

Weaknesses

- The program was very expensive, costing over \$200 million for 86 projects (Holden 2009, personal communication).
- Early on, the program put too much emphasis on concrete structures (e.g., barnyards), with limited public benefit. Little attention was given to cropland and streambank/lakeshore erosion control practices that are less costly and serve a greater public good but are harder to “sell” to a producer. This misplaced focus was partly due to the type of funding that could be used for hard practices (e.g., manure storage systems). Later in the project additional funding was allocated for “soft practices,” such as nutrient management and soil erosion control practices (Holden 2009, personal communication).
- Before the critical site element was added, the voluntary approach allowed some of the worst sites to go untreated if landowners refused to cooperate (Holden 2009, personal communication).
- Watersheds were often too large to be relevant to all landowners. People living far from targeted waterbodies felt less incentive to change. It also took a long time for changes to manifest and required high participation rates to see a difference in water quality (Holden 2009, personal communication).
- The last watershed project was designated in 1995. The program will end December 31, 2009.

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CAFO/AFO Nutrient Management

Overview

This accountability measure is based on regulatory mechanisms under the Clean Water Act for Concentrated Animal Feeding Operations (CAFOs) and state programs for smaller animal feeding operations (AFOs). Nutrient management plans (NMPs) provide the implementation mechanism in NPDES permits to ensure nutrients from CAFOs are not being discharged.

Description

CAFO facilities that discharge or propose to discharge are required to seek NPDES permit coverage. The most recent iteration of the national regulations for the permitting of CAFOs was signed on December 22, 2008. In determining if a facility is required to seek permit coverage, the facility's owner/operator will assess the CAFO's design, construction, operation, and maintenance to determine if the facility is discharging from or will discharge from its production area or land application area to waters of the U.S. Owner/operators are also given the voluntary option of certifying that the facility is a no discharge facility. Permitted or certified facilities are not liable under § 122.23(d)(1) duty to apply, and only permitted discharges (those authorized by a NPDES permit) or discharges defined as agricultural stormwater (precipitation-related discharges from facilities land application area) are allowed (USEPA 2008).

Those facilities seeking permit coverage must develop a Nutrient Management Plan (NMP), the terms of which must be incorporated into the NPDES permit, and thus subject to permitting authority review and public comment. Terms of the NMP to be incorporated into the NPDES permit "are the information, protocols, best management practices, and other conditions" necessary to meet the requirements of 40 CFR 122.42(e)(1), and in addition for large CAFOs the best management practices necessary to meet the requirements of 40 CFR 412.4(c) (USEPA 2008). Specifically, terms of the NMP would need to demonstrate the facility has the structural design capacity to meet the storage requirements imposed by the volume of manure, litter, and process wastewater generated from the facility. Those facilities applying manure, litter, and process wastewater must incorporate specifics regarding the fields available for land application, the rates of application, and the timing limitation for application (USEPA 2008).

Assessment of How the Approach is Working

Permitted CAFOs are required to submit annual reports detailing how the facility has achieved substantive compliance with the terms of the NMP. Annual reporting requirements include total amount of generated waste, amount of waste transferred, the facility's total land application acreage, total acreage utilized, specific crops planted, yields for each field, the nitrogen and phosphorus content of all waste land applied, the total amount of waste applied to each field, and a summary of production area discharges (USEPA 2008).

The 2008 Final CAFO Rule estimated annual pollution reductions of 56 million pounds of phosphorus and 110 million pounds of nitrogen. EPA utilized Groundwater Loading Effects of Agricultural Management Systems (GLEAMS) model, which relies on information on soil characteristics and climate, along with characteristics of the applied manure and commercial

fertilizers, to estimate losses of nutrients in surface runoff, sediment, and ground water leachate (USEPA 2008).

Specific state programs vary, though all have one year from EPA's 2008 Final CAFO Rule effective date of December 22, 2008, to revise their NPDES requirements to adopt the requirements of the 2008 Rule. States, such as New York, utilize inspectors for random and complaint-based CAFO investigations to determine compliance with state and federal water quality regulations, and to determine the adequacy of a facility's waste management system (NYDAM 2003). Illinois develops statewide annual reports summarizing yearly activities of the state regarding CAFO enforcement and compliance. This information includes facility specifics, such as the number/type of animals, as well as waste management structures and regulatory violations. The reports may detail water pollution concerns, facility specific sources of water pollution, and measures taken by facilities to correct pollution sources (IEPA 2006).

