

IMPROVING THE EFFICIENCY AND EFFECTIVENESS OF AGRI-ENVIRONMENTAL POLICIES FOR THE CHESAPEAKE BAY

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THE PROBLEM

- Traditional approaches are not achieving Ag nutrient and sediment reduction goals
- Should we ramp up the traditional approaches or implement new ones?
- What mix of policy instruments can achieve and maintain water quality goals while
 - Minimizing the social costs of pollution control?
 - Distributing burdens fairly?
 - Complimenting other social goals (farm prosperity, open space conservation, carbon sequestration, etc.?)

FUNDAMENTAL CHOICES IN DESIGNING POLLUTION CONTROL INSTRUMENTS

- To whom and where do they apply?
 - Cost effectiveness requires some selectivity in watersheds and sources within watershed
 - Low control cost – high control impact sources
- What indicators are used to monitor compliance?
 - You manage what you measure
- What mechanisms are used to induce the farm management and structural changes in agriculture needed to achieve WQ goals?
 - The carrots and sticks applied to indicators

INDICATORS

- Means
 - Fertilizer and manure applications
 - Nutrient and conservation practices
 - Land use
- Ends – Farm Performance
 - Farm level performance indicators
 - Nutrient balances, edge of field soil losses
 - Water quality impact indicators
 - Calculated contributions to sediment and nutrient loads
 - Actual contributions

CARROTS AND STICKS (MECHANISMS)

- Education
- Community engagement
- Subsidies (e.g., cost sharing)
- Collective incentives (e.g. Green certification)
- Payments for performance
 - Reverse auctions
 - Tournaments
 - Compliance incentives

CARROTS AND STICKS (MECHANISMS)

- Cap-and-trade
- Taxes/fees
- Regulatory restrictions (e.g., enforced NMP and CMPs)
- Liability rules (litigation)

PUTTING THEM TOGETHER

	Mechanisms (carrots/sticks)						
Indicators	Education	Subsidies	PFP	Cap and Trade	Taxes	Regulatory Standards	Collective Incentives
Inputs	Traditional approaches						
Practices	Traditional approaches						
Land use							
Farm Indicators							
WQ Indicators							

THE ELEPHANT IN THE BARN

WHO PAYS?

- Polluter pays or Pay the polluter?
- Equity Issues
- Uncompensated agricultural services
- Budget constraints!

TRADITIONAL TOOLS

- Historic soil and water conservation instruments applied to WQ protection
 - Education, Technical Assistance
 - Cost Sharing Subsidies for BMPs
 - Land retirement (e.g., CRP)
- The Good:
 - Noncoercive
 - Utilize mechanisms and agencies familiar to farmers
 - Can serve multiple social goals



TRADITIONAL INSTRUMENTS

- The Bad
 - Limited WQ Impact
 - Low hanging fruit mostly picked
 - Public funding increasingly tight
 - Political resource allocations do not match WQ problems

TRADITIONAL INSTRUMENTS

- The Bad
 - Inefficient
 - Means rather than performance based
 - Payments in excess of minimum required
 - Low cost – high impact pollution sources are not guaranteed to participate

NEW OPTION



Replace

Traditional Agricultural Water Pollution Instruments
with

Traditional Point Source Water Pollution Instruments

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National Pollution Discharge Emissions Permits (NPDES) for All
(Technology Based Effluent Standards)

