

Maryland's Nutrient Trading Program

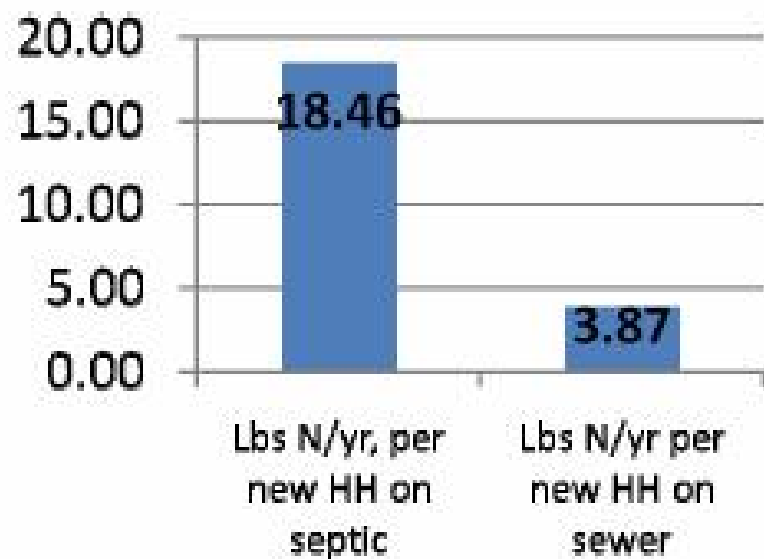
How Trading Works

John Rhoderick

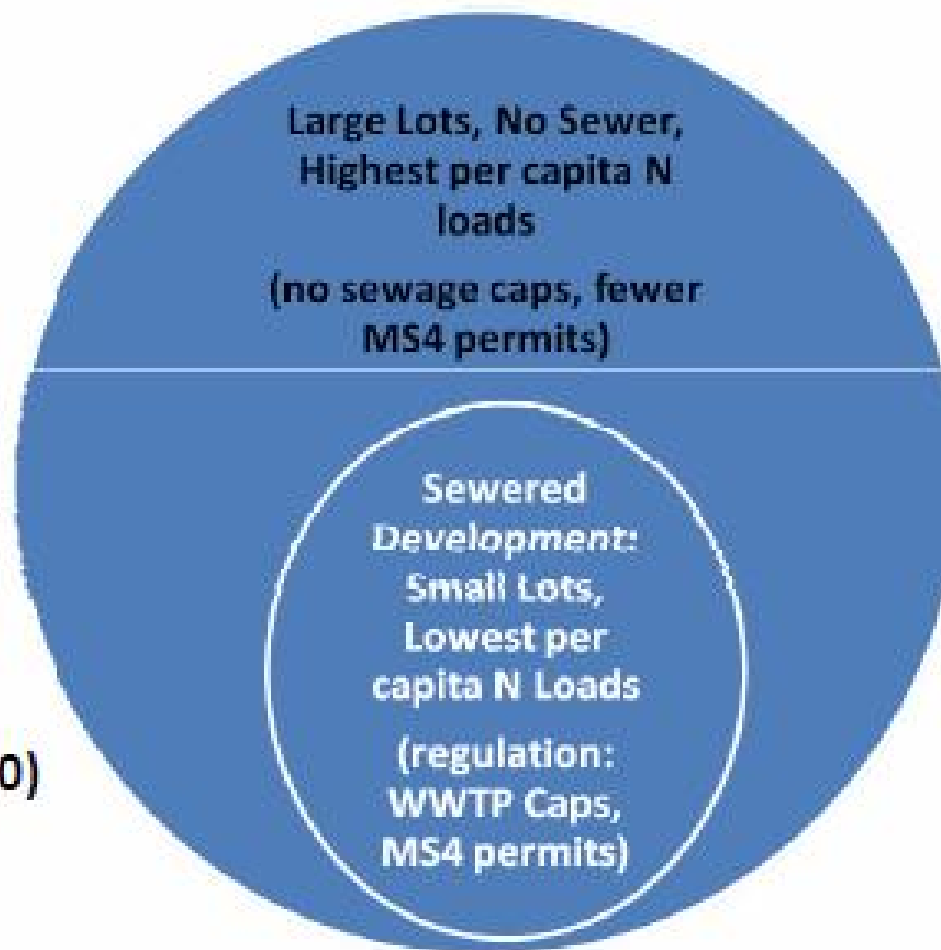
Maryland Department of Agriculture

Maryland Nutrient Trading Program Overview

- n Currently provides separate programs for PS-PS and PS-Agricultural NPS trading
 - n Phase I addresses Point Source-Point Source trading
 - n Final issued March, 2008
 - n Phase II addresses Point Source-Non Point Source trading
 - n Agricultural Trading Program June 1, 2010
 - n Phase III to address NPS to NPS
 - n Urban NPS trading to be developed



**263,225 Additional Households
Forecasted in Maryland (2010 -2020)**
29% served by septic tanks
71% served by ENR WWTP



Maryland Nutrient Trading Program

Phase I Policy
Point Source---Point Source
Trading

Purpose of Point Source Trading

- n To offset new or increased discharges
- n To establish economic incentives for reductions from all sources within a watershed
- n To achieve greater environmental benefits than through the existing regulatory programs

Key Principles

- n All new and expanded point source nutrient loads must be fully offset
- n Trades must be consistent with County Water and Sewerage Plans
- n Trading will not be available in lieu of required Enhanced Nutrient Removal upgrades
- n Point source trades will be implemented and enforced via NPDES permits

