALS

Contents

- 5.A Framework
- 5.B Maryland’s Major Watershed Drainage Areas
- 5.C Chesapeake Bay
 - o 5.C.1 Chesapeake Bay Agreement
 - o 5.C.2 Chesapeake Bay TMDL
 - o 5.C.3 Chesapeake Bay WIP
 - o 5.C.4 Milestone Goals
 - o 5.C.5 WIP Tracking
 - o 5.C.6 Partnerships, Coordination and Outreach
 - o 5.C.7 National Water Quality Initiative – Catoctin Creek Watershed
 - o 5.C.8 National Nonpoint Source Monitoring Program Project – Corsica River Watershed
- 5.D Coastal Bays
- 5.E Casselman River and Youghiogheny River

5.A Framework

Maryland State nonpoint source management, planning, TMDLs and implementation are conducted in a watershed-based framework consistent with State policy and programs. In each of Maryland’s three major watershed drainage areas, NPS management and planning are focused to address the unique circumstances found there. Within each major watershed drainage area, NPS goals may be set for the regional watershed, the local watershed, and a stream segment scales at the same time. This nested approach characterizes Maryland’s NPS management framework.



For example, NPS nutrients and sediment management goals, and implementation plans, are set at different watershed scales, with increasing detail, nested within each other:

- Chesapeake Bay TMDL limits nitrogen, phosphorus and sediment. The State Watershed Implementation Plan (WIP) , composed of local WIPs, represents a very broad strategy for meeting the Bay TMDLs.
 - o Baltimore Harbor TMDL limits phosphorus
 - Gwynns Falls TMDL, within Baltimore Harbor watershed, limits sediment. The local jurisdiction’s watershed plan describes how the nutrient and sediment TMDLs will be achieved.
 - Scotts Level Run within the Gwynns Falls watershed is targeted by the local jurisdiction for neighborhood watershed scale implementation and assessment.

For TMDLs in Maryland that set limits at different watershed scales for the same pollutant, the intent is to eliminate water quality impairments at the scale of each TMDL. Therefore, all the

TMDLs remain in force and the most stringent TMDL limit must be met even though the less stringent TMDLs might be surpassed.

Watershed plans designed meet TMDLs and other NPS goals that address the same pollutant at different watershed scales are in effect nested. Together these watershed plans show how NPS implementation can be accomplished and contribute to meeting goals at different scales.

5.B Maryland's Major Watershed Drainage Areas

Waterways in the State of Maryland naturally flow in three major drainage areas. Nonpoint source management in each of these drainage areas has evolved watershed management approaches tailored to address the unique circumstances of each:

- Chesapeake Bay watershed: Over 90% of Maryland is in the Chesapeake Bay watershed. Here, the partnership between the States and federal EPA Chesapeake Bay Program provides a cooperative management umbrella and large scale goals. Within this umbrella, numerous local watershed management efforts are nested that contribute to meeting State-level Chesapeake Bay goals and serve local NPS management needs.
- Coastal Bays watershed: The Coastal Bays are embayments formed between the mainland and barrier islands in the Atlantic Ocean. In these watersheds, the Maryland Coastal Bays Program, which is a local nonprofit group, provides a forum for State and Federal agencies and Worcester County to work toward common water quality and resource management interests.
- Youghiogheny River and Casselman River watersheds: These mountainous watersheds in Garrett County, Maryland drain north into Pennsylvania and West Virginia, and eventually to the Ohio River and the Mississippi River. With their legacy of resource extraction, these watersheds are addressed thru State and local cooperation on watershed management at the local watershed scale.

5.C Chesapeake Bay Drainage Area

Following renewal of the Chesapeake Bay Agreement (Chesapeake 2000) and completion of the last State NPS Management Plan, progress toward meeting some of the ambitious Chesapeake Bay restoration goals did not meet expectations. To help re-focus Chesapeake Bay Restoration efforts in December 2010, EPA completed the *Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorus and Sediment* (Bay TMDL) and the State of Maryland completed *Maryland's Phase I Watershed Implementation Plan for the Chesapeake Bay Total Maximum Daily Load* (Phase I WIP). Then in October 2012, the State of Maryland developed greater detail for implementing the Bay TMDL in *Maryland's Phase II Watershed Implementation Plan for the Chesapeake Bay TMDL* (Phase II WIP).

5.C.1 Chesapeake Bay Agreement

For over thirty years, cooperative partnership between Maryland, Virginia, Pennsylvania, Washington DC, US EPA and the Chesapeake Bay Commission has been fostered thru the Chesapeake Bay Agreement. Since the original 1983 signing, the Agreement has been renewed and reinvigorated, was joined by the State of West Virginia, and was amplified by the 2009 Presidential Executive Order. The most recent renewal of the partnership embodied in the 2014

Chesapeake Bay Agreement now brings all the States the drain to the Chesapeake Bay into the partnership with the addition of Delaware and the State of New York. The Agreement also involves collaboration from the Federal Leadership Committee for the Chesapeake Bay, including the federal agency members listed below:

- U.S. Environmental Program Agency
- U.S. Department of Agriculture
- U.S. Department of Commerce
- U.S. Department of Defense
- U.S. Department of Homeland Security
- U.S. Department the Interior
- U.S. Department of Transportation

These federal agencies collaborated in working to meet Presidential Executive Order 13508 by producing a strategy in 2010 and action plan in 2012. These documents summarize the many areas of cooperation between federal and state agencies that benefit Maryland and the Chesapeake Bay. (see Appendix Internet Sources, Executive Order 13508)

Maryland is striving to attain the goals and outcomes in the 2014 Chesapeake Bay Agreement. The schedule identified in the Agreement affects Maryland's NPS management program most directly in the water quality goal where the 2017 Watershed Implementation Plans Outcome expects the signatories "to achieve a 60% of the nutrient and sediment pollution load reductions necessary to achieve applicable water quality standards compared to 2009 levels". To address this outcome, progress assessments will be conducted and the results will be used to support NPS management decisions. If significant changes are made in Maryland's NPS management program, they will be reflected in future updates to this document. (see Appendix Internet Sources: Chesapeake Bay Agreement)

5.C.2 Chesapeake Bay TMDL

The Bay TMDL specifies the amount of nitrogen, phosphorus, and sediment that the Chesapeake Bay may receive while continuing to maintain water quality standards and it identifies specific pollution reduction requirements. This TMDL is comprised of 294 separate TMDLs (98 impaired bay segments for each of three pollutants: nitrogen, phosphorus, and sediment). Maryland is responsible for 58 impaired segments and the 174 TMDLs that apply to them.

Because this is the first a multi-jurisdictional TMDL on this scale, EPA requires an enhanced "reasonable assurance of implementation" element in the TMDL to ensure that load outcomes are met. The reasonable assurance being required is Maryland's Final Phase I WIP, which was approved by EPA, and eventually Maryland's Phase II WIP.

The Bay TMDL calls for at least 60% of all pollution control measures to be implemented by calendar year 2017 and for all of them to be in place by calendar year 2025.

5.C.3 Chesapeake Bay WIP

Maryland's Watershed Implementation Plan (WIP) for the Chesapeake Bay TMDL is a component of the State NPS Management Program that guides NPS implementation to meet the Bay TMDL. The State WIP is a roadmap for how the Bay TMDL will be achieved and maintained. It is also documentation of "reasonable assurance" that the Bay TMDL will be implemented. The Phase I WIP provides an overall picture of how reductions can be achieved.

The Phase II WIP presents a more detailed picture of nutrient loading reductions at the scale of major river basins.

Maryland's Phase I WIP built on current restoration efforts and identified 58 options to reduce nitrogen, phosphorus, and sediment for wastewater, urban run-off, septic systems, agriculture, and air pollution. While the final Phase I WIP addressed the overall funding need for calendar 2012 through 2017, it did not break down the costs sufficiently to determine responsibility for costs as would be needed in an overall spending plan. The Phase I WIP focused on the following three approaches for bridging the remaining loading gaps: (1) develop new technology and approaches before calendar 2017; (2) increase the scope of implementation of existing strategies such as upgrading wastewater treatment plants and increasing the number and efficiency of stormwater runoff controls; and (3) improve regulatory requirements.

Maryland's Phase II WIP sets the framework for allocating the pollutant loads on a major river basin scale and providing greater detail about proposed pollution controls but does not actually state the detailed level reductions proposed since EPA was continuing to evaluate proposed strategies by watershed model runs. The Phase II WIP strategies were designed using the Maryland Assessment and Scenario Tool (MAST), which is a simplified proxy model for the Chesapeake Bay watershed model that allows users to test implementation strategies.

5.C.4 Chesapeake Bay Milestone Goals

In May 2009, the Chesapeake Bay partners including Maryland discarded the broad 10-year goal framework used over the prior 30 years and committed to new voluntary 2-year incremental goals called milestones for reducing nitrogen, phosphorus and sediment loads. The 2-year milestones for the Maryland portion of the Chesapeake Bay watershed are integrated into the State's restoration policy framework and they are components of Maryland's NPS Management Plan. Maryland's BayStat website publicly distributes tracking of Maryland's progress toward these milestones and related program information.

The first set of Maryland Chesapeake Bay-wide milestones targeted June 30, 2011 to correspond with the end of the State fiscal year (relative to calendar 2008 load levels):

- Nitrogen load reduction of 15.8 million pounds and
- Phosphorus load reduction of 1.05 million pounds.

To achieve this, Maryland had to reduce its nitrogen loads by 3.75 million pounds and its phosphorus loads by 193,000 pounds (from calendar 2008 levels). Maryland achieved the necessary reductions according to the level of implementation of best management practices, although the progress made in calendar 2010 was obscured by heavy rainfall.

Maryland's Chesapeake Bay Milestone Goals for 2011-2013 and 2014-2015 are publicly available on the Internet. (see Appendix Internet Sources) These two-year milestones are components of the State NPS Management Plan. They are designed to facilitate achieving Maryland's overall Chesapeake Bay WIP goals by 2025 following a timeline:

- December 2010: EPA published the final Bay TMDL and Maryland's Phase I WIP was completed;
- October 2012: Maryland's Phase II WIP and two-year milestones submitted to EPA;
- November 2017: Meet 60% of the Bay TMDL targets and submit to EPA final Phase III WIP detailing calendar 2018 to 2025 actions;

- December 2025: Meet final Bay TMDL targets.

5.C.5 Chesapeake Bay WIP Tracking

Maryland continues to develop and enhance NPS management, implementation and progress tracking for the Chesapeake Bay drainage area in the State thru the WIP process in cooperation with the EPA Chesapeake Bay Program. Public distribution of program documents is provided thru the Department of the Environment's Internet home page including the Phase I WIP, the Phase II WIP and the current 2-year milestones. Updates to the WIP documents will be components of the State NPS Management plan, such as the 2-year milestones for 2013-2015, and will be posted on the Internet. (see Appendix Internet Sources)

5.C.6 Partnerships, Coordination and Outreach

Maryland's Chesapeake Bay area is the focus of a very extensive array of coordination and outreach efforts at all levels. Some examples of ongoing entities that conduct coordinating and outreach activities related to Bay or statewide NPS management (not complete list):

- Anacostia River Watershed Restoration Partnership: Maryland State agencies, Washington DC, Montgomery County, Prince George's County and citizen representatives voluntarily partner thru the Metropolitan Washington Council of Governments (MWCOC). Annual memoranda of understanding provide funds for coordination by MWCOC. Adopted the current Restoration Plan in February 2010. NPS issues are addressed in standing Anacostia watershed coordinating bodies: the Management Committee and the Steering Committee.
- Baltimore Reservoir Technical Advisory Group: The voluntary body serves to coordinate management and protection of Baltimore's three public drinking water reservoirs. It is coordinated by the Baltimore Metropolitan Council. Its membership includes Baltimore City, five counties (Anne Arundel, Baltimore, Carroll, Harford, Howard), two soil conservation districts (Baltimore and Carroll), and three State agencies (MDP, MDA and MDE).
- Chesapeake Bay Cabinet: Maryland State agencies' Secretaries meet periodically to coordinate work between and among the agencies.
- Chesapeake Bay Commission: Legislative representatives from MD, PA, VA meet periodically to coordinate efforts among the states.
- Chesapeake Bay Program: Federal agencies maintain local offices focused on Bay work and coordinate work between the Federal agencies and among the States. Maryland participates in various Program committees for this regional voluntary agreement.
- Chesapeake Bay Workgroup: Maryland State agencies lead technical managers meet periodically to coordinate work between and among the agencies.
- Children's Environment Health and Protection Advisory Council: This State body established by statute in 2000 to identify environmental health issues for children and seeks to protect children in Maryland from exposure to environmental hazards. Its members include experts appointed by the Governor, the Governor's Office for Children, representatives of the State legislature and State agencies DHMH, MDA, MDE, Dept. of Housing and Community Development, and the Dept. of Human Services.
- Critical Area Commission for the Chesapeake and Atlantic Coastal Bays. State and local members focused on buffers and 1000 ft adjacent to tidal waters.
- Dredged Material Management Plans Executive Committee: This State body was established by statute in 2001. The Committee oversees development of State plans to manage dredged material from the Port of Baltimore. The Committee ensures that the

management program is environmental sound and economically effective. Members represent the Governor, three State Departments (Environment, Natural Resources, and Transportation), the Dredged Material Placement Program Management Committee, the US Army Corps of Engineers and the Chesapeake Bay Foundation.

- Environmental Health Liaison Committee: The Committee was voluntarily created in 2000 to review and address updating a memorandum of understanding between DHMH, MDE, Local Health Officers and Local Environmental Health Directors. The MOU, and its updates, sets forth the working relationships and cooperation among these entities. Examples of NPS issues addressed under the MOU include safeguarding water quality affecting shellfish harvesting waters and public bathing beaches.
- Governor's BayStat: Both a website and a body of State Department Secretaries responsible for Bay restoration. The website is intended to serve as the public outreach side of the BayStat process. The body meets monthly to assess Bay restoration progress.
- Governor's Emergency Management Advisory Council: The State body was created by Executive Order pursuant to federal law to advise and coordinate on all matters emergency management including hazardous materials spills, and vulnerability assessment.
- Federal Leadership Committee for the Chesapeake Bay: Federal agencies with responsibilities to carry out the federal *Strategy for Protecting and Restoring the Bay*.
- Interstate Commission on the Potomac River: State representatives.
- Patuxent River Commission: Members named in State law include MDP, MDA, MDE, Maryland DNR, each of the seven Counties in the watershed, and representatives of business and academia. Meet periodically to coordinate protection and restoration of water quality. Adopted the 2015 Policy Plan in March 2014.
- Pesticide Advisory Committee: The State body was established by Executive Order. Its missions include ensuring proper handling, safeguarding human health, and protecting environmental resources. Members represent the State legislature, State agencies (DHMH, DNR, MDA, MDE), the Maryland Agricultural Commission, the University of Maryland, and various fields of expertise.
- Susquehanna River Basin Commission: Commissioners represent the US Army Corps of Engineers and States (MD, NY, PA).

Outreach aligned with Maryland's Chesapeake Bay priorities and issues is a high priority. See Chapter 6 for specific outreach programs and also see the Appendix for Internet Sources.

5.C.7 National Water Quality Initiative - Catoctin Creek Watershed

The National Water Quality Initiative (NWQI) works in priority watersheds with impaired streams to help farmers and forest landowners voluntarily implement more conservation practices. The purpose of this cooperative effort between the US EPA, the USDA-NRCS and the States is to target a portion of EQIP funding to fund conservation practices in targeted watersheds to expedite agricultural NPS conservation practice implementation and to promote accelerated water quality improvement.

Partnership: In Maryland, several agencies cooperated to select the Catoctin Creek watershed: the Maryland NRCS office, the NRCS State Technical Committee, the Maryland Dept. of Agriculture and MDE. The Catoctin Soil Conservation District is also partnering to provide the technical support necessary to effectively employ the funding support and to rapidly implement the conservation practices. To monitor in-stream water quality conditions as one gauge of

project results, a memorandum of agreement has been signed so that the Maryland NRCS office provides funding support for monitoring and MDE conducts the monitoring and analysis.

Location: The Catoctin Creek watershed encompasses the southern portion of Frederick County between Catoctin Mountain on the east and South Mountain on the west. The watershed drains 120 square miles including forested mountain slopes, agricultural valleys and small towns. Some local streams exhibit impairments associated with sediments, nutrients, biological communities, and face coliform bacteria. Land use in the watershed about 43% agriculture (mostly row crops and pasture), 42% forest/herbaceous and 15% urban.

Status: Funding became available and implementation of conservation practices began in 2012 and has continued each year thru 2014. During that time over \$400,000 in financial assistance has contributed to installing conservation practices such as waste storage facilities, prescribed grazing systems and livestock exclusion from stream corridors.

5.C.8 National Nonpoint Source Monitoring Program Project – Corsica River Watershed
Maryland's Corsica River watershed has become a laboratory for nonpoint source management and assessment techniques. The Corsica River is a tributary to the Chester River and Chesapeake Bay on Maryland's Eastern Shore in Queen Anne's County and encompasses the Town of Centreville. In 2005, Governor Robert Ehrlich proclaimed the Corsica River to be a State targeted watershed. The original intent was to invest significant State and federal resources in the watershed for a 5-year period, build local funding and governance structures and then spin it off to be a locally managed initiative.

In great part, that effort was implemented successfully, although it required a little more time than anticipated. Following years of funding by the Clean Water Act Section 319(h) Grant for a local watershed manager, the Town of Centreville adopted a storm water fee ordinance intended to fund a part-time watershed manager and other needs. Early on, the Corsica Implementers Committee (CIC) was established to promote collaboration among cooperating government agencies. The CIC, which among other successes, developed a 6-Year progress report that also revised NPS implementation goals that meets EPA guidance thereby maintaining eligibility for 319(h) grant implementation funding. Aside from institutionalizing governance and funding structures, significant implementation progress has been made, including land conservation. Perhaps most noteworthy has been the successful demonstration of observable in-stream water quality improvements at a subcatchment scale.

Although the original commitment of State and federal resources was limited to 5-years, the success of the monitoring element of the Corsica River initiative has prompted a continued commitment of Section 319 funding and State staffing. The Corsica has been accepted as one of EPA's approximately 28 National Nonpoint Source Monitoring Program (NNSMP) projects. This affords the Corsica initiative with special technical assistance from EPA. The objectives of the NNPSMP are 1) to scientifically evaluate the effectiveness of watershed technologies designed to control nonpoint source pollution; and 2) to improve our understanding of nonpoint source pollution¹. (For more information, see Appendix Internet Sources)

¹ D.E. Line, D.L. Osmond, and G.D. Jennings. 2000. *Section 319 NonpointSource National Monitoring Program Successes and Recommendations*. NCSU Water Quality Group, Biological and Agricultural Engineering Department, NC State University, Raleigh, North Carolina., http://www.bae.ncsu.edu/programs/extension/wqg/319monitoring/doc/nmp_successes.pdf

5.D Coastal Bays

Streams in the eastern half of Worcester County, Maryland, flow toward coastal bays formed by barrier islands near the mainland in the Atlantic Ocean. These coastal bays are unique in Maryland because slow flushing and evaporation commonly cause some areas to be saltier than the open ocean.

In this drainage area, NPS watershed planning and implementation is conducted thru cooperation facilitated by the Maryland Coastal Bays Program, which is a nonprofit organization partnering with the National Estuary Program. Cooperators include:

- Local government: Worcester County and towns of Berlin and Ocean City;
- State agencies including the Departments of Natural Resources, Agriculture, Environment, and Planning, and also State Highway Administration;
- Federal agencies: EPA, Fish & Wildlife Service, National Park Service and the US Geological Survey.

From 1999 thru 2014, these government entities focused their cooperation on water quality issues across the 175 square mile watershed by using a comprehensive conservation and management plan (CCMP) entitled *Today's Treasures for Tomorrow: Towards a Brighter Future, The Comprehensive Conservation and Management Plan for Maryland's Coastal Bays*. The 1999 CCMP addressed a multitude of natural resource and environmental issues.

Under the umbrella of the CCMP and consistent with the TMDLs, watershed management plans produced between 2002 and 2006 focus on the major Coastal Bays watersheds: Assawoman Bay, Isle of Wight Bay, Newport and Sinepuxent Bays, and Chincoteague Bay. Priorities for watershed planning and plan implementation are driven by local needs and State agency regulatory responsibilities. (No current intent to seek 319(h) Grant implementation funds.)

Total maximum daily loads (TMDLs) and water quality analyses (WQAs) have been approved for watersheds within the larger Coastal Bays watershed, including: Assawoman Bay, Big Mill Pond in the Chincoteague Bay watershed, Chincoteague Bay, Herring and Turville Creeks in the Isle of Wight Bay watershed, Newport Bay, and the northern coastal bays system (Assawoman Bay, Isle of Wight Bay, St. Martin River). In August 2014, nutrient TMDLs for the entire Maryland Coastal Bays system were approved EPA. These TMDLs will help to guide NPS management by identifying baseline loadings, pollutant sources and by setting pollution reduction targets.

In 2011, a 13-year progress report (1999 thru 2011) summarized progress toward meeting the CCMP's numerous goals and objectives. In consideration of these findings, a draft update to the CCMP was released in January 2014 for public review. In April 2014, two public workshops were held to facilitate public understanding and input. It is anticipated that the revised CCMP will be completed by the end of 2014. Then, the Maryland Coastal Bays Program will continue to work with local, state and federal agencies to implement the plan.

The nutrient control strategy for the Coastal Bays watershed is embodied in the *Total Maximum Daily Loads of Nitrogen and Phosphorus for Assawoman Bay, Isle of Wight Bay, Sinepuxent Bay, Newport Bay and Chincoteague Bay in the Coastal Bays Watersheds in Worcester County, Maryland* section 5.0 Assurance of Implementation and in the Draft CCMP.

5.E Casselman River and Youghiogheny River Watersheds

Streams in Garrett County, Maryland, in the Youghiogheny and Casselman River watersheds flow northward into Pennsylvania. This part of Maryland is in the Appalachian Mountains and is characterized by steep slopes and valleys with some areas of bottomland sphagnum bogs that produce naturally acidic drainage water. These watersheds are headwaters to part of the Ohio-Mississippi River watershed which is a national water quality priority. Some federal efforts (e.g., NRCS Mississippi River Basin Healthy Watersheds) exclude some States and are not truly watershed focused (e.g., excluding MD, WV, PA as Ohio River headwater states) or lack the level of funding necessary to address water quality efforts, as is being done on an estuarine scale in the Chesapeake Bay, on a continental scale. Even so, Mississippi-Ohio watershed programs are periodically reviewed to determine if Maryland can leverage federal funding opportunities with State and local nonpoint source funding for NPS projects in the Western Region.

In these river basins, NPS watershed planning and implementation is conducted on a watershed-by-watershed basis considering the unique issues that characterize each area. Priorities for watershed planning and implementation in this watershed consider several factors in addition to those listed in Chapter 4:

- Statutory requirement. Plan implementation is driven by the requirement to protect wild character traits. This purpose also serves to protect water quality. (Maryland Scenic and Wild River Act: Youghiogheny River).
- Government ownership/management. Plan implementation is driven by the need to serve multiple public use needs while maintaining water quality standards. (Deep Creek Lake).
- Impairment correction by a government agency is likely to be successful. Implementation is driven by the likelihood that water quality impairment can be successfully eliminated, TMDLs can be met, and water quality standards can be maintained. (Casselman River acid mine drainage mitigation by MDE).

In the Youghiogheny River watershed, the largest recreational lake in Maryland, Deep Creek Lake, is owned by the Maryland Dept. of Natural Resources. Beginning in 2013, Maryland DNR and Garrett County began partnering to develop a watershed plan that will address locally important management issues including NPS. The plan will be completed in 2014 focusing on State/local needs. (No current intent to seek 319(h) Grant implementation funds.)

The most pervasive NPS water quality problem in this part of Maryland is acid mine drainage associated with abandoned coal mines. In 2007, opportunities to mitigate acid mine drainage (AMD) were re-evaluated and the Casselman River watershed was identified as a high priority for remediation. Using 319(h) Grant funds and considering public input from the August 2011 public meeting, MDE completed a watershed plan to guide NPS implementation. The *Casselman River Watershed Plan for pH Remediation* is the State NPS Management Program component that guides NPS implementation to meet the pH TMDL for this watershed.

Chapter 6 – PUBLIC EDUCATION, OUTREACH AND FINANCIAL ASSISTANCE

Contents

- 6.A Public Education and Outreach
 - o 1. BayScapes
 - o 2. Education and Homeowner Tips (MDA)
 - o 3. Enforcement and Compliance (MDE)
 - o 4. Environmental Finance Center
 - o 5. Harry R. Hughes Center for Agro-Ecology, Inc.
 - o 6. Manure Matching Service
 - o 7. Maryland Bay-Wise Program
 - o 8. Maryland Clean Marina Initiative
 - o 9. Maryland Green School Awards Program
 - o 10. Maryland Master Gardener Program
 - o 11. Maryland Public Schools Environmental Literacy Requirement
 - o 12. Maryland Sea Grant (Program and Extension)
 - o 13. Maryland Woodland Stewards Project
 - o 14. Nutrient Management Program Continuing Education and Certification
 - o 15. Nutrient Management Program: Fertilizer Act (for turf mgmt & homeowners)
 - o 16. Pesticide Safety Education
 - o 17. Project WET
 - o 18. Reclaim the Bay Campaign
 - o 19. Special Rivers Project
 - o 20. TEAM DNR
 - o 21. Watershed Assistance Collaborative
- 6.B Public Participation
 - o 6.B.1 Agriculture
 - a. Agricultural Certainty Oversight Committee
 - b. Agricultural Waste Technology Fund Advisory Committee
 - c. Conservation Reserve Enhancement Program Advisory Committee
 - d. Maryland Agricultural Commission
 - e. Nutrient Management Advisory Committee
 - f. State Soil Conservation Committee
 - o 6.B.2 Environment
 - a. Bay Restoration Fund Advisory Committee
 - b. Land Reclamation Committee
 - c. Maryland State Water Quality Advisory Committee
 - d. Volunteer Corps and Internship Program
 - o 6.B.3 Natural Resources
 - a. Coastal and Watershed Resources Advisory Committee
 - b. Critical Area Commission for the Chesapeake and Atlantic Coastal Bays
 - c. Maryland Stream ReLeaf Coordinating Committee
 - d. Maryland Stream Waders
 - e. Maryland's Tributary Teams
 - f. Scientific Advisory Panel
- 6.C Financial Assistance Programs
 - o 6.C.1 Agriculture
 - a. Agricultural Management Assistance Program
 - b. Animal Waste Technology Fund
 - c. Conservation Innovation Grants
 - d. Conservation Reserve Program and Conservation Reserve Enhancement Program
 - e. Conservation Security Program
 - f. Conservation Stewardship Program
 - g. Direct Farm Loans
 - h. Environmental Quality Incentives Program and Chesapeake Bay Initiative Program
 - i. Low Interest Loans for Agricultural Conservation (LILAC)
 - j. Manure Transport Program

- k. Maryland Agricultural Water Quality Cost-Share (MACS)
 - l. Maryland Income Tax Subtraction for Conservation Equipment
 - m. Maryland Agricultural Land Protection Foundation
 - n. Regional Conservation Partnership Program (RCPP)
 - o. Sustainable Agriculture Research and Education (SARE)
 - p. Wetlands Reserve Program
 - q. Winter Cover Crop Program
- 6.C.2 Environment
 - a. Abandoned Mine Land Grant
 - b. Nontidal Wetlands Mitigation Program
 - c. Onsite Disposal Systems Grant (Bay Restoration Fund)
 - d. Section 319(h) Nonpoint Source Program
 - e. Section 106 Water Pollution Control Program Grant
 - f. Small Creeks and Estuaries Restoration Program
 - g. Stormwater Pollution Control Cost-Share Program
 - h. Supplemental Assistance Program (WWTPs)
 - i. Water Quality Revolving Loan Fund
 - j. Water Quality Revolving Loan Fund – Linked Deposit Program for private burrowers
- 6.C.3 Federal
 - a. Chesapeake Bay Watershed Education and Training Grant (B-WET)
 - b. Chesapeake Bay Implementation Grant
 - c. Chesapeake Bay Innovative Nutrient and Sediment Reduction Grant
 - d. Coastal Counties Restoration Initiative
 - e. Environmental Education Grants Program
 - f. Five Star Restoration Grants
 - g. Forest Legacy Program
 - h. National Coastal Wetlands Conservation Grant Program
 - i. Public Works and Development Facilities Program
 - j. Pollution Prevention Program
 - k. Resource Conservation Partnership Program
 - l. Small Watershed Grants Program
 - m. Wetland Program Development Grants
- 6.C.4 Natural Resources
 - a. Aquatic Resources Education Grant
 - b. Chesapeake and Atlantic Coastal Bays Trust Fund
 - c. Coastal Zone Management Grant
 - d. Forest Stewardship Program / Stewardship Incentive Program
 - e. Income Tax Modification Program – for forestland owners
 - f. Innovative Technology Fund
 - g. Landowner Incentive Program
 - h. Marine Sewage Pumpout Program
 - i. Rural Legacy Program
 - j. Shoreline Erosion Control Financial Assistance
 - k. Woodland Incentive Program
- 6.C.5 Other State Entities
 - a. Bill James Environmental Grant – MET
 - b. Environmental Education Grant – CBT
 - c. Living Shorelines Grant – CBT
 - d. Margaret Rosch Jones Award – MET
 - e. Maryland Environmental Trust – MET
 - f. Mini Grant Program – CBT
 - g. Outreach and Community Awareness Grant – CBT
 - h. Pioneer Grant Program – CBT
 - i. Restoration Grant Program – CBT
 - j. Watershed Assistance Grant – CBT
- 6.C.6 Private
 - a. Global ReLeaf Grants
 - b. Rauch Foundation Grants

6.A Public Education and Outreach Programs

Maryland's leadership in public education relating to NPS management is exemplified by the State requirement that all public school students must complete an environmental literacy program that is locally designed to meet standards adopted by the Maryland State Board of Education. This requirement will help ensure that public school graduates have a foundation for comprehending NPS issues and for making informed decisions that can contribute to effective NPS management and implementation.