NPDES PERMITS FOR ALL

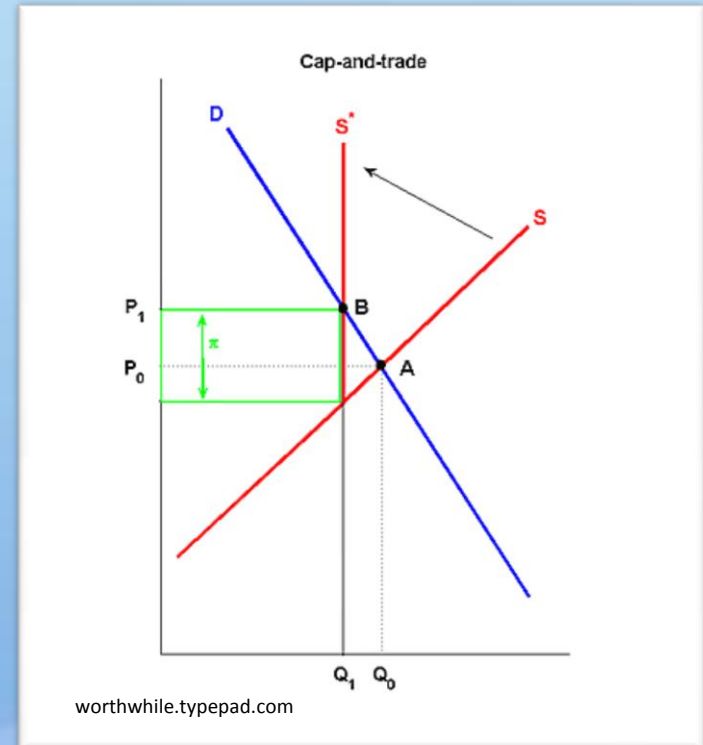
- The Good
 - Can be effective
- The Bad
 - Highly coercive
 - Inefficient
 - Means rather than performance based
 - Mandated practices not least cost
 - Not targeted across pollution sources to get the greatest improvements at the least cost
 - High public and private transactions costs

TECHNOLOGY REGULATION IN AGRICULTURE IS HIGHLY PROBLEMATIC

- High spatial heterogeneity and temporal variability of production conditions
- Agricultural innovation – rapid and transformative
 - Adaptation is essential for success
- Comprehensive technology regulation would be
 - highly costly
 - limit innovation and dynamic responses to changing agricultural markets

NEW OPTION

2nd Generation Market Based Pollution Management



EMISSIONS BASED CAP AND TRADE

- The Good
 - Effective (if we can do it)
 - Allows policy makers flexibility in determining distributional outcomes
 - More efficient than technology regulation
 - Performance based
 - Allows lowest cost compliance technologies
 - Allows targeting (implemented through market incentives)
 - Positive innovation incentives

EMISSIONS BASED CAP AND TRADE

- The Bad
 - High public and private transactions costs
 - Monitoring, enforcement, litigation
 - Emissions-based systems difficult and costly to apply to agriculture
 - Requires reliable quantification of pollution entitlements by source
 - Only one application: Lake Taupo, New Zealand (in development)



NEW OPTION

A Variation on the Theme
Cap and Trade
for
Nutrient Inputs, Manure
Surplus Nutrients



