

Nutrient Trading in Maryland

2017 National Watershed and Stormwater Conference

April 4, 2016

Jason Keppler

Watershed Implementation Program



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

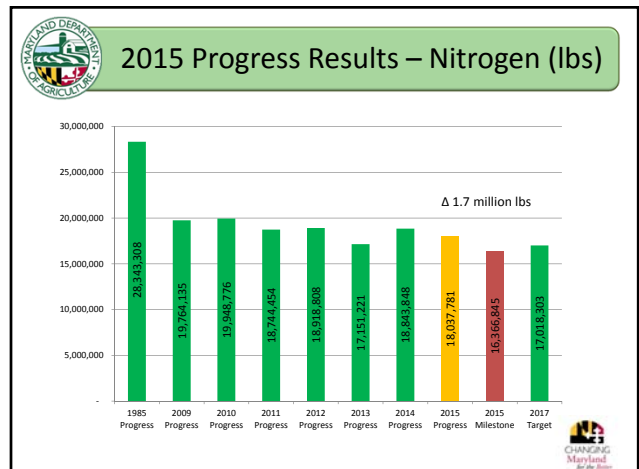
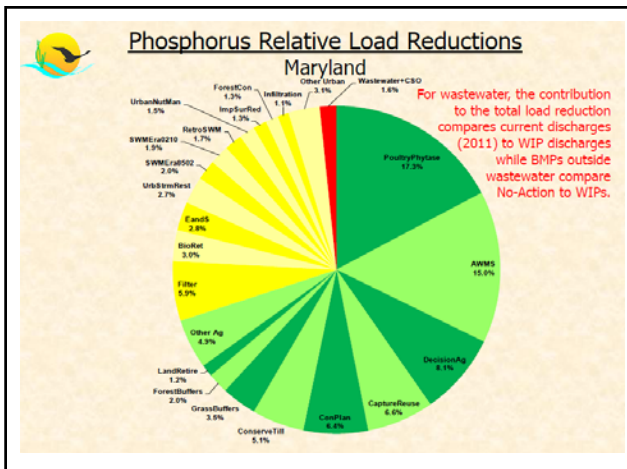
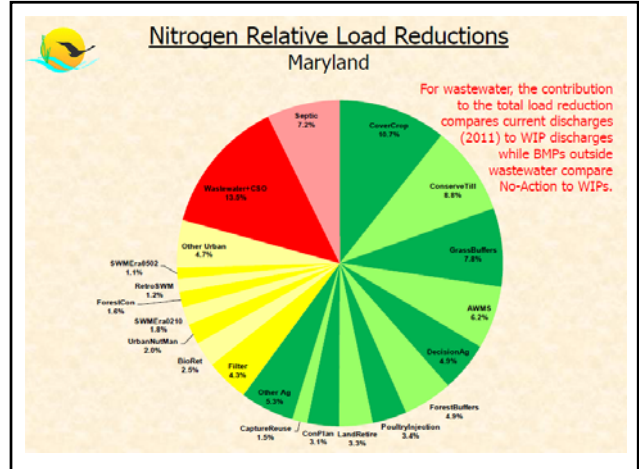
- Forest and Grass Buffers
- Wetland Restoration
- Land Retirement
- Tree Planting
- Carbon Sequestration/Alternative Crops
- Conservation Plans/SCWQP
- Non-Urban Stream Restoration
- Manure Transport
- Animal Waste Management Systems
- Mortality Composters
- Poultry & Swine Phytase
- Dairy Precision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