For all individuals and groups to gain a better understanding of nonpoint source issues, educational efforts must be concise and cater to their individual needs. For this reason, many different educational formats are used to earn the attention of different audiences. Resources from the State of Maryland, as well as from individual networked agencies, is used to educate local governments, property owners, businesses, children and local citizens, helping them to understand the importance of limiting nonpoint source pollution. With so many education efforts going on throughout the State of Maryland, it is impossible to list them all. The following are descriptions of the programs that are advocated by the NPS Program.

6.A.1 BayScapes

The Alliance for the Chesapeake Bay and the U.S. Fish and Wildlife Service sponsor the BayScapes program, which educates landowners and property managers about sustainable landscaping practices like rain gardens. BayScapes pamphlets and videos promote the minimal application of nutrients to protect water quality.

Connection with the State NPS Management Program: This Federally supported program targets the Chesapeake Bay drainage area but has proven popular across Maryland. It promotes landscape designs and management of residential and commercial properties that tends to increase onsite infiltration of stormwater, reduce use of pesticides and fertilizers and thereby reduce NPS pollution.

Web site: <http://www.fws.gov/chesapeakebay/bayscapes.htm>

6.A.2 Education and Homeowner Tips (MDA)

This Maryland Department of Agriculture program provides outreach and education targeted to homeowners, school children and the general public. A series of factsheets and displays educate citizens as to actions they can take to improve water quality including trying pesticide alternatives, using fertilizers wisely, controlling soil erosion, composting and conserving water. Educational information is also currently provided to students thru interactive games that convey watershed concepts.

Connection with the State NPS Management Program: The information offered is designed to support understanding of issues related to NPS management by young people and homeowners. This statewide effort promotes voluntary incorporation of beneficial NPS management into daily living at the grassroots scale.

Website: (outreach and education tools are frequently updated)

http://mda.maryland.gov/resource_conservation/Pages/environmental_education.aspx

6.A.3 Enforcement and Compliance (MDE)

MDE is responsible for enforcement and compliance for many regulatory programs associated with management of air, water and land resources. Many of actions taken by the Department to carry out these responsibilities are reported so that stakeholders and the public can be aware. In order to provide a readily accessible central site for public awareness of enforcement and compliance activities, MDE maintains an Internet site that serves as a starting point for finding recent information.

Connection with the State NPS Management Program: This statewide outreach is designed to improve awareness and compliance with regulatory requirements including those related to NPS issues such as stormwater management.

Web site:

<http://www.mde.state.md.us/aboutmde/DepartmentalReports/Pages/aboutmde/enfcomp.aspx>

6.A.4 Environmental Finance Center

The Environmental Finance Center (EFC) at the University of Maryland is one of ten centers based at universities across the country providing communities with information and tools for managing changes the support a healthy environment and improving quality of life. The Center helps develop innovative funding and financing strategies that can help improve water quality. Local, state, and regional governments, homeowners associations, business and trade groups, land trusts and others may receive assistance. The EFC does not directly provide funding but it uses a number of tools to help communities identify the financing strategies that best fit their needs. These include:

- Technical Assistance
- Financing charrettes and seminars
- Conferences and workshop sessions
- Handbooks and publications
- Training programs
- Program facilitation, coordination, and management

The EFC gives technical assistance to communities struggling to implement stormwater and wet weather management programs. These communities gain a better understanding of their legal, fiscal, administrative and political capacity to implement stormwater management permit requirements. For small-scale watershed organizations, the EFC has helped to create sustainable strategies for accomplishing watershed protection goals. Training programs for local communities cover topics such as financing sewer, stormwater, source drinking water, and cover similar systems such as septic upgrades and watershed financing.

Connection with the State NPS Management Program: The EFC can provide critical support for NPS programs by offering strategies for entities who are working toward NPS management goals and implementation to navigate the complex and technical issues facing government and to identify and pursue the financial resources are necessary for successful results. Two of several EFC focus areas are agricultural nutrient management & finance and stormwater financing & outreach. During 2013 these topics were addressed during EFC workshops in cooperation with the Chesapeake Bay Program Office in Pennsylvania, Virginia and West Virginia. Within Maryland, the EFC cooperates with the Watershed Assistance Collaborative and also assisted the Town of Berlin and City of Salisbury as they considered stormwater utilities.

Web site: <http://www.efc.umd.edu/>

6.A.5 Harry R. Hughes Center for Agro-Ecology, Inc.

This University of Maryland-funded organization brings together diverse interests from the agricultural, forestry, and environmental communities for the purpose of protecting the Chesapeake Bay watershed while retaining working landscapes that support industry. To promote this mission, the Harry R. Hughes Center offers education and outreach, in addition to funding scientific research and policy analysis. Outreach activities include the following:

- Workshops on research topics, such as tools to preserve working landscapes
- Presentations to local governments and community groups
- Briefings to House and Senate committees

Connection with the State NPS Management Program: The Center funds scientific research, conducts policy analysis and provides outreach/education that contribute to informed decision making on NPS issues. Because it is a 501(c)(3) organization associated with the University of Maryland College Park, it is uniquely positioned to facilitate cooperative discussion, consensus building, interdisciplinary decision making valuable to effective NPS management, particularly regarding agricultural NPS issues.

Web site: <http://agresearch.umd.edu/agroecol>

6.A.6 Manure Matching Service

MDA's Agriculture's Manure Matching Service helps farmers to properly utilize animal waste. Via lists of sending and receiving operations, farmers with excess animal manure are linked to recipients that may use the manure as a nutrient source or for alternative products and processes. The goal of the service is to reduce the potential impact from animal waste runoff to Maryland's streams, rivers and the Chesapeake Bay by establishing a marketplace where farmers can sell their excess manure to buyers who need the valuable nutrients it contains for crop production or alternative use business ventures.

Connection with the State NPS Management Program: This service is a nonregulatory statewide program that reduces the potential for excessive amounts of manure application on land and the increased risk of NPS pollution. The matching service is designed so that it can support the Manure Transport Program.

Web site: http://mda.maryland.gov/resource_conservation/Pages/financial_assistance.aspx

6.A.7 Maryland Bay-Wise Program

Homeowners learn to protect water quality through smarter gardening and landscape management in this University of Maryland Extension program. First, the Bay-Wise Program encourages environmentally sound landscape and gardening through the certification of home landscapes. Interested homeowners can download a "yardstick" to assess conditions on their property. The yardstick provides a learning tool for homeowners by offering a grading system for the environmental impact of different types of home landscapes. After using the yardstick, homeowners can apply for a Bay-Wise certification by contacting their local Master Gardener Program to arrange a site visit. Accredited Master Gardeners also reach residents through the following Bay-Wise activities: classes and lectures to community groups, teaching youth in schools/community projects and staffing information booths at community fairs.

Connection with the State NPS Management Program: The Bay-Wise Program is one of the ways to promote property management behaviors that increase urban NPS BMP implementation and reduce stormwater runoff and pollution. This outreach and education program is an

important way to reach interested homeowners who voluntarily carryout best management practices including wise fertilizer use, controlling stormwater runoff, using integrated pest management, and protecting waterfront areas.

Web site: <http://extension.umd.edu/baywise>

6.A.8 Maryland Clean Marina Initiative

The Maryland DNR runs the Maryland Clean Marina Initiative to promote voluntary adoption of practices to prevent water pollution by marinas, boatyards and yacht clubs and to promote those that successfully carryout these practices. Since its inception in 1997, the Maryland Clean Marina Initiative has served as a model for more than 20 states to develop their own programs addressing water pollution from marinas.

The Clean Marina Initiative produced a guidebook in both electronic and print form that explains the actions that marine industry professionals can take to protect water and air quality. To become certified, a marina must exceed regulatory requirements by adopting the majority (70-85 percent) of recommended practices listed in the guidebook. These Best Management Practices apply to the following categories: siting and design, vessel maintenance and repair, petroleum control and emergency planning, sewage handling, waste containment and disposal, marina management and stormwater management.

Maryland achieved its goal of certifying at least 25 percent of the marinas in the state as Clean Marinas in 2014. As of fall 2014, there were 131 Certified Maryland Clean Marinas and 24 Certified Clean Marina Partners listed on the Initiative's Internet Page. Additionally, the Initiative provides clean boating tips and resources and it also offers lesson plans designed to assist instructors on topics including control of petroleum products, sewage handling, waste containment, and vessel cleaning.

Connection with the State NPS Management Program: The statewide Clean Marina Initiative is the primary program in Maryland to reach marinas and related facilities and influence operations to implement NPS BMPs and to promote clean boating behaviors that protect water quality.

Funding: The Clean Marina Initiative is funded by the Maryland Waterway Improvement Funds. Previously both NOAA (Sections 309) and EPA (Section 319) provided funding for demonstration projects of pollution prevention equipment in selected watersheds.

Web site: <http://www.dnr.state.md.us/boating/cleanmarina/>

6.A.9 Maryland Green School Awards Program

Any public or private school that serves students between pre-K and Grade 12 is eligible to become certified as a Maryland Green School. The program is designed to recognize Maryland schools that integrate of environmental education into curricula and implement BMPs at the school and address community environmental issues. The program is administered thru the Maryland Association for Environmental and Outdoor Education (MAEOE). The Maryland DNR supports this program by providing assistance assisted with tree plantings, teacher training, grants, restoration of submerged aquatic vegetation, etc. A certified school receives recognition, environmental gift baskets, books and resources for its library or classes.

Connection with the State NPS Management Program: Green Schools is an important statewide outreach and education program that promotes integration of learning that supports NPS management objectives and promotes implementation of urban BMPS on school grounds.

Recognizing these schools provides a reward for students and teachers and promotes similar activity among other schools.

Web site: <http://www.dnr.state.md.us/education/greenschools.asp>

6.A.10 Maryland Master Gardener Program

The principal outreach unit of the University of Maryland, the University of Maryland Extension, established our state's Master Gardener Program in 1978 to extend its horticultural and pest management expertise to the public. Today, the program's mission is to provide education about environmentally sound horticultural practices. The Master Gardener Program can be found in 18 counties, Baltimore City and two state prisons. Participants agree to work in their communities to teach Marylanders how to cultivate garden spaces and manage landscapes sustainably, in exchange to 40-50 hours of basic training from Extension specialists. The training includes 9-12 hours in Bay-Wise Landscape Management, in which trainees are taught to lead discussions about reducing pollution and runoff from lawns and gardens. Accordingly, Master Gardeners advocate less fertilizer and pesticide use so as to improve soil and water quality. Typical outreach activities include:

- Environmental gardening demonstrations and classes;
- Plant clinics teaching residents pest problem diagnosis and least toxic solutions;
- Individual phone and site consultations;
- Composting classes and demonstration sites;
- Speakers' bureaus that make public presentations;
- Youth gardening;
- Community gardening and beautification;
- Information booths at fairs and festivals;
- Therapeutic horticulture, and;
- Advanced training/continuing education.

Connection with the State NPS Management Program: Maryland's Master Gardener program includes several programs that support NPS management: agricultural nutrient management, the Bay-Wise Program, Master Naturalist, and woodland stewardship. This statewide program promotes understanding of NPS issues by individuals seeking to become Master Gardeners and helps to disseminate that understand various teaching and training opportunities.

Web site: Maryland Master Gardeners: <https://extension.umd.edu/mg>

Web site: Bay-Wise Program: <http://extension.umd.edu/baywise>

6.A.11 Maryland Public Schools Environmental Literacy Requirement

In 2011, Maryland was the first state in America to adopt a high school environmental literacy graduation requirement. All Maryland public school students must complete a high school program of environmental literacy, beginning with students who entered high school in 2011-2012. (Maryland Regulation COMAR 13A.03.02.04.C)

The environmental literacy programs are designed locally consistent with standards adopted by the Maryland State Board of Education (Maryland Regulation COMAR 13A.04.17.01). The purposes of these programs are to advance students' knowledge, confidence, skills, and motivation to make decisions and take actions that create and maintain an optimal relationship

between themselves and the environment, and preserve and protect the unique natural resources of Maryland, particularly those of the Chesapeake Bay and its watershed. Students are required to investigate, analyze and apply properties of systems thinking to address a variety of environmental topics that include non-point source pollution. In addition, a number of public and private non-formal educational organizations, state agency education programs, local outdoor education centers, and foundations support the local school systems' programs through funding or by providing both on-site and off campus educational experiences.

The environmental literacy requirement is a result of the work by Maryland's *Partnership for Children in Nature*. The Partnership was created in 2008 by Executive Order of the Governor. A focus of the Partnership was to ensure that all Maryland young people have the opportunity to learn about their environment, connect with their natural world and grow to become responsible stewards.

Connection with the State NPS Management Program: This statewide program is a keystone in Maryland's efforts to provide citizens with the basic understanding necessary to understand NPS issues and to make informed decisions that can bolster efforts to reach NPS management goals. As students learn about these issues, it is common for them to bring the information home and to influence the choices that their parents make.

Web site for Maryland State Department of Education:

<http://www.marylandpublicschools.org/MSDE/programs/environment/>

Web site for Maryland Partnership for Children in Nature:

<http://www.dnr.maryland.gov/cin/>

6.A.12 Maryland Sea Grant (Program and Extension)

The Maryland Sea Grant Program is one of 32 university-based programs around the nation that foster innovative marine research, education and outreach in coastal communities. Research efforts around the Chesapeake Bay seek to improve the efficacy of restoration activities.

Maryland Sea Grant also supports a variety of programs and resources in marine and environmental sciences for K-12 students and teachers, undergraduate and graduate students, and the general public. *Chesapeake Quarterly*, an award-winning publication of Maryland Sea Grant, is used by managers, citizens, and others to explain important aspects of Bay science, culture, and history.

Maryland Sea Grant Extension, a partnership between Maryland Sea Grant and University of Maryland Extension, provides Maryland citizens with objective technical information on diverse issues related to the Chesapeake Bay and the state's coastal waters. Serving as a bridge between university-based research and potential users, the Maryland Sea Grant Extension Program brings together the experience and expertise of specialists in aquaculture, seafood technology, marine economics, community planning, science education, water quality, and related fields to offer information, instruction, and advice to a range of stakeholders. The Sea Grant Extension Program's cadre of specialists conduct research, facilitate workshops and training seminars, produce targeted publications and videos, and develop websites and other media. Maryland Sea Grant Extension's efforts focus on coastal water quality, among other areas. Program areas related to NPS are their new Watershed Protection and Restoration, and Sustainable Communities programs. Maryland Sea Grant receives funding from the National Oceanic and Atmospheric Administration and the State of Maryland.

Connection with the State NPS Management Program: The University of Maryland

Maryland Sea Grant program is an active partner in the State NPS Management Program. Currently, its statewide services address water issues, particularly watershed restoration, including working to help Marylanders install green design projects like stream restoration and rain gardens, and providing technical assistance and funding to support watershed restoration activities. Maryland Sea Grant also offers an Internet listing of sources for technical and financial assistance called the *Maryland Watershed Restoration Assistance Directory*. They also have five Maryland Sea Grant Extension Watershed Specialists who work directly with groups and communities that are interested in NPS planning and implementation at the watershed scale. The work of these Specialists is frequently provided in cooperation with the Watershed Assistance Collaborative.

Web site: Maryland Sea Grant: <http://www.mdsg.umd.edu/programs/extension/>

Web site: Maryland Watershed Restoration Assistance Directory:
<http://ww2.mdsg.umd.edu/wra/>

6.A.13 Maryland Woodland Stewards Project

A joint program of University of Maryland Extension and the National Wild Turkey Federation, the Maryland Woodland Stewards Project teaches sound forest and wildlife management practices. Maryland Woodland Stewards agree to develop and implement forest stewardship plans on their own properties. This stewardship includes the maintenance of forested riparian buffers that improve water quality by filtering runoff and catching suspended sediment. Maryland Woodland Stewards also actively encourage others to practice good forest stewardship.

Since 1990, 405 people owning 69,693 acres have been trained through this program. Maryland Woodland Stewards across the state have reached out to thousands of Marylanders with information and resources to encourage sound forest and wildlife stewardship.

Connection with the State NPS Management Program: The Woodland Stewards provide educational support for citizens statewide who are managing forest areas. This effort supports long term retention of these lands in natural forest vegetation, which tends to generate the least NPS pollution loads to surface and groundwater compared to other land use categories.

Web site: www.extension.umd.edu/woodland/maryland-woodland-stewards

6.A.14 Nutrient Management Program Continuing Education and Certification

In Maryland, all farmers grossing \$2,500 annually or more, and livestock producers with 8,000 pounds or more of live animal weight, are required to run their operations using a nutrient management plan that addresses both nitrogen and phosphorus inputs, according to the Water Quality Improvement Act (WQIA) of 1998. This requirement applies to all agricultural land used to produce plants, food, feed, fiber, animals or other agricultural products. Farmers must update their nutrient management plans at least once every three years or more frequently if their operation changes. To help farmers and producers affected by this requirement, MDA's Nutrient Management Program offers a variety of continuing education and certification courses on how to comply with the State's nutrient management law. These opportunities are designed to help farmers and crop consultants learn about managing nutrients so that water quality is protected. The program makes it easier and more cost efficient for farmers to comply with Maryland's nutrient management law by training them to write their own nutrient management plans. These plans describe the annual amounts of primary nutrients that farmers should apply to maximize

crop yields while minimizing water pollution. Training and certification of farmers takes place during a two-day workshop. During the session, farmers work with a University of Maryland Extension expert to develop a nutrient management plan for their own operations. Once certified, farmers are required to attend six hours of continuing education classes once every three years. In cooperation with the University of Maryland, voucher training courses are also offered and required for farmers and individuals who apply nutrients to 10 or more acres.

The Nutrient Management Program provides training, certification and licenses for individuals who provide crop consulting services related to soil fertility. Classes include composting livestock mortalities, fertilizer application to turf grass, and phosphorus management on cropland.

Connection with the State NPS Management Program: Education and certification for individuals statewide who must comply with Maryland's Nutrient Management Program requirements are essential mechanisms for helping to ensure that nutrients are being managed according to the State law and regulation. This activity is designed to reduce NPS pollutant loads to surface and groundwater at the site and operation level.

Web site: www.mda.maryland.gov/resource_conservation/pages/nutrient_management.aspx

6.A.15 Nutrient Management Program: Fertilizer Use Act (for turf mgt & homeowners)

The Maryland Department of Agriculture publicizes information that is important in implementing Maryland's lawn fertilizer law. The intent of the law is to protect the Chesapeake Bay from excess nutrients entering its waters from a variety of urban sources, including golf courses, parks, recreation areas, athletic fields, businesses and hundreds of thousands of suburban and urban lawns. Nutrients, primarily nitrogen and phosphorus, are key ingredients in lawn fertilizer. When it rains, excess nutrients can wash off the land and into the streams and rivers that feed the Chesapeake Bay. Once in our waterways, excess fertilizers fuel the growth of algae blooms that block sunlight from reaching Bay grasses, rob the water of oxygen and threaten underwater life. While certain restrictions on fertilizer use have been in place for farmers since 2001, additional stakeholder involvement is needed if Maryland is to meet new nutrient reduction goals outlined in its Watershed Implementation Plan (WIP) to restore the Bay. Maryland's new lawn fertilizer law affects fertilizer manufacturers and distributors, lawn care professionals and homeowners.

New phased-in restrictions affect all lawn fertilizer products sold and distributed in Maryland. The changes are aimed at helping lawn care professionals and homeowners maintain healthy lawns without applying unnecessary amounts of nitrogen and phosphorus. All lawn care professionals must pass an exam to be certified in order to apply fertilizer in Maryland. The rules apply to professionals for hire as well as individuals responsible for turf management at golf courses, public parks, airports, athletic fields, businesses, cemeteries and other non-agricultural properties. MDA also provides training and licensing. Additionally beginning October 1, 2013, homeowners and do-it-yourselfers will be required to follow University of Maryland recommendations when fertilizing lawns. Mandatory restrictions, similar to those imposed for lawn care professionals apply.

Connection with the State NPS Management Program: These statewide nutrient management requirements are keystones in Maryland's approach to ensuring wise use of fertilizer and to reducing NPS loads of nitrogen and phosphorus.

Website: <http://mda.maryland.gov/Pages/fertilizer.aspx>

6.A.16 Pesticide Safety Education

University of Maryland Extension runs the Pesticide Safety Education Program to teach pesticide applicators how to use pesticides in the safest, most effective manner, and to control pest infestations while protecting the health of humans and the environment.

County Extension offices offer training for private applicators to help them prepare for both certification and recertification. Private applicators who use pesticides that may harm humans or the environment on a crop or commodity, must pass a certification exam administered by the Maryland Department of Agriculture. University of Maryland Extension also offers commercial pesticide applicator recertification training for the following categories: agricultural, right-of-way, industrial weed, forest, aquatic, grain and commodity fumigation, wood treatment, ornamentals and turf, and structural pests.

Connection with the State NPS Management Program: These statewide pesticide management requirements are central to Maryland’s approach to ensuring wise use of pesticides and to reducing the likelihood of contaminating surface and groundwater.

Web site: www.extension.umd.edu/tags/pesticide-recertification

6.A.17 Project WET

The Department of Natural Resources administers Maryland’s chapter of Project WET (Water Education for Teachers). The goal of Project WET is to facilitate and promote the awareness, appreciation, knowledge, and management of water resources, through the development and dissemination of classroom-ready teaching aids. A trained network of teachers, resource professionals, and citizens organize free Project WET workshops for educators throughout Maryland. The workshops cover many aspects of water resources, including the water cycle, water conservation and wetlands ecology. After completion of six hours of training, educators are given a free Project WET curriculum and activity guide with hands-on activities that cross many disciplines in the study of water and water resources—chemistry and physics, life science, earth systems, natural resource management, history and culture.

Connection with the State NPS Management Program: Project WET supports NPS management by educating and assisting teachers statewide who are interested in providing students with the educational foundation necessary to understand NPS issues.

Web site: www.dnr.state.md.us/education/are/wet.asp

6.A.18 Reclaim the Bay Campaign

The Reclaim the Bay is public awareness campaign focused on enhancing public awareness of Maryland’s leadership and accomplishments in Chesapeake Bay restoration and promoting greater understanding of what everyone can do to contribute to Bay restoration:

- Seeks to get Marylanders involved in Bay restoration efforts by sharing what they can do at home to contribute to attaining the State’s 2025 pollution reduction goals;
- Promotes cost-effective solutions for compliance with water quality standards to ensure that the Chesapeake Bay is fully restored;
- Invites students in grades K thru 8 to participate in MDE’s first Earth Day posted contest. The 2013 theme is Reclaim the Bay. Students are encouraged to submit entries that depict what Marylanders can do to help restore the Chesapeake Bay.

The following agencies and organizations are partnering on the Reclaim the Bay campaign to highlight accomplishments of Maryland's restoration initiatives and to solidify the commitment of each organization in working in partnership to encourage more Marylanders to get involved in restoring the Bay:

- State agencies: DNR, MDA, MDE, MDP, MEA, SHA;
- Federal agencies: Chesapeake Bay Program;
- Education institutions: University of Maryland Center for Environmental Science (UMCES), Maryland Sea Grant Foundation;
- Private nonprofits: Chesapeake Bay Foundation;
- State/Private entities: Chesapeake Bay Trust.

Connection with the State NPS Management Program: This Chesapeake Bay-focused outreach campaign is part of the State of Maryland's efforts designed to encourage interest, understanding of issues, behaviors, and active participation in ways that contribute to effective NPS management and restoration of water quality.

Web site for the campaign:

<http://www.mde.state.md.us/programs/Marylander/outreach/Pages/ReclaimtheBay.aspx>

Web site for the social media news release:

<http://www.mde.state.md.us/programs/PressRoom/Pages/MarylandKicks-offReclaimtheBayCampaign.aspx>

6.A.19 Special Rivers Project

The Maryland Forest Service's Special Rivers Project improves water quality by encouraging the restoration and maintenance of forests in the Susquehanna, Monocacy, Anacostia and Town Creek watersheds. In the education and outreach component of the Special Rivers Project, students, resource professionals and the general public learn about the benefits of forests for watersheds and water quality. For example, the Susquehanna area project has trained professionals in forest harvesting Best Management Practices. In addition, the Anacostia project has engaged in outreach to landowners with unbuffered waterways. Through such activities, the Special Rivers Project reaches at least 600 members of the public annually. The program also helps with forest stewardship planning, forest restoration, and riparian forest buffer monitoring and maintenance. Funding for the Special Rivers Project is covered by part of Maryland's Chesapeake Bay Implementation Grant.

Connection with the State NPS Management Program: The Special Rivers Project focuses on watershed-based forest management and restoration. This effort contributes at the watershed scale to supporting long term retention of natural forest vegetation, which tends to generate the least NPS pollution loads to surface and groundwater compared to other land use categories.

Web site: <http://www.dnr.state.md.us/forests/programapps/wbfm.asp>

6.A.20 TEAM DNR

TEAM DNR is a volunteer-led program educating elementary and middle school students about the Chesapeake Bay and other natural resource issues in Maryland. The Maryland Department of Natural Resources trains volunteers to deliver hands-on presentations to students around the State. Since the program's inception in 1998, TEAM DNR has reached more than 72,000 students. Teachers at both public and private schools may request any of several TEAM DNR programs appropriate for students in grades 3-8. The Chesapeake Bay Watershed program includes an interactive lesson on nonpoint source pollution. During the summer, volunteers

work with summer day camps and school enrichment programs. The full list of TEAM programs may be found on the website.

Connection with the State NPS Management Program: TEAM DNR supports NPS management by educating students statewide regarding natural resource and environmental issues that contribute to understanding NPS issues.

Web site: www.dnr.maryland.gov/education/teamdnr/Teacher_Resources_Watershed.asp

6.A.21 Watershed Assistance Collaborative

Although the Watershed Assistance Collaborative (Collaborative) is a collection of some entities already listed in this group of resources, its whole is greater than the sum of its parts. In recognition that not all jurisdictions currently have the capacity to implement large-scale non-point source restoration and protection efforts, Maryland's State agencies, the Chesapeake Bay Trust, University of Maryland Sea Grant Extension Program, University of Maryland Environmental Finance Center, NOAA and the EPA joined together to create the Watershed Assistance Collaborative (Collaborative) in the Fall of 2008. The Collaborative is a partnership that provides services, financial and technical assistance to communities to advance restoration activities and projects. By leveraging resources of existing programs, the Watershed Assistance Collaborative exists to provide coordinated capacity building opportunities to local implementers.

One strategy of the Collaborative is to provide funding for planning and design, which enables smaller jurisdictions to compete for larger capital funding. Another strategy of the Collaborative has been to fund five regional watershed specialists who work with local governments, citizen groups and individuals to solve funding problems, navigate through technical and administrative issues and who provide many other services.

Connection with the State NPS Management Program: The Collaborative provides project-scale assistance to local parties that have an interest in nonpoint source pollution control. The Collaborative is closely integrated with the State's Bay TMDL implementation efforts and the State's Chesapeake and Coastal Bays Trust Fund, which is closely coordinated with Maryland's 319(h) grant.

Web site: http://www.dnr.state.md.us/ccs/healthy_waters/wac.asp

6.B Public Participation

There are numerous small or localized public participation programs taking place within government and at the community level. These programs are specifically geared to particular interests. Many focus on providing educational material to local citizens, students and businesses. The State of Maryland works with standing advisory committees to facilitate gathering public or stakeholder input and recommendations regarding NPS program goals, direction and administration. Several programs provide a structured opportunity for volunteer training and participation in valuable work contributing to NPS management or water quality monitoring. A description of various significant standing committees and partnerships with agricultural, forestry, marinas, mining, and building associations is described below.

6.B.1 Agriculture

Web Site for all agriculture boards and commissions:

http://mda.maryland.gov/about_mda/Pages/Boards-and-Commissions.aspx

6.B.1.a Agricultural Certainty Oversight Committee

The Committee assists the Maryland Department of Agriculture (MDA) in developing Agricultural Certainty Program regulations and then in continuing to work with the Program to offer evaluation and recommendations. The Agricultural Certainty Program was authorized in 2013 by the Maryland General Assembly to allow farmers, who voluntarily implement BMPs that address nitrogen, phosphorus and sediment to achieve TMDL thresholds, to conduct their business without additional regulations for ten years. After ten years, participating farmers must be in full compliance with current regulations. The Program's intent is to accelerate meeting TMDL requirements and the Chesapeake Bay Watershed Implementation Plan goals by encouraging farmers to implement BMPs more rapidly in exchange for providing a predictable regulatory environment.

Connection with the State NPS Management Program: One purpose of agricultural certainty is to promote early adoption and implementation of NPS implementation. If this result comes to fruition, the hope is that greater NPS pollution can be realized in the near term.

6.B.1.b Agricultural Waste Technology Fund Advisory Committee

The 2011 State legislation authorized the Maryland Department of Agriculture (MDA) to administer the Agricultural Waste Technology Fund (AWT Fund) considering recommendations from an advisory committee to demonstrate technologies that improve management and use manure. Members of the committee who are appointed by Secretary of Agriculture represent the following constituencies: poultry industry, livestock industry, agriculture community, environmental community, agriculture fertilizer industry, energy sector and other groups that the Secretary may deem as necessary because of their expertise. In addition, the committee includes the following ex-officio representatives: Department of the Environment, Department of Natural Resources, Department of Business and Economic Development, Director of the Maryland Energy Administration, and the Dean of the College of Agriculture and Natural Resources in the University of Maryland.

Connection with the State NPS Management Program: Input from this committee assists MDA in focusing delivery of assistance that meets the needs of agricultural community and thereby has reduce the potential for NPS pollution associated with agricultural waste.

6.B.1.c Conservation Reserve Enhancement Program Advisory Committee

The CREP Advisory Committee was formed at the inception of the State-Federal partnership that manages this program. The program provides financial assistance for implementation of riparian buffers, wetlands and protection of highly erodible land. The Committee meets quarterly to review program progress, evaluate program criteria and recommend changes necessary to improve the program and participation. The Committee is led and staffed by the Maryland Department of Agriculture and includes the following representatives: Maryland Department of Natural Resources; USDA Farm Services Agency; USDA Natural Resources Conservation Service; US Fish & Wildlife Service; Maryland Association of Soil Conservation Districts; Chesapeake Bay Foundation; Ducks Unlimited, and; landowner participants in the program.

Connection with the State NPS Management Program: This advisory helps coordinate delivery of the CREP so that needs of the target audience and CREP outcome goals can be better met. The committee activities also generally support statewide NPS management needs.

