# BUILDING THE TOOLS TO LINK URBAN DEMAND FOR WATER QUALITY CREDITS WITH AGRICULTURAL SUPPLIERS

SUSAN PAYNE

MARYLAND DEPARTMENT OF AGRICULTURE

# **CHESAPEAKE BAY NUTRIENT TRADING/TRACKING TOOL** or **CBNTT**

- Maryland Agricultural Nonpoint Source Program utilizes a web-based trading application to calculate eligibility as well as nitrogen, phosphorus, and sediment credit potential from agricultural sources
- . Original tool based on World Resources Institute (WRI) NutrientNet platform as modified to reflect the Chesapeake Bay Watershed Model land use loads, calculations, and BMP efficiencies
- . Maryland tool revised to incorporate USDA/NRCS Nutrient Tracking Tool (NTT)
- WRI used the Maryland version to create a new multi-state platform, the CBNTT, that incorporates state-specific tools for MD, VA, and PA



# CHESAPEAKE BAY NUTRIENT TRADING TOOL LOAD **CALCULATIONS**



#### ☆ ▼ C 8 ▼ Google MARYLAND NUTRIENT TRADING



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

## **NUTRIENTNET OPERATIONS**

- NutrientNet is an interface that links NTT to the Bay Model
- . It incorporates ex-post BMP efficiencies from the Bay Model and, for trading, can process credit generating activities as an alternative
- NutrientNet applies structural BMPs to the NTT model (buffers, fencing, etc.) utilizing Bay Model efficiencies
- NutrientNet platform includes registry, marketplace, and administrative module

#### CHESAPEAKE BAY NUTRIENT TRADING



Velcome 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 <u>www.mdnutrienttrading.com</u> 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 also been some changes



#### View Nitrogen and Phosphorous Credits

Login to CBNTT Login to Market (Under Construction)

Technical References & Guidelines

 Guidelines for Agricultural Credit Sellers <u>Guidelines for Agricultural Credit</u> Buyers Policy for Point Source Buyers & Sellers NRCS BMP List (PDF)



#### AGRICULTURAL PROJECT WORKSHEET CBNTT Sign Up & Login





AGRICULTURAL PROJECT WORKSHEETS Home » Projects » My Farm4 » Edit location

Velcome, Susan Pa

Summary Details Edit Location Fields Review Submit



#### CHESAPEAKE BAY NUTRIENT TRADING **AGRICULTURAL PROJECT WORKSHEETS** ome » Projects » My Farm4 » Fields » 2 General Soil Current Crop Management Current BMPs Current Nutrient Load Future ( FIELD INFORMATION Enter field information Enter field information Natershed: Chapel Branch-Choptank Rive Land river segment A24011EM3 4321 000 Eastern Shore Major basin: TMDL watershed: N/A COMMERCIAL FERTILIZER APPLICATIONS Field number:\* Enter all commercial fertilizer applications used on this field. Please enter the Select field type Field type: total phosphorus values (not ammonium or phosphate Add a Commercial Fertilizer Application Field is adjacent to stream/water body\* Permanent pasture MANURE FERTILIZER APPLICATIONS The term adjacent refers to land the Continuous hay ally part of your land parce Animal confinemer Enter animal manure applications for the given year. If pasture, manure ger Non-managed land is automatically accounted for based on the information entered in the grazine

	Forest buffer:		
	Grass buffer:		
	FERTILIZER APPLIC	ATION	SETBACK
	Setback in place:		
	Average width of setback:*		ft
	Linear feet of setback:*		ft
	Area of setback:*	N/A	ac
	Planned:		
	WETLAND		
	Wetland in place:		
	LAND USE C	ONVER	RSION
otal nitrogen and	ate any non-ripariar	land conve	ersion in place or pla
ondi milogon and	verted:		ac
	I to:	Select	vegetation type
ated by livestock livestock	BEST MANA	GEMEN	T PRACTICE
			w

Enter	current	/future	BMPs
	Carrent	/ acar c	

<b>s):</b> 0.00 lbs/y
1.0
271.52 lb
271.52 lb
272
0.00 lbs/y
1.0
1.96 lbs/y
1.96 lbs/y
2
<b>HQ</b> 0.00 t/yr
1.0

### **ACCOUNTING FOR GROWTH (AFG)**

(Urban Stormwater)

AFG policies address any increase in Maryland's pollution load from population growth or new development by:

1. Strategic allotment of nutrient loads to large wastewater treatment plants upgraded to best available technology

2. Requirement that all other new loads must be offset by securing credits

### The AFG Concept

#### Enter current/future agronomic practices

#### perations here dd a Tillage Operatio

Click here to see typical manure values.

