Bringing Water Quality Trading to the Stormwater Sector Under the Chesapeake Bay TMDL

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World Resources Institute

National Workshop on Water Quality Markets

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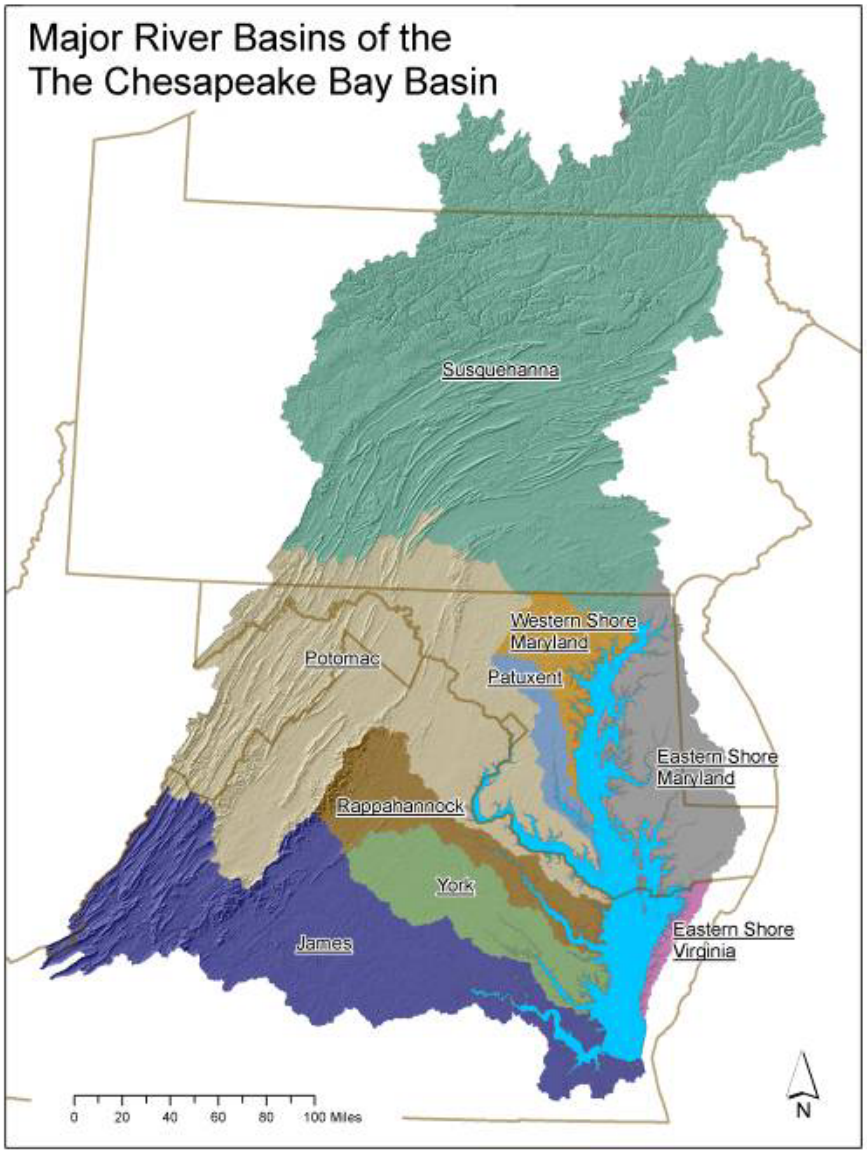

Pennsylvania

Maryland

West Virginia

Delaware

Virginia

New York

Washington, D.C.