6.B.1.d Maryland Agricultural Commission

This 29-member commission serves as an advisory body to the Maryland Secretary of Agriculture on matters pertaining to farming. Issues that may interest or impact the agricultural community, including water quality issues, are often brought before the Commission. Members of the advisory body represent all agricultural commodities in the state.

Connection with the State NPS Management Program: The Commission provides advice to the MDA that may include high profile NPS issues affecting the agricultural community.

6.B.1.e Nutrient Management Advisory Committee

Established in 1992 to develop and refine regulations to certify crop consultants, it continued to advise MDA in development of requirements for Maryland's Nutrient Management Program, which became regulatory in 1998. The Nutrient Management Advisory Committee includes representatives from the US Department of Agriculture, University of Maryland, Maryland Departments of the Environment, Agriculture and Natural Resources, Maryland Farm Bureau, Delaware-Maryland Agribusiness Association, Chesapeake Bay Foundation, commercial lawn care companies, the biosolids industry, as well as local governments and the State Legislature.

Connection with the State NPS Management Program: Effective implementation of Maryland's nutrient management requirements depends on efficient coordinated delivery of accurate technical assistance to land owners/managers. This committee helps to ensure that consistent accurate information is shared among stakeholder representatives and agency representatives.

6.B.1.f State Soil Conservation Committee

The State Soil Conservation Committee, established in 1938, has several missions related to soil conservation and water quality: appointing Boards managing local Soil Conservation Districts (SCDs); establishing policy for SCDs; providing recommendations to the Secretary of the Maryland Department of Agriculture on agricultural soil conservation and water quality programs and policy, and; facilitating coordination among local, state and federal agencies. Thirteen members serve on the Committee representing the following groups: an SCD board member from each of five state regions; the Maryland Association of SCDs; the University of

Maryland Cooperative Extension; the Maryland Agricultural Commission; ex officio representatives from the State Departments of Agriculture, Environment and Natural Resources, and; nonvoting/advisory ex-officio representatives from the USDA Natural Resources Conservation Service and Farm Services Agency.

Connection with the State NPS Management Program: This committee provides a valuable forum for dissemination of NPS technical information and sharing of experience among agencies that are responsible for aspects of NPS Program implementation and oversight.

6.B.2 Environment

6.B.2.a Bay Restoration Fund Advisory Committee

This Committee has advised Maryland's Department of the Environment in implementation of the Bay Restoration Fund since 2004. It serves several functions including the following NPS-related functions: makes recommendations to improve the effectiveness of the Bay Restoration Fund in reducing nutrient loadings; makes recommendations in fees, identifies users of onsite sewage disposal systems and holding tanks, advises MDE regarding education/outreach/upgrade programs, report to the Governor and legislature annually. Eighteen members sit on the Committee, including representatives from environmental organizations, the business community and a state university or research institute.

Connection with the State NPS Management Program: This Committee coordinates and supports efficient operation of the program to upgrade onsite sewage treatment systems (septics).

Web site:

<http://www.mde.state.md.us/programs/water/bayrestorationfund/pages/water/cbwrf/advisorycommittee/default.aspx>

6.B.2.b Land Reclamation Committee

The Committee assists MDE by studying, recommending, and approving procedures to reclaim, conserve, and replant land affected by open-pit coal mining. The Committee consists of 13 members, including representatives of the mining industry, county planning commissions, soil conservation districts, the State and the public. Reclamation plans in applications for a coal mining permit in Maryland are reviewed/approved by the Committee. Federal and State laws and regulations require the reclamation of land disturbed by surface mining. This serves to reduce pollution from acidic or alkaline drainage.

Connection with the State NPS Management Program: This Committee's role allows it to help ensure that permits and projects adequately protect and restore water quality related to existing and potential NPS management issues.

Website: <http://msa.maryland.gov/msa/mdmanual/14doe/html/14agen.html>

6.B.2.c Maryland State Water Quality Advisory Committee (SWQAC)

The SWQAC advises state agencies that receive EPA funding about the potential effects of their programs and activities on water quality. Specific areas of interest include point and non-point water pollution, land use and growth as they affect water quality, and regulatory review. As Maryland's federally mandated public participation group under the Clean Water Act, the Committee represents a broad array of state interests. The thirty-two members represent private

citizens, public officials, economic interests and public interest organizations from different geographic areas. Meetings occur on the first Friday of odd months throughout the year. All Maryland citizens are welcome to participate in subcommittee meetings.

Connection with the State NPS Management Program: The long-standing committee is an important forum for facilitating communication between State agencies and representatives stakeholder groups. Feedback and input received thru the committee helps responsible agencies to refine NPS programs delivery.

Web site: <http://www.marylandwaterquality.org/>

6.B.2.d Volunteer Corp & Internship Program

The mission for the program is to promote and encourage retirees, high school students, and the citizens of Maryland to assist MDE to protect and restore the quality of Maryland's air, water and land resources. Volunteers must have an established US residency and be able to work at 8 hours per work during standard office hours. Interns may earn credits and be paid or unpaid.

Connection with the State NPS Management Program: The Program has provided eager low-cost volunteers/interns who assisted in conducting in-stream monitoring in support of NPS assessments and performed data manipulation in support of the TMDL Program.

Web site:

<http://www.mde.maryland.gov/programs/Marylander/CitizenParticipation/Volunteering/Pages/benefits.aspx>

6.B.3 Natural Resources

6.B.3.a Coastal and Watershed Resources Advisory Committee (CWRAC)

Established in 1976, CWRAC is the primary organization that stakeholders may use to voice their ideas and opinions about coastal resources management in Maryland. CWRAC acts as an independent advisory body for Maryland's Secretary of Natural Resources and for the State Coastal Program. Maryland DNR administers the Committee, and NOAA provides funding through the Coastal Zone Management grant. The diversified membership on the committee allows for informed discussion of coastal issues, often leading to integral input to state programs and policies. This membership includes representatives of business, civic and conservationist groups as well as local government agencies and concerned citizens. To get involved, members of the public may contact the executive secretary of CWRAC. CWRAC's advisory responsibilities include:

- Review proposed federal and state legislation affecting the coast and make recommendations
- Inform the coastal zone managers of proposed projects, plans and issues
- Review and make recommendations on annual coastal program initiatives and budget priorities
- Recommend changes to State policies and procedures to better address coastal conflicts
- Use standing subcommittees to assist membership in addressing coastal management issues

Connection with the State NPS Management Program: The long-standing committee is an important forum for facilitating communication between State agencies and representatives

stakeholder groups. Feedback and input received thru the committee helps responsible agencies to refine NPS programs delivery.

Web site: <http://www.dnr.state.md.us/ccs/cwrac.asp>

6.B.3.b Critical Areas Commission for the Chesapeake and Atlantic Coastal Bays

The Critical Area Act, passed in 1984, identified the "Critical Area" as all land within 1,000 feet of the Mean High Water Line of tidal waters or the landward edge of tidal wetlands and all waters of and lands under the Chesapeake Bay and its tributaries. The law created a statewide Critical Area Commission to oversee the development and implementation of local land use programs directed toward the Critical Area that met the following goals:

- Minimize adverse impacts on water quality that result from pollutants that are discharged from structures or conveyances or that have run off from surrounding lands;
- Conserve fish, wildlife, and plant habitat in the Critical Area; and
- Establish land use policies for development in the Critical Area which accommodate growth and also address the fact that, even if pollution is controlled, the number, movement, and activities of persons in the Critical Area can create adverse environmental impacts.

All local Critical Area Programs had been approved and were operational by 1990. Today the Commission's primary responsibilities are the following:

- Review and approve State projects on State-owned land in the Critical Area;
- Review and approve State or local agency actions resulting in major development on private lands or lands owned by local jurisdictions; and
- Review and approve all changes to a jurisdiction's Critical Area Program, including growth allocation and changes or updates to ordinances, regulations, and maps that govern the local program.

Connection with the State NPS Management Program: Requirements of this State law, with oversight by the State commission, are important tools for limiting increases in NPS pollution that would otherwise arise from conversion of land to more intensive uses. In particular, the buffer requirement is an important counterbalance to the great desire to develop Bay shorelines for residential and commercial uses.

Web site: <http://www.dnr.state.md.us/criticalarea/>

6.B.3.c Maryland Stream ReLeaf Coordinating Committee

The Stream ReLeaf Coordinating Committee advances the practice, science, and progress of riparian forest buffers in Maryland. In developing the Stream ReLeaf Implementation Plan, the Committee helped to track and report on buffer restoration and conservation. The Committee may get involved in the Chesapeake Bay Program's Natural Filters strategy to reduce nitrogen and phosphorus pollution from private and public land. This effort establishes two-year milestones for planting streamside buffers, restoring wetlands and retiring highly erodible land from production by 2011. The 47 members of the Committee represent natural resource management, agriculture, watershed advocacy, education, state and local government, business and industry, landowners, and philanthropy. Each occupies a different niche in implementing buffers.

Connection with the State NPS Management Program: This Committee's role allows it to

offer advice on expediting implementation to address NPS issues.

Web site: <http://www.dnr.state.md.us/forests/programapps/ripfbi.html>

6.B.3.d Maryland Stream Waders

Volunteers recruited and trained by Maryland DNR monitor in-stream water quality and collect aquatic invertebrates “bug identification” by DNR specialists. Beginning in February 2000, this statewide volunteer program has helped to enhance the State’s monitoring efforts by increasing the density of sampling sites used for stream assessment. The quality-assured data collected by the volunteer Stream Waders participants supplements the more in-depth monitoring by DNR’s Maryland Biological Stream Survey (MBSS). This public participation educates local citizenry about the relationship between land use and stream quality, improves stream stewardship ethics and encourages local action to improve watershed management.

Connection with the State NPS Management Program: The volunteer citizen data generated thru this program provide important expansion of temporal and spatial coverage for monitoring that are beyond the capacity of government monitoring alone. The additional data contributes to improved understanding and confidence for protection and gauging changes occurring in streams.

Web site: http://www.dnr.state.md.us/streams/mbss/mbss_volun.html

6.B.3.e Maryland’s Tributary Teams

In the early 1990’s, the Chesapeake Bay partners recognized that restoration efforts must extend into the Tributaries of the Bay watershed in order to reach the goal of a restored Bay. Maryland answered this challenge by establishing Tributary Strategy Teams in 1995. The Teams provided a venue for a broader group of stakeholders to participate in restoration efforts and to advocate for solutions especially at the State and local levels. Approximately 300 volunteers were initially appointed to the Teams and many more people participated in the events, programs, training and field trips held by the Teams throughout the next 16 years.

The mission of the Maryland Tributary Strategy Teams was to build consensus and advocate for policy solutions, to promote stewardship through education, and to coordinate activities and projects necessary to protect and restore the Chesapeake Bay’s water quality and assure healthy watersheds with abundant and diverse living resources. Tributary Strategies were also adopted which consisted of a list of Best Management Practices (BMPs) that would need to be implemented at specified levels or amounts to achieve the required nutrient reductions. The first set of Tributary Strategies were developed in 1994 then updated in 2003. Throughout this timeframe, implementation was mostly voluntary and the role of the Teams was to help make progress toward the 2000 Bay Agreement goals and objectives.

Each Team chose goals and initiatives to address that were relevant to their geographic area.

Through the work of the Tributary Teams, more Marylanders are aware of and have participated in watershed protection and improvement actions. The Teams have also helped to establish new watershed organizations focused on local issues and needs. The Tributary Teams and their dedicated members helped lay the foundation for the next phase of the restoration process (Watershed Implementation Plans).

Funding and staff support for the Tributary Teams ended in July 2010, but the Teams were encouraged to continue as independent watershed organizations. Six Teams have continued to meet and members of other Teams have merged with other organizations to share their experience and insights.

Connection with the State NPS Management Program: One likely result of the Tributary Teams activities was to help improve understanding and buy-in by local agency representatives. This help to provide a foundation for more recent activities associated with creating the local Chesapeake Bay Watershed Implementation Plans.

Web sites: <http://www.dnr.maryland.gov/waters/tribstrat/>

6.B.3.f Scientific Advisory Panel

In the natural resources code that established the Chesapeake and Atlantic Coastal Bays Trust Fund (Trust Fund), there is a section that created the BayStat Program Scientific Advisory Panel (SAP). This section specifies that the chair and members will be appointed by the Governor, and will include scientists and other technical experts. The role of the SAP is outlined to as:

- Annually provide recommendations to the BayStat Subcabinet on the use of funds of the Trust Fund for the following fiscal year;
- Monitor the distribution of funds from the Trust Fund;
- Review the categories of grants made in the previous year to assess nutrient loading reduction estimates and cost efficiencies and the effectiveness of any innovative nonpoint source pollution reduction measure;
- Review the proposed annual work plan and advise the BayStat Subcabinet of any recommended changes;
- On request by the BayStat Subcabinet, review individual grant applications, and;
- Annually review any Trust Fund moneys that are not distributed on a competitive basis to assess whether those moneys may be distributed on a competitive basis.

Connection with the State NPS Management Program: This body develops objectives and review procedures for Bay restoration projects. Through geographic targeting, BMP development and financial oversight, the SAP maximizes reductions in pounds of nutrients and sediment for the least dollar spent.

6.C Financial Assistance Programs

There are many different types of financial assistance programs designed to address nonpoint source pollution thru outreach and education or water quality protection and restoration. These various programs are available to state and local governments, institutions of higher learning, non-profit organizations and landowners in the State of Maryland. This section describes many of the financial assistance programs that are offered by government (Federal, State, local government) and by non-profit organizations.

6.C.1 Agriculture Financial Assistance via MDA and USDA

6.C.1.a Agricultural Management Assistance Program

Overview: The USDA's Agricultural Management Assistance (AMA) Program provides cost share assistance to agricultural producers who voluntarily address issues such as water management, water quality, and erosion control by incorporating conservation into their farming operations. The AMA Program was authorized by the Agricultural Risk Protection Act of 2000 and began in 2001. Under the conservation provisions of the AMA program, producers implement any of the following practices:

- Constructing or improving water management structures or irrigation structures
- Planting trees for windbreaks, or to improve water quality
- Mitigating risk through production diversification, or resource conservation practices, including soil erosion control, integrated pest management, or transition to organic farming
- Cropland, hayland, pasture and rangeland, non-industrial forestland and other areas, are eligible for the Program

The Natural Resources Conservation Service works with landowners to develop a conservation plan, in which they agree to maintain certain cost-share practices for the life of the practice. Contracts are for a minimum of one year after completion of the last conservation measure, but not more than ten years.

Connection with the State NPS Management Program: This Federal program offers funding assistance for implementing NPS BMPs statewide.

Funding: The federal cost-share rate is up to 75% of the cost of an eligible practice. Total AMA payments may not exceed \$50,000 per participant for any fiscal year.

Application process: Applications may be obtained and filed at any time with your local USDA Service Center or Soil Conservation District office.

Web site: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/ama/>

6.C.1.b Animal Waste Technology Fund

Overview: MDA's Animal Waste Technology Fund (AWTF) provides financial assistance in

the form of grants or loans to individuals, partnerships and companies to develop alternative uses of animal waste in order to provide farmers with new technologies and options to improve management of animal wastes on farms and to reduce the potential for nutrient impacts to local waterways and the Chesapeake Bay. The AWTF is intended to pilot-type projects that demonstrate or commercialize existing technology or management strategies. The fund encourages the development and implementation of economically feasible technologies that help protect the public health and the environment by expanding or improving animal waste management, enabling farmers to meet nutrient management requirements. Specific objectives of project funding include:

- Reducing the amount of nutrients in animal wastes;
- Altering the composition of animal waste;
- Developing alternative waste management strategies; or
- Using animal waste in a production process.

Connection with the State NPS Management Program: This State program offers funding to help improve management of animal waste in ways that help meet NPS management needs.

6.C.1.c Conservation Innovation Grants

Overview: The USDA's Natural Resources Conservation Service offers Conservation Innovation Grants (CIG) to stimulate the development and adoption of innovative conservation approaches and technologies for agricultural production. In the Chesapeake Bay watershed, the grant program seeks to expand the collective knowledge about the most effective ways to engage working farms in protecting and restoring vital natural resources while sustaining agricultural production. Projects must meet one of the Chesapeake Bay Program's priority goals. Non-profits and local governments may apply.

Connection with the State NPS Management Program: This Federal program helps to stimulate voluntary development and adoption of innovative conservation approaches

Funding: Grants range from \$75,000 to \$1 million. Applicants must provide a 1:1 match for federal funds.

Application: There is an annual grant cycle with proposals typically due in early spring.

Web site: <http://www.nrcs.usda.gov/programs/cig/>

6.C.1.d Conservation Reserve Program and

Conservation Reserve Enhancement Program

Overview: The federal Conservation Reserve Program (CRP) is a voluntary program that compensates landowners who agree to adopt certain conservation practices to set aside farmland that meet program criteria. Participants enroll in contracts between 10 to 15 year duration and establish vegetative covers that reduce soil erosion, improve water quality, and enhance or create wildlife habitat on environmentally sensitive cropland or, in some cases, on marginal pasture land. Nationally, the CRP protects millions of acres of American topsoil from erosion and is designed to safeguard the Nation's natural resources. In Maryland, the CRP is usually bypassed for the Conservation Reserve Enhancement Program (CREP), which specifically addresses resource issues to improve the water quality of the Chesapeake Bay and provides more attractive incentives. The USDA established CREP to improve water quality by filtering

agricultural runoff and to enhance wildlife habitat. In 1997, Maryland was the first state approved to participate in CREP. The CREP targets the most environmentally sensitive lands to address important resource protection issues, focusing on riparian grass and forest buffers, wetland restoration and protection of highly erodible lands. Both CRP and CREP offer 10-to-15 year contracts with annual rental payments, as well as cost-share assistance for adopting conservation practices. In Maryland, two State programs offer farmers increased incentives in addition to the traditional CRP competitive bid process: The Maryland Department of Agriculture MACS program provides cost share for BMP installation and \$100/acre as an additional signing incentive, and the Maryland Department of Natural Resources offers purchase agreements for conservation easements.

Funding: In return for establishing conservation measures, the USDA provides annual rental payments to participants. Rental rates are based on the relative productivity of soils within each county and the average dry land cash rent. For CREP enrolled acres, the annual rental rate is the base soil rental rate plus 80% to 200% of that rate depending upon which practices were installed. Additionally, a participant receives cost share to install the enrolled practices. In CRP, USDA covers up to 50% of costs. In CREP, USDA and MACS reimburse up to 87.5% of the cost. Also for CREP, USDA provides a \$200/acre one-time signing bonus for new contracts and MACS provides a \$100/acre signing bonus for both new and re-enrolled contracts.

Application process: Offers for CRP contracts are ranked according to a competitive environmental benefits index. Producers can apply either for general sign-up during designated periods or continuous sign-up at any time. Sign-up for the CREP is typically continuous and remains open until the program's enrollment goals have been met. Interested landowners should contact their local soil conservation district or USDA Farm Service Agency.

Web sites:

USDA Farm Service Agency: http://www.fsa.usda.gov/Internet/FSA_File/mdcrep.pdf

Maryland Department of Agriculture:
http://mda.maryland.gov/resource_conservation/Pages/crep.aspx

6.C.1.e Conservation Security Program

Overview: The USDA's Natural Resources Conservation Service runs the Conservation Security Program to promote the conservation and improvement of soil, water, air, energy, plant and animal life, and other conservation purposes on Tribal and private working lands. Working lands include cropland, grassland, prairie land, improved pasture, and range land, as well as forested land that is an incidental part of an agriculture operation. Land must be privately owned, applicants must be in compliance with highly erodible and wetland provisions, have an active interest in the agricultural operation, and have control of the land for the life of the contract. Applicant must share in the risk of producing any crop or livestock and be entitled to a share in the crop or livestock marketed from the operation.

Funding: The level of funding and contract duration depends on the type of agreement. For Tier I, contracts are for 5 years; maximum payment is \$20,000 annually. For Tier II, contracts are for 5 to 10 years; maximum payment is \$35,000 annually. For Tier III, contracts are for 5 to 10 years; maximum payment is \$45,000 annually.

Application: Contact your local USDA Service Center, listed in the telephone book under U.S. Department of Agriculture, or your local Soil Conservation District.

Web site: <http://www.nrcs.usda.gov/programs/CSP/>

6.C.1.f Conservation Stewardship Program

Overview: The USDA Natural Resources Conservation Service administers the program. The Conservation Stewardship Program (CSP) was established by the 2008 Farm Bill to provide financial and technical assistance for agricultural and forestry producers to maintain existing conservation activities, and to adopt additional conservation in their operations. The CSP is available on Tribal and private agricultural lands, as well as nonindustrial private forest lands. Through 2017, the program is authorized to enroll more than 12 million acres per year. Eligible practices include water quality and soil erosion “enhancements” that exceed basic conservation standards. For example, producers may implement no-till agriculture, biological suppression of weeds instead of chemical techniques, controlled application of nitrogen and phosphorus fertilizers, or legume cover crops as a nitrogen source.

Funding: The CSP provides participants with two possible types of payments. An annual payment is available for installing new conservation activities and maintaining existing activities. A supplemental payment may be earned by participants receiving an annual payment who also adopt a resource-conserving crop rotation. Through 5-year contracts, payments will be made as soon as practical, after October of each year, for contract activities installed and maintained in the previous year. For all contracts, CSP payments to a person or legal entity may not exceed \$40,000 in any single year or \$200,000 during any 5-year period. Each CSP contract will be limited to \$200,000 over the term of the initial contract period. Funding for the CSP is supported by the Cooperative Conservation Partnership Initiative (CCPI), also established by the 2008 Farm Bill. Under CCPI, the Natural Resources Conservation Service (NRCS) enters into partnership agreements with eligible entities that want to enhance conservation outcomes on agricultural and nonindustrial private forest lands. Six percent of the allowed acres in the Conservation Stewardship Program are reserved for CCPI agreements.

Application process: Producers interested in the CSP are encouraged to begin the application process by completing a producer self-screening checklist that is available online. The level of environmental benefit to be achieved will be estimated to determine eligibility, rank applications, and establish payments. Sign-up is continuous.

Web site: http://www.nrcs.usda.gov/programs/new_csp/csp.html

6.C.1.g Direct Farm Loans

Overview: The USDA’s Farm Service Agency makes direct loans to family-size farmers and ranchers who cannot obtain commercial credit from a bank, Farm Credit System institution, or other lender. As a condition of these loans, the Farm Service Agency (FSA) requires borrowers to carry out certain conservation measures. For example, farmers must comply with highly erodible land and wetland policies. The main types of loans available under the Direct program are Farm Ownership, Operating, Emergency and Youth loans. Direct loan funds are also set aside each year for loans to minority applicants and beginning farmers. Loans may be used to purchase land, livestock, equipment, feed, seed, and supplies; to construct buildings; or to make farm improvements.

Funding: Repayment terms and interest rates vary according to the type of loan made, the collateral securing the loan, and the applicant’s ability to repay. The interest rates for direct

loans are adjusted periodically based on the Federal Government's cost of borrowing. A lower interest rate may be available for producers with limited resources. Loans to limited resource producers are reviewed periodically to adjust the interest rate based on repayment ability.

Application process: The loan applicant should contact their local FSA office to receive an application package. Next, the applicant submits the application and meets with the FSA. The latter then determines if the applicant is eligible and disburses the loan.

Web site:

<http://www.fsa.usda.gov/FSA/webapp?area=home&subject=fmlp&topic=landing>

6.C.1.h Environmental Quality Incentives Program

Overview: The federal Environmental Quality Incentives Program (EQIP) is a voluntary conservation program that provides financial and technical assistance for farmers and ranchers to address soil, water, air and related natural resource management issues on their land. These programs address reductions in nonpoint source pollution and the conservation of water resources. It is the responsibility of the State Conservationist, with advice of a technical committee, to identify which specific conservation practices are eligible. Examples of practices include nutrient management, manure management, integrated pest management, irrigation water management and wildlife habitat enhancement. Owners of land in agricultural production, or persons who are engaged in livestock or agricultural production on eligible land, may participate. Eligible land includes cropland, rangeland, pastureland, private non-industrial forestland, and other farm or ranch lands. Recently, forest management and conservation practices related to organic production have been given stronger emphasis in the Program. A certain amount of EQIP funding is reserved for forest improvement activities, especially those that restore forests to healthy and productive conditions, or targets invasive species for removal.

Connection with the State NPS Management Program: EQIP is an important incentive tool for NPS implementation that compliments State programs like the Maryland Agricultural Cost-Share. Together, the Federal and State programs rise incentives to levels that greatly improve success in meaningfully assisting farm owner/operators and in achieving more NPS BMPs and measurable environmental improvements.

Funding: The USDA Natural Resources Conservation Service (NRCS) contracts range from one to ten years in duration. Cost share payments are available for up to 75% of the incurred costs and income foregone of certain conservation practices and activities. However, certain historically underserved producers (limited resource farmers/ranchers, beginning farmers/ranchers, socially disadvantaged producers) may be eligible for payments up to 90 percent of the estimated incurred costs and income foregone. The funds reimburse landowners up to 75% of the costs of conducting forest improvement activities. Rates are higher for people in historically underserved populations. The 2008 Farm Bill established a new payment limitation for individuals or legal entity participants who may not receive, directly or indirectly, payments that, in the aggregate, exceed \$300,000 for all program contracts entered during any six year period. Projects determined as having special environmental significance may, with approval of the NRCS Chief, have the payment limitation raised to a maximum of \$450,000.

Application process: Applicants should refer to the latest online Maryland EQIP Handbook. They must submit a signed and dated Conservation Program Contract Application, as well as other certifications, to the local Natural Resources Conservation Service office. Applications received during sign-up periods are processed until all program funds are expended. Upon approval, the Natural Resources Conservation Service develops a conservation plan and

schedule with the participant. This plan identifies the appropriate conservation practice (or practices) that will address identified resource concerns and provide environmental benefits. The participant agrees to implement practices as scheduled in the contract and according to Maryland NRCS conservation practice standards and designs.

Web sites: <http://www.md.nrcs.usda.gov/programs/eqip/eqip.html>

<http://www.nrcs.usda.gov/programs/awep/index.html>

Other sources: <http://www.dnr.state.md.us/forests/programapps/eqip.html>

6.C.1.i Low Interest Loans for Agricultural Conservation

Overview: MDA/MDE's Low Interest Loans for Agricultural Conservation (LILAC) are available to help farmers supplement federal and state cost-share payments for structural best management practices, such as animal waste management systems or stream protection measures. They may also be used to purchase certain types of equipment to reduce soil erosion and manage nutrients. Loans offered through LILAC may be used to purchase conservation equipment or install approved best management practices on agricultural land to protect water quality. Eligible equipment and BMPs include:

- Manure spreaders, pumps, appurtenances and other equipment needed to manage nutrients
- Conservation equipment
- Animal waste management systems
- Erosion control structures
- Sediment control ponds
- Composting facilities
- Stream protection practices
- Grazing land management
- Wetland creation and enhancement

Funding: Guaranteed by the State Revolving Loan Fund, LILAC loans are typically offered at three to four percent below market rates, and are available at lending institutions statewide. In Fiscal Year 2012, approximately \$162,000 in LILAC loans was issued.

Connection with the State NPS Management Program: This low interest loan program is a valuable tool for assisting farmers to make changes in their operations to reduce NPS pollution in ways the existing grant programs do not. Together with NPS technical assistance and grant incentives, the loans can help serve more farmers and result in more NPS restoration.

Application process: Applicants contact their local Soil Conservation District for technical assistance in designing or verifying equipment or eligible BMPs that address water quality issues. An applicant also needs to work with an eligible financial institution prior to submitting an application. The District assists with applications for available cost-share funds and submits documentation to obtain certification by the Maryland Departments of Agriculture and Environment that the BMPs or equipment meet all LILAC program criteria. This certification is submitted to a participating bank when applying for a LILAC-supported loan.

Web site:

http://mda.maryland.gov/resource_conservation/Pages/financial_assistance.aspx

6.C.1.j Manure Transport Program

Overview: Established in 1999 as a pilot program for poultry producers, the MDA's Manure Transport Program has expanded to become a permanent program assisting all animal producers including dairy, beef and other animal producers to cover the costs of transporting excess manure off their farms. Animal producers are eligible for the program if they have insufficient land to use all their manure for crop production, as determined by a nutrient management plan, or if they test for high soil phosphorus levels. The manure is transported to eligible receiving farms or alternative use facilities that can apply the product safely as a nutrient source.

Funding: Cost-share grants of up to \$20 per ton are available to help cover transportation, loading and handling costs associated with moving manure. Grants may not exceed 87.5 percent of eligible costs. Delmarva poultry companies provide matching funds to transport poultry manure. In addition, cost-share rates are 20 percent higher for farms located in Dorchester, Somerset, Wicomico or Worcester counties to support Maryland's goal of transporting 20 percent of the poultry litter produced on the Lower Eastern Shore to other areas of the state. Finally, even though the Manure Transport Program is administered by the Maryland Agricultural Water Quality Cost-Share (MACS) Program, funds are not calculated against the per-farm allowable limit for financial assistance.

Connection with State NPS Program: State financial assistance to transport excess manure to areas that can benefit by receiving manure for use as fertilizer is an important State NPS Program component. This program helps to reduce local NPS nutrient pollution by reducing over-application of manure, because high transport costs have inhibited independent private sector solutions. The transport program frequently involves the Manure Matching Service to efficiently identify receiving areas.

Application process: Farmers work with their local Soil Conservation District, or an alternative use facility, or a manure broker approved by MDA as a participant in the program. Manure Transport Applications are completed and submitted with manure analysis from the sending-farm and the receiving-farm's nutrient management plan. Before transportation of the manure, an approved agreement must be signed and the manure analyzed for nitrogen and phosphorus levels.

