



# 2011 Milestones for Reducing Nitrogen and Phosphorus



## Introduction to Milestones

In the past, the Chesapeake Bay Program has set one overall pollution reduction goal for cleaning up the Bay a decade or more in the future. But this approach was like a ladder without rungs – it did not include the incremental, short-term goals needed for steady progress in reducing pollution.

Now the partnership will use short-term goals to increase restoration work, called milestones. Every two years, the six states and D.C. will meet milestones for implementing measures to reduce pollution from nitrogen and phosphorus, with the first milestone on December 31, 2011.

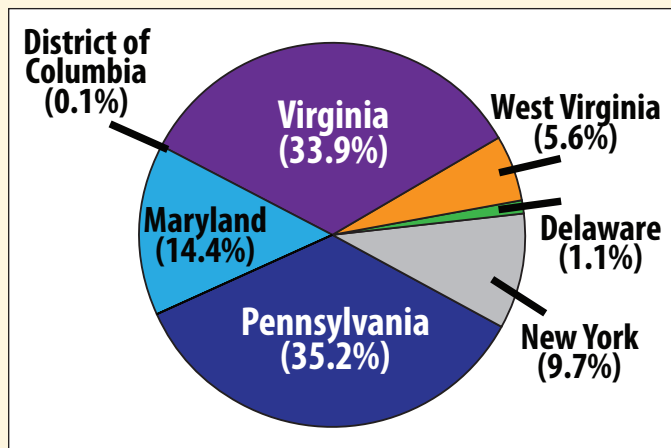
By meeting the 2011 milestones, an additional 6.9 million pounds of nitrogen will be reduced in the watershed, which is a 77 percent increase over the previous rate of progress. For phosphorus, an additional 463,948 pounds will be reduced watershed-wide, which is a 79 increase over the previous rate of progress.

## Milestone Fact Sheets

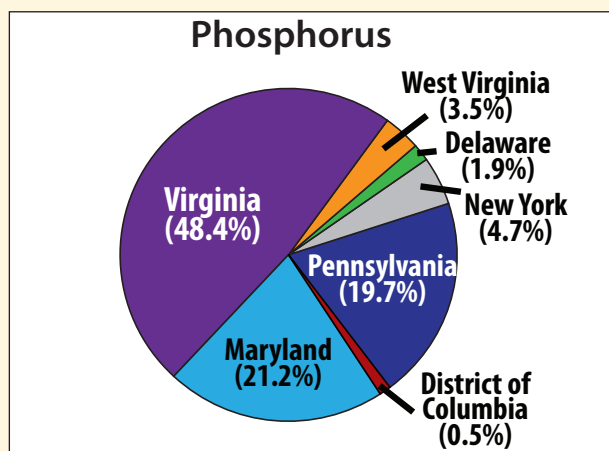
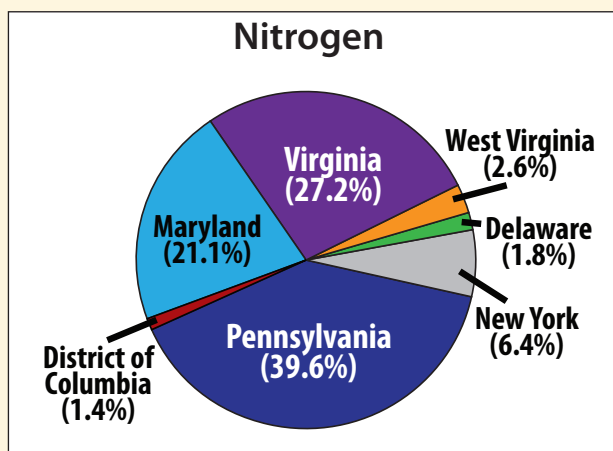
These fact sheets present 2011 milestones for all jurisdictions and contain common elements:

- **Reduction Milestone:** These tables show the amount of pollution the jurisdiction will reduce.
  - *Maryland, Pennsylvania and Virginia:* The table shows what the state would have reduced at its previous rate of progress and the amount of pollution that will be reduced by meeting the 2011 milestone. Comparing these numbers shows the increase in the pace of cleanup.
  - *Delaware, New York and West Virginia:* The limited implementation data record in the Phase 4.3 Watershed Model prevents the same jurisdiction-specific comparisons between previous rates of progress and milestone rates of progress for Delaware, New York and West Virginia.
  - *District of Columbia:* The District has met its phosphorus reduction goal and will meet its nitrogen goal when the Blue Plains facility upgrades treatment in 2015.
- **Pollution Reductions by Source:** These charts show from what sources the jurisdiction will achieve the reductions.
- **Funding During Milestone Period:** This box displays the projected funding that will be used to implement pollution reduction measures through 2011.
- **Pollution Reduction Actions by End of 2011:** These are the actions the jurisdiction will take to reduce pollution to meet its milestones.
- **Additional Reduction Options:** These are options for reducing pollution that a jurisdiction could pursue if necessary to meet its milestones.

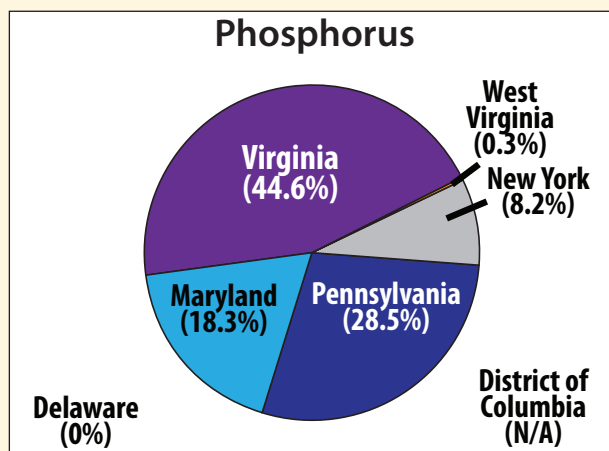
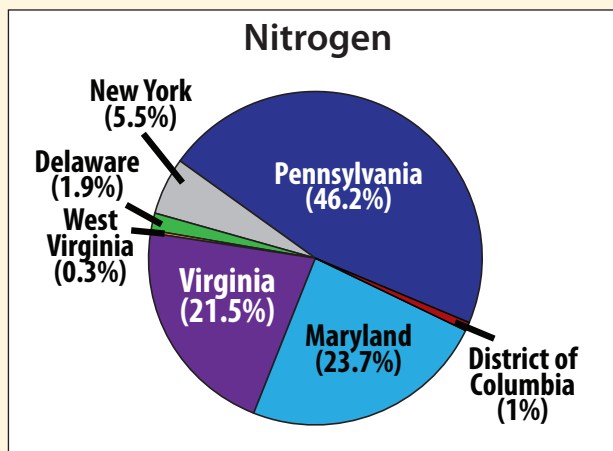
## Percentage of Total Watershed Acreage



## Percentage of Pollution Delivered by Each Jurisdiction



## Percentage of Milestone Load Reductions from Each Jurisdiction



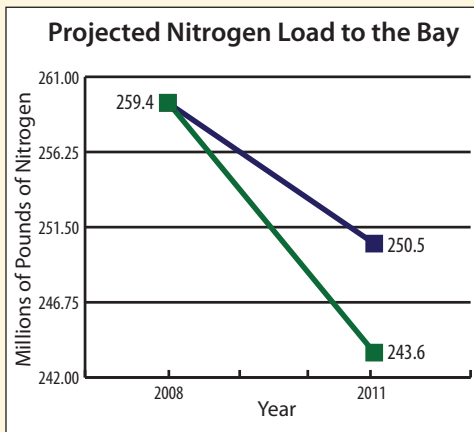


# Watershed-Wide

Total of 2011 Milestones to  
Reduce Nitrogen and Phosphorus



## Nitrogen Reduction Milestones

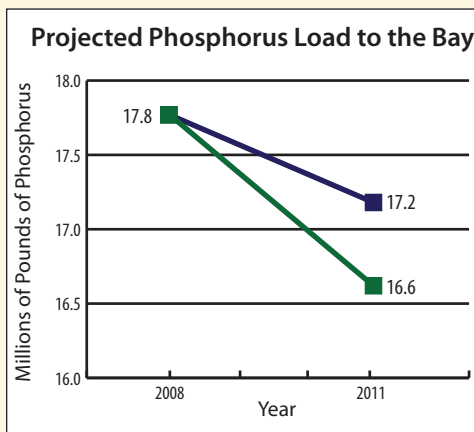


By meeting the 2011 milestones, the amount of nitrogen entering the Bay will decrease by 15.8 million pounds, which is 6.9 million pounds more than at the previous rate of progress -- a 77 percent increase.

