Maryland
319 Nonpoint Source Program
2009 Annual Report

Prepared by:

Department of the Environment
1800 Washington Boulevard, Suite 540
Baltimore MD 21230-1718

March 15, 2010

Published and distributed by the

Section §319(h) Nonpoint Source Program
Maryland Department of the Environment
1800 Washington Boulevard, Suite 540
Baltimore MD 21230

Phone: 410-537-3906
Fax: 410-537-3873

Richard Eskin, Director
Science Services Administration

Jim George, Manager
Water Quality Protection and Restoration Program

Primary Author:
Ken Shanks, Chief
TMDL Implementation Division

Contributors:
Susan Douglas
Paul Emmart
Pamela Harris
Connie Loucks
Robin Pellicano
Eric Ruby
Greg Sandi
Joe Woodfield

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

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

COVER PHOTOGRAPHS

Center: Volunteers create a rain garden (Frederick County DPW)
Upper Left: Minebank Run stream restoration (Paul Emmart, MDE)
Lower Left: Grade stabilization structure (Caroline Soil Conservation District)
Upper Right: Aaron Run acid mine drainage treatment cell (Connie Loucks, MDE)
Lower Right: Spring Branch stream restoration (Baltimore County DEPRM)

Preface

The report is produced by the Maryland Department of the Environment to meet a grant condition that appears in each annual 319(h) Grant award to Maryland from the US Environmental Protection Agency. This programmatic condition in the FFY09 award states:

> The report shall contain the following:
>
> a. A brief summary of progress in meeting the schedule of milestones in the approved Management Program, and,
> b. Reductions in nonpoint source pollutant loading and improvements in water quality that has resulted from implementation of the Management Program.
> c. Descriptions of priority Watershed Based Plan accomplishments. Accomplishments should be based on the implementation milestone goals/objectives as identified in each priority plan. The goal information can be displayed in the form of a watershed goal/accomplishment chart showing percent achieved, supplemented by a short narrative that should give the reader a clear understanding of the actions being taken and the outputs and outcomes which are occurring from the actions. If monitoring was completed, a summary of that information should also be included. For example, if 1000 feet of streambank stabilization was completed, then how does that compare to the needs identified in the watershed based plan i.e. what percent of streambank stabilization was completed compared to the overall needs as identified by the plan. Similar comparisons should also be provided for each significant pollutant load reduction.

What is Nonpoint Source Pollution?

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

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

The pollution contributed by nonpoint sources is the main reason why many of Maryland's waters are considered "impaired." Impaired waters are those waters that do not meet Water Quality Standards for designated uses (e.g., fishing, swimming, drinking water, shellfish harvesting, etc.). The most recent Chesapeake Bay model associates nonpoint source pollution into several land use categories as shown in Figures 1 and 2. The figures also show that the relative amount of nitrogen and phosphorus generated by the different land uses in Maryland varies significantly.

I. Executive Summary

This report documents the activities and accomplishments of the State of Maryland in general and the Maryland Department of Environment (MDE) Water Quality Protection and Restoratior Program, in particular the administration of the State's §319(h) Grant Program. MDE plays a lead role in helping to achieve protection and improvement of Maryland's water quality by promoting and funding state and local water quality monitoring, stream and wetland restoration, education and outreach, and other measures to reduce and track nonpoint source pollution loads.

MDE is the lead agency responsible for coordination of policies, funds, and cooperative agreements with state agencies and local governments. Several other state agencies have key responsibilities, including the Departments of Natural Resources (DNR), Agriculture (MDA), and Planning (MDP). The NPS Program is housed within MDE's Science Services Administration (SSA). During the past 20 years, Maryland has received a total of nearly $41.4 million through the Federal Clean Water Act Section 319(h) Grant. (See Appendix A)

In calendar year 2009, there have been notable successes and accomplishments:

- Projects funded by 319(h) Grant reported implementing 420 best management practices resulting in pollutant load reductions: nitrogen 131,804 pounds/year; phosphorus 10,998 pounds/year; sediment 403 tons/year. (This data includes technical assistance projects.)
- EPA accepted one watershed plan in 2009. Now a total of six watershed plans in Maryland are eligible for 319(h) Grant implementation funding.

The Program faces several challenges and concerns. Because of increasing development, there has been in an increase in the urban/suburban component of nonpoint source pollution. While the funding in 319(h) Grant to Maryland has been approximately the same for several years, other federal and state budgets are continuing to decrease, which leads to an ever-tightening restraint on the amount of help, either technical or financial, that a state can provide. There is also the need to show effectiveness or environmental results in an area that may take years or decades to do so.

II. Mission and Goals of the NPS Program

Maryland's mission is to implement effective nonpoint source pollution control programs. These programs are designed to achieve and maintain beneficial uses of water, improve and protect habitat for living resources, and protect public health through a mixture of water quality and/or technology based programs including: regulatory and/or non-regulatory programs; and financial, technical, and educational assistance programs.

Through leadership and financial support Maryland's Section §319(h) Nonpoint Source (NPS) Program plays a lead role in helping to achieve protection and improvement of Maryland's water quality. The Program promotes and funds state and local watershed planning efforts, water quality monitoring, stream and wetland restoration, education and outreach, and other measures to reduce, prevent and track nonpoint source pollution loads. The NPS Program plays a key role in promoting partnerships and inter- and intra-governmental coordination to reduce nonpoint

sources of pollution, and helps bring the necessary technical and financial resources to local watershed management planning, best management practices, and restoration of streams and wetland habitats. Program partners include State agencies, local government (counties, municipalities, Soil Conservation Districts), private landowners and watershed associations.

The NPS Program's three priority goals for funding of implementation projects through the 319(h) Grant are (FFY2010 RFP):

- Eliminating or reducing nonpoint source pollution
- Removing waters from the State's list of impaired waters (the 303(d) list)
- Restoring and protecting habitat in streams, riparian buffers and wetland areas

III. Overview

Maryland surface waters flow into three major drainage areas:

- The Chesapeake Bay watershed receives runoff from of Maryland's mid section and encompasses about 90% of the State.
- Maryland's Coastal Bays receives runoff from Maryland's east side.
- The Youghiogeny River, which is part of the Ohio and Mississippi Rivers drainage, receives runoff from Maryland's west side.

It is the Program's policy to maintain an active presence in all three major drainage areas. Western Maryland, characterized by mountains and cold water streams, is also characterized by a history of coal mining and resultant acidic mine drainage impacts. The 319 Program has invested significantly in watershed planning in Maryland's Coastal Bays, a system characterized by shallow, highly diverse ecosystems that are sensitive to development pressure that accommodates tourist destinations like the beach. In the central part of the State, the 319 Program is undergoing a process of evolution as management of the Chesapeake Bay transitions from a voluntary framework to a more regulatory one.

Overall, Maryland has over 9,940 miles of non-tidal streams and rivers. Maryland's water resources provide food and water for its residents, jobs for the economy and a place where people may relax and enjoy the natural environment. Maryland's water resources are under stress from a variety of causes, with nonpoint source pollution the greatest single factor.

Maryland's rich heritage and the bounty of its waters are threatened by the very prosperity that continues to draw newcomers. Recreation, tourism, commercial and recreational fishing, wildlife habitats, and our quality of life are ultimately dependant upon healthy watersheds. Yet, the state's waters are increasingly impacted by and remain impaired due largely to nonpoint sources of pollution and related habitat degradation due to altered land uses.

Addressing Nonpoint Source Pollution

Many agencies and programs in Maryland, including State agencies, Counties, Soil Conservation Districts and municipalities, have responsibilities in managing NPS pollutant. Contacts for key State agency programs with NPS management responsibility are listed in Appendix B.

The best methods for controlling NPS pollution are frequently called Best Management Practices (BMPs). These BMPs are designed to meet specific needs, like grassed buffers to control sediment and phosphorus that could leave farm fields, or wet stormwater ponds to capture sediment and nutrients in urban runoff. Every year, Maryland generates a cumulative total of BMPs implemented in the State. The most recent findings through 2008 are summarized in Appendix C.

A wide array of approaches and programs help to prevent, reduce or eliminate pollution from nonpoint sources. The general approach employed in Maryland to manage NPS pollution is summarized in Appendix D.

