Maryland Nonpoint Source Program
2007 Annual Report

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I. 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 and local government, Soil Conservation Districts, private landowners and watershed associations.

The NPS Program's three priority goals are:

- Reducing nonpoint source pollution;
- Restoring and protecting habitat (e.g., streams, riparian buffers and wetlands); and,
- Removing waters from the State's list of impaired waters (e.g. the 303(d))

II. Executive Summary

This report documents the activities and accomplishments of the State of Maryland in general and the Maryland Department of Environment's Water Quality Restoration and Protection Program, in particular the administration of the State's §319(h) Program. Maryland Department of Environment (MDE) plays a lead role in helping to achieve protection and improvement of Maryland's water quality by promoting and funding state and local efforts, 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), Planning (MDP), and State Highway Administration (SHA). The NPS Program is housed within MDE's Science Services Administration (SSA).

In the past year, there have been notable program changes and successes. Progress was made in implementing best management practices in all nonpoint source areas through the provision of technical assistance, and project 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. Also because federal and state budgets are steadily decreasing there is 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.

Highlighted Effort

Benefits of 319(h) Investment to Increase Local Capacity

Beginning in 2005, the Corsica River Restoration project is Maryland's paramount intergovernmental attempt to target and de-list one of the many water bodies on Maryland's 303(d) list of impaired water bodies. Many governmental jurisdictions and agencies are working together to reduce sediment and nutrient pollution, develop outreach and education components, and increase the capacity of local governments in reducing pollutant loads and implement TMDLS. Funds were committed from the State of Maryland and the Federal Government, specifically the Federal 319(h) Non-point Source Pollution Grant Program.

As the Corsica River Restoration Project was being developed, it was known that one of the most effective means of bringing about environmental improvements is at the local jurisdictional level (county, township, or town). Many of the actions that negatively affect the environment are decided up on at these local levels, not the state or federal level. Fortunately, making changes at the local level can be relatively easy in comparison to the laborious, costly administrative process associated with making change at the state and federal levels. As a result the local jurisdictions in the Corsica River Watershed were encouraged to develop capacity to make this change. The town of Centreville, MD, in Queen Anne's County, is one of these jurisdictions.

Located at the head of tide on the Corsica River, Centreville is the only jurisdiction that is located wholly within the Corsica River Watershed. Like many local jurisdictions in Maryland, the town of Centreville had no staff dedicated to environmental issues within its jurisdiction. Therefore the Town, with the aid of the Maryland Department of the Environment, had applied for 319(h) funding to hire a watershed manager to fill a full-time position for three years. After the three years (2010), this position would be funded primarily by the local jurisdictions. This Watershed Manager is tasked with three main objectives: provide intensive outreach and recommended code and regulation changes, mitigate highway and urban runoff impacts to the Corsica River's two main tributaries, and target landowners with increased technical assistance in the design and installation of best management practices (BMPs).

Chris Clark was hired to fill this role, and since his hiring in 2006, he has made tremendous contributions to Centreville's environmental efforts and the Corsica River Restoration Project. Upon starting his term, Mr. Clark motivated the town to develop and vote in place, for the first time in history, an Environmental Advisory Council (EAC) that is composed of resident, environmental professionals, including the Watershed Manager.

The Centreville EAC provides guidance to the town on environmentally sensitive issues and has the responsibility of reviewing and updating Centreville's ordinances. Based on the advise of the EAC, the Centreville Town Council passed a pet waste ordinance and a tree canopy ordinance, which is identified by the Maryland Forest Service as on the of the most progressive tree canopy ordinances in the state of Maryland. The Town's EAC has also developed an Environmentally Sensitive Areas ordinance, that is currently under Town Council review.

The Centreville EAC has also provided guidance to the Town Council on the purchase of a two acre wharf property designed to increase public connectivity to the Corsica River, and the EAC has provided guidance on a potential PCB hot spot identified in an impounded portion of Gravel Run, a tributary that flows through town.

Mr. Clark has also begun the process of retrofitting the Town's circa 1800s-storm water problems. Working with the Maryland Department of the Environment, Mr. Clark has develop storm water retrofits in town that follow an environmentally sensitive design approach to storm water treatment. Two such sites have been identified, for which design plans are 95% complete. Design work was funded by the Town's 319(h) grant. Funding for the construction of one site will come from a grant that Mr. Clark obtained from the Maryland State Highway Administration, and funding for the other site will come from the Maryland Department of the Environment. Runoff from approximately 30 acres of urban land will be treated by these two stormwater treatment sites.

Coastal Plain Outfall Design to Treat Stormwater (Source: Underwood and Associates)

Chris Clark has also developed one of Centreville's first environmental outreach efforts. Working with an outreach company, Mr. Clark has developed a logo for the Corsica River restoration effort, "Get Your Feet Wet, Join the Riverlution!". This logo will be strategically placed at public locations and on the sides of the town's works vehicles. Mr. Clark has also obtained 500 steel plates that will be cemented to storm drains around the town. These markers are designed to inform the public about the connectivity between the storm drains and the River. Mr. Clark as also developed an agreement with the local supermarket in Centreville to create a showcase of environmentally friendly products. These showcases will be coupled with the logo that he created which promote the restoration of the Corsica River. Mr. Clark is also developing a website that can be used as a planning tool and that will serve the purposes of informing the public on the status

Corsica River Restoration Project

Storm Drain Plate

of the Corsica River restoration and the condition of the River, and provide information on how watershed residents can get involved.

In addition the to the tasks specified in the original grant agreement that provides the funding for his salary, The town watershed manager has also been able to develop interjurisdictional cooperation between the Town and the surrounding Queen Anne's County that has not been witnessed in the past. The Town of Centreville, Queen Anne's County, and a local citizen's group has received a 319(h) grant that will be used to create a bioswale along a county road that passes through town. This sort of cooperation would not be present in the watershed if not for the efforts of the watershed manager and the increased capacity in Centerville, which was made possible by the 319(h) Grant Program. And intuitively, this interjurisdictional cooperation, whether state and county, county and state, or state and federal, is hoped to be the channel by which local actions will eventually have a larger-scaled impact.

III. Overview

In Maryland, a complex web of water weaves its way through the State. Maryland is home to the Chesapeake Bay, the nation's largest estuary system, and the Coastal Bays that provide habitat for a wide range of aquatic life. Maryland has over 9,940 miles of non-tidal streams and rivers. Several major rivers (Monocacy, Patuxent, Potomac, Choptank, Nanticoke, Gunpowder, Pocomoke and Susequehanna) run through the state. 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.

What is NPS Pollution?

