



ENVIRONMENTAL DEFENSE

finding the ways that work

Nonpoint Source Pollution Control: Breaking the Regulatory Stalemate

For the last few decades, agricultural pollution has been the primary cause of water quality problems in the United States. Moreover, agricultural run-off continues to decimate ecosystems that provide habitat for some of our nation's most endangered and treasured creatures.

The task of controlling agricultural pollution, however, is caught in a regulatory stalemate. The commonly-accepted method for controlling nonpoint source pollution –voluntary adoption of “Best Management Practices” or BMPs – has predictably achieved minimal success, particularly in areas where pollution control expenses are significant. Yet the conventional regulatory alternatives – mandatory BMPs and permits – have long been considered inefficient, invasive, and politically infeasible.

How can a program make farmers accountable for their drainage in a way that is practical for farmers and administratively feasible for regulatory agencies yet still meets pollution reduction goals? Environmental Defense and a group of farmers in California's San Joaquin Valley, aided by various government officials, found a way that worked.

The Problem: Agricultural Pollution in the San Joaquin Valley

The west side of San Joaquin Valley riveted the nation's attention in 1983 when selenium-contaminated farm drainage left a trail of dead and deformed baby birds in Kesterson Reservoir, which was part of a national wildlife refuge. By the early 1990s, selenium-laden drainage was still being discharged into other nearby federal and state wildlife refuges, threatening ecosystems and violating water quality standards in the San Joaquin River downstream.

The Proposed Solution: Economic Incentives and a Performance Goal

In 1994, Environmental Defense responded to the agricultural pollution problem by proposing a system that would make farmers accountable for their discharges, preserve farmers' operation flexibility, and be reasonably cost-effective. The system included a regional discharge cap, discharge trading among farm districts in the region, and tiered water pricing (a pollution input tax) for the farmers within the districts. This proposed system appeared attractive for several reasons:

- The regional discharge cap, if enforced, ensured meeting the water quality goal.
- The use of tradable permits and input fees would, in theory, promote a cost-effective mix of farmer and district pollution control actions.
- Both the choice of pollution control actions and the allocation of pollution control responsibility would be determined locally by individual farmers and their district representatives.
- Regulatory oversight of the program would be streamlined because farmers are already organized into locally-controlled irrigation districts, drainage pipes and canals can be monitored, and the task of tracking drainage outputs can be piggy-backed onto the existing record-keeping system for irrigation inputs.

Proposal to Reality

By 1997, the system proposed by Environmental Defense was largely being implemented. The motivation and legal foundation for implementing the system came from a surprising source, however. In 1995, the region's farmers requested permission from the U.S. Bureau of Reclamation to use the San Luis Drain (a federal canal) to convey drainage around the wildlife refuges and directly into a river tributary. In exchange for the privilege, the Bureau required specific guarantees that the discharge would not violate federal law. The resulting contract, the Agreement for the Use of the San Luis Drain (Use Agreement):

- specifies a regional limit on the amount of selenium load that can be discharged by month and by year;
- allows the farm community to design its own method for compliance;
- enforces provisions by imposing penalty fees for exceeded limits and closing the San Luis Drain if selenium loads exceed 120% of the regional limit; and
- requires the consortium of farm districts to form a regional entity with the legal authority to administer and enforce discharge requirements among its member districts.

The farm districts formed a regional entity called the Grassland Area Farmers. In order to meet the regional load limit, the Grassland farmers developed a formal selenium discharge allocation system with sanctions for noncompliance. Building on this foundation, they also designed an inter-district selenium trading system to provide additional incentives for decreasing discharges. The trading system is fairly straightforward and allows trades between farm districts as long as the trade is consistent with the regional allocation. The ability to trade selenium allocations has provided valuable flexibility for the farm districts to adjust initial allocations in response to differences among districts, such as marginal costs and changing farming conditions.

Under the trading system, each district is allowed to develop its own mix of economic incentives and drainage control methods to meet a specified load limit. In response, each district has developed its own portfolio of techniques. The primary economic incentive that has been employed is tiered water pricing. Direct actions to reduce drainage have involved such techniques as recycling drainwater, recycling tailwater, using drainwater to grow selenium enriched feed for dairy cows, using drainage to water farm roads, and planting eucalyptus trees to utilize drainage.

A Successful Program

The farmers have met discharge limits under this compliance system, demonstrating that farmers can be held accountable for the pollution they produce. The farmers also obtained an NPDES-style state permit containing load limits for selenium. To our knowledge, this permit is the first state permit containing effluent load limits that has ever been issued to farmers.