Key Principles

- n Trades must be consistent with TMDLs
- n Trades must protect local water quality
- n Adequate public outreach/stakeholder participation

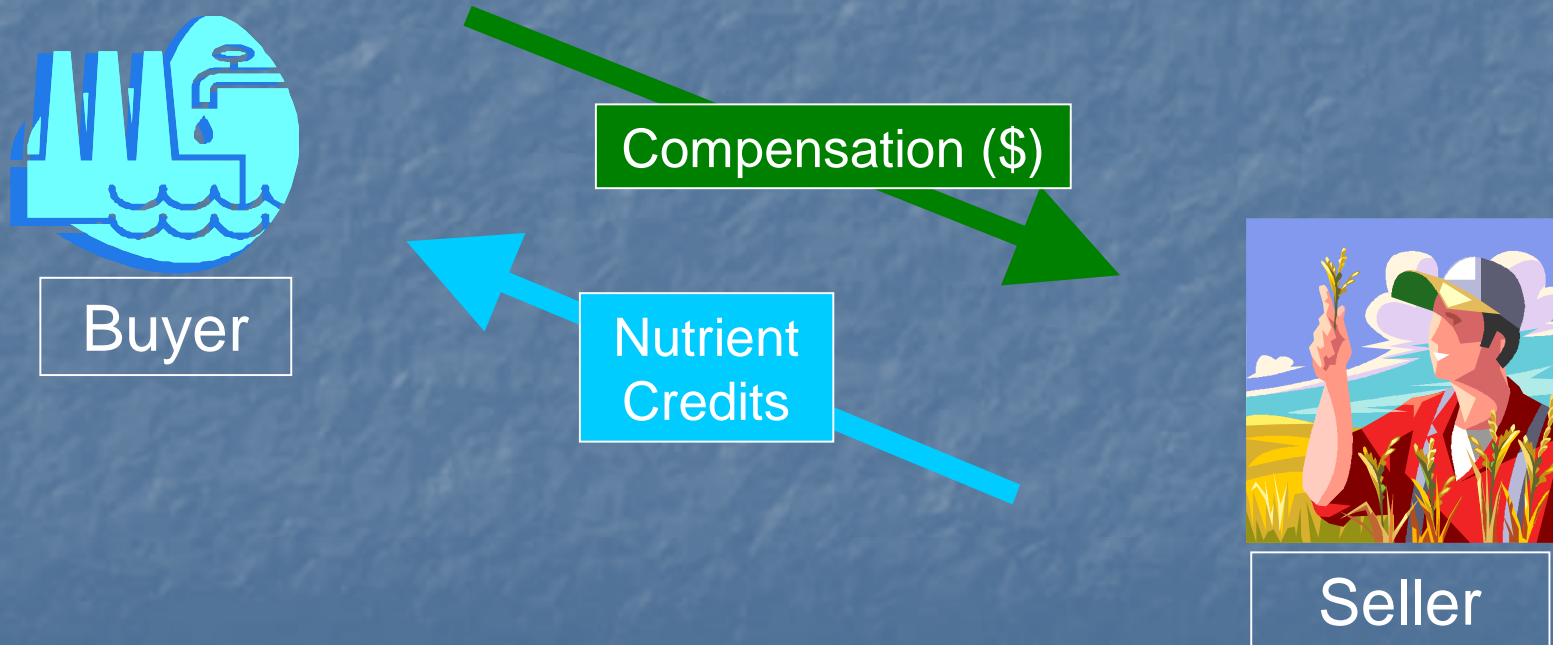
Generating Credits

- n ENR facilities may generate point source discharge credits by:
 - n Reducing effluent concentration
 - n Maintaining flow at less than the design flow basis of wasteload allocation
- n Land application of wastewater with pretreatment and nutrient management controls

Generating Credits

- n Upgrading an existing minor WWTP to BNR or ENR
- n Retiring an existing minor WWTP and sending its flow to a BNR or ENR facility
- n Retiring an existing Onsite Sewage Disposal System by connection to public sewer or cluster treatment

Phase II – Agricultural Nutrient Trading in Maryland



Agricultural Nutrient Trading

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

- A. The practices provide offsets to address new or increased loads associated with a growing population.

WWTP, Development, Industrial Facilities

- B. Private purchase of nutrient reduction projects and practices (retirement credits)

Chesapeake Bay Foundation

Ducks Unlimited

Maryland's Fundamental Trading Principles

A. Key Program Principles

B. How to Generate Agricultural Credits

- n Eligibility to participate
- n Baseline requirements
- n What is tradeable
- n Verification and certification requirements

C. How to Exchange Agricultural Credits

- n Finding trading partners
- n How to sell credits
- n Developing Trade Agreements
- n 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

- n 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. These include the minimum level of nutrient reductions outlined in the Tributary Strategies or the applicable TMDL requirements. Baselines provide assurance that participants are at a minimum level of conservation stewardship and are not currently impacting local water quality

Key Principles (cont.)

Key Principle #2

- n Agricultural generators must be in compliance with all local, state, federal laws, regulations and programs. The credit purchaser and generator can not cause or contribute to water quality effects locally, downstream or, bay wide.

Key Principle #3

- n BMP's funded by federal or state cost-share can not be used to generate credits during their contract life. However, these BMP's can count toward baseline or after the funded lifespan has expired, you can use the BMP to generate credits.

Key Principles (cont.)