California has achieved substantive compliance with its CAFO/AFO permitting program for dairy by utilizing the California Dairy Quality Assurance Program (CDQAP), which provides dairy operators training and technical assistance. To help offset programmatic costs, the state requires permitted facilities to pay a surcharge in support of the states' Surface Water Ambient Monitoring Program (SWAMP), and pay an annual fee based on a facilities' animal population that ranges from \$200 to \$4,000. California's permitting program also includes groundwater monitoring provisions in some facilities' permit conditions (CEPA 2007). Oregon's CAFO/AFO permitting program has been in effect since the 1980's, and currently is under the authority of the Oregon Department of Agriculture (ODA), which recently implemented a NPDES permitting program. Permitted facilities are inspected, on average, once a year to determine permit compliance, and any violations require the formulation of a compliance schedule. Facilities implementing a compliance schedule will often receive routine visits by state inspectors. Oregon also utilizes a complaint based inspection system, in which facilities with validated complaints will be inspected and any problems relating to the complaint rectified (ODA 2009).

Wisconsin's Department of Natural Resources (WDNR) began regulating the handling, storage, and application of wastes from CAFOs/AFOs in 1984. All facilities with greater than 1,000 animal units are permitted via Wisconsin Pollutant Discharge Elimination System (WPDES) Concentrated Animal Feeding Operation permits. Smaller facilities are not permitted, but like larger facilities, they are required to follow agricultural performance standards and the state's four Manure Management Prohibitions. The state also utilizes complaint-based inspections to address water quality issues, with regulatory action being taken on any facilities found to be discharging. The state provides both technical and financial assistance (cost-share programs) to help facilities address water quality issues (WDNR 2008).

Summary of Strengths and Weaknesses

Strengths

- NMP approach is flexible to accommodate dynamic conditions associated with agriculture.
- Annual reporting requirements ensure permitting authority oversight and public involvement.
- Terms of the NMP are flexible to accommodate changing facility conditions but specific enough to ensure adequate nutrient management.

- Based on estimated annual nutrient reduction loads, program will achieve a significant reduction in the amount of nitrogen and phosphorous reaching U.S. waters.
- Voluntary certification option allows CAFO facilities to certify they do not discharge via submission of a signed certification option after an objective assessment of the facility by the owner/operator.
- States are able to modify CAFO permitting programs to satisfy state-specific needs and concerns.
- Successful permitting of a traditionally nonpoint source industry via modified NPDES permitting.

Weaknesses

- Site-specific inspections are resource intensive.
- Legislative history has promoted confusion and atmosphere of inaction among states and producers, as stakeholders await further litigation.
- No nationwide assessment of programmatic success or goals to judge water quality and pollution reduction programmatic success; success seems measured more by administrative outcomes (number of facilities permitted) rather than environmental outcome-based performance.
- Large degree of variability among states regarding enforcement and compliance actions, including frequency and reasons prompting facility inspections.
- Receiving water monitoring is not explicitly required by the 2008 CAFO Final Rule; principal focus is to monitor land application (e.g., routine soil testing, determining nutrients in land-applied wastes).

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California Agricultural Water Quality Grant Program

Overview

The Agricultural Water Quality Grant Program (AWQGP) provides grants to eligible recipients for projects that reduce or eliminate the discharge of nonpoint source pollution (NPS) to surface waters from agricultural lands (SWRCB 2007).

Description

The AWQGP is administered by the State Water Resources Control Board (SWRCB) and given to public agencies and non-profit organizations (SWRCB 2007). Funding sources for the AWQGP include state bond monies and Clean Water Act (CWA) section 319 funds listed below.

- State Proposition 40 and 50: Coastal Protection Act of 2002 (Proposition 40) and Coastal and Beach Protection Act of 2002 (Proposition 50) were passed in 2002 by California voters. The propositions authorized the sale of bonds to finance a variety of resource programs, including the AWQGP. Under Proposition 40 and 50, grants are available for \$11.4 million and \$29.5 million, respectively, for agricultural water quality improvement through monitoring and implementation of NPS management measures and practices (SWRCB and RWQCB 2004).
- State Proposition 84: Starting in fiscal year 2007–2008, \$15 million has been allocated for AWQGP (DOF 2008).
- Federal CWA Section 319: Under section 319, EPA provides funding to SWRCB to support implementing the *Plan for California's Nonpoint Source Pollution Control Program* (NPS Program Plan). The SWRCB uses some of the section 319 funds to provide grants for NPS implementation projects. Approximately \$5.5 million is available under this funding source (SWRCB and RWQCB 2004).

