Nutrient Trading Pilot & Reverse Auction Projects

Chesapeake Bay Foundation
SAVE THE BAY

DCP
e
environmental defense
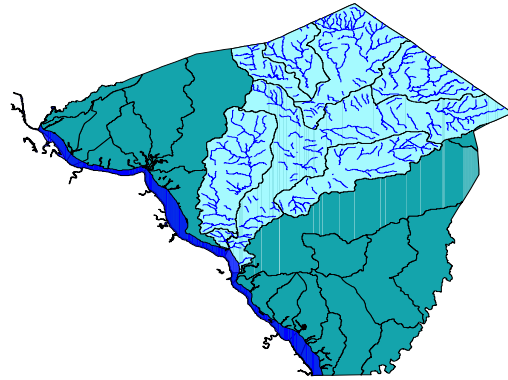finding the ways that work

Pennsylvania Environmental Council

CH2MHILL

THE CONSERVATION FUND

Conestoga River Watershed, Pennsylvania

Presentation Outline:

- **Conestoga Pilot Project**

- **PA Trading Policy Development/Tributary Strategy**

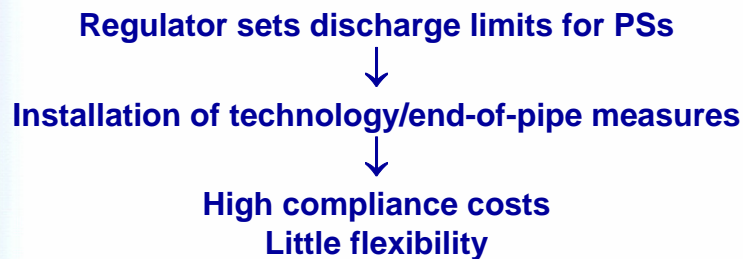- **Conestoga River Reverse Auction Project**

2

Environmental Setting

CWA $\rightarrow$ Point Source permitting $\rightarrow$ improved water quality

- Technology $\rightarrow$ $\downarrow$ nutrients from POTWs

- 1/3 of assessed waters don't meet standards
    - most pollution from NPSs
    - Nutrients are one of top causes for impairments
    - NPSs = farms, urban development, septic

- PA, 88% nutrients from NPSs

3

Conventional Effluent Management

Regulator sets discharge limits for PSs
$\downarrow$
Installation of technology/end-of-pipe measures
$\downarrow$
High compliance costs
Little flexibility

What is Nutrient Trading?

Trading:
•**Allows PS options:**
       1. Adapt facility OR
       2. Pay for reductions elsewhere
       •*Buyer: pays another to meet/exceed its effluent limit*
       •*Seller: exceeds its environmental obligation and*
       benefit from it by selling its "credits"
•**Describes the re-allocation of effluent loads (nutrients) among sources to meet water quality goals**

• **Bottom line → Get cleaner water at a cheaper price**

5

Hypothetical:

PS1: Exceeds limit:
       New technology @ $26/lb P?
       Or buy reductions?

PS2: $15/lb P   **NPS: $10/lb P**
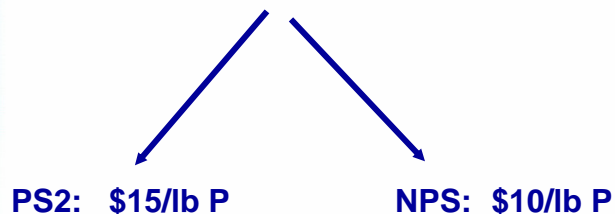
6

Nutrient Trading:

- Market driven approach to environmental management that can enhance options available to reduce pollutant loadings.

- Takes advantage of the fact that some pollution sources are easier (and less expensive) to reduce than others.

Advantages:

Economic Benefits:

- **Increased flexibility by $\uparrow$ compliance options**

- **Generates market demand for new, innovative technologies**

- **Reduces compliance costs:**
    - **WRI Study:**
        - **Best available technology $\rightarrow$ 24% cut in P = $26/lb**
        - **Trading: 50% cut = $10/lb**

Advantages:

Environmental Benefits:

•Encourages sources to reduce discharges to create credits that can be sold, banked for future use or retired

•Target reductions to priority areas

•Potential for broader environmental benefits from ecological restoration, etc.