Reduction at Previous Rate of Progress	8.9M
<b>Pollution Load after Previous Rate of Progress</b>	<b>250.5M</b>
Reduction at Milestone Rate of Progress	15.8M
<b>Pollution Load after Milestone Rate of Progress</b>	<b>243.6M</b>
<b>Increase in Rate of Progress</b>	<b>77%</b>

M = Millions of Pounds of Nitrogen

## Phosphorus Reduction Milestones

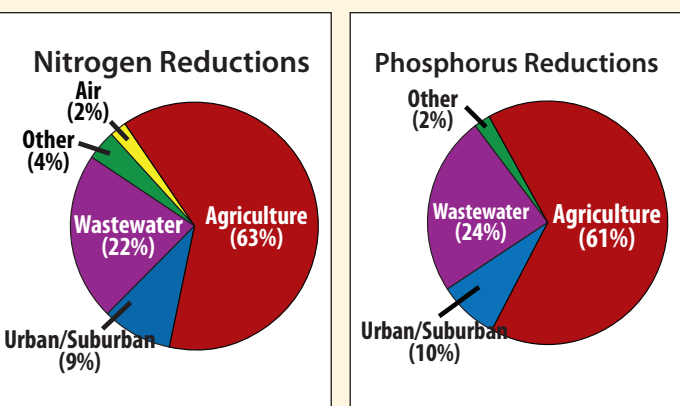


For phosphorus, the amount entering the Bay will decrease by 1.05 million pounds, which is 463,948 pounds more than at the previous rate of progress -- a 79 increase.

Reduction at Previous Rate of Progress	586,681 lbs.
<b>Pollution Load after Previous Rate of Progress</b>	<b>17.2M</b>
Reduction at Milestone Rate of Progress	1.1M
<b>Pollution Load after Milestone Rate of Progress</b>	<b>16.6M</b>
<b>Increase in Rate of Progress</b>	<b>79%</b>

M = Millions of Pounds of Phosphorus

## Pollution Reductions by Source



## Funding During Milestone Period

Delaware	\$17M
District of Columbia	\$266M
Maryland	\$774M
New York	\$15.2M
Pennsylvania	\$67.5M
Virginia	\$1,195.2M
West Virginia	\$22M
<b>TOTAL</b>	<b>\$2,356,900,000</b>

\* Nitrogen and phosphorus reductions are based on Phase 4.3 Watershed Model data for agricultural, urban/suburban and air reductions and monitored data for wastewater reductions.

For more, visit [www.chesapeakebay.net](http://www.chesapeakebay.net) or call 1-800-YOUR BAY

## Pollution Reduction Actions by End of 2011

### **Agriculture**

Nutrient Management	1,082,251 acres
Conservation Tillage	306,991 acres
Cover Crops	652,152 acres/year
Pasture Grazing BMPs	168,800 acres
Streamside Forest Buffers	39,110 acres
Streamside Grass Buffers	14,910 acres
Forest Harvesting Practices	125 acres
Wetland Restoration	3,809 acres
Land Retirement	81,676 acres
Tree Planting	27,965 acres
Carbon Sequestration/Alternative Crops	25,740 acres
Conservation Plans/SCWQP	584,648 acres
Animal Waste Management Systems	1,016 systems
Mortality Composters	22 systems
Water Control Structures	25,000 acres
Horse Pasture Management	300 acres
Non-Urban Stream Restoration	232,088 feet
Poultry Phytase	19,626 fewer pounds phosphorus
Manure Transport	131,503 net tons
Dairy Precision Feeding and/or Forage Management	291,203 pounds N/51,264 pounds P
Heavy Use Poultry Area Concrete Pads	400 farms
Livestock and Poultry Waste Structures	198 structures
Dairy and Poultry Manure Incorporation Technology	5,000 acres

### **Wastewater**

1,887,350 pounds nitrogen reduced  
201,500 pounds phosphorus reduced

### **Urban/Suburban**

Urban Stormwater Management	148,740 acres
Tree Planting	30 acres
Urban Stream Restoration	18,656 feet
Erosion and Sediment Control	62,731 acres
Nutrient Management	133,000 acres
Wetland Restoration	350 acres
Abandoned Mine Reclamation	2,219 acres
Dirt and Gravel Road Erosion	124,913 feet
Septic Improvements	27,125 systems

### **Air**

Heavy Truck Anti-Idling Rule	9.78M hours reduced
NOx Reductions	56,000 tons
Maryland Healthy Air Act	305,882 fewer pounds nitrogen/year



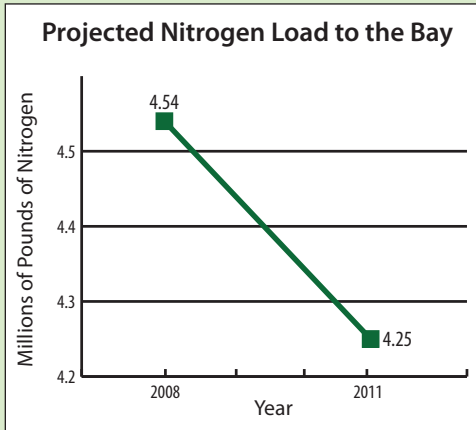
# Delaware

## 2011 Milestones to Reduce Nitrogen and Phosphorus



Chesapeake Bay Program  
A Watershed Partnership

### Nitrogen Reduction Milestone



Delaware's 2011 milestone commitment is to reduce nitrogen by 292,072 pounds by the end of the three-year period (2009-2011).

**Reduction at Milestone Rate of Progress**

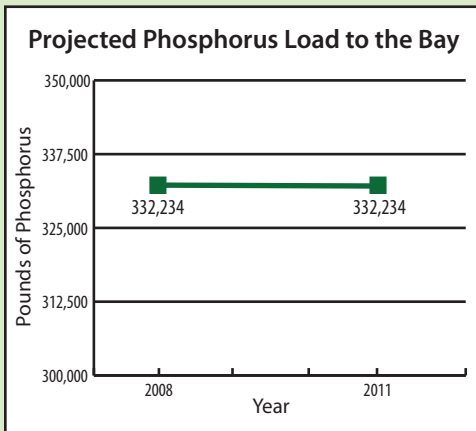
**Projected\*\*  
292,072 lbs.**

**Pollution Load after Milestone Rate of Progress** **4.25M**

*M = Millions of Pounds of Nitrogen*

\* Based on model estimates of reductions achieved through implementing specific non-point source actions (listed on back) and utilizing permitted point source loads to account for potential growth, Delaware will fall 264,229 pounds short of its nitrogen milestone load goal. To address this shortfall, Delaware will explore additional pollution reduction options (see back).

### Phosphorus Reduction Milestone



Since 2000, Delaware has fully implemented many effective phosphorus-reducing agricultural practices and now must focus on other practices to achieve the nonpoint source reduction goal, which may show a slower rate of progress. As a combined result of decreased rates of non-point reductions and utilizing permitted point source loads to account for potential growth, Delaware plans to maintain phosphorus loads at 2008 levels through this first milestone period.