OTHER TILLAGE OPERATIONS

Add a Manure Fertilizer Applicatio

section.

HARVEST / END OF SEASON OPERATION

such as corn, you should select Harvest and Terminate Crop.' Generally, a termination d should occur before the plant date of any subsequent crop in this rotation, though in some instances aerial seeding might be used to plant a subsequent crop before the final harvest an kill dates of an existing crop in which case the harvest and kill dates of the existing crop would come after the plant date of the subsequent cro End Of Season

# End of season operation type:\* Select end of season operation type



t BMP type

nned on this field

# **COMPLEMENTARY ONLINE OFFSET CALCULATION TOOL** FOR AFG

Expand the existing agricultural credit assessment and trading platform by developing a new complementary calculation tool to provide the capabilities to estimate credit and offset needs in the stormwater sector

Modify the registry, marketplace, and administrative modules to meet programmatic changes, facilitate the ease of market participation for sellers and buyers, provide a transparent and accessible tracking and accounting system for credits and offsets, and generate reports for state entities and EPA.

#### **Buyers**

- Calculate pre and post-development nutrient loads from the development parcel
- Mitigate load on site to maximum extent possible
- Require developer to offset 100% of the post-development load
- Allow trading with other sectors to offset post-development load



# **NUTRIENT OFFSET PROCESS**



Development S	ite		Flourmill Ct	Development S	ite		Flourmill Ct	CH
Site Area		Ages	23.5	Site Area	Flourmill Ct Acres 23.5 Acres 3.5 Space Acres 0.2 re/Hay Acres 2.7 tial 1-acre Acres 17.8 Crops Acres 0.8	23.5 3.5		
Impervious Are	pervious Area Acres		0.0	Imperviou: Are			3	
	Open Space	Acres	0.3		Open Space	Acres	0.2	
	Pasture/Hav	Acres	4.5		Pasture / Hay	Acres	2.7	
Li 🤻	Boon Crons	Arres	24	Landuse	Residential 1-acre	Acres	17.8	
	Woodr	Acres	16.2		Row Crops	Acres	0.8	
	VVDDOS	Ares	10.2		Woods	Acres	2.0	
		ib/year	63.2	Balutantiand	TN	b/year	133.9	
	IP	ib/year	1/9	Poliutant Load	TP	b/year	20.1	
	55	100s/vear	7.7					



### REFERENCES

· Maryland Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed, Phase IIA – Guidelines for the Generation of Agricultural Nonpoint Nutrient Credits, and Phase IIB – Guidelines for Agricultural Nonpoint Credit Purchases (2008)

#### Results showing offset needs

Single family, large lots, rural example (7 acres ag, 16 acres woods)

Pre development TN load = 83.2 lbs/yr Post development TN load = 129.3 lbs/yr (stormwater) + 212.8 lbs/yr (septic) = 342.1 lbs/yr Net post development TN load = 342.1 -83.2 = 258.9 lbs/yr Per unit load = 258.9/14 = 18.5 lbs

	Areas within		
Forest	development site set	Acres	-
Conservation	aside for forest		
ar us and a im	conservation credits.		
% woods in	Percentage of		
good	development site used		-
condition	tor torest conservation.		
	Areas within		
ESD treatment	development site set	Acres	-
	aside for ESD treatment		
	Percentage of		
% ESD	development site used		-
treatment	for ESD treatment.		
Structure	Areas within		
BIAP	development site set	Acros	2.0
trastmast	aside for BMP	A Class	2.0
treatment	treatment.		
M et met and	Percentage of		9.5
76 structural	for EMD treatment		0.0
	TN	b/sear	120.3
Pol utant Load	TP	b/year	19.0
(With BMPs)	TSS	toos hear	17
	Number septic systems	consyves	1.7
	per site.	Units	14
	Amount of nitrogen from		
	septic systems entering	Delivery	
Septi: Load	waterway dependent on	Defici	50
	system di stance to	nato	
	waterway.		
	TN	lb/year	212.8
MANTE Local	TN TN	lb/year lb/year	212.8 0.0
WWTP Load	TN TN TP	b/year b/year b/year	212.8 0.0 0.0
WWTP Lead	TN TN TP TN	b/year b/year b/year b/year	212.8 0.0 0.0 258.9
WWTP Load Pollutant Export	TN TN TP TN TP	b/year b/year b/year b/year	212.8 0.0 0.0 258.9 1.1