Figure 1
2008 Total Nitrogen Sources In Maryland

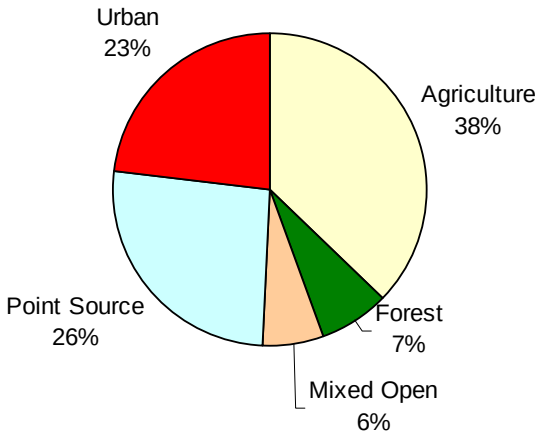
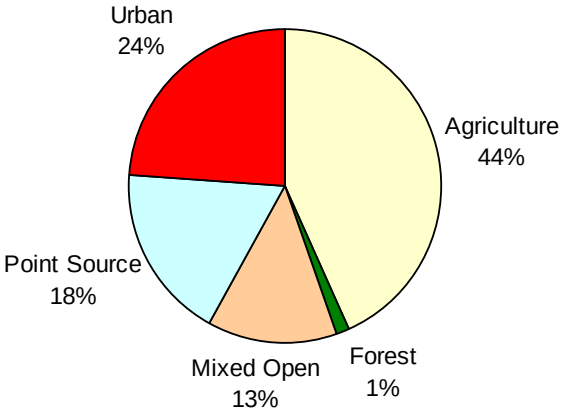


Figure 2
2008 Total Phosphorus Sources In Maryland



* Data referenced from the Phase 4.3 Chesapeake Bay Model. The reported statistics include all of Maryland lands within the Chesapeake Bay Watershed except the main body of the Bay. Nitrogen pollutant loads for on-site sewage treatment systems (septic systems) are incorporated in the "urban" nitrogen loads.

IV. Accomplishments, Successes and Progress

In the past year, there have been notable program accomplishments, successes and challenges. Progress was made in implementing best management practices in all nonpoint source areas through the provision of technical assistance, project funding or both.

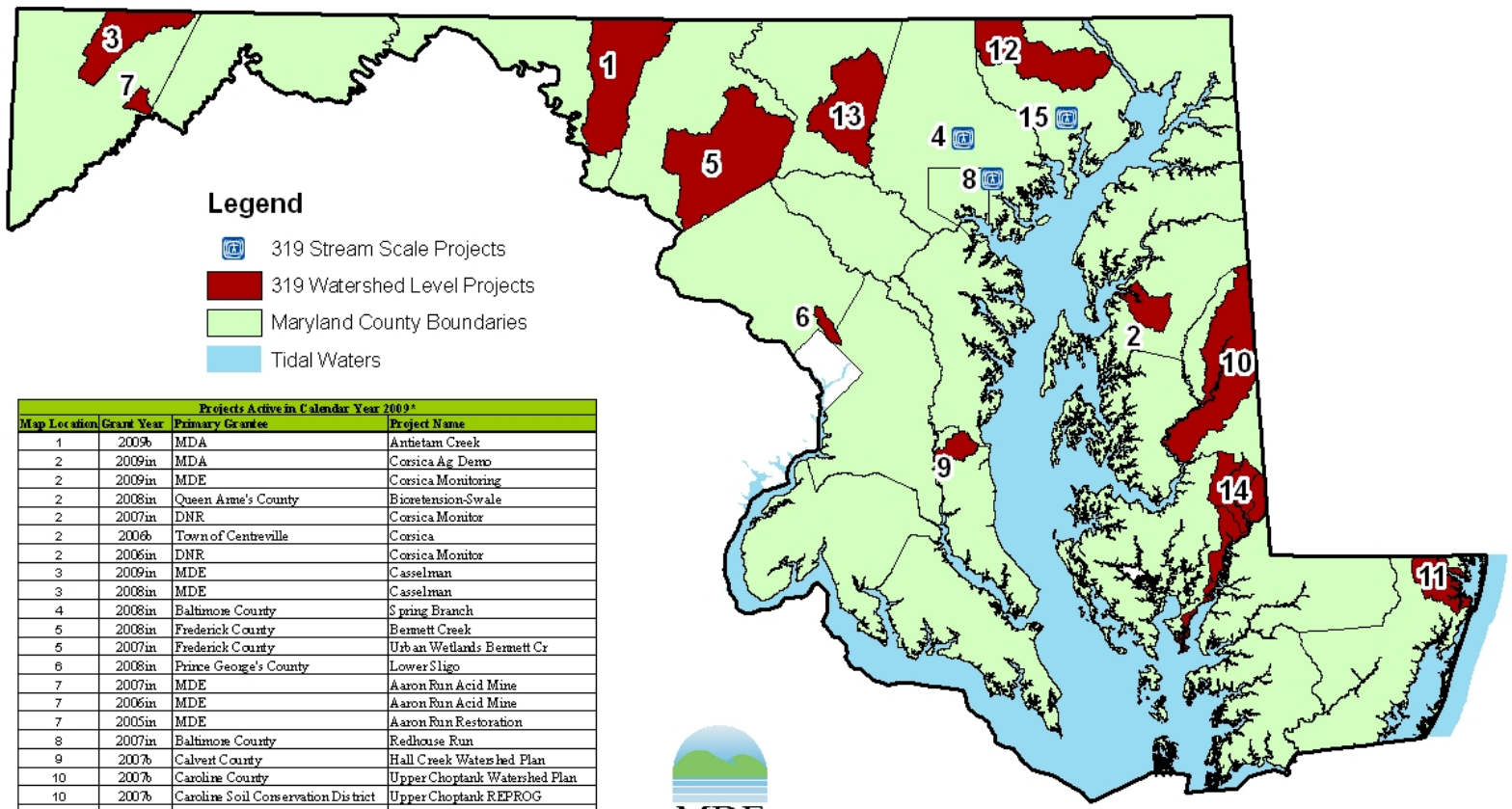
A. Active 319(h) Grant-Funded Projects and Project Outcomes

During calendar year 2009, 31 projects in Maryland were reimbursed using the Federal 319(h) Grant. Sixteen of these projects are implementation and four are planning in preparation for implementation. The geographic area encompassed by this implementation and planning activity is shown in Figure 3. The status of all 31 active projects as of December 31, 2009 is summarized in Table 1.

Of these projects, outcomes resulting from 13 are presented in Table 2 as being completed in 2009 and all multi-year projects submitted annual reports that were reported to EPA. Overall, pollutant load reductions per year reported by these projects for the following key pollutants were nearly:

Nitrogen:	131,804	Pounds
Phosphorus:	10,998	Pounds
Sediment:	403	Tons

Figure 3 - Map Of Implementation And Planning Project Area In 2009



Projects Active in Calendar Year 2009*			
Map Location	Grant Year	Primary Grantee	Project Name
1	2009b	MDA	Antietam Creek
2	2009in	MDA	Corsica Ag Demo
2	2009in	MDE	Corsica Monitoring
2	2008in	Queen Anne's County	Bioretension-Swale
2	2007in	DNR	Corsica Monitor
2	2006b	Town of Centreville	Corsica
2	2006in	DNR	Corsica Monitor
3	2009in	MDE	Casselman
3	2008in	MDE	Casselman
4	2008in	Baltimore County	Spring Branch
5	2008in	Frederick County	Bennett Creek
5	2007in	Frederick County	Urban Wetlands Bennett Cr
6	2008in	Prince George's County	Lower Sligo
7	2007in	MDE	Aaron Run Acid Mine
7	2006in	MDE	Aaron Run Acid Mine
7	2005in	MDE	Aaron Run Restoration
8	2007in	Baltimore County	Redhouse Run
9	2007b	Calvert County	Hall Creek Watershed Plan
10	2007b	Caroline County	Upper Choptank Watershed Plan
10	2007b	Caroline Soil Conservation District	Upper Choptank REPROG
11	2006in	Worcester County	Isle of Wight Enhancement
12	2006b	MDA	Deer Creek
13	2006b	MDA	Liberty
14	2006b	MDA	Marshyhope/Nanticoke
15	2006in	Harford County	Laurel Run

DNR - Maryland Department of Natural Resources
MDA - Maryland Department of Agriculture
MDE - Maryland Department of the Environment