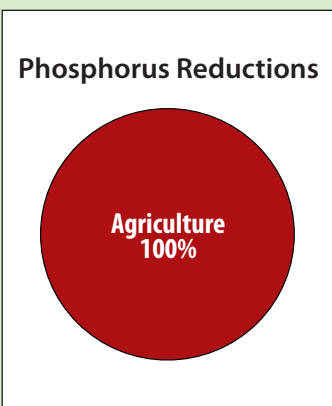
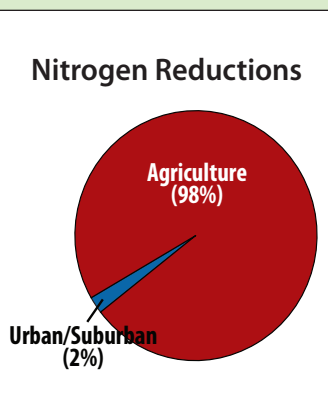
**Reduction at Milestone Rate of Progress**

**Projected\*\*  
0 lbs.**

**Pollution Load after Milestone Rate of Progress** **332,234 lbs.**

\* Based on model estimates of reductions achieved through implementing specific non-point source actions (listed on back) and utilizing permitted point source loads to account for potential growth, Delaware will fall 5,958 pounds short of its phosphorus milestone load goal. To address this shortfall, Delaware will explore additional pollution reduction options (see back).

### Pollution Reductions by Source



### Funding During Milestone Period

CBP Implementation Grant	\$2M
319 Nonpoint Source Funds	\$1.392M
106 Funds	\$120,000
Farm Bill-NRCS EQIP	\$3M
State Water Pollution Control Revolving Funds (including 2009 Recovery Act funds)	\$4.5M
State General Funds	\$3.836M
Community Water Quality Improvement Grant	\$150,000
Private Landowner Match for Agricultural BMPs	\$1.95M
<b>TOTAL</b>	<b>\$16.948M</b>

\*\* Nitrogen and phosphorus reductions are based on Phase 4.3 Watershed Model data for agricultural and urban/suburban reductions and permitted data for wastewater loads.

For more, contact: Jennifer Volk, (302) 739-9939, [jennifer.volk@state.de.us](mailto:jennifer.volk@state.de.us)

## Pollution Reduction Actions by End of 2011

### Agriculture

Cover Crops Late Planting	18,600 acres/year
Cover Crops Early Planting	18,600 acres/year
Forest Buffers	2,700 acres
Wetland Restoration	420 acres
Tree Planting	200 acres
Poultry Litter Transport	55,100 tons/year
Nutrient Management	177,000 acres

### Urban/Suburban

On-Site Pumpouts	8,800 systems/year
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### Wastewater

Reduction of Invista's Permitted Load	215,350 lbs. nitrogen
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## Additional Reduction Options

### Agriculture

Maintain/increase acres of grass buffers

Use Farm Bill to fund five priority BMPs through EQIP in the Nanticoke and Choptank watersheds

- Cover Crops
- Heavy Use Area Protection
- Irrigation Water Management
- Nutrient Management
- Manure Transfer

### Urban/Suburban

On-site wastewater voluntary upgrades and elimination through sewer connections

Stormwater BMPs in new developments; retrofits and installation of BMPs in existing urban areas

Review of all new development in the Chesapeake (of a certain size threshold) using the Nutrient Budget Protocol to determine land use change impacts on nutrient loadings

Explore creating and reviewing regulations and ordinances:

- Riparian buffers (promulgate new regulation for the Nanticoke Watershed within Sussex County; revise existing ordinance in Kent County)
- Advanced stormwater treatment through revised regulations
- Standards and measures for on-site wastewater treatment disposal systems through revised regulations

### Other

Improve data tracking and reporting systems to more accurately reflect progress to date

Conduct BMP data and/or efficiency studies/reviews to allow more informed decisions on future BMP implementation

- Reductions associated with irrigation management
- Reductions associated with sediment trapping in ditches
- Reductions resulting from poultry house decommissioning
- Reductions related to road improvements that could result from stimulus projects
- Effectiveness of nutrient management planning in Delaware
- High P-soils mapping
- GIS analyses to produce maps of areas where BMPs should occur

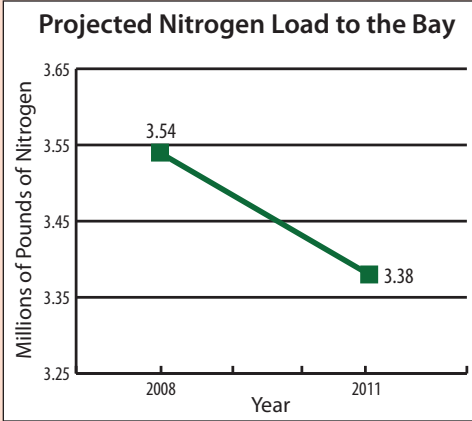


# District of Columbia

## 2011 Milestones to Reduce Nitrogen and Phosphorus



### Nitrogen Reduction Milestone



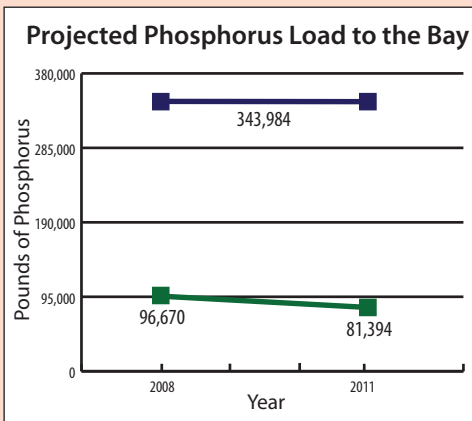
The District of Columbia's 2011 milestone commitment is to reduce nitrogen by 159,000 pounds by the end of the three-year period (2009-2011).

Reduction at Milestone Rate of Progress	<b>Projected*</b> 159,000 lbs.
<b>Pollution Load after Milestone Rate of Progress</b>	<b>3.38M**</b>

M = Millions of Pounds of Nitrogen

\*\* The District will likely meet its nitrogen reduction commitment in 2015. However, because of requirements to construct Enhanced Nutrient Removal at the Blue Plains wastewater treatment plant, for this milestone period the nitrogen loadings will increase temporarily. The next phase of two-year milestones (2011-2013) will reflect the changes at Blue Plans and will result in decreasing nitrogen loads (see back for more information).

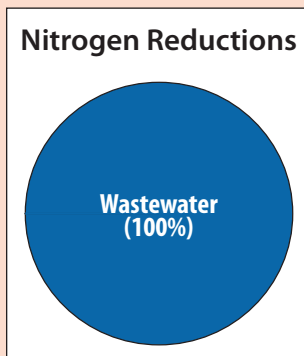
### Phosphorus Reduction Milestone



The District of Columbia has already achieved its phosphorus reduction goal of 343,984 pounds. In 2008, the District's phosphorus load was 96,670 pounds\*.

<b>2003 Phosphorus Reduction Goal</b>	<b>343,984 lbs.</b>
<b>2008 Phosphorus Load*</b>	<b>96,670 lbs.</b>
<b>2011 Projected Phosphorus Load*</b>	<b>81,394 lbs.</b>

### Pollution Reductions by Source



### Funding (FY 2010 and FY 2011)

MS4 Funds	\$26.15M
Non-Point Control	\$7.09M
Point Source (BTN)	\$85.77M
CSO Funds	\$147M
<b>TOTAL</b>	<b>\$266M</b>

\* Nitrogen and phosphorus reductions are based on Phase 4.3 Watershed Model data for urban/suburban reductions and monitored data for wastewater reductions.

## Non-Point Source Pollution Reduction Actions by 2011

While wastewater from Blue Plains constitutes the majority of nutrient loadings to the Potomac River, the District is very aggressively tackling other pollutant sources through its innovative non-point source programs. The District is addressing other equally critical pollutants such as: controlling/mitigating thousands of pounds of urban stormwater runoff, containing thousands of pounds of trash, and increasing urban tree canopy by many thousands of acres. All together, these activities will contribute significantly to controlling urban sources of pollutants in this milestone period and beyond.

