

The State of Water Quality Trading

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Preview

- 1. Support for Trading**
- 2. Trading efforts to date**
- 3. Notable programs**
- 4. Targeted Watershed Grant programs**
- 5. Examples from agriculture (four)**
- 6. Common trading elements for agriculture**
- 7. Necessities for success**

1. Support for Trading

U.S.EPA

- Trading Policy 2003
- Handbooks (WQT and Permit Writer's Guide)
- Targeted Watershed Grants
- EPA Regional Interests
- WQT and wetlands

USDA

- Trading Policy Statement
- Farm Bill Conservation Innovation Grants (CIG)

States (Programs/Rules)

- OH, VA, FL, PA, MI, ID, OR, MN...

Local

- Watershed-based
- Bi-lateral trades

2. Trading Efforts to Date

- Early efforts mostly pilots – many have faded
- Most trades have been PS/PS
- Most trades focus on nutrients (and temperature)
- Some wouldn't call these "market-based" trades
- Concerted efforts for PS/NPS (few trades -- local & small; mostly agricultural credit generation)
- Growing interest in urban NPS/NPS trades -- MEP problem
- Growing interest in multiple credits– air/water/habitat
- EPA WQT/wetlands – GHG non-starter, high costs, scale issues, no Wetland Mitigation Banking/WQT overlaps
- Environmental Group participation (realism)
- Confusion over trading definitions (Baselines...“Idaho”)
- Pilots or rules (“chicken or the egg”)

3. Notable Programs

South Nation Conservation, ON -- PS/NPS for P

- Over 200 trades with ag; largest program in N.A.

Great Miami River, OH – PS/NPS for N & P

- Nutrient standards driven; will be largest program

Boise River, ID – PS/NPS for P

- Pending TMDL; standardized program; trading authority

Kalamazoo River, MI – PS/NPS for P

- Ag brokering schemes; No regulatory threat to drive trades

Conestoga Basin, PA – PS/NPS for P & other

- Ag reverse auction approach; Ag leadership in PA



Notable Programs (Concluded)

Lower James River, VA – PS/PS for N & P

- Mandated by law; Trading Association; PS/NPS with growth

Florida

- New Trading Rules; NPS caps

Minnesota River, MN – PS/NPS to PS/PS for P, N, other

- Watershed permits driving trading, interest in trading rules

Long Island Sound, CT – PS/PS for N

- Legislatively established for muni. WWTPs; credit shortages

4. Targeted Watershed Grant Programs (New)

- Location
- Watershed landuse
- Regulatory driver
- Commodities
- Credit sources
- Types of trades
- Program highlights
- Common elements

2004 TWG WQT Programs

~ Bear River ~

Location:	UT & ID, (three 8-HUCs)
Watershed Landuse:	Mostly agriculture
Regulatory Driver:	Numerous TMDLs
Commodities:	TP
Credit Sources:	All sources
Trade Types:	?
Program Highlights:	Integrated Watershed Information System, including a “virtual trading room” (electronic bulletin board)

~ Cape Fear River ~

Location: NC (six 8-HUCs)
Watershed Landuse: Many urban centers
Regulatory Driver: Jordan Lake nutrient TMDL
Commodities: TP, TN
Credit Sources: MS4s, WWTPs, agriculture
Trade Types: PS/MS4s, PS/PS, PS/NPS
Program Highlights: Emphasis on urban stormwater sources

~ Passaic River ~

Location: NJ & NY (one 8-HUC, non-tidal)
Watershed Landuse: 2M people live in 669 mi²
Regulatory Driver: WQ standard (0.1 mg/L TP)
Commodities: TP
Credit Sources: WWTPs, MS4, agriculture
Trade Types: PS/PS, PS/NPS, MS4/NPS
Program Highlights: Research oriented study of other programs

~ Lake Tahoe ~

Location:	CA & NV
Watershed Landuse:	Urban, Forested & Recreational
Regulatory Driver:	TMDL
Commodities:	TP, TN, Fine Sediment
Credit Sources:	Urban stormwater, Streambanks
Trade Types:	NPS/NPS
Program Highlights:	Rigorous models & BMP efficiency data

2004 Common Project Elements

- **Monitoring and/or modeling emphasized for program environmental effectiveness evaluation**
- **Multiple sources trading in watershed-scale with multiple trades**

2005 TWG WQT Programs

~ Vermillion River ~

Location:	Southeastern Twin Cities, MN (one 8-HUC)
Watershed Landuse:	Suburban & agriculture
Regulatory Driver:	WMP: flow and thermal impact; TMDL: turbidity, fecal coliform
Commodities:	Flow volume, riparian quality
Credit Sources:	Model-identified infiltration and restoration sites
Trade Types:	Urban NPS offsets
Program Highlights:	Develop a “common currency” for trading “watershed functions”