9

Who Is Looking at Water Quality Trading?

**16 "active" programs
Few trades**

10

WQ Trading Policy Chronology

◆ **Chesapeake Bay Program Nutrient Trading Fundamental Principles & Guidelines, March 2001**

◆ **EPA Office of Water: Water Quality Trading Policy, January 2003**

◆ **PA DEP – Water Quality Trading Policy Discussion Paper, April 2003**

◆ **PA DEP – Nutrient Trading Program Assumptions, spring 2004**

◆ **PA DEP – Pennsylvania's Chesapeake Bay Tributary Strategy, December 2004**

11

The Conestoga Pilot Project

•**Why the Conestoga**

•**Project development**

12

Conestoga Project Sponsors & Partners

PA DEP
Pennsylvania Environmental Council
Chesapeake Bay Foundation
The Conservation Fund
Environmental Defense
CH2M HILL
Jones Day
Heinz Endowments
LandStudies, Inc.
Lancaster County Conservation District
Natsource, LLC
National fish & Wildlife Foundation
NRCS
Penn State, Institutes of the Environment
US EPA
World Resources Institute, NutrientNet
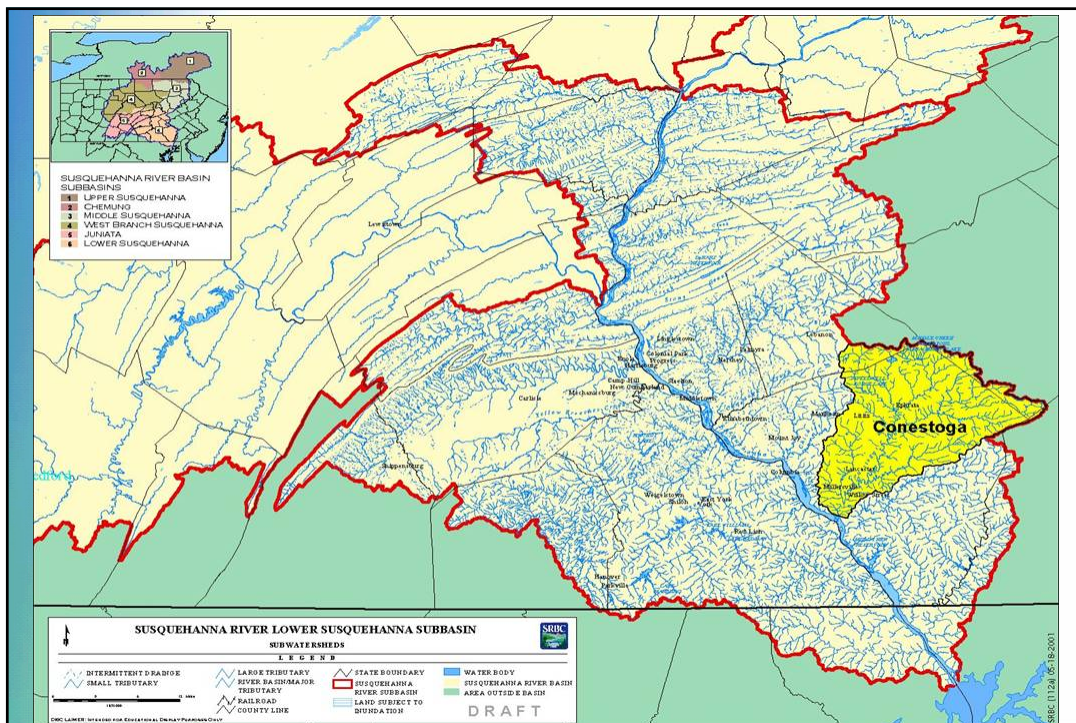
13