Key Principle #4

- n The Agricultural Trading Program is not intended to accelerate the loss of productive farmland. Therefore, credits will not be generated under this policy for the purchase and idling of whole or substantial portions of farms to provide nutrient credits.

Key Principle #5

- n Trades must result in a net decrease in loads. A portion of the agricultural credits generated in a trade will be retired 10% and used to achieve Tributary Strategies or TMDLs, the other portion becomes tradable credit.

Key Principle #6

- n An Agricultural practice can only generate credits once it is installed and verified, or placed in operation.

"Baseline" Requirements for Agricultural Non-point sources

Maryland's agricultural non-point nutrient trading program requires that operators of agricultural operations or other landowners wishing to generate credits must have achieved a level of nutrient reduction known as baseline

Baselines are applied to all the pasture/field/animal areas within a tract that is being used to generate credits and must first achieve the stricter of:

- a) the level of nutrient reduction called for in the tributary strategies; or
- b) the level of nutrient reduction called for in an applicable TMDL for the watershed where the credits are generated from.

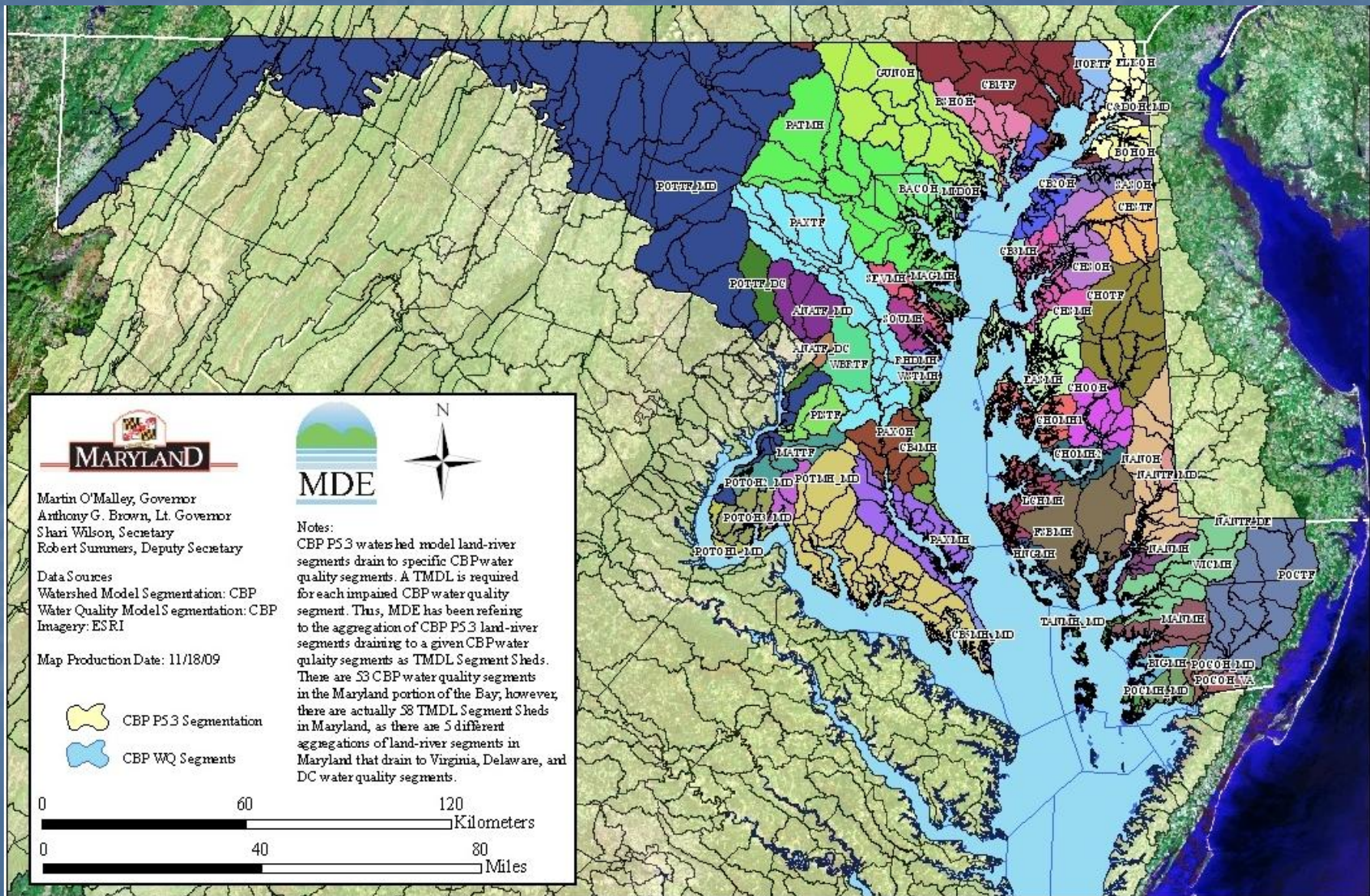
The entire tract must meet the baseline to be eligible to generate credits

Current agronomic and structural practices can be utilized to meet baseline.

