

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

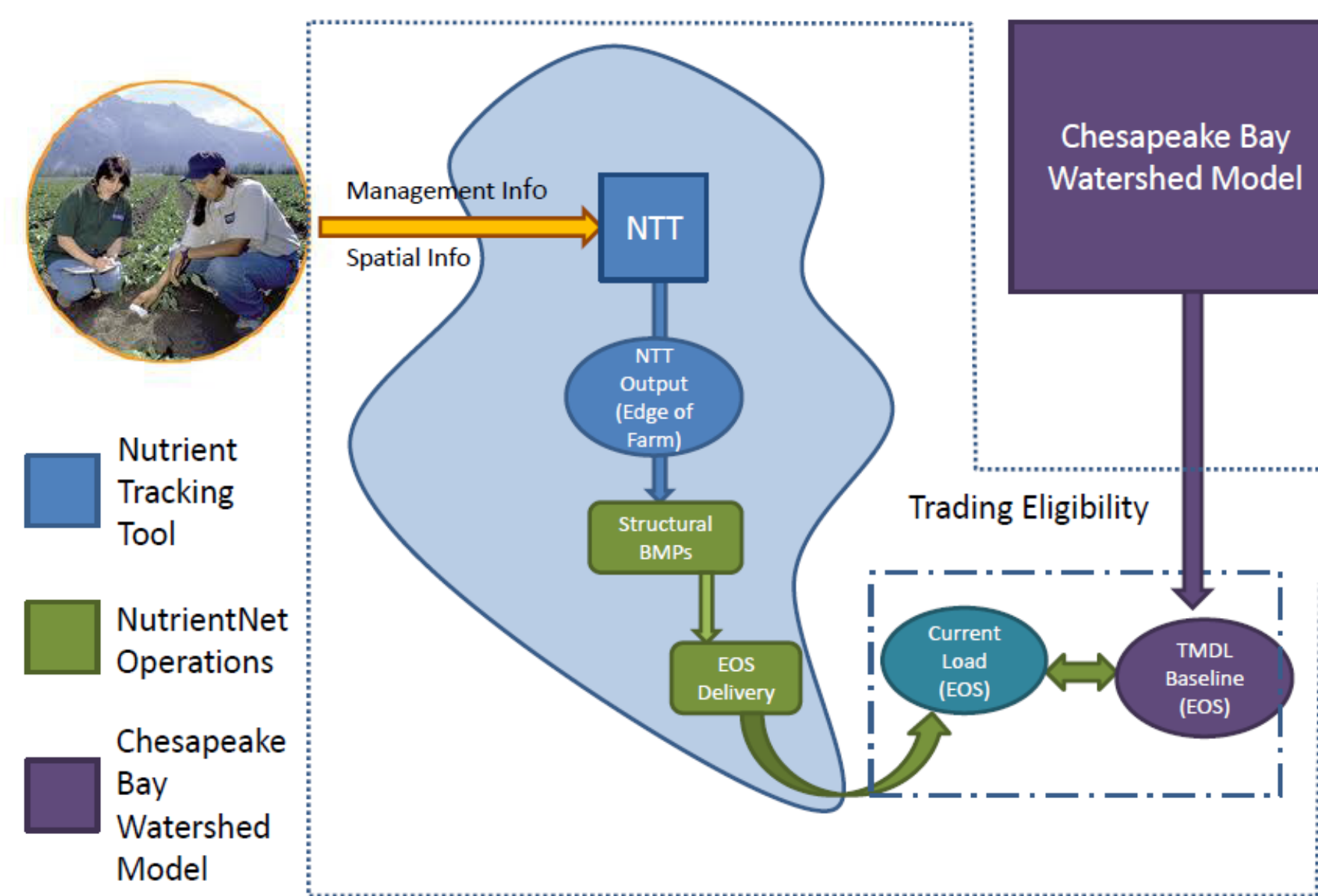


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## CHESAPEAKE BAY NUTRIENT TRADING/TRACKING TOOL or CBNTT

- 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



## NUTRIENT TRACKING TOOL (NTT)

- 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

## BASELINE AND CREDIT CALCULATION EXAMPLE

	Input/Uptake	Total N/ac
Residual in Soil	+5lbs N/ac	5lbs N/ac
Total Application	+133lbs N/ac	138lbs N/ac
Crop Uptake	-114lbs N/ac	24lbs N/ac
1985 Load (22lbs N/ac) CBP Model		
Conservation Tillage	-4lbs N/ac	20lbs N/ac
Grassed Buffers	-11.5lbs N/ac	8.5lbs N/ac
Baseline (8.9lbs N/ac)		
Cover Crops	-6lbs N/ac	2.5lbs N/ac
Water Control Structure	-2lbs N/ac	0.5lbs N/ac
	8lbs N/ac	