To further define and identify the source of water quality problems related to agriculture, the state uses funds outlined under Proposition 40 for surface water quality monitoring projects, referred to as Project Planning Monitoring. These projects must be used to develop a plan to implement appropriate management measures to address the identified water quality problem. Proposition 50 and section 319 monies are used to fund implementation projects that demonstrate immediate and long-term improvements to surface water quality (SWRCB and RWQCB 2004).

Proposals are evaluated in two stages. First, SWRCB and Regional Water Quality Control Board (RWQCB) staff review all proposals for completeness and eligibility, and then rank them for funding priority. Second, SWRCB request technical assistance for proposal review from agencies including RWQCB, USEPA, USGS, and external agencies⁵. All eligible proposals undergo a thorough review and ranking process by which the appropriate funding source is determined. All

⁵ The SWRCB requests technical assistance for proposal review from the state and federal agencies including: California Department of Pesticide Regulation; California Department of Water Resources; California Department of Food and Agriculture; UC Cooperative Extension; USEPA, United States Geological Survey; and United States Department of Agriculture.

projects must be consistent with the NPS Program Plan and either implement appropriate management measures or monitor water quality (SWRCB and RWQCB 2004).

Each implementation project must include a plan to evaluate project effectiveness, specific information as delineated in the proposal guidelines, and a plan to document results including water quality improvement. A monitoring plan and Quality Assurance Project Plan (QAPP) with associated schedules and budgets are required for all projects that include water quality monitoring. Qualified impartial experts must assist in developing and implementing the plan and certifying the results (SWRCB and RWQCB 2004). Plans are selected by the Project Selection Panel (consisting of one member from the agencies listed above) and must be approved by SWRCB before funds can be allocated.

Projects selected for funding under AWQGP are required to spend grant funds according to the approved project scope and budget. SWRCB requires progress reports (no less than quarterly) for all projects and conducts site visits during construction of each development project. Payment requests must include a certification by the grantee that each expense complies with requirements outlined in the grant agreement. Grantees must also submit supporting documentation for each expense, with reimbursements approved only for eligible expenses pursuant to program guidelines and contained within the approved project budget (SWRCB 2007).

SWRCB prepares and presents an annual project accounting report on projects under AWQGP to the Department of Finance (DOF) and DOF performs audits on select projects. SWRCB maintains a publicly accessible Web site listing all current projects by program, the funding source, and the timeframe for completion (SWRCB 2007).

All projects funded through AWQGP receive a close-out site visit conducted by SWRCB or RWQCB staff when a project has been completed. The purpose of the close-out site visit is to ensure all project components were completed according to program guidelines and the terms of the grant agreement, including project scope and budget. Grantees must submit a final report, which documents the outcomes of the project and summarizes all project data and expenditures. In accordance with all current laws and regulations that apply to the project, grantees must also submit documents summarizing total project costs and all additional funding sources. The SWRCB is enhancing its Web site to post final project reports (SWRCB 2007).

Assessment of How the Approach is Working

There is limited information available on the effectiveness of AWQGP. There seems to be little public information available on what projects were accepted, progress of those projects, the results, and final assessments. Therefore it is difficult to assess the implications for future NPS pollution reduction policies.

DOF conducted an audit on bond funds in *An Audit of Bond Funds: State Water Resources Control Board Propositions 13, 40, and 50* (2008) to determine whether SWRCB awarded and expended bond funds that were consistent with applicable legal requirements and established criteria, and whether SWRCB had adequate project monitoring processes. DOF concluded that there is a lack of supporting documentation and that SWRCB does not always monitor the financial aspects of bond funded projects to ensure eligibility of project costs (DOF 2008).

However, it is not possible to draw specific conclusions about AWQGP from the DOF report. The report does not list specific projects audited, but rather highlights general trends.

Summary of Strengths and Weaknesses

Strengths

- Specific grants geared towards finding a solution to the reduction of NPS pollution from agriculture may hold the key to future reduction.
- Projects with this specific goal will not have to compete against other NPS pollution funds.
- Project assessment at various stages will help determine the success of future projects.

Weaknesses

- There is little public information available on whether or not the project had been successful and how it can be improved.
- It is unclear whether funds were actually used in compliance with project guidelines. There may be insufficient oversight by SWRCB.

