Making Water Quality Trading Work in Ohio

Brent Sohngen
Dept. of Agr., Env., and Dev. Economics
OSU Extension
Ohio State University

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What is an Environmental Quality Trading Market?

- A system for exchanging rights to emit pollutants into the environment.

- Examples
  - SO_2 market is most widely known (since mid 1990s)
  - Emerging Carbon Markets
    - Chicago Climate Exchange (since 2004)
    - European Trading System (since Feb. 2005)
    - New South Wales (Australia) (since 2005)
    - California Climate Registry (emerging)
  - Wetland Mitigation Banking.
  - Biodiversity Conservation.

Trading Pros

- Reduce costs.
- Provide opportunities to reward “good” behavior and penalize “bad” behavior.
- Use market mechanisms to promote innovation
- Provide efficient mechanisms to handle risk and uncertainty.

Trading Cons

- Need enough participants to ensure that prices are market based.
  - Must balance participation with the complexities of water flow (i.e. high and low flows and regional hotspots).
- Participants must have cost differences.
- Not all environmental problems fit…

Why Aren't These Issues Cons?

- Uncertainty
  - Is uncertainty in trading programs greater than the uncertainty in alternative programs?
- Quantification and measurement
  - Need new tools that measure the results of the trading programs
  - Example: *MCD/OSU project in Stillwater*; *Forestry carbon credits.*
- Hotspots
  - Issue is market design, not an inherent flaw.

Why Have NPS Water Credit Trading Programs Not Worked as Well as Hoped?

- Demand is low due to flexibility or targets.

- Trading ratios too high.
  - Uncertainty in Weather: Total uncertainty likely declines with application of BMPs => Suggests T-ratio < 1

  - Uncertainty in Performance: Increases T-ratio above 1
    - *Most important rationale, but argues for performance based approaches*

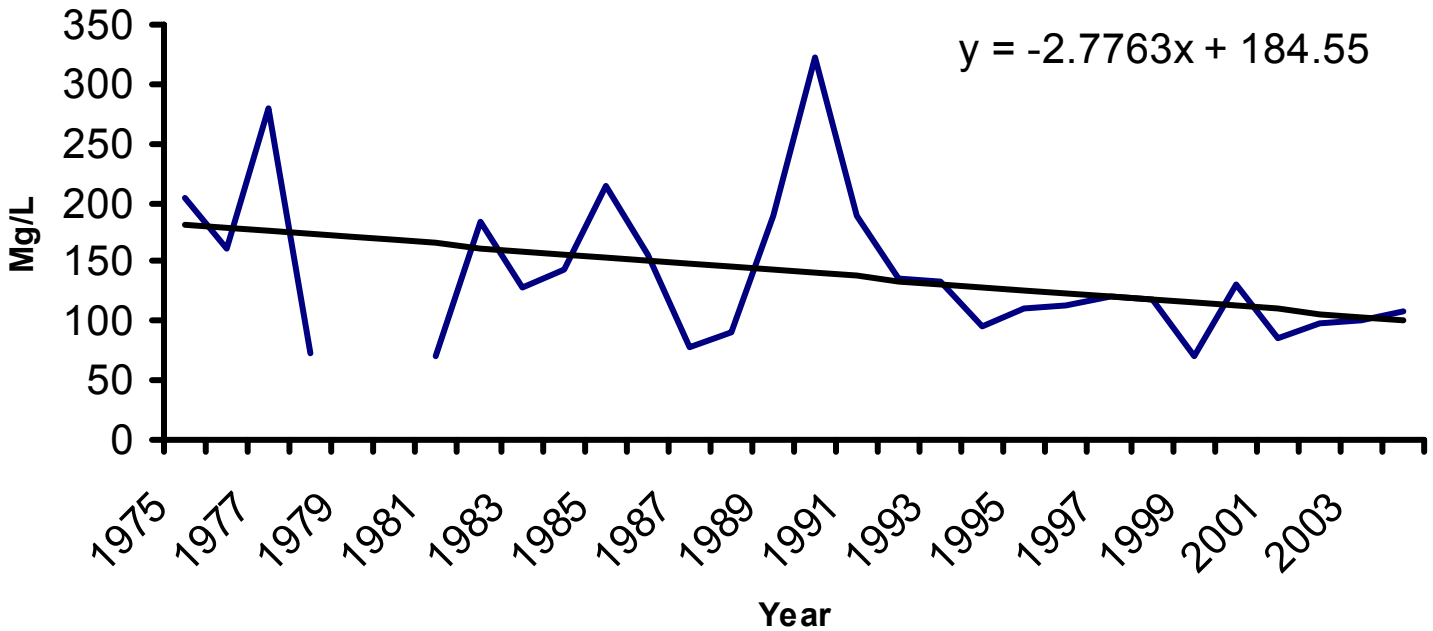
  - Fate and Transport: Could go either way.

➔ **Suggests that T-ratios should be at least 1, but maybe not substantially above.**

Example of Changes in Variance...

Maumee River Basin Data (from Heidelberg WQL)

- Standard Deviation* in Suspended Sediments has decreased 2% per year since 1975
  - Std. Dev. in flow has decreased 1% per year.



•Std. Dev. calculated annually based upon the annual measurements taken by the Heidelberg Water Quality Lab.

How Can we Make Water Quality Credit Trading Work in Ohio??

- Ensure that demand will be present...
  - Allow for reasonable sized areas to be involved.
    - Don’t create a double standard on fate and transport.
  - Ensure flexibility in NPDES permits.
  - Trading ratios should be low to begin with & dynamic.
    - Base them on water quality measurements (collect more data)
    - Move away from T-ratio approach and towards measuring performance.

- Carefully think through supply issues
  - Define the rights (temporary credits?).
  - Get the prices right! Use auctions.

- Prove that NPS abatement can work through BMPs.