Nonpoint source 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 the Chesapeake and Coastal Bays. Nonpoint source pollution is associated with a variety of land-based activities including farming, logging, mining, urban/construction runoff, onsite sewage systems, streambank degradation, shore erosion, etc. Nonpoint source pollution 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 to the following land use categories:

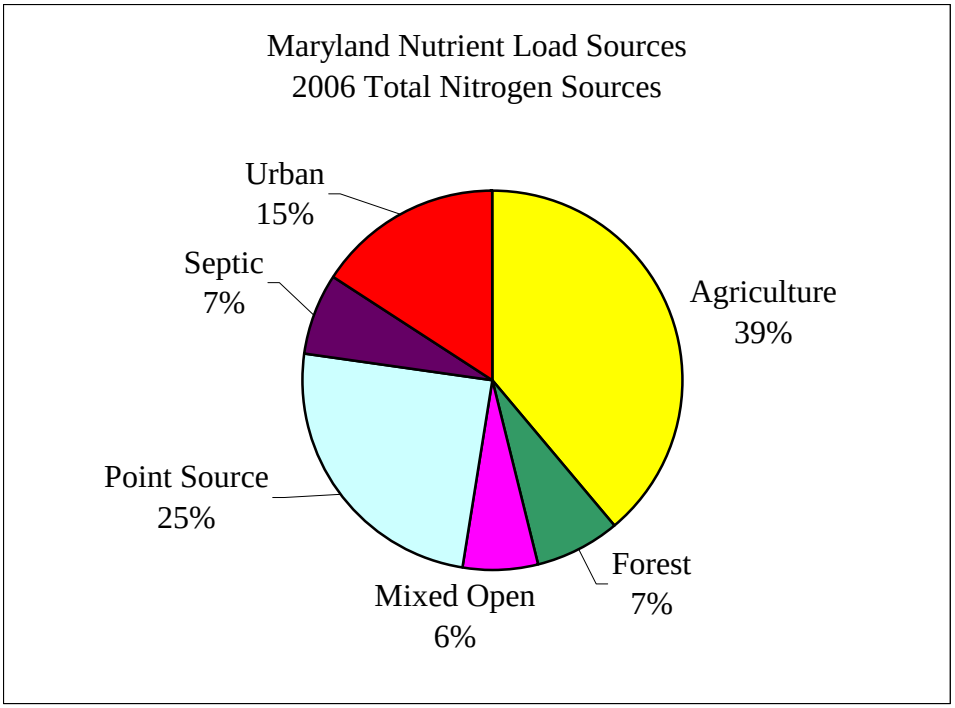


Figure 1: Chart showing the distribution of sources of nitrogen in Maryland[1]

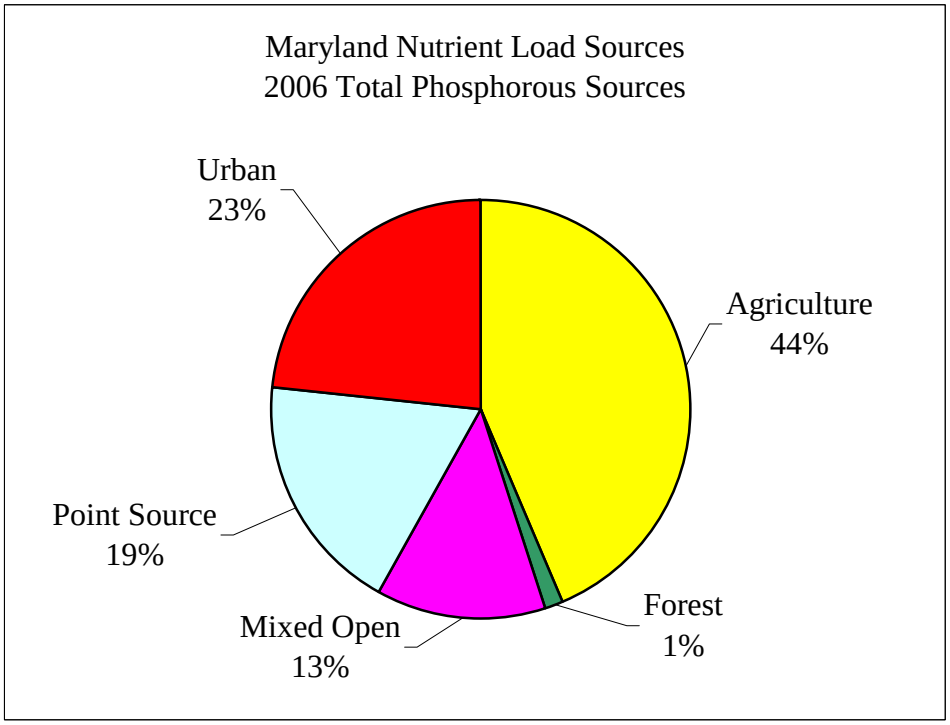


Figure 2: Chart showing the distribution of sources of phosphorus in Maryland[1]

[1] 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.

Nonpoint Source Total Maximum Daily Load Implementation

The Maryland Department of the Environment (MDE) is responsible for developing the state's list of impaired waters (i.e., the 303(d) list). MDE is also responsible for developing Total Maximum Daily Loads (TMDLs) for impaired waters. A TMDL establishes the maximum amount of a pollutant that a waterbody can assimilate and still meet Water Quality Standards. TMDLs allocate pollution loads for both point and nonpoint sources. A TMDL addresses a single pollutant (e.g., nutrients, sediment, fecal coliform). Each waterbody can have multiple TMDLs.

During 2007 MDE submitted 17 TMDLs to EPA for review and approval (Table 1). In past years most TMDLs have addressed nutrient impairments in tidal waters of the State, which have significant nonpoint source implications.
In addition to TMDL development activities, Maryland continues to advance TMDL implementation activities. Maryland recognizes that the §319(h) Program should address the restoration and protection of water quality standards under the Clean Water Act.

Table 1: TMDLs Submitted to or Approved by EPA in 2007

Basin Name	DNR 8-digit Basin Number	Impairment	Status
Anacostia River	2140205	Bacteria	Approved: March 14, 2007
Anacostia River (tidal)	2140205	PCBs	Approved: Oct. 31, 2007
Anacostia River	2140205	Sediment	Approved: July 24, 2007
Back River (Herring Run)	2130901	Non-tidal Bacteria	Approved: Dec. 4, 2007
Baltimore Harbor	2130903	Nutrients	Approved: Dec. 17, 2007
Bynum Run	2130704	Nutrients (WQA)	Approved: June 12, 2007
Cabin John Creek	2140207	Bacteria	Approved: Mar. 14, 2007
Casselman River	5020204	Low pH	Submitted: Sept. 26, 2007
Catoctin Creek	2140305	Sediments	Submitted: Sept. 28, 2007
Chester River, Lower	2130505	Fecal Coliform	Submitted: Sept. 24, 2007
Chester River, Middle	2130509	Fecal Coliform	Submitted: Sept. 24, 2007
Double Pipe Creek	2140304	Non-Tidal Bacteria	Submitted: Sept. 21, 2007
Evitts Creek	2141002	Sediment	Approved: Jan. 16, 2007
Georges Creek	2141004	Bacteria	Approved: Sept. 20, 2007
Georges Creek	2141004	Low pH	Submitted: Sept. 26, 2007
Little Youghiogheny River	5020202	Non-tidal Sediment	Approved: Feb. 7, 2007
Loch Raven Reservoir	2130805	Nutrients and Sediments	Approved: March 27, 2007
Lower Monocacy River	2140302	Non-Tidal Bacteria	Submitted: Sept. 27, 2007
Lower Patuxent River Mainstem	2131101	Bacteria (WQA)	Approved: May 15, 2007
Lower Patuxent River	2131101	Chlorpyrifos (Pesticide)	Approved: July 3, 2007
Lower Wicomico River	2130301	Bacteria	Submitted: Sept. 25, 2007