Project Goals

- Facilitate the development of state nutrient trading policy
- Serve as a model for a full-scale, statewide nutrient trading program & similar programs nationwide
- Reduce nutrient loadings from both nonpoint and point sources
- Lower compliance costs
- Avoid the need for additional regulation
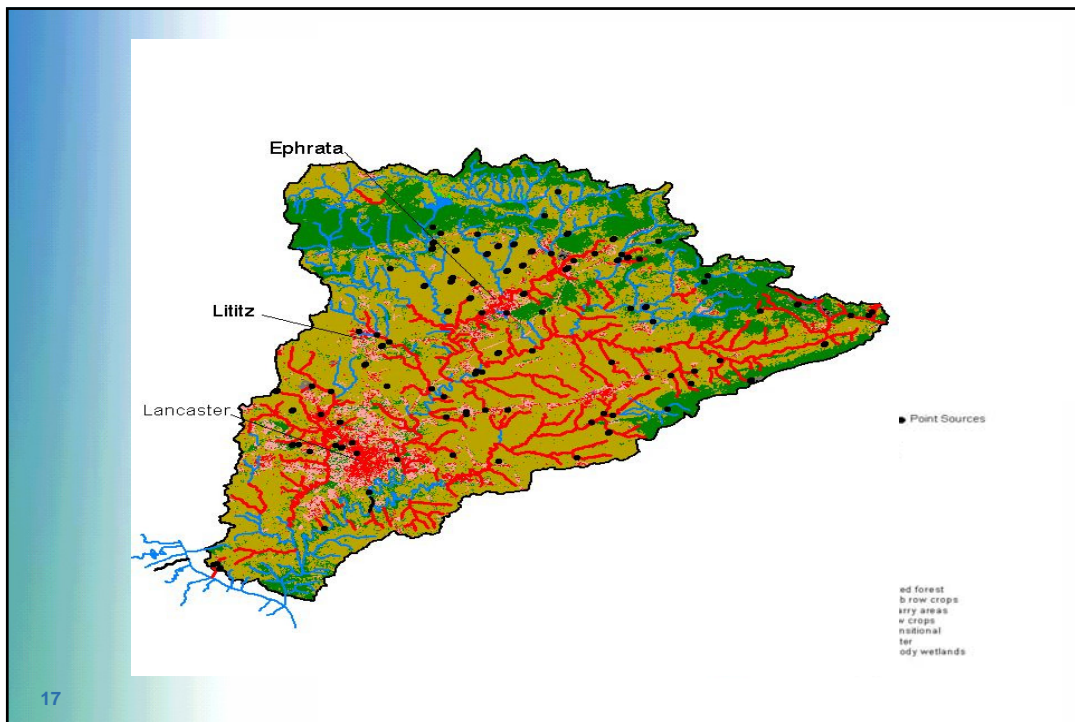- Improve water quality

14

Why the Conestoga Watershed?

- Within the Chesapeake Bay watershed
- Diverse mix of point and nonpoint sources
- Potential for significant community involvement
- Point sources have phosphorous limits
- Voluntary nitrogen targets under Bay agreement

15

SUSQUEHANNA RIVER BASIN SUBBASINS
1 UPPER SUSQUEHANNA
2 CHEMUNG
3 MIDDLE SUSQUEHANNA
4 WEST BRANCH SUSQUEHANNA
5 JUNIATA
6 LOWER SUSQUEHANNA

Conestoga

SUSQUEHANNA RIVER LOWER SUSQUEHANNA SUBBASIN
SUBWATERSHEDS
LEGEND

INTERMITTENT DRAINAGE
SMALL TRIBUTARY
LARGE TRIBUTARY
RIVER BASIN MAJOR TRIBUTARY
RAILROAD
COUNTY LINE
STATE BOUNDARY
SUSQUEHANNA RIVER SUBBASIN
LAND SUBJECT TO INUNDATION
WATER BODY
SUSQUEHANNA RIVER BASIN AREA OUTSIDE BASIN

DRAFT

8

Facilitate Policy Development:

Key Policy Challenges:

1. Threshold for Eligibility: When can reductions be deemed credits?

- **PSs → pollution caps**
- **NPS scenario is complex**
  - **Under PA Trib Strategy, 95% of farms w/in CB need BMPs to reach nutrient goals.**
    - **Riparian buffers, etc. = creditable actions**
    - **How much reduction needed before actions = credits? Ex. 50%?**

2. Uncertainty Discount: NPS uncertainty, 1 lb = 1 lb?
- **2:1 or even 4:1 discount?? Different for various BMPs?**

Pfizer Voluntary Trade:

Pfizer Pharmaceuticals → Santo Domingo Creek restoration
- **1,300-foot restoration project**
- **$80,000**
- **sediment monitoring: 28 tons sediment lost/4 mo**
- **modeling to determine reductions**

Estimated Credits: 387 lbs N/year
                     74 lbs P/year
                     66 tons sediment/year

Credits held & "retired" by Pfizer (??)

