

Performance-Based Water Quality Programs: Getting the Most for Your Dollar

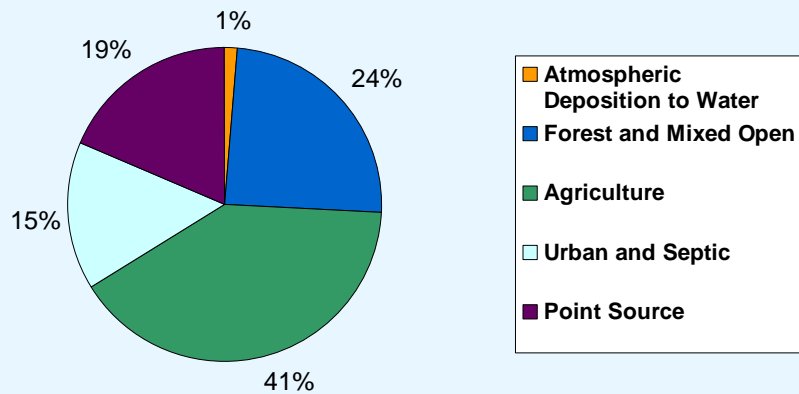
Jenny Guiling & Jon St John



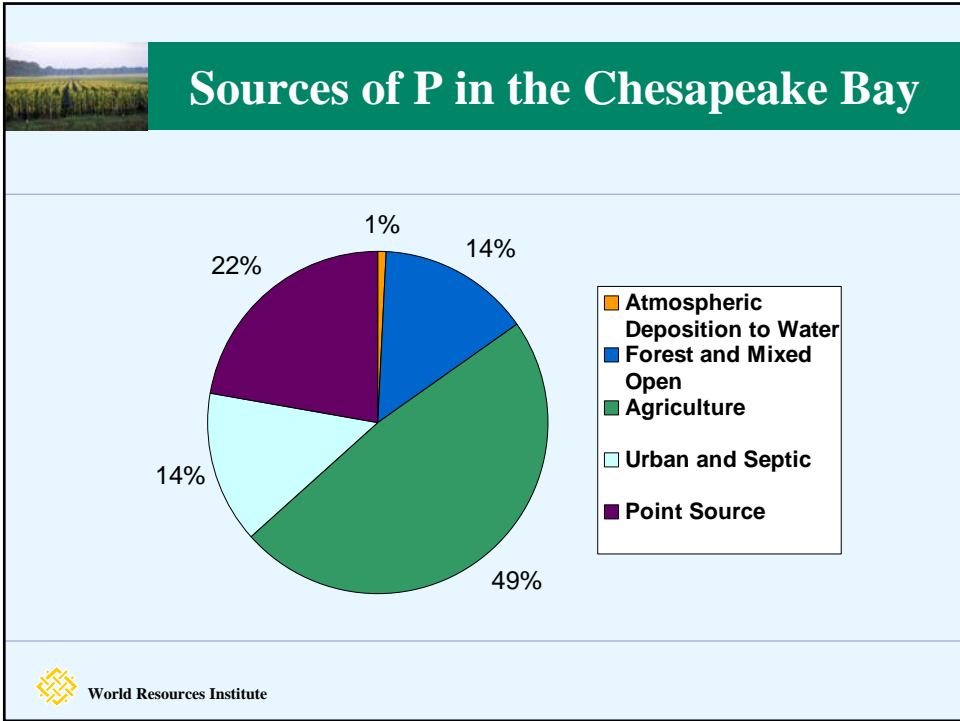
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Sources of N in the Chesapeake Bay



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Performance-Based Approaches

Water Quality Trading

- Many buyers and sellers
- PS-PS, PS-NPS, or NPS-NPS trading

Two basic steps:

- Set a goal for the total amount of nutrients that enter surface waters
- Allow sources with low-cost mitigation options to reduce beyond required amount and sell excess reductions

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Performance-Based Approaches

Reverse Auctions

- 1 buyer, many sellers
- Cost-effective method of allocating funding- Bids are ranked by \$/pound of N or P removal
- Can be used:
 - By credit aggregators in water quality trading program
 - In conservation BMP program with limited funds



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Benefits to Performance-Based Approaches

- Cost-effective improvements in environmental quality
- Estimated environmental outcomes from agricultural BMPs
- Including agriculture can help meet watershed environmental goals, e.g., TMDL
- Potential environmental co-benefits



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Challenges to Implementing Performance Based Approaches

- Quantifying non-point source reductions
- Identifying buyers and sellers
- Potentially high transaction costs



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Applications of NutrientNet

- Kalamazoo Watershed- Michigan
- Pennsylvania Water Quality Trading Program- Susquehanna and Potomac Watersheds
- Potomac Watershed- West Virginia (future)
- Conestoga Watershed Reverse Auction- Pennsylvania