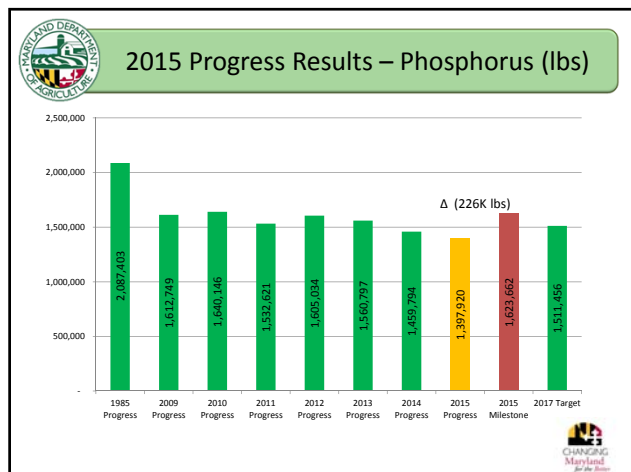


Agriculture WIP II Plan Goals

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 WIPs 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	351,728
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	1,345,328
Sorbing Materials in Ag Ditches	Acres	737	3,087	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	17,171
Wetland Restoration	Acres	502	2,110	3,516
Phytase	%	24%		
Poultry Waste Structures	Operations	7	31	52
Livestock Waste Structures	Operations	20	87	145





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 this year
- Expected to be a critical tool for Phase III development

Trading Program Overview

Policy developed in three phases:


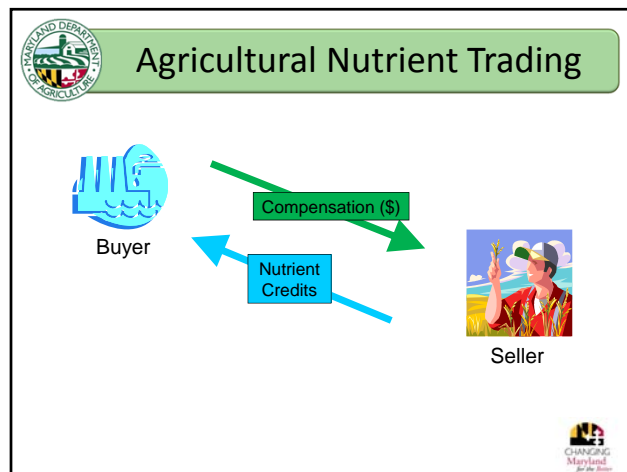

- Phase I addresses Point Source-Point Source trading
Final issued March 2008 by MDE
- Phase II addresses NPS to Point Source trading
Agricultural Trading Program June 1, 2010 by MDA
- Phase III to address NPS to NPS
Cross Sector Trading



Agricultural Nutrient Trading



A program to provide to Maryland farmers a payment for conservation practices.

- The practices provide offsets to address new or increased loads associated with a growing population.
 - WWTP, Development, Industrial Facilities
- Private purchase of nutrient reduction projects and practices (retirement credits)
 - Chesapeake Bay Foundation
 - Ducks Unlimited

Fundamental Trading Principles

- Key Program Principles
- How to Generate Agricultural Credits
 - Eligibility to participate
 - Baseline requirements
 - What is tradable
 - Verification and certification requirements
- How to Exchange Agricultural Credits
 - Finding trading partners
 - How to sell credits
 - Developing Trade Agreements
 - Accountability & Administration






Key Principles

Establish the foundation of any trading program. They are essential for an equitable, environmentally protectable, yet viable, trading program.

Key Principle #1

- Any generator of agricultural non-point source credits must first demonstrate they have met the baseline water quality requirements for nitrogen and phosphorus levels in their watershed.







Baseline Evaluation



Agricultural Baseline Based on Model
Version 5.3.2 (Edge of Segment)

	PTX	POT	SUS	WS	ES
N =	10.3	24.9	17.6	15.9	11.7
P =	1.34	1.78	0.9	1.1	1.0
Sediment =	51.35	552.56	48.58	89.25	117.50
Statewide N =	16.7				
Statewide P =	1.3				
Statewide Sediment =	171.9				



Bay TMDL vs Local TMDL

Eastern Shore Bay TMDL Nitrogen		Chester River (Middle) Local TMDL Nitrogen
Raw	29.96 lbs/acre	29.96 lbs/acre
TMDL	11.7 lbs/acre	6.91 lbs/acre
% Red	61%	77%
Phosphorus		Phosphorus
Raw	2.01 lbs/acre	2.01 lbs/acre
TMDL	1.03 lbs/acre	0.49 lbs/acre
% Red	49%	73%

Key Principles (cont.)