* List excludes statewide projects

TABLE 1 Active Projects In Calendar Year 2009 Using Federal 319(h) Grant Funds				
Project	**Watershed (Maryland 8-Digit)**	**TMDL or WQA**	**303(d) List Impairment ***	**Status**
Aaron Run Watershed Acid Mine Drainage Remediation	Savage River 02141006	Low pH, Nutrients	Low pH, Methylmercury-fish tissue	Project start Oct. 2005 Anticipate completion 2010
Anacostia Lower Sligo Plan and Implementation	Anacostia 02140205	Bacteria, Sediment, PCBs, Nutrients	Biological, Debris, Heptachlor Epoxide, Fecal Coliform, PCBs in water, PCBs in fish tissue, Nitrogen, Phosphorus, TSS	Project start July 2008 Anticipate completion 2010
Antietam Creek Watershed Ag Technical Assistance	Antietam Cr 02140502	Bacteria, BOD, Sediment	Biological, Fecal Coliform, PCB in fish tissue, Phosphorus, TSS	Multi Year/Grant Project
Bennett Creek Pilot Urban Wetlands Prog.	L. Monoc. River 02140302	Bacteria, Sediments	Biological, Fecal Coliform, Phosphorus, Sedimentation, TSS	Project start Nov. 2006 Anticipate completion 2010
Bennett Creek Implementation	L. Monoc. River 02140302	Bacteria, Sediments	Biological, Fecal Coliform, Phosphorus, TSS, Sedimentation	Project start July 2008 Anticipate completion 2010
Casselman River Watershed Plan	Yough. Riv. 05020204	pH, WQA Nutrients	Low pH, Methylmercury –fish tissue	Project start July 2008 Anticipate completion 2010
Casselman River Watershed Implementation	Yough. Riv. 05020204	pH, WQA Nutrients	Low pH, Methylmercury –fish tissue	Project start July 2009 Anticipate completion 2013
Coastal Bays Interns	Coastal Bays 021301	N/A	N/A	Project start July 2007 Anticipate completion 2009
Corsica River Watershed Bioretention Swale	Corsica Riv 02130507	Bacteria, PCBs, Nutrients	Estuarine Bioassessments, Nitrogen, Phosphorus, Fecal Coliform, PCB in fish tissue, TSS	Project start July 2008 Anticipate completion 2009
Corsica River Watershed, Centreville Capacity	Corsica Riv 02130507	Bacteria, PCBs, Nutrients	Estuarine Bioassessments, Nitrogen, Phosphorus, Fecal Coliform, PCB in fish tissue, TSS	Project start April 2006 Anticipate completion 2011
Corsica River Watershed Ag. Technical Assistance	Corsica Riv. 02130507	Bacteria, PCBs, Nutrients	Estuarine Bioassessments, Nitrogen, Phosphorus, Fecal Coliform, PCB in fish tissue, TSS	Multi Year/Grant Project

TABLE 1 Active Projects In Calendar Year 2009 Using Federal 319(h) Grant Funds				
Project	**Watershed (Maryland 8-Digit)**	**TMDL or WQA**	**303(d) List Impairment ***	**Status**
Corsica Riv., Monitor Living Resources, BMP Implem.	Corsica Riv 02130507	Bacteria, PCBs, Nutrients	Estuarine Bioassessments, Nitrogen, Phosphorus, Fecal Coliform, PCB in fish tissue, TSS	Project start April 2006 Anticipate completion 2010
Corsica Monitoring On-Site Domestic Systems	Corsica Riv 02130507	Bacteria, PCBs, Nutrients	Estuarine Bioassessments, Nitrogen, Phosphorus, Fecal Coliform, PCB in fish tissue, TSS	Project start Oct. 2005 Anticipate completion 2011
Deer Creek Watershed Ag Technical Assistance	Deer Creek 02120202	None	None	Multi Year/Grant Project
GIS Hydro Model	Statewide	N/A	N/A	Project start July 2007 Completed 2009
Hall Creek Watershed Plan	Lower Patuxent 02121101	None	None	Project start 2009 Anticipate completion 2010
Isle of Wight Bay Watershed Plan Enhancement	Isle of Wight 02130103	Nutrients (N Coastal Bays) Bacteria (2 creeks)	Nitrogen, Phosphorus	Project start Oct. 2007 Anticipate completion 2010
Laurel Valley Stream Restoration	Bynum Run 02130704	WQA Nutrients	Biological, PCB in fish tissue, TSS	Project start Jan. 2007 Completed 2009
Liberty Reservoir Targeted Watershed Project	Liberty Reservoir 02130907	Bacteria, Mercury, WQA Chrome/Lead	Methylmercury-fish tissue, Fecal Coliform, Phosphorus, Sediment	Multi Year/Grant Project
Marshyhope Creek and Nanticoke River Watersheds Ag Technical Assistance	02130305	Nutrients (Marshyhope) Bacteria (Nanticoke)	Enterococcus, Fecal Coliform, PCB in fish tissue, Nitrogen, Phosphorus, TSS	Multi Year/Grant Project
Maryland Biological Stream Survey (monitoring)	multiple	N/A	N/A	Multi Year/Grant Project
Nonpoint Source Program	Statewide	N/A	N/A	Multi Year/Grant Project
Nutrient Trading Pilot	N/A	N/A	N/A	Project start 2009 Anticipate completion 2010
Redhouse Run at St. Patrick Stream Restoration	Back River 02130901	Bacteria, Chlordane, Nutrients, PCBs, Zinc	Biological, Fecal Coliform, Nitrogen, Phosphorus PCB in fish tissue, TSS	Project start 2009 Anticipate completion 2010
Spring Branch Stream Restoration	Loch Raven Reservoir 02130805	Nutrients, Sediment, Mercury, WQA Heavy Metals	Biological, Fecal Coliform, Phosphorus, Sedimentation, Methylmercury in fish	Project start July 2008 Completed 2009
Targeted Watershed Incl. Monitoring & Analysis	Statewide	N/A	N/A	Multi Year/Grant Project

TABLE 1 Active Projects In Calendar Year 2009 Using Federal 319(h) Grant Funds				
Project	**Watershed (Maryland 8-Digit)**	**TMDL or WQA**	**303(d) List Impairment ***	**Status**
Track and Analyze Data including Chesapeake Bay Implementation Tracking	Statewide	N/A	N/A	Multi Year/Grant Project
Upper Choptank River Watershed Ag Technical Assistance	Upper Choptank 02130404	None	Biological, Nitrogen, Phosphorus, PCB in fish tissue, TSS	Multi Year/Grant Project
Upper Choptank River Watershed Plan	Upper Choptank 02130404	None	Biological, Nitrogen, Phosphorus, PCB in fish tissue, TSS	Project start July 2009 Anticipate completion 2010
Urban Stormwater Management Implementation Tracking	Statewide	N/A	N/A	Multi Year/Grant Project
Western Chesapeake Coastal Plain Stream Restoration Targeting	multiple	N/A	N/A	Project start Dec. 2006 Completed 2009

* The 2008 Integrated Report of Surface Water Quality in Maryland. The MDE document was submitted in accordance with Sections 303(d), 305(b) and 314 of the Clean Water Act.

Figure 4 Aaron Run Watershed Acid Mine Drainage Remediation Implementation

Construction of this Aaron Run treatment cell in Garrett County, Maryland is nearing completion in November 2009. It is designed to intercept acid mine drainage and increase pH before it enters the stream. This site is part of the Owens North project phase. (photo by Connie Loucks, MDE)

Stream bank stabilization is included in the overall Aaron Run Project so that stream bank erosion and sedimentation will be reduced. Work at this site is nearing completion in November 2009. It is another element of the Owens North project phase and it is adjacent to the treatment cell shown above.
(photo by Connie Loucks, MDE)

TABLE 2 Completed Projects In Calendar Year 2009 Using Federal 319(h) Grant Funds			
Project/Grantee	**Funding ($)***		**Accomplishments**
	Federal	**Match**	
Antietam Cr Watershed Ag Tech. Assistance Md Dept of Agriculture with the Washington Soil Conservation Dist.	156,544 (FFY08)	104,363	Ongoing project outcome for July 2008 through June 2009: 1) BMPs: 140 were implemented resulting in annual pollutant load reductions: 35,990 lbs/yr nitrogen; 2,154 lbs/yr phosphorus. 2) Nutrient Management Plans: 180 were completed resulting in annual pollutant load reductions: 35,248 lbs/yr nitrogen; 3,400 lbs/yr phosphorus.
Coastal Bays Interns (Maryland Coastal Bays Program)	18,580 (FFY06)	12,387	Two local-resident student interns were hired to participate in monitoring and assessment activities. After gaining experience, they shared their findings and experiences with the local community as part of a broader effort to involve under-served local populations in ongoing efforts to reduce NPS pollution and protect Maryland's coastal bays.
Corsica Monitoring - Cover Crops - Stormwater BMPs - Living Resources (DNR)	184,140 (FFY08)	122,760	Ongoing project work includes monitoring/analysis of: Cover crop monitoring of 100 soil cores, 1500 samples and four wells; continuous stormwater flow monitoring associated with BMPs; seasonal assessment of local stream flow; habitat survey in freshwater tributaries for anadromous fish.
Corsica River Watershed Ag. Technical Assistance (Md Dept of Agriculture with the Queen Anne's Soil Conservation Dist.)	50,780 (FFY08)	33,853	Ongoing project outcome for July 2008 through June 2009: 1) BMPs: 3 were implemented resulting in annual pollutant load reductions: 46 lbs/yr nitrogen; 3 lbs/yr phosphorus; 62 tons/yr sediment. 2) Conducted manure composting education/outreach program.
Corsica River Watershed Demonstration (Town of Centreville)	300,500 (FFY06)	200,333	The Town, with assistance of their grant-funded Watershed Manager, is implementing stormwater management retrofit and conducting public education/outreach (see watershed plan progress section and Appendix E in this report.)
Deer Creek Watershed Ag Technical Assistance (Md Dept of Agriculture with the Harford Soil Conservation Dist.)	54,882 (FFY08)	36,388	Ongoing project outcome for July 2008 through June 2009: 1) BMPs: 21 were implemented resulting in annual pollutant load reductions: 193 lbs/yr nitrogen; 28 lbs/yr phosphorus. 2) Conservation Plans: 36 new plans, 43 plan revisions, contacted 58 land owners. 3) Cover crops: 3,500 acres total, including 2,800 certified by grant-funded staff, resulting in pollutant load reductions: 22,400 lbs/yr nitrogen; 196 lbs/yr phosphorus.
GIS Hydro Nutrient Loading Interpolator (University of Maryland)	49,973 (FFY06)	33,316	Project expanded and enhanced a previously existing Internet-based computer tool designed to estimate pollutant loads for used defined watersheds to be ready for using release of the Chesapeake Bay Program Version 5 Computer model. One new capability is adding user input for agricultural BMPs.
Laurel Valley Stream Restoration (Harford County)	140,000 (FFY06)	93,333	Restored 1,200 feet of Bynum Run, including stream channel restoration and stabilization, habitat improvement, to reduce nitrogen 242 lbs/yr, phosphorus 13 lbs/yr and sediment 2.1 tons/yr.