Middle Patuxent River	2131106	Non-Tidal Nutrients (WQA)	Approved: Feb. 21, 2007
Nanticoke River	2130305	Bacteria	Submitted: Sept. 25, 2007
Patuxent River Middle	2131102	Chlorpyrifos (Pesticide)	Approved: July 3, 2007
Patuxent River Upper	2131104	Non-tidal Nutrients (WQA)	Approved: Feb. 21, 2007
Piscataway Creek	2140203	Bacteria	Approved: Sept. 20, 2007
Potomac River, Lower Tidal	2140101	PCBs	Approved: Oct. 31, 2007
Potomac River, Middle Tidal	2140102	PCBs	Approved: Oct. 31, 2007
Potomac River, Upper Tidal	2140201	PCBs	Approved: Oct. 31, 2007
Prettyboy Reservoir	2130806	Nutrients	Approved: Mar. 27, 2007
Rock Creek	2140206	Bacteria	Approved: July 30, 2007
Rocky Gorge Reservoir/T. Howard Duckett Reservoir(Patuxent River)	2131107	Phosphorus	Submitted: Sept. 26, 2007
Savage River	2141006	Low pH	Submitted: Sept. 26, 2007
Severn River	2131002	Bacteria	Submitted: Sept. 28, 2007
Southeast Creek (Chester River)	2130508	Fecal Coliform	Submitted: Sept. 24, 2007
Triadelphia Reservoir (Patuxent River)	2131108	Phosphorus & Sediments	Submitted: Sept. 26, 2007
Upper Monocacy River	2140303	Bacteria	Submitted: Sept. 27, 2007
Upper North Branch Potomac River	2141005	Low pH	Submitted: Sept. 26, 2007
Upper North Branch Potomac River	2141005	Sediments	Approved: May 15, 2007
Wicomico River Headwaters	2130304	Bacteria	Approved: Sept. 20, 2007
Wills Creek	2141003	Low pH	Submitted: Sept. 26, 2007
Wills Creek	2141003	Non-tidal Bacteria	Approved: Nov. 6, 2007
Wills Creek	2141003	Non-tidal Sediments	Approved: Jan. 16, 2007
Youghiogheny River	5020201	Low pH	Approved: Sept. 20, 2007
Youghiogheny River	5020201	Non-tidal Sediments	Approved: Feb. 21, 2007

IV. Major Accomplishments and Successes

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.

Implementation Projects

Table 2 shows the projects that were funded from the §319(h) program.

Table 2: List of FFY2006 and FFY2004 reprogrammed funded projects

Title of Project	Watershed	Is there a TMDL or WQA?	303(d) List Impairment	Sources of impairment
Aaron Run Watershed Remediation Project	02141006	No	pH	AMD
Antietam Creek Watershed Project	02140502	WQA	Bacteria, Sediments, Nutrients, Biological	Non-point and Point sources
Corsica	02130507	Yes	Bacteria, Sediments, Nutrients	Nonpoint sources
Corsica Capacity	02130507	Yes	Bacteria, Sediments, Nutrients	Nonpoint, Point Sources, Natural
Corsica Monitor	02130507	Yes	Nitrogen & Phosphorus	Nonpoint
Corsica Monitoring OSDS	02130507	Yes	Bacteria, Sediments, Nutrients	Nonpoint sources, Point Sources
Deer Creek Watershed Agricultural Soil Conservation and Water Quality Technical Assistance	02120202	WQA	Biological	Nonpoint sources
Liberty Reservoir Targeted Watershed Project	02130907	Yes	Nutrients, Mercury	Nonpoint sources
Marshyhope Creek and Nanticoke River Watersheds Agricultural Soil Conservation	02130305	Yes	Bacteria, Sediments, Nutrients, Biological	Point sources and Nonpoint sources
Maryland Biological Stream Survey	multiple	N/A	N/A	N/A
NPS Program	Statewide	N/A	N/A	N/A
Targeted Watershed	Statewide	Yes	Bacteria, Sediments, Nutrients	Nonpoint sources, Point Sources, Natural
Track and Analyze Data	Statewide	N/A	N/A	N/A
Upper Choptank	02130404	N/A	Bacteria, Sediments, Nutrients	Nonpoint
Urban SWM Database	Statewide	N/A	N/A	N/A

Urban Wetlands Program, Bennett Creek Watershed Pilot	02140302	N/A	Biological	Nonpoint sources