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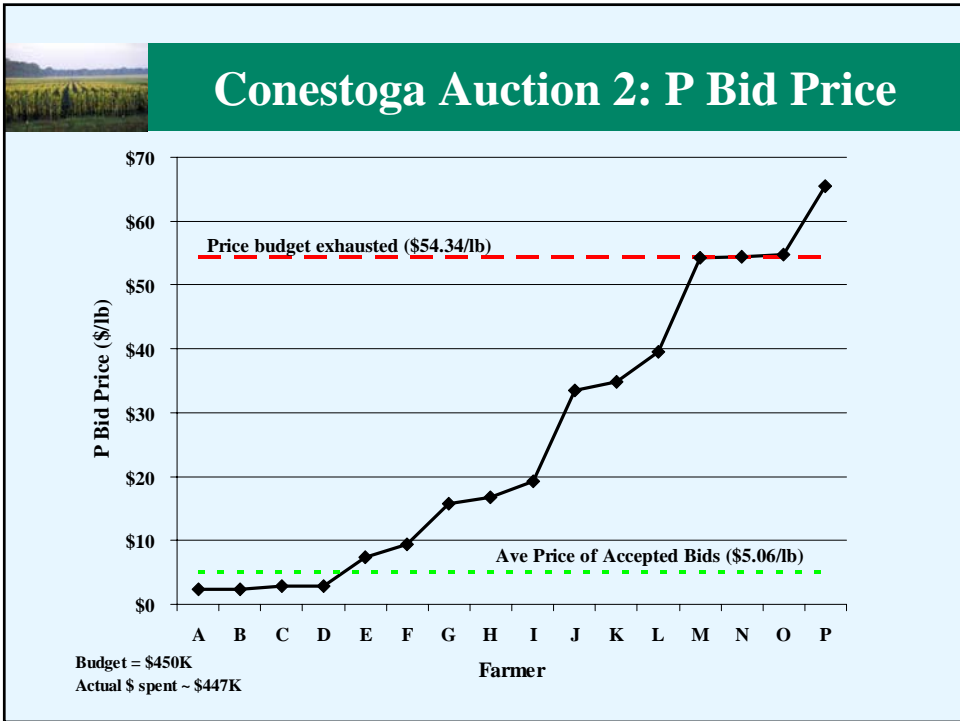


Auction II Results

Rank	BMPs Implemented	Lifespan (yrs)	Farmer Bid	Pounds Reduced (lifespan)	Cost per Pound
1	Stacking Pad, NMP*	15	\$84,000.00	35,576	\$2.36
2	Stacking Pad, NMP	15	\$59,000.00	24,350	\$2.42
3	Waterways	10	\$1,678.50	590	\$2.84
4	Waste Storage Facility	15	\$36,772.43	12,886	\$2.85
5	Underground Outlet in HUAP**	10	\$3,184.50	428	\$7.43
6	Contour Stripcropping	5	\$2,000.00	215	\$9.30
7	Stacking Pad, NMP	15	\$106,000.00	6,742	\$15.72
8	Stacking Pad, Animal Composting	15	\$104,140.00	6,198	\$16.80
9	Streambank Stabilization, Crossing	20	\$1,500.00	78	\$19.29
10	Terraces, Tile Drains	10	\$9,463.59	282	\$33.54
11	Terraces, Tile Drain Repair	10	\$4,500.00	129	\$34.90
12	Stacking Pad, Animal Composting	15	\$31,051.00	785	\$39.57
13	Grassed Waterway	10	\$3,700.00	68	\$54.33

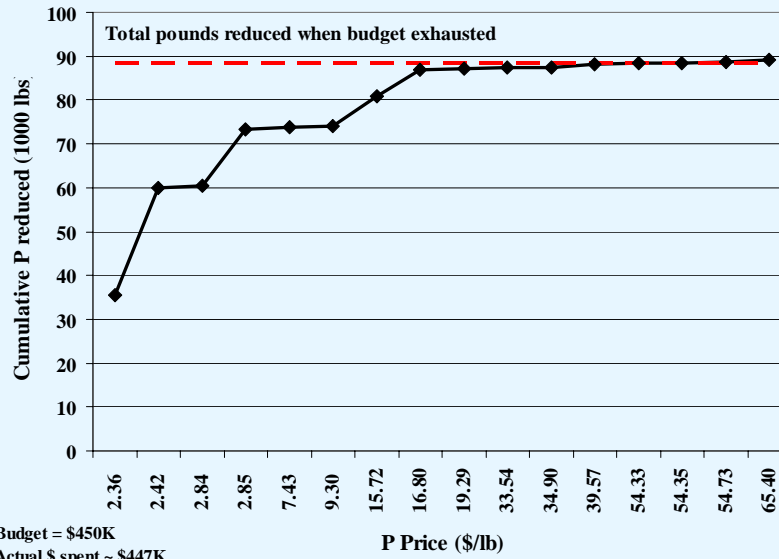
Total Dollars Spent: \$446,990.02

* NMP = Nutrient Management Plan, **HUAP = Heavy Use Area Protection





Conestoga Auction 2: P Reduced



Why *NutrientNet*?

- Standardizes baseline & reduction calculations
- Estimates cost-effectiveness of reductions
- Converts reductions to credits
- Provides easy-to-access marketplace



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Nutrient Loading Estimations

- Point Sources
 - Location in Watershed
 - Current Discharge
 - Permitted Discharge
- Non-Point Sources:
 - Location in watershed
 - Site-specific environmental factors
 - On-farm practices
 - BMP efficiencies

...Can be modified for any trading program



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Thank You!

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