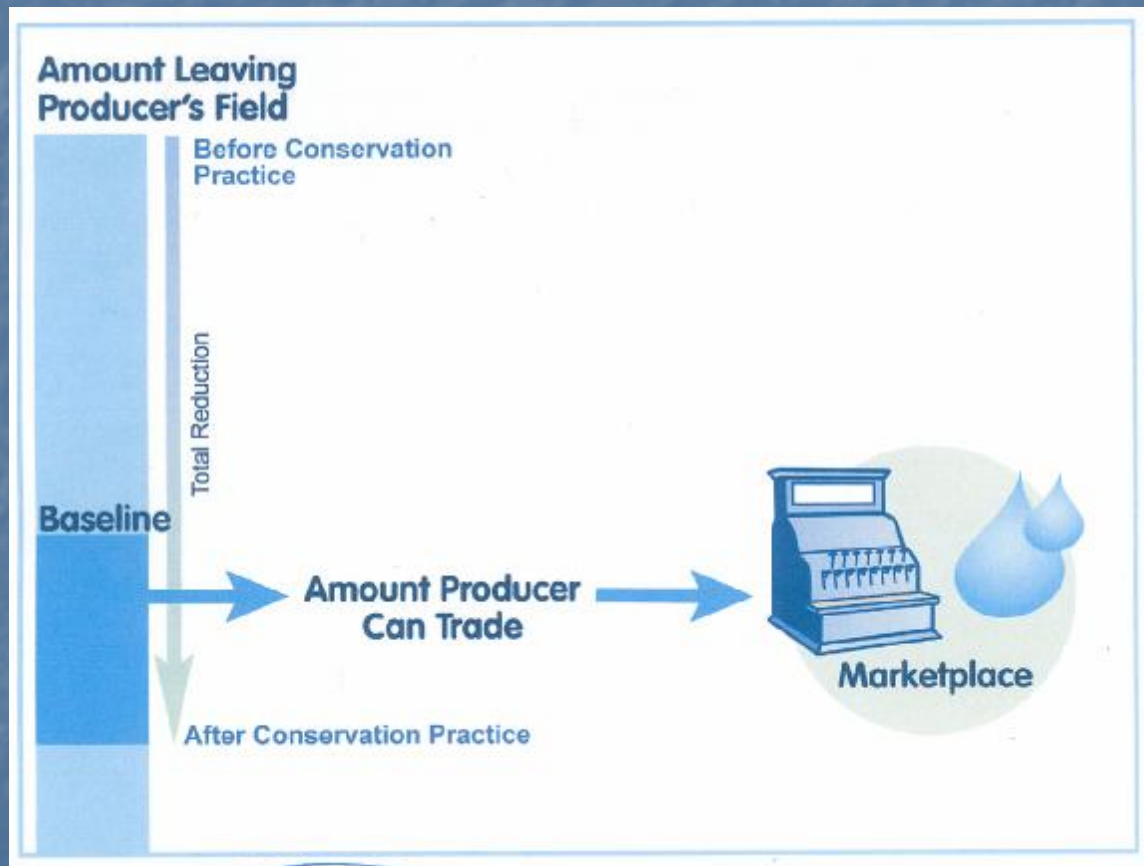
Baseline requirements may require additional implementation of BMP's.

An agricultural operator or landowner may use federal, state or private cost-share assistance to implement BMP's that are used to meet the baseline nutrient reductions.