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Delaware's Nutrient Management Program

Overview

The Delaware Nutrient Management Program was established in June 1999 under the Delaware Nutrient Management Law to regulate activities involving the generation and application of nutrients and to protect water quality. The Delaware Nutrient Management Commission (DNMC) (also established by the Law) is responsible for directing the program and developing regulations pertaining to nutrient management, waste management for animal feeding operations (AFOs), and National Pollutant Discharge Elimination System (NPDES) permits for concentrated animal feeding operations (CAFOs) (DDA, n.d.).

Description

The Nutrient Management Program, as defined by the Nutrient Management Law, consists of the following (DE, 2009):

- Certification of persons directly involved with generating or applying nutrients within Delaware.
- Development and implementation of best management practices (BMPs) designed to improve water quality, optimize nutrient use, and maintain a profitable agricultural industry in the state.
- Establishment of educational programs instructing on the use of BMPs.
- Development of a method for certifying applicants by testing comprehension of BMPs.
- Any other programs established by the Commission.

More specifically, the Nutrient Management Law states that all affected operations must have nutrient management plans in place by dates specified in the Law. Operations that generate manure, but do not land apply any nutrients, must develop an Animal Waste Management Plan (Hanson, 2002). In addition, at least one person from each operation must become certified by participating in approved classroom instruction (Hansen and Binford, 2004).

The Law affects two categories of people (Hanson, 2002):

1. Those who operate any animal feeding operation in excess of 8 animal units (8,000 pounds).
2. Those applying nutrients to land in excess of 10 acres as a component of a commercial venture.

In addition to farmers, commercial nutrient applicators (e.g., fertilizer companies), golf courses, school districts, lawn care companies, and landscaping firms must develop and implement nutrient management plans (Hanson, 2002).

The Delaware Department of Agriculture provides a suite of services as part of the Nutrient Management Program (DDA, n.d.):

- Nutrient Management Relocation Program: This is a cost assistance program to assist in the transport of manure from areas of excess manure to areas in need.

- Delaware Manure Matching: This service provides names and contact information for manure providers, receivers, and manure brokers/transport agents.
- Complaints and investigations: DDA staff members handle and resolve complaints related to manure management and general nutrient management practices.
- Nutrient Management Planning Program: This is a cost assistance program for implementing nutrient management plans. Cost share is available at \$5 per acre for a 3-year plan. Funds are provided on a first-come-first-serve basis.
- Certification and Education: Individuals must be certified if they:
 - Apply nutrients to 10 acres or greater.
 - Operate an animal feeding operation of 8 animal units or greater.
 - Apply nutrients to lands as a component of a commercial agriculture business in exchange for a fee or service charge.
 - Advise or consult with persons as part of the development of a Nutrient Management Plan.

Assessment of How the Approach is Working

By 2008, 92,157 tons of excess poultry litter was relocated to alternative use projects, 355,984 acres of nutrient applied farmland was managed under a current nutrient management plan with assistance from the program, 44 nutrient management compliance complaints had been resolved, and 12 farms were managed under an EPA CAFO permit administered by the program (UDaily, 2008). In addition, more than 2,600 individuals have attended nutrient management certification classes since 2001 (UDaily, 2008).

Summary of Strengths and Weaknesses

Strengths

- The Law applies to both agricultural and non-agricultural lands.
- The Law and regulations require certification. Certification requires continuing education to keep all certified generators, handlers, and consultants up-to-date with recent information and requirements.
- The Law requires phosphorus limited nutrient management plans and application rates.
- Local conservation district offices have certified planners that will write free plans (Hanson, 2002) and the Nutrient Management Program provides funding to farmers who hire private consultants.
- Regulations require that all nutrient handlers maintain records of nutrient handling, storage, application, and disposition.
- Regulations require that farmers submit an annual report to the Nutrient Management Program.

Weaknesses

- The program emphasizes education, there is little in the way of a regulatory component.
- The program relies heavily on “professionalism, judgment and experience” of certified consultants to develop reasonable recommendations (Bill Rohrer, from Hanson, 2002). The plans are only as good as the certifiers and their certifications.

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Iowa Livestock Water Quality Facilities Program

Overview

The Livestock Water Quality Facilities Program (the Program), started in 2006, offers low-interest loans through participating lenders to Iowa livestock producers for projects to prevent, minimize, or eliminate nonpoint source (NPS) pollution of Iowa's rivers and streams from animal feeding operations (IFA undated).