### **Expand Urban Tree Canopy**

- Plant 4,150 trees (30 acres) per year
- Increase urban tree canopy coverage by 5 percent (from 35 percent to 40 percent) in 25 years
- Create new tree box standards to allow for better tree growth

### **Low-Impact Development (LID) Practices**

- Install approximately 100 rain gardens and 250 rain barrels
- Perform 300 downspout connections
- Develop lot-level residential stormwater detention/retention through RiverSmart Homes incentive program
- Incorporate LID into 24 percent of all District DOT projects
- Train federal facilities on new stormwater requirements

### **Build Green Roofs**

- Convert 2.5 million square feet to green roofs each year

### **Stormwater Practices and Pollution Prevention**

- Implement a program to control discharges from District and federally owned facilities
- Strengthen auto repair shop education campaign in Hickey Run (pilot)
- Inspect all auto repair shops, laundromats and dry cleaners at least once every five years
- Develop and implement a pet waste strategy
- Mandate installation and use of pumpout stations at all District marinas
- Restore 2.7 miles of Watts and Pope branches
- Replace/eliminate 1.5 miles of sewer lines in Watts and Pope branch
- Complete a DPW street sweeping study and implement long-term enhanced street sweeping and fine particle removal
- Implement and promote new stormwater regulations that require LID construction as a first option and mandate training for site managers
- Implement an impervious area-based stormwater fee
- Review and update zoning regulations to encourage green building

## Point Source Pollution Reduction Actions by 2011

The District of Columbia is implementing the new Blue Plains NPDES permit to install Enhanced Nutrient Removal (ENR) at Blue Plains.

Award contract for design	June 1, 2009
Award contract for construction	December 31, 2011
Place in operation	July 1, 2014
Begin compliance with total nitrogen effluent limit	January 1, 2015

Blue Plains reports the following nutrient reductions (aside from ongoing reductions via the BNR processes for CSOs):

Total nitrogen before any CSO control	123,329 pounds per average year of rain
After completion of nine minimum control projects (May 2009)	70,298 pounds per average year of rain
After completion of first phase of Anacostia CSO Program (2018)	40,000 pounds per average year of rain
After completion of LTCP (2025)	5,300 pounds per average year of rain

## Trash TMDL and Trash Removal

The District is developing a Trash Total Maximum Daily Load (TMDL) and implementation Plan for the Anacostia River by December 2010. The District will:

- Retrofit 100 catch basins for trash control in conjunction with enhancements to the District's street sweeping efforts.
- Install 1,000 storm drain markers annually.
- Install litter trap demonstration projects to divert 6,800 pounds of trash by 2011.
- Determine the type of trash control devices that would be the most effective in retaining large debris and sediment in hot-spot areas identified by a trash survey.





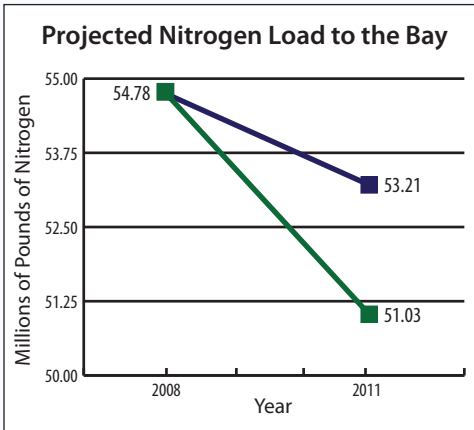
# Maryland

## 2011 Milestones to Reduce Nitrogen and Phosphorus



Chesapeake Bay Program  
A Watershed Partnership

### Nitrogen Reduction Milestone

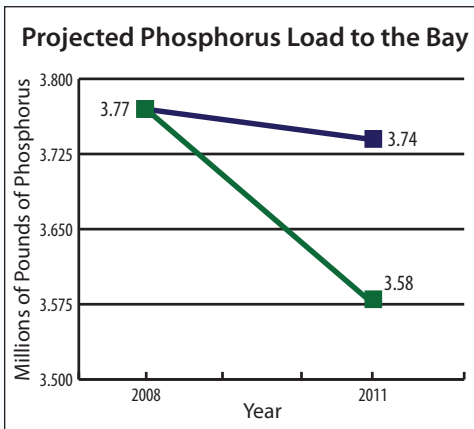


Maryland's 2011 milestone commitment is to reduce nitrogen by 3.75 million pounds by the end of the three-year period (2009-2011).

	<b>Projected*</b>
Reduction at Previous Rate of Progress	1.57M
<b>Pollution Load after Previous Rate of Progress</b>	<b>53.21M</b>
Reduction at Milestone Rate of Progress	3.75M
<b>Pollution Load after Milestone Rate of Progress</b>	<b>51.03M</b>
<b>Increase in Rate of Progress</b>	<b>138%</b>

M = Millions of Pounds of Nitrogen

### Phosphorus Reduction Milestone

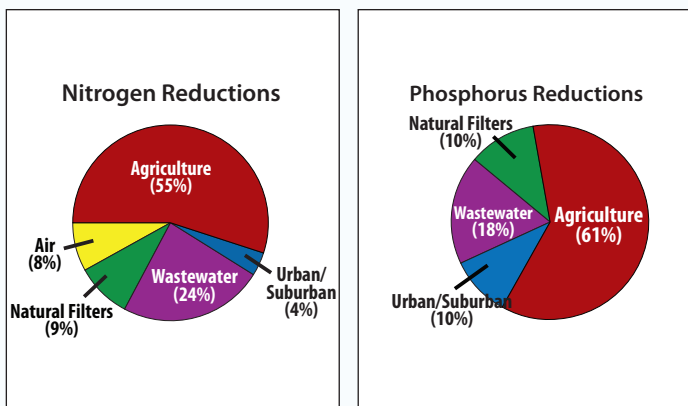


Maryland's 2011 milestone commitment is to reduce phosphorus by 193,000 pounds by the end of the three-year period (2009-2011).

	<b>Projected*</b>
Reduction at Previous Rate of Progress	32,045 lbs.
<b>Pollution Load after Previous Rate of Progress</b>	<b>3.74M</b>
Reduction at Milestone Rate of Progress	193,000 lbs.
<b>Pollution Load after Milestone Rate of Progress</b>	<b>3.58M</b>
<b>Increase in Rate of Progress</b>	<b>502%</b>

M = Millions of Pounds of Phosphorus

### Pollution Reductions by Source



### Funding During Milestone Period

Bay Restoration Fund	\$590M
Trust Fund	\$69.6M
MACS	\$17.8M
Farm Bill	\$96.6M
<b>TOTAL</b>	<b>\$774M</b>

\* Nitrogen and phosphorus reductions are based on Phase 4.3 Watershed Model data for agricultural, urban/suburban and air reductions and monitored data for wastewater reductions.