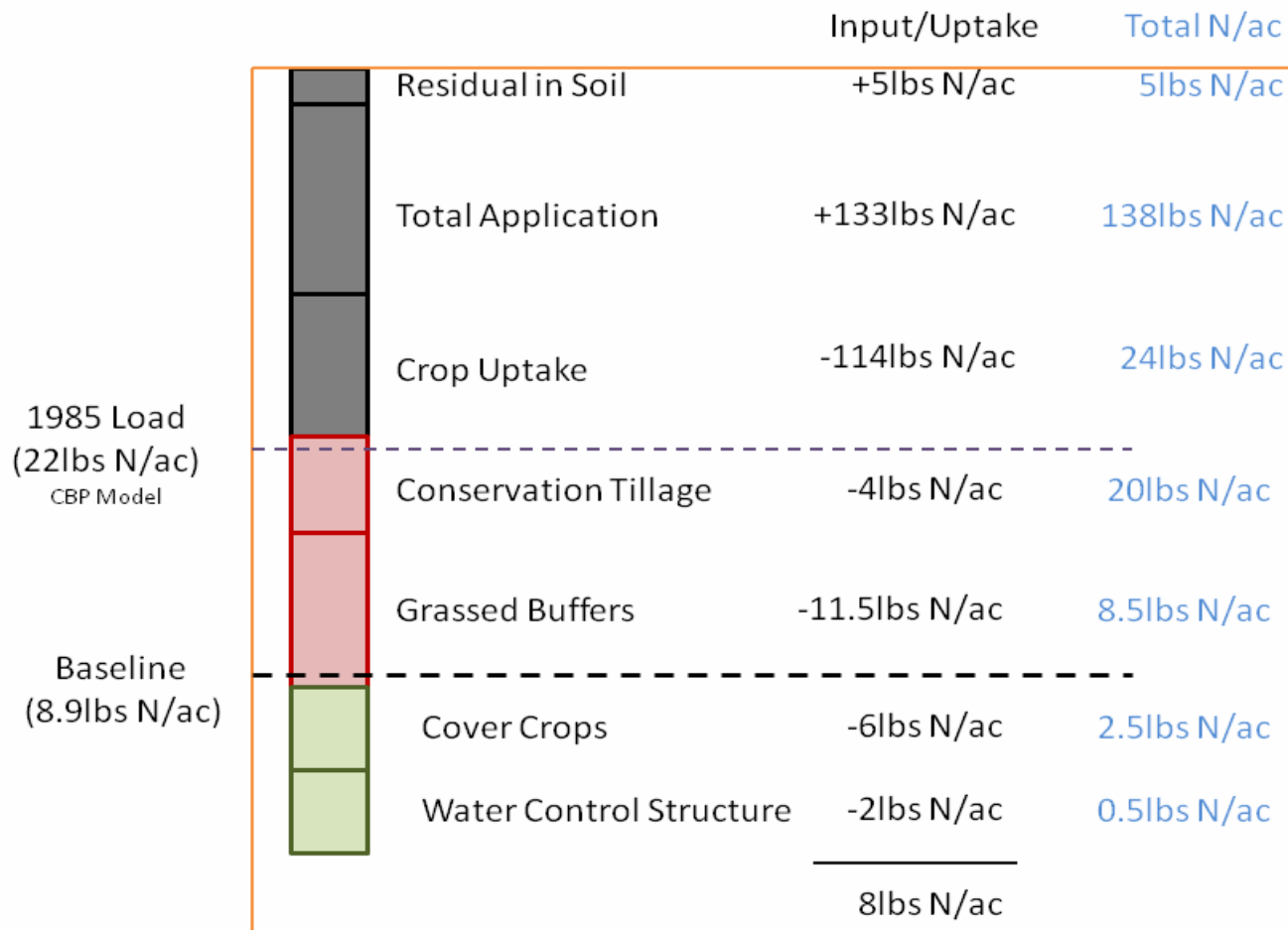
58 Sub-Allocation (TMDL) Segmentsheds



Determining How To Meet Baselines



Baseline and Credit Calculation Example



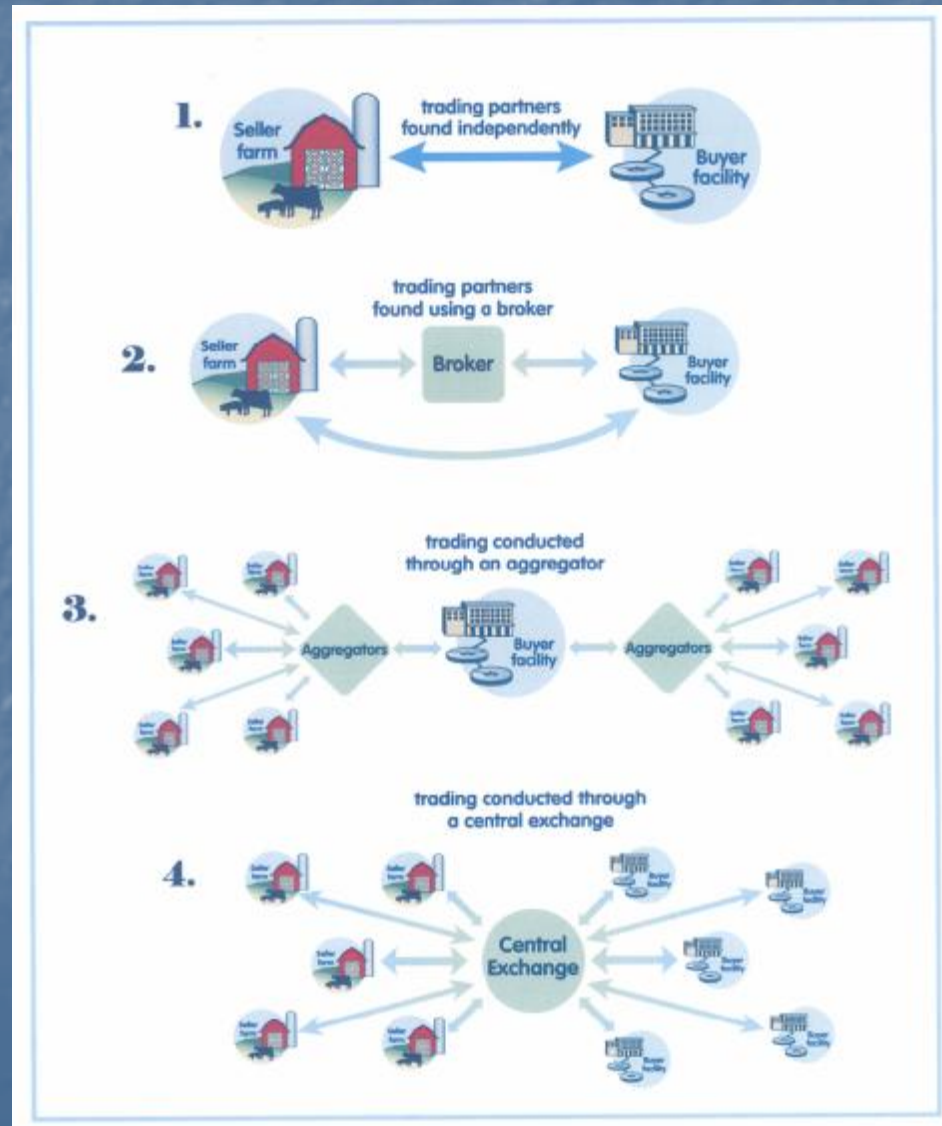
What is Tradeable

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

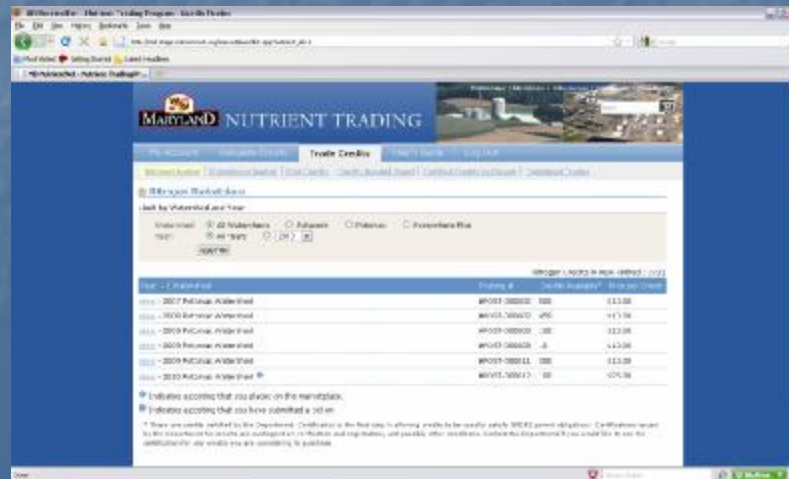
Finding a Trading Partner



Exchange of Non Point Credits

n Marketplace

- n Program functions as a free market, buyers and sellers are free to negotiate the terms of a trade
- n Trades are formalized through private agreements, a contractual arrangement
- n Participants are free to utilize the web base marketplace as a mechanism to assist with credit purchase



The screenshot shows the Maryland Nutrient Trading website interface. It features a header with the Maryland logo and 'NUTRIENT TRADING'. Below the header, there are navigation tabs for 'Home', 'About Us', 'Credits', 'Trades', 'Help', and 'Contact Us'. The main content area is titled 'Credits for Sale' and displays a table of available credits. The table has columns for 'Credit ID', 'Credit Description', 'Quantity', 'Price', and 'Status'. The credits listed are for various water bodies and are categorized by 'Credit ID' and 'Credit Description'. The table shows a list of credits for sale, including '2007 Potomac Watershed', '2008 Potomac Watershed', '2009 Potomac Watershed', '2010 Potomac Watershed', '2011 Potomac Watershed', '2012 Potomac Watershed', '2013 Potomac Watershed', and '2014 Potomac Watershed'. The table also shows the quantity of credits available and the price per credit. The website is designed to facilitate the trading of non-point credits between buyers and sellers.

Credit ID	Credit Description	Quantity	Price	Status
2007 Potomac Watershed	2007 Potomac Watershed	100	\$13.00	Available
2008 Potomac Watershed	2008 Potomac Watershed	100	\$13.00	Available
2009 Potomac Watershed	2009 Potomac Watershed	100	\$13.00	Available
2010 Potomac Watershed	2010 Potomac Watershed	100	\$13.00	Available
2011 Potomac Watershed	2011 Potomac Watershed	100	\$13.00	Available
2012 Potomac Watershed	2012 Potomac Watershed	100	\$13.00	Available
2013 Potomac Watershed	2013 Potomac Watershed	100	\$13.00	Available
2014 Potomac Watershed	2014 Potomac Watershed	100	\$13.00	Available

Accountability/Verification/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

Summary of Non Point Source Program Structure

- Utilizing a web based nutrient trading application with tools to calculate eligibility and credit potential
- Provides for nitrogen and phosphorus credit calculation from agricultural sources
- Provides a separate market place for buyers and sellers of approved credits to post and exchange information on credit quantity and price