- Agricultural generators must be in compliance with all local, state, federal laws, regulations and programs
- BMP's funded by federal or state cost-share can not be used to generate credits during their contract life.
- The Agricultural Trading Program is not intended to accelerate the loss of productive farmland.
- An Agricultural practice can only generate credits once it is installed and verified, or placed in operation.






What is Tradable

How to Generate Credits

Once a landowner or operator has determined the tract has achieved the baseline requirements for the watershed additional implementation of water quality improvements can be considered as a tradable credit.

- No partial credits for BMPs utilized to meet baseline.
- Tradable credits can be generated from any planned agronomic, land conversion, or structural practice.
- Some practices (grass buffers/fencing/manure incorporation) are excluded because they are required by nutrient management regulations.







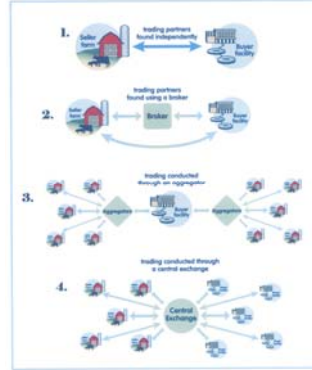


Agricultural NPS Credit Potential

Three categories of credit-generating practices

- 1) BMPs with “approved” load reductions (in CBWM and loaded into trading tool)
- 2) BMPs currently in use and requiring technical review
- 3) Other BMPs, practices, or innovative approaches not currently in widespread use and requiring technical review





Finding a Trading Partner


Accountability & Administration

- A practice can only generate credits once it is installed and functioning
- An inspection to certify standards and spec were met and the BMP is functional is required
- The full annual credit produced by the practice will not be certified until the year following the year of installation
- Credits are used in the year they are generated
- Credits can not be banked for sale and used in future years
- The Maryland Department of Agriculture (or its designee) will perform annual spot checks on a minimum of 10% of all traded Agricultural credits




Chesapeake Bay Nutrient Trading/Tracking Tool (CBNTT)

www.mdnutrienttrading.com




Trading Tool Recap

- Based on the World Resources Institute (WRI) NutrientNet platform as modified to reflect the Chesapeake Bay Watershed Model land use loads, calculations, and BMP efficiencies
- Tool revised to incorporate the USDA/NRCS Nutrient Tracking Tool (NTT) – APEX Model
- New multi-state platform, the Chesapeake Bay Nutrient Trading/Tracking Tool or CBNTT, that incorporates state-specific tools for Maryland, Virginia, and Pennsylvania




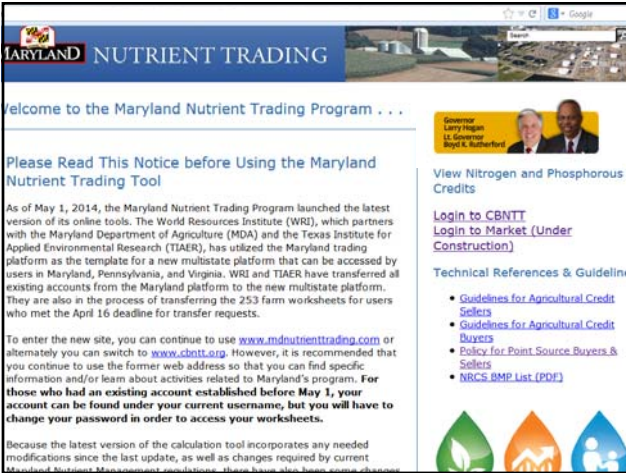

Web-Based Tool Components

- Calculator to determine eligibility as well as assess nitrogen, phosphorus, and sediment credit potential from agricultural sources
- Registry to register credits and track trades and other pertinent information
- Marketplace for buyers and sellers to post and exchange information on credit availability and price
- Administrative module to manage data and prepare required reports