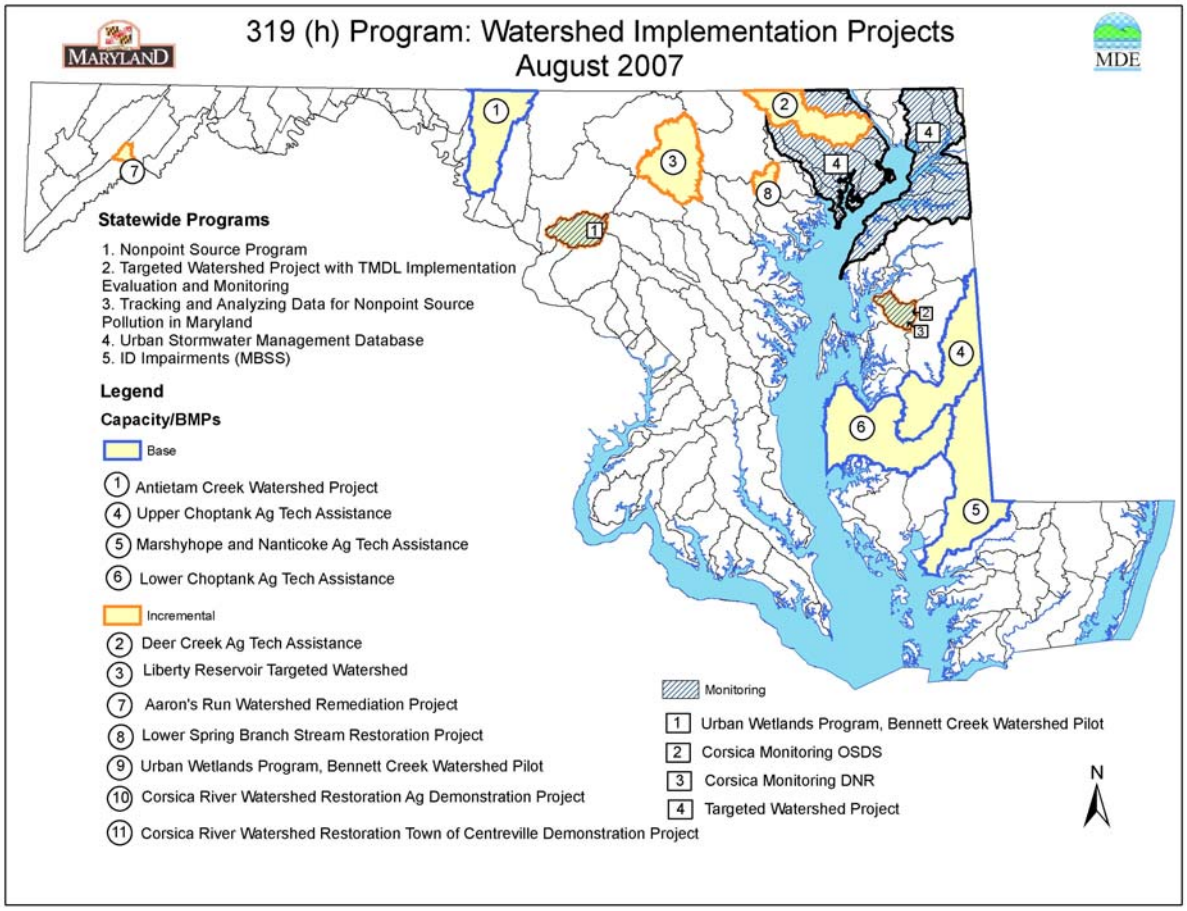


Figure 3: Map showing the locations of the FFY2007 Implementation projects

Corsica River Targeted Watershed: At the end of 2003, representatives from Centreville, a small town near the tidal head waters of the Corsica River, coordinated with a diverse group of citizens and with MD Department of Natural Resources to develop a Watershed Restoration Action Strategy which was funded by the EPA §319(h) program. This plan identifies needed implementation to address the TMDL and other restoration goals. Using funding from EPA §319(h) FFY 05, Maryland Bay Restoration Fund, Oyster Recovery Partnership, the National Fish and Wildlife Foundation, and the Chesapeake Bay Trust the stakeholders began to strategize and implement the objectives of the WRAS. A comprehensive Corsica River report for 2007 should be available in the Spring of 2008.

This targeted watershed initiative included the following funded §319(h) projects, Agriculture Demonstration Project, Town of Centerville Demonstration Project, Maryland Department of Environment Monitoring Project and the Maryland Department of Natural Resources Monitoring Project. These projects were allotted approximately 19% of the funds awarded in the 2007 Grant Year. Each project is described below.

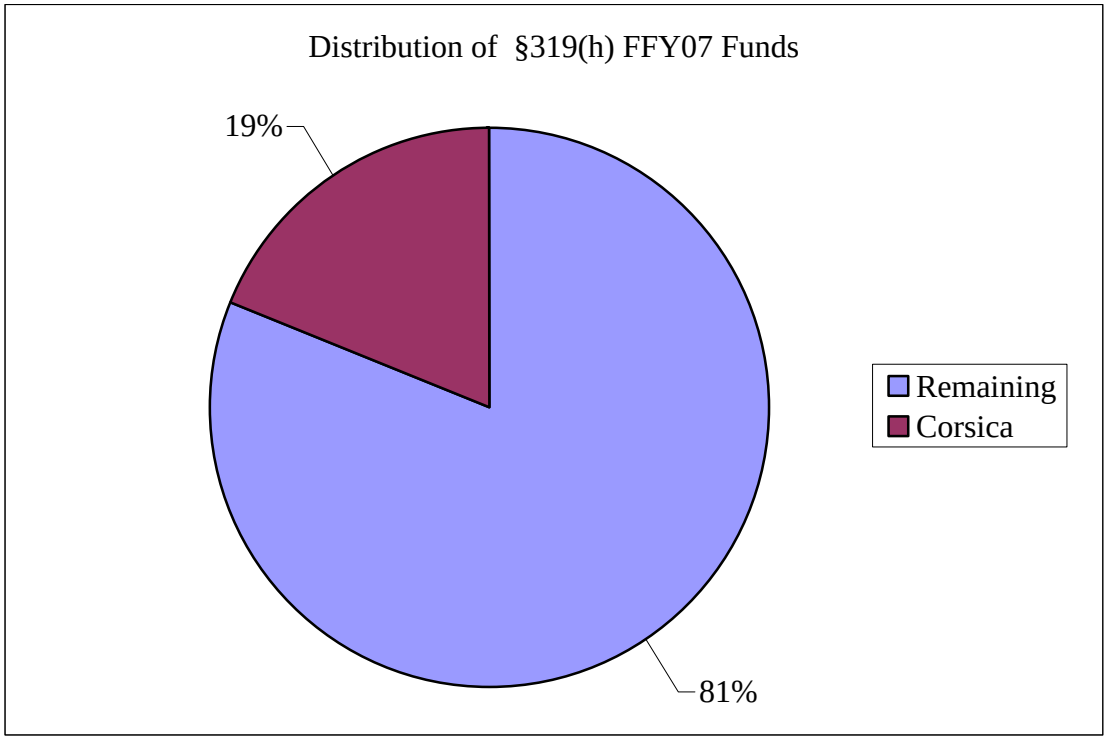


Figure 4: Chart showing distribution of Maryland's FFY 2007 §319(h) funding between the Corsica Targeted Watershed Project and Remaining Projects

- Corsica River Watershed Restoration Project Agriculture Project Capacity Development Demonstration: This project addresses the need for capacity assistance in order to facilitate and accelerate the implementation of best management practices, enhance the participation in Maryland's cover crop program and support other demonstration BMPs with particular focus on farmette horse pasture management demonstrations.

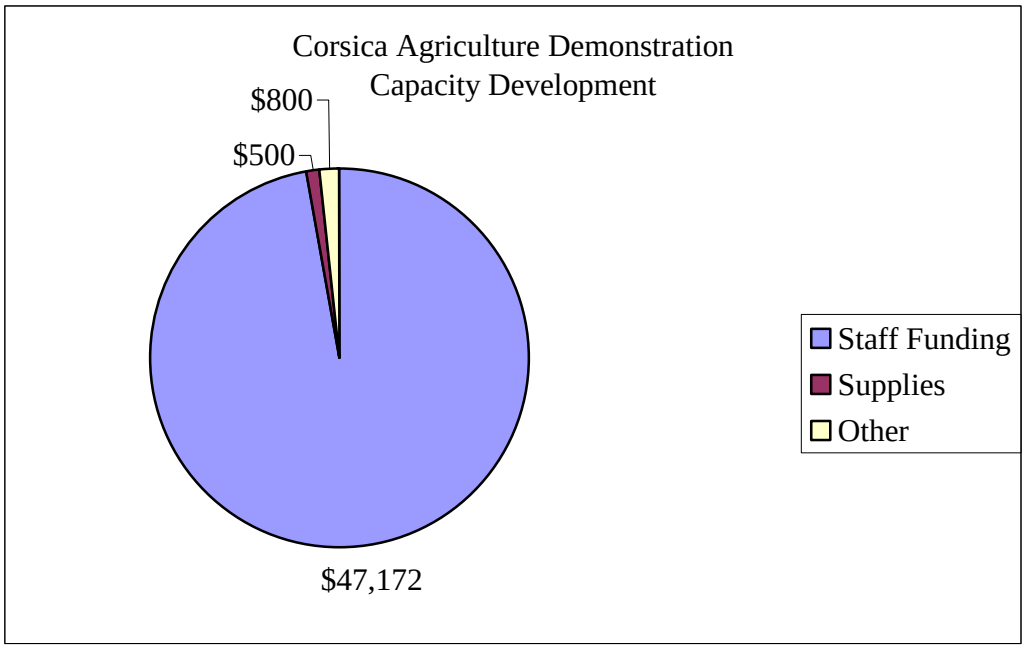


Figure 5: Chart showing the distribution of FFY 2007 §319(h) funds for the Corsica River Watershed Restoration Project- Agriculture Capacity Development Demonstration