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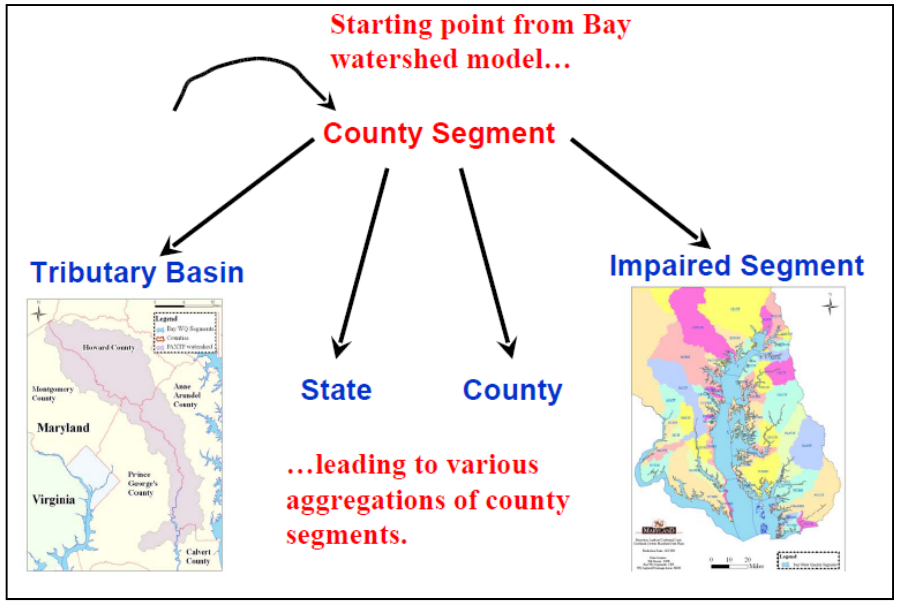
Chesapeake Bay Total Maximum Daily Load

Final issued December 28, 2010

Four Key Questions:

- What needs to be done?
- Who will be doing it at the state and local scale?
- How will it be done?
- By when will it be done?

Answers in the next generation implementation plans!



Watershed Implementation Plans

- State Level
- County Level

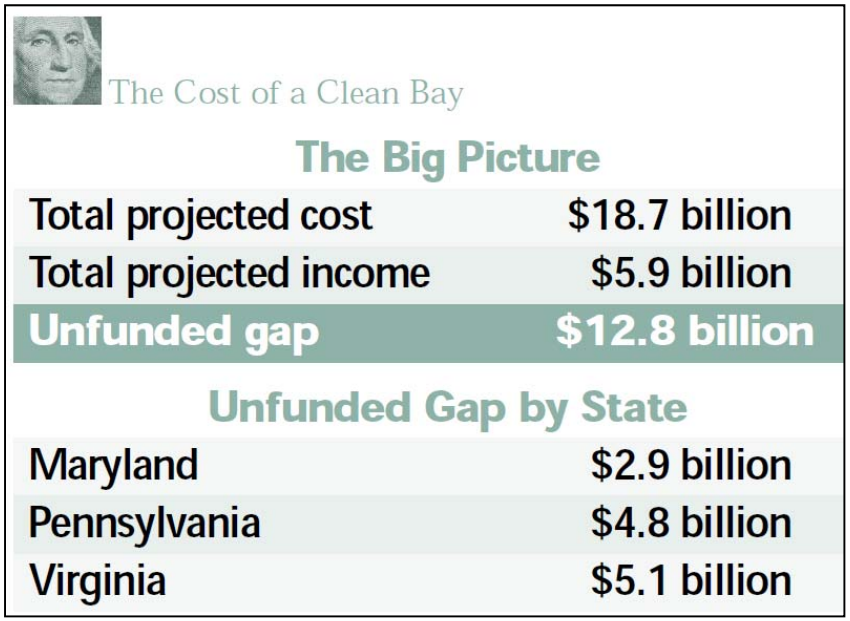
→

County-Level Load Caps for each Sector

- Wastewater
- Urban
- Agriculture
- Septics

Role of Nutrient Trading in the TMDL

Affordability and Cost-Effectiveness



The Cost of a Clean Bay

The Big Picture

Total projected cost	$18.7 billion
Total projected income	$5.9 billion
Unfunded gap	**$12.8 billion**

