

Maryland Agriculture's Role in Chesapeake Bay TMDL

Agriculture and Environmental Law Conference

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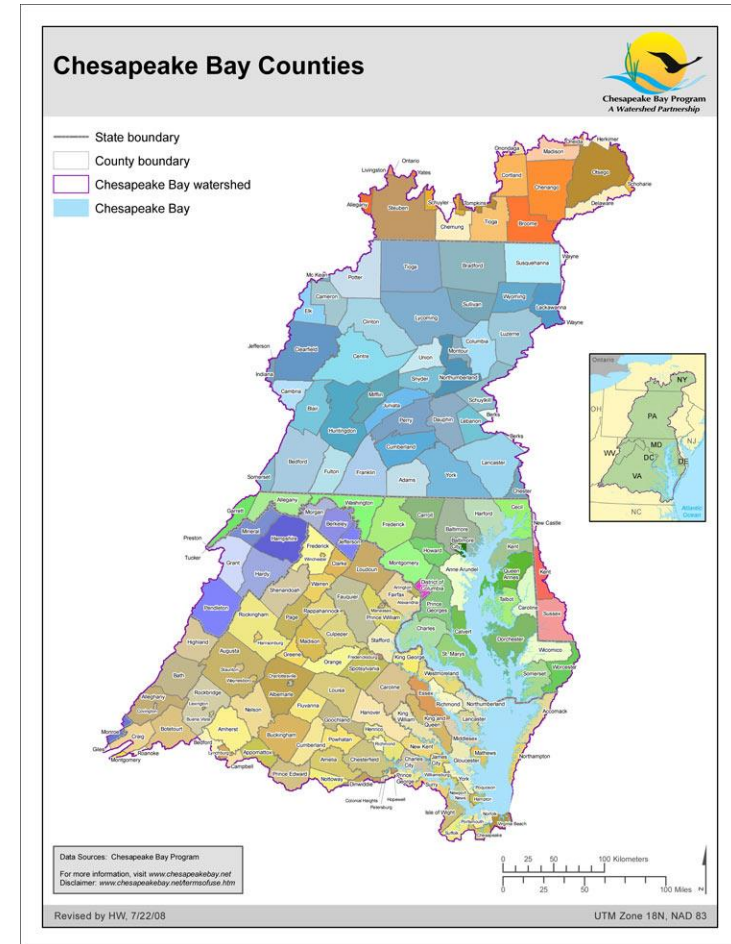
Watershed Implementation Program





Chesapeake Bay Restoration

- 1983 Bay Agreement
 - Simple pledge to restore Bay
 - Established EPA-CBPO
- 1987 Bay Agreement
 - 40% N&P reduction goal
- Chesapeake 2000
 - 102 goals
 - Water quality
 - Habitat
 - Land management





Chesapeake Bay TMDL

- May 12, 2009, President signed an Executive Order that recognizes the Chesapeake Bay as a national treasure and calls on the federal government to lead a renewed effort to restore and protect the nation's largest estuary and its watershed.
- Established TMDL for each state by source sector
- Requires Bay States to submit Watershed Implementation Plan to meet TMDL



Statewide Results (Final Target)

Nitrogen Sector	2009 Progress	2025 Allocation
Agriculture	19,764,135	15,215,223
Forest	5,259,099	5,306,179
Municipal-Industrial	13,582,981	10,537,733
Non-Tidal Atm	664,672	664,672
Septic	2,971,870	1,852,103
Urban	9,705,199	7,594,089
Total	51,947,957	41,170,000

Phosphorus Sector	2009 Progress	2025 Allocation
Agriculture	1,612,749	1,451,036
Forest	150,362	151,820
Municipal-Industrial	763,255	657,239
Non-Tidal Atm	39,836	39,836
Septic	0	0
Urban	735,039	510,068
Total	3,301,242	2,810,000



Agricultural BMPs

Nutrient Management

- Nutrient Management
- Precision Agriculture
- Enhanced Nutrient Management

Conservation Tillage

Cover Crops

Pasture Grazing BMPs

- Pasture Fencing
- Precision or Intensive Rotational Grazing
- Horse Pasture Management
- Water Control Structures

Interim (tracked, but no credit received)

- Manure Technologies and Incorporation
- Poultry HUAs
- Cropland Irrigation Management
- Ag Stormwater/Nursery Capture and Reuse
- P-Sorbing Materials