## Pollution Reduction Actions by End of 2011

### **Agriculture**

Cover Crops	460,000 acres/year
Nutrient Management Plan Enforcement	100,000 acres
Soil Conservation and Water Quality Plans	257,049 acres
Manure Transport	10,000 tons/year
Heavy Use Poultry Area Concrete Pads	400 farms
Livestock Waste Structures	145 structures
Water Control Structures	200 structures
Dairy Manure Incorporation Technology	2,500 acres/year
Stream Protection with Fencing	3,000 acres
Poultry Manure Incorporation Technology	2,500 acres/year
Poultry Waste Structures	53 structures
Stream Protection without Fencing	3,000 acres
Runoff Control Systems	75 systems

### **Wastewater**

Wastewater Treatment Plants ENR	39,000 fewer lbs. P
	740,000 fewer lbs. N
Blue Plains BNR Upgrade	190,000 fewer lbs. N

### **Urban/Suburban**

Stormwater Runoff Management Retrofits	90,000 acres
Required septic retrofits (inside Critical Area)	1,080 systems
Voluntary septic retrofits (non-Critical Area)	1,920 systems

### **Natural Filters - Private Land**

Streamside Grass Buffers	7,000 acres
Streamside Forest Buffers	3,000 acres
Wetland Restoration	700 acres
Retire Highly Erodible Land	1,800 acres

### **Natural Filters - Public Land**

Streamside Grass Buffers	1,000 acres
Streamside Forest Buffers	2,100 acres
Wetland Restoration	1,000 acres
Retire Highly Erodible Land	2,000 acres

### **Air**

Maryland Healthy Air Act	305,882 less N
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## Additional Reduction Options

### **Agriculture**

- Increase manure transport program activity exporting poultry litter out of the watershed.
- Increase enrollment of dairy and poultry manure incorporation technology beyond 2,500 acres each, annually.
- Implement precision agriculture on 100,000 acres.
- Implement ammonia emissions reductions at poultry houses.

### **Urban/Suburban**

- Require all new and failing septic systems statewide to be replaced with best available technology.
- Require 1:1 or 2:1 best available technology septic system offsets for all new septic systems statewide.
- Require each acre of new development to be offset by retrofitting two acres of pre-1985 land for stormwater management.
- Connect septic systems in targeted watersheds with high septic loads (e.g., Magothy, Severn and South Rivers) to WWTPs where it is cost-effective and where sprawl growth will not be encouraged.

### **Natural Filters**

- Substantially increase conversion of state-owned agricultural leases to forests or wetlands.
- Increase implementation of streamside buffers on agricultural and suburban lands.

### **General**

- Implement Bay Bank and/or other effective nutrient and sediment cap and trade program.
- Increase funding for the 2010 Trust Fund as needed.

### **Assessments of Future Management Actions**

- Revise nutrient reduction estimates for cover crops to reflect the latest scientific conclusions.
- Conduct an independent review of Maryland's nutrient management planning program and consider options to improve effectiveness based on available science.
- Conduct nutrient mass balance study to better target and implement BMPs.
- Study the feasibility of extending the critical area protective provisions to non-tidal waters.
- Evaluate the potential nutrient reduction for wastewater treatment plants using ENR from 4 mg/l limit on each plant to 3 mg/l and the potential sprawl implications of that action.
- Create a State Development Plan, as required by Maryland law, to identify changes to State-level programs and policies that could significantly reduce sprawl.



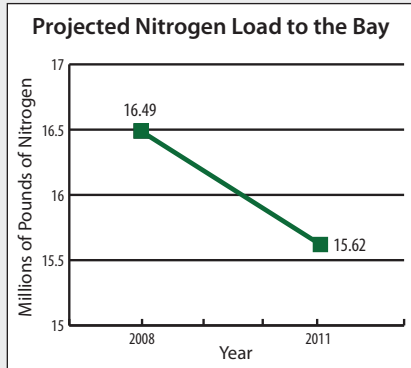
# New York

## 2011 Milestones to Reduce Nitrogen and Phosphorus



This initial set of 2-yr milestones is based largely on continuing implementation of the New York State Tributary Strategy for Chesapeake Bay Restoration (2007) and our partnership with the Upper Susquehanna Coalition. New York will continue to seek solutions for water resource protection and conservation needs, including wetland restoration and flood damage reduction. New York will also continue to be an aggressive partner in efforts to fully restore the water quality of Chesapeake Bay and the entire watershed basin.

### Nitrogen Reduction Milestone



New York's 2011 milestone commitment is to reduce nitrogen by 1,830,000 pounds in New York's portion of the watershed (870,500 pounds as delivered load to tidal waters) by the end of the three-year period (2009-2011). This is a 5 percent reduction from 2008 levels (16.5 million pounds delivered load).

**Reduction at Milestone Rate of Progress**

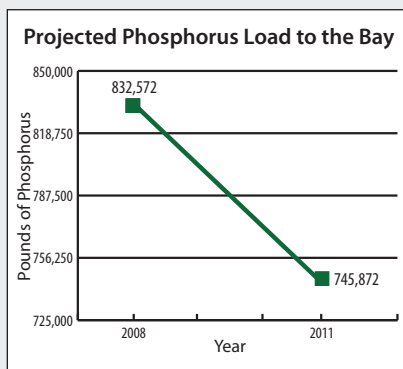
Projected\*

**870,500 lbs.**

**Pollution Load after Milestone Rate of Progress 15.62M**

*M = Millions of Pounds of Nitrogen*

### Phosphorus Reduction Milestone



New York's 2011 milestone commitment is to reduce phosphorus by 194,000 pounds in New York's portion of the watershed (86,700 pounds as delivered load to tidal waters) by the end of the three-year period (2009-2011). This is a 10% reduction from 2008 levels (831,000 pounds delivered load).

**Reduction at Milestone Rate of Progress**

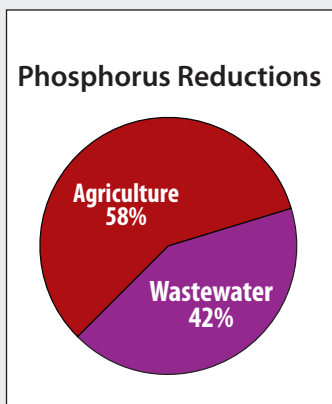
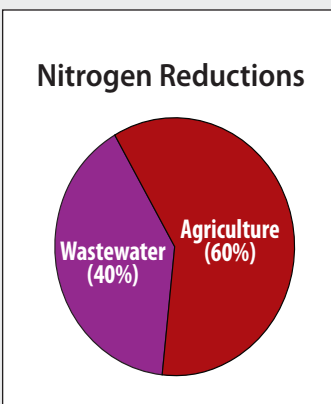
Projected\*

**86,700 lbs.**

**Pollution Load after Milestone Rate of Progress 745,872 lbs.**

*M = Millions of Pounds of Phosphorus*

### Pollution Reductions by Source



### Funding During Milestone Period

• Landowner-Funded Implementation Projects and Cost-Share Contributions	\$300K
• Soil and Water Conservation Committee Agricultural Non-Point Source Abatement and Control Grant Program Using N.Y. State Environmental Protection Fund	\$6M
• N.Y. Ecosystem-Based Management Fund for Buffers	\$250K
• USDA NRCS Farm Bill Programs	\$4M
• USDA Farm Service Agency Farm Bill Programs (including CRP and CREP)	\$50K
• Special Congressional Funds for Agricultural Env. Mgmt. Program Planning and Prescribed Grazing	\$2.6M
• CBP Headwater Assistance Grants	\$700K
• Special Grants Obtained through RFPs	\$800K
• Upper Susquehanna Coalition Stormwater Funding	\$500K
<b>TOTAL (beyond base program funds)</b>	<b>\$15.2M</b>

\* Nitrogen and phosphorus reductions are based on Phase 4.3 Watershed Model data for agricultural and urban/suburban reductions and monitored data for wastewater reductions.

For more, contact: Peter Freehafer, (518) 402-8205, pfreeha@gw.dec.state.ny.us

## Pollution Reduction Actions by End of 2011

New York constitutes 10% of the Bay watershed with only 4% of the population, is predominately forested and is an area with high quality waters with essentially no impairments. Effective delivery of existing controls in binding permits and regulatory programs is largely responsible for high quality water in New York. New York has a full suite of well established regulatory permitting and enforcement programs: sewage treatment plants, septic systems, concentrated animal feeding operations (>200 cows), polluted runoff from urbanized areas, and erosion from construction and post-construction controls.