Private Contract – Transfer of Pollutant Reductions from Borough of Lititz to Pfizer, Inc. (Jones Day)

19

New Street Park, Lititz, PA, before improvements

Photograph courtesy of LandStudies, Inc.

20

New Street Park, Lititz, PA, during improvements

21

Photograph courtesy of LandStudies, Inc.

New Street Park, Lititz, PA, after improvements

22

Photograph courtesy of LandStudies, Inc.

PA Tributary Strategy
PA DEP December 2004

Cap on Point Sources – 142 sign. disch.
(>0.4mgd): 8mg/l N, 1mg/l P based on 2010 predicted
flows – convert to lbs/yr allocation

Watershed Permit – Cap & Trade: Susquehanna,
Potomac, subwatersheds (13 watershed teams, 12&1)
Conestoga – Lower Susquehanna East

Tributary Strategy Steering Committee

DEP Public Meetings & Outreach

23

PA Tributary Strategy
PA DEP December 2004

Nonpoint Source Strategy – 89% Nitrogen, 82%
Phosphorous: PA NP load to the Bay

Agricultural NP Strategy – "Agricultural BMPs account
for 75% of the nitrogen reductions in the strategy but only
account for about 7.2% of the costs at $592 million" – total
cost of PA strategy: $8.2 billion

P to NP trading policy under development:
"Pennsylvania's nutrient trading program for point and
nonpoint sources in anticipated to generate additional
nutrient reductions at reduced costs."

24

Trading Policy Development:

Policy Challenges:
1. Hot Spots: Upstream vs. Downstream
   • **Local impacts** → **policy considerations?**
2. Enforcement:
   • **PSs = permit**
   • **NPSs = ?**
3. Baseline for Agriculture:
   • **PA Trib Strategy**
   • **Nutrient Management Plan (<CAOs?)**
   • **Erosion and Sedimentation (conservation)**
   Plan
4. Monitoring:
   • **PSs = self-monitoring & reporting**
   • **NPSs = County Cons. Dist.???**

25

Next Step: Creating a Mock Trading Platform

Questions:

Within the context of the Conestoga,

1. How do potential sellers (farmers) find buyers to fund BMP projects?

2. How can buyers judge which projects are the most cost effective for reducing nutrients (i.e., creating credits)?

Answer: NutrientNet, a "reverse auction" trading platform/estimation tool

26

Conestoga River Reverse Auction

- USDA NRCS Conservation Innovation Grant Program – Environmental Quality Incentives Program funding for "innovative conservation approaches and technologies for environmental enhancement and protection in conjunction with agricultural production"

- Develop, customize, test and evaluate an online tool for conservation districts and farmers to estimate and register nutrient reductions for specific BMPs

- Provide a mechanism to direct EQIP and other conservation funding to the most cost-effective nutrient (phosphorous) reduction projects

27

Reverse Auction: Goal

Conduct 2 auctions:

- Summer 2005 & Winter 2006
- Award $$ to farmers w/ successful bids to install BMP
    - PEC awarded $980k grant from NRCS to fund projects
    - Buyer = PEC
    - Nutrient reduction "credits" →"retired," (i.e., not formally traded)
        - Credits will be tracked to help PA understand its compliance w/ Tributary Strategy

28

CIG Program Guidelines

- ◆ Participating Producers – EQIP eligible
  < $2.5million AGI over 3 years
- ◆ Any awards from CIGP count towards EQIP eligibility
  - $450k payment limitation
- ◆ Highly Erodible Land and Wetlands Conservation Compliance
- ◆ Otherwise flexible: BMP costs, cost share, contract form, etc.