Web site: http://mda.maryland.gov/resource_conservation/Pages/financial_assistance.aspx

6.C.1.k Maryland Agricultural Water Quality Cost-Share Program

Overview: The Maryland Agricultural Water Quality Cost-Share (MACS) Program was established in 1983 to help farmers pay for the installation of Best Management Practices (BMPs) that control or manage soil, nutrient and chemicals to protect water quality. In this program administered by the Maryland Department of Agriculture (MDA), more than 30 BMPs that address erosion, animal wastes, nutrients, and agricultural chemicals are eligible for grants. These practices include grassed waterways constructed to prevent gully erosion in farm fields, riparian buffers of grasses and trees planted to filter sediment and farm runoff, and animal waste management systems constructed to help farmers safely handle and store manure resources. Applicants for the MACS program may be individuals, partnerships, corporations, trusts, or other business enterprises where the owner, landlord, or tenant participates in the operation of a farm. Certain horse operations may also be eligible. There are several requirements to become

eligible for funding. First, there must be an existing or potentially critical condition on agricultural land causing nutrients, sediment, animal wastes or agricultural chemicals to run off and enter State waters. Second, the project must include eligible and cost-effective BMPs that will improve water quality. Finally, applicants should be in compliance with their mandatory nutrient management plans.

Funding: Cost-share is available for eligible BMPs up to 87.5% of eligible project costs. The cost-share for individual projects is capped at \$50,000. However, animal waste management projects may not exceed \$200,000 per project. Per farm limits are \$150,000 for non animal waste BMPs and an additional \$300,000 for animal waste management BMPs. Funding for the MACS program currently comes from State bond funds. In State Fiscal Year 2014, farmers received \$4.7 million in grants to install more than 540 projects. To maximize financial assistance, applicants may combine MACS cost-share funds with those from the USDA.

Connection with the State NPS Management Program: The statewide MACS program a keystone in Maryland's NPS Program. It is voluntary and nonregulatory. This State funding assistance program is designed to compliment other Federal and State programs for technical and financial assistance so that more agricultural BMPs are implemented and less NPS pollution occurs. For example, it is common for Soil Conservation District technical assistance to coordinate State MACS funding and Federal funding so that financial incentives are maximized and more BMPs are voluntarily implemented. The work accomplished with MACS grant assistance accounts for a significant portion of the agricultural NPS implementation and pollution load reduction across Maryland. Expenditures of these funds may be used to meet match requirements, or to leverage, Federal grants to Maryland under CWA Section 319(h).

Application process: Farmers work with the local Soil Conservation District to determine if a water quality problem exists and can be corrected by a BMP that is eligible for cost-share support. The Soil Conservation District then assists in completing the BMP design and MACS Program application. MDA reviews the application for eligibility and adherence to program guidelines. Funding for each BMP is approved by the Maryland Board of Public Works, which is comprised of the State Governor, Comptroller and Treasurer.

Web site: http://mda.maryland.gov/resource_conservation/Pages/financial_assistance.aspx

6.C.1.1 Maryland Income Tax Subtraction for Conservation Equipment

This MDA program helps farmers offset costs associated with buying certain types of conservation equipment to control soil erosion, manage nutrients and protect water quality in streams, rivers and the Chesapeake Bay. The subtraction modification allows farmers to subtract eligible equipment purchases from taxable income on Maryland individual and corporate tax returns. Equipment eligible for tax subtraction include no till planters and drills, no till rippers, manure spreaders, manure injectors, vertical tillage equipment, global positioning system devices and optical sensing and nutrient application systems. Certain requirements apply. Farmers bring receipts to their local Soil Conservation District who verifies eligibility and assists in submission of a form to MDA for approval.

Connection with the State NPS Management Program: This nonregulatory statewide program provides an incentive for owner/operators to voluntarily invest in conservation equipment that will support application conservation practices and result in reduced NPS pollution.

Web site (see brochure on web page):

http://mda.maryland.gov/resource_conservation/Pages/financial_assistance.aspx

6.C.1.m Maryland Agricultural Land Protection Foundation

The Maryland Agricultural Land Preservation Foundation (MALPF) was established by the Maryland General Assembly in 1977 and is part of the Maryland Department of Agriculture. The Foundation purchases agricultural preservation easements that forever restrict development on prime farmland and woodland. MALPF settled on its first purchased easement in October 1980.

The mission of the Maryland Agricultural Land Preservation Foundation is: to preserve productive farmland and woodland for the continued production of food and fiber for all of Maryland's citizens; to curb the expansion of random urban development; to protect wildlife habitat; and to enhance the environmental quality of the Chesapeake Bay and its tributaries.

At the end of June 30, 2012, the Foundation has purchased easements on a cumulative total of 2,078 properties, permanently preserving about 282,957 acres, at a total state investment of more than \$609 million. The Maryland Agricultural Land Preservation Program is one of the most successful programs of its kind in the nation. Maryland has preserved in perpetuity more agricultural land than any other state in the country.

Connection with the State NPS Management Program: MALPF contributes to the State NPS Program by reducing the conversion of rural lands to more intensive development.

Website: http://mda.maryland.gov/Pages/Agland_Preservation_Foundation.aspx

6.C.1.n Regional Conservation Partnership Program (RCPP)

Overview: The 2014 Farm Bill authorized the US Dept. of Agriculture to create the RCPP. The RCPP has about \$400 million is available for financial assistance during the first year and about \$1.2 billion over five years that is provided thru three funding pools:

- Critical Conservation Areas will receive 35% of available funding. The Chesapeake Bay drainage is one of eight eligible areas. This program, replaces the former Chesapeake Bay Watershed Initiative, will be a major conduit for federal funding assistance for agricultural conservation and NPS management.
- Regional or multi-state projects will receive 40% of available funding.
- State-level projects will receive 25% of available funding.

RCPP assistance will be delivered in accordance with rules of the Environmental Quality Incentives Program (EQIP), Conservation Stewardship Program (CSP), Agricultural Conservation Easement Program (ACEP), and Healthy Forests Reserve Program (HFRP), and in certain areas, the Watershed Operations and Flood Prevention Program.

Connection with the State NPS Management Program: RCPP contributes to the State NPS Program statewide by providing financial assistance for implementing NPS BMPs.

6.C.1.o Sustainable Agriculture Research and Education (SARE)

Overview: The USDA's National Institute of Food and Agriculture (NIFA), formerly Cooperative State Research, Education, and Extension Service (CSREES), runs the SARE program to invest in groundbreaking research and education that improves the profitability, environmental stewardship and quality of life of American farmers. Competitive grants are available for researchers, agricultural educators, farmers, ranchers, and students. The Northeast SARE region administers funding to Maryland. Between 1988 and 2008, grantees in Maryland have received over \$3.1 million to support 85 individual projects. Northeast SARE offers several types of financial assistance:

- Farmer Grants: for commercial producers who have an innovative idea they want to test using a field trial, on-farm demonstration, or other technique
- Partnership Grants: for agricultural service providers — extension and NRCS staff, consultants, state departments of agriculture, and others working in the agricultural community — who want to conduct on-farm demonstrations, research, marketing, and other projects with farmers as cooperators
- Sustainable Community Grants: make a direct connection between community revitalization and farming
- Professional Development Grants: fund outcome-based projects that train Extension educators and other agricultural service providers in sustainable techniques and concepts
- Research and Education Grants: fund outcome-based projects offering research, education, and demonstration projects that engage farmers as cooperators in the exploration of sustainable farm practices
- Agro-ecosystems Research Grants: fund long-term research that explores the ecological interactions that are the basis of sustainable agriculture
- Conference and Workshop Support: for assorted events with speakers and educators about sustainable agriculture.

Funding: Levels of funding vary among the individual grant programs. Visit the Northeast SARE Web site for information on recent project awards under each grant.

Application Process: Obtain a copy of the call for proposals from Northeast SARE and ask to be put on the regional mailing list for future calls. Determine the relevant deadline for the grant program(s) from which you seek funding. Contact potential collaborators and develop proposal ideas. Submit your proposal, following all guidelines specified by the region, prior to the specified deadline.

Web site: <http://www.sare.org/> and <http://nesare.org/>

6.C.1.p Wetlands Reserve Program

Overview: The Wetlands Reserve Program is a voluntary program that provides technical and financial assistance to private landowners and Tribes to restore, protect, and enhance wetlands in exchange for retiring eligible land from agriculture. Wetlands perform many vital ecological services, including the improvement of water quality by filtering sediments and chemicals. As of 2008, over 1.9 million acres were enrolled in the Wetlands Reserve Program. The program offers three enrollment options:

- Permanent conservation easement in perpetuity
- 30-year easement, and
- Restoration cost-share agreement, which designed to restore or enhance the wetland

functions and values over a 10-year contract without placing an easement on the enrolled acres. To enter into an agreement, the landowner must have owned the land for the preceding seven years

Eligible land for enrollment includes wetlands cleared or drained for farming, pasture, or timber production; lands adjacent to restorable wetlands that contribute to wetland functions and values; restored wetlands that need long-term protection; drained wooded wetlands where hydrology will be restored; existing or restorable riparian habitat corridors that connect protected wetlands; and lands substantially altered by flooding where wetland restoration at a reasonable cost is likely.

Funding: The USDA's Natural Resources Conservation Service allocates Wetlands Reserve Program funding based on three criteria: (1) ecological considerations regarding the number of wetlands lost in a State and whether the State impacts migratory birds, (2) landowner interest in the program as reflected by the level of unfunded applications, and (3) State performance related to prior-year program activity. In a permanent easement, the USDA pays 100% of the easement value and up to 100% of the restoration costs. In a 30-year easement, however, the USDA pays up to 75% of the easement value and up to 75% of the restoration costs. Under a restoration cost-share agreement, the agency pays up to 75% of the restoration costs. Annual payments may not exceed \$50,000 per year. Since the restoration cost-share agreement does not place an easement on the property, the landowner provides the restoration site without reimbursement.

Application process: Landowners can submit enrollment applications at any time during the year through NRCS. Applications are available at any USDA Service Center office.

Web sites:

Federal: <http://www.nrcs.usda.gov/Programs/WRP/>

State: <http://www.md.nrcs.usda.gov/programs/wrp/wrp.html>

Other sources: <http://www.nj.nrcs.usda.gov/programs/wrp/>

6.c.1.q Winter Cover Crop Program

Overview: The Maryland Department of Agriculture's (MDA) Winter Cover Crop Program provides farmers with cost-share payments to plant small grains cover crops that planted in the fall to reduce erosion and take up nitrogen leftover in the soil. Cover crops are one of the most cost-effective and efficient ways to manage unused nitrogen. MDA offers both a Traditional Cover Crop Program, which prohibits harvest, and a Commodity Cover Crop Program, for farmers interested in harvesting their small grain cover crops in the spring. Eligibility prohibits use of fertilizer until March 1 for both program options. The Winter Cover Crop Program is administered by the Maryland Agricultural Water Quality Cost-Share (MACS) Program and delivered locally by Soil Conservation Districts.

Funding: Major funding sources include MDE's Chesapeake Bay Restoration Fund and Maryland DNR's Chesapeake and Atlantic Coastal Bays Trust Fund, which have earmarks for MDA's cover crop program. Farmers may receive a number of incentives for implementing practices that improve the water quality protection value of this BMP. In State Fiscal Year 2014, implementing every practice garners a maximum of \$100/acre in cost-share for traditional cover crops and \$35/acre for commodity cover crops. For the 2013-2014 program, the Winter Cover Crop Program disbursed \$21.2 million and farmers planted over 423,212 acres.

Connection with State NPS Program: Winter cover crops are among the most cost effective

NPS BMPs available to the State NPS Program. This grant is important because farmers are financially unable to independently apply cover crops without this incentive.

Application process: Sign-up takes place during a specific period during June and July at local Soil Conservation District offices. The planting deadline is November 1. Soil Conservation Districts inspect a percentage of fields planted by each applicant. Cover crops must be killed or harvested by June 1.

Web site: http://mda.maryland.gov/resource_conservation/Pages/financial_assistance.aspx

6.C.2 Environment Financial Assistance via the MDE

6.C.2.a Abandoned Mine Land Grant

Overview: The U.S. Department of the Interior provides annual grants to MDE to construct reclamation projects that reclaim disturbed lands and reduce water pollution from abandoned coal mines. Abandoned mines can pose a serious threat to water quality, especially in the form of highly acidic water, rich in metals. About 200 abandoned mine sites exist in Maryland, according to MDE's Land Management Administration. The Abandoned Mine Land Grant is authorized in Title IV of the federal Surface Mining Control and Reclamation Act (SMCRA).

Funding: Maryland receives an annual allocation of \$3 million from the federal Office of Surface Mining to reclaim abandoned mines. The Department of the Environment uses this funding to pay contractors who carry out reclamation projects. Federal funding comes from the fees paid by active coal mine operations on each ton of coal mined.

Connection with the State NPS Management Program: This Federal funding source is an important compliment to other Federal and State programs for mitigating NPS problems associated with acid mine drainage. NPS successes achieved in the North Branch Potomac River watershed, including Aaron Run, and ongoing work in the Casselman River watershed rely on the complimentary assistance provided thru these programs.

Application process: As a state with an approved abandoned mine land program, Maryland applies for federal funding annually; it receives an allocation based on SMCRA's statutory formula. The program grant complies with federal and state laws such as the National Environmental Policy Act. Construction companies provide bids to MDE or designated partner agency to implement reclamation projects.

Web site: <http://www.osmre.gov/topic/grants/grants.shtm>

6.C.2.b Nontidal Wetlands Mitigation Program

Overview: Maryland's Nontidal Wetlands Act requires "no net loss" of wetland acreage and function. In order to achieve this goal, compensatory mitigation is required when wetland impacts are unavoidable. The Nontidal Wetlands Mitigation Program regulates wetland impacts from development and promotes conservation of existing wetlands. Projects funded include nontidal wetland restoration, enhancement and creation. State and local governments, universities, businesses, non-profits and individuals may apply. To qualify for funding, the applicant must demonstrate that the impact cannot be avoided or minimized and that wetland restoration or creation elsewhere is not feasible.

Funding: Up to 100 percent funding is available for projects.

Connection with the State NPS Management Program: This program is an important mechanism for avoiding the loss of nontidal wetlands and the NPS benefits that they provide.

Application process: Contact the Maryland Department of the Environment's Nontidal Wetlands and Waterways Division to apply.

Web site:

http://www.mde.state.md.us/programs/Water/WetlandsandWaterways/PermitsandApplications/Pages/Programs/WaterPrograms/Wetlands_Waterways/permits_applications/nontidal_permits.aspx

6.C.2.c Onsite Disposal Systems Grant (Bay Restoration Fund)

Overview: Maryland's Bay Restoration Fund provides grants for homeowners and businesses to upgrade their septic systems, or on-site disposal systems (OSDS), to the Best Available Technology (BAT) for reducing nitrogen pollution. The Bay Restoration Fund, administered by the Department of the Environment, was signed into law in 2004 to upgrade Maryland's wastewater treatment plants and septic systems. The State has a Bay milestone goal of upgrading at least 3,000 septic units by 2011. Special priority goes to failing systems in the Critical Area, within 1,000 feet of tidal waters.

Funding: This State program is funded by an annual fee paid by owners of septic systems. In 2012, the fee originally set in 2004 was doubled. Funds may be used for any one of the following eligible project options:

- The cost attributable to upgrading an existing OSDS to BAT for nitrogen removal;
- The cost differential between a conventional OSDS and on that uses BAT for nitrogen removal for new construction;
- The cost, up to the sum of each "individual BAT system", of replacing multiple OSDS located in the same community with a new community system that is owned by a local government and meets Enhanced Removal Standards;
- The cost, up to the sum of the cost of each "individual OSDS system using BAT", to connect properties to an existing municipal enhanced nutrient removal wastewater facility.

Connection with the State NPS Management Program: This grant is the keystone the State NPS Program's effort to reduce NPS nitrogen impacting groundwater and surface water.

Expenditures of these funds may be used to meet match requirements for Federal grants to Maryland under CWA Section 319(h) and for the Chesapeake Bay Restoration and Accountability Grant (CBRAP). This grant has demonstrated great success in implementing technologies that make measurable improvements in groundwater nitrogen concentrations.

Application process: Program delivery is conducted by County health departments. Owners of septic systems contact them directly to apply for funding.

Websites: <http://mde.maryland.gov/programs/Water/BayRestorationFund/Pages/index.aspx>
http://mde.maryland.gov/programs/Water/QualityFinancing/Pages/Programs/WaterPrograms/water_quality_finance/index.aspx

6.C.2.d Section 319(h) Nonpoint Source Program

Overview: Section 319(h) of the Federal Clean Water Act serves as a major funding source for programs and projects that address nonpoint source pollution. The Maryland Department of the Environment receives an annual funding allocation from the U.S. EPA and provides grants to reimburse projects that reduce or eliminate water quality impairments associated with nonpoint source pollution. A wide variety of NPS activities are eligible for funding:

- Implementation (in-the-ground projects resulting in measurable NPS pollution reduction)
- Protection (projects that prevent water quality degradation from nonpoint sources)
- Watershed assessment, priority planning, implementation progress tracking
- State NPS management program(s)
- Education/outreach (in association with other 319-funded NPS projects)
- Demonstration projects (showing the overall effectiveness of an adopted approach in solving a particular water quality problem)

Eligible implementation projects may use Best Management Practices (BMPs) such as stream restoration, wetland creation or restoration, and riparian buffers. Before securing grant funds for an implementation project, however, the EPA must have accepted a watershed plan that encompasses the work area and identifies the work as a high priority. The watershed plan can be accepted in advance or it can be developed during the grant project, with assistance provided by the Department of the Environment.

Funding: Grant awards for individual projects tend to vary from \$30,000 to \$300,000. The award may cover no more than 60 percent of total project costs, so the nonfederal share must be at least 40 percent. All matching funds must be directly related to the project proposed for funding and must occur in the same timeframe as the project. (Match for 319-funded State NPS program projects is from sources described in sections 6.C.1.k and 6.C.2.c.)

Eligibility requirements and selection goals/criteria: When selecting NPS implementation projects for grant funding, the 319(h) Grant uses the following factors to help ensure that funds will be used efficiently:

- Project helps to meet a goal or objective in a watershed plan accepted by EPA.
- Reduces or eliminates an impairment or helps to meet a TMDL.
- Produces a measurable pollutant load reduction for nitrogen, phosphorus, sediment, biological, bacteria or acidity.
- If the BMPs will reduce nitrogen, phosphorus and/or sediment, and it is in the Chesapeake Bay drainage, then the type of BMP is accepted by the EPA Chesapeake Bay Program and it helps to meet the Bay TMDL and it is consistent with the State and local Watershed Implementation Plan.
- Cost per pound of pollution reduction demonstrates efficient funding use.
- Ready to proceed and commits to successful completion of the project.

Connection with the State NPS Management Program: This grant, along with other Federal and State funding, is essential for funding management work in the State's NPS Program. It also is an incentive for implementing NPS BMPs, particularly in watersheds, and/or for pollutants, that are not served by other funding assistance programs in Maryland. The 319(h) Grant's requirement for 40% matching funds from nonfederal source ensures that State and local contributions always leverage the Federal funds. Also, it is common for 319(h) Grant to leverage State/local funding in addition to the 40% match as reported in Maryland's Annual Report (for implementation projects).

Application Process: To apply for a 319(h) grant, the first step is to submit a proposal in response to the Department of the Environment's annual Request for Proposals (RFP). The Department typically releases the RFP in winter/spring and selects proposals in a competitive process. Project proposals must demonstrate the capacity exists or will exist to successfully complete the project. Priority for project selection is higher for projects that will result in quantifiable improvements in the health of waterways that are on Maryland's List of Impaired Water, especially where Total Maximum Daily Loads (TMDLs) of pollutants have been approved. Projects may be located in any part of the state, with either a statewide or local scope. Several local and State entities may apply for 319(h) grants, including county and municipal agencies, Soil Conservation Districts, State agencies and State institutions of higher learning. A grant application is then submitted to EPA for review and award. Project start dates may be as early as July 1 following the release of the RFP.

Web site:

<http://www.mde.state.md.us/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319NPS/index.aspx>

Other sources: <http://www.epa.gov/nps/cwact.html>

6.C.2.e Section 106 Water Pollution Control Program Grant

Overview: Section 106 of the Clean Water Act authorizes EPA to provide federal assistance to States, territories, the District of Columbia, Indian Tribes and interstate agencies to help bring impaired water bodies into attainment with water quality standards. The grant supports the establishment and implementation of ongoing water pollution control programs. Prevention and control measures supported by State Water Quality Management programs include permitting, pollution control activities, surveillance, monitoring, and enforcement; advice and assistance to local agencies; and the provision of training and public information. In Maryland, 106 grants have been used to help support water quality/biological monitoring, the State integrated report, enhanced tidal monitoring, aquatic resource surveys, NPDES program/permitting, regulatory monitoring, and TMDLs. Increasingly, EPA and states are working together to develop basin-wide approaches to water quality management. The Water Pollution Control Program is helping to foster a watershed protection approach at the state level by looking at states' water quality problems holistically, and targeting the use of limited finances available for effective program management.

Funding: Determined by Federal allocation process.

Connection with the State NPS Management Program: This Federal grant provides important support for ongoing NPS-related work in Maryland, particularly as a compliment to other Federal and State NPS funding.

Application process: Access to these funds is limited to specified government entities.

Web site: <http://www.epa.gov/owm/cwfinance/pollutioncontrol.htm>

6.C.2.f Small Creeks and Estuaries Restoration Program

Overview: This state program previously used state bond funds to offer financial assistance to local governments for voluntary stream and creek restoration projects that improve water quality

and restore habitat in seriously degraded water bodies in Maryland.

Funding: This program is not currently funded, however, stream restoration projects are eligible for Water Quality Revolving Loan Funds. (See this section for information.)

6.C.2.g Stormwater Pollution Control Cost-Share Program

Overview: This state program previously used state bonds to offer grant funding to local governments to reduce NPS pollution by implementing stormwater management retrofit and conversion projects in pre-1984 urban areas.

Funding: This program is not currently funded, however, stormwater retrofit projects are eligible for Water Quality Revolving Loan Funds. (See this section for information.)

6.C.2.h Supplemental Assistance Program

Overview: The Department of the Environment administers this program to help local governments fund planning, design, and construction of essential wastewater facility improvements that address public health or water quality problems. It can be used to address NPS pollution by eliminating failing septic systems in older established communities by connecting to a public sewer system.

Funding: The Supplemental Assistance Program provide state bond funds as grants for up to 87.5% of eligible project costs not to exceed \$1.5 million per applicant. These grants are typically used in conjunction with other State and federal funding sources. For example, this program can supplement Maryland's Water Quality Revolving Loan Fund when a loan by itself cannot meet the need of a local government. These program funds are limited to sewerage-related projects.

Application process: Projects are rated and ranked based on the Integrated Project Priority System (IPPS). All projects must be eligible under the Clean Water Act, must conform to Smart Growth Criteria, be located in a Priority Funding Area, and be consistent with the County Water and Sewer Plan. The IPPS focuses on compliance, documented public health concerns, relative effectiveness of projects to protect the Chesapeake Bay, sustainability criteria and water quality restoration. A solicitation for projects is conducted each year from December thru January.

Web site:

http://www.mde.state.md.us/programs/Water/QualityFinancing/Pages/Programs/WaterPrograms/water_quality_finance/index.aspx

6.C.2.i Water Quality Revolving Loan Fund

Overview: Maryland's Water Quality Revolving Loan Fund (WQRLF) uses Federal and State funds to provide below-market rate of interest loans, as well as subsidies to eligible recipients, for a wide variety of point and nonpoint source projects. Maryland targets financial assistance to projects that help meet the State's nutrient reduction objectives for nitrogen and phosphorus and restore surface water quality. Projects eligible for WQRLF financing include:

- Landfill leachate collection, storage and treatment;
- Non-hazardous landfill capping and closure;

- Highway deicing material storage facilities;
- Remediation of contamination from leaking storage tanks, underground injection wells, and inactive hazardous waste sites;
- Stormwater management and BMPs;
- Stream bank stabilization;
- Shoreline erosion control;
- Restoration/establishment of riparian vegetation, wetlands and other water bodies;
- Land or easement purchase for water quality protection of wellheads or watersheds;
- Correction of failing septic systems;
- Agricultural Best Management Practices, and;
- Energy Efficiency, Renewable Energy and Distributed Generation for selected purposes.

Funding: WQRLF has several funding sources: annual EPA grants, 20% match from the state, revenue bond proceeds, loan principal and interest repayments and investment earnings. Expenditures of these funds (once converted to State funds) may be used to meet match requirements, or to leverage, Federal grants to Maryland under CWA Section 319(h). These loans provide up to 100% of a project's capital costs, with no requirement of matching funds. Maryland offers water quality loans at below market interest rates, which changes monthly (e.g., the August 2013 standard rate is 2.00%/yr and disadvantaged community rate is 1.00%/yr), plus administrative fees, which raise the effective interest rate by approximately 0.50%. Loan repayment is flexible and can be up to 20 years.

Connection with the State NPS Management Program: In Maryland, the revolving loan provides a funding alternative that reaches customers, and can help to fill funding assistance gaps, that other NPS financial assistance programs are less able to serve. Currently, this funding source is less available for NPS work compared to past years because of a State priority to rapidly complete nutrient management upgrades at publicly owned sewage treatment plants. In future years, Maryland will likely be able to ramp up NPS assistance thru this funding source.

Application & Selection process: The Department of the Environment's Water Quality Financing Administration generally accepts proposals annually. Eligible projects are placed on the Project Priority List (PPL). Priority projects are selected each year by MDE to be included in a draft Intended Use Plan (IUP), which describes how federal and State funds would be disbursed. After public hearing held on the draft IUP, the final IUP is included in the State's application for new funding from EPA.

MDE uses its Integrated Project Priority System (IPPS) to rate and rank candidate projects for Revolving Loan funding. The IPPS was most recently revised/approved by EPA in 2012 (and revisions are anticipated in December 2014). IPPS criteria focus on water quality benefits, documented public health concerns, relative effectiveness of nutrient reduction to the Chesapeake Bay, compliance status, cost efficiency and sustainability. In the context of water quality benefits, the IPPS is used to help target financial assistance to both point source projects and nonpoint source projects that help meet the Maryland's Final Watershed Implementation Plan (WIP) goals and to help meet the Chesapeake Bay Total Daily Maximum Daily Load (TMDL).

Projects proposed for FFY13 funding in Maryland's Intended Use Plan included four NPS-related projects including treatment wetlands, bioswale installation, and stormwater management. The state fiscal year 2015 list also ranked remaining unfunded projects including several additional types of NPS projects: green streets, bioretention, stream restoration, green roof and LID/environmental sensitive designs.

Web sites:

http://www.mde.state.md.us/programs/Water/QualityFinancing/Pages/Programs/WaterPrograms/water_quality_finance/index.aspx

[http://www.mde.state.md.us/programs/Water/QualityFinancing/Documents/2010%20CW%20IP PS_Final_2012%20SW%20Rev.pdf](http://www.mde.state.md.us/programs/Water/QualityFinancing/Documents/2010%20CW%20IP%20PS_Final_2012%20SW%20Rev.pdf)

Federal: http://water.epa.gov/grants_funding/cwsrf/cwsrf_index.cfm

6.C.2.j Water Quality Revolving Loan Fund - Linked Deposit

Program for private borrowers

Overview: The Department of the Environment administers the Linked Deposit Program to provide low-interest financing for private entities to implement capital improvements that reduce nonpoint source pollution. Instead of receiving loans directly from the State, borrowers apply to eligible commercial lending institutions. This network of private lenders has received investments of below-market rate interest from the State's Water Quality Financing Administration, which enables the lenders to offer loans with similar interest rates. The Linked Deposit Program can be used in conjunction with the Water Quality Revolving Loan Fund to provide low-interest private loans for nonpoint source pollution control. The following circumstances are eligible for financing under the Linked Deposit Program:

- Agricultural Best Management Practices (BMPs) to reduce water pollution
- Replacement of failing septic systems
- Repair and enhancements to existing stormwater management facilities to protect water quality
- Nonstructural shoreline erosion control, or structural control where the former will not provide adequate protection
- Wetland creation, enhancement and restoration
- Stream restoration and stream bank stabilization
- Brownfields and voluntary cleanup activities

Funding: The Linked Deposit Program uses the Maryland's Water Quality Revolving Loan Fund to offer loans thru eligible private lenders listed by the Department of the Environment. Loan terms are worked out on an individual basis with the private lenders. Interest rates tend to be more favorable when CD rates are higher.

Application process: Prior to applying for a loan, the borrower must obtain a "Certificate of Qualification" from the local approving authority (i.e. Soil Conservation District, Health Department). Loan applicants should then contact and select a lender from the Water Quality Finance Administration's list of eligible banks. The loan agreement is between the lender and the applicant (not with the State). Thus, participating lenders will be accountable for processing, underwriting and servicing the loan. The bank will also evaluate the credit worthiness of an applicant according to the lender's own underwriting criteria. Following a successful credit evaluation, the lender will send to the Department of the Environment an investment request form identifying the landowner, loan terms, and a copy of the Certificate of Qualification. Upon approval of the financing terms and project eligibility by the State, funds from the Water Quality State Revolving Fund will be invested with the lender equal to the amount of the loan to the borrower. In addition, each bank will be permitted to charge

origination, servicing and other such fees normally associated with loans issued by the bank.

Information on Linked Deposit Program is disseminated to interested parties thru a cooperative effort by the Maryland Departments of the Environment, Natural Resources, and Agriculture, and by local Soil Conservation Districts and local health departments. Linked Deposit lending occurs on a first come first served basis and information for interested parties is available on MDE's website. Since inception, \$23 million has been set aside for linked deposit loans for eligible private NPS projects. MDE's FFY 2014 Intended Use Plan did not allocate any additional funding for Linked Deposit loans because eligible NPS borrowing requests can be satisfied with prior year funding still available.

Web sites:

http://www.mde.state.md.us/programs/Water/QualityFinancing/Pages/Programs/WaterPrograms/water_quality_finance/index.aspx

6.C.3 Federal – Financial Assistance Directly From Federal Agencies

6.C.3.a Chesapeake Bay Watershed Education and Training (B-WET)

Overview: NOAA’s Chesapeake B-WET grant is awarded competitively to support existing environmental education programs, to foster the growth of new programs, and to encourage development of partnerships among environmental education programs throughout the entire Chesapeake Bay watershed. Projects support organizations that provide students with meaningful Chesapeake Bay or stream outdoor experiences (investigative or experimental projects that engage students in thinking critically about the Bay watershed). Chesapeake B-WET supports the commitment of the Chesapeake Bay Program to provide every student in the watershed with a meaningful watershed experience before graduation from high school. In addition, projects provide teachers with professional development opportunities in the area of environmental education related to the Chesapeake Bay watershed. Eligible applicants are K-12 public and independent schools and school systems, institutions of higher education, community-based and nonprofit organizations, state or local government agencies, interstate agencies, and Indian tribal governments in the Chesapeake Bay watershed.