### **Agriculture**

Comprehensive Nutrient Management Plans	38,000 acres
Barnyard Runoff Controls	25,000 animal units
Animal Waste Systems	18,500 animal units
Rotational Grazing	18,700 acres
Stream Protection with Fencing	608,000 feet
Riparian Buffers (Grass and Forest)	5,600 acres
Precision Feeding	7,600 animal units
Wetlands on Agricultural Land	100 acres
Wetlands on Other Land	350 acres
Land Retirement	2,000 acres
Conservation Tillage	3,000 acres
Cover Crops	1,000 acres
Tree Planting	200
Horse Pasture Management	300 acres
Erosion and Sediment Control	150 acres

### **Urban/Suburban**

Full Suite of Post-Construction Controls  
Peak Flow Mitigation

### **Wastewater**

Binghamton/Johnson City Nitrogen Removal Upgrade  
Optimization of Nutrient Removal at Other 27 Significant Bay Facilities

### **Air**

Power Plants and Major Boilers

- Heightened Regulation and Enforcement
- Enhanced Summer Control Per Ozone Transport Commission NOx Budget Trading Program
- Year-Round Control Per Acid Deposition Reduction Program

## Anticipated Additional Reductions

Atmospheric deposition, including agricultural sources, contributes about 30% of the Bay's nitrogen. New York has taken regulatory action to reduce nitrogen oxide emissions and encourages other jurisdictions to do the same: California car—285,000 tons since 1996 (a 55% reduction); and power plants/major boilers: 82,000 tons since 1995 (a 66% reduction); heightened regulation and enforcement; enhanced summer control per Ozone Transport Commission NOx budget trading program; and year-round control per Acid Deposition Reduction Program.

**Ecosystem-Based Watershed Planning:** The N.Y. State Dept. of Environmental Conservation (NYSDEC) has initiated development of a comprehensive Susquehanna/Chemung River Basin Action Agenda, focusing on water quality protection, habitat improvement and flood damage reduction. Working with the Upper Susquehanna Coalition and other stakeholders, a draft is expected to be completed in 2010.

**Phosphorus Legislation:** Governor Paterson has proposed legislation to greatly limit the phosphorus content of non-farm fertilizer and to require low phosphorus content in dishwashing detergent.

### **NOx Emissions:**

- Even more stringent regulatory controls for power plants and industrial boilers as part of the technical re-definition of "reasonably available control technology" for NOx.
- Additional NOx reductions from cement kilns, glass manufacturers and asphalt plants.
- Carbon offsets accomplished through implementation of the Regional Greenhouse Gas Initiative, like carbon sequestration from afforestation and methane emissions avoided from agricultural manure management operations.
- Governor Paterson announced a program to meet 45 percent of New York's current energy needs by 2015 via renewable energy sources and energy efficiency.

**Regional Water Quality Planning:** NYSDEC will soon announce the availability of funds for proposals that promote regional comprehensive water quality management planning activities. The American Recovery and Reinvestment Act provides New York with \$1.7 million for planning activities associated with green infrastructure, TMDLs, phase II stormwater for MS4s, and water quality management.

**Upper Susquehanna Wetland Program:** Nearly 1,000 new wetland acres since 2005; program is continuing.

**Compliance Assurance and Enforcement:** The NYSDEC Water Integrated Compliance Strategy System has established criteria for identifying and responding to priority violations against the state's water resources.

**Land Protection:** About 300,000 acres of forested land in New York is permanently protected. The state's goal is to increase protection to an additional 5,800 acres by 2012 and 15,000 acres by 2020.

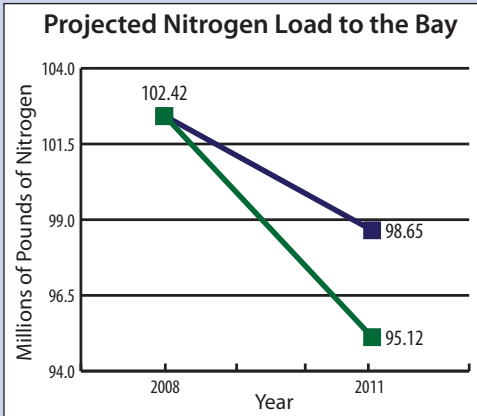


# Pennsylvania

## 2011 Milestones to Reduce Nitrogen and Phosphorus



### Nitrogen Reduction Milestone

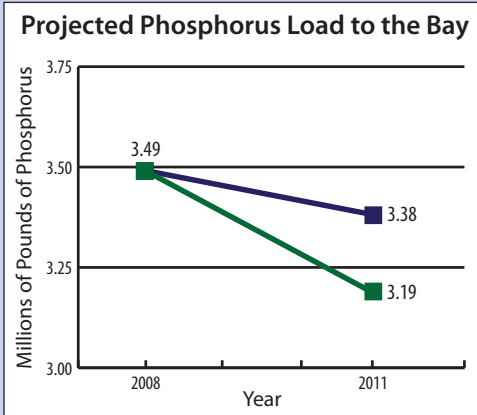


Pennsylvania's 2011 milestone commitment is to reduce nitrogen by 7.3 million pounds over the three year period (2009-2011).

	<b>Projected*</b>
Reduction at Previous Rate of Progress	3.78M
<b>Pollution Load after Previous Rate of Progress</b>	<b>98.65M</b>
Reduction at Milestone Rate of Progress	7.30M
<b>Pollution Load after Milestone Rate of Progress</b>	<b>95.12M</b>
<b>Increase in Rate of Progress</b>	<b>93%</b>

*M = Millions of Pounds of Nitrogen*

### Phosphorus Reduction Milestone

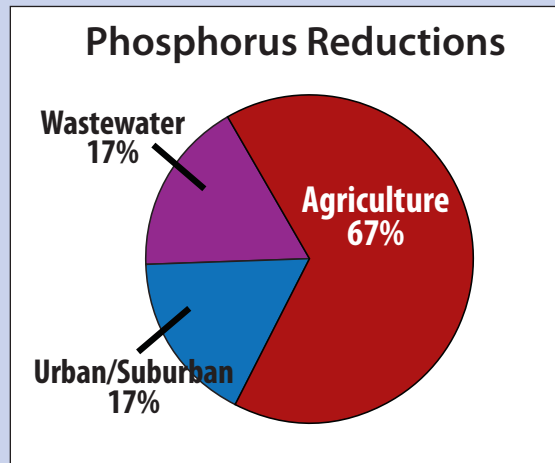
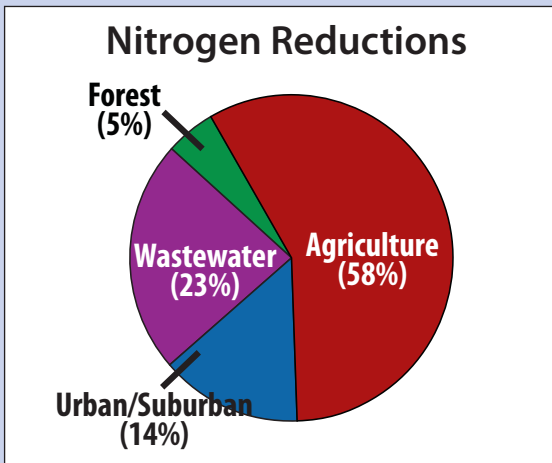


Pennsylvania's 2011 milestone commitment is to reduce phosphorus by 300,000 pounds over the three year period (2009-2011).

	<b>Projected*</b>
Reduction at Previous Rate of Progress	116,000 lbs.
<b>Pollution Load after Previous Rate of Progress</b>	<b>3.38M</b>
Reduction at Milestone Rate of Progress	300,000 lbs.
<b>Pollution Load after Milestone Rate of Progress</b>	<b>3.19M</b>
<b>Increase in Rate of Progress</b>	<b>159%</b>

*M = Millions of Pounds of Phosphorus*

### Pollution Reductions by Source



\* Nitrogen and phosphorus reductions are based on Phase 4.3 Watershed Model data for agricultural, urban/suburban and air reductions and monitored data for wastewater reductions.

