

# Policy implications of lags in pollutant delivery

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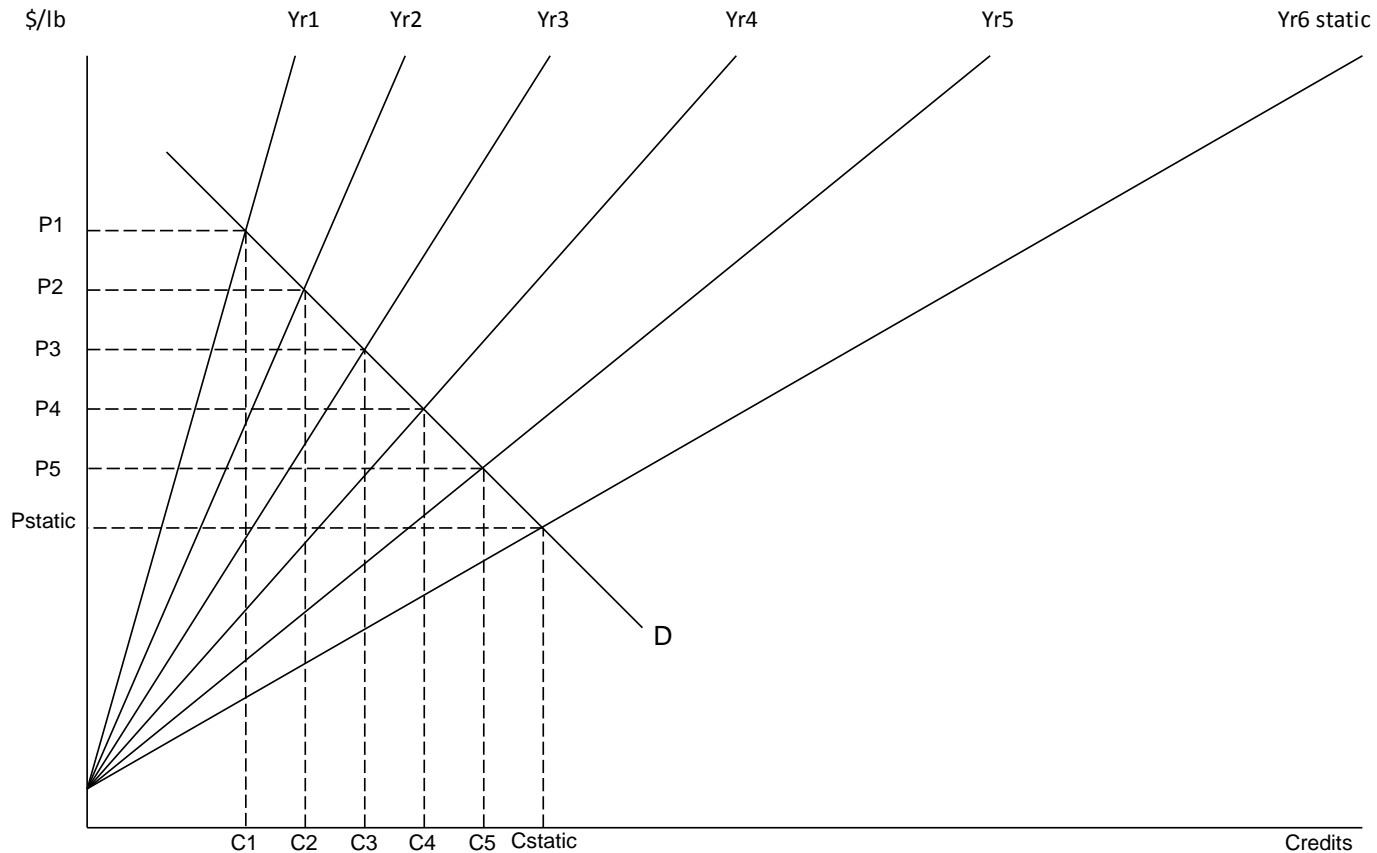
# Areas of concern

- Water quality trading
- Public perceptions

# Water quality trading

- Policy option that allows regulated firms to purchase discharge offsets from unregulated, low-cost abaters, such as agriculture
- Agriculture produces credits by implementing management practices such as nutrient management, manure management, conservation tillage, and riparian buffers to reduce nitrogen losses
- Credits are assumed to be perfect substitutes for forgone abatement by regulated source both physically and temporally

# Allocation of abatement among sources over time



# Impact of lag on regulated sources' decisions

- Regulated point sources generally face high capital costs for additional abatement
- Supply of credits in near years are limited if lags predominate
- If permit must be met annually, incentives are increased for point sources to adopt technology and forgo trading for long term (capital investment irreversible)

# Markets with lags

- Forward markets essential to achieve efficient temporal allocation of abatement
  - Unlagged sources must know future credit prices to make efficient current decisions
- Spatial and temporal heterogeneity makes for very complex markets
  - Design problems for policy makers
  - Participation problems for market participants

# Public perceptions

- Achieving TMDL goals requires that nonpoint sources make significant contributions to pollutant reductions
- Question: Will the public accept delayed improvements in Bay water quality?

# Strategies for dealing with public perceptions

- Increase focus on local water quality rather than the main body of the Bay (more immediate results)
- Publicize additional environmental services generated by actions to improve water quality
  - Wildlife habitat
  - Recreation opportunities (hunting, birdwatching, greenhouse gas mitigation)

# Research questions

- What is public's tolerance for lagged results?
- What are the risks of ignoring lags in trading programs?
  - Do benefits of a vibrant market outweigh short-term risks to water quality?
- What would forward markets look like, and how would permits have to change to accommodate them?