- Corsica River Watershed Restoration Project Town of Centreville Demonstration Project: This projects funds stormwater retrofit/stormwater management techniques such as wetland creation, riparian buffer plantings, and fish migration barrier removals if necessary. Wetlands, especially when constructed adjacent to waterways will provide added benefits of flood attenuation, sediment retention, and will slow storm water sufficiently to allow the stream system to heal unstabilized stream banks immediately downstream of the wetland area. Stormwater retrofits are easier to connect to an impacted area, as they generally are the immediate recipient of storm flow. This project also addresses the need for capacity assistance. It funds a watershed/grants manager and outreach manager to accelerate the application of urban code and programmatic development, outreach, and urban BMP's in this watershed. It is through this additional management capacity and technical support that water quality improvement, in both surface and ground water, will lead to improving the waters of the Corsica River. This project funds Programmatic Changes, to professionally review and recommend code changes, programmatic changes, and local/state regulation changes. The effort also includes extensive public outreach and education and upfront participation in the process. Estimated load reductions are calculated to be 33% for nitrogen and 46% for phosphorous improvement over existing untreated lands. A calculation for Centreville is

as follows: 996 acres (urban impervious) x 8.1 lbs/ac. x 0.33 = 2668.3 lbs of nitrogen and 996 acres x 0.5 lbs/ac. x 0.46 = 235.7 lbs of phosphorous.

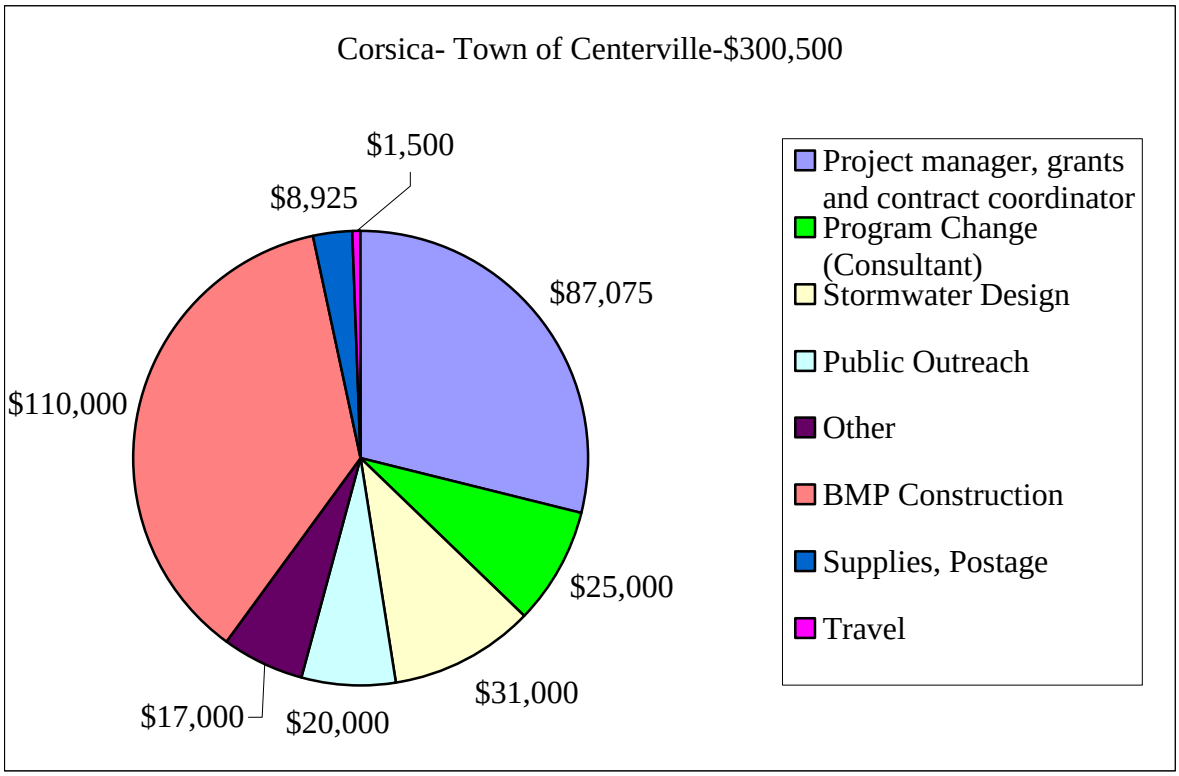


Figure 6: Chart showing the distribution of FFY 2007 §319(h) funds for the Corsica River Watershed Restoration Project- Town of Centreville Demonstration

- Corsica River Watershed Implementation Monitoring: The goal of this project is to monitoring the effectiveness of retrofitting conventional OSDSs with nitrogen reducing technology in the Corsica watershed. This project will monitor the Town of Centreville's upgrade of 30 septic systems that lie in close proximity to impaired streams. Conventional systems that are currently permitted in the County discharge 40 - 60 mg/l of nitrogen (estimated N content in what flows from the whole septic system into the groundwater). There are existing systems that are installed in marginal soils, some are very poorly (if ever) maintained, some lie within 300 feet of a tributary stream or the edge of tidal water, and employ dated technology not capable of any significant nutrient reduction.

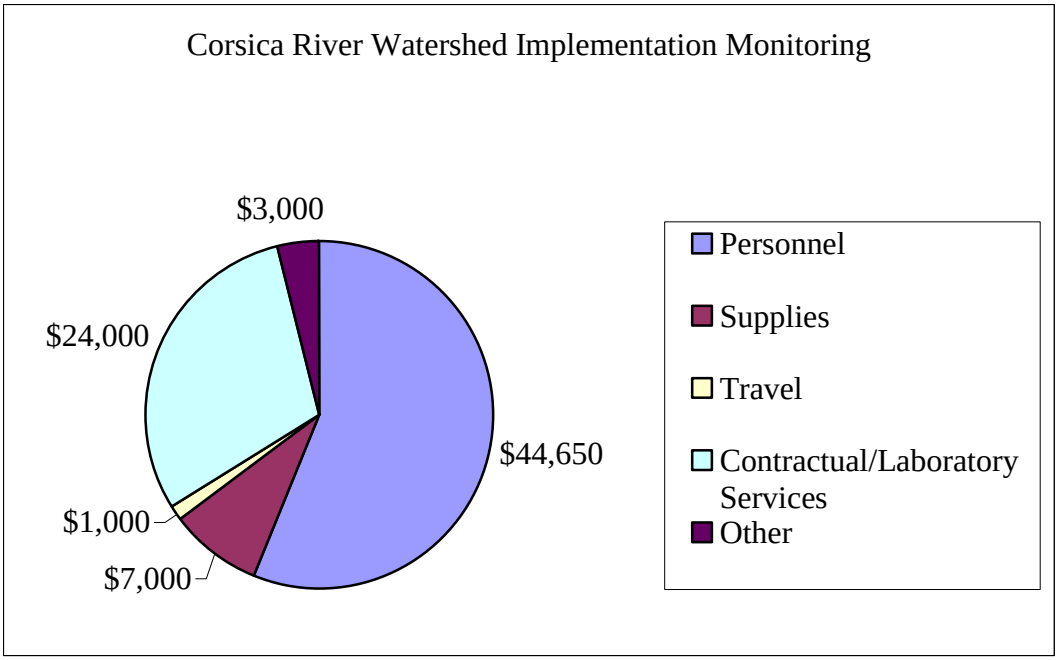


Figure 7: Chart showing the distribution of FFY 2007 §319(h) funds for the Corsica River Watershed Restoration Project- Maryland Department of the Environment's Implementation Monitoring