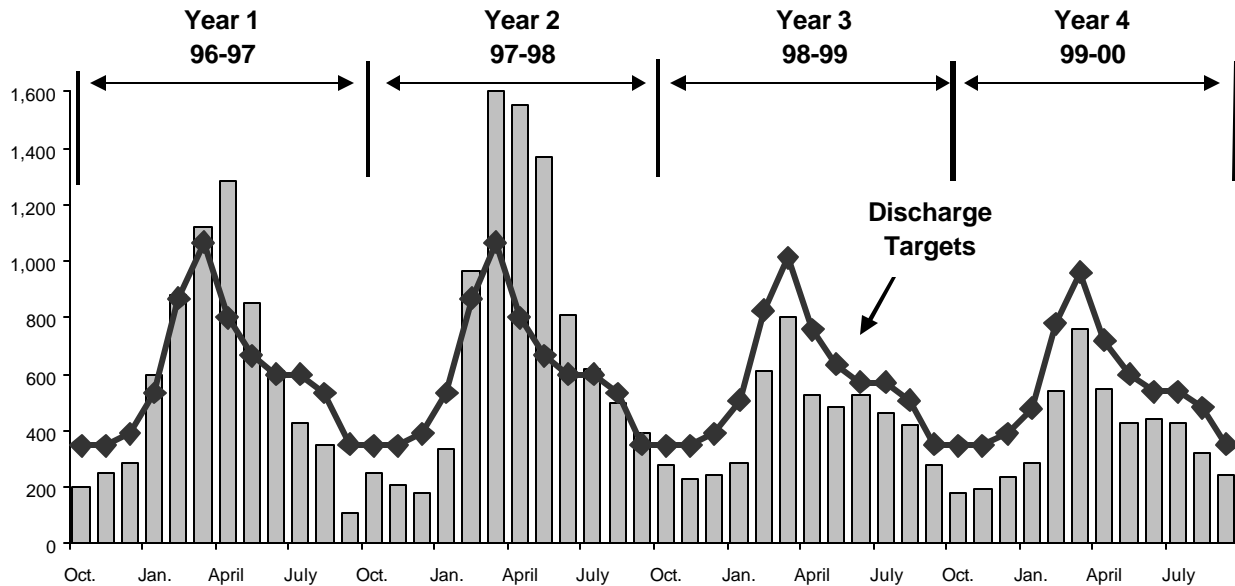
All parties involved benefit from the results of the program:

- Farmers benefit from the decentralized decision-making process that preserves their flexibility to respond to changes in economic, environmental, and technological conditions. Moreover, the economic incentives in the program have provided financial rewards for innovative pollution control methods. Local control also has promoted the farmers' perception that both responsibility and benefits are equitably allocated.
- State and federal regulatory agencies benefit from the administrative ease of enforcing the program. The Bureau of Reclamation signed one contract, and the state issued a single permit.

- Environmentalists applaud the reduction in nonpoint source pollution. By the third year of the program, discharges were only 75% of the allowable load. By the end of the fourth year, discharges were only 77% of the allowable load. By the end of the five-year contract, selenium discharges will be 15% lower than the historical amounts. (See figure.)

Cloning the Program

Grassland Area Monthly Selenium Discharges



* February - June 1998 (Year 2) discharges were declared by the Grassland Bypass Oversight Committee as "unforeseeable and uncontrollable", due to record-breaking rainfall in the El Nino year.

Data Sources: San Francisco Estuary Institute Monthly Data Reports. All data are selenium loads at Station B.

Although the Grasslands program may seem unique at first, the prerequisites for setting up similar programs elsewhere are not unusual. And the need to use performance-based systems for nonpoint source pollution control has recently mushroomed. In order to implement provisions of the Clean Water Act, the U.S. Environmental Protection Agency is requiring the development of 40,000 "Total Maximum Daily Load" (TMDL) allocations. TMDLs, which are required for every waterbody that will not meet water quality standards under current regulatory programs, describe how much pollution can be discharged into a local waterbody and by whom. Because approximately 45% of these TMDLs apply to nonpoint source pollution, the Grassland program may provide an example to many locations around the U.S.

Based on the Grasslands experience, it appears that the following requirements must be met to establish a program that requires agricultural sources to meet a quantified performance standard.

- Motivation to meet water quality standards. For any system to function, farmers must become convinced that complying with water quality standards is preferable to living with the consequences of noncompliance. Given this shift to accountability for pollution discharges, farmers respond well to performance standards that give them local control over their farming practices.
- Legal mechanisms and an institutional structure to regulate districts and farmers. California is unusual in that its legal authority to directly regulate pollution discharges from farms includes a mechanism to specify effluent limits. This authority, however, proved unnecessary in the Grasslands

case. A contract for federal privileges was used instead. Water and drainage districts provide the requisite institutional structure because the districts have broad authority to govern water distribution and use. Districts can use this authority to link farmers' ability to receive water and drainage service to compliance with pollution limits.

- Discharge targets and effective measurement systems. TMDL processes, well-underway across the U.S., establish discharge targets for impaired water bodies. In order to make farmers accountable for their share of the required pollution reduction, it must be feasible to monitor either pollution outputs or an input surrogate (based on knowledge of the relationship between farm inputs and pollution outputs). Pollution outputs can be measured individually by farmers at sumps or collectively by farm districts that collect drainage from individual farms in a series of pipes.
- Enforcement capability. Successful implementation of any pollution control program requires clear and credible enforcement. In the Grasslands case, the threat of contract termination is widely regarded as the prime motivating factor for successful investment by the farmers.

This list of pre-requisites may apply to numerous areas in the arid west, particularly where the plumbing and local decision-making structure has evolved in response to federal irrigation projects. For this reason, the Grasslands program may serve as an example of a nonpoint source pollution control system that can be implemented elsewhere.

For more information, please contact Angela Sherry or Terry Young at Environmental Defense at (510) 658 – 8008. A more detailed description of the program is provided in the following references:

Austin, S. "A Tradeable Loads Program and Other Policies to Improve Water Quality in California's Grassland Area: Design, Implementation, and Lessons Learned." Harvard Law Review Article. Publishing in progress.

Congdon, C., Young, T., Gray, F. "Economic Incentives and Nonpoint Source Pollution: A Case Study of California's Grasslands Region." *Hastings West-Northwest Journal of Environmental Law and Policy*. West-Northwest. University of California, Hastings College of Law. Vol.2, No. 3. Spring 1995.

Karkoski, J., Young T. "Green Evolution: Are Economic Incentives the Next Step in Nonpoint Source Pollution Control?" *Water Policy*. Volume 2. Elsevier Science. Summer 2000.

Young, T., Congdon, C. *Plowing New Ground: Using Economic Incentives to Control Water Pollution from Agriculture*. Environmental Defense Fund. 1994.