TABLE 2 Completed Projects In Calendar Year 2009 Using Federal 319(h) Grant Funds			
Project/Grantee	**Funding ($)***		**Accomplishments**
	Federal	**Match**	
Liberty Reservoir Targeted Watershed Project (Md Dept of Agriculture with the Carroll Soil Conservation Dist.)	18,256 (FFY08)	12,171	Ongoing project outcome for July 2008 through June 2009: 35 BMPs were implemented resulting in an estimated pollutant load reduction of 15,884 lbs/yr nitrogen, 762 lbs/yr phosphorus and 292 tons/yr sediment.
Lower Spring Branch Stream Restoration (Baltimore County)	240,000 (FFY08)	160,000	Restored 2,814 feet of Spring Branch, including stream channel restoration and stabilization, habitat improvement, to reduce nitrogen 521 lbs/yr, phosphorus 32 lbs/yr and sediment 5.2 tons/yr.
Marshyhope Creek and Nanticoke River Watersheds Ag Technical Assistance (Md Dept of Agriculture with the Dorchester Soil Conservation Dist.)	42,767 (FFY08)	28,511	Ongoing project outcome for July 2008 through June 2009: 1) BMPs: 81 were implemented resulting in annual pollutant load reductions: 9,637 lbs/yr nitrogen; 2,316 lbs/yr phosphorus. 2) Conservation Plans: 4 new plans on 258 acres and 28 revised plans on 2,652 acres.
MD Biological Stream Survey (DNR)	207,433 (FFY07)	138,289	Ongoing project outcome for 1/1/2008 through 6/30/2009: Conducted sampling at 50 sites in 22 watersheds to address MDE needs regarding impaired waters regarding: fish, benthic macroinvertebrates, periphyton, water chemistry, physical habitat. Reported on stressor identification for fish and macroinvertebrates. Data was reported in database/GIS.
Upper Choptank River Watershed Ag Technical Assistance Caroline Soil Conservation Dist.	58,243 (FFY08)	38,829	Ongoing project outcome for July 2008 through June 2009: 1) BMPs: 138 were implemented resulting in annual pollutant load reductions: 11,643 lbs/yr nitrogen; 2,094 lbs/yr phosphorus and 41.2 tons/yr sediment. 2) Conservation Plans: 7 new plans on 1,262 acres and 28 revised plans on 2,652 acres.

* Federal: Project expenditures reimbursed by Federal grant. Match: Project expenditures covered by non-Federal fund sources. Some projects may also involve funding sources in addition to the Federal grant and the funding documented as match for the grant.

B. Success Story – Minebank Run

Beginning in the late 1990s, Baltimore County, Maryland embarked on a multi-year effort to implement stream restoration on Mine Bank Run. In 2009, the Minebank Run success story received national recognition for demonstrating improved nitrogen uptake by restoring the stream's connection to the floodplain. A copy of the success story that EPA posted is in Appendix F Mine Bank Run Success Story.

Table 3 Minebank Run Implementation Summary

Year Constructed	Project Area (linear feet)	Description
1999	7,900	Cost: $1.2 Million
2005	9,500	Cost: $4.42 Million including $150,000 of 319(h) Grant funds that helped to pay for restoration of an unnamed tributary. (also incl. $1,635,000 for infrastructure changes)

The following background on the Minebank Run projects is based in-part on a County brochure:

The heavily developed headwater area of Minebank Run exhibited problems commonly found in streams in developed areas: extensive imperviousness in the watershed, inadequate stream buffer, severely eroding banks, flashy stream flows, and floodplain encroachment. There was also a failed concrete channel and an eight-foot drop in the stream caused by a concrete structure that contributed to disruption of ecological connectivity. This area was addressed by Phase I of the Minebank Run effort.

Downstream of the Phase I area where Phase II work was accomplished, less development is present, in-part because the County-owned Cromwell Valley Park and Loch Raven High School grounds encompassed this part of the stream and a small unnamed tributary. Here, the riparian buffer was diminished by school fields and pasture and streambank erosion was undermining sewer lines, park roads and bridges. The stream banks in this area are highly erodible, which contributed to unbalanced sediment loading and a frequent migration of stream location.

Restoration required the creation of a more stable stream planform by adjusting sinuosity and armoring stream banks at key locations to provide long term protection for sanitary sewer lines, roads and bridges, reconnection of the stream to the floodplain, and re-establishment of the riparian/wetland ecosystem. A portion of Phase II included restoration of the unnamed tributary on high school land that was funded in-part by the 319(h) Grant.

In conjunction with the Minebank Run restoration, studies have been conducted on the affect of stream restoration on reducing nitrogen pollutant load. A series of monitoring wells were installed at intervals along the project area prior to construction. Water samples were collected and analyzed that demonstrated a significant uptake of nitrogen in the restored floodplain/riparian area.

Figure 5 Minebank Run Success Story

The map area labeled as *LRHS Tributary Project Site* shows where $150,000 of 319(h) Grant funded contributed to the overall Minebank Run effort. The two mid-page pictures show the confluence of this tributary with Minebank Run before and after the restoration. The two pictures below show a portion of the Minebank Run mainstem before and after restoration reconnected the stream to its floodplain. (map and before photos are by Baltimore County. After photos are by Paul Emmart, MDE, Spring 2009.)

C. Implementation Tracking for Nonpoint Source Management

Two projects supported by Federal 319(h) Grant funds include responsibilities to collect and integrate information on implementation projects that protect or restore water bodies affected by nonpoint source pollution.

On urban lands in Maryland, numerous of stormwater management projects are constructed each year. These urban lands include residential, commercial, industrial and institution properties. In order to track stormwater management implementation progress, 23 Counties, Baltimore City and dozens of municipalities that each collect and maintain data for their jurisdiction using various methods designed to meet local needs. In cooperation with these jurisdictions, MDE's Urban Stormwater Management Practices Database project collects this information and integrates it into a single system that supports statewide progress tracking.

On non-urban lands in Maryland, thousands of best management practices are implemented each year. These nonpoint source control practices include animal waster management, cover crops, forest management practices, stream buffers and restoration, wetland restoration, and others. Implementing and tracking these projects and involves many different entities such as Soil Conservation Districts, State and local agencies.

Coordination and integration of these divergent data from urban and non-urban is performed by MDE's Analyzing and Tracking Nonpoint Source Data project. This ongoing project has successfully coordinated the consolidation of nonpoint source Best Management Practices for use in the Chesapeake Bay Watershed Model.

The most current cumulative progress tracking data through 2007 is presented in Appendix C.

D. Watershed Planning Status

Protecting and restoring water quality depends on effective planning to be successful. To meet these needs, Maryland State agencies, counties, municipalities, watershed organizations and other groups conduct planning at a watershed scale. The form and focus of these watershed plans are as diverse as groups that produce them.

Some of these watershed-based plans are produced, in part to meet requirements under the Federal Clean Water Act including the 319(h) Grant. In particular, watershed plans must be accepted by EPA based on EPA guidance for components of a watershed-based plan (A-I Criteria) in order to expend funds for implementation from the "Incremental" portion of the 319(h) Grant. The table below lists watershed plans accepted by EPA in Maryland.