29

Reverse Auction: Process

Note: NutrientNet is an on-line, internet tool (www.nutrientnet.org)

1. Farmer identifies the BMP & its location
- • **Eligible Farms = EQIP eligible**
- • **Eligible BMPs: cover crops, buffer strips, manure storage systems, streambank fencing, terraces & waterways, barnyard runoff controls**

2. NutrientNet provides farmer w/ information:
- • **BMP cost estimates**
- • **Quantifies nutrient (lbs. of P) reductions**

3. Farmer submits final bid/project

30 **4. NutrientNet ranks bids according to nutrient reduction**

15
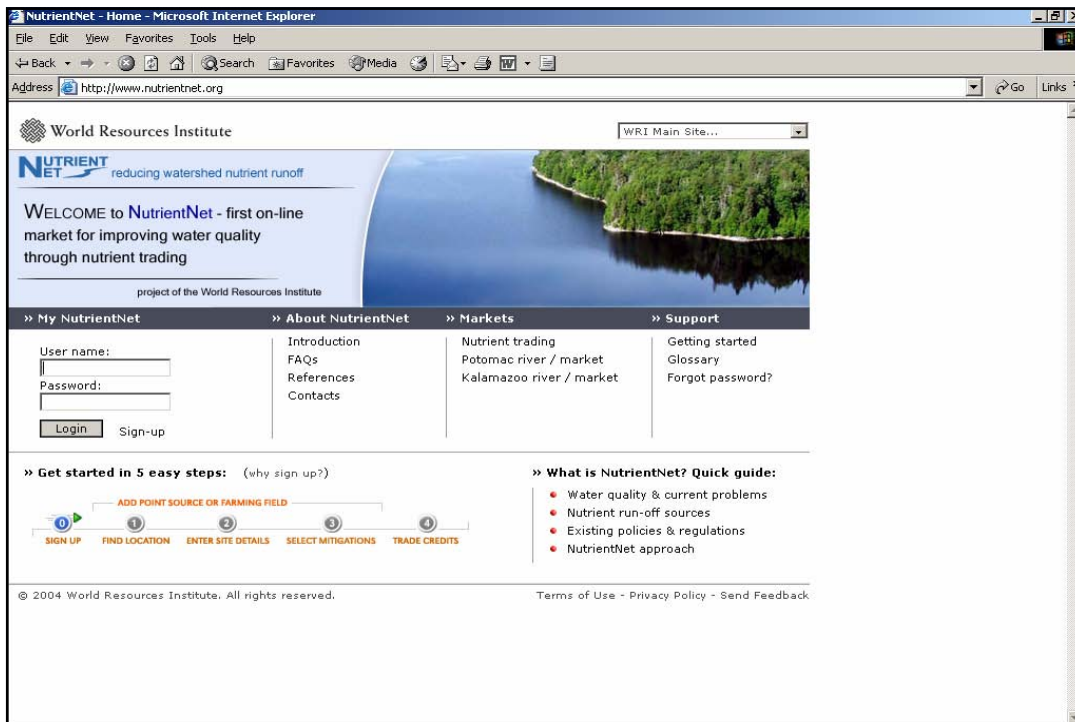
Quantifying Nutrient Reductions

◆ Sediment P baseline calculated using RUSLE (edge of field) and SEDMOD (to edge of stream)

◆ Uses reduction efficiency coefficients to estimate P reductions from BMPs

32

Reverse Auction: Process

•Designed to direct resources to the most cost-effective reductions

•Buyer is interested in securing maximum quantity of nutrient reductions from limited budget

•Farmers/producers compete for Buyer's budget

→ Winning bids come from BMPs that maximize P reductions/$

33

More Questions:

• How will the P reductions be tracked in light of the CB Trib Strategy Goals?

• Who will be responsible to report total nutrient reductions to DEP?

• Enforcement?

• BMP monitoring?

34

"We hope that this nutrient trade will serve as a model for future trades," said PEC President Andrew McElwaine. "As our nutrient trading program moves forward, it will provide an important tool to help Pennsylvania meet its goals for reducing nutrient and sediment loads in the Conestoga watershed and the Chesapeake Bay."