Short Memo
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Reduction in agricultural nonpoint source pollution: California's Grassland Region

Overview

Nonpoint source pollution is the leading cause of water pollution nationwide, and agricultural runoff has been the primary contributor for decades. Young and Congdon, 1994, suggest a redefinition of the term "nonpoint source" to represent "large collections of small, independent, and controllable sources, rather than diffuse, uncontrollable, and unmonitorable sources" (1). This encourages a reachable goal of targeting and reducing specific causes and pollutant levels among regions and/or municipalities. The Grassland Bypass Project in the western San Joaquin Valley provides a working example of farmers regulating practices to reach pollutant caps and to maintain a defined water quality standard.

Creating a Means for Pollutant Reduction

National attention turned to the Grasslands region of California's Central Valley when selenium-contaminated farm drainage caused deaths and deformations of several species of birds in the Kesterson National Wildlife Refuge. By the early 1990s, drainage containing high levels of selenium continued to leach into surrounding refuges and to contaminate the San Joaquin River downstream (Environmental Defense, 2000). Selenium is a naturally occurring trace element in the soil that accumulates in irrigation drain pools, becoming a subsurface contaminant in its increased concentration.

In 1994, Environmental Defense proposed a system that could mitigate pollution levels through farmer organization and decentralized decision-making. The purpose is to control subsurface drainage through institutional creation of accountability for pollution reduction at the farm level (Young & Congdon, 1994). The system is based on economic incentives, including trade permits and effluent fees, to maintain allowable pollution loads and allocations by the most cost-effective means. Research defined specific water quality standards and determined TMDL's for the Grassland region, and calculations identified a necessary reduction in annual farm drainage by 80 to 89% in order to meet the water quality standard. The next step was to determine how to equally allocate the pollution load among responsible parties.

The study emphasizes local decision-making tailored to specific situations, but suggests for the Grassland region a combination of specific load allocations for water and drainage districts with "a more flexible within-district system designed to meet average targets at the farm level" (Young & Congdon, 1994, 5). The optimal regulatory system includes a district-level tradable discharge permit program with farm-level input fees (ibid, 9). By 1997, this system was largely being implemented through inter-district trading and partnerships.

The Grassland Area Farmers

In 1995, Grassland region farmers entered a use agreement with the Bureau of Reclamation. The agreement granted use of a portion of the San Luis Drain (a federal canal) to route farmland drainage around wetland habitat areas. In exchange for use of the canal, drainage could not violate federal law and comply with the National Environmental Policy Act and the California Environmental Quality Act requirements (Environmental Defense, 2000). The Agreement specifies a regional limit on the amount of selenium load that can be discharged by month and year and enforces this limit through penalty fees. The San Luis Drain is to be closed if selenium loads exceed 120% of the regional limit. The Agreement also allows for farmers to construct methods for compliance and required the formation of a regional entity (Environmental Defense, 2006).

This project became the Grassland Bypass Project and in 1996, the farmers formed the Grassland Area Farmers (GAF) regional drainage entity under the San Luis and Delta-Mendota Water Authority (McGahan, 1999). The project consolidates subsurface drainage on a regional level from the 97,000-acre Grassland Drainage Area.

GAF implemented a tradable loads system with section 319 funding where the total allowable regional selenium load is allocated among the member districts, who then either meet their load or buy/trade allocations from other districts (EPA, 1999). Each district can then develop its own methods to meet the allowable load through economic incentives and best practices (Environmental Defense, 2000). A primary economic incentive has been tiered water pricing, where the Bureau of Reclamation charges a subsidized rate for water consumption for up to 80% of the contracted quantity used. The last 10% is subject to standard cost, with 80-90% usage at a pro-rated cost (DOI, 1997).

The tradable loads system has been largely successful in reducing pollutant loads in the Grasslands region. GAF have also implemented several other practices to reduce selenium loads and improve water quality, including a monitoring program, utilization of salt-tolerant crops to filter subsurface drainage, installation of drainage reuse systems through irrigation, and improved irrigation systems with the use of State Revolving Funds (EPA, 1999).

Replicating the Program: Applications for Georgia?

Enhanced water quality monitoring, specific discharge limits, and increased irrigation efficiency may be able to be executed in coordination with existing policies and practices within Georgia's Department of Environmental Protection. Key aspects of the Grasslands project were legal regulations, flexibility of compliance options, and organizational partnerships. It may be possible at a regional or multiple-county level to implement such economic incentives as tiered water pricing, effluent fees, and/or allowable load trading. Within the regional level, perhaps counties and municipalities could create their own regulations as a means to achieve the specified regional TMDL levels. Alternative and efficient irrigation practices, such as drip irrigation, recycling of

drain water, and reduced use of pollutants could be explored as an enforced means to reduce nonpoint source pollutants. Monitoring and targeting specific TMDLs would be essential to formulating a mitigation plan, and, among many complexities, distributing allocations of pollutant loads among parties may be a difficulty. Low-interest State Revolving Funds and Section 319 funding incentives are existing sources from which projects could be specified. Research of current practices, as well as public interest, would allow for insight into applicability for a Georgia program.

Works Cited

Environmental Defense. *Nonpoint Source Pollution Control: Breaking the Regulatory Stalemate.* 2000.

McGahan, Joseph. "Drainage Control Activities by Grasslands Area Farmers." *Grassland Bypass Project Annual Report.* 2000-2001.

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

US DOI, Bureau of Reclamation. *Water Use Conflicts in the West: Implications of Reforming the Bureau of Reclamation's Water Supply Policies.* August, 1997.

US EPA. *Section 319 Success Stories, Vol. III.* 2000.

US Federal Register. *Continuation of the Grassland Bypass Project.* Vol. 64, No. 169. September 1, 1999.