Water Quality Trading in the Chesapeake Bay

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United States Department of Agriculture - Office of Environmental Markets
What is Water Quality Trading

- Regulated source purchases credits in lieu of upgrades (or until upgrades can be made)
- New or expanding source purchases an allocation
- Credits generated by other regulated sources or from unregulated sources like agriculture.
Benefits of WQT

- Reduces cost of compliance
- Accelerates pace of compliance
- Allows for growth under a pollution cap
- Provide incentive for nonregulated sources to meet allocation
Drivers for WQT in the Chesapeake Bay

- Chesapeake Bay 2000 Agreement
- Chesapeake Bay TMDL
- State-level policies
  - NPDES permits
  - Construction Stormwater
  - MS4 permits
Trading Example

Annual discharges into a local stream

- Farmer: 2,000 pounds per year
- WWTP: 2,000 pounds per year
Trading Example

State adopts phosphorus TMDL
Trading Example

Load is allocated among the sources of phosphorus

- Farmer: 1,200 pounds per year
- WWTP: 1,200 pounds per year

Total annual load: 2,400 pounds per year
Trading Example

- WWTP can reduce to 1400 lbs at relatively low cost
- Next 200 lbs would be very expensive for WWTP.
- Farmer can get cost-share to reduce to 1,200 lbs.
- Farmer can use private dollars to reduce an additional 200 lbs to sell as credits.
Trading Example

Farmer reduces load to 1000 lbs, has 200 credits to sell
Trading Example

Net Result

Pounds per Year

- 1,000
- 2,000
- 3,000
- 4,000
- 5,000

Annual Load

1,000
1,400
2,400

Farmer
WWTP
Offsetting new growth

A proposed development in the watershed will discharge an estimated 300 lbs.
Offsetting new growth

Agriculture generates 300 lbs of offsets below its TMDL obligation. The new development is granted a permit.

![Graph showing annual load and pounds per year for Farmer, WWTP, and New Source categories.]

2,400 lb permit
State Trading Programs in the Chesapeake Bay

- Virginia
- Pennsylvania
- Maryland
Virginia

- Nutrient trading law signed in 2005
  - To provide flexibility for point sources to meet compliance schedules and cost-effectively meet upcoming loading caps
- Trading for P allowed to offset post-construction requirements in 2009
- Program expanded in 2012 to authorize MS4s, other sectors to trade
Virginia

• PS-PS trades for compliance; PS-NPS trades for new/expanded growth
• Virginia Nutrient Credit Exchange established for PS-PS trades
• Credits selling for $3.75/lb N and $5.65/lb P in 2017
• No trades to offset new or expanded growth
Virginia

- Post-construction stormwater offsets for P only
- Offsets must be permanent
- Credits generated through land conversion/stream restoration and/or urban BMPs
- Permanent P credits trading for up to $30,000/lb
Virginia

- Virginia only state to add numeric N and P goals to Phase I MS4 permits
- MS4 can trade with PS or NPS
- Arlington county currently exploring a trade with its WWTP
- VDOT has purchased NPS credits to help meet its MS4
Pennsylvania

- Nutrient trading policies and guidance issued in 2006
  - To meet regulatory obligations and offset new loads
- Trading regulations passed in 2010
- PS and NPS baselines updated 2015
- Offset options for MS4s recently added to permits
Pennsylvania

- Trades for permit compliance
- 82 trades in 2017
- Credits sold bilaterally (majority) and some through PennVest Auction
- Average price is $2.37/N and $3.75/P
- Credits generated from PS and NPS
• PS-PS and PS-NPS programs established in 2008
• Ag credit generation policies & guidelines developed in 2008
• Legislation established in 2010/2012 for ag credit certification
• In 2015 trading policy expanded to include MS4s
• Pending approval of regulations for the exchange of credits (includes all sectors)
• Aligning for Growth policy is under review
Maryland

- WWTPs cannot trade to comply only to offset new and expanding growth
- No trades conducted under the new regulations
- MS4 trades would require a translation between impervious acres and nutrient loads.
### Allowable Trading Scenarios

<table>
<thead>
<tr>
<th>Who can buy?</th>
<th>Wastewater</th>
<th>Municipal Stormwater</th>
<th>Post-construction Stormwater</th>
<th>CAFO</th>
<th>Septic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>When can trading occur?</strong></td>
<td><strong>Who can sell?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>To Comply</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Point sources</td>
<td>VA, PA</td>
<td>VA, MD</td>
<td></td>
<td>VA</td>
<td></td>
</tr>
<tr>
<td>Nonpoint sources</td>
<td>PA</td>
<td>VA, MD</td>
<td></td>
<td>VA</td>
<td>MD</td>
</tr>
<tr>
<td><strong>To Offset</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Point sources</td>
<td>VA, MD, PA</td>
<td>VA</td>
<td>VA, MD*</td>
<td>VA</td>
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</table>
# Trading Ratios

<table>
<thead>
<tr>
<th></th>
<th>Maryland</th>
<th>Pennsylvania</th>
<th>Virginia</th>
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</thead>
<tbody>
<tr>
<td>Delivery Ratio</td>
<td>Chesapeake Bay Watershed Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reserve Ratio</td>
<td>5% (all)</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Retirement Ratio</td>
<td></td>
<td></td>
<td>5% for NPS*</td>
</tr>
<tr>
<td>Uncertainty Ratio</td>
<td>2:1 for NPS to PS</td>
<td>3:1 (for NPS-temporary)</td>
<td>2:1 for NPS to PS</td>
</tr>
</tbody>
</table>

* *proposed*
Agricultural Baseline

• A level of environmental performance that must be achieved before being eligible to trade.

• Because agriculture is not regulated, baseline is used to determine trading eligibility
## Agricultural baseline

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<th>Virginia</th>
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<tbody>
<tr>
<td>Meet a per-acre annual loading rate (e.g., lbs TN/acre) calculated from the Bay or local TMDL, whichever is more restrictive</td>
<td>(1) Implement a 100-foot manure setback, (2) implement a 35-foot vegetative buffer, or (3) reduce the farm’s total nutrient balance by additional 20%</td>
<td>Implement, as applicable: 1) Soil conservation plan 2) Nutrient management plan 3) Cereal cover crops 4) Fencing 5) Riparian buffers</td>
</tr>
</tbody>
</table>

**Performance-based**
- EPA: TMDL

**Practice-based**
- EPA: TMDL
- EPA: TMDL
Questions?

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