Nutrient Tracking Tool (NTT)

- Created by USDA from APEX to provide access to environmental outcomes, such as changes in nutrients, sediment, and yields at the field scale
- Applies parameters (weather, evapotranspiration, crop growth models, temperature, slope, soils) to inputs
- Agronomic options include application methods and type of fertilizer, planting method, harvesting method, cover crops, tillage, irrigation, drainage, etc.
- Calculates the change in N, P, sediment, and yield based upon an initial condition and the adoption of agronomic conservation practices

Welcome to the Maryland Nutrient Trading Program . . .

Please Read This Notice before Using the Maryland Nutrient Trading Tool

As of May 1, 2014, the Maryland Nutrient Trading Program launched the latest version of its online tools. The World Resources Institute (WRI), which partners with the Maryland Department of Agriculture (MDA) and the Texas Institute for Applied Environmental Research (TIAER), has utilized the Maryland trading platform as the template for a new multistate platform that can be accessed by users in Maryland, Pennsylvania, and Virginia. WRI and TIAER have transferred all existing accounts from the Maryland platform to the new multistate platform. They are also in the process of transferring the 253 farm worksheets for users who met the April 16 deadline for transfer requests.

To enter the new site, you can continue to use www.mdnutrienttrading.com or alternately you can switch to www.cbntt.org. However, it is recommended that you continue to use the former web address so that you can find specific information and/or learn about activities related to Maryland's program. **For those who had an existing account established before May 1, your account can be found under your current username, but you will have to change your password in order to access your worksheets.**