Other Agricultural BMPs

- Forest and Grass Buffers
- Wetland Restoration
- Land Retirement
- Tree Planting
- Carbon Sequestration/Alternative Crops
- Conservation Plans/SCWQP
- Non-Urban Stream Restoration
- Manure Transport
- Animal Waste Management Systems
- Mortality Composters
- Poultry & Swine Phytase
- Dairy Precision Feed and/or Forage Management
- Ammonia Emissions Reductions
- Barnyard Runoff Controls



Agriculture WIPII Plan Goals

BMP	Unit	2013 Milestones	2017 Goal	2025 Goal
10' Fertilizer Setback	Acres	5,280	3168	5,280
Alternative Crops	Acres	200	498	830
Barnyard Runoff Control	Acres	168	219	1,180
CAFO Manure Application Setback	Acres	2,500	1500	2,500
Conservation Tillage	Acres	764,630	704,198	765,487
Cover Crop	Acres	355,000	424,086	424,086
Cropland Irrigation Management	Acres	92,000	119,728	119,728
Dairy Manure Incorporation	Acres	3,976	16,703	27,838
Decision Agriculture - Cropland	Acres	84,920	356,665	594,441
Enhanced Nutrient Management - Tier I	Acres	14,285	60,000	100,000
Enhanced Nutrient Management - Tier II	Acres	14,285	60,000	100,000
Enhanced Nutrient Management - Tier III	Acres	25,000	105,000	175,000
Forest Buffers	Acres	335	1,406	2,344
Grass Buffers; Vegetated Open Channel - Agriculture	Acres	538	2,258	3,763
Heavy Use Poultry Area Concrete Pads	Operations	19	81	136
Horse Pasture Management	Acres	712	2,994	4,990
Irrigation Water Capture Reuse	Acres	1,000	2,120	3,533
Land Retirement to hay without nutrients (HEL)	Acres	2,030	8,536	14,226
Land Retirement to pasture (HEL)	Acres	5,285	22,200	37,000
Loafing Lot Management	Acres	34	145	241