## FY 2008-2009 Funding

### Pennsylvania Department of Environmental Protection (DEP)

Nutrient Management Delegation Agreements	\$1,749,000
Conservation District Fund Allocation Program	\$2,065,320
Chesapeake Bay Implementation Grant State Match Plus	\$3,410,000
PA Stormwater Planning and Management (Act 167)	\$2,200,000
Growing Greener Watershed Protection Grant Program	\$13,512,087

### Pennsylvania State Conservation Commission (SCC)

Dirt and Gravel Road Maintenance Program	\$2,441,000
Nutrient Management Program	\$2,301,000
Conservation District Fund Allocation Program	\$1,091,600
NRCS Engineering Assistance for BMP installation	\$64,000
Commercial Manure Hauler and Broker Certification Program	\$89,400
Resource Enhancement and Protection Program (REAP)	\$8,450,000

### Pennsylvania Infrastructure Investment Authority (PENNVEST)

Loans and grants for wastewater projects	\$30,078,120
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**TOTAL** **\$67,451,527**

## Pollution Reduction Actions by End of 2011

Abandoned Mine Reclamation	2,219 acres	Nutrient Management	128,800 acres
Animal Waste Management Systems	275 units	Off-Stream Watering with Fencing	6,143 acres
Carbon Sequestration/Alternative Crops	25,740 acres	Off-Stream Watering w/ Fencing & Rotational Grazing	21,249 acres
Conservation Plans/SCWQA	327,599 acres	Off-Stream Watering without Fencing	7,335 acres
Continuous No-Till	86,567 acres	Other Conservation Tillage	88,924 acres
Cover Crops (late planting)	174,818 acres	Poultry Litter Transport Out of Watershed	55,659 tons
Dirt and Gravel Road Erosion and Sediment Control	124,913 feet	Poultry Litter Transport Into Watershed	3,256 fewer tons
Enhanced Nutrient Management	450 acres	Poultry Phytase	19,626 pounds P
Erosion and Sediment Control	7,000 acres	Septic Connections	7,353
Forest Buffers (all land uses)	19,059 acres	Tree Planting	15,065 acres
Forest Harvesting Practices	125 acres	SWM Practices	8,690 acres
Grass Buffers	1,161 acres	Urban Stream Restoration	4,400 feet
Land Retirement	58,876 acres	Wetlands	1,548 acres
Mortality Composters	22 units	Heavy Truck Anti-Idling Rule	9.78M fewer hours
Non-Urban Stream Restoration	215,088 feet	Wastewater Treatment Plant Nutrient Reduction	40 plants

## Additional Reduction Options

### **Erosion and Sediment Control Regulations**

- Codification of post-construction stormwater requirements
- Mandatory riparian forest buffers for exceptional value waters
- Conservation Plan revision to include animal heavy use areas

### **Stormwater Management Planning Act expansion to provide for Integrated Water Resource Planning**

### **Legacy Sediment BMP Development and Implementation**

### **Phosphate Dishwasher Detergent Ban**

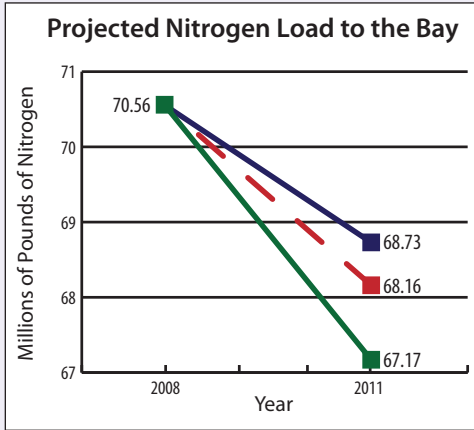


# Virginia

## 2011 Milestones to Reduce Nitrogen and Phosphorus



### Nitrogen Reduction Milestone



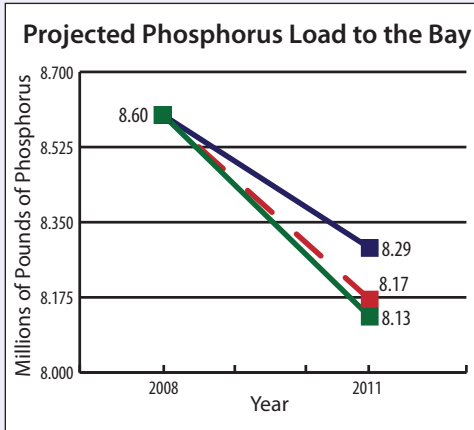
Virginia's 2011 milestone commitment is to reduce nitrogen by 3.39 million pounds over the three year period (2009-2011).

Reduction at Previous Rate of Progress	<b>Projected**</b> 1.83M
<b>Pollution Load after Previous Rate of Progress</b>	<b>68.73M</b>
Reduction after Recent Nutrient Reduction Actions	2.40M
<b>Pollution Load after Recent Nutrient Reduction Actions*</b>	<b>68.16M</b>
Reduction at Milestone Rate of Progress	3.39M
<b>Pollution Load after Milestone Rate of Progress</b>	<b>67.17M</b>
<b>Increase in Rate of Progress</b>	<b>86%</b>

*M = Millions of Pounds of Nitrogen*

\* Based on the current rate of progress, Virginia will fall 990,000 pounds short of its milestone to reduce 3.39 million pounds of nitrogen. To address this shortfall, Virginia will explore additional pollution reduction options (see back).

### Phosphorus Reduction Milestone



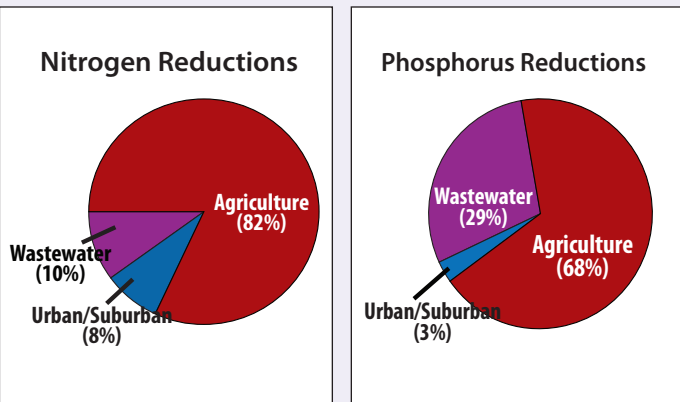
Virginia's 2011 milestone commitment is to reduce phosphorus by 470,000 pounds over the three year period (2009-2011).

Reduction at Previous Rate of Progress	<b>Projected**</b> 308,953 lbs.
<b>Pollution Load after Previous Rate of Progress</b>	<b>8.29M</b>
Reduction after Recent Nutrient Reduction Actions	435,000 lbs.
<b>Pollution Load after Recent Nutrient Reduction Actions*</b>	<b>8.17M</b>
Reduction at Milestone Rate of Progress	470,000 lbs.
<b>Pollution Load after Milestone Rate of Progress</b>	<b>8.13M</b>
<b>Increase in Rate of Progress</b>	<b>52%</b>

*M = Millions of Pounds of Phosphorus*

\* Based on the current rate of progress, Virginia will fall 35,000 pounds short of its milestone to reduce 470,000 pounds of phosphorus. To address this shortfall, Virginia will explore additional pollution reduction options (see back).

### Pollution Reductions by Source



### Funding During Milestone Period

Farm Bill	\$38M
Natural Resources Commitment Fund	\$26M
Water Quality Improvement Funding Nonpoint Source Program	\$35M
Virginia Agricultural BMP Tax Credit Incentives	\$1.2M
Water Quality Improvement Funding Point Source Program	\$627M
Virginia Clean Water Pollution Control Revolving Loan Fund	\$456M
Grant Funding	\$12M
<b>TOTAL</b>	<b>\$1,195,200,000</b>

\*\* Nitrogen and phosphorus reductions are based on Phase 4.3 Watershed Model data for agricultural, urban/suburban and air reductions and monitored data for wastewater reductions.