Table 4 EPA-Accepted Watershed Plans In Maryland
March 2010

Year EPA Accepted	Description
2005	*Corsica River Watershed Restoration Action Strategy*, Town of Centreville, Final Report September 2004. http://www.dnr.state.md.us/watersheds/surf/proj/wras.html
2008	*Lower Jones Falls Watershed Small Watershed Action Plan*, Baltimore County, October 15, 2008. http://www.baltimorecountymd.gov/Agencies/environment/watersheds/ep_jonesmain.html
2008	*Lower Monocacy River Watershed Restoration Action Strategy (WRAS) Supplement*: *EPA A-I Requirements, Frederick County Maryland*, July 2008, Version 1.0 http://www.watershed-alliance.com/mcwa_pubs.html
2008	*Spring Branch Subwatershed – Small Watershed Action Plan (Addendum to the Water Quality Management Plan for Loch Raven Watershed)*, Baltimore County, March 2008. http://www.baltimorecountymd.gov/Agencies/environment/watersheds/ep_lrmain.html
2008	*Upper Back River Small Watershed Action Plan*, Volume 1 and 2, Baltimore County, November 2008. http://www.baltimorecountymd.gov/Agencies/environment/watersheds/ep_brmain.html
2009	*Sassafras Watershed Action Plan*. Sassafras River Association.

Table 5
Watershed Planning Activities For NPS Management And Implementation Status*
Maryland 319(h) NPS Program
March 2010

Watershed	County	Lead	Watershed Plan	Implementation
Aaron Run	Garrett	MDE	Completed 2005	In progress 2008 to 12/31/2010 (FFY05, 06, 07 319(h) Grant funding)
Casselman River	Garrett	MDE	Drafting in progress (319(h) Grant funded)	FFY09 319(h) implementation funding contingent on plan acceptance
Corsica River	Centreville, Queen Anne's Co.	Town & Co	Accepted by EPA	In progress (2005 to ?) (319: FFY05, FFY06, FFY09)
Hall Creek	Calvert	Co.	Drafting in progress (319(h) Grant funded)	To be determined during the planning process.
Lower Jones Falls	Baltimore Co.	Co.	Accepted by EPA (plan production did not use federal funding)	Implementation projects are eligible for 319(h) implementation funding
Lower Monocacy River	Frederick	Co.	Accepted by EPA (Lower Monocacy plan, did not use federal funding)	In progress (FFY07 & FFY08 319(h) Grant funding)
Sassafras River	Sassafras River Association	NGO	Accepted by EPA	In progress (no 319(h) funding)
Sligo Creek	Prince George's	Co.	In EPA review (319(h) Grant funded)	Proposed implementation is not funded by the 319(h) Grant.
Spring Branch	Baltimore Co.	Co.	Accepted by EPA (Supplement to Loch Raven plan, supplement production did not use federal funding)	Implementation complete (Construction was partially 319(h) Grant funded.)
Upper Back River	Baltimore Co.	Co.	Accepted by EPA (plan production do not use federal funding)	Redhouse Run stream restoration project using FFY07 319 funds
Upper Choptank River	Caroline	Co.	Drafting in progress (319(h) Grant funded)	To be determined during the planning process.

* Watershed plans and implementation of those plans that are identified in the table are limited to projects that were accepted by EPA and/or involve MDE's 319(h) NPS Program.

E. Priority Watershed Based Plan Accomplishments

Several watersheds in Maryland have EPA-accepted watershed plans and commitments by local government jurisdictions to pursue implementation consistent of plan goals. For these watersheds, this is the first year that annual progress reporting is included in the Maryland 319 NPS Program annual report. This section includes progress summaries for five watersheds:

- Corsica River
- Lower Jones Falls
- Lower Monocacy River
- Spring Branch
- Upper Back River

1. Corsica River Watershed Plan Implementation

Location

The Corsica River, which is 6.5 miles in length, is located in the upper eastern shore in Queen Anne's County. The watershed area is 40 square miles and is part of the larger Chester River Watershed (see map). The land use break down is 66% agriculture, 26.3% forestry, 4.5% residential urban, 3.3% nonresidential urban and 0.3% wetlands.

Goal

The nonpoint source annual TMDL load allocation for nitrogen is 268,211lbs and for P is 19,380 lbs. Corsica River watershed ambient NPS nutrient loads already met the TMDL when it was approved by EPA, so the TMDL serves as a benchmark to prevent degradation (TMDL page 4 and 20). In addition, other goals were established as listed in the implementation progress table below.

Implementation

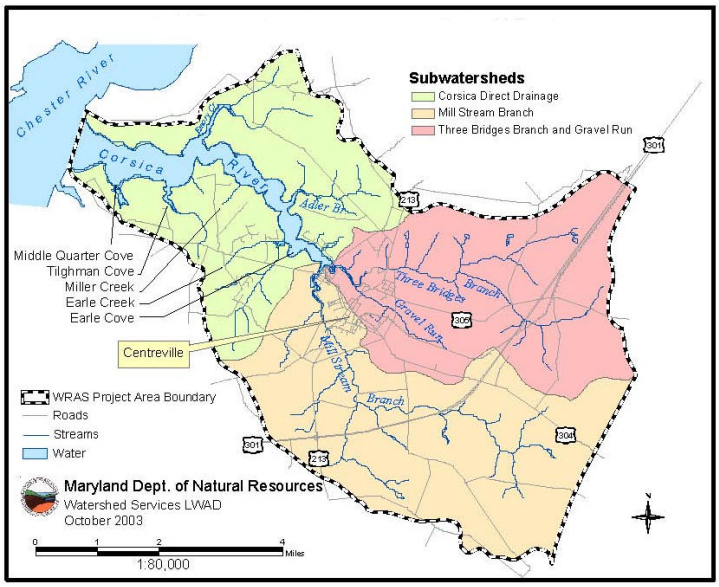
Table 6 Corsica River Watershed Plan Implementation Summary

Goals			Progress		
Control Measure	**Unit**	**Units Needed**	**Installed 2009**	**Prior Years 2005-2008**	**Goal % Achieved**
Ag Cover Crop	Acres per year	4,000	1,521	n/a	38
Ag Small Grain Enhancement	Acres per year	2,000	1,371	n/a	69
Forest Buffers - Urban	Acres	200	0	12	6
CREP Buffers - Agriculture	Acres	100	72	49	121
Horse Farm BMPs	Acres	50	0	30	60
Septic System Retrofits	Individual systems	30	14	1	50
Stormwater Management	Acres served	300	27	0	9
Stream Restoration	Feet	10,560	0	0	0
Wetland Restoration	Acres	50	0	0	0

Storm Water Management retrofits completed in the developed portions of the watershed include completion of the Coastal Plain Outfall project, which serves a total of 10 acres and the Gravel Run project that serves approximately 17 acres of which approximately 2.2 acres is directly attributed to impervious surface. Additionally a bio retention swale serving the local sheriff office was constructed and completed. Since 2005, 173 rain gardens have been put in place. The 27 acres of retrofits have resulted in a reduction of 100lbs/22lbs of nitrogen and phosphorus respectively.

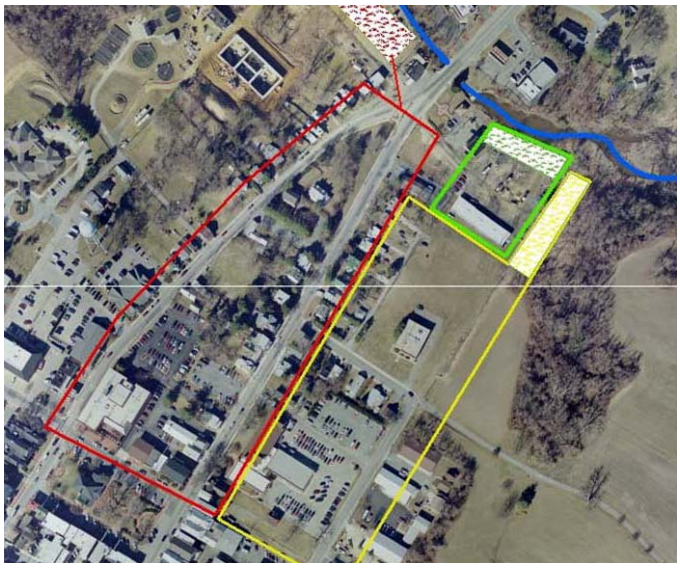
Implementation progress information supporting the table, pollutant load reduction estimates, and information on manure containment/transport efforts are presented in Appendix E.

Figure 6 Corsica River Watershed Map and Implementation



The map on the left shows that stormwater in the Town of Centreville flows toward Gravel Run to the north and Millstream Run on the south. In December 2009, two stormwater management projects were more than 90% complete.

The *Rt. 213 Retrofit Wooded Wetland* project drains 17 acres shown in the aerial image within the red outline. The location of this wetland constructed in 2009 is depicted in the aerial by the red/white polygon adjacent to Gravel Run (blue line in aerial). The lower left photo shows the wetland immediately after construction when the hydro-seeding ground stabilization (turquoise in the photo) was newly applies and before vegetation began to grow.