Agriculture WIPII Plan Goals

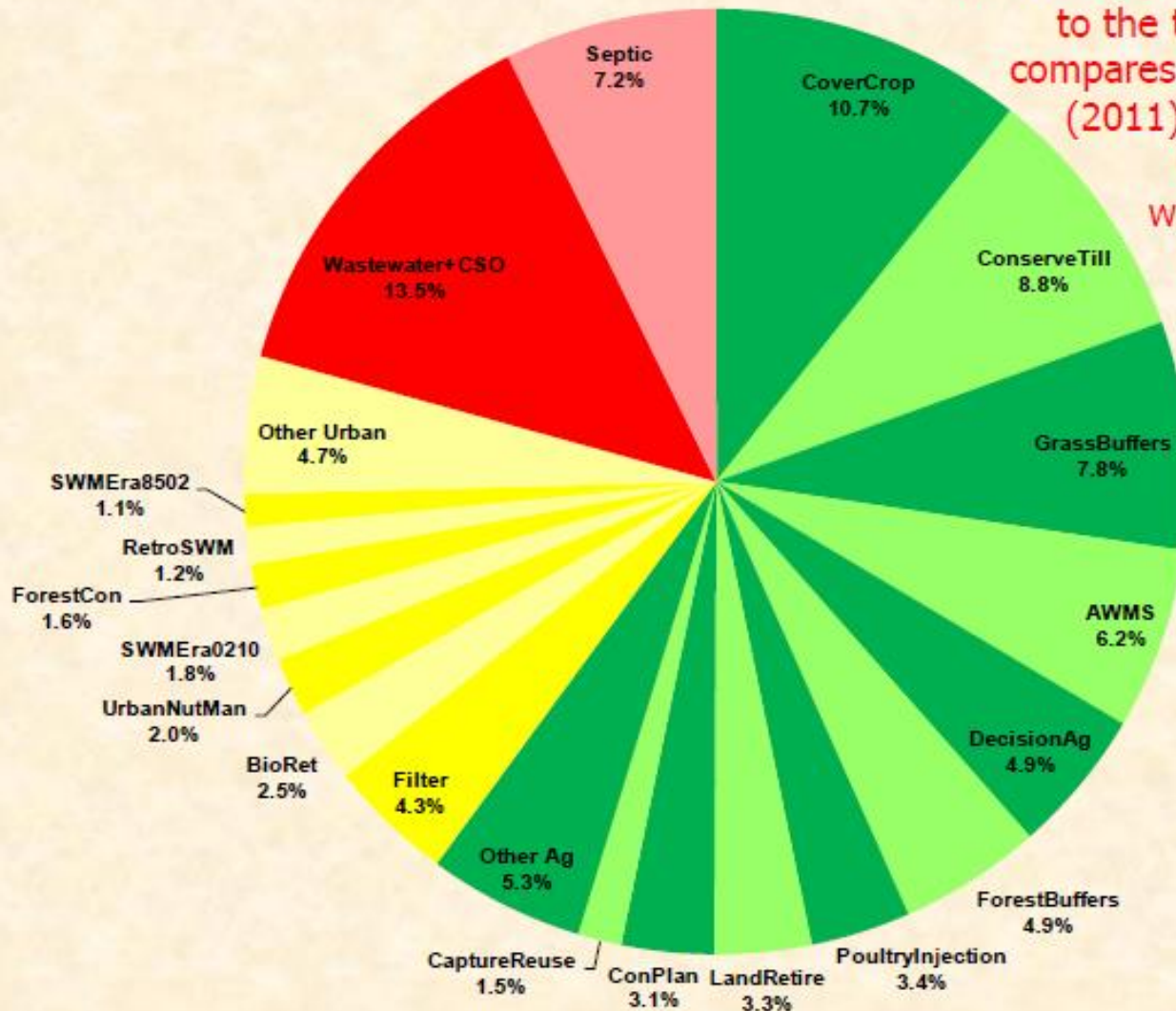
BMP	Unit	2013 Milestones	2017 Goal	2025 Goal
Manure Transport - Out of Watershed	Tons	37,000	51,000	85,000
Mortality Composters	Operations	20	87	145
Non Urban Stream Restoration	Linear Feet	6,919	29,061	48,435
Nutrient Management - Cropland	Acres	685,000	211,036	351,726
Nutrient Management - Hayland	Acres	75,000	11,207	18,679
Nutrient Management - Nursery	Acres	1,836	1,836	3,060
Off Stream Watering Without Fencing	Acres	655	2,500	4,167
Poultry Litter Incorporation	Acres	23,876	100,283	167,138
Poultry Litter Treatment	Operations	64	270	450
Precision Intensive Rotational Grazing	Acres	398	1,671	2,785
Prescribed Grazing	Acres	2,614	10,982	18,304
Shallow Wildlife Wetland Habitat Management	Acres	35	150	250
Shoreline Erosion Control	Linear Feet	3,649	15,326	25,543
Soil Conservation and Water Quality Plans	Acres	826,000	1,026,413	1,145,326
Sorbing Materials in Ag Ditches	Acres	737	3,097	5,162
Stream Access Control with Fencing	Acres	5,050	20,956	35,355
Tree Planting; Vegetative Environmental Buffers - Poultry	Acres	118	500	830
Water Control Structures	Acres	2,453	10,289	17,173
Wetland Restoration	Acres	502	2,110	3,516
Phytase	%	24%		
Poultry Waste Structures	Operations	7	31	51
Livestock Waste Structures	Operations	20	87	145