Funding: Typical grants range from \$25,000 to \$200,000.

Application process: Access the application on www.grants.gov . Full proposals and a complete application package are typically due in October.

Web site: <http://chesapeakebay.noaa.gov/bwet>

6.C.3.b Chesapeake Bay Implementation Grant

Overview: The 2000 Chesapeake Bay Agreement calls for reductions in nutrient and sediment loads and an evaluation of the potential impacts of nonpoint sources of chemical contaminants. Under Section 117 of the federal Clean Water Act, the U.S. EPA awards the Chesapeake Bay Implementation Grant (CBIG) to support the implementation of these priorities, as well as continued water quality monitoring. State agencies receive these federal grants to support long term programs related to the control of nonpoint source pollution. CBIG is coordinated by the Department of Natural Resources.

Funding: The disbursement of grant funds (over \$2 million annually) is currently limited to long-term programs within several state agencies, including the Departments of Natural Resources, Agriculture and the Environment. In recent years, these funds have been used to support special-purpose programs such as: the Special Rivers Project, the Tributary Strategy Program, Maryland’s Agricultural Cost-Share Program and the Chesapeake Bay Trust’s Watershed Assistance Grant Program.

Application process: The Department of Natural Resources applies for these EPA funds on a three-year cycle. If an opportunity to compete for grants is offered, an RFP will be posted on the Chesapeake & Coastal Program web site.

Web site: <http://dnr.maryland.gov/ccs/index.asp>

6.C.3.c Chesapeake Bay Innovative Nutrient and Sediment Reduction Grant

Overview: This National Fish and Wildlife Federation manages this EPA-funded program to

expand the collective knowledge of the most innovative, sustainable and cost-effective strategies that reduce excess nutrient loads in specific tributaries to the Chesapeake Bay. To achieve this goal, the program awards competitive grants to projects that target and reflect the diverse conditions (e.g., urban, rural, suburban) and sources of nutrients (e.g., agricultural, stormwater, other non-point sources) that exist throughout the Chesapeake watershed. Collectively, these projects help the Chesapeake Bay Program meet its goals for restoring the health and resources of the Bay ecosystem. Priorities for funding include:

- Field-scale demonstrations of innovative technologies, conservation practices and Best Management Practices (BMPs) that have potential to significantly reduce excess nutrient loads
- Demonstrations, within targeted small watersheds, of the most effective and efficient strategies for implementing nutrient load reductions contained in state Tributary Strategies
- Water quality trading demonstrations (including point source to non-point source) and other market-based strategies to reduce nutrient loads to the Bay and its tributaries, and
- Proposals that will demonstrate strategies that overcome barriers to adoption of the most effective and efficient BMPs; and conservation practices for reducing excess nutrient loads

Funding: Individual grants run from \$200,000 to \$1 million. Projects must include a 1:1 match with a non-federal partner. Primary funding for the Program is provided through a cooperative agreement with the Environmental Protection Agency.

Web site: www.nfwf.org

6.C.3.d Coastal Counties Restoration Initiative

Overview: The National Association of Counties and NOAA jointly provide funding for multi-year national and regional habitat restoration partnerships that will result in implementation of a wide-range of habitat restoration projects thru locally-driven hands-on projects that emphasize stewardship, to mid-scale, watershed-scale projects that yield significant ecological and socioeconomic benefits. Eligible projects include restoration of coastal wetlands. State and local governments, private entities and nonprofits may apply.

Funding: Typical Partnership awards will range from \$500,000 to \$1,000,000 per year. Funding of approximately \$10 million is expected to be available for cooperative restoration partnerships in 2010, with annual funding anticipated to maintain these for up to three years.

Application: Requests for Proposals circulate annually and are due in early April.

Web site: http://www.sfbayjv.org/pdfs/2007-2008CCRI_RFP.pdf

6.C.3.e Environmental Education Grants Program

Overview: Sponsored by the U.S. EPA, Environmental Education Grants support environmental education projects that enhance the public's awareness, knowledge and skills to help people make informed decisions that affect environmental quality. The Program commonly funds projects that focus on water issues. In EPA Region 3, (Pennsylvania, Maryland, D.C., West Virginia, Delaware and Virginia) 124 grants to investigate water issues were disbursed between 1992 and 2008. While individual teachers may not apply for the Grant,

the following are eligible applicants: local education agencies, State education or environmental agencies, colleges or universities, nonprofit organizations, noncommercial educational broadcasting entities, and tribal education agencies.

Funding: The EPA awards grants each year using funds appropriated by Congress. Annual funding for the program ranges between \$2 million and \$3 million. Most grants will be in the \$15,000 to \$25,000 range.

Application process: Download the application and budget form from the Web site to complete the application electronically. Print a hard copy of both and mail them to the EPA, by the deadline listed online. Approximately 6 months after receipt of applications, the EPA will contact finalists to request additional federal documentation.

Web site: <http://www.epa.gov/enviroed/grants.html>

6.C.3.f Five Star Restoration Grant Program

Overview: The National Fish and Wildlife Foundation manages the Five Star Restoration Program to bring together diverse partners to provide environmental education and training through projects that restore wetlands and streams. The Program provides challenge grants, technical support and opportunities for information exchange to enable community-based restoration projects. Typical projects include at least five diverse partners, including school or youth groups; public, private or corporate landowners; local, state and federal government agencies; local community or environmental non-profit organizations; universities or K-12 schools; local businesses; rural electric cooperatives; or land trusts. Project sites can be public land, such as park, streams and school campuses, or private land, such as corporate facilities. Projects with long-term monitoring and protection plans are preferred. At the completion of Five Star projects, each partnership will have experience and a demonstrated record of accomplishment, and will be well-positioned to take on other projects. Aggregating over time and space, these grassroots efforts will make a significant contribution to our environmental landscape and to the understanding of the importance of healthy wetlands and streams in our communities.

Funding: Primary funding is from the Wetlands Division of the U.S. EPA and the energy utility Southern Company. Grants range from \$5,000 to \$20,000, with \$10,000 as the average amount awarded per project. This acts as seed funding to leverage additional community resources. On average, for each dollar of sponsor funds, five additional dollars in matching contributions will be provided by restoration partners in funding, labor, materials, equipment or in-kind services.

Application process: Grant applications can be downloaded from the Web site of the National Fish and Wildlife Foundation.

Web site: <http://www.epa.gov/owow/wetlands/restore/5star/>

6.C.3.g Forest Legacy Program

Overview: The USDA's Forest Legacy Program supports State efforts to protect environmentally sensitive forest lands. It is a voluntary program for privately owned forestlands. A primary goal of the Forest Legacy Program is the protection of water quality, wetlands, and riparian buffers. The Forest Legacy Program complements private, federal and

state programs focusing on conservation in two ways. First, FLP directly supports property acquisition. Additionally, FLP supports efforts to acquire donated conservation easements. FLP funded acquisitions serve public purposes identified by participating states and agreed to by the landowner. To qualify, landowners are required to prepare a multiple resource management plan as part of the conservation easement acquisition.

Funding: The federal government may fund up to 75% of project costs, with at least 25% coming from private, state or local sources. In addition to gains associated with the sale or donation of property rights, many landowners also benefit from reduced taxes associated with limits placed on land use.

Website: <http://www.fs.fed.us/spf/coop/programs/loa/aboutflp.shtml>

6.C.3.h National Coastal Wetlands Conservation Grant Program

Overview: This U.S. Fish and Wildlife Service (USFWS) program was established in 1990 to provide matching grants to States for the acquisition, restoration, management or enhancement of coastal wetlands. Coastal States that border the Atlantic Ocean, the Gulf of Mexico, the Pacific Ocean and the Great Lakes are eligible. Under the program, the USFWS prioritizes projects that are:

- Consistent with the criteria and considerations outlined in the National Wetlands Priority Conservation Plan
- Located in States with dedicated funding for programs to acquire coastal wetlands, natural areas and open spaces, and
- Located in maritime forests on coastal barrier islands

Additional ranking factors developed by the USFWS include giving credit to projects that benefit threatened and endangered species, promote partnerships, and support conservation and recovery programs. The Program will not provide grants to support planning, research, monitoring activities, construction or repair of structures for recreational purposes.

Funding: Typically, between \$13 million and \$17 million in grants are awarded annually through a nationwide competitive process. Funding for the Program comes from excise taxes on fishing equipment; and motorboat and small engine fuels. States provide 50 percent of the total costs of a project. If, however, the State has established and maintains a special fund for acquiring coastal wetlands, other natural areas or opens spaces, the Federal share can be increased to 75 percent. Grants awarded under the National Coastal Wetlands Conservation Grant Program cannot exceed \$1 million for an individual project.

Application process: Eligible State agencies should submit a complete grant proposal by the deadline specified in the annual announcement. Applicants are encouraged to consult with the USFWS's Regional Program Coordinators in developing their proposals.

Web site: <http://www.fws.gov/coastal/CoastalGrants/>

6.C.3.i Public Works and Development Facilities Program

Overview: This U.S. Department of Commerce program provides assistance to help distressed communities attract new industry, encourage business expansion, diversify local economies, and generate long-term, private sector jobs. Eligible restoration activities, as part of a larger project

such as an industrial park, include the development of stormwater control mechanisms (e.g. retention ponds). A wide range of groups may apply: community/watershed groups; nonprofits; educational institutions; private landowners; conservation districts; water and wastewater utilities; and local, state and tribal agencies.

Funding: Financial assistance varies. In FY2009, \$240 million total was disbursed.

Application: Send to the Commerce Department's Economic Development Administration.

Web site: <http://www.federalgrantswire.com/grants-for-public-works-and-economicdevelopment-facilities.html>

6.C.3.j Pollution Prevention Program

Overview: The Pollution Prevention (P2) Program, formerly known as Pollution Prevention Incentives for States, provides matching funds to support State and Tribal programs that help businesses identify better environmental strategies and solutions for reducing or eliminating waste at the source. The P2 Program also aims to improve business competitiveness without increasing environmental impacts. The majority of P2 Grants fund State-based projects for technical assistance, training, outreach, education, regulatory integration, data collection, research, demonstration projects, and recognition programs. Proposed project activities should meet the following criteria to be eligible for funding:

- Reduce the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment prior to recycling, treatment or disposal
- Reduce the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants, and
- Reduce or eliminate the creation of pollutants through increased efficiency in the use of raw materials, energy, water, other resources, or by protection of natural resources through conservation

Funding: The P2 Program provides no more than a 50 percent match of the total allowable project cost. Individual grant awards tend to be in the range of \$20,000-\$180,000. Applicants may apply for up to three years of funding.

Application process: Hard copy proposals must be received by the applicable Regional P2 Program Coordinator noted in Section VII by Friday, April 17, 2009. Alternatively, applicants may submit electronic proposals through Grants.gov. Eligible proposals will be reviewed by the EPA Regional review panel.

Web site: <http://www.epa.gov/opptintr/p2home/pubs/grants/ppis/ppis.htm>

6.C.3.k Regional Conservation Partnership Program (RCPP)

Overview: The 2014 Farm Bill authorized the US Dept. of Agriculture to create the RCPP. The program is delivered by NRCS working with farmers, ranchers and private forest owners to identify and address natural resource objectives by implementing conservation practices and activities to deliver environmental benefits. Under the RCPP, partners work with producers and landowners to promote restoration and sustainable use of natural resources on regional and watershed scales. The program promotes solutions that benefit individual operations and

simultaneously benefit local economies, communities and resource users in a watershed or area that depends on the quality of the natural resources.

Funding: The RCPP has about \$400 million is available the first year and about \$1.2 billion over five years that is provided thru three funding pools:

- Critical Conservation Areas will receive 35% of available funding. The Chesapeake Bay drainage is one of eight eligible areas. This program, replaces the former Chesapeake Bay Watershed Initiative, will be a major conduit for federal funding assistance for agricultural conservation and NPS management.
- Regional or multi-state projects will receive 40% of available funding.
- State-level projects will receive 25% of available funding.

Application Process: RCPP assistance will be delivered in accordance with rules of the Environmental Quality Incentives Program (EQIP), Conservation Stewardship Program (CSP), Agricultural Conservation Easement Program (ACEP), and Healthy Forests Reserve Program (HFRP), and in certain areas, the Watershed Operations and Flood Prevention Program.

Web site: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/farmbill/rcpp/>

6.C.3.l Small Watershed Grants Program

Overview: The Chesapeake Bay Small Watershed Grants Program assists organizations working on community-based projects that improve the condition of their local watershed while building stewardship among citizens. Projects should address one of the Program's three goals: restoration, conservation or planning of watersheds. Eligible applicants are either non-profit 501 (c) organizations (e.g., watershed organizations, homeowners associations, environmental organizations, private schools, etc.) or local governments (e.g., counties, townships, cities, boroughs, conservation districts, planning districts, utility districts, public schools, etc.) from the Chesapeake Bay watershed. The Small Watershed Grants Program is administered by the National Fish and Wildlife Foundation, in cooperation with the Chesapeake Bay Program, and authorized by the Chesapeake Bay Restoration Act of 2000.

Funding: Individual grants are usually from \$20,000 to \$200,000. In 2008, the Program awarded more than \$2.1 million in funding to 34 projects from across the Bay watershed. Projects must include a minimum 25 percent match from a non-federal source. Additional sources of funding for the program are NOAA Fisheries, USDA Forest Service, USDA Natural Resources Conservation Service, and other sponsors.

Application process: The applicant is available on the National Fish and Wildlife Federation Web site. The submission deadline is May 1. Advisory teams then review the applications and issue grant agreements in mid-August.

Web site: <http://www.chesapeakebay.net/smallwatergrants.htm>

6.C.3.m Wetland Program Development Grants

Overview: Since 1990, the EPA's Wetland Program Development Grants (WPDGs) have promoted the coordination and acceleration of research, investigations, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, reduction, and elimination of water pollution. States, Tribes, local governments, interstate associations, intertribal consortia, and national non-profit, nongovernmental organizations are eligible to apply. While WPDGs can be used to build and refine any element of a

comprehensive wetland program, implementation projects are not eligible for funding under this program and preference will be given to funding projects that address these three priority areas:

- Developing a comprehensive monitoring and assessment program
- Improving the effectiveness of compensatory mitigation, and
- Refining the protection of vulnerable wetlands and aquatic resources

Funding: The EPA's Mid-Atlantic Region awarded approximately \$1.4 million in 2009. Individual awards were expected to range from \$250,000 to \$400,000.

Application process: RFPs are posted on the program Web site.

Web site: <http://www.epa.gov/owow/wetlands/grantguidelines/>

6.C.4 Natural Resources – Financial Assistance via Maryland DNR

6.C.4.a Aquatic Resources Education Grant

Overview: This Department of Natural Resources program provides reimbursement grants for Maryland educators to design projects about aquatic resources. Teachers of K-12 students at both public and private schools are eligible. The program has funded hundreds of projects in all 24 school districts in Maryland, over the past fifteen years. Recent projects have included a rain garden in Kensington, Md., and a middle-school wetland project. Projects that incorporate student service learning and community involvement are recommended. Educators are encouraged to involve children in the project from the beginning, including the grant writing process.

Funding: Educators are encouraged to formulate a project and then to apply for project funding. Schools are eligible to apply for up to \$2000 per school year; county outdoor education facilities can apply for up to \$4000 per school year. The program encourages matching funds, partnerships, technical support from local resources, and volunteer time.

Application process: Schools should download the application from the Web site, complete it and mail it to the Department of Natural Resources. Once grant approval paperwork is received by the school, it may bill the Aquatic Resources Education Program for 75% of the grant award and the remaining 25% once the project is complete and the final report is received by the program.

Web site: <http://www.dnr.state.md.us/education/are/aregrants.html>

6.C.4.b Chesapeake and Atlantic Coastal Bays Trust Fund

Overview: The State of Maryland established the Trust Fund in November 2007 to provide a dedicated source of funding for the most effective projects to reduce nutrients and sediment in the Chesapeake Bay and its tributaries. The Departments of Natural Resources administers the Trust Fund. Funds enhance and support a number of programs in the Maryland Departments of Agriculture, Environment and Natural Resources. Additionally, the State's Local Implementation Grant (LIG) is component of the Trust Fund designed to provide implementation dollars directly to Maryland's local governments. This grant is for comprehensive and innovative watershed implementation projects of one to three years. A wide pool of state entities may apply for Local Implementation Grants: counties, bi-county agencies,

municipalities, forest conservancy district boards, soil conservation districts, academic institutions, and non-profit organizations having a demonstrated ability to implement nonpoint source pollution control projects.

Funding: Particular revenue generated from motor fuel tax and rental car tax is earmarked solely for NPS pollutant reduction thru the Trust Fund. Up to 50 million dollars per year may be available for on the ground activities related to nonpoint source implementation projects. Expenditures of these funds may be used to meet match requirements, or to leverage, Federal grants to Maryland under CWA Section 319(h).

Eligibility requirements and selection goals/criteria: When selecting NPS implementation projects for grant funding, the Trust Fund uses the following factors to help ensure that funds will be used efficiently:

- Project is in an urban/suburban area (excludes funds earmarked for agriculture)
- Reduces nutrients/sediment using BMPs approved by the EPA Chesapeake Bay Program or commits to a robust performance monitoring plan.
- Ready to proceed.
- Cost per pound of pollution reduction demonstrates efficient use of funds.
- Long term commitment to protect the BMP/land location.
- Commits to providing detailed cost information before and during project.

Application process: The Trust Fund issues an RFP to gather new proposals when funds are available and when the backlog of eligible proposals from the last RFP are exhausted. Ongoing State projects will continue to receive funding. Trust Fund RFPs are posted on the Web sites of BayStat and the Chesapeake and Coastal Program. Proposals for grants are evaluated using several criteria, including readiness to proceed, capacity for successful completion, project efficiency, leveraging of funds, partner support and priority watersheds. For the Local Implementation Grant, applicants would request between \$6,000 and \$5 million.

Web sites: http://www.dnr.state.md.us/ccs/funding/trust_fund.asp

http://www.baystat.maryland.gov/trustfund_info.html ;

6.C.4.c Coastal Zone Management Grant

Overview: Maryland Department of Natural Resources receives funds from the NOAA to implement the state Coastal Zone Management Program. This State program is part of a national effort to protect, restore and responsibly develop the nation's important and diverse coastal communities and resources. NOAA funds are available to support projects such as coastal wetlands management and protection; natural hazards management; public access improvements; reduction of marine debris; assessment of the impacts of coastal growth and development; special areas management planning; regional management issues; and demonstration projects with the potential to improve coastal zone management.

Funding:

- Coastal Communities Initiative grants are available under the Section 309 program enhancement grant for which no match is required. These competitive grants, which are awarded once a year, focus on code and ordinance changes by the county and municipal governments to protect and restore coastal community's property, shorelines, habitat and water quality
- Coastal Nonpoint Source Program, or Section 6217, provides funds for improving the

Coastal NPS Pollution Program. The Coastal Zone Management Division of the Maryland DNR administers these grant programs.

Application Process: Interested applicants may ask to be placed on the RFP distribution list by contacting the Coastal Zone Management Grant Coordinator.

Web sites: <http://www.dnr.state.md.us/ccp/grants.asp>

6.C.4.d Forest Stewardship Program/Stewardship Incentive Program

Overview: The Department Natural Resources receives funds from USDA's Forest Stewardship Program to provide technical assistance, through State forestry agency partners, to nonindustrial private forest owners to encourage and enable active long-term forest management. A primary focus of the Program is the development of comprehensive, multi-resource management plans that provide landowners with the information they need to enhance and protect habitat. The Stewardship Incentive Program provides cost-share assistance for over nine approved practices for those participating in a Forest Stewardship Plan, including streamside and wetlands protection. Stewardship practices must be maintained for at least ten years. To be eligible, a landowner must have at least five acres of forest land, or non-forest land that can be planted with trees.

Funding: The maximum cost share in a year is \$10,000.

Application: Interested applicants may apply to the Maryland Department of Natural Resources

6.C.4.e Income Tax Modification Program – for forestland owners

Overview: This Maryland Forest Service program provides financial incentive for forest landowners to manage their land. Eligible participants receive deductions on their Maryland state income tax. Approximately 30 to 50 landowners participate in the program annually. Participants must own or lease between ten and 500 acres of forest capable of growing more than 20 cubic feet of wood per acre per year; and for which the primary purpose is growing and harvesting trees. Christmas tree and ornamental tree operations are not eligible. Only participants using forest management practices on ten to 100 acres may receive the tax modification in any one year. Practices receiving the modification must remain in effect for at least 15 years, and periodic inspections will occur. If the practices are not maintained, the tax savings must be repaid.

Funding: Participants can deduct double the cost of reforestation and timber stand improvement practices (less any cost-share assistance received through other programs) on their Maryland State income tax. This deduction is subtracted from the federal adjusted gross income.

Application process: Contact a local Department of Natural Resources forester.

Web site: <http://www.dnr.state.md.us/forests/programapps/tax.html>

6.C.4.f Innovative Technology Fund

Overview: Maryland's Innovative Technology Fund is for technologies that reduce nutrients and sediment from nonpoint sources provides. It provides funding for research and

development. It also provides seed capital funding for commercialization development. The research and development arm provides funds to a University researcher to test the efficiency of a company-owned technology. Projects have assisted with the development of technologies that reduce emissions of ammonia from poultry houses, and reduce NO_x and other air pollutants to prevent deposition of these pollutants. Manure to energy technologies are also funded under this program.

Funding: Research and development awards between \$30,000 and \$50,000 are targeted to University of Maryland System students, faculty and staff. Seed capital awards between \$50,000 and \$150,000 are targeted to Maryland companies.

Application: Turn in applications to the Maryland Department of Natural Resources.

Web site: <http://www.dnr.state.md.us/ccs/intechfund.asp>

6.C.4.g Landowner Incentive Program

Overview: The Landowner Incentive Program is a voluntary, non-regulatory Maryland State cost-share program that reimburses landowners for conservation efforts on their property benefiting species-at-risk. In Maryland, target habitats for funding include stream systems, shale barrens & glades, cliffs & rock outcrops, caves, mature forests, cypress & Atlantic cedar swamps, xeric sand ridges, fens & seepage wetlands, groundwater interfacing wetlands, tidal marshes, and grassland habitats. Restoration activities include forested and warm-season grass buffer establishment, reforestation, invasive species removal, vegetation management, livestock fencing, and restoration of wetland hydrology.

Funding: Project costs must include a minimum 25% match by the landowner, either cash or in-kind (e.g., use of equipment, volunteers). Upon project completion, DNR will reimburse the landowner for up to 75% of project costs. There is no cap to the maximum amount of funding that can be received by an individual applicant. Funding will be based on the scope and duration of each individual project.

Application: Turn in applications to the Maryland Department of Natural Resources.

Web site: <http://www.dnr.state.md.us/wildlife/lip.asp>

6.C.4.h Marine Sewage Pumpout Grant

Overview: Since the passage of the Federal Clean Vessel Act of 1992, the Clean Vessel Act Grant (CVA) Program has awarded grants to States for pumpout stations and waste reception facilities that dispose of sewage from recreational boaters. The proper disposal of sewage from vessels at these sites reduces the discharge of raw sewage into bodies of water. Maryland DNR disburses CVA grants and other funds to individual marinas, community associations and businesses with a boating clientele. These funds are available for the purchase and installation of marine sewage pumpout facilities, which State law requires for all marinas with 50 or more slips berthing any boats over 22'. Supplemental funding for yearly pumpout operations and maintenance is also available, as is funding to upgrade or even replace existing pumpout facilities.

Funding: DNR offers reimbursements of up to \$15,000 for eligible applicants. The Marine Sewage Pumpout Grant is funded 75% from the federal CVA program and 25% from the Maryland Waterway Improvement Fund.

Application process: The grant application is available on the Marine Sewage Pumpout Grant Web site. Applications are submitted to DNR, which coordinates with MDE. When both agencies approve the application, then the applicant submits a proposed plan for the pumpout facility. Following agency approval of the pumpout plan, then the project implementation may proceed.

Web site for Maryland DNR: <http://www.dnr.state.md.us/boating/pumpout/>

Other sources:

<http://wsfrprograms.fws.gov/Subpages/GrantPrograms/CVA/CVA.htm>

<http://www.dep.state.fl.us/cleanmarina/CVA/default.htm>

6.C.4.i Rural Legacy Program

Overview: The Maryland Rural Legacy Program was created to discourage sprawl development and protect areas for future generations to enjoy. The program provides farmers and landowners an alternative to developing (or subdividing) their land or selling their property to developers. Under the Program they can sell or donate their development rights and still retain ownership to continue growing crops or raising livestock. Rural Legacy Areas are primarily evaluated based on:

- Significance and extent of agricultural, forestry, natural and cultural resources proposed for protection
- Threat to resources from development pressure and landscape changes
- Significance of historic and cultural resources proposed for protection
- Economic value of the resource-based industries or services proposed for protection through land conservation, such as agriculture, forestry, tourism and recreation

Funding: The Rural Legacy Program is funded through a combination of Maryland Program Open Space dollars and general obligation bonds from the State capital budget. Local jurisdictions also contribute monies for a variety of land preservation efforts within these areas.

Application process: The Rural Legacy Advisory Committee reviews all applications and makes recommendations to the Rural Legacy Board. Then, the Rural Legacy Board in turn reviews the applications and recommends Rural Legacy Areas for designation and funding for consideration by the Governor and Board of Public Works. The Board of Public Works designates Rural Legacy Areas and determines which projects are funded within the Rural Legacy Areas.

Web site: <http://www.dnr.state.md.us/land/rurallegacy/index.asp>

6.C.4.j Shoreline Erosion Control Financial Assistance

Overview: This Department of Natural Resources program assists waterfront property owners, local governments and community organizations in resolving shoreline and streambank erosion problems. Interest-free loans are offered for the design and installation of three basic types of projects: (1) non-structural projects involve marsh creation/protection with natural or living materials, (2) structural projects consisting of stone or concrete, and (3) hybrid projects combine elements of the two. The level of wave energy at each site determines the type of project that is eligible for funding. Property owners and local governments are both eligible for loans to

implement nonstructural projects. The program only awards loans to local governments for structural projects. Technical assistance is also provided through site evaluations, problem assessments and recommended solutions. Project planning and implementation by a property owner will require an understanding of alternative methods of protection, costs, maintenance needs, regulatory requirements, contracting and project management.

Funding: All loans are interest-free, but the term of the loan and the extent to which it covers project costs can vary. Loans for non-structural projects, hybrid and structural projects last five, 15 and 20 years, respectively. The extent of assistance depends on the type of applicant. For community or local government projects, 100% funding may be available. At loans of greater than \$60,000, the following applicants must share some of the project costs: private property owners, and businesses, and municipalities or counties sponsoring them. Finally, matching grants are not available.

Application process: Applications are available on the program Web site. When completed, applications should be sent to the Shore Erosion Control Program at Maryland DNR. Priority is assigned to applicants based on the severity of erosion problems. There are no annual deadlines for application.

Web site: <http://www.dnr.state.md.us/ccws/sec/secforms.html>

<http://www.dnr.state.md.us/ccws/sec/secintro.html>

Other sources: <http://www.dnr.state.md.us/land/grantsandloans/grants.asp>

6.C.4.k Woodland Incentive Program

Overview: Private, non-industrial woodland owners who manage their forest land may apply for financial assistance through the Woodland Incentive Program (WIP). WIP is administered by the Department of Natural Resources - Forest Service. Landowners who own 5 to 1,000 acres of woodland and agree to maintain the forestry practice for 15 years, are eligible to apply for this cost-share program. The Woodland Incentive funds can be applied to such practices as: reforestation of open land, such as abandoned farm fields; reforestation of cutover woodlands; timber stand improvement practices, including thinning, prescribed burning, and other silvicultural treatments; and for preparation of Forest Stewardship Plans. These practices can reduce the erosion of sediment into Maryland's waterways.

Funding: WIP can pay up to 65 percent of the cost associated with forest management, not to exceed \$5,000 per year (or \$15,000 per 3-year period). Landowners may not have applied for, received approval for, or be receiving federal cost-share assistance for the same forestry practice for which assistance is sought. .

Connection with the State NPS Management Program: This incentive helps to reduce the trend to increasing NPS pollution by protecting land from conversion to uses that tend to produce more NPS pollution.

Application process: Landowners may apply for Woodland Incentive assistance through your local DNR forester. The forester reviews the request for sufficiency and submits the application to the State Forester for final approval. Payments are made to the landowner only after the approved practice is completed and the landowner presents a claim for payment along with all bills that were incurred.

Web site: <http://dnr.maryland.gov/forests/programapps/wood.html>

http://www.dnr.state.md.us/forests/download/wip_brochure.pdf

6.C.5 Other State Entities – Maryland State Sources of Financial Assistance

6.C.5.a Bill James Environmental Grant - MET

Overview: The Maryland Environmental Trust awards Bill James Environmental Grants to environmental education projects proposed by school groups, science and ecology clubs, and other non-profit youth groups. The objectives of the grants are:

- To encourage a sense of stewardship and personal responsibility for the environment.
- To stimulate a better understanding of environmental issues; and to aid in the elimination or reduction of a local environmental problem.
- To encourage education about growth management — protection of rural areas and sensitive resources; and discouragement of sprawling development patterns. Past grant recipients have restored wetlands and promoted tree conservation, among other causes.

Funding: The Bill James Environmental Grant is up to \$1,000. As a program of the Maryland Environmental Trust, the grant is partly funded by the State Highway Administration.

Connection with the State NPS Management Program: This grant helps to improve the understanding and interest necessary to build interest and buy-in with the State and Federal NPS programs.

Application process: Applications are accepted until March 31, each year. Online submission is strongly preferred.