Description

The Program is one of four financing programs through the Iowa Water Quality Loan Fund, the NPS fund of the Clean Water State Revolving Fund (CWSRF), which helps Iowans address NPS water quality problems (Iowa State University 2005; Iowa DNR undated). The Program is operated by the Division of Soil Conservation (DSC) and the Iowa Department of Natural Resources (DNR), with the Iowa Finance Authority (IFA) acting as the financial agent. Local Soil and Water Conservation Districts (SWCDs) help with Program implementation (IFA undated; Iowa DNR undated).

Loans funded under this program are available to livestock and poultry producers who are not required to have a National Pollutant Discharge Elimination System (NPDES) permit (Iowa DNR 2008). Types of eligible projects include lagoons, manure management structures, equipment⁶, vegetative filters, and development of manure management plans. Assistance is limited to existing facilities for animal feeding operations with less than 1,000 total animal units⁷ (IFA undated; Iowa State University 2008).

For riparian water protection practices, such as grass waterways, terraces, pasture or hayland planting, streamside forest buffers, and filter strips, the loan amounts can range from \$5,000 to \$50,000, with a loan term of up to 10 years. For manure management projects, developing manure management plans, and construction of manure management structures, the minimum loan amount is \$10,000 with no maximum loan amount for a loan term up to 20 years (Iowa State University 2008).

The following process is used to allocate funds and monitor projects (IFA undated):

- A landowner must receive project approval prior to receiving a loan from the local SWCD and complete the online loan application.
- After the project has been completed, inspected, and certified by local Natural Resources Conservation Service (NRCS) staff, DSC approves the project and loan amount online.
- IFA approves the application and provides funding to the borrower. The interest rate charged will not exceed 3% and borrowers can finance up to 100% of the project cost.

⁶ Due to high demand for the loans, DNR and IDALS reprioritized funding requests. Manure management equipment was funded when the Program started, but was not eligible after October 2008 (Iowa DNR, 2008).

⁷ 1,000 animal units are equal to 1,000 beef cattle, 700 mature dairy cattle, or 2,500 finishing swine.

By 2008 109 projects had been funded, totaling more than \$7 million. The average loan amount for the funded projects was \$65,000 (Iowa State University 2008).

Assessment of How the Approach is Working

The Program has been so successful that livestock producers have requested nearly all of the \$12 million allotted for this year in the first three months of the 2009 fiscal year. Due to the high demand for the loans, DNR and IDALS have prioritized funding requests, and since October 2008 no longer fund loans for manure management equipment. This change will leave more loan money for practices that offer more benefits to water quality (Iowa DNR 2008). One reason for the success of the program is producers' willingness to address existing problems. However there seems to be little information publicly available, such as monitoring data, on direct impacts that the program has had.

Summary of Strengths and Weaknesses

Strengths

- The Program is a source of low-cost financing available to landowners. This opportunity is available specifically to assist and encourage landowners to address NPS pollution of Iowa streams and lakes.
- Applications are accepted any time of the year and turnaround time is quick (characteristic of the CWSRF) (IDALS undated).
- Quick loan processing and friendly loan repayment terms let borrowers implement projects right away (characteristic of CWSRF) (IDALS undated).
- Significant cost savings; interest rates are well below other financing sources (characteristic of CWSRF) (IDALS undated).
- Complements other funding sources; can be used to provide project share costs for other funding sources (characteristic of CWSRF) (IDALS undated).

Weaknesses

- The program is so popular that the state has had to reprioritize funding. Manure management equipment will no longer be funded under the program (Iowa DNR 2008).
- It is unclear what direct impacts the program has had on water quality. Monitoring data before and after the implementation of the program may be one way to prove that the program has been successful.

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Kansas Clean Water Farms—River Friendly Farms Project

Overview

The Clean Water Farms Project (CWFP) was initiated in 1995 by the Kansas Rural Center (KRC). With the 2001 use of the River Friendly Farm Environmental Assessment, CWFP became the Clean Water Farm—River Friendly Farm Project (CWF-RFFP) (KRC 2007a). CWF-RFFP helps farmers and ranchers in Kansas adopt land management practices to address water quality issues involving nonpoint source (NPS) pollution (Kansas University 2007).