Nitrogen Relative Load Reductions Maryland



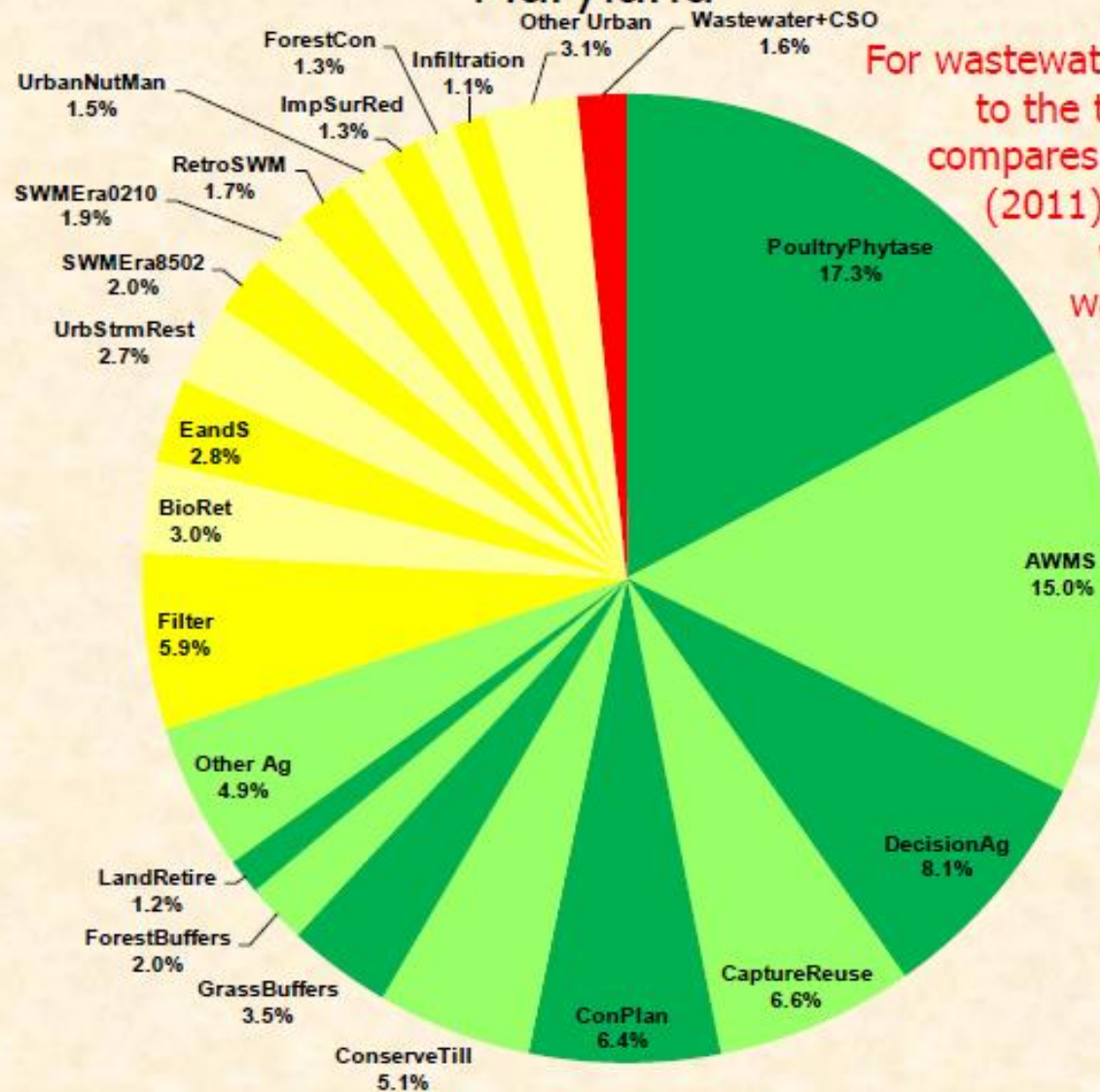
For wastewater, the contribution to the total load reduction compares current discharges (2011) to WIP discharges while BMPs outside wastewater compare No-Action to WIPs.