Web site: <http://www.dnr.state.md.us/met/index.asp> ;
<http://www.dnr.state.md.us/met/bjegrants.html>

6.C.5.b Environmental Education Grant – CBT

Overview: This Chesapeake Bay Trust program seeks to increase environmental stewardship through hands-on education and public involvement in the Bay and its rivers. The grants build and expand K through 12 environmental education programs that focus on watershed issues. Field trips and classroom activities can provide experience in water quality monitoring, as well as terrestrial issues such as erosion control, buffer control, groundwater protection, and pollution prevention. Eligible applicants include municipal and county agencies and school districts, public and independent higher educational institutions, non-profit organizations, soil/water conservation districts, and resource conservation and development councils. As part of the Trust's effort to build capacity to implement comprehensive Environmental Education programs for all Maryland students, it encourages applicants to target underserved school districts or communities. In addition, the strongest proposals will show committed partnerships that provide funding, technical assistance, or other in-kind services to support the successful implementation of the project.

Funding: Applicants can request up to \$20,000 per project.

Connection with the State NPS Management Program: This grant helps to improve the understanding and interest necessary to build interest and buy-in with the State and Federal NPS programs.

Application process: Applications are submitted online

Web site: www.cbtrust.org

6.C.5.c Living Shorelines Grant - CBT

Overview: The Chesapeake Bay Trust, in cooperation with NOAA and MDE solicits proposals to create and promote living shorelines in the Maryland, Virginia, and Washington, D.C. portions of the Chesapeake Bay. “Living Shorelines” are defined as shoreline stabilization techniques that use natural habitat elements to protect shorelines from erosion while also providing critical habitat for Bay wildlife. This grant initiative is designed to reverse the trend of shoreline hardening by encouraging the creation of living shoreline restoration projects, and by enhancing public awareness about the benefits of living shorelines. The funding partners invite non-profit organizations, community associations, academic institutions, and state and local governments to submit applications for the Living Shoreline Initiative grant program. Though preference will be given to projects on public property, on property owned by non-profit 501(c)(3) organizations, and on community property, projects on private residential or commercial land will be considered. As part of an effort to more fully engage under-represented groups in its environmental work, the Trust encourages projects that increase awareness and participation of communities of color.

Funding: Requests for funding from this program will generally be less than \$100,000 and less than \$400 per linear foot. Applicants are strongly encouraged to contact Trust, NOAA, and/or MDE staff to discuss request level prior to submitting proposals. Projects should be completed in eighteen months, starting at the time the grant is approved. There is no commitment of continued or additional grant funding beyond that period.

Connection with the State NPS Program: Eroding shorelines are known to be a significant source of NPS phosphorus and sediment. The grant helps to provide a solution that simultaneously improvement water quality and habitat.

Application process: Applications are submitted online www.cbtrustgrants.org

Web site: www.cbtrust.org

6.C.5.d Margaret Rosch Jones Award – MET

Overview: The Maryland Environmental Trust offers the Margaret Rosch Jones Award to non-profit groups or communities that show continuing plans for a project that has already demonstrated of an environmental issue. Applicants must also meet one or both of the following criteria:

- Groups that have been active in educating people in their community about at least one of these concerns: litter prevention, community beautification, and local or statewide environmental issue(s)
- Groups that have been successful in eliminating or reducing the causes of a local environmental problem rather than addressing the symptoms

Funding: The Margaret Rosch Jones Award is up to \$2,000. The Maryland State Highway Administration contributes funding toward this award.

Application process: Applications are accepted until March 31 each year. Online submission is strongly preferred.

Web site: <http://www.dnr.state.md.us/met/mrjaward.html>

6.C.5.e Maryland Environmental Trust - MET

Overview: The mission of the Maryland Environmental Trust (MET) is to provide landowners with information and tools to permanently protect natural, historic and scenic resources. MET evaluates easement purchase offers on a case-by-case basis, purchases and/or accepts donation of eligible easements and retains ownership of these easements. Since its establishment by State statute in 1967, MET has permanently protected more than 129,000 acres on over 1,000 properties.

Funding: Varies case by case.

Connection with the State NPS Management Program: MET helps to reduce the trend to increasing NPS pollution by permanently protecting easement-lands from conversion to development.

Application process: MET accepts requests at all times. However, if an easement donation should conclude within a particular calendar year, contact MET no later than September 19.

Web Site: <http://www.dnr.state.md.us/met/>

6.C.5.f Mini Grant Program - CBT

Overview: Thru the Mini Grants Program, the Chesapeake Bay Trust awards small-scale funding to projects that increase public awareness and involvement in the restoration and protection of the Maryland's watersheds. The majority of Mini Grant applications are submitted by schools for field experiences and on-the ground student service projects. However, organizations and agencies may also submit grants for small projects and public awareness initiatives. Commonly supported projects include riparian forest buffers, rain gardens and rain barrels, and wetland and marsh creation and enhancement.

Funding: Mini Grants are available for up to \$5,000 per project. Requests for school yard habitat restoration projects should be on the order of \$2,000 or less. The Trust requires a 50 percent match for transportation, program fees, and substitute costs for field trips.

Application process: Mini Grants are accepted on an on-going basis. Decisions for the Mini Grant program will be made within six weeks from the date your grant is received by the Trust.

Web site: www.cbtrust.org

6.C.5.g Outreach and Community Awareness Grant - CBT

Overview: The Chesapeake Bay Trust offers this grant program increase public awareness and public involvement in the restoration and protection of the Bay and its rivers. The Outreach and Community Awareness Grant Program was established to provide accessible funds to organizations and agencies for projects that raise public awareness about watershed issues and challenges to and solutions for its restoration and protection. The following organizations are eligible to apply:

- 501(c)3 Private Nonprofit Organizations
- Faith-based organizations
- Community Associations
- Service, Youth, and Civic Groups
- Municipal, County, Regional, State, Federal Public Agencies

- Soil/Water Conservation Districts & Resource Conservation and Development Councils
- Forestry Boards
- Public and Independent Higher Educational Institutions

Projects may include workshops promoting restoration and protection best practices; awareness activities such as stream/trash clean-ups and storm drain stenciling; and water quality monitoring leading to awareness products, such as state of the watershed reports or watershed report cards. In light of the Trust's commitment to the advancement of diversity in its grant-making and environmental work, the Trust strongly encourages grant applications for projects that increase awareness and participation of communities of color in the restoration and protection of the watershed.

Funding: Grant requests may be made for \$5,001 to \$20,000.

Application process: See Chesapeake Bay Trust web site.

Web site: www.cbtrustgrants.org

6.C.5.h Pioneer Grant Program - CBT

Overview: This Chesapeake Bay Trust grant is designed to accelerate the rate of nutrient and sediment load reduction in the Chesapeake Bay. It focuses on new techniques, new information, or new programs that will help managers, policy-makers, restoration scientists, and others achieve load reductions faster and more efficiently. The Trust is open to various types of projects to accelerate the rates of nutrient (nitrogen and phosphorous) and sediment load reduction in the realms of agriculture, stormwater, air, and septic.

Funding: Grantees may receive up to \$75,000.

Application: See Chesapeake Bay Trust web site.

Web site: www.cbtrustgrants.org

6.C.5.i Restoration Grant Program - CBT

Overview: The Restoration Grant Program (formerly the Restoration Track of the Stewardship Grant Program) seeks to increase public awareness and public involvement in a wide array of activities that work to restore and protect the Bay and its rivers. The Restoration Grant Program was established to provide accessible funds to organizations and agencies for demonstration-scale, community-based, on-the-ground restoration projects. All projects should have three goals:

- To accomplish on-the-ground restoration projects that will result in improvements in watershed health, either through habitat enhancement or water quality improvement
- To provide a demonstration-scale restoration project that can be used to showcase potential of a restoration technique
- To engage citizens in restoration activities and promote awareness of bay restoration either short-term (during the project period), through volunteer activities or events directly related to the project; or long-term (post-project period), through creating potential for workshops, training, and information education through interpretive signage

Specific projects that may receive funding include bioretention cells, streamside forest buffers, and wetland creation and enhancement. The Trust welcomes requests from an array of groups

and organizations listed on their Internet site. As part of an effort to more fully engage underrepresented groups in environmental work, the Trust encourages projects that increase awareness and participation of communities of color.

Funding: For projects not based on, consistent with, or identified in a watershed plan, applicants may request \$5,001 to \$25,000. For projects that do pertain to a watershed plan, the maximum amount increases to \$50,000.

Connection with the State NPS Management Program: This grant provides valuable support for NPS implementation, education/outreach and demonstration projects.

Application process: Applications are submitted online www.cbtrustgrants.org

Web site: www.cbtrustgrants.org

6.C.5.j Watershed Assistance Grant Program - CBT

Overview: The Chesapeake Bay Trust (CBT) administers this grant program with support/funding from Maryland DNR and funding from MDE. Grants funds can be used for several purposes:

- To complete plans, designs or other deliverables listed in the applicant's proposal to the Maryland Chesapeake and Atlantic Coastal Bays 2010 Trust Fund through Maryland DNR (the Local Implementation Grant Program),
- To craft proposals for implementation funding through other CBT programs, Maryland DNR, MDE, or other agencies
- Two-Year Milestone Support – Project Design Track. Local governments and watershed organizations can design implementation projects to reduce nutrient and sediment reaching the Chesapeake Bay. (Maryland DNR-administered federal CBIG funds partnering with CBT manage grants projects.)
- Two-Year Milestone Support – Watershed Planning and Program Development Track. Local governments and watershed organizations can help reduce NPS nutrient and sediment loads to the Chesapeake Bay by improving management programs, training, outreach, or watershed planning/assessment. (MDE-administered federal CBIG funds partnering with CBT manage grants projects.)

The Watershed Assistance Grant Program is one element of the State of Maryland's Watershed Assistance Collaborative. The Watershed Assistance Collaborative includes other opportunities for local governments and non-profit organizations, such as training events and programs for watershed restoration financing and planning.

Funding: Two-Year Milestone Support funding for projects generally ranges up to \$70,000 per project. Funding for other individual projects generally runs up to \$35,000.

Connection with State NPS Program: This funding source provides financial support to local communities trying to prepare for and to conduct NPS implementation. It is particularly important for helping likely partners for NPS implementation to overcome initial financial limitations.

Application process: Applications are submitted online www.cbtrustgrants.org

Web site: www.cbtrust.org

6.C.6 Private – Sources of Financial Assistance

6.C.6.a Global ReLeaf Grants

Overview: The non-profit conservation group American Forests partners with private and public sector organizations and agencies to provide cost-share grants for reforestation projects that would otherwise not be feasible. Global ReLeaf-funded projects cover 18,000 acres of land, including both rural and urban locations. Projects must meet the following basic criteria:

- Site on public lands or certain public-accessible land on private property
- Forest ecosystem damaged by natural disasters or human mismanagement
- Plantable area of 20 acres or more

Due to the keen competition for grants, successful project proposals leverage local support resulting in a lower cost per tree and maximizing the number of trees planted for the funds available. Grants are made available annually in advance of the growing season.

Funding: The funds provided are generally for the costs associated with planting seedlings (including site preparation, seedling purchase, contracting, and shelters). Successful proposals have seedlings costing between \$.25 and \$.50 a piece.

Connection with State NPS Program: Forest restoration projects can reduce NPS pollution loads compared to pre-existing land uses to forest. For land owners who do not wish to work with government programs, the private non-profit funding source provides a viable alternative when financial assistance is needed. Since the year 2000, 24 projects have been funded in Maryland. In recent years, projects were associated with restoration efforts by The Natural Conservancy in Western Maryland.

Application: Visit the American Forests Web site to apply. There are two grant cycles per year, January 15 and July 1, with notification in two to three months.

Web site: <http://www.americanforests.org/our-programs/global-releaf-projects/global-releaf-grant-application/global-releaf-project-criteria/>

6.C.6.b Rauch Foundation Grants

Overview: The Rauch Foundation aims to restore the Chesapeake Bay by increasing land and water protection and restoration, expanding the capacity of other organizations to do this work, engaging citizens in this work, and transforming systems that impede progress. In the area of water pollution, the Rauch Foundation supports the implementation of sustainable farming efforts, and the conservation and restoration of lands that affect water quality. This grant focuses on projects in Baltimore City, Baltimore County and the six counties of the mid and upper Eastern Shore. Nonprofits and local governments may apply.

Funding: Sample grants range up to \$150,000 over two years.

Connection with State NPS Program: The Foundation provided support for the merger of local watershed groups to form Blue Water Baltimore. In 2014, Blue Water Baltimore was selected for nearly \$50,000 of State grant funding thru the Chesapeake and Atlantic Coastal Bays Trust Fund to implement NPS BMPs in Baltimore City.

Web site: <http://www.rauchfoundation.org>

| Abbreviations Key for the General Public | |
|---|--|
| 319 | Federal Clean Watershed Act Section 319(h), addresses nonpoint sources |
| AMAP | NRCS Agricultural Management Assistance Program |
| AWEP | NRCS Agricultural Water Enhancement Program |
| AMD | Acid mine drainage |
| BMP | Best Management Practice |
| BRF | Bay Restoration Fund (Maryland) |
| CAC | Citizens Advisory Committee |
| CBIG | Chesapeake Bay Implementation Grant |
| CBNERR | Chesapeake Bay National Estuarine Research Reserve |
| CBP | Chesapeake Bay Program |
| CBRAP | Chesapeake Bay Regulatory and Accountability Program (EPA grant to states) |
| CES | Cooperative Extension Service (University of Maryland) |
| COMAR | Code of Maryland Annotated Regulations |
| CMP | Coastal Management Plan (relates to the Coastal Zone Management Act) |
| CREP | Conservation Reserve Enhancement Program (USDA Farm Service Agency) |
| CRP | Conservation Reserve Program (USDA Farm Service Agency) |
| CSO | Combined Sewer Overflow |
| CSREES | Cooperative State Research Education and Extension Service |
| CWA | Clean Water Act (Federal) |
| CWRAC | Coastal and Watershed Resources Advisory Committee |
| CZM | Coastal Zone Management |
| CZMA | Coastal Zone Management Act |
| DHMH | Department of Health and Mental Hygiene (State of Maryland) |
| DNR | Department of Natural Resources (State of Maryland) |
| DoD | U.S. Department of Defense |
| EPA | US Environmental Protection Agency |
| EQIP | Environmental Quality Incentives Program (NRCS) |
| FFY | Federal Fiscal Year (October 1 thru September 30) |
| FIFRA | Federal Insecticide, Fungicide, and Rodenticide Act |
| FIP | Forestry Incentive Program |
| FSA | Farm Service Agency (USDA) |
| GIS | Geographic Information Systems |
| IBI | Index of Biotic Integrity |
| ICPRB | Interstate Commission on the Potomac River |
| IPM | Integrated Pest Management |
| MACS | Maryland Agricultural Cost Share Program |
| MBSS | Maryland Biological Stream Survey |
| MCBP | Maryland Coastal Bays Program (private nonprofit group) |
| MDA | Maryland Department of Agriculture |
| MDE | Maryland Department of the Environment |
| MDE-LMA | Land Management Administration |
| MDOT | Maryland Department of Transportation |
| MDP | Maryland Department of Planning |
| MEA | Maryland Energy Administration |

| Abbreviations Key for the General Public | |
|---|--|
| MHT | Maryland Historic Trust |
| MS4 | Municipal Separate Storm Sewer System |
| MWCOG | Metropolitan Washington Council of Governments |
| MWMC | Maryland Water Monitoring Council |
| NEIEN | National Environmental Information Exchange Network |
| NOAA | National Oceanographic and Atmospheric Agency |
| NPDES | National Pollutant Discharge Elimination System |
| NPS | Nonpoint Point Source, sources of pollution not traced to single point of origin |
| NRCS | National Resources Conservation Service (part of the US Dept. of Agriculture) |
| PDA | Public Drainage Association |
| PFA | Priority Funding Area |
| RCA | Resource Conservation Area |
| SARE | Sustainable Agriculture Research and Education (grant program) |
| SAV | Submerged Aquatic Vegetation |
| SCD | Soil Conservation District (local government entity, agricultural programs) |
| SCWQP | Soil Conservation and Water Quality Plan |
| SHA | State Highway Administration (part of Maryland Dept. of Transportation) |
| SMCRA | Federal Surface Mining Control and Reclamation Act |
| SWAP | Small Watershed Action Plan (synonyms: WIP, WRAS) |
| SWQAC | State Water Quality Advisory Committee |
| SRF | State Revolving Fund |
| STAC | Scientific and Technical Advisory Committee |
| TEAM | Teaching Environmental Awareness in Maryland |
| TMDL | Total Daily Maximum Load |
| UME | University of Maryland Extension |
| USDA | United States Department of Agriculture |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |
| WET | Water Education for Teachers |
| WHIP | Wildlife Habitat Incentive Program (NRCS) |
| WIP | Watershed Implementation Plan (synonyms: WRAS, SWAP) |
| | Woodland Incentives Program |
| WQIA | Water Quality Improvement Act |
| WRAS | Watershed Restoration Action Strategy (synonyms: WIP, SWAP) |
| WRP | Watershed Reserve Program |
| WSSC | Washington Sanitary Sewer Commission |

Appendix – Maryland’s Chesapeake Bay Two-Year Milestones

- Maryland 2014-2015 BMP Milestones
- Maryland’s 2014-2015 Programmatic Two-Year Milestones
- Maryland 2016-2017 BMP Milestones
- Maryland’s 2016-2017 Programmatic Two-Year Milestones

Maryland 2014-2015 BMP Milestones

5/15/2014

| BMP NAME | UNITS | FY14-15 Milestone Incremental | Comment/Interpretation |
|---|------------|-------------------------------|--|
| Agriculture | | | |
| Alternative Crops | ACRE | 141 | |
| Barnyard Runoff Control | ACRE | 252 | |
| Conservation Plans/SCWQP | ACRE | 926,207 | |
| Conservation Tillage | ACRE | 765,058 | |
| Cover Crops | ACRE | 386,007 | |
| Cropland Irrigation Management | ACRE | 105,864 | |
| Dairy Manure Incorporation | ACRE | 10,340 | Same as Dairy Manure Injection |
| Decision/Precision Agriculture | ACRE | 299,212 | |
| Enhanced Nutrient Management | ACRE | 207,393 | |
| Forest Buffers | ACRE | 353 | |
| Grass Buffers; Vegetated Open Channel | ACRE | 866 | |
| Heavy Use Poultry Area Concrete Pads | Operations | 31 | |
| Horse Pasture Management | ACRE | 713 | |
| Irrigation Water Capture Reuse | ACRE | 560 | |
| Land Retirement to hay without nutrients | ACRE | 973 | Same as Retirement of Highly Erodible Land |
| Loafing Lot Management | ACRE | 55 | Livestock Heavy Use Area Protection |
| Manure Transport | TON | 44,000 | |
| Mortality Composters | Operations | 34 | Same as Composting Facility |
| Non Urban Stream Restoration | FEET | 11,071 | Same as Streambank Restoration |
| Nutrient Management -Cropland | ACRE | 458,628 | |
| Nutrient Management -Pasture | ACRE | 76,714 | |
| Off Stream Watering Without Fencing | ACRE | 1,832 | Same as Stream Protection without Fencing, Same as Watering Facility |
| Phytase | % | | |
| Poultry Litter Incorporation | ACRE | 62,080 | Same as Poultry Manure Incorporation |
| Precision Intensive Rotational Grazing | ACRE | 637 | |
| Prescribed Grazing | ACRE | 4,184 | |
| Shoreline Erosion Control | FEET | 5,838 | |
| Sorbing Materials in Ag Ditches | ACRE | 386 | |
| Stream Access Control with Fencing | ACRE | 565 | |
| Tree Planting; Vegetative Environmental Buffers - Poultry | ACRE | 48 | |
| Urban Nutrient Management | ACRE | 220,000 | |
| Waste Structures, Livestock | Structures | 55 | Roughly 125 AU/structure for livestock |
| Waste Structures, Poultry | Structures | 12 | Roughly 270 AU/structure for poultry |
| Water Control Structures | ACRE | 2,411 | |
| Wetland Restoration | ACRE | 645 | |
| Natural Filters on Public Lands | | | |
| Wetland Restoration | ACRE | 135 | |
| Streamside Forest and Grass Buffers (Non) | ACRE | 28 | |
| Urban and Forest BMPs | | | |
| Stormwater Retrofits - ALL | ACRE | 12,000 | |

| BMP NAME | UNITS | FY14-15 Milestone Incremental | Comment/Interpretation |
|------------------------|-------|----------------------------------|------------------------|
| Septic Systems | | | |
| Septic Denitrification | COUNT | 2,400 | |

Maryland’s 2014 - 2015 Programmatic Two-Year Milestones

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|--|--|--------------------------|-------------|--|
| (Point Sources/Major Municipal) | | | | |
| 2015 | Cumulative Number of Major WWTP Upgrades to ENR Completed. | 51 of 76 Plants | MDE | ENR construction for 47 of the original 67 plants identified for ENR upgrades will be completed. In addition to these, 4 of 9 federal/private (non-BRF funded) facilities, will be upgraded for a total of 51 of 76 plants. Note: The effect on nutrient loads of plants upgraded in calendar year 2015 may not be reflected in load changes in the 2015 Annual Progress evaluation, because the Annual Progress evaluation reflects activities in fiscal year 2015. |
| (Point Sources/Minor Municipal) | | | | |
| 2014-2015 | <p>Upgrades of Minor WWTPs:</p> <ul style="list-style-type: none"> –Evaluate feasibility, cost effectiveness, permitting, and funding options. –Coordinate with local governments. –Execute grant agreements for BNR and ENR funding. –Include BRF, state cost-share funds and low interest loans request into State annual budgets. –Modify NPDES permits for minor WWTPs upgrading with BRF funding to include WLA. | List of candidate plants | MDE | In 2012 the Maryland General Assembly approved legislation to double the BRF fee starting July 1, 2012. In addition, the legislative amendment approved in the 2012 General Assembly session, HB 446 established additional authorized uses for BRF. Increased fee and expanded BRF uses will allow Maryland to begin funding planning, design and construction of ENR upgrades of minor WWTPs seeking state funding, while completing the upgrade of major plants. |

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|---|---|--|-------------|--|
| (Point Sources/Minor Industrial) | | | | |
| 2014-2015 | <p>Update minor industrial nutrient load data:</p> <ul style="list-style-type: none"> –Evaluate minor industrial permits to determine if significant quantity of nutrients might be produced. –Require, where considered necessary, appropriate combinations of effluent data and/or material balance for nutrients. –Require, where considered necessary, monitoring and/or nutrient reductions. –Update minor industrial facilities lists, input decks to reflect permit evaluation, findings, permit requirements. | Summary of the update | MDE | <p>Existing facilities will be required, as needed, to provide appropriate combinations of effluent data and/or material balance for nutrients.</p> <p>Survey requirements are being implemented in minor permits as they are renewed.</p> |
| Septic Systems | | | | |
| 2015 | Historical Data Cleanup (Septic Systems) | 2015 Submittal to EPA Bay Program | MDE/MDP | In collaboration with MDP, MDE SSA will facilitate local septic system inventory refinements and submittals to the Chesapeake Bay Program. The 2015 submittal will be an opportunity for local partners to provide their most accurate septic system inventories for use in calibrating the Phase 6 watershed model. |
| 2014-2015 | Develop and launch net-based BAT data tracking /reporting system for new and replacement systems (to be tracked separately). | Net-Based BAT tracking/reporting system. | MDE | Meet with IT and stakeholders representing the industry and local government to outline and finalize database needs. Finalize scope of work. |

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|---------------------------------------|--|---|-------------|--|
| | Outreach to stakeholders representing the industry and local government on reporting BAT upgrades using new net-based system. | | | The net-base system will allow for more efficient, comprehensive data collection, automated tracking/reporting of progress in upgrading septic with BAT, provide the necessary data for modeling implementation, tracking load reductions from septic sector. |
| 2014-2015 | Refine septic strategy to increase implementation and load reductions from the septic sector. When feasible and cost effective, encourage septic connection to ENR upgraded plant as an alternative to BAT upgrade. | Revised septic implementation strategy | MDE | Develop new options, strategies for reducing septic loads. Identify steps, potential legislation to increase implementation, level of reductions, gap closures to address septic load reductions. |
| (Urban Stormwater/Phase I MS4) | | | | |
| 2014 | Complete issuance of the Phase I MS4 Permits | | MDE | Work with EPA and local jurisdictions to complete issuance of NPDES MS4 permits for Phase I jurisdictions. - Tentative Determination for the remaining county Phase I MS4 permits by June 15, 2014 and Maryland SHA by December 31, 2014 - Final Determination for the remaining county Phase I MS4 permits by December 31, 2014 |
| 2014 -2015 | Guidance to local governments on meeting MS4 permits requirements, Bay restoration requirements, tracking, monitoring, and verification | Updated MS4 Guidance, Final Geodatabase and corresponding User's Guide. | MDE | MDE incorporated the MS4 guidance in draft permits and will finalize a guidance based on adopted recommendations from the CBP's Urban Stormwater Work Group. Revised guidance will be included in Phase I and II |

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|-------------|---|-------------|-------------|--|
| | <p>procedures.</p> <ul style="list-style-type: none"> –Finalize the stormwater retrofit guidance; make it consistent with adopted recommendations from the CBP's Urban Stormwater Work Group - September 30, 2014. –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. | | | <p>permits in tandem with the promulgation of the permits.</p> <p>MDE continues to participate in CBP's Urban Stormwater Work Group and will incorporate any 2013 recommendations into an updated version of the MS4 restoration guidance.</p> <p>MDE has been updating an NPDES Geographic Information System (GIS) database, which is "Attachment A" of the permit. The geodatabase (GDB) will provide for better organization of the MS4 program data, remove redundancies and allow for important statewide data collection processes and assessments to be automated and shared with various community partners. The improved geodatabase design can be used to automate reports, aid in the assessment of MS4 management programs, and provide the necessary data for modeling implementation plans in response to total maximum daily loads (TMDLs), stormwater waste load allocation (WLAs), and Chesapeake Bay Program milestones.</p> <p>The database will be accompanied by the Geodatabase User's Guide. Both are being developed with funding from the EPA's CBRAP grant.</p> <p>The User Guide will show how various implementation projects can be graphically represented in the MS4 geodatabase to ensure that maximum credit is received under the</p> |

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|--|--|--|-------------|---|
| | | | | Chesapeake Bay Program (CBP) when either approved or alternative BMPs are used for restoration or to meet SWM ESD to MEP requirements for new development. |
| (Urban Stormwater/Phase II MS4) | | | | |
| February 2014 | Submit draft Phase II MS4 permits to EPA | Draft Permits for Phase II MS4 jurisdictions | MDE | MDE has drafted Phase II MS4 permits with 20 percent restoration requirement and submitted them to EPA for review on February 7, 2014. |
| 2014-2015 | Complete issuance of Phase II MS4 permits based on the new and expanded urbanized areas identified in the 2010 Census. | Tentative Determination for Phase II MS4 permits | MDE | Following EPA review: - Tentative Determination for Phase II MS4 permits by December 31, 2014. - Final Determination for Phase II MS4 permits by June 15, 2015. |
| Stormwater – Other | | | | |
| 2014 | Construction General Permit | Finalized Permit | | -Tentative Determination by June 15, 2014 - Final Determination by December 31, 2014. |
| 2014 | General Permit for Industrial Stormwater Discharge will address restoration of impervious surfaces for a specific subset of facilities | Finalized Permit | MDE | Permit became effective on January 1, 2014. |
| 2014 | Letter of Agreement with EPA | Signed Letter | | Letter of Agreement with EPA responding to EPA’s assessment of Maryland’s stormwater program. |
| 2014-2015 | Outreach to non-MS4 jurisdictions on reporting SWM requirements, retrofit BMPs. | Documentation of outreach | MDE | |
| 2014 and 2015 | Maryland will ask its Congressional delegation to work to pursue the authorization for federal funding to support | Annual Correspondence | MDE | |

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|-------------|---|---|-------------|---|
| | urban/suburban stormwater restoration for the Chesapeake Bay jurisdictions through either pending or new legislation. | | | |
| 2014-2015 | Chesapeake and Atlantic Coastal Bays Trust Fund: Green Streets, Green Towns, Green Jobs Initiative | The program will engage 15 communities to implement greening plans that reduce stormwater runoff through impervious surface removal and green infrastructure, increase tree canopy, improve air quality, improve local and Bay water quality, and enhance the quality of life in communities throughout the State of Maryland. DNR and the Trust Fund will identify additional funds to continue partnership. | DNR | The Green Streets, Green Jobs, Green Towns (G3) Grant Program is administered by the Chesapeake Bay Trust, and jointly funded by the State of Maryland (Chesapeake and Atlantic Coastal Bays Trust Fund), the Chesapeake Bay Trust, and EPA. The RFP was released in early November and close on February 14, 2014. After a review period and CBT Board approval, 19 recipients were awarded with the \$3M Trust Fund investment. An event is tentatively planned for June 18, 2014 to announce all awardees. |
| 2014-2015 | Chesapeake and Atlantic Coastal Bays Trust Fund : Urban non-point source solicitation | The Chesapeake & Atlantic Coastal Bays Trust Fund will solicit, review and fund proposals to 25 grantees to implement the most cost-effective nutrient and sediment reduction projects in areas of the State that have been heavily impacted by previous development | DNR | A Request for Proposals was issued in fall 2013 to fund Capital Improvement projects to compliment previously identified projects in FY 14 and to identify projects for FY 15 funding. Awards were made based on cost-effectiveness (cost per unit of nutrients and sediments reduced), reduction efficiency, and readiness to proceed. Projects were also be evaluated on geographic targeting that emphasizes urban and suburban watersheds demonstrating the highest nutrient loads to the main stem of the Chesapeake Bay. Seven proposals were accepted for FY 14 remaining dollars (~\$9M) and 15 proposals for the \$25M |