## Recent Nutrient Reduction Actions

Significant funding and programs recently established over the last several years are in place to reduce 2.4 million pounds of nitrogen and 435,000 pounds of phosphorus by 2011.

These actions include:

1. \$61 million in funding for agricultural conservation practices in the Bay watershed.
2. \$1.08 billion in grants and loans for nutrient removal technologies at sewage treatment plant upgrades to meet and maintain pollution caps.
3. Agreements with poultry companies to achieve a 30 percent phosphorus reduction in poultry litter.
4. Acceleration of landowner participation in the Conservation Reserve and Enhancement Program (CREP).
5. Significantly increased compliance with erosion and sediment control requirements.
6. Development of aggressive stormwater control regulations.
7. Revision of poultry waste management regulations to address off-site nutrient management.

To meet the 2011 milestone, additional actions will be needed to achieve further nitrogen and phosphorus reductions -- 995,500 pounds and 35,000 pounds, respectively.

## Pollution Reduction Actions by End of 2011

### Agriculture

Cover Crops	119,000 acres/year
Small Grain Commodities (harvestable)	38,000 acres/year
Agricultural Nutrient Management	258,000 new acres
Conservation Tillage (NRCS)	47,500 acres/year
Continuous No-Till (State Cost-Share)	81,000 acres
Animal Waste Management Systems	241 systems
Runoff Control AWMS	32 systems
Off-stream Watering with Fencing	89,500 acres
Forest Buffers	10,000 acres
Grass Buffers	2,000 acres
Wetland Restoration	36 acres
Retirement of Highly Erodible Land	19,000 acres
Reforestation	12,500 acres
Agricultural Stream Restoration	13,000 linear feet

### Urban/Suburban

Stormwater Management BMPs	49,000 acres
Erosion and Sediment Control	61,000 acres
Additional Urban Nutrient Management	133,000 acres
Septic System BMPs	806 systems

### Wastewater

233,000 Pounds Nitrogen Reduced
126,000 Pounds Phosphorus Reduced

## Additional Reduction Options Needed to Meet Milestone Commitment

Specific actions to achieve additional nutrient pollution reductions will be a priority of Governor Kaine as he develops his biennial budget and legislative agenda. Further details will be available in late 2009.

Additional options for consideration will include funding, policies or programs designed to further encourage pollution reductions from agricultural lands, developed lands and air sources.

Virginia's five priority agricultural conservation practices have been, and will continue to be, a focus for additional nutrient pollution reductions.

- Nutrient Management Planning
- Cover Crops
- Conservation Tillage
- Riparian Buffers
- Livestock Exclusion



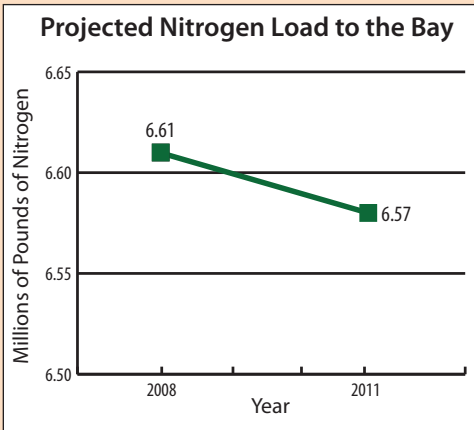


# West Virginia

## 2011 Milestones to Reduce Nitrogen and Phosphorus



### Nitrogen Reduction Milestone



West Virginia's 2011 milestone commitment is to reduce nitrogen by 42,254 pounds by the end of the three-year period (2009-2011).

Reduction at Milestone Rate of Progress

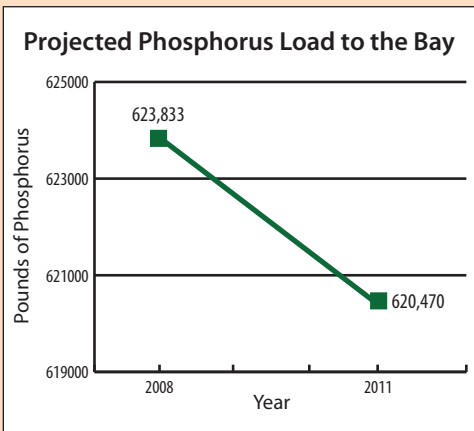
Projected\*

42,254 lbs.

**Pollution Load after Milestone Rate of Progress 6.57M**

*M = Millions of Pounds of Nitrogen*

### Phosphorus Reduction Milestone



West Virginia's 2011 milestone is to reduce phosphorus by 3,364 pounds by the end of the three-year period (2009-2011).

Reduction at Milestone Rate of Progress

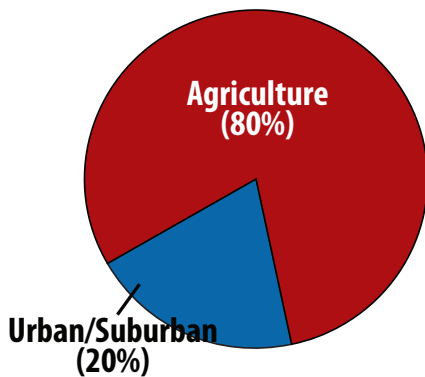
Projected\*

3,364 lbs.

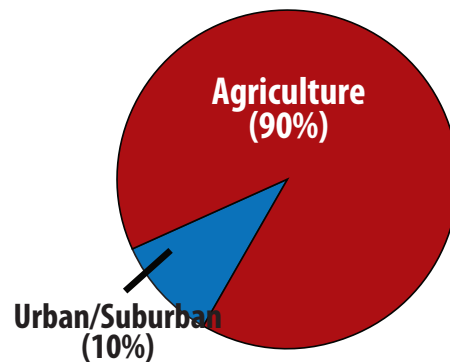
**Pollution Load after Milestone Rate of Progress 620,470 lbs.**

### Pollution Reductions by Source

#### Nitrogen Reductions



#### Phosphorus Reductions



\* Nitrogen and phosphorus reductions are based on Phase 4.3 Watershed Model data for agriculture, urban/suburban and air reductions and monitored data for wastewater reductions.

## Funding During Milestone Period

USDA Farm Bill Programs	\$2,600,000
West Virginia State Revolving Loan Fund	\$7,250,000
West Virginia Infrastructure, Jobs and Development Council	\$9,249,751
Section 319 Nonpoint Source Program	\$1,124,633
Local 319 Match	\$749,756
Chesapeake Bay Grant	\$1,000,000
<b>TOTAL</b>	<b>\$21,974,140</b>

## Pollution Reduction Actions by End of 2011

The state of West Virginia plans to develop a nutrient trading/offset program initially focused on the Potomac River drainage and the state's obligation for reducing nutrients into the Chesapeake Bay.

- A guidance document with policies and procedures will be developed and finalized in 2009.
- Recommendations for funding the infrastructure necessary to implement the trading program -- approximately \$500,000 -- will be developed and submitted to the appropriate funding authorities in 2010.
- With adequate funding, the trading program will be in operation by 2011.

West Virginia will implement the following specific implementation goals by the end of 2011:

Off-Stream Watering with Fencing and Rotational Grazing	14,000 acres	Animal Waste Management Systems	11 systems
Cover Crops	1,500 acres/year	Wet Ponds and Wetlands	500 acres drained
Forest Buffers	200 acres	Dry Extended Detention Ponds	500 acres drained
Grass Buffers	200 acres	Urban Filtering Practices	50 acres drained
Manure Transfer	14,000 tons	Erosion and sediment control	1,400 acres
Wetland Restoration	5 acres	Septic connections	364 systems
Non-Urban Stream Restoration	4,000 feet	Septic pumping	6,800 systems
		Septic denitrification	2 systems