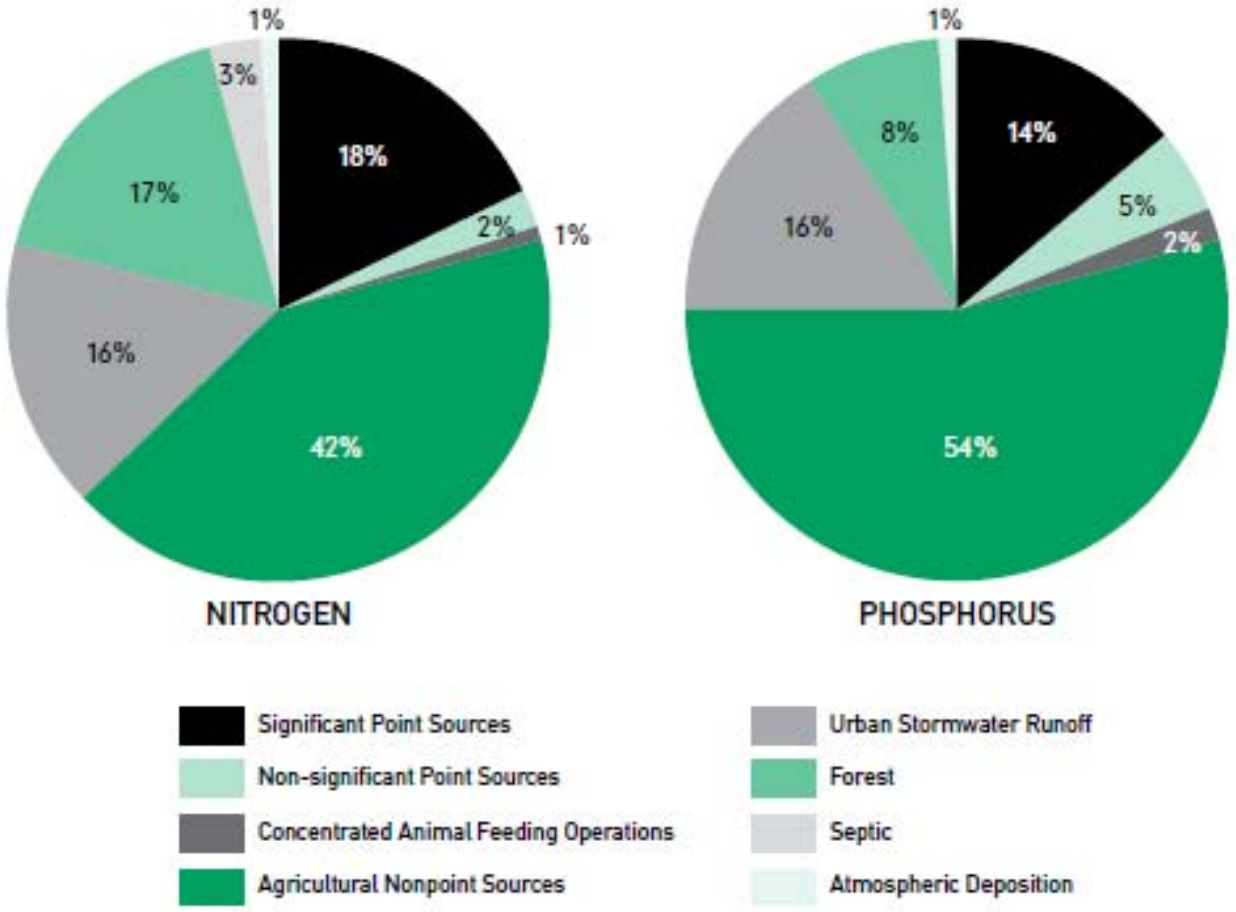
Unfunded Gap by State

Maryland	$2.9 billion
Pennsylvania	$4.8 billion
Virginia	$5.1 billion

2003 Blue Ribbon Finance Panel: $28 Billion

Figure 2-2

Contributions of Nutrient Loads Delivered to the Chesapeake Bay from Different Sources