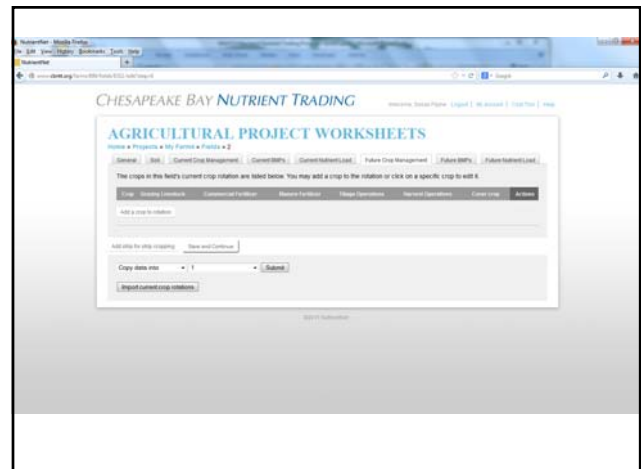
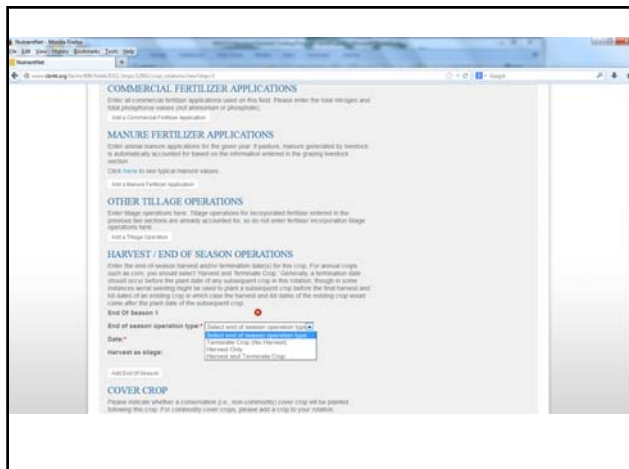
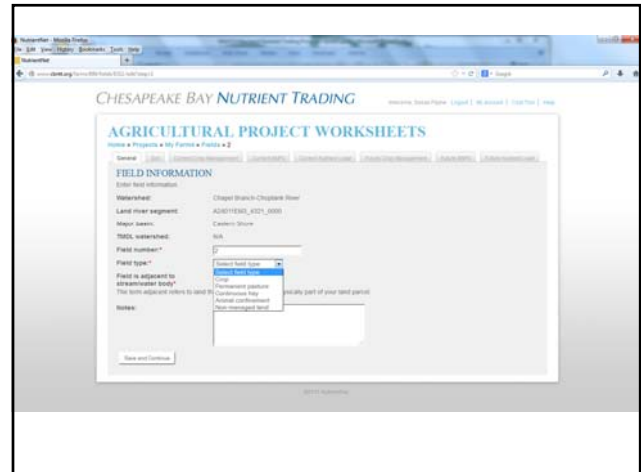
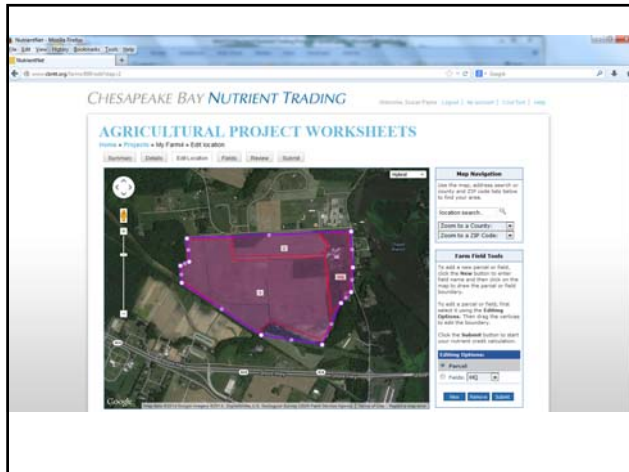
Because the latest version of the calculation tool incorporates any needed modifications since the last update, as well as changes required by current Maryland Nutrient Management regulations, there have been some changes.

View Nitrogen and Phosphorous Credits

Login to CBNTT
Login to Market (Under Construction)

Technical References & Guidelines

- Guidelines for Agricultural Credit Sellers
- Guidelines for Agricultural Credit Buyers
- Policy for Point Source Buyers & Sellers
- NRCS BMP List (PDF)



FUTURE BMPs

All additional BMPs not captured under the Current Corp Management Plan should be listed here.

Click here to view BMP descriptions (PDF format).

If Current BMPs will remain in place, click on the Import Current BMPs button below. Add additional BMPs and/or expand existing BMPs.

Import current BMPs

RIPARIAN CONSERVATION BUFFER BMPs

Enter information if you have a riparianconservation buffer BMP in place. Note: If the ridgeline and wetlands calculated for alternative wetland facility is greater than that for buffers, it will be used instead.

Permit buffer: ☐

Grass buffer: ☐

FERTILIZER APPLICATION SETBACK

Setback in place: ☐

WETLAND

Wetland in place: ☐

OTHER LAND USE CONVERSION

Please indicate any non-riparian use conversion in place or planned on this field.

Acres converted:

Converted to:

Planned: ☐

OTHER BEST MANAGEMENT PRACTICES

See other

STREAMBANK RESTORATION

Streambank restoration in place: ☐

The diagram illustrates the partnership between several organizations and the Maryland Department of the Environment (MDE). At the top, a green box labeled "Partners" contains the logos of the following organizations: Maryland Department of the Environment (MDE), Chesapeake Bay Program, Tarleton State University, World Resources Institute, and the National Oceanic and Atmospheric Administration (NOAA). Arrows point from each of these logos down to a central box labeled "MDE", indicating their collaborative role.



Questions

Jason Keppler
jason.keppler@maryland.gov
410-841-5879
www.mdnutrienttrading.com

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