The *Coastal Plain Outfall* project drains about 10 acres that are outlined in yellow in the aerial image. Within the yellow outline, the white polygon shows the location of the swale that carries stormwater from the catchment area to Gravel Run. In the lower right photo, the newly constructed outfall at the down-stream end of the drainage swale near Gravel Run shows how the site looked just before ground stabilization is put in place. (photos by Town of Centreville)

2. Lower Jones Falls

Location

The Lower Jones Falls watershed encompasses 16,550 acres (25.9 mi^2) that drains portions of Baltimore County (30.09%) and Baltimore City (69.91%). About 54 miles of streams in the watershed flow into the tidal Patapsco River and then the Chesapeake Bay. Overall impervious cover is 31.8%. Land use in the watershed is:

- 55.9% Residential (11.1% low density, 23.7% mid density and 21.1% high density),
- 21.7% Developed land uses cover (6.9% commercial, 2.4% industrial, 10.5% institutional and 1.9% highway).
- 22.5% Open land uses (6.1% open urban, 13.6% forest, 1.3% agriculture, 0.6% bare ground, 0.6% extractive and 0.3% water).

Goal

The Lower Jones Falls Watershed Small Watershed Action Plan (Plan) was developed by Baltimore County in 2008 (CWA 104(b) funding) in conjunction with Baltimore City and the Jones Falls Watershed Association. (Go to http://www.baltimorecountymd.gov/Agencies/environment/watersheds/ep_jonesmain.html) The Plan was accepted by EPA in 2009. The Plan calls for the following nutrient load reduction over ten years (which includes City and sanitary sewer overflow abatement):

1. Total nitrogen 111,160 pounds/yr (22%)
2. Total phosphorus 14,357 pounds/yr (30%)

Implementation

Numerous implementation projects that were implemented in Jones Falls watershed (Upper and Lower) prior to development of the Plan in 2008 are not reported here. In 2009, no implementation is reported.

In Baltimore City, several implementation projects are in progress or planned. Lower Stoney Run stream restoration project will stabilize several thousand feet of stream using natural channel design techniques (design: $0.2 million, construction $1 million, construction completion expected early 2010). The Western Run Stream restoration (ER4014 Project 1) will stabilize 2,100 feet of stream (design: $235,776, construction $600,000, potential 2010 start). The East Stoney Run Phases I and II will stabilize stream using natural channel design techniques (design: $0.4 million, construction: $4 million, potential construction start 2010).

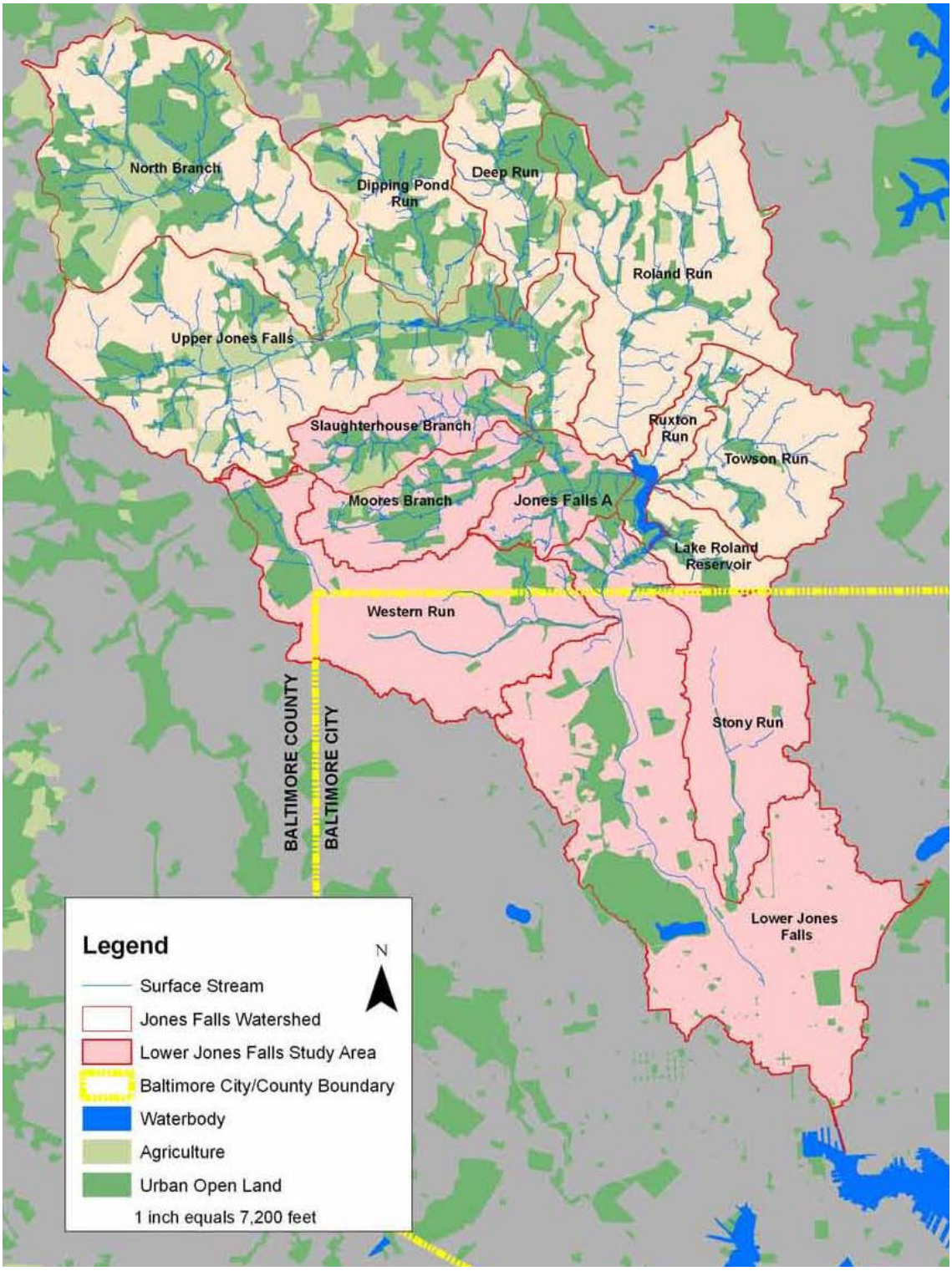


Figure 7 Map of Lower Jones Falls Watershed
(Map is extracted from the Lower Jones Falls Watershed Small Watershed Action Plan)

3. Lower Monocacy River

Location

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

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

Goal

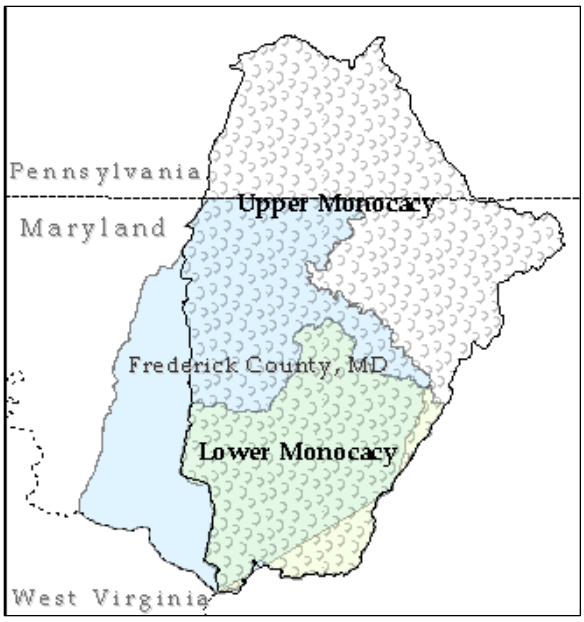
The Lower Monocacy River Watershed Restoration Action Plan was developed by Frederick County in 2004 to address the 168,960 acres (264 mi^2) that drain Frederick County. In 2008, the County used local funds to generate a Plan supplement and EPA accepted the Plan/supplement (Plan), in 2008. The Plan calls lists 25-year goals presented in the implementation tables below for the Lower Monocacy River watershed and for the Lake Linganore watershed within it because the lake has a TMDL for phosphorus and sediment.

Implementation

Table 7 Lower Monocacy River Watershed Plan Implementation Summary

Lower Monocacy Goals				Lower Monocacy Progress		
Parameter		Unit	Units Needed	Reduction 2009	Prior Years 2008	Goal % Achieved
Nitrogen	Agriculture	Pounds	582,949	Not Reported	Not Reported	
	Urban	Pounds	67,049	73.91	615.9	1 %
Phosphorus	Agriculture	Pounds	57,337	Not Reported	Not Reported	
	Urban	Pounds	11,615	11.4	43.9	0.4%
Sediment	Agriculture	Pounds	18,342,280	Not Reported	Not Reported	
	Urban	Pounds	2,348,084	284.7	16,449.4	0.7%
Lake Linganore Goals				**Lake Linganore Progress**		
Phosphorus	Agricultural	Pounds	601,489.6	Not Reported	Not Reported	
	Urban	Pounds	92,106.3	Not Reported	Not Reported	
	Forest	Pounds	4,186.7	Not Reported	Not Reported	
Sediment	Agricultural	Tons	38,401	Not Reported	Not Reported	
	Urban	Tons	3,615	Not Reported	Not Reported	
	Forest	Tons	1,033	Not Reported	Not Reported	

Figure 8 Lower Monocacy River Watershed Map and Implementation



Above. Prior to wetland planting in the 319(h) Grant-funded Windsor Knolls Middle School demonstration project, student volunteers receive instructions Sept. 2010 before beginning work.