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|-------------|--|--|-------------|--|
| | | | | available in FY15. |
| 2014-2015 | Historical BMP Cleanup (Stormwater) | –2014 BMP Submittal to EPA Bay Program. –2015 BMP Submittal to EPA Bay Program | MDE | MDE SSA will facilitate local stormwater BMP inventory refinements and submittals to the Chesapeake Bay Program. The 2014 submittal will be a “test” submittal. The 2015 submittal will be the final opportunity for local partners to provide their most accurate stormwater BMP inventories for use in final calibration of the Phase 6 watershed model. |
| 2014-2015 | Chesapeake and Atlantic Coastal Bays Trust Fund: Leadership by Example: Stormwater and Nutrient Abatement Program (SNAP) | The program will identify, evaluate, prioritize and implement stormwater management and nutrient reduction opportunities on State lands with \$12.3M dedicated in FY14 and \$6M in FY15 | DNR | SNAP is needed because under the Bay TMDL the State, not counting SHA, must reduce nutrient loadings on State land by 34,623 lbs of Nitrogen and 3,907 lbs of Phosphorus. In addition to the State allocations, SHA has a further load reduction of 108,395 lbs of Nitrogen 12,390 lbs of Phosphorus. This program will help the State reach its allocated TMDL reduction and provide a great sense of leadership by example throughout the state. |
| 2014-2015 | SMART Homeowner BMP Tracking Tool | Statewide release in 2014 of an Online Tracking Tool to Quantify the Contribution of Small Scale Community and Homeowner Best Management Practices (BMPs) in the Chesapeake Bay Total Maximum Daily Load (TMDL). | UME/ DNR | Maryland Sea Grant Extension Partnered with The Center for GIS at Towson University in the development of an interactive mapping and tracking tool for counties and towns to account for small scale residential BMPs that will help them show nutrient reductions in compliance with TMDLs and NPDES and MS4 permit requirements. Three counties are currently testing the tool. |
| 2015 | Online BMP Reporting Tool for Non-MS4 local governments. | Online reporting tool | MDE | MDE is developing an online reporting tool that will allow non-MS4 local governments to submit stormwater management information |

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|--------------------|---|--|-------------|--|
| | | | | for new development and retrofits of existing development with little or no controls. This tool relates to the SMART Homeowner BMP tool as follows: Private property owners may report to local governments via the SMART Tool and the local governments report to the State via the Online BMP Reporting tools, including the Geodatabase tool being developed for MS4 jurisdictions. |
| 2014-2015 | Chesapeake and Atlantic Coastal Bays Trust Fund : Watershed Assistance Collaborative/Stormwater Financing | Provide leadership with a dedicated DNR staff and continue funding for Maryland’s Watershed Assistance Collaborative’s (WAC) effort to work with 3 new communities. | DNR | One of the major barriers to implementation is a consistent and reliable funding stream to achieve restoration goals. As a member of the WAC, the Environmental Finance Center is working to address community’s stormwater financing questions and help craft a strategy that best meets local needs. |
| FY14 | Chesapeake and Atlantic Coastal Bays Trust Fund: GO Bonds for Stormwater Infrastructure past FY 15 | Maintain GO Bonds support past SFY 15 to the Trust Fund to accelerate State and local efforts to improve the health of the Chesapeake Bay and support local economies. | DNR | GO Bonds have been used to leverage local projects in FY 13 & 14. In FY 15, Maintain funding for projects developed from local stormwater utilities. |
| Agriculture | | | | |
| FY14 | Chesapeake and Atlantic Coastal Bays Trust Fund: Animal Waste Technology Fund | The Maryland Department of Agriculture (MDA) through the Advisory Committee for the Animal Waste Technology Fund is working to determine funding mechanisms as well as soliciting proposals for funding that will support pilots for alternative | MDA | MDA has \$2.5 million available to invest in these types of innovative technologies during State Fiscal Year 2014, which ends June 30, 2014. This could include offering technologies, equipment, infrastructure, or services that can improve the management and utilization of manure and other agricultural waste resources. |

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|-------------|--|--|-------------|--|
| | | technologies that use and manage animal waste, including manure-to-energy technologies. | | |
| FY14 | Manure Matching Service | Manure Matching Service that connects livestock producers who have excess animal manure with other farmers or alternative use projects that can use the product as a valuable resource. | MDA | |
| FY14 | Certainty | The Maryland Agricultural Certainty Oversight Committee is working to develop regulations by spring 2014 needed to implement the Agricultural Certainty Program passed by the General Assembly and signed by the Governor in 2013. | MDA | |
| 2014-2015 | Chesapeake and Atlantic Coastal Bays Trust Fund: Innovative Technology Fund Manure to Energy Program | Working with the University of Maryland’s Maryland Industrial Partnership and others, MD will advance implementation of manure to energy technologies and quantify their nutrient reduction benefits by funding 1-5 projects. | DNR | In SFY 14 and 15 \$0.5 million will be allocated each year to the Innovative Technology Fund for particular use in developing nutrient reduction technologies compatible with manure-to-energy generation. This provides the opportunity to reduce nutrients through research and development. |
| 2014 | Promulgate regulations in 2014 to implement a new Phosphorus | Regulation | MDA | |

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|--|--|--|-------------|--|
| | Management Tool using a phased-in approach. | | | |
| 2014-2015 | Renew the general discharge permit for animal feeding operations. | Renew General Permit | MDE | |
| Accounting for Growth and Nutrient Trading Programs | | | | |
| 2014 | Adopt final Accounting for Growth regulations | Finally adopted regulations | MDE | Events could delay this schedule if there is serious opposition to the proposed regulations. |
| December 31, 2014 | Communicate the roles and responsibilities of Accounting for Growth to local jurisdictions. | Documentation of meetings | MDE | |
| 2014 - 2015 | Complete the development of a tracking system for accounting for new growth. | Tracking system | MDE/ MDA | Developed through the State Conservation Innovation Grant. |
| 2014-2015 | Revise the Policy Documents for trading to harmonize with the Accounting for Growth program. | Revised policy documents | MDE/ MDA | Among other things, this process will address EPA's nine elements of trading programs common to all Bay jurisdictions. |
| 2014-2015 | Enhance Implementation through Nutrient Trading. | Trading among the sectors is being researched and developed by MD state agencies to potentially offset growth and help lower implementation costs. | MDA | |
| Other | | | | |
| 2015 | Historical Data Cleanup (Landuse) | -2015 Submittal to EPA Chesapeake Bay Program (CBP) | MDE/ MDP | In collaboration with MDP, MDE SSA will facilitate local landuse inventory refinements and submittals to the Chesapeake Bay Program. The 2015 submittal will be an opportunity for local partners to provide their most accurate landuse inventories for use in calibrating the Phase 6 watershed model. |

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|--------------------|--|---|--------------------|--|
| 2015 | BMP Tracking and Reporting Documentation | Update of the State’s documentation of dataflow for BMP reporting from local sources, through the State and to the CBP. | MDE | |
| 2014 | Application of Innovative Technologies | Develop a new program for pilot scale demonstrations of technologies, providing greater confidence that the technologies will function when implemented under operational conditions. | DNR | DNR will work with state and federal partners, and private parties, to enhance field testing of promising Bay restoration technologies; helping to close the gap between research and development and commercialization. |
| 2014 | Advance the adoption of innovative Natural Filter BMPs verified as options to accelerate Bay restoration | Two new innovative BMPs will be reviewed using the Bay Partnership approval process. | DNR | Working with the Bay Program Partnership, MD will continue to offer support to review various new BMPs. Specifically, DNR staff will work on innovative BMPs that would be considered natural filters. Natural filter BMPs are often the most efficient for nutrient and sediment reduction as they utilize biomimicry. Continue working with the Chesapeake Bay Program to define and estimate reductions of new BMPs. As more Innovative Technology Fund projects prove successful, staff will nominate the technology for a BMP review and continue to staff the expert panels. |
| 2014-2015 | Develop Lawn-to-Woodland Program | Program rules and partners in place | DNR | Being developed in partnership with National Arbor Day Foundation |
| 2014- 2015 | Expanded cost-share for no-net-loss of forests | Program rules and partners in place | DNR | Sustainable Forestry Act of 2013 authorized expansion |

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|--------------------|--|--|--------------------|--|
| 2014-2015 | Tracking expanded buffer planting through Backyard Buffers | Survival reports allow verified estimate of residential buffer tree planting | DNR | Participant surveys and spot checks are now being used and will be collated to develop survival estimates. |

DNR – Maryland Department of Natural Resources

MDA – Maryland Department of Agriculture

MDE – Maryland Department of Environment

MDP – Maryland Department of Planning

Maryland 2016-2017 BMP Milestones

4/29/2016

| BMP NAME | UNITS | FY16-17 Milestone Incremental | Comment/Interpretation |
|---|-----------------|-------------------------------|--|
| Agriculture | | | |
| Alternative Crops | ACRE | 480 | |
| Barnyard Runoff Control | ACRE | 656 | |
| Conservation Plans/SCWQP | ACRE | 1,026,413 | |
| Conservation Tillage | ACRE | 765,487 | |
| Cover Crops | ACRE | 417,014 | |
| Cropland Irrigation Management | ACRE | 119,728 | |
| Dairy Manure Incorporation | ACRE | NA* | Same as Dairy Manure Injection |
| Forest Buffers | ACRE | 927.46 | |
| Grass Buffers; Vegetated Open Channel | ACRE | 2,273 | |
| Heavy Use Poultry Area Concrete Pads | Operations/ACRE | 81 | |
| Horse Pasture Management | ACRE | 2,994 | |
| Irrigation Water Capture Reuse | ACRE | 2,120 | |
| Land Retirement to hay without nutrients (HEL) | ACRE | 2,554 | Same as Retirement of Highly Erodible Land |
| Loafing Lot Management | ACRE | 145 | Livestock Heavy Use Area Protection |
| Manure Transport | TON | 51,000 | |
| Mortality Composters | Operations | 88 | Same as Composting Facility 1 oper = 50 AU |
| Non Urban Stream Restoration | FEET | 29,061 | Same as Streambank Restoration |
| Nutrient Management (All Forms) | ACRE | 939,000 | |
| Off Stream Watering Without Fencing | ACRE | 4,809 | Same as Stream Protection without Fencing, Same as Watering Facility |
| Poultry Litter Incorporation | ACRE | NA* | Same as Poultry Manure Incorporation |
| Poultry Litter Treatment | Operations | 270 | Same as Ammonia Emission Reduction |
| Precision Intensive Rotational Grazing | ACRE | 1,671 | |
| Prescribed Grazing | ACRE | 10,982 | |
| Shoreline Erosion Control | FEET | 15,324 | |
| Sorbing Materials in Ag Ditches | ACRE | 3,097 | |
| Stream Access Control with Fencing | ACRE | 1,490 | |
| Tree Planting; Vegetative Environmental Buffers - Poultry | ACRE | 125 | |
| Urban Nutrient Management (Commercial Applicators) | ACRE | TBD | |
| Waste Structures, Livestock | Structures | 144 | Roughly 125 AU/structure for livestock |
| Waste Structures, Poultry | Structures | 31 | Roughly 200 AU/structure for poultry |
| Water Control Structures | ACRE | 10,116 | |
| Wetland Restoration | ACRE | 2,710 | |
| Urban and Forest BMPs | | | |
| Stormwater Retrofits - ALL | ACRE | 14,000 | 1,750 impervious acres per year |
| Septic Systems | | | |
| Septic Denitrification | COUNT | 2,400 | |
| Point Sources | | | |
| Wastewater ENR Reductions (Completed Upgrades) | Facilities | 63 of 67 | |

NA* - Incorporation is part of Nutrient Management and may not have a separate BMP Implementation level

Maryland’s 2016 – 2017 Programmatic Two-Year Milestones

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|--------------------------------------|--|--|-------------|---|
| Point Sources | | | | |
| 2016-2017 | Improve point source data quality through NetDMR implementation. -Advocate NetDMR reporting to all NPDES permittees. -Train NPDES permittees on using web-based NetDMR system. - Facilitate creation of NPDES and outfall specific NetDMR accounts, approval of administrator authority and going “live” with data entry. | Report NetDMR implementation | MDE - WMA | |
| Point Sources/Major Municipal | | | | |
| 2016-2017 | Upgrade Major WWTPs to ENR with State grant/loan support. | A cumulative total of 63 of 67 major WWTPs will have completed construction. | MDE - WQFA | Maryland’s Phase II WIP called for upgrading 67 major WWTP plants with State funds*. MDE is on track to meet this goal. State funds are available and MDE seeks Maryland Board of Public Works approval upon initiation of construction. Current status: 42 of the 67 WWTPs are in operation 21 are under construction 3 in design 1 in planning * 9 additional federal and privately owned plants, being upgraded at their own expense, are not included in this accounting. |

Maryland 2016-2017 Programmatic Milestones
FINAL 6/14/16

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|---------------------------------------|--|--|-------------------------------------|--|
| Point Sources/Minor Municipal | | | | |
| 2016-2017 | Upgrade minor WWTPs to ENR with State grant/loan support. | A cumulative total of 8 minor WWTPs will have completed construction; the Phase II WIP goal requires 5 minor plant upgrades. MDE will provide an inventory of WWTPs that have been upgraded and those scheduled for upgrades based on EPA template. | MDE - WQFA | Maryland's Phase II WIP called for upgrading 5 large minor WWTPs to achieve about 50,000 pounds of nitrogen reduction. MDE is on track to exceed the goal for minor WWTP upgrades. Currently State funding is being allocated to 15 minor plants. Current Status: 3 WWTPs are in operation 4 are under construction 4 in design 4 in planning |
| Point Sources/Minor Industrial | | | | |
| 2016-2017 | Update minor industrial nutrient load data. | Summary of the minor industrial load data updates. | MDE - WMA/SSA | |
| Septic Systems | | | | |
| 2016-2017 | Facilitate implementation of septic connections to ENR facilities in Critical Area and other areas of Maryland with funding support of BRF funds. - Provide technical and policy assistance to local governments to facilitate connections of septic tanks to WWTPs. -Market recent changes in the eligible use of BRF as a funding source for septic connections to ENR facilities. | Report number of Septic Connections to ENR facilities. New programs will be part of the December 2015 and future solicitations. | MDE WMA/ MDP MDE - WQFA | This program will start in FY 2018 (7/1/2017) |
| 2016-2017 | Improve tracking and reporting | Reports to SSA (Bay | MDE - | |

Maryland 2016-2017 Programmatic Milestones
FINAL 6/14/16

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|-------------------------------------|---|--|----------------|-------------------------|
| | of O&M and BAT upgrades via newly developed and launched net-based BAT data tracking database. | Program) on BAT implementation and O&M. | WMA | |
| 2016-2017 | Review and expand a range of new, innovative, cost-effective nutrient removal BAT technologies to be available for upgrade of septic systems in Maryland. | Develop criteria for evaluation and selection of new BAT systems utilizing national peer reviewed BMPs (soil distribution and other innovative practices.) | MDE - WMA | |
| Urban Stormwater/Phase I MS4 | | | | |
| 2016 | Phase I MS4 Financial Assurance Plans. - Analyze all financial assurance plans based on the specific criteria in Maryland law for what constitutes an adequate financial assurance plan. | Report on the status of Phase I MS4 Financial Assurance Plans by September, 2016. | MDE - WMA | |
| 2017 | Report Phase I MS4 BMP implementation for Progress via newly developed GIS database | Database output | MDE - WMA/ SSA | |
| 2016-2017 | Maryland will develop an MS4 permit template for EPA review that articulates the requirements of the Phase I permits set to expire in 2018. A draft will be shared with the Agency and a final will be developed based on | Provide draft and final MDE template to EPA | MDE/ WMA | |

Maryland 2016-2017 Programmatic Milestones
FINAL 6/14/16

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|--------------------------------------|--|--|-------------|--|
| | that feedback before the end of the 2016/2017 milestone period. | | | |
| 2017 | Montgomery County Phase I MS4 Permit | Current Montgomery County permit will be administratively continued. MDE will enter into Consent Agreement with Montgomery County. | MDE/WMA | MDE is negotiating a Consent Agreement with Montgomery County. |
| 2016-2017 | Maryland will review, approve, and/or take appropriate enforcement actions according to established SOP on Phase I MS4 Restoration Plans submitted during or prior to the 2016/2017 period. Maryland will report to EPA on the status of reviews quarterly towards a target of completing at least 50% of the review actions by the end of 2016 and 100% by the end of 2017. | Provide MDE review documents to EPA. | MDE/WMA/SSA | |
| 2016-2017 | Keep MS4 Guidance up-to-date. – Include latest BMP efficiencies and flexibility in meeting permit requirements and 2025 goals. | Updates as appropriate | MDE - WMA | |
| 2016-2017 | Market BRF as an eligible funding source for SWM Retrofit implementation. | This new program will be the December 2015 and future solicitations | MDE - WQFA | This program will start in FY 2018 (7/1/2017) |
| Urban Stormwater/Phase II MS4 | | | | |
| 2016-2017 | Issue Tentative Determination for Phase II MS4 permits | September 30, 2016 | MDE - WMA | Phase II MS4 permits are currently |

Maryland 2016-2017 Programmatic Milestones
FINAL 6/14/16

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|--------------------|---|---|-------------|--|
| | <ul style="list-style-type: none"> - Review Draft Phase II permits for consistency with outcomes of the legal issues associated with Phase I MS4 permits. - Review and incorporate EPA’s final stormwater general permitting rule, to be published by EPA by November 17, 2016, into Maryland’s Phase II MS4 general permits. <p>Issue Final Determination for Phase II MS4 permits</p> | March 31, 2017 | | <p>expired; however, as allowed by the Code of Federal Regulations, both are administratively continued until new ones are issued.</p> <ul style="list-style-type: none"> - MDE continues to meet and work with the Phase II jurisdictions to prepare them for new requirements: MDE and EPA hosted a two-day Phase II Forum in November, 2015 in anticipation of issuing these permits; MDE published a “Getting Started” fact sheet to advise Phase II community of anticipated new requirements; MDE encourages all small MS4s to begin preparing for restoration requirements by evaluating the level of water quality treatment provided on existing impervious areas within their jurisdiction; MDE has developed a database structure for Phase II MS4 permittees to use for reporting stormwater best management practice (BMP) data. |
| Agriculture | | | | |
| 2016-2017 | Solicit proposals for funding that will support demonstrations for alternative technologies that use and manage animal waste, including manure-to-energy technologies. | Solicitations will be forthcoming in FY2016 and FY2017. | MDA/ DNR | Chesapeake and Atlantic Coastal Bays Trust Fund: Animal Waste Technology Fund MDA has approved 5 projects for use of FY14 and 15 funds. Three projects utilize poultry litter, one dairy manure and on horse manure. Four different technologies are being demonstrated. Grant solicitation for FY2016 issued 12/15/15 and proposals due 3/15/16. |
| 2016-2017 | Facilitate and provide continued | Connect livestock producers | MDA | |

Maryland 2016-2017 Programmatic Milestones
FINAL 6/14/16

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|-------------|---|---|-------------|--|
| | service in FY2016 and 2017 for the Manure Matching Service in support of the Maryland Phosphorus Initiative. | who have excess animal manure with other farmers or alternative use projects that can use the product as a valuable resource | | |
| 2016-2017 | Certify the verifiers for the Agricultural Certainty program. | Work closely with the Nutrient Trading Program and anticipate future trades will be used in conjunction with the Certainty Program. Continued outreach to local farm community | MDA | As of April 2016, MDA has certified four verifiers. |
| 2016-2017 | Accounting for growth in the Poultry Industry | Document current and future growth in the poultry industry through CAFO/MAFO permits numbers and reconcile those against NASS annual numbers. Estimate nutrients associated with manure incrementally over two year milestone period | MDA | Data is submitted to CBPO modelers to align with Poultry Litter Subcommittee Report for inclusion in the model Data is submitted to CBPO modelers to align with Poultry Litter Subcommittee Report for inclusion in the model |
| 2016-2017 | Phosphorus Management Tool using a phased-in approach through 2022 with potential to extend to 2024 for reasons of resource shortfalls. | Conduct a two year study (2015-2016) "PMT On-Farm Economic Analysis Project" to better understand outcomes and impacts of requirements. Collecting soil analysis data to better understand the scope | MDA | Regulation took effect June 8, 2015, restricting all farms with phosphorus FIV levels over 500 from applying manure. |

Maryland 2016-2017 Programmatic Milestones
FINAL 6/14/16

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|--------------------------------|---|---|-------------|---|
| | | of farm fields with phosphorus FIV levels above 150. Collect information to track operations according to the appropriate Tier that will govern PMT implementation schedule. | | |
| 2016-2017 | CAFO Permit/Registration | Increased registrations | MDE | Maryland will make its best effort to ensure all new CAFO/MAFOs receive permit coverage by December 2018 and all renewal registrations that are administratively extended are also processed. |
| Nutrient Trading Policy | | | | |
| 2016-2017 | Finalize Draft Maryland Trading and Offset Guidance Manual Explore potential for pilot projects. Finalize actions/recommendations of the Maryland Water Quality Trading Advisory Committee (WQTAC). | Final Maryland Trading and Offset Guidance Manual – January 2017. 2017-Report on status of the Pilot Projects. . | MDE/ MDA | The Draft Maryland Trading and Offset Guidance Manual is being reviewed by WQTAC. It consolidated MDE's 2008 point-to-point trading policy, MDA's trading policy documents and incorporated new trading policy for MS4 jurisdictions. WQTAC is completing the review of the Draft and will identify any needed amendments to State law and regulations, actions to implement trading. |
| 2016-2017 | Accounting for Growth | Policy on AfG | MDE | Continue formulation of an accounting for growth policy and regulations if appropriate |
| 2016 | Regulations that establish the requirements and standards for | Final Regulations | MDA | Regulations were adopted as proposed and amendments were simultaneously proposed on |

Maryland 2016-2017 Programmatic Milestones
FINAL 6/14/16

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|------------------------------------|---|---|--------------------|--|
| | the generation and certification of nutrient and sediment credits on agricultural land. | | | 04/15/16. Revisions are expected to be published in the <i>Maryland Register</i> of 05/13/16. |
| Sector Growth Demonstration | | | | |
| 2016-2017 | Sector Growth Demonstration | Sector Growth Demonstration Documentation | MDE - SSA | From EPA Interim Evaluation (June 2015): EPA expects Maryland to continue to identify new or increased sector loads and offset these within the appropriate timeframe and to continue to track and account for new or increased loads identified in sector growth demonstrations. The demonstration should address how to quantify and offset any increase of nutrients from increases in poultry houses that are projected for the Delmarva region. |
| Other | | | | |
| 2016-2017 | Market recently approved eligible uses of BRF and other State Funding Programs to increase implementation of Septic Strategies, SWM retrofits, Minor WWTP upgrades. | WQFA has already started with the solicitation to fund minor WWTPs. New programs will be part of December 2015 funding solicitation and every year thereafter, which will introduce these funding programs to over 600 eligible applicants. | MDE - WQFA | Please see minor WWTPs status above. |
| 2016 – 2017 | Chesapeake and Atlantic Coastal Bays Trust Fund: Cost-Effective Non-Point Source Pollution Reduction Projects | Increase funding available for competitive solicitations of the most cost-effective, efficient nonpoint source pollution reduction projects by exploring opportunities | DNR (Bay Agencies) | The SFY 16 Trust Fund budget allowed for \$9.8 M of special funds (tax revenue) to be competitively awarded based on a ‘pay for performance’ model. SFY 17 Trust Fund budget for competitive projects is \$20 M. Trust Fund managers will continue to target |

Maryland 2016-2017 Programmatic Milestones
FINAL 6/14/16

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|-------------|---|--|-------------|--|
| | | for private capital and continued leveraging of public funds. | | the funds on a cost-effective basis while exploring legislative and grant mechanism changes to leverage more private capital and investment in non-point source pollution reduction. |
| 2016-2017 | Chesapeake & Atlantic Coastal Bays Trust Fund: Strategic & Targeted Monitoring | Continue to monitor targeted Trust Fund projects sites for efficacy and annually issue a Restoration Research grant in partnership with Chesapeake Bay Trust to answer key scientific questions about Non-point Source pollution reduction projects. | DNR | The Restoration Research grant was initiated in SFY15 with roughly \$880,000 awarded to four projects focused on discovering additional scientific data on stream restoration. The SFY16 budget of \$550,000 will also focus on stream restoration to help inform restoration specialists, regulators, and legislators. Five projects have been selected but not awarded. In addition to these stream restoration monitoring sites, Resource Assessment Service continues to provide long-term monitoring of three subwatersheds to evaluate BMP implementation. |
| 2016 – 2017 | Chesapeake & Atlantic Coastal Bays Trust Fund: Technical Support through Restoration Specialists | Provide continued hands-on landscape level technical assistance to local governments and non-governmental organizations implementing restoration projects in the watershed | DNR | Five restoration specialists continue to provide technical assistance. |
| 2016 – 2017 | Chesapeake & Atlantic Coastal Bays Trust Fund: Technical Support through Soil Conservation District staff | Provide continued technical support to evaluate, design, and assist farmers with the installation of BMPs. | DNR/ MDA | Supports 50 SCD technical positions |
| | | | | |
| 2016 - 2017 | Chesapeake and Atlantic Coastal Bays Trust Fund: | Develop new non-point source BMPs for nitrogen, | DNR | (1) SFY16 & 17 budget sufficient to sustain this level of implementation; (2) Limited funds |

Maryland 2016-2017 Programmatic Milestones
FINAL 6/14/16

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|-------------|---|--|-------------|--|
| | Innovative Technology Fund | phosphorus and sediment reduction by: (1) Annually fund 2-6 research and development projects, and invest in one commercial project; (2) Develop and implement a new program for pilot scale demonstrations of technologies, providing greater confidence that the technologies will function when implemented under operational conditions; (3) Applicable new innovative BMPs will be reviewed using the Bay Partnership approval process. | | for one project are available in SFY16. DNR will continue to pursue partnerships with state, federal, and local government partners, as well as private parties, to enhance field testing of promising Bay restoration technologies; helping to close the gap between research and commercialization; (3) Working with the Bay Program Partnership, MD will continue to offer support for review of various new BMPs. Potential BMPs are: Agricultural Cascading Systems, Floating Treatment Wetlands. Algal Flow-way Technologies was approved by the Bay Program in winter 2016. |
| 2016 | BMP Calculator | Design and develop a publicly available open-source application that enables applicants and grantees to estimate the nitrogen, phosphorus and sediment reductions expected from their implementation projects. | DNR | CBIG funds are available for Chesapeake Commons to develop the tool for the Chesapeake and Atlantic Coastal Bays Trust Fund. The tool is available at FieldDoc.com for calculating BMP reductions. |
| 2016-2017 | Chesapeake and Atlantic Coastal Bays Trust Fund: Watershed Assistance Collaborative | Provide leadership with a dedicated DNR staff and continue funding for Maryland's Watershed Assistance Collaborative's (WAC) effort to expand the communities it works with | DNR | In addition to the five restoration specialists, long-term financing strategy development is provided by the Environmental Finance Center to local communities. These strategies will address local community stormwater financing and help craft strategies that best meet local needs. |

Maryland 2016-2017 Programmatic Milestones
FINAL 6/14/16

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|-------------|--|--|-------------|---|
| | | and improve outreach. Fund and manage two Watershed Specialists' outreach in 9 counties. | | |
| 2016-2017 | Local 2-year Milestone Support Funding | Annually provide at least \$1 million in funding to support local two-year milestone implementation. | DNR/MDE | Beginning in FFY14 MDE, DNR and the Chesapeake Bay Trust (CBT) began a collaborative process of administering federal funds to support local 2-year milestone implementation. This is an extension of the Watershed Assistance Grant Program (WAGP) initiated by DNR and CBT. This funding goes toward program development planning and the design of urban stormwater projects. The later leads to shovel-ready projects for larger capital grant funding of restoration. Funding continued in SFY16 and is in the SFY17 budget. |
| 2016-2017 | Create a Maryland Stream ReLeaf Implementation Plan for 2015-2020 through the multi-stakeholder Stream ReLeaf Coordinating Committee | Maryland Stream ReLeaf Implementation Plan for 2015-2020 | DNR | Membership is being updated, and the Stream ReLeaf Coordinating Committee will be meeting in September 2015 to outline goals. Plan should be drafted by early 2016. |
| 2016-2017 | Stormwater and Nutrient Abatement Program (SNAP) | Implementation of a program to identify, evaluate, prioritize and implement restoration projects on DNR lands to assist the State Highway Administration in reaching its allocated TMDL reduction. | DNR/SHA | A Memorandum of Understanding between DNR and SHA is under revision to provide restoration projects on DNR lands funded by SHA. The MOU will be signed in the fall of 2015 with one project implemented by the end of 2015 and additional projects coming on-line throughout the milestone period. |
| 2016 | SMART Homeowner BMP Tracking Tool | Statewide release in fall 2015/winter 2016 of an on-line tracking tool to quantify | UME/DNR | |

Maryland 2016-2017 Programmatic Milestones
FINAL 6/14/16

| Target Date | Milestone | Deliverable | Lead Agency | Comments/Status Updates |
|--------------------|------------------|--|--------------------|--------------------------------|
| | | the contribution of small scale community and homeowner BMPs | | |

Appendix - Components of Maryland's 2015-2019 Nonpoint Source Management Plan

The Maryland NPS Management Program is comprised of various components listed below that may be updated or revised as necessary to meet diverse needs and requirements. Updates and revisions to these components are intended to be updates and revisions to the State Program. The links to the Internet for each component are provided so that the most current version continues to be accessible.

Annual Reports

The Maryland 319 Nonpoint Source Program Annual Report is produced by the Maryland Department of the Environment. (see Appendix Internet Sources, 319(h), MDE 319 NPS Program)

Casselman River Watershed

The *Casselman River Watershed Plan for pH Remediation* was produced by the Maryland Department of the Environment and may be updated or revised when assessments of implementation progress are conducted. The most recent Annual Report provided an Internet link to download this document.