- Provides a registry to track and register trades
- User's guide provides procedures to calculate credits and submit credit proposals with "non approved" load reduction BMPs

Maryland Nutrient Trading - Mozilla Firefox

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http://www.mdnutrienttrading.org/

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Welcome To Maryland's Nutrient Trading Program . . .

What is Nutrient Trading?

Nutrient trading is a form of exchange (buying & selling) of nutrient reduction credits. These credits have a monetary value that may be paid to the seller for installing Best Management Practices (BMPs) to reduce nitrogen or phosphorous. In general, water quality trading utilizes a market-based approach that allows one source to maintain its regulatory obligations by using pollution reductions created by another source. As a market-based approach, increased efficiency and cost-effectiveness are achieved by letting the market determine costs. To achieve a desired load reduction, trades can take place between point sources (usually wastewater treatment plants), between point and nonpoint sources (a wastewater treatment plant and a farming operation) or between nonpoint sources (such as agriculture and urban stormwater sites or systems).

Why is there a need for a Nutrient Trading Program?

Over the years, pollution levels in the Chesapeake Bay have been increasing.

Office of the GOVERNOR

View Nitrogen and Phosphorous Credits

- Available Credits
- Traded Credits

[Login to Market](#)

Technical References & Guidelines

- [Guidelines for Agricultural Credit Sellers](#)
- [Guidelines for Agricultural Credit Buyers](#)
- [Policy for Point Source Buyers & Sellers](#)

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NutrientNet - Online Nutrient Trading System - Mozilla Firefox

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http://nutrientnet.mdnutrienttrading.com/

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Water Quality Marketplace

[How do I get started?](#)
[View Nitrogen Marketplace](#)
[View Phosphorus Marketplace](#)
[View Certified Credit Registry](#)

Welcome to NutrientNet, Maryland's online trading tool. NutrientNet is developed by [World Resources Institute](#) and [Tarleton State University, TIAER](#) in cooperation with the [Maryland Department of Agriculture](#) and [Maryland Department of the Environment](#).

NutrientNet is comprised of two main components:

- Calculation Tools:* Calculate credits generated by agricultural management practices.
- Trading Marketplace:* Trade nutrient credits.

Please feel free to [contact us](#) for more information.

Return to [Maryland's Nutrient Trading Program](#).