Eligible practices include planning and implementing extended legume-based crop rotations; use of cover crops, buffer strips, riparian filter strips, field grass filter strips, and stream bank stabilization efforts; livestock management systems that reduce confinement feeding and potential pollution; livestock waste management systems that limit potential pollution from feedlots, wintering, feeding, and storage; high residue cropping systems; conversion to no-till or minimum till with a planned crop rotation; household wastewater systems (e.g., septic); and construction of fuel containment structures (KRC 2007a).

Description

The KRC is a non-profit research, education, and advocacy organization, working to promote an environmentally sound, economically viable, and sustainable system of agriculture (French et al. 2001). Since 1995, with funding from EPA Clean Water Act section 319 NPS funds through the Kansas Department of Health and Environment (KDHE), KRC has been able to offer cost-share and planning assistance to Kansas farmers and ranchers willing to adopt clean water farming practices in vulnerable watersheds (KRC 2007b).

Since 2001, the CWF-RFFP has included the use of the River Friendly Farm Environmental Assessment. The River Friendly Farm Environmental assessment consists of a notebook with questions to help farmers assess and score the status of soil conservation, nutrient management, pest management, and livestock waste utilization on their farms. Most farmers can complete the assessment within a day and a half, using information they already have from conservation plans, aerial maps, and field and yield data (KRC 2007a). The project assessments and costs share demonstrations have been incorporated in the state's Watershed Restoration and Protection Strategy (WRAPS) since 2005.

For farmers or ranchers to receive a grant through CWF-RFFP the following steps are taken (KRC 2007a):

- Participating farmers complete the environmental self-assessment for their farms with assistance from KRC staff. The farmer develops an action plan to protect or improve water quality on the farm. Farmers who complete the assessment and develop an approved action plan are eligible for a \$250 incentive payment.
- With an approved action plan, farmers and ranchers are eligible to apply for up to \$5,000 in cost-share funds to implement their plan, which can be used in conjunction with state and federal cost-share programs.

- To be eligible for the incentive payment or cost share program, participants must operate or own a farm or ranch within a WRAPS watershed or high priority total maximum daily load (TMDL) watershed area.
- A CWF-RFFP advisory team will review the action plans and cost share applications for approval. CWF-RFFP staff will work with individual farmers through all phases of the project: completing the assessment; developing the action plan; identifying possible solutions; and monitoring progress.
- Cost-share recipients must match the requested cost share funds with an equal value of labor, machinery or land use, and/or purchased materials.
- At the completion of the project, a final accounting of expenditures and contributed resources is required. If funded at the full \$5,000 limit, the project is considered a “demonstration project” and the participant will be asked to host a farm tour or share information through workshops or other outreach methods.
- KRC monitors the completion of the BMPs and final payments of cost-share dollars are not made until the projects are verified.

Assessment of How the Approach is Working

By September 2001, KRC had provided nearly \$150,000 in cost-share funds to 35 farmers and ranchers through the CWRF. These farms and ranches were located in 20 counties and covered over 24,000 acres within eight of the 12 major river basins in the state. The size of the participating farms ranged from 60 acres to over 5,000 acres, and covered a wide range of operations and management styles (French et al. 2001).

By 2005, there had been over 80 on-farm demonstrations, farm tours, workshops, and feature stories in the media. Through these KRC has brought good examples or models of clean water farming practices to hundreds of other farmers and ranchers (KRC 2007b).

Summary of Strengths and Weaknesses

Strengths

- Better defined farm goals and a clear plan for achieving those goals (KRC 2007a).
- Farmer control over the process; assessment of information remains confidential (KRC 2007a).
- Improved conservation management, which translates into money saved (KRC 2007a).
- Improved position for qualifying for cost-share funds from a variety of sources (KRC 2007a).
- Better position to comply with (or avoid) future environmental regulation (KRC 2007a).
- Incentive for farmers to implement these management practices.

Weaknesses

- Marketing of the program: not all farmers or ranchers know about this program.
- KRC does not measure the load reductions, or impacts of the installed BMPs. KRC provides the information (acres, feet, livestock units involved, etc.) to the KDHE to calculate the benefits.

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North Carolina Agriculture Cost Share Program (ACSP)

Overview

North Carolina's Agriculture Cost Share Program (ACSP) is a voluntary program designed to protect water quality by installing best management practices (BMPs) on agricultural lands. The program is supported by "financial incentives, technical and educational assistance, research, and regulatory programs provided to farmers by local soil and water conservation districts" (NCDENR undated).