- Corsica River Restoration Project Maryland Department of Natural Resources Monitoring for Interim and Post Project Water Quality: This project is a comprehensive monitoring project being conducted to assess early progress in the Corsica River Watershed Restoration Project and to provide feedback necessary to enhance the success of future watershed restoration projects which include: cover crop implementation results, stormwater bmp implementation results, and monitoring for living resource projections. All of the project grant funding is for contractual services.

Other Projects supported with §319(h) this year covered a variety of efforts aimed at habitat or water quality improvements. The projects included:

Aaron Run Watershed Project: In this project the Maryland Bureau of Mines intended to design and construct best treatment technologies for acid mine drainage at four sites in the watershed. The construction of these treatment systems will abate the impacts of the presently uncontrolled discharge of acid mine drainage from four sites. With the abatement of these acid discharges, the mainstem of Aaron Run will recover good water quality capable of sustaining native fish populations. This project also planned to include the re-introduction of native brook and brown trout to the upper reaches isolated by several waterfalls in the watershed.

Urban Wetlands Program, Bennett Creek Watershed Pilot Project: This two year project intended to develop a mechanism for Frederick County Government's Watershed Management Section to establish wetland assessment standards and protocols, update and map the nontidal wetlands GIS layer, define characteristics for benchmark nontidal wetlands in the Piedmont hydrophysiographic province. In the first year this project monitoring objectives, strategy and protocols to identify benchmark nontidal wetlands in the Piedmont Region were developed. Also, field wetland inventory procedures, habitat assessments protocols for vegetative, amphibian, and nesting bird surveys and data sheets were created. Plan sets of land use change and create scanned electronic version for Bennett Creek watershed were compiled. Delineated wetlands from plan sets for the pilot watershed were digitized to create a GIS data layer. There was also a review of NWI for recognizable changes since layer development; earmark changes for future assessment, and a list of identified nontidal wetland areas that require field verification was developed. In the second year of this project, two stormwater wetland restoration/enhancement projects that treat 36.35 acres will be established. Restoration will remove 279.5 pounds of phosphorus, 1739.3 pounds of nitrogen, and 42.5 tons of sediment over the project lifespan.

Several projects include those which support the tracking of achievements in BMP implementation:

Urban Stormwater Management Practices Database: This project continues to support the need for coordination and communication between jurisdictions regarding stormwater management data. This project fulfills the need to continue providing necessary information to the Chesapeake Bay Program.

Analyzing and Tracking Nonpoint Source Data: This ongoing project has successfully coordinated the consolidation of nonpoint sources Best Management Practices for inclusion in the Chesapeake Bay Watershed Model. It also achieved the goal of coordinating information exchange with other agencies concerning BMPs. See Appendix B for the tracked BMPs by major watershed and their approximate nutrient reductions.

Agricultural Projects: The following watersheds received §319(h) funding for technical assistance and various BMP Implementation: Antietam Creek Watershed, Deer Creek, Liberty Reservoir Targeted Watershed Project, Upper Choptank, Marshyhope Creek and Nanticoke River. The funding for the projects supplies the continual need for capacity support. These individuals make the implementation of the BMPs as shown in Table 3 possible.

Table 3:Agriculture 2007 Outcomes as proposed in Project Work Plans

Practice	Planned BMPs	Nitrogen Reduction Approx. (lb/yr)	Phosphorous Reduction Approx. (lb/yr)
Animal Waste Storage Structures	3	1,593	312
Best Management Practices (acres)	70	N/A	N/A
Best Management Practices (number)	170	N/A	N/A
Conservation Tillage (acres)	1,000	4,640	1,130
Cover Crops (acres)	5,050	47,874	657
CREP (acres)	102	1,724	2,550
Nutrient Management Plans (acres)	2,500	7,775	750
Precision Agriculture	400	N/A	N/A
Roof Runoff Control System	1	69	13
Soil Conservation and Water Quality Plans	130	N/A	N/A
Soil Conservation and Water Quality Plans (acres)	11,436	10,635	1,601
Waste Management Plans (tons manure)	1,350	N/A	N/A
Wetland (acres)	3	82	6
Total		74,392	7,019

Other Agricultural Programs: The implementation of agricultural programs [Nutrient Management, Maryland Agricultural Cost Share (MACS), Soil Conservation and Water Quality (SCWQ) Program, Conservation Reserve Enhancement Program (CREP)] continues to play a key role in reducing nonpoint source pollutants.

Maryland's Agriculture Programs

Good water quality is the most critical element in the overall restoration and protection of the Chesapeake Bay, the Coastal Bays and their tributaries for the support of living resources and to ensure safe drinking water supplies and other beneficial uses. Agricultural activity, human population growth, development activities, atmospheric deposition and septic systems are each contributing nonpoint source pollution in the form of sediment, nutrients and other potential pollutants which affect the State's surface and ground waters.

A strong agricultural industry and a healthy environment go hand in hand. As we move ahead into the future, agricultural and soil conservation partners will continue to preserve Maryland's rural legacy by developing and promoting farming practices that are both environmentally sensitive and economically sound. Maryland has a variety of agricultural programs (Nutrient Management Program, MD Agricultural Water Quality Cost Share Program, Soil Conservation and Water Quality Planning, Conservation Reserve Enhancement Program, Manure Transport Program, and Agricultural Water Management Program) described below that address the control and reduction of nonpoint source pollution.

Nutrient Management /Water Quality Improvement Act (WQIA)

In 1998, the Maryland General Assembly passed landmark legislation that placed Maryland at the forefront of national efforts to protect water quality. The Water Quality Improvement Act (WQIA) established both short and long-term strategies for reducing nutrient levels in our streams, rivers and Chesapeake and Coastal Bays. The most significant feature of the Act is a provision requiring nutrient management plans for virtually all Maryland farms. The WQIA changed the nutrient management program from its voluntary status to a regulatory program. It requires farmers who use chemical fertilizers to submit a nitrogen and phosphorus based nutrient management plan to the Maryland Department of Agriculture (MDA) by December 31, 2001 and implement it by December 31, 2002. Farmers who use animal manure or sludge must have and implement nitrogen based plans by the same dates as those who use chemical fertilizers. Those who have sludge or animal manure have until July 1, 2004 to submit phosphorus based nutrient management plans and must implement them by July 1, 2005. Although the law includes a number of deadlines and requirements, it also offers many new incentives aimed at helping farmers comply.