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MD NutrientNet - Create New Worksheet - Mozilla Firefox

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http://nutrientnet.mdnutrienttrading.com/calc/newWorksheet.asp

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Getting Started Worksheets

New Worksheet

To begin, enter a worksheet name. The name will not be displayed publicly.

Worksheet Name

Create Worksheet

Done

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MD NutrientNet - Field Worksheet - Soil - Mozilla Firefox

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http://nutrientnet.mdnutrienttrading.com/calc/field/worksheet_app?view=land&id=1d512b94-29f1-102e-b3c5-000c296c8a76&id=1069

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MD NutrientNet - Field Worksheet - S...

Keppler Farm 2 > Field 1 > Land Worksheet PCL-000318

General **Soil** Baseline Crop Management Baseline BMPs Baseline Nutrient Load Future Crop Management Future BMPs Future Nutrient Load

Soil Characteristics

Enter soil information. If the soil information below, derived from the farm's location, is incorrect, complete one or more of the soil characteristic survey questions below.

Field area	<input type="text" value="80.00"/> ac	From map: 80.08 ac
Map unit	Ingleside loamy sand, 2 to 5 percent slopes (1600079)	
Soil component	Ingleside (1229499)	
Map symbol	IeB	
Hydrologic group	B	
Mehlich-3 P test value	<input type="text" value="41"/> ppm	Average across field. Typically, in the range of 20-200 ppm. If you have a unitless Mehlich-3 FIV (Fertility Index Value), no conversion is required to express in ppm.
Slope <small>optional</small>	<input type="text" value="2.00"/> %	If you do not know the slope of this field, leave this blank and a default slope for this soil type will be used.
Tile drainage depth	<input type="text" value="3.00"/> ft	

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MD NutrientNet - Field Worksheet - Baseline Nutrient Load - Mozilla Firefox

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http://nutrientnet.mdnutrienttrading.com/calc/field/worksheet_app?view=current_load&id=4da12b84-28f1-102e-b3c5-000c296cb576&fid=1069

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Edge or Segment Baseline Load Summary

Summary of edge-of-segment load before planned BMPs are implemented. If current load is higher than the baseline load, you must implement BMPs sufficient to reduce your load below baseline in order to generate credits. For any field to generate credits, every field in the farm must meet baseline.

This field meets the baseline load requirements. Additional planned BMPs will allow you to generate credits.

Nitrogen

Baseline Load (EOS):	889.6 lb	11.1 lb/ac
Current Load (EOS):	718.5 lb	9.0 lb/ac

This field meets the nitrogen load requirements.

Phosphorus

Baseline Load (EOS):	89.6 lb	1.1 lb/ac
Current Load (EOS):	61.5 lb	0.8 lb/ac

Done

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MD NutrientNet - Farm Worksheet - Summary - Mozilla Firefox

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http://nutrientnet.mdnutrienttrading.com/calc/worksheet_app?view=summary&id=4da12b94-20f1-102e-b3c5-000c296cb676

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MD NutrientNet - Farm Worksheet - ...

Keppler Farm 2

Worksheet PCL-000318

Summary Edit Details Edit Location Review Submit

Farm Overview

DETAILS

Farm name: Keppler Farm 2

Number: PCL-000318

(FSA) Tract number: 3456

Farm notes: *n/a*

Generator type: Landowner/Producer

Name: Jason Keppler

Address: 50 Harry S. Truman Parkway

Address 2: *n/a*

Location description: *n/a*

City: Annapolis

Zip code: 21401

County: Caroline

TOTALS

Number of fields: 3

Percent complete: 89%

Farm meets baseline: Yes

N reduction (EOS): 625.8 lb/yr

N reduction to bay: 625.8 lb/yr

N credits generated: 625 credits/yr

P reduction (EOS): 355.1 lb/yr

P reduction to bay: 355.1 lb/yr

P credits generated: 355 credits/yr

Field Listing

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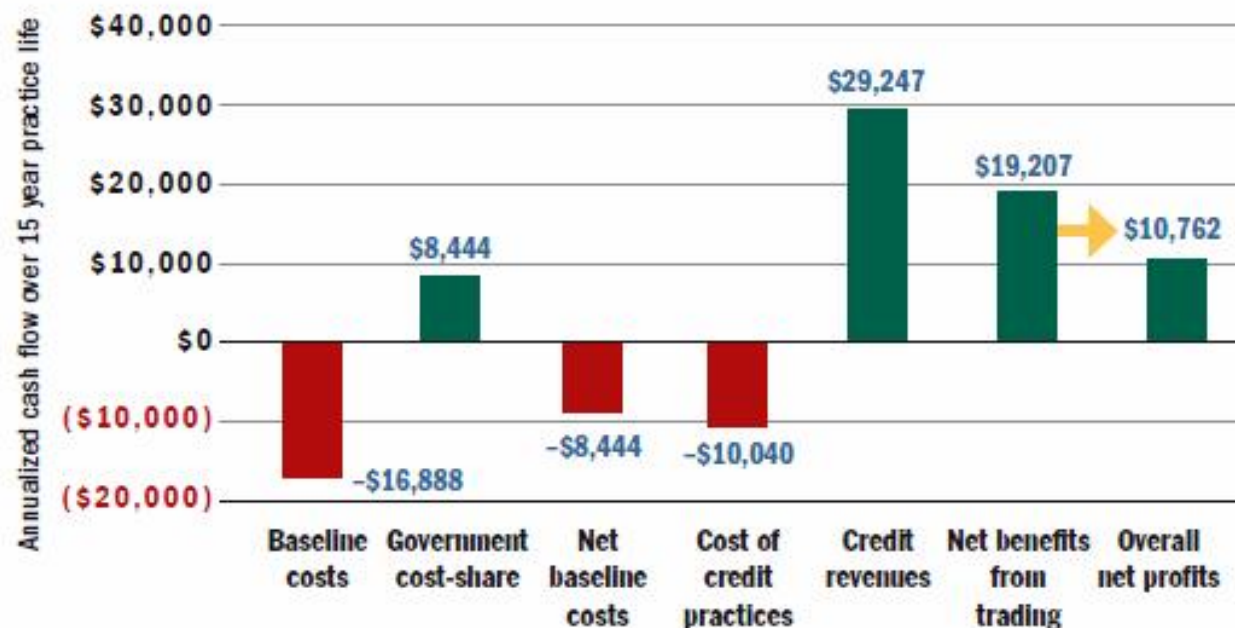
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Figure 3 | Potential Economic Benefit of a Baywide Nutrient Trading Program to a Crop and Poultry Farm with 200 Acres in the Lower Eastern Shore Basin (50% cost-share cap)