Left. Students at Urbana High School volunteer to place wetland plants in another 319(h) Grant-funded wetland creation demonstration project September 2010. In this project, 95 students from four classes learned about the value of stormwater management and wetlands. The hands-on experience reinforced their new understanding.

Below. The Volunteer Frederick Youth Action Corps pitches in to help install a rain garden at the Mountainside Challenge and Retreat Center in Urbana, Frederick County, on *Make A Difference Day* October 24, 2010.

Each of these projects is 319(h) Grant-funded in-part, implements working demonstration projects at accessible sites, provides hands-on education and reduces costs through use of volunteer labor.

(The map and photos on this page were contributed by Frederick County, Dept. of Public Works, Watershed Management Section.)

4. Spring Branch

Location

The Spring Branch watershed encompasses 1,005 acres (1.57 mi^2) that drains a portion of Baltimore County. About 3.96 miles of streams in the watershed flow into the Loch Raven Reservoir, then to the Gunpowder River and then the Chesapeake Bay. Land use in the watershed is 91.5% residential (33% low density, 54.8 mid density and 3.7% high density). Institutional land use covers 1.7% of the watershed. Forest covers the remaining 6.7% of the watershed. Overall impervious cover is 18.6%.

Goal

The Spring Branch Subwatershed Small Watershed Action Plan (Plan) was completed in 2008 and accepted by EPA in 2008. Plan included various qualitative goals to restore stream channel stability, reduce sediment loading to the Loch Raven Reservoir, improve water quality to Spring Branch and Loch Raven, and others. Additionally, the Plan stated (Pages 2-35 to 2-26) "...the pollutant loads derived from the MDE-TMDL model will serve as the base for determining the necessary load reductions... a 15% reduction in Total Phosphorus from urban lands and reduction in sediment…"

Implementation

Based on monitoring conducted in Spring Branch, pollutant load reductions for NPS implementation in the Spring Branch watershed are summarized in the table below, which shows that the quantitative Spring Branch goal has been attained. No additional implementation opportunities have been identified at this time. Unless the Plan is revised in the future to address currently unforeseen needs, Plan implementation is complete.

Table 8 Spring Branch Watershed Plan Implementation Summary

	Area Or Length	Cost	Total Nitrogen	Total Phosphorus	Sediment
TMDL Load Estimated Prior to Implementation			**4436**	**645**	**111,765**
New Wet Pond	**47 acres served**	**$276,473**	**343.4**	**42.3**	**5,821**
Phase I Stream Restoration	**10,000 feet**	**$1,868,380**	**2,020.0**	**107.0**	**35,800**
Phase II Stream Restoration	**2,500 feet**	**$1,080,495**	**505.0**	**26.8**	**8,950**
Total Pollutant Reduction			**2,868.4**	**176.1**	**50,571**
Percent Load Reduced			**65%**	**27%**	**45%**

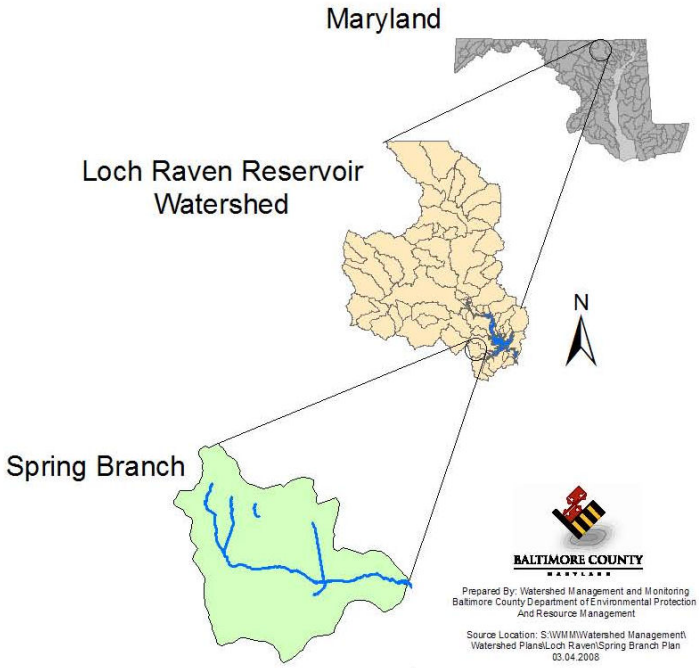
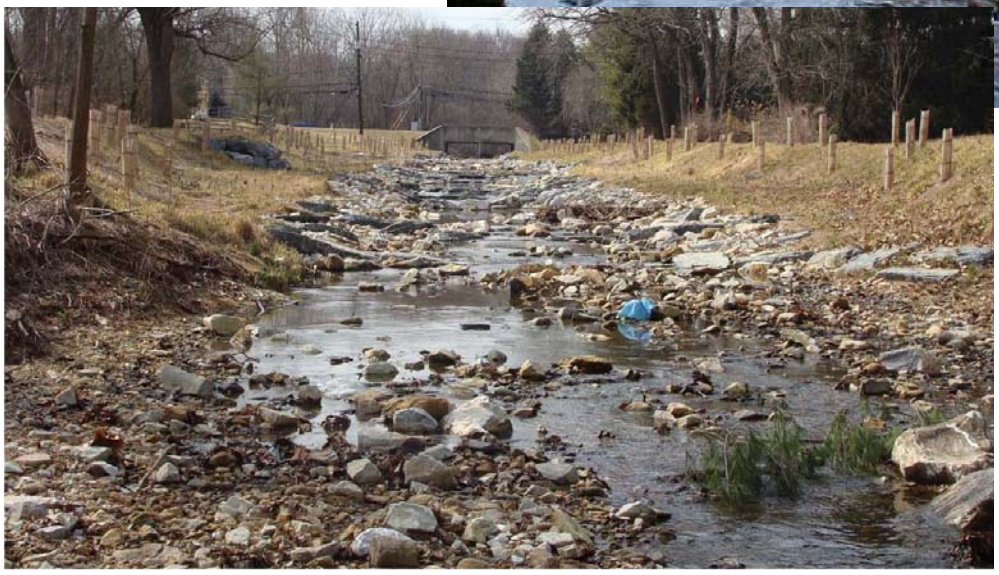


Figure 9 Spring Branch Watershed Map and Implementation

Spring Branch is one of the many tributaries to Loch Raven Reservoir, which is part of the drinking water system that serves over a million residents of Baltimore City and Baltimore County, Maryland.

In the mid-page photo, concrete channel that was in the stream prior to construction of the Phase II stream restoration significantly reduced water quality or habitat attributes. The drop at the end of concrete provides an indication of the down-stream stream bed erosion caused in-part by the structure. (The view is looking west upstream towards Pot Spring Road.)

In the bottom photo, six months after implementation of the Phase II Spring Branch stream restoration project, the stream's appearance is transformed with less than one season of growth and regeneration after construction. Because sewer lines run on both sides of the stream in this area, the project's design and implementation were constrained by needs to protect this existing infrastructure. (This view is approximately at the location shown in the "before" photo.



(Map and photos are contributed by Baltimore County.)

5. Upper Back River

Location

The Upper Back River watershed encompasses 27,716.7 acres (43.3 mi^2) that drains portions of Baltimore County (55.5%) and Baltimore City (44.5%). About 139 miles of streams in the watershed flow into the tidal Back River and then the Chesapeake Bay. Land use in the watershed is 55.4% residential (8.5% low density, 26.5% mid density and 20.4% high density). Various developed land uses cover 24.4% of the watershed (9.9% commercial, 6.5% industrial and 8.0% institutional). Open land uses account for the remaining 17.7% of the watershed area (open urban 6.2% and forest 11.5%).

Goal

The Upper Back River Small Area Watershed Plan (Plan) was developed by Baltimore County in 2008 (CWA 104(b) funding) in conjunction with Baltimore City and the Herring Run Watershed Association. (Go to www.baltimorecountymd.gov/go/backriver) EPA accepted the Plan in 2009. The Plan calls for reducing annual average loads nutrient loads by 15%:

- Total nitrogen reduction: 48,190 pounds
- Total phosphorus reduction: 6,056 pounds

Implementation

Prior to development of the Plan, numerous projects that reduced nutrients were implemented that are not reported here, including stormwater management pond conversation and stream restoration. No implementation in 2009 is reported.