SOURCE: CHESAPEAKE BAY PROGRAM PHASE 5.3.2 WATERSHED MODEL (2010 PROGRESS SCENARIO)

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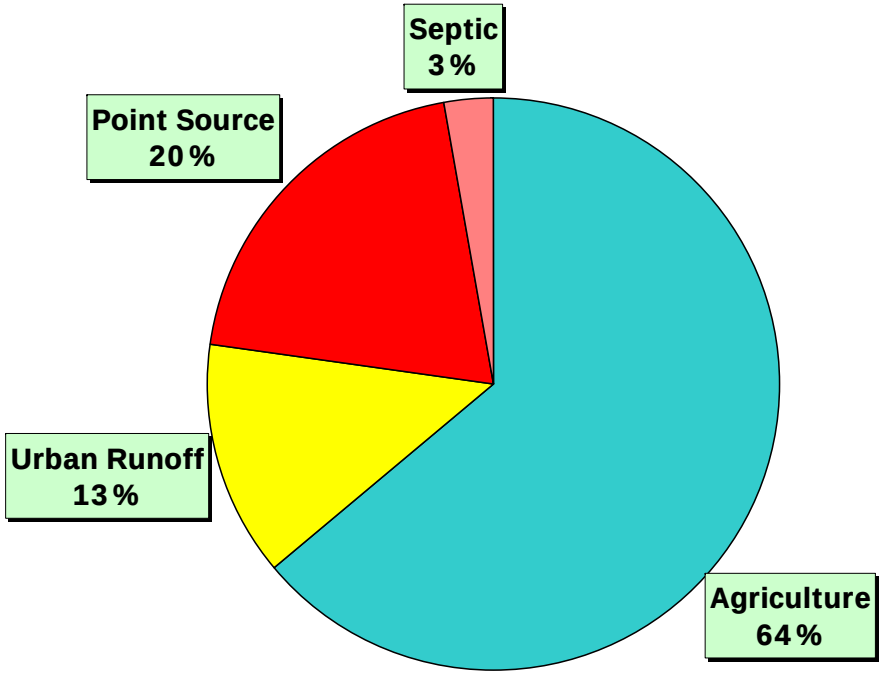
Expected Tributary Strategy Load Reduction by Source vs. Cost

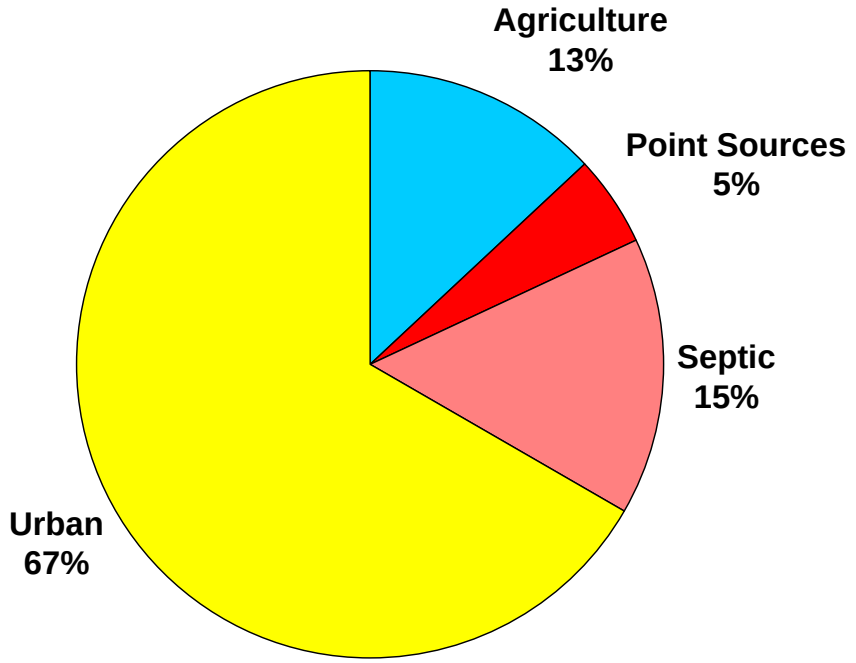
Nutrient Reduction by Source

Percent of necessary nitrogen load reduction States expect to achieve from Tributary Strategies* from 2002 to 2010 by source.