Description

The ACSP was established in 1984 in response to nutrient enrichment concerns in two Piedmont lakes. The program originally included 16 counties in the watersheds of Jordan Lake, Falls Lake, and the Chowan River Basin, but was expanded to all 100 counties in North Carolina in 1990 (Williams 2007).

The ACSP provides landowners and renters of existing agricultural operations (in operation for more than three years) with cost-sharing funds and technical design assistance. Farmers submit applications for the program with their local soil and water conservation districts. Applications are accepted and reviewed on a rolling basis, and ranked based on county resource concerns (NCDENR undated).

Farmers receive up to 75 percent of the pre-determined average cost of installed BMPs (up to \$75,000/year) used to protect water quality in streams adjoining their agricultural lands (NCDENR undated). Farmers may supply the remaining balance through a financial contribution, existing materials, or labor (CCSWCD undated). The ACSP also provides up to 50 percent cost share for technical positions in the districts (districts must match with local funds) (Williams 2007).

Approved BMPs include vegetative, structural, or management systems that can improve the efficiency of agricultural operations and reduce the potential for polluting surface and groundwater (NSWCD undated). Installation of the BMP must be accomplished within 3 program years, beginning with the program year in which the cost share contract was approved (NCDENR 2007). Also, BMPs must be maintained for ten years and are subject to random checks by Division staff and the District personnel. Farmers who fail to keep their BMPs in proper working order are subject to repaying some or all of the original cost share funds (NCDENR 2007).

Overview of Program Responsibilities (Williams 2007)

- The North Carolina Soil and Water Conservation Commission sets program requirements and allocates funds to districts.
- Local soil and water conservation districts establish local priorities, solicit and rank applications, prepare/approve conservation plans and contracts and submit them for state approval, oversee and assist practice implementation, certify installation according to standards, conduct maintenance spot checks, and enforce contracts.
- The North Carolina Division of Soil and Water Conservation is responsible for the overall program development and administration, and approval of contracts and payments.

- Natural Resources Conservation Service supplies technical standards, design and job approval authority, and advice technical aspects.
- The North Carolina Cooperative Extension Service researches and develops new practices and develops tools to quantify benefits.

Annual funding for the program is \$5.24 million for financial assistance (monies paid directly to farmers for BMP installation) and \$2.45 million for technical assistance (monies allotted to Soil and Water Conservation Districts to fund new positions or support program implementation) (as of 2007) (Williams 2007).

Assessment of How the Approach is Working

In 2007, \$8.2 million was allocated for 1,412 contracts. Prominent BMPs include poultry litter storage structures, livestock exclusion and alternate watering systems, cropland conversions to grass and trees, cover crop incentives, and mortality management systems (Williams 2007).

By the end of 2007, nearly \$143 million had been expended through 48,000 contracts, nearly 1,000 miles of livestock exclusion fencing has been installed, over 2,000 waste management systems have been installed, over 600,000 acres have been converted to conversion tillage or long term no till, 17,000 acres of riparian buffer have been installed, and 128,000 acres of sensitive cropland have been converted to permanent vegetation or wildlife cover (Williams 2007).

From 1998 to 2007, more than 6.8 million tons of soils have been saved annually, nitrogen losses were reduced by more than 19 million pounds, and phosphorus losses were reduced by more than 5 million pounds (Williams 2007).

Summary of Strengths and Weaknesses

Strengths

- By providing funding for technical employees in the districts, ACSP provides technical support for planning and installation, which builds district capabilities (Williams 2007).
- The program helps build resources for districts to respond to water quality needs.
- Infrastructure developed for this program can be used for other programs (nearly 20 different special programs use ACSP infrastructure) (Williams 2007).
- ACSP provides a ready source of non-federal match funds for federal grants, which encourages districts to apply for grants (Williams 2007).
- Projects are prioritized based on watershed needs.

Weaknesses

- The program lacks a strong evaluation aspect, limiting the potential for future analysis and correction.
- The program is not universally applied because it is voluntary.
- The only stated goal of the program is to “reduce the input of agricultural nonpoint source pollution,” there are no specific reduction goals (NCDENR, 2007).
- No publicly available information was found regarding numeric targets.

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Ohio Agriculture Pollution Abatement Program

Overview

Ohio's Agriculture Pollution Abatement Program (APAP) provides farmers with cost share assistance to develop and implement best management practices (BMPs). This voluntary program provides agricultural