## CHESAPEAKE BAY NUTRIENT TRADING

## ACCOUNTING FOR GROWTH (AFG)

(Urban Stormwater)

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

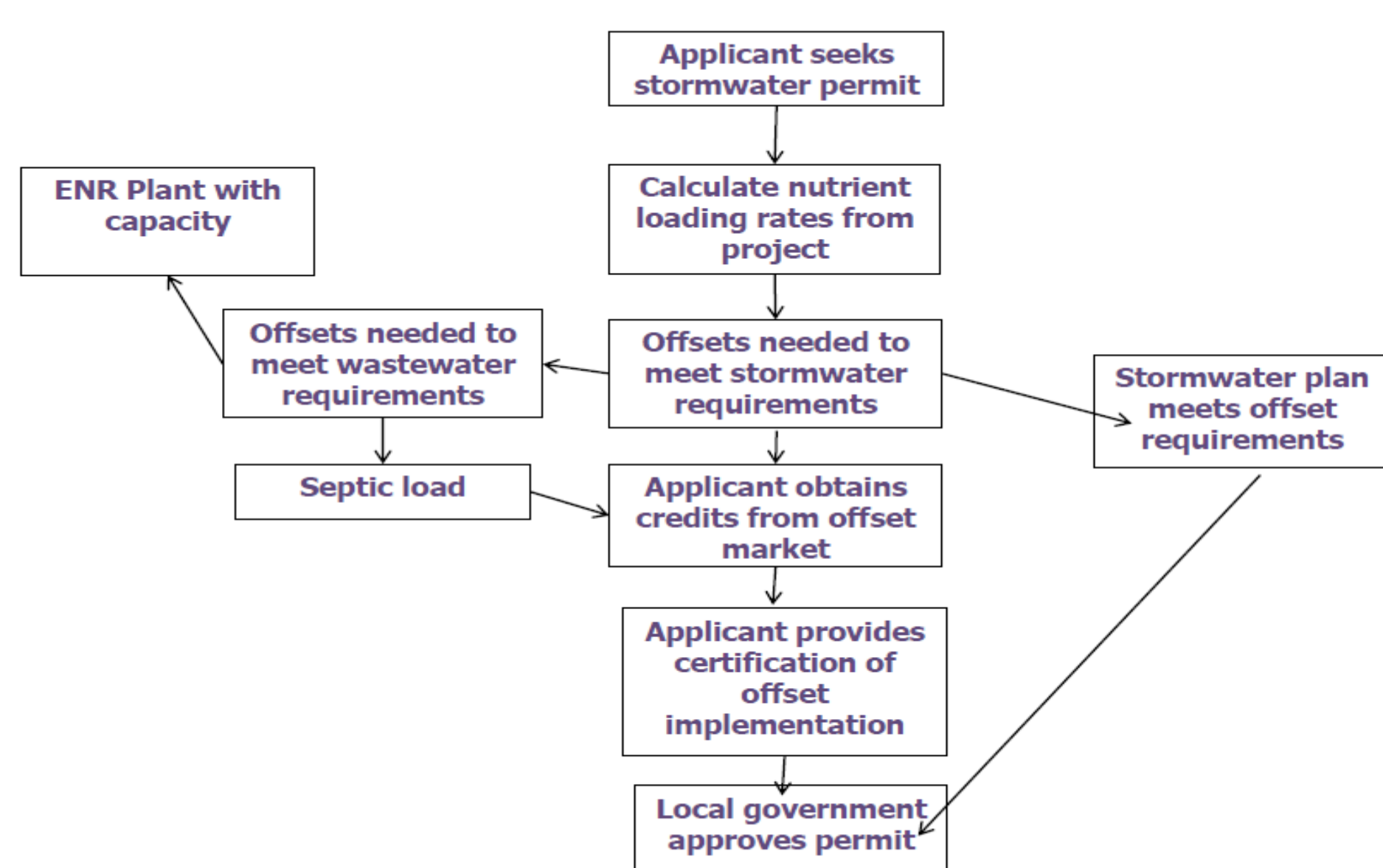
- Strategic allotment of nutrient loads to large wastewater treatment plants upgraded to best available technology
- Requirement that all other new loads must be offset by securing credits

## The AFG Concept

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



## 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.

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

Development Site	Area	Household Eq.
Site Area	23.5	
Impervious Area	0.0	
Open Space	0.3	
Parking/Play	4.3	
Low Crops	2.8	
Woods	15.2	
TN	lb/acre	83.2
TP	lb/acre	17.9
SS	tons/year	2.2

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

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