Annualized Cost

Percent of Total Annualized Cost of Tributary Strategy Implementation* By Source



* The District of Columbia, Delaware, and West Virginia draft tributary strategies do not meet all of the cap load allocations; these jurisdictions are refining their strategies. Load reductions will increase and costs are likely to change. Because the New York Tributary Strategy has not been finalized, we assumed that the load reductions are based on the strategy meeting the state's nitrogen goal.

Source: Chesapeake Bay Commission

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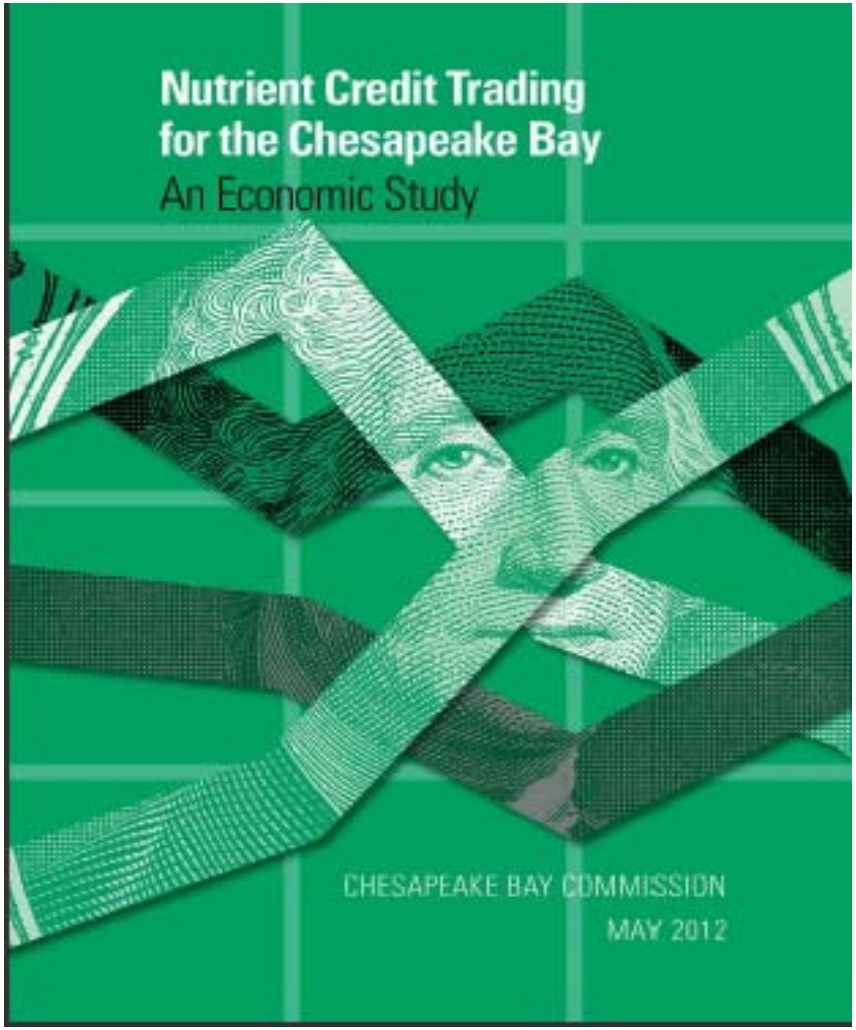

Prepared for CBC by RTI International
Funded by Linden Trust for Conservation

Trading Participation Scenarios

- No trading;
- Trading between significant point sources;
- Trading between significant point sources and agricultural NPSs; and
- Trading between significant point sources, urban stormwater, and agricultural NPSs.

