Transaction costs of nonpoint source water quality credits: Implications for Chesapeake Bay trading programs

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Objectives

- What range of transaction costs might be associated with nutrient trading programs?
- Using a Bay State case study (Virginia), what are transaction costs now and what might they be in an expanded program?
- To what degree can alternative designs lower transaction costs?
**Conceptual Framework:**

**Transactions costs of Implementation**

**Transaction Costs**

(1) Legislative Environment

(2) Regulatory Design

(3) Implementation

**Credit Creation**

- Search for program participants
- Service provision
- Certification of service provision
- Credit registration & reporting

**(Market) Transactions**

- Assessing the market
- Trading partner search & contracting
- Demonstrating eligibility to trade
- Trade Approvals
- Market support functions

**Monitoring & Enforcement**

- Third party accreditation
- Monitoring
- Enforcement
Virginia Nutrient Trading (NPS element)

Legend:
- Service flow
- Money flow

Landowner
- Monitoring
- Enforcement

Credit Providers
- Verification
- Certification
- Enforcement

Permittee (Developer)
- Compliance
- Conditions
- Enforcement

Regulatory Agency (VADEQ)
- Fee
- Registry

Local Stormwater Program

P Requirements via Land Use Restriction

Offsite P requirements
15 NPS credit projects supplying 1,637 permanent P credits (VADEQ registry as of 8/22/2014)

- 14 out of 15 projects are land conversion (typically ag. land to forest)
- Permanent land protection required for land conversion (for SW land disturbing activities)
- Performance straight-forward (native 400 stems/ac)
- Pending VA credit certification rule specifying application fees to cover costs
Current TCs:
VA WQT program

➢ VADEQ:
  ➢ Site visits: ~$550 per project
  ➢ Credit administration costs are minimal (process fairly straightforward)
  ➢ Monitoring costs are minimal (remote monitoring)

➢ Service provider: “cost and time to move projects through the process is straightforward and the costs are modest compared to those incurred in other environmental service markets.”
Costs are currently relatively low:

- Low complexity of generating credits
- Land conversion projects do not involve the implementation of baseline practices
- Clear and uncomplicated procedures to quantify credits
- Low-cost monitoring regime
What might future TCs look like?

Potential future changes:
- New sources of demand (MS4s) may need term credits
- Working lands participation

If VA WQT program expands:
- Higher complexity of generating credits (e.g. fixed-term credits generated by ag. management practices or structural BMPs)
- Frequency and/or cost of monitoring increases?
What might future TCs look like?

- Severe data limitations (confidentiality, lack of experience, etc.)

Method:

- Gather data from other water quality programs (Ohio (EPRI), Oregon (Willamette Partnership))
- Consult with credit providers
- Use NRCS data on transactions costs of getting conservation on the ground
Which transactions costs did we focus on?
- Costs of “Credit Creation”
- Costs of ex-post certification and monitoring

Costs borne by whom?
- TC costs by category, regardless of who bears them
- Costs faced by credit providers
Transactions costs of credit creation depend on the type of practice(s) used.

Estimated TCs using NRCS interviews/data:

- Simple project (e.g. ag. land conversion)
- Moderate project (e.g. livestock exclusion fence + watering)
- Complex project (e.g. livestock waste management + prescribed grazing)
Credit Creation - simple project

Total TCs: $1709
Credit Creation
- medium project

Total TCs: $3335

NPV

Planning & Application
Approval
Contracting
Implementation
Certification
Credit registration & reporting
Credit Creation - complex project

Total TCs: $5324
Credit Creation

- complex contract + “false starts”

Total TCs:
- w/o FS: $5324
- w/ FS: $7601
2 approaches used by WQT programs:

- **Full “boots-on-the-ground”:** regulator / third party verifier visits site
- **Remote:** information provided by credit provider; use of remote sensing to check site

Alternative monitoring regimes:

- **Low cost** (current VADEQ): remote annual monitoring
- **Medium costs** (Willamette Partnership): full every 5 years + remote in between
- **High cost** (EPRI, Ohio): full every year

Future TCs: Ex-post Monitoring
Cost of monitoring regimes

- High-cost monitoring
- Medium-cost monitoring (a)
- Low-cost monitoring

NPV per year vs. Year

No. projects operating each year (right axis)
Putting this all together, what do we know about total TCs?
Transactions costs
60 P credits over 30 years

$NPV

$25,000
$20,000
$15,000
$10,000
$5,000

Land conversion
(permanent)

Structural practice
(10 yr term)

Ag. management practice (3 yr term)

- Commodity creation*
- Initial certification
- Ex-post re-certification
- Ex-post monitoring

*includes “false starts”
Implications for Agency cost recovery

What do we know about total TCs and how they are distributed across parties?
Costs faced by credit providers
60 P credits over 30 years

- Land conversion (permanent)
- Structural practice (10 yr term)
- Ag. management practice (3 yr term)

Initial application fees
Ex-post fees
Estimated certification & monitoring costs incurred

*based on hours for credit creation provided by NRCS
Use of third parties

ERPI WQT Trading Program (Ohio)

Legend:
- Orange: Service flow
- Purple: Money flow
- Dotted: Activity
- Red: Third Party

Flowchart:
- Landowner
  - Tech assistance, Verification
- Soil & Water Cons. District
  - Contracted BMPS
  - Credit
  - Verification
- EPRI (credit provider)
  - Credits
  - Credit
  - Certification
- State Ag. Agency
  - Verification
- Regulatory Agency
  - Registry
- Credit Buyer
  - Markit
Benefits:

- Lower search costs
- Specialized service provision
- Mitigate market risks
- Lower demands on regulator staff time (cost shifting)

Costs:

- Additional relationships / contracts to manage
- Conflict of interest?
- Different objectives re: conservation
Transaction costs: What have we learned?

- TCs of creating credits from management and structural BMPs significantly higher than for credits from land conversions.
- Verification protocols are a significant driver of transactions costs.
- There are both benefits and costs of using third parties in WQT programs.
Thank you

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