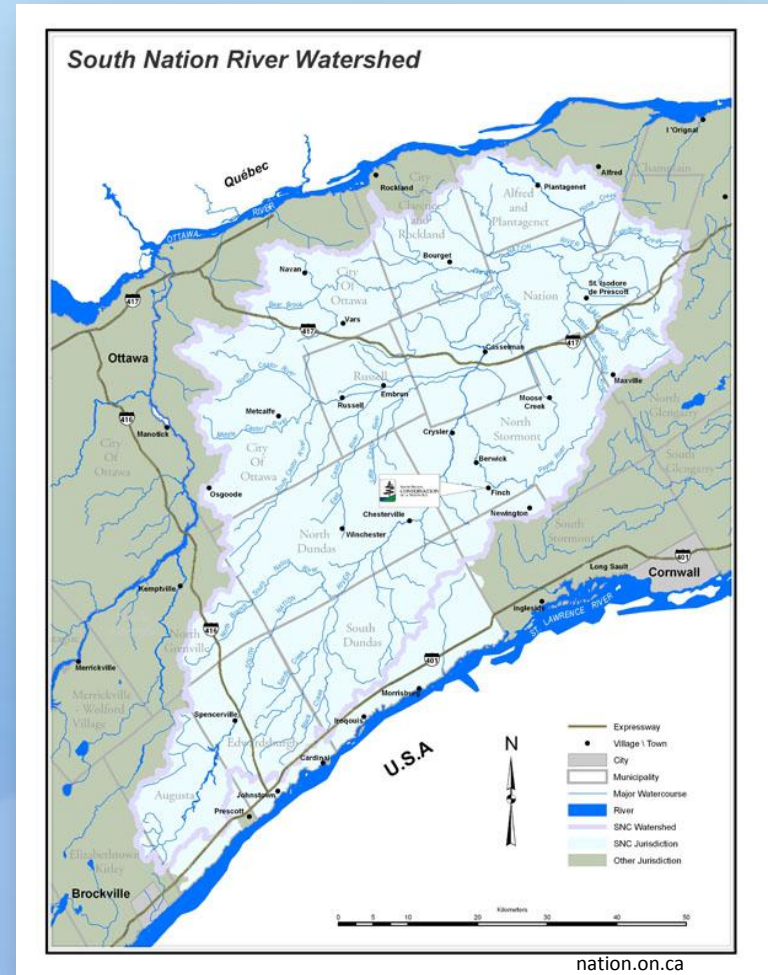
INPUTS/MANURE CAP AND TRADE

- The Good
 - Easier to cap and monitor inputs than actual or reliably estimated emissions
 - Facilitates regional integration of nutrient management
 - Effective, and efficient by comparison to technology-based regulations
 - Dutch manure production quotas
 - Nontradable quotas 1987 -1994
 - Tradable quotas 1994 – 1997

OTHER CAP AND TRADE

- The Bad
 - High transactions costs (Dutch scheme \$200 -\$600 in administration costs per farm)
 - Cost-effectiveness limited by focus on inputs or surpluses rather than environmental outcomes

Another Variation on the Theme Offset Trading



OFFSET TRADING

- The Good
 - Generates income for farmers
 - Can improve efficiency by facilitating reallocation of emissions reductions from high to low cost source
- The Bad
 - Offset trading may not fully cap emissions
 - More an efficiency measure than pollution reduction mechanism
- South River Nation and Little Miami River of Ohio programs show promise – demonstrate importance of institutional design

NEW OPTION

Tax Nutrient Inputs,
Manure, Surpluses,
Estimated WQ outcomes



TAXES

Some nations do tax...

- Pesticides: Belgium, Denmark, France, Italy, Norway, Sweden
- Fertilizer: Italy, Sweden, some US states (low rates)
- Surplus nutrients: Netherlands, Belgium
- Ammonia emissions: Czech Republic

TAXES

- The Good

- Can be effective when:

- Set as sufficiently high levels to affect decision making
 - Swedish fertilizer tax – 30% tax gives an estimated reduction of 10 – 20% in applications
 - Dutch levies have contributed to 30% WQ improvements in vulnerable regions
 - Low public and private transactions costs for simple indicators – higher for more complex
 - Administrative costs less than 1% of revenues for Swedish fertilizer tax
 - Generate revenues for financial assistance to farmers or for environmental projects

TAXES

- The Bad
 - Coercive
 - Highly politically unpopular
 - Tax aversion
 - Harmful to farm prosperity
 - Targeted recycling can improve acceptance
 - Cost-effectiveness ?
 - Better for performance indicators than inputs
 - Limited capacity for spatial targeting

NEW OPTION

Keep
the “Pay the Polluter Approach”
But Increase Efficiency and Effectiveness
Using
Performance Incentives
(e.g, Reverse auctions, Compliance Rewards)

REVERSE AUCTIONS

- The Good
 - Noncoercive
 - Income for farmers
 - Environmental indices in bid evaluation improve targeting and cost-effectiveness
 - Competitive bidding helps economize on public costs
 - GMRWQTP cost savings 14 to 32%
 - USDA ERS study estimates competitive with environmental indices to score bids can increase environmental outcomes by 25% for same expenditure



REVERSE AUCTIONS

- The Bad
 - Depends on continuing public willingness to fund program at adequate levels
 - Nonparticipation by high impact polluters

COMPLIANCE REWARDS

- The Good
 - Supporting incentive for programs involving regulatory or contracted pollution reduction activities
 - Intended to improve cost-effectiveness of monitoring and enforcement by increasing compliance
- The Bad
 - Depends on continuing public willingness to pay

POLICY SCENARIOS

- Public funding for Ag NPS remains strong
- Key is to increase effectiveness and efficiency of public spending
 - Education (management capacity is crucial to environmental and economic success e.g. Dutch research)
 - Minimum standards
 - Payments for performance
 - Compliance rewards
 - R&D

POLICY SCENARIOS

- Money is tight = Hard decisions
 - How much NPS control do we really want?
 - Who pays?
 - Taxes or regulation?
 - Research on options essential for sound decisions
 - Best use of public funds?
 - Monitoring and compliance
 - Education
 - Compliance incentives
 - Research to inform policy
 - R&D