Trading area sub-scenarios

- In-basin, in-state trading;
- In-state trading;
- In-basin trading; and
- Watershed-wide trading

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Cost Optimization Model - Maximum Theoretical Cost Savings

TABLE 7.5 Annual cost savings for point-source to point-source and point-source to agricultural NPS trading (CBC, 2012).

Scenario	Annual savings Million $/Yr	Annual savings Percent	Annual cost Million $/Yr
No trading	--	--	385
Point sources	77 – 108	20 – 28	277 – 308
Point sources and agricultural NPSs	139 – 189	36 – 49	196 – 246

TABLE 7.6 Annual cost savings for point-source to point-source and point-source/urban stormwater to agricultural NPS trading (CBC, 2012).

Scenario	Annual savings Million $/Yr	Annual savings Percent	Annual cost Million $/Yr
No trading	--	--	1,470
Point sources, Urban stormwater, and agricultural NPSs	1,160 – 1,210	79 – 82	310 – 263

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Chesapeake Water Quality Trading Initiative:

Facilitating Nutrient Trading for the Stormwater Sector Through Local Government Partners

Queen Anne's County, Maryland
Montgomery County, Maryland
Arlington, Virginia
Chesapeake Bay Foundation
World Resources Institute

Funded by Linden Trust for Conservation

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Demand Side Analysis

- Nutrient Reduction Requirements
  - Watershed Implementation Plans
  - MS4 Permit Requirements
- Current Planning and Budgeting
- Current Nutrient Loads
- Load Reductions from Planned Stormwater Projects
- Identify Load and Timing Shortfalls
- Economic Analyses

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Supply Side Analysis

Overall Potential for Agricultural Credit Production
Outreach to Farmers
Assess Individual Farms
Quantify Potential Credit Availability
Credit Price Discovery

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Goals

Demonstrate Feasibility and Benefits to Stormwater, Agricultural and Regulatory Communities

Engage the Agricultural Community in Trading

Achieve Regulatory Compliance, Cost Savings and Additional Environmental Benefits

Influence Trading Policy and Regulations and Stormwater Permitting Strategy Locally, Regionally, and Nationally

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Current Status

Queen Anne's County, Maryland

Non-MS4, No Regulatory Driver
Credit Purchases Authorized and Funds Budgeted
Ongoing Individual Farm Assessments
Aggregator Recruited

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Current Status

Montgomery County, Maryland

- Phase II MS4
- Stormwater Strategic Plan -- $2 Billion to Comply

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Cost per pound of nutrient reductions from stormwater BMPs used by Montgomery County

	Nitrogen	Phosphorus
Highest cost BMP[1]	$8,404	$102,491
Lowest cost BMP[1]	$531	$907
Median[1]	$1,650	$4,613
Restoration projects[2]	$6,219	$17,606

1) King and Hagan analysis; 2) Montgomery County

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INTERIM STRATEGY NUTRIENT REDUCTION TARGETS (lbs)*

	2009 Baseline	2017 Target	2020 Target
Total N	948,441	115,939	165,627
Total P	45,610	8,919	12,741

NUTRIENT REDUCTIONS RESULTING FROM REDUCTIONS IN IMPERVIOUS ACRES (Lbs)

	By 2015	By 2020
Nitrogen	18,638	22,174
Phosphorus	1,906	2,504

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Current Status

Demand Analysis Completed

Credit Supply Analyses

- Working with Montgomery Soil Conservation District

Starting to Assess Individual Farms

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Current Status

Arlington County, Virginia

- MS4 Phase II
- Load Reductions over Three 5-Yr Permit Periods
- Need for Credits End of Next Permit Period
- Will Buy Credits from Water Reclamation Facility
- WRF May Sell Credits to Other Virginia MS4s

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Thank You

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