e	Accomack				CHESAPEAKE BAY NUTRIENT TRADING REGISTRY							
	ect 24003-00	0001 Maryland Anne Arundel	James	Ŧ	Home A	Accounts Project	s - Verifications	Credits	Trades	- Usag	e Records Market	
	24021-00	0001 Maryland Frederick	Eastern Shore		Home / Crea	dits / Index			, 17, 1994, 1994, 1994 , 1994, 1994, 1994, 1994, 1994, 1994, 1994, 1994, 1994, 1994, 1994, 1994, 1994, 1994, 19			
					MAN	NAGE CI	REDITS					
					This is a listin	ng of all credits that have	been issued.					
					Project 🕶	Current Owner	Original Owner	Pollutant	Vintage	Quantity	Serial Numbers	Permanent/Ten
	Accou	int manad	her for i	ISers	t project	Virginia Manager	person	Ν	2014	3	2014-N-VA1-51179-00043- 2014-N-VA1-51179-00045	Term
	710000		geriori		project	person	person	N	2014	37	2014-N-VA1-51179-00001- 2014-N-VA1-51179-00037	Term
					test project	Virginia Manager	person	N	2015	3	2015-N-VA1-51179-00043- 2015-N-VA1-51179-00045	Term
					test project	person	person	N	2015	42	2015-N-VA1-51179-00001- 2015-N-VA1-51179-00042	Term
										3	2016-N-VA1-51179-00043- 2016-N-VA1-51179-00045	Term
S,	APEAKE	BAY NUTR	rient Tr	ADIN	G RE	GISTRY				42	2016-N-VA1-51179-00001- 2016-N-VA1-51179-00042	Term
				rados	- Llea	no Decordo	Markat			4	2014-P-VA1-51179-00067-	Term
Н	ome Accounts	s Projects <del>-</del> Veri	ifications Credit	5 Haves	5 - Usa	ige Records	market				2014-P-VA1-51179-00070	
H	ome Accounts Home / Market / Inde	e Projects <del>-</del> Veri	ifications Credit	5 Haues	, - Usa	ige Records	Market				2014-P-VA1-51179-00070	
H ] ]	ome Accounts Home / Market / Inde MARKE This is the public mark	ex ET LISTIN ET LISTIN Retplace to buy and sell credit	Infractions Credit	ng, click "Add L	isting".	ige Records	Market	Mar	ketį	plac	2014-P-VA1-51179-00070	yers &
H	ome Accounts Home / Market / Inde MARKEF This is the public mark All Buy Sell Account	ex ET LISTIN xetplace to buy and sell credit Email	Infractions Credit	ng, click "Add L	isting".	20llutant		Mar	ketį	olac	e for Bu	yers &
	ome Accounts Home / Market / Inde MARKE This is the public mark All Buy Sell Account superadmin	ex ET LISTIN xetplace to buy and sell credit Email superadmin@kirglie.com	T	ng, click "Add L rading Basin	isting".	Pollutant	Trade Type	Mar Quantit	ketı	olac	e for Bu	yers &
	ome Accounts Home / Market / Inde MARKEP This is the public mark All Buy Sell Account superadmin		GS ts. To submit a new listing P	ng, click "Add L rading Basin otomac	isting".	Pollutant Vitrogen	Trade Type Buy	Mar Quantit 500	ketı	olac	e for Bu	yers &
	ome Accounts Home / Market / Inde MARKE  This is the public mark All Buy Sell Account superadmin superadmin	Projects - Veri EX ET LISTIN setplace to buy and sell credit Email superadmin@kirstie.com superadmin@kirstie.com	Infractions Credit	ng, click "Add L rading Basin otomac atuxent	isting".	Pollutant Nitrogen	Trade Type Buy Buy	Mar Quantit 500 1000	ketı	olac	e for Bu	yers &

• Final Report of the Workgroup on Accounting for Growth in Maryland (2013) Anne Arundel County Pollution Loading Examples (2013)

#### ACKNOWLEGMENTS

• Funding support for the development of the Maryland platform, the CBNTT, and the new urban offset tool and enhancements has been provided by USDA/NRCS Conservation Innovation Grants and an EPA Clean Water Act Section 319(h) Grant Collaborative partners include the World Resources Institute, the Texas Institute for Applied Environmental Research, and the Maryland Department of the Environment