Maryland Agricultural Cost Share (MACS)

State and federal funds are used to provide grants to Maryland farmers for the installation of best management practices (BMPs) to address existing or potential water pollution conditions associated with farming activity. Farmers may receive up to 87.5% of the cost of approximately 30 eligible BMPs. For more detailed information on the program, see the MACS website at: http://www.mda.state.md.us/resource/mawqca10.htm.

Soil Conservation and Water Quality (SCWQ) Program

Soil Conservation and Water Quality (SCWQ) Plans are at the heart of Maryland's resource conservation and protection efforts. Developed and implemented through a local delivery network of soil conservation districts, these plans help farmers manage natural resources and identify and solve potential environmental problems while reaching optimal but sustainable production goals. SCWQ plans contain a menu of best management practices (BMPs) to help farmers prevent sediment, nutrients and fertilizers from impacting nearby waterways.

Conservation Reserve Enhancement Program (CREP)

Maryland was the first state to take advantage of the innovative Conservation Reserve Enhancement Program (CREP), which allows states to focus on natural resource issues of the greatest local concern. Under the program, Maryland landowners can protect sensitive streamside areas and highly erodible lands and restore wetlands. CREP provides annual rental payments for 10 –15 years and cost share for installing BMPS to conserve these sensitive resource areas. Since program initiation in October of 1997, Maryland landowners have protected over 71,200 acres of these sensitive lands through CREP enrollment and BMP installation.

Manure Transport Program
The Manure Transport Program provides support to animal producers who have excess manure and need to find alternative means of managing it in order to be in compliance with the WQIA. The two-fold objectives of the program include subsidizing the cost of transporting animal manure to make it affordable for animal producers to address excess manure and providing an incentive for the development of alternative technologies and business ventures to create a market for use of animal manures. See http://www.mda.state.md.us/nutrient/transport.pdf for more information.

Operations receiving manure for land application under the program must apply it in accordance with a nutrient management plan prepared by a certified consultant. Receiving operations with alternative uses for manure are also eligible to participate. Current alternatives to direct land application include the use of poultry litter as a substrate for growing mushrooms and the manufacture of fertilizer pellets by Perdue Agri-Cycle for use in landscaping and shipment to other regions of the country. To date, practically all of the manure transported has been poultry litter. Reimbursement for all participants is capped at $20 per ton. Livestock producers receive up to 87.5% of transport costs from public funds.

Agricultural Water Management Program
The Maryland Department of Agriculture (MDA) regulates agricultural public drainage facilities administered as Public Drainage Associations (PDAs). PDAs are independent political subdivisions with local taxing authority and cover over 850 miles of drainage ditches in the coastal zone, mostly on the Eastern Shore. The PDAs are required to develop and implement approved operation and maintenance plans that address sediment control and water quality protection. MDA assists PDAs to conduct biannual inspections and provides technical assistance through the SCDs. Typical best management practices include vegetative filter strips and channel stabilization.

Nonpoint source program incremental funds that went towards implementation of innovative BMPs were leveraged by State funds and local funds raised through taxing landowners beneficiaries. The Soil Conservation Districts, PDA Coordinators and National Resource Conservation Service (NRCS) engineers' time in planning, design, permit applications, construction checks and final approval were all services provided as in-kind and free to landowners and PDAs.

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. As more land becomes developed, there has been an increase in the urban/suburban component of nonpoint source pollution to our rivers and bays. The Maryland Department of the Environment has been promoting new and innovative practices to control stormwater through environmentally sensitive design techniques described in the "2000 Maryland Stormwater Management Manual." This manual promotes innovative design measures (e.g., sheet flow to buffers, natural conservation, reduction of impervious area, open section roadways and grass swales, etc). These design techniques are targeted to new

development. There is also a need to address development built before modern stormwater regulations took effect.

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.

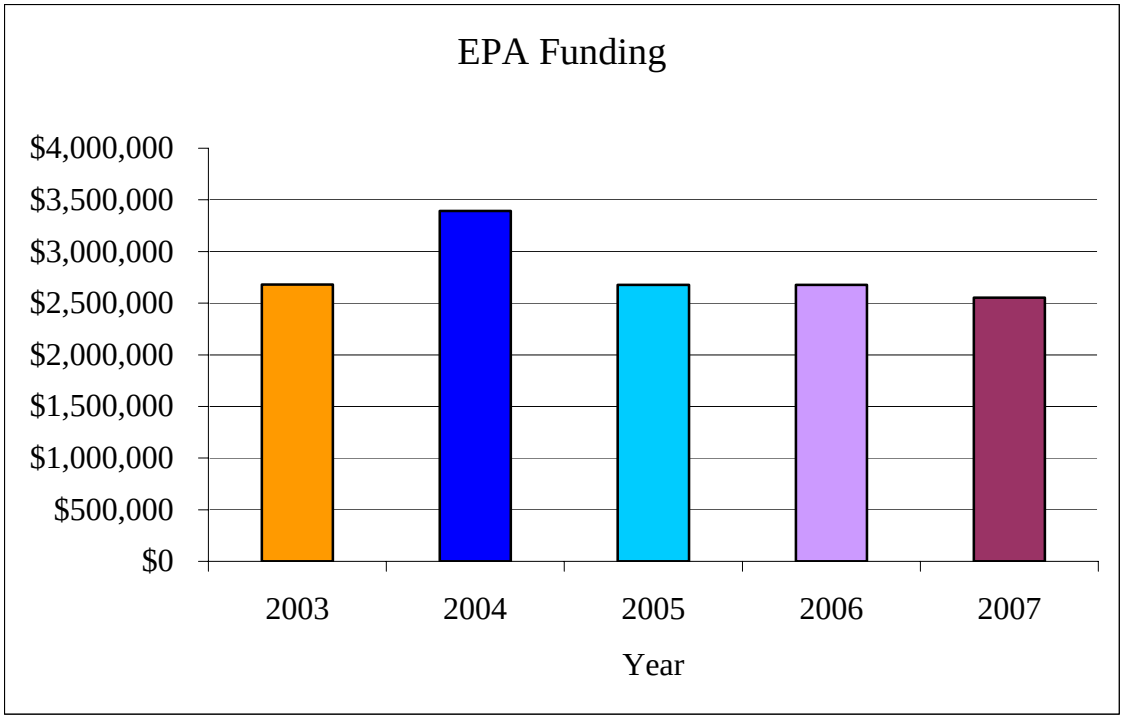
In the future the State's Priorities include:

Reducing nutrient and sediment pollution: Nutrient and sediment pollution are the main reason our waterways remain impaired. 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 the 303(d) list, either entirely or partially, is a priority. As part of the EPA Strategic goals there is a call for improvement in a state's living resources. As part of this goal, targeting watersheds that can either be removed or partially removed is a priority. Plans to strategically target these watersheds are being developed.