In Baltimore County at least one implementation project is scheduled. The Redhouse Run at St. Patrick Road Stream Restoration project is in pre-construction. Its estimated construction cost is $1.5 million including $418,500 319(h) Grant funding. Projected load reductions for the completed project are 606 lb/yr nitrogen and 32.1 lb/yr phosphorus.

In Baltimore City, two projects are scheduled. The Moores Run Wetland project will be constructed to provide extended detention for first-flush stormwater (design: $186,000, construction $3.2 million, funding delays have postponed project start). The Yorkwood Elementary School Greening project will include removal of impervious area (design: $30,000, construction: $150,000, construction projected for 2010).

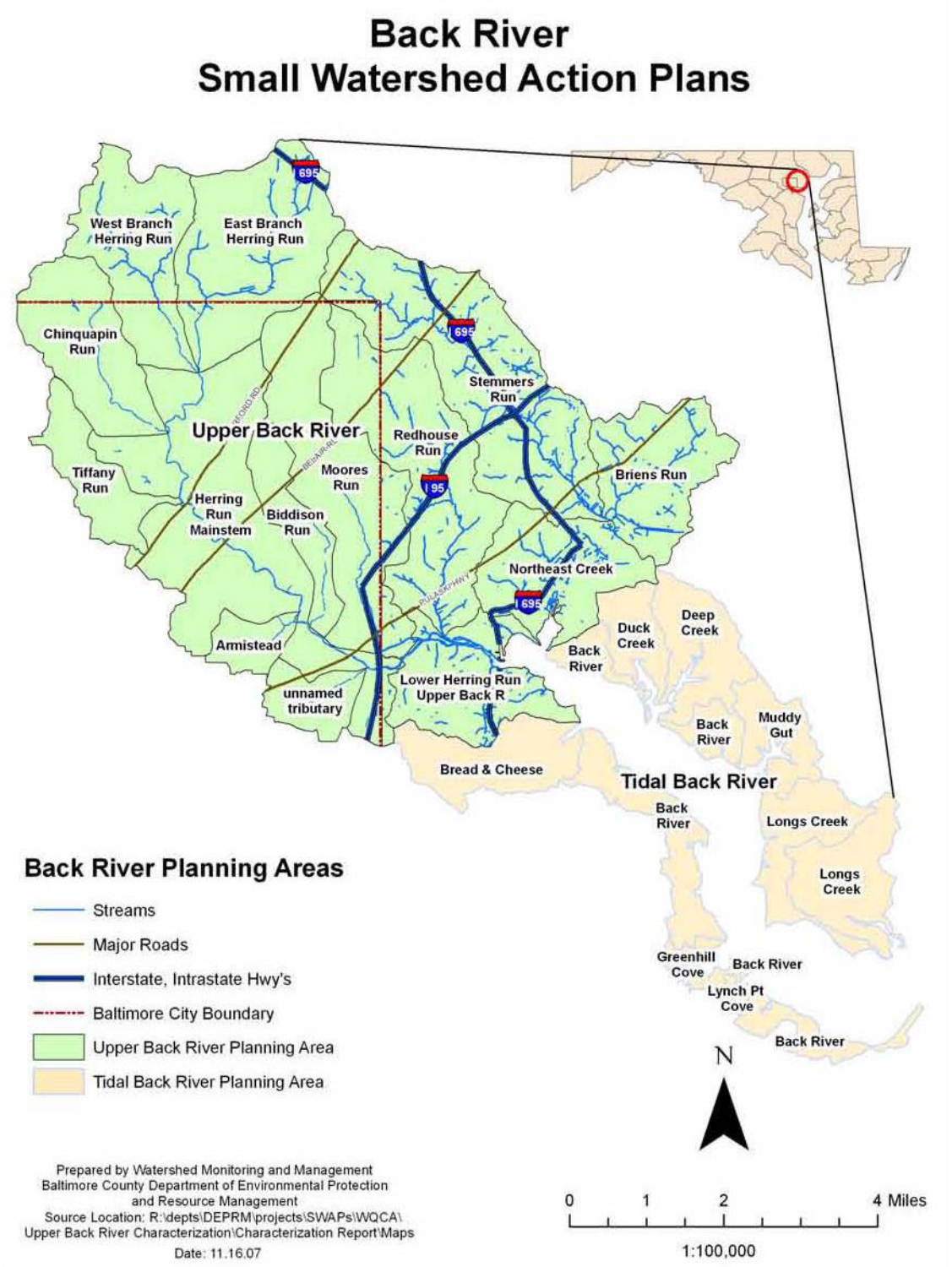


Figure 10 Map of Upper Back River Watershed
(Map is extracted from the Upper Back River Small Area Watershed Plan.)

V. Areas of Concern/Recommendations/Future Actions

Key challenges addressed by the NPS Program in collaboration with other state efforts include:

Urban/Suburban Nonpoint Source Pollution is increasing: Maryland has seen tremendous population growth over the last 20 years and the trend is projected to continue. An accompanying trend is a decrease in the number of people per household. These trends contribute to increasing development acreage, increasing impervious area as a percentage of the landscape and increasing urban nonpoint source pollutant loads in affected watersheds. During 2009, the Maryland Department of the Environment (MDE) continued to promote new and innovative practices to control stormwater through environmentally sensitive design techniques described in the "2000 Maryland Stormwater Management Manual." Also during 2009, MDE's Stormwater Management Program was drafting a new manual with updated information, guidelines and requirements. MDE is committed to maintaining a state-of-the-art approach to stormwater management and can contribute to control and reduction of the negative affects of urban stormwater runoff.

One current and ongoing effort to improve NPS management in Maryland is State Agency assistance to local governments as they improve the Water Resource Elements (WRE) in their comprehensive plans. To promote increasingly effective local NPS management, MDE assisted local governments in 2009 in several key ways: 1) developed and made available NPS analysis tools for use by local governments, 2) provided direct staff assistance in using these tools and in meeting NPS program objectives, and 3) reviewed and commented on local government's draft WRE sections for their comprehensive plans. It is anticipated that the work to promote effective NPS management by local government must continue into the future.

Another important way to help address this issue, is for erosion/sediment control practices to evolve toward increasingly efficient and cost effective ways to protect water quality. To promote this evolution, MDE initiated a comprehensive review of the State's erosion and sediment control standards in early 2009. An initial draft "2010 Maryland Standards and Specifications for Soil Erosion and Sediment Control" was released. This work addresses numerous suggestions that MDE received related to improvements of the State's erosion and sediment control requirements during the development of Montgomery County's municipal separate storm sewer system discharge permit, new stormwater regulations required by the State Stormwater Management Act of 2007, and the general discharge permit for stormwater related to construction activity. When final, this effort will result in revised minimum standards for erosion and sediment control and will be the official guide for erosion and sediment control principles, methods and practices in Maryland. One challenge that be met during evolution process is to define the best mix of pollutant control efficiency and practical, cost effective solutions.

Resource Constraints/Measurable Environmental Results: As federal and state budgets grow tighter, there is a push for all programs to demonstrate their effectiveness at producing results. The national Nonpoint Source Program is under pressure to demonstrate program effectiveness through measurable environmental results. Over the past few years, the Maryland NPS Program has focused on a watershed approach to help local government effectively leverage their

resources to meet environmental goals and objectives. In the future, the NPS Program will selectively target program resources to aid efforts aimed at removing waters from the impaired waters list. Maryland priorities include:

Protection of high quality (Tier II) waters: The 319 Program is supporting refinement and implementation of Maryland's anti-degradation regulations by funding biological monitoring. This is being targeted to Tier II waters in which proposed development activities serve to test the effectiveness of the anti-degradation policies.

Reducing nutrient and sediment pollution to the Chesapeake Bay: Nutrient and sediment pollution are the main reason our waterways remain impaired, particularly in tidal waters. These pollutants are the foremost threats to the state's living resources. Although significant progress has been made in reducing nutrient and sediment pollution, significant progress still needs to be made to meet Chesapeake Bay 2000 agreement and Coastal Bays management plan nutrient reduction goals.

Improvement of Impaired Waters:
Removal of impaired waters from Maryland's 303(d) list, either entirely or partially, is a priority. This priority is designed in part to address EPA's Strategic goals that call for improvement in a state's living resources. During 2009, MDE assessed the list of waters with biological impairment in Maryland and ranked them to identify watersheds that appear to be the best opportunities for implementation to remove an entire watershed from the list. Each of these watersheds has multiple stream segments with biological impairments, which means that in-the-field assessment and implementation activities will be necessary in multiple locations across the watershed. Beginning in 2010, MDE will work to integrate these priorities into the selection process for implementation projects. It is anticipated that soliciting implementation partners and funding implementation projects will be a challenge because this priority must compete with other State implementation priorities.

Documenting Success Stories: Maryland is committed to documenting at least one success story each year. The results will be summarized in the next annual report.