Chesapeake Bay Watershed

Maryland programs for NPS planning and implementation focused on the Chesapeake Bay are addressed in several documents listed below and also are publicly accessible. (see Appendix Internet Sources, Chesapeake Bay WIP) Some of these, such as the milestones, will be updated or revised in consideration of implementation progress:

- 2014 Chesapeake Bay Watershed Agreement
- Maryland's Phase I Watershed Implementation Plan for the Chesapeake Bay Total Maximum Daily Load
- Maryland's Phase II Watershed Implementation Plan for the Chesapeake Bay TMDL
- Two-Year Milestones

Continuing Planning Process

The Federal Clean Water Act Section 303(e) and EPA regulations require that each state maintain a Continuing Planning Process (CPP) document. Maryland's CPP explains State processes for administering its water programs. It also describes methods used to develop plans for protecting, maintaining and improving water quality. Maryland's CPP document was first completed in 1976, and has been updated in 1986, 2001 and 2007. (see Appendix Internet Sources, Continuing Planning Process)

Enforceable Policies

The listing of enforceable policies was last updated in 2011 including statewide authorities with emphasis on coastal areas. (see Appendix Internet Sources, Coastal Policies)

Integrated Report

Maryland's Integrated Report of Surface Water Quality is produced by the Maryland Department of the Environment every second year in accordance with Federal Clean Water Act Sections 303(d), 305(b) and 314. (see Appendix Internet Sources, 303(d))

Monitoring Strategy

The *State of Maryland's Comprehensive Water Monitoring Strategy* was produced by the Maryland Department of the Environment in 2009. (see Appendix Internet Sources, Monitoring Strategy)

State Revolving Fund

In order to rate and rank candidate project for funding by the State Revolving Fund, the Maryland Department of the Environment uses the *Integrated Project Priority System for Water Quality Capital Projects, Point Source and Nonpoint Sources*, which is reviewed and approved by EPA. (see Appendix Internet Sources, Water Quality Revolving Fund)

Success Stories

In Maryland, at least one success story is produced each year by the Maryland Department of the Environment to meet specifications set by EPA. (see Appendix Internet Sources, Success Stories)

Appendix - Internet Sources for Maryland's 2015-2019 Nonpoint Source Management Plan

| Name | Topic | Entity | Link |
|---------------------------------------|--|----------------|--|
| 303(d) | New Vision / guidance for States | EPA | http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/programvision.cfm |
| | Maryland Integrated Report | MDE | http://mde.maryland.gov/programs/Water/TMDL/Integrated303dReports/Pages/Programs/WaterPrograms/TMDL/Mar |
| 319(h) | MDE 319 NPS Program | MDE | http://www.mde.state.md.us/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319NPS/index.aspx |
| | Maryland 319(h) Grant | MDE | http://www.mde.state.md.us/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319nps/factsheet.aspx |
| | EPA 319(h) Grant | US EPA | http://water.epa.gov/polwaste/nps/cwact.cfm |
| Abandoned Mine Lands | restoration & acid mine drainage mitigation | MDE | http://mde.maryland.gov/programs/Land/mining/abandoned/Pages/AbandonedMineLandsDivision.aspx |
| Agriculture | State agency program | MDA | http://mda.maryland.gov/Pages/homepage.aspx |
| Anacostia Restoration Partnership | watershed restoration and protection | interagency | http://www.anacostia.net/index.html |
| Animal Feeding Operations | Maryland program | State of Md | http://www.mde.state.md.us/programs/Land/RecyclingandOperationsprogram/AFO/Pages/index.aspx |
| BayStat | Chesapeake Bay restoration tracking | State of Md | http://baystat.maryland.gov/ |
| Beaches Program | Maryland management under the federal law | MDE | http://www.mde.maryland.gov/programs/water/beaches/pages/beacheshome.aspx |
| Chesapeake Bay Agreement 2014 | Chesapeake Bay Agreement 2014 | US EPA | http://www.chesapeakebay.net/chesapeakebaywatershedagreement/page |
| Chesapeake Bay Commission | legislative cooperation by MD, PA, VA | interstate | http://www.chesbay.us/ |
| Chesapeake Bay Program | watershed restoration and protection | Federal | http://www.chesapeakebay.net/ |
| Chesapeake Bay Program Data | downloadable data | US EPA | http://www.chesapeakebay.net/data |
| Chesapeake Bay Trust | State grant funding program | State of Md | http://www.cbtrust.org/site/c.mjPKXPCJnH/b.5368633/k.BDEA/Home.htm |
| Chesapeake Bay WIP | implementation plans, milestones, initiatives | MDE | http://mde.maryland.gov/programs/Water/TMDL/ChesapeakeBayTMDL/Pages/programs/waterprograms/tmdl/cb_tmd |
| ChesapeakeState | Chesapeake Bay restoration tracking | EPA | http://stat.chesapeakebay.net/?q=node/130 |
| Clean Marina Program | voluntary marina participation/recognition | MDNR | http://www.dnr.state.md.us/boating/cleanmarina/ |
| Climate Change | Maryland programs and plan | State of Md | http://climatechange.maryland.gov/plan/ |
| Coastal NPS Program | Maryland Dept. of Natural Resources program | MDNR | http://dnr2.maryland.gov/ccs/Pages/programs.aspx |
| Coastal Policies | Enforceable authorities | State of Md | http://dnr2.maryland.gov/ccs/Pages/coastalpolices.aspx |
| Coastal Training Program | Training decision makers in NPS-related issues | State of Md | http://www.coastaltraining-md.org/ |
| Continuing Planning Process | MDE document | State of Md | http://www.mde.maryland.gov/assets/document/cpp_071107.pdf |
| Critical Area Commission | focus on buffers & 1000 ft adjacent to tidal waters | State of Md | http://www.dnr.state.md.us/criticalarea/ |
| Executive Order 13508 | Federal agencies commitments to the Chesapeake Bay | U. S. agencies | http://executiveorder.chesapeakebay.net http://executiveorder.chesapeakebay.net/EO_13508_FY13_Action_Plan.pdf |
| Fertilizer Regulation | lawn application limitations | MDA | http://mda.maryland.gov/Pages/fertilizer.aspx |
| Fish Consumption Advisory | public health | MDE | http://mde.maryland.gov/programs/Marylander/CitizensInfoCenterHome/Pages/citizensinfocenter/fishandshellfish/index.aspx |
| Green Infrastructure Funding | EPA list/links to opportunities | US EPA | http://water.epa.gov/infrastructure/greeninfrastructure/gi_funding.cfm |
| iMap | Interactive mapping & data portal | State of Md | http://imap.maryland.gov/Pages/applications.aspx |
| MAST | Tool for developing NPS mgmt BMP scenarios | MDE | http://www.mastonline.org/default.aspx?AcceptsCookies=yes |
| MDE | State agency program | MDE | http://www.mde.state.md.us/Pages/Home.aspx |
| MDP | Maryland Department of Planning | State of Md | http://planning.maryland.gov/ |
| Monitoring Strategy | Maryland document | MDE | http://www.mde.maryland.gov/assets/document/maryland_monitoring_strategyq2009.pdf |
| National Estuary Program | home page | EPA | https://www.epa.gov/nep |
| Natural Resources | State agency program | MDNR | http://dnr2.maryland.gov/Pages/default.aspx |
| National Water Quality Initiative | Federal program | USDA | http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/equip/?cid=stelprdb1047761 |
| Nonpoint Source | home page for Maryland NPS Program | MDE | http://www.mde.state.md.us/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319NPS/index.aspx |
| Patuxent River Commission | river restoration and protection | interagency | http://planning.maryland.gov/ourwork/patuxentrivercomminfo.shtml |
| Pesticide Regulatory Program | State agency program | MDA | http://mda.maryland.gov/plants-pests/pages/pesticide_regulation.aspx |
| Pesticide Work Group | addresses Md issues on use, tracking, reporting | MDA | http://mda.maryland.gov/about_mda/Pages/Pesticide-Information-and-Reporting-Workgroup.aspx |
| Plan Maryland | Statewide planning program with MDP | State of Md | http://plan.maryland.gov/ |
| SMART Tool | Stormwater Mgmt and Restoration Tracker | U of Md Exter | http://extension.umd.edu/watershed/smart-tool |
| StormwaterPrint | State & local urban stormwater mgmt maps | MDE | www.mde.state.md.us/stormprint/Pages/index.aspx |
| Stream Health | Local stream information maps | MDNR | http://www.streamhealth.maryland.gov/ |
| Stronghold Watersheds | Greatest aquatic biodiversity maps | MDNR | http://www.streamhealth.maryland.gov/stronghold.asp |
| Stormwater Management | program for urban/developed lands | MDE | http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/SedimentandStormwaterHome/Pages/Programs/WaterPrograms/sedimentandstormwater/home/index.aspx |
| Success Stories | Documentation of NPS implementation success | MDE | http://www.mde.state.md.us/programs/Water/319NonPointSource/Pages/Programs/WaterPrograms/319NPS/index.aspx |
| | | US EPA | http://www.epa.gov/owow/nps/Success319/ |
| Susquehanna River Basin Commission | interagency watershed coordination & cooperation | interstate | http://www.srbc.net/ |
| TMDL New Vision | Federal program direction described | US EPA | http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/programvision.cfm |
| Water Quality Revolving Fund | loans and grants for clean water and drinking water capital programs | State of Md | http://mde.maryland.gov/programs/Water/QualityFinancing/WaterQualityRevolvingFund/Pages/Programs/WaterPrograms/WaterQualityFinance/WaterQualityFund/index.aspx http://www.mde.state.md.us/programs/Water/QualityFinancing/Documents/2010%20CW%20IPPS_Final_2012%20S_W%20Rev.pdf |
| | | US EPA | http://water.epa.gov/grants_funding/cwsrf/cwsrf_index.cfm |
| Watershed Restoration Action Strategy | Local watershed plans, 2000-2006 assistance | MDNR | http://www.dnr.state.md.us/watersheds/surfi/pro/wras.html |
| Watershed Assistance Collaborative | technical assistance | MDNR | http://dnr2.maryland.gov/ccs/Pages/healthy_waters/wac.aspx |
| Watershed Stewards Academy | training residents to protect/restore water quality | U of Md Exter | http://extension.umd.edu/watershed/watershed-stewards-academy |
| Water Quality Mapping Center | geographic information distribution | MDE | http://mde.maryland.gov/programs/Water/TMDL/Integrated303dReports/Pages/WaterQualityMappingCenter.aspx |

Appendix Milestones for Tracking Progress Maryland’s 2015 – 2019 Nonpoint Source Management Plan

The following annual milestones coincide with Maryland’s NPS Management Program objectives presented in Chapter 2 of Maryland’s 2015-2019 Nonpoint Source Management Plan (Plan). The Management Plan is intended to achieve and maintain water quality standards and to maximize water quality benefits among other broad strategic goals presented in Chapter 1 of the Plan. These milestones, in concert with the Plan’s goals and objectives, address Key Component #1 of EPA’s Section 319 Program Guidance entitled, “Key Components of an Effective State Nonpoint Source Management Program (November 2012).”

The following milestones are organized into two broad groups: Statewide Milestones and Watershed Milestones. To the degree possible the milestones are further organized in groups for each objective. However, in some cases, the category in which to place a milestone is subjective. For instance, an evaluation metric for stormwater permit could be place under Objective 4 (*Pollutant Sources*) or Objective 8 (*Program Management and Evaluation*).

However, for practical reasons, separate milestone categories are not included for the first two objectives, 1) “*State Regional Coverage: Ensure that the Program addresses the three broad geographic regions of the State*”, and 2) “*Multiple Scales: Ensure that the Program is attentive to multiple scales of geography at which different NPS issues are managed.*” Objective 1, *State Regional Coverage*, is addressed in large part by the Watershed Milestones. Objective 2, *Multiple Scales*, is addressed throughout the categories of milestones. For example, a milestone under the “pollutants” category for mercury pollution reflects the need for strategies and actions on a large geographic scale. This is due to the fact that a significant proportion of mercury in Maryland’s waters comes from atmospheric deposition the sources of which are of national and even international origin. At the other end of the scale, Maryland’s NPS Program invests in the identification of highly localized sources of PCBs, which is reflected as another annual milestone.

Each year, the following tables will be included in Maryland’s 319 Annual Report with updates to reflect annual progress. The Annual Reports will be posted to the 319 Program webpage following EPA review. Maryland’s 2015-2019 Nonpoint Source Management Plan will be updated to reflect the status.

| Maryland 2015-2019 NPS Program – Statewide Milestones Objective 3: Pollutants & Stressors | Lead | 2015 | 2016 | 2017 | 2018 | 2019 |
|--|------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Annual Nitrogen Nonpoint Source Loads to Bay: Used to show progress on nutrient load reductions. (reported for state fiscal year) | MDE | report progress |
| 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 | 100,000 | 150,000 | 200,000 | 250,000 |
| Annual Phosphorus Nonpoint Source Loads to Bay: Used to show progress on nutrient load reductions. (reported for state fiscal year) | MDE | report progress |
| Phosphorus: For all watersheds with EPA-accepted plans, overall total annual reduction by NPS implementation completed during the past year: (Cumulative lbs/yr phosphorus starting 2015 excluding annual practices) | MDE | 1,000 | 2,000 | 3,000 | 4,000 | 5,000 |
| Sediment: 319-funded projects Estimated annual reductions in pounds of sediment to local water bodies: Annually determine NPS load reductions of nitrogen and include information in NPS annual report. (Cumulative starting in 2015 tons/yr) | MDE | 5 | 10 | 15 | 20 | 25 |
| Sediment: For all watersheds with EPA-accepted plans, overall total annual reduction by NPD implementation completed during the past year: (Cumulative tons/yr sediment starting 2015 excluding annual practices.) | MDE | 200 | 400 | 600 | 800 | 1,000 |
| Bacteria: Annual Report on Monitoring Results for Maryland Beaches | MDE | report findings |
| Bacteria: Conduct Annual Meeting of County Beach Management Programs | MDE | report findings |
| Bacteria: Conduct Shoreline Field Surveys near Shellfish Waters to identify potential pollutant sources of concern (part of a 7-year cycle). | MDE | report findings |
| Bacteria: Conduct Sanitary Surveys of relevant data for all shellfish growing areas. | MDE | report findings |

| Maryland 2015-2019 NPS Program – Statewide Milestones Objective 3: Pollutants & Stressors | Lead | 2015 | 2016 | 2017 | 2018 | 2019 |
|--|------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Chloride: Number of water bodies that have a detailed watershed assessment based on monitoring data. (Cumulative starting in 2015) | MDE | 2 | 3 | 4 | 5 | 6 |
| Chloride: TMDL development (Cumulative # of new TMDLs starting 2015) | MDE | 2 | | | | |
| Chloride: Annual Road Salt Application Management Training by State Highway Administration. | MDE | report result |
| PCBs: TMDL development (Cumulative # of new TMDLs starting 2015) | MDE | 6 | 8 | 10 | 12 | 14 |
| PCBs: Conduct monitoring in an attempt to locate upland sites that are contaminated by high concentrations of PCBs. Annually report monitoring plans and findings. | MDE | report status |
| Mercury: Update Maryland's 319 Program webpage to summarize Maryland's existing mercury mitigation activities. | MDE | report status | | | | |
| Mercury: Update Maryland's 319 Program webpage to summarize regional, national and international initiatives designed to reduce mercury. | MDE | | report status | | | |
| 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 a summary of the findings as an appendix to the 319 Annual Report. | MDE | | | report findings | | |
| 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 |

| Maryland 2015-2019 NPS Program – Statewide Milestones Objective 4: Pollutant Sources | Lead | 2015 | 2016 | 2017 | 2018 | 2019 |
|--|------|---------------|---------|---------------|---------------|---------------|
| Agricultural Milestones¹ | | | | | | |
| Maintain Annual Cover Crop Implementation Acreage Levels | MDA | 386,000 | 386,000 | 417,000 | 418,000 | 419,000 |
| Maintain Annual Nutrient Management Plan Acreage Levels | MDA | 448,570 | 565,408 | 682,247 | 713,516 | 744,785 |
| Maintain Annual Soil Conservation and Water Quality Plan Acreage Levels | MDA | 926,000 | 926,000 | 1.026 million | 1.041 million | 1.055 million |
| Maintain Annual Manure Transported out of Chesapeake Bay watershed (tons) | MDA | 44,000 | 44,000 | 51,000 | 55,000 | 60,000 |
| Maintain Annual Conservation Tillage Acreage Levels | MDA | 765,000 | 765,000 | 765,000 | 765,000 | 765,000 |
| Plant Riparian Forest Buffers (Acres/year) | MDA | 350 | 472 | 591 | 710 | 829 |
| Wetland Restoration (Acres treated/year) | MDA | 645 | 1,032 | 1,419 | 1,806 | 2,193 |
| Phosphorus Management Tool regulation adoption | MDA | report status | | | | |
| Renew the general discharge permit for animal feeding operations | MDA | report status | | | | |
| Refine agriculture nitrogen and phosphorus reduction strategies for the Chesapeake Bay | MDA | | | | | report status |
| On-site Disposal Systems | | | | | | |
| Upgrade septic systems to nitrogen removal technology (systems/year) | MDE | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 |
| Refine septic system nitrogen reduction strategy for the Chesapeake Bay | MDE | report status | | | | report status |
| Adopt online system for reporting installation of Best Available Technology OSDs. | MDE | report status | | | | |
| Facilitate refinement of septic system information and submit it to the EPA Chesapeake Bay Program (numbers, locations and types of systems) | MDE | report status | | | | |
| Urban/Suburban Stormwater and Erosion & Sediment Control | | | | | | |
| Stormwater retrofits of land without sufficient controls (pounds nitrogen reduced/year). (may be refined in future Chesapeake Bay 2-Yr Milestones. | MDE | 18,000 | 20,000 | 20,000 | 22,000 | 22,000 |
| Refine stormwater nitrogen and phosphorus reduction strategies for the Chesapeake Bay | MDE | | | | | report status |

| Maryland 2015-2019 NPS Program – Statewide Milestones | | Lead | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|-----|---------------|--------------|--------------|--------------|--------------|--------------|
| Objective 4: Pollutant Sources | | | | | | | |
| 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 | report status | | | | | |
| Online BMP Reporting Tool for Non-MS4 local governments: | MDE | report status | | | | | |
| Outreach to non-MS4 jurisdictions on reporting stormwater controls on new development and retrofitting development with insufficient controls. | MDE | report result | | | | | |
| Historical BMP Cleanup as part of the Chesapeake Bay Midpoint Assessment | MDE | report status | | | | | |
| SMART Homeowner BMP Tracking Tool: Make the tool available to users. | UME | report status | | | | | |
| Online BMP Reporting Tools for MS4 and Non-MS4 local governments: Make the tool available to users. | MDE | report status | | | | | |
| Issue tentative determination for Phase II MS4 permits. | MDE | report status | | | | | |
| 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 | 4 | 5 | | | | |
| Erosion and Sediment site “inspection coverage rate” conducted by MDE (Source: Annual Enforcement & Compliance Report) | MDE | report rate | report rate | report rate | report rate | report rate | report rate |
| Forestry | | | | | | | |
| Develop Lawn-to-Woodland Program, Program rules and partners in place | DNR | report status | | | | | |
| Update Maryland’s 5-year Forest Action Plan (Forest Assmt & Strategy) | DNR | report status | | | | | |
| 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 | report acres | report acres | report acres | report acres | 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 | | | | | | revise table |

| Maryland 2015-2019 NPS Program – Statewide Milestones Objective 4: Pollutant Sources | Lead | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|------|-------------|-------------|-------------|-------------|-------------|
| Resource Extraction (information source: Annual Enforcement & Compliance Report) | | | | | | |
| Coal Mining site “inspection coverage rate” conducted by MDE | MDE | report rate |
| Non-Coal Mining site “inspection coverage rate” conducted by MDE | MDE | report rate |
| Hydromodifications (information source: Annual Enforcement & Compliance Report) | | | | | | |
| Non-tidal wetlands and floodplains permit site “inspection coverage rate” | MDE | report rate |
| Tidal wetlands permit site “inspection coverage rate” | MDE | report rate |

| Maryland 2015-2019 NPS Program – Statewide Milestones Objective 5: Types of Waterbodies | Lead | 2015 | 2016 | 2017 | 2018 | 2019 |
|--|---|----------------|----------------|--------|--------|--------|
| <u>Statewide Lakes and Reservoirs</u> | | | | | | |
| 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 | report results | | | |
| Patuxent Reservoirs Annual Report of the Technical Advisory Committee | WSSC | report | report | report | report | report |
| <u>Central Maryland – Chesapeake Bay Drainage</u> | Watersheds with EPA-accepted watershed plans that are eligible for 319(h) Grant implementation funding. | | | | | |
| <u>Antietam Creek Watershed.</u> Water quality goal is to reduce annual pollutant loads: 12,923 tons/yr sediment, approx. 3 million-billion <i>E. coli</i> MPN. (see the Washington County Soil Conservation District's 2012 watershed plan Tables 8, 10, 13, 18, and 19) | | | | | | |
| Watershed plan milestones: Report progress in the 319 Annual Report. | WCSCD | report | report | report | report | report |
| Assess Implementation Progress toward sediment and bacteria reduction watershed plan milestones and update plan if needed. | | | | assess | update | |
| <u>Back River – Tidal Watershed.</u> Water quality goal is to reduce annual nutrient loads: 6,498 lbs/yr nitrogen and 679 lbs/yr phosphorus. (see Baltimore County's 2010 watershed plan Table 3-2 and Appendix A-1) | | | | | | |
| Watershed plan milestones: Report progress in the 319 Annual Report. | Baltimore County | report | report | report | report | report |
| Assess action items progress: #2 lawn fertilizer, #3 bayscape education, #34 outfall inspections, #53 outfall inspections, and #60 incentives. | | assess | | | | |
| Assess action item progress: #37 hot spots | | | assess | | | |
| Assess action item progress: #10 stormwater retrofits | | | | | assess | |
| Assess action item progress: #31 wetland plantings | | | | | | assess |
| <u>Back River – Upper Watershed.</u> Water quality goal is to reduce annual nutrient loads: 48,189.6 lbs/yr nitrogen and 6,055.8 lbs/yr phosphorus. (see Baltimore County's 2008 watershed plan Table 3-2 and Appendix A Table A-2) | | | | | | |
| Watershed plan milestones: Report progress in the 319 Annual Report. | Baltimore County | report | report | report | report | report |
| Assess plan implementation progress, particularly: open space tree planting, impervious area removal on institutional land. | | | | | assess | |
| Assess hotspot investigation and follow-up | | | | | | assess |

| Maryland 2015-2019 NPS Program – Statewide Milestones Objective 5: Types of Waterbodies | | Lead | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|------------------|---|--------|--------|--------|--------|------|
| Choptank River – Upper Watershed. Water quality goal is to reduce nutrient loads from 2002 levels by 39% for nitrogen (704,000 lbs/yr) and 28% for phosphorus (34,5000 lbs/yr). (see Caroline County’s 2010 watershed plan, Table 11) | | | | | | | |
| Watershed plan milestones: Report progress in the 319 Annual Report. | Caroline County | report | report | report | report | report | |
| Assess BMP implementation progress and update plan if needed. | | assess | update | | | | |
| Corsica River Watershed. Water quality goal is to continue meeting the Corsica TMDL for nitrogen and phosphorus. (see Centreville’s 2012 watershed plan Update, Table 1) | | | | | | | |
| Watershed plan milestones: Report progress in the 319 Annual Report. | Centreville | report | report | report | report | report | |
| Assess implementation progress for BMP goals and update plan if needed. | | | assess | update | | | |
| Gwynns Falls – Middle Watershed. Water quality goal for 2017 is to reduce annual nutrient loads: 35,350 lbs/yr nitrogen and 5,915 lbs/yr phosphorus. (see Baltimore County’s 2014 watershed plan Table 3-24 and Appendix A Table A-2) | | | | | | | |
| Report implementation progress in the 319 Annual Report. | Baltimore County | report | report | report | report | report | |
| Jones Falls – Lower Watershed. Water quality goal is to reduce annual pollutant loads: 23,146 lbs/yr nitrogen, 3,887 lbs/yr phosphorus, 204.9 tons/yr sediment. (see Baltimore County’s 2008 watershed plan Table 5.4) | | | | | | | |
| Watershed plan milestones: Report progress in the 319 Annual Report. | Baltimore County | report | report | report | report | report | |
| Monocacy River – Lower Watershed. Water quality goal is to reduce annual pollutant loads: 649,998 lbs/yr nitrogen, 68,952 lbs/yr phosphorus, 10,345 tons/yr sediment. (see Frederick County’s 2008 watershed plan page 16 and Table “X” p34) | | | | | | | |
| Watershed plan milestones: Report progress in the 319 Annual Report. | Frederick County | report | report | report | report | report | |
| Assess implementation progress and update plan if needed. | | | | | assess | update | |
| Sassafras River Watershed. Water quality goal is to reduce annual pollutant loads: 462,225 lbs/yr nitrogen, 12,602 lb/yr phosphorus, 1,143 tons/yr sediment. (see the Sassafras River Association’s 2009 watershed plan Table 5.4) | | | | | | | |
| Watershed plan milestones: Report progress in the 319 Annual Report. | SR Assoc. | report | report | report | report | Report | |
| Central Maryland – Chesapeake Bay Drainage | | Plans not designed to seek 319(h) implementation funds. | | | | | |
| 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 | | | | report | |

| Maryland 2015-2019 NPS Program – Statewide Milestones Objective 5: Types of Waterbodies | Lead | 2015 | 2016 | 2017 | 2018 | 2019 |
|--|---|--------|--------|--------|--------|-------------|
| <u>Western Maryland – Casselman River and Youghiogheny River</u> | Watersheds with EPA-accepted watershed plans that are eligible for 319(h) grant implementation funding. | | | | | |
| <u>Casselman River Watershed Management Plan</u> Water quality goal is to meet the pH water quality standard. (see MDE’s 2011 watershed plan Chapter 3.2) | | | | | | |
| 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 | report | report | report | report |
| Percentage of impaired stream segments in watershed that remediated and meet the State water quality standard for pH. | MDE | 50% | | | | 75% 2020 |
| Report 303(d) stream segments that achieve pH criteria via Maryland’s Integrated Report. | MDE | | report | | report | |
| <u>Western Maryland – Casselman River and Youghiogheny River</u> | Plans not designed to seek 319(h) implementation funds. | | | | | |
| <u>Deep Creek Lake Watershed Plan</u> Water quality goal to be determined when the plan is finalized. | | | | | | |
| Plan completion anticipated in 2014. Potential milestones TBD. | DNR | | | | | |
| <u>Coastal Region – Coastal Bays and Atlantic Ocean</u> | Plans not designed to seek 319(h) implementation funds. | | | | | |
| <u>Coastal Bays Conservation and Management Plan</u> Water quality goal to be determined when the plan is finalized. | | | | | | |
| Plan completion anticipated in 2014-2015. Potential milestones TBD. | MCBP | | | | | |

Objective 6 – Protection and Restoration: Because many restoration activities are addressed under Objective 3 (Pollutants and Stressors) and Objective 4 (Pollutant Sources) the milestones associated with Objective 6 (Protection and Restoration) are focused on protection.

| Maryland 2015-2019 NPS Program – Statewide Milestones Objective 6: Protection and Restoration | Lead | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|------|------------------|------------------|------------------|------------------|------------------|
| 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 |
| 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 results | |
| Expand Antidegradation pilot project with MDE Waterways and Wetlands Program beyond Central Maryland. | MDE | | | report results | | |
| Revise Maryland’s Antidegradation regulations to be more clear and protective. | MDE | | | report results | | |
| Conduct State Clearinghouse reviews of state and federally funded projects to ensure consistency with the State Anti-degradation Policy (approximately 400/year) | MDE | report results |

| Maryland 2015-2019 NPS Program – Statewide Milestones Objective 7: Priority Setting | Lead | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|------|---------------|---------------|---------------|---------------|---------------|
| 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 selected project. | MDE | report | report | report | report | report |
| 303(d) Program Vision: Priorities - 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 facilitate State strategic planning for achieving water quality goals. | MDE | | report | | report | |
| 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 achieve the water quality goals, including identifying and reducing nonpoint sources of pollution. (Assess alternatives to influence priorities) | MDE | | | | report | |

| Maryland 2015-2019 NPS Program – Statewide Milestones Objective 8: Program Management and Evaluation | Lead | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|------|---------------------------------|-------------------|---------------------------------|-------------------|---------------------------------|
| Chesapeake Bay Two-Year Milestones: Maryland has set benchmarks to gauge BMP implementation and programmatic progress for 2014-2015 (see Appendix Two-Year Milestones). 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 | assess progress report findings | update milestones | assess progress report findings | update milestones | assess progress report findings |
| 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 | | report | |
| <u>Number of water bodies identified in Integrated Report as being primarily NPS impaired that are partially or fully-restored¹:</u> 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 | 0 | 1 | 1 | 1 | 2 |
| Report NPS BMP implementation progress annually. | MDE | report | report | report | report | report |
| BMP Implementation Verification Protocols: Draft documentation due to EPA Chesapeake Bay Program | MDE | report | | | | |
| Produce Maryland's 319 NPS Program Annual Report (319 Annual Report). Annually report if findings necessitate a future NPS Management Program Plan update. Post the report on the Internet following EPA review. | MDE | report | report | report | report | report |
| Report progress achieved toward goals for 319-eligible watershed plans in Maryland's 319 Annual Report. | MDE | report | report | report | report | report |
| Report significant findings from targeted watershed monitoring plans in Maryland's 319 Annual Report. | MDE | report | report | report | report | report |

| Maryland 2015-2019 NPS Program – Statewide Milestones Objective 8: Program Management and Evaluation | Lead | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|------|--------|--------------------|--------|--------|--------|
| 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 | report | report | report | report |
| Evaluate progress on each of these 319 Program milestones and report the status in Maryland’s NPS Program Annual Report. | MDE | report | report | report | report | report |
| Evaluate Local Chesapeake Bay 2014-2015 2-year Milestones for Bay Restoration (post local milestones and State evaluation to MDE webpage) | MDE | | report | | | |
| Adopt State Chesapeake Bay 2016-2017 2-Year Milestones as 319 Plan Milestones by reference (Document via 319 Annual Report) | MDE | | report | | | |
| Evaluate Local Chesapeake Bay 2016-2017 2-year Milestones for Bay Restoration (post local milestones and State evaluation to MDE webpage) | MDE | | | | report | |
| Adopt State Chesapeake Bay 2018-2019 2-Year Milestones as 319 Plan Milestones by reference (Document via 319 Annual Report) | MDE | | | | report | |
| Maintain/increase State agency investment in NPS programs and implementation. Report status by state fiscal year. (See Annual Report Appendix A) | MDE | report | report | report | report | report |
| 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 | | | |
| Continuing Planning Process (CPP) update for consistency with this NPS Program Management Strategy | MDE | | update & report | | | |

| Maryland 2015-2019 NPS Program – Statewide Milestones Objective 8: Program Management and Evaluation | Lead | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|------|------|------|--------------------|---|------|
| State Monitoring Strategy Update | MDE | | | update & report | State Monitoring Strategy Update | MDE |
| See Objective 4 (Pollutants and Stressors) for additional evaluation milestones | | | | | | |
| See Objective 3 (Pollutant Sources) for additional evaluation milestones. | | | | | | |