Appendix A: Financial and Contact Information

A. Amount of EPA §319(h) funding from 2003 to 2007



Year	EPA Funding
2007	**$2,551,736**
2006	$2,675,598
2005	$2,675,598
2004	$3,391,964
2003	$2,678,890
Total	$14,076,550

B. List of Agency Cooperators

1. State Lead Agency
Maryland Department of Environment
Technical and Regulatory Services
1800 Washington Blvd.
Baltimore MD 21230

Jim George – Director, Water Quality Protection and Restoration Program
Ken Shanks- MDE §319(h) Grant Manager
Joe Woodfield- MDE §319(h) GRTS Manager

2. Other State Agencies – Contacts

Maryland Department of Natural Resources
580 Taylor Ave. E-2
Annapolis, MD 21401

Matt Fleming – Chesapeake & Coastal Programs
John McCoy – Ecosystem Restoration Services
Catherine Shanks – Community & Local Government Services

Maryland Department of Agriculture
50 Harry S. Truman Parkway
Annapolis, MD 21401

John Rhoderick- Office of Resource Conservation

Maryland Department Of Planning
301 W. Preston Street Suite 1101
Baltimore, MD 21201-2305

Joe Tassone- Landuse Planning and Analysis

3. Federal Agencies – Contacts

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Appendix B: 2006 BMP Progress Implementation on Maryland from the FFY07 *Analyzing and Tracking Nonpoint Source Data* Project

Type of Practice	Choptank River	Lower Eastern Shore	Lower Western Shore	Lower Potomac River	Middle Potomac River	Patapsco / Back River	Patuxent River	Upper Eastern Shore	Upper Potomac River	Upper Western Shore	Statewide Total	Nitrogen Reduction Approx. (lb/yr)	Phosphorous Reduction Approx. (lb/yr)
Animal Waste Management Systems-Livestock	50	31	4	20	12	49	49	138	107	657	1,117	1,344,644	152,255
Animal Waste Management Systems-Poultry	159	886	0	0	0	0	0	69	0	11	1,125	252,798	28,624
Cover Crops	8,123	14,257	535	4,802	1,710	556	1,820	13,220	3,417	7,048	55,488	100,115	4,575
Dry Detention Ponds and Hydro Structures	756	1,678	3,917	714	4,882	12,648	2,423	1,721	13,079	14,122	55,939	20,425	2,528
Dry Extended Detention Ponds	222	80	4,170	883	1,517	8,334	3,032	143	5,223	7,677	31,280	68,529	7,068
Erosion and Sediment Control	54	1,136	4,321	410	11,740	5,893	8,457	184	3,477	2,491	38,163	91,970	8,624
Filtering Practices	53	125	71	72	374	891	485	49	1,314	915	4,349	12,705	1,179
Forest Conservation	1,193	2,585	2,903	10,662	9,775	4,723	18,631	7,514	10,275	3,445	71,705	N/A	N/A
Forest Harvesting Practices	1,784	9,651	226	3,617	237	566	1,231	1,493	1,979	4,698	25,483	17,444	227
Grassed Buffers	12,212	17,001	12	889	50	574	313	8,591	231	1,881	41,754	408,745	48,368
Infiltration Practices	160	368	3,551	101	1,238	3,452	3,454	32	1,854	2,458	16,668	60,863	5,273
Nutrient Management Plan Implementation	176,714	249,026	21,186	62,148	52,024	81,808	77,282	286,835	118,438	312,033	1,437,494	1,636,296	288,205
Retirement Of Highly Erodible Lands	332	152	43	1,056	753	1,155	711	3,684	749	6,101	14,736	N/A	N/A
Riparian Forest Buffers on Ag Lands	1,121	7,333	50	672	443	758	680	1,798	1,231	5,303	19,388	225,112	27,642
Riparian Forest Buffers on Urban Lands	3	0	47	26	55	63	73	34	11	33	346	408	1,183
Runoff Control	5	8	5	22	3	50	164	43	278	212	790	577	36
Septic Connections to Sewers	485	796	332	697	0	977	220	4,561	570	2,008	10,646	77,745	N/A
Septic Denirification	0	2	189	4	1	104	118	2	6	2	426	1,554	N/A
Soil Conservation Water Quality Plans	101,188	157,199	3,061	22,701	31,396	13,964	45,753	112,573	72,226	162,634	722,695	822,642	144,894
Stream Protection w/Fencing	0	0	12	6,934	121	117	585	1,112	1,382	4,898	15,161	207,093	20,264
Stream Protection w/o Fencing	0	0	606	94	225	6,025	6,741	225	12,973	2,700	29,589	202,087	19,774

Type of Practice	Choptank River	Lower Eastern Shore	Lower Western Shore	Lower Potomac River	Middle Potomac River	Patapsco / Back River	Patuxent River	Upper Eastern Shore	Upper Potomac River	Upper Western Shore	Statewide Total	Nitrogen Reduction Approx. (lb/yr)	Phosphorous Reduction Approx. (lb/yr)
Stream Restoration	655	1,203	2,652	1,509	22,527	17,110	7,675	3,497	34,405	15,602	106,835	486,440	833
Tree Planting on Agricultural Lands	1,139	1,870	84	43	96	246	248	1,774	1,007	2,655	9,163	106,384	13,063
Wet Ponds	794	6,127	4,532	1,074	11,045	10,051	9,802	790	5,206	5,711	55,132	120,786	12,458
Wetland Restoration on Ag Lands	1,493	2,643	5	169	35	102	90	2,049	188	195	6,969	80,913	9,936

Appendix C: General Approach and Schedule to Implement Applicable Management Measures

Category	Priority	Implementation Timeline (Years)		
		1998-2002	2003-2007	2009-2012
Agriculture	Statewide	Farmers using commercial fertilizers must have n & P based plans by 2002 Farmers using animal manure or sludge must have n & P based plans by 2002	Soil Conservation Water Quality Plans (SCWQP) on 50% of all farms by 2003 SCWQP implemented on 25% of all farms by 2003 Farmers using animal manure or sludge must have n & P based plans by July 1, 2004	
	Watershed Focus	Tributary Strategies Agricultural Priority Watersheds**	Agricultural Priority Watersheds**	
Forestry	Statewide	Riparian Forest Buffer (RFB) goal of 43 miles per year	Riparian Forest Buffer (RFB) goal of 43 miles per year	600 miles of created RFB by 2010
	Watershed Focus	Coastal Bays Special Streams Project Monocacy Anacostia Susquehanna Town Creek Rock & Carroll Creek		
Urban runoff: developing and developed areas	Statewide			
	Watershed Focus	Washington - Baltimore Metro Area, Roland Run, Redhouse Run, Severn River SWM plan Anacostia Watershed		

From "Maryland Nonpoint Source Management Plan December 1999"

Category	Priority	Implementation Timeline (Years)		
		1998-2002	2003-2007	2009-2012
Marinas and Recreational Boating	Statewide	96 Certified Clean Marinas by 2002	125 Certified Clean Marinas by 2004	270 Certified Clean Marinas by 2010 Marine Sewage Pumpout Program goal of 460 facilities by 2010
	Watershed Focus	Chesapeake Bay Coastal Bays Deep Creek Lake		
Channelization and Channel Modification, dams, and shoreline erosion	Statewide			
	Watershed Focus	Chesapeake Bay Shoreline CWAP Priority Watersheds Anacostia Northwest Branch Town Park Stream		
Wetlands	Statewide	3000 acres by 2002	10,500 acres by 2007	15,000 acres by 2010
	Watershed Focus	CWAP Priority Watersheds Coastal Bays		

From "Maryland Nonpoint Source Management Plan December 1999"