Key assumptions
(practice acres):

- Credit price: \$20/lb N.
- Practices to meet baseline include cover crops (196), nutrient management plan (196), conservation tillage (196), soil and water conservation plan – buffer strip cropping (10), manure export (196) and forest buffer (4).
- Credit-generating practices include extended forest buffer (3), early plant cover crops (100), conversion to mixed open space (3), 15% fertilizer reduction (185), and wetland restoration (5).
- Cost share capped at 50%.



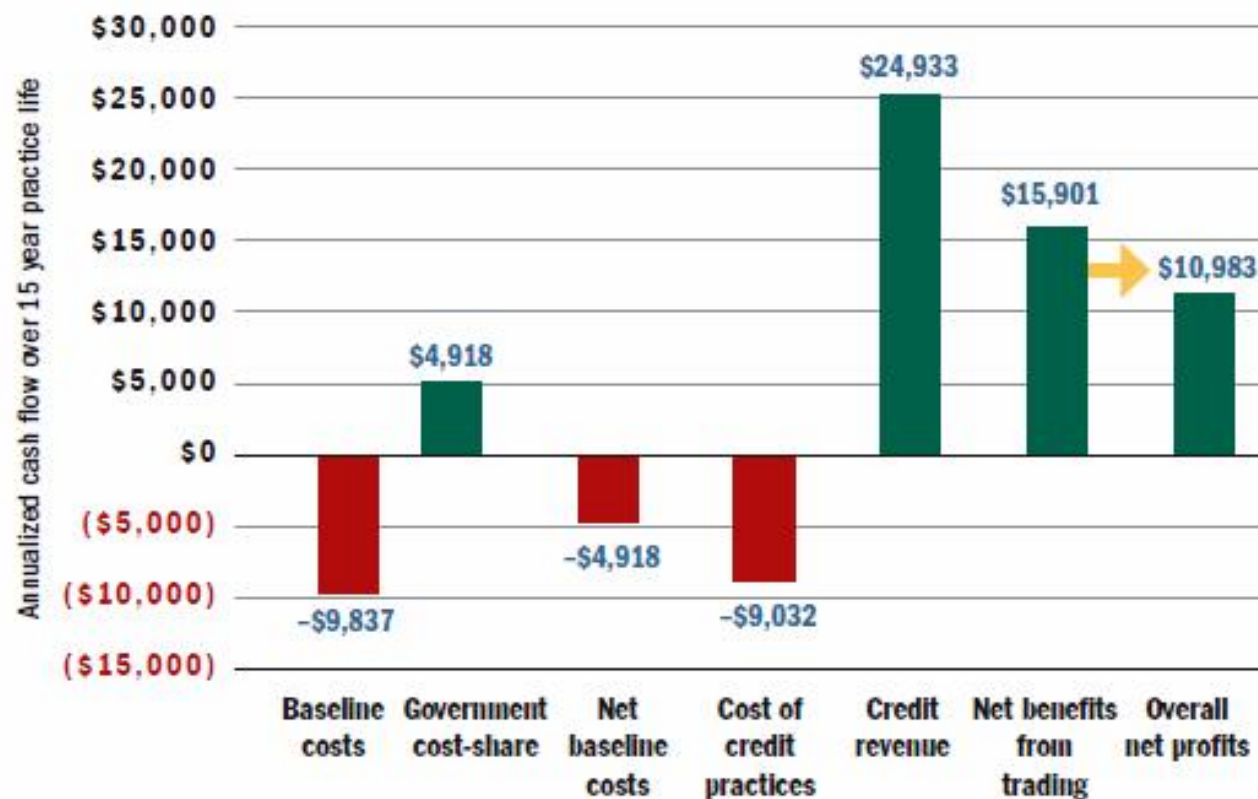
Source: WRI analysis.

Figure 4 | Potential Economic Benefit of a Baywide Nutrient Trading Program to a Farm with 200 Acres of Cropland in the Upper Potomac Basin (50% cost-share cap)

Key assumptions

(practice acres):

- Credit price: \$20/lb N.
- Practices to meet baseline include cover crops (105), nutrient management plan (196), conservation tillage (196), soil and water conservation plan – buffer strip cropping (10).
- Credit-generating practices include forest buffer (1), grass buffer (1), early plant cover crops (88), 15% fertilizer reduction (193), and wetland restoration (5).
- Cost share capped at 50%.



Source: WRI analysis.