~ Willamette River ~

Location:	Western OR (twelve 8-HUCs)
Watershed Landuse:	Forest, agriculture & urban
Regulatory Driver:	TMDLs: temperature, mercury, and bacteria
Commodities:	Temperature, other
Credit Sources:	Public and private landowners and water rights owners
Trade Types:	PSs, other sources
Program Highlights:	Develop a temperature credit trading and banking program & create a marketplace for multiple ecosystem functions trading

2005 Common Program Elements

- **Go beyond pollutant specific trades towards ecosystem restoration**
- **Work to develop a “common currency” for trading ecosystem functions**

5. Examples from Agriculture (Land-based changes for WQT credits)

- **Michigan**
- **Ontario**
- **Pennsylvania**
- **Ohio**

Statewide Rules Trading Rules (Michigan)

- Purpose
- Water Quality Benefit
- Restrictions
- Eligibility
- Closed/Open Trading
- Pollutants Traded
- Baselines
- Credits Generated
- Discount Factors
- Banking
- Notice Requirements
- Registry
- Trading ratios
- Program Evaluations
- Compliance/Enforcement
- Citizen Petitions

Efforts to Broaden Trading in Michigan

- New trading infrastructure per rules
- State registry (regulatory tracking)
- Marketplace tools (connecting buyers & sellers)
- Ag banking schemes (credit aggregation)
- Brokerage opportunities (3rd party verification)

South Nation Watershed **Ontario, Canada**

- Rural watershed (northeast Ontario)
- Agriculture dominates the landscape
- Phosphorus over-enrichment of streams
- WWTPs with tighter discharge limits & need to expand - expensive upgrades (\$775/lb P)
- SNC contracts with PS's; guarantees credit purchase based on costs+administration
- SNC engages farmer in private contract & calculates credits for proposed BMPs at 4:1 trading ratio
- Point source/non-point source trading
- SNC banks/brokers credits to point sources



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Conestoga River Watershed, PA

Reverse Auction to Generate P Reduction Credits

- Conservation Innovation Grant
- \$480,000 to give to farmers for P reductions
- Winning bids based on least cost P reductions – purchase P reductions until budget exhausted

How auction works:

- Sellers compete to supply buyers with the specified good or service
- Sellers bid prices down
- Used in markets with multiple sellers and one buyer

Auction Results (from WRI, 2005)

Bids	Proposed BMP	Price (\$) (Total cost)	Annual Reduction (lbs P/yr)	Total Reduction (lbs P/project life)	Phosphorus reduction price (\$/lb)
1	Barnyard Runoff Control	\$22,594 (\$60,653)	236	3,537	\$6.39
2	Roof runoff control	\$2,153 (\$2,691)	11	165	\$13.06
3	Terraces	\$8,409 (\$11,213)	50	502	\$16.75
4	Waterways	\$2,063 (\$2,750)	6.4	64	\$32.26
5	Terraces	\$1,485 (\$1980)	2.2	22	\$66.29
6	Waterway	\$1,650 (\$2,200)	1.6	16	\$103.06
7	Waterway	\$1,705 (\$1,279)	1.1	11	\$113.67
Total		\$40,014		4,371	\$9.27 (ave. \$/lb P)

Ownership of credits vs. "BMPs" questioned - contracts

Great Miami River, Ohio

- **Ohio's pending water quality standards**
 - TP: 1 mg/L; TN: 10 mg/L for NPDES permittees)
 - 904,000 lbs. TP and 4,500,000 lbs. TN reductions
- **High costs for BNR upgrades**
- **Predominantly agricultural landuse/loads**
- **Miami Conservancy District (MCD)**
brought point & nonpoint sources together
- **PS/NPS trading interest (WQ benefits/\$ savings)**
- **Trading framework developed (legal and administrative structures)**
- **10-year agreement with state**

Watershed Total Cost Comparisons

(Net present worth over 20 years; 5% interest rate)

Agricultural Management Practices	PS Upgrade Total Cost (millions)	Agricultural Management Total Cost (millions)	Cost Savings (millions)
No-till	\$422.5	\$37.8	\$384.7
No-till & fertilizer reduction		\$108.5	\$314.0
No-till, fertilizer reduction & hay-only		\$425.1	--

6. Common Trading Elements for Agriculture

- **Trading framework (*buyers, sellers, regulators*)**
- **Private contracts**
- **Standardized calculation approaches**
- **Defined list of BMPs**
- **Technical assistance/conservation planning**
- **Brokering to provide some separation from permits**
- **Practice verification**
- **Infrastructure (communications, tracking)**
- **Market pricing (to certain extent)**
- **Farmer participation during program development**

7. The Necessities for Success

- **Flexibility (development/implementation)**
- **Local champion (“bottom-up” process)**
- **Accept some uncertainty**
- **Keep it simple (costs, participation)**
- **Keep it consistent with what works**
- **Get all the players to the table**
- **Don’t force it**
- **What works on the farm**
- **Demonstrations and pilot efforts**
- **Time**