Phosphorus Relative Load Reductions

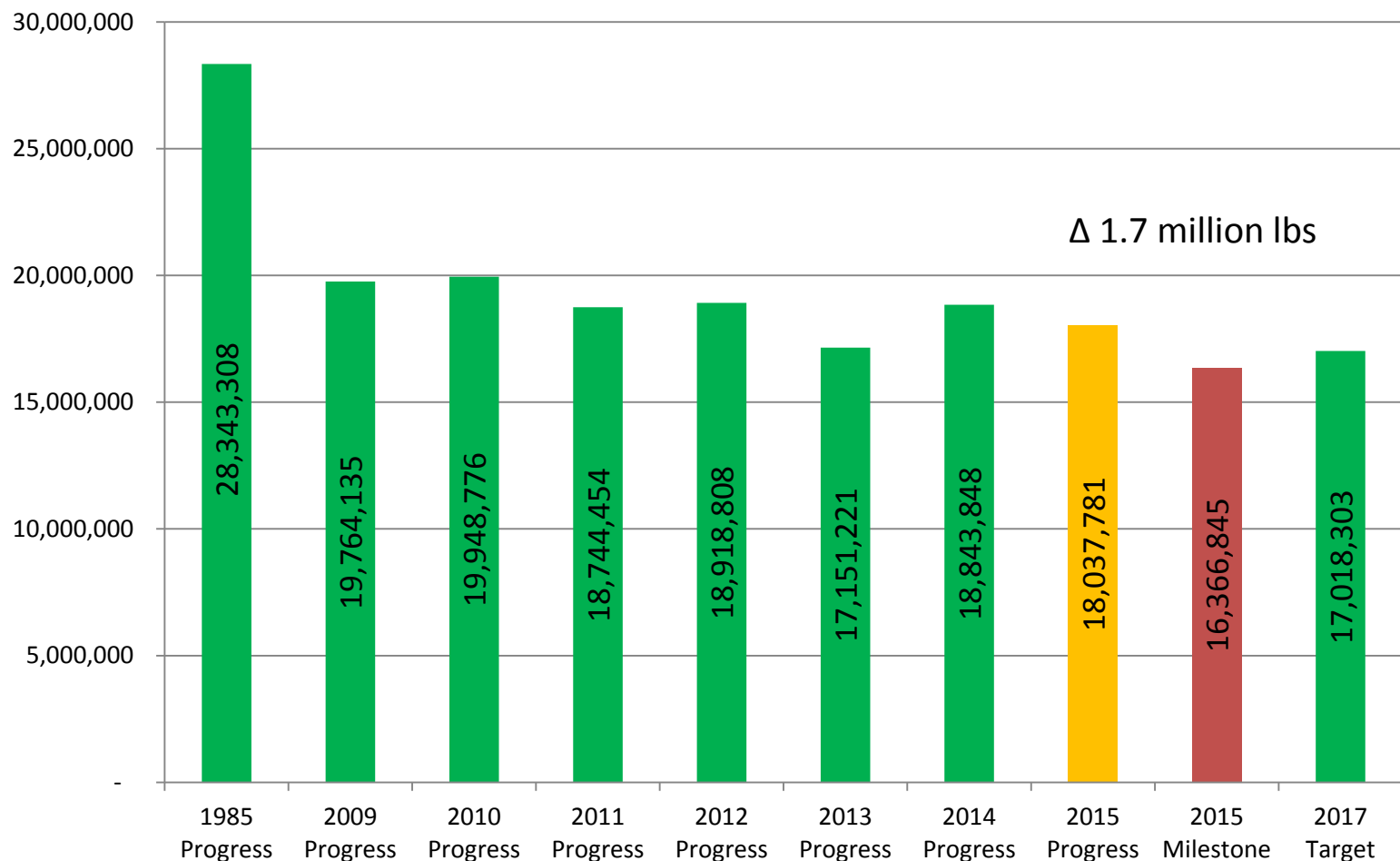
Maryland



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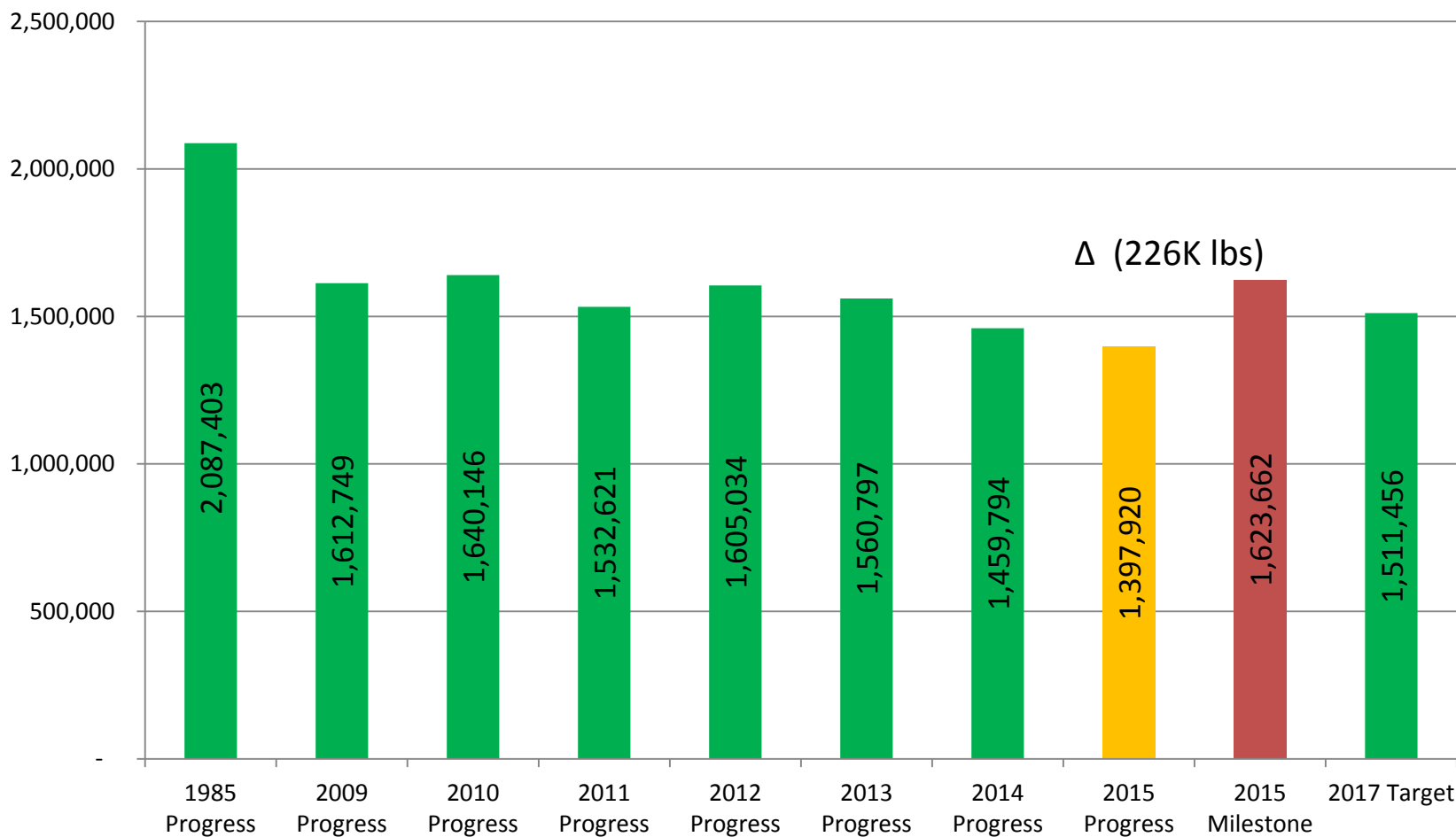


2015 Progress Results – Nitrogen (lbs)





2015 Progress Results – Phosphorus (lbs)





Allocation Responsibility & Cost

Source Sector	N Reduction Mil/lbs/yr	Phase II WIP Cost (Mil)	Cost/lb Reduced	% of Total Load Reduction	% of Total Cost
WWTP	5.45	\$2,368	\$400	41%	16%
Agriculture	4.73	\$928	\$200	36%	6%
Urban Retrofits	1.93	\$7,388	\$3,800	15%	51%
Septic Systems	1.15	\$3,719	\$3,200	9%	26%
Total	13.26	\$14,403	\$1,100	100%	100%

Source Sector	P Reduction Mil/lbs/yr	Phase II WIP Cost (Mil)	Cost/lb Reduced	% of Total Load Reduction	% of Total Cost
WWTP	0.177	\$2,368	\$13,400	30%	22%
Agriculture	0.190	\$928	\$4,900	32%	9%
Urban Retrofits	0.220	\$7,388	\$33,600	37%	69%
Total	0.587	\$10.684	\$18,200	100%	100%



Options for Achieving 2025

- Trading between sectors
 - 32 Member Water Quality Trading Advisory Committee
 - Issues
 - Amount of credits that can be purchased
 - Geographic restrictions
 - Agricultural assurances
 - Draft policy out later end of April
 - Expected to be a critical tool for Phase III development



Trading Program Overview

Policy developed in three phases:

- Phase I addresses Point Source-Point Source trading

Final issued March 2008 by MDE

- Phase II addresses Source trading

Agricultural Trading Program June 1, 2010 by MDA
Certification Program regulations pending

- Phase III to address NPS to NPS

Urban NPS trading or Aligning for Growth to be finalized
by MDE mid



Phase III WIP Strategy

- Targets Spring 2017
- Local Ag WIP Meetings Fall 2017
- Build Upon Phase II
- Re-evaluate opportunities
- Incorporate new BMPs
- BMP Verification
- Nutrient Trading



Questions

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