

Effluent Trading for Water Quality Management: Concept and Application to the Chesapeake Bay

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This paper examines effluent trading for water quality management and the case of the Chesapeake Bay where the implementation of the trading system is discussed.

This policy instrument was applied to the field of air pollution first in the U.S., known as emissions trading. U.S. Environmental Protection Agency (EPA) recommends the watershed-based effluent trading.

The regulatory framework of water quality management in the U.S. is as follows. Point sources must have permits if they discharge wastewater directly into a body of water. There are concentration-based standards, so-called "technology-based effluent limitations," which apply to direct dischargers of point sources throughout the U.S. Total maximum daily loads (TMDL) are set where the concentration-based standards fail to attain ambient water quality standards. TMDL is followed by waste load allocation to each point source. In contrast, there is no specific regulation on nonpoint sources except for limited areas.

Under the effluent trading system in a watercourse with load-based regulation, sources which would reduce pollutant discharge could transfer the pollutant discharge credits to other sources which need to increase pollutant discharge.

Point-nonpoint source trading system enables point sources to give money to nonpoint sources for installing best management practices, instead of further reduction in pollutant discharge by themselves. This system is expected large cost savings, because the marginal abatement cost for nonpoint source is generally inexpensive relative to the marginal abatement cost for point source.

Potential benefits of effluent trading are the following.

- (1) The total pollutant loadings can be kept at the prespecified level or below with appropriate monitoring and enforcement.
- (2) New and expanding dischargers can be allowed as long as they purchase credits.
- (3) Abatement cost of pollutants can be reduced.
- (4) Flexible regulation with trading can reduce the incentive for industry to move to the area where the water quality regulation is less stringent.
- (5) Broader environmental goals can be addressed, such as wildlife habitat provision and endangered species protection.
- (6) Examination of implementation of trading system encourages dialogue among stakeholders and fosters concerted and holistic solutions for the water body.

U.S. EPA, Maryland, Pennsylvania, Virginia, and Washington D.C. formed the regional partnership, the Chesapeake Bay Program, with voluntary agreements and has been working for restoration of the Bay ecosystem for nearly two decades. They set the goal of 40 percent reduction of nitrogen and phosphorus discharge from 1985 level. The Chesapeake Bay Program presented fundamental principles and guidelines for nutrient trading in the Bay in early this year after the stakeholder meetings and public workshops. Based on these principles and guidelines, each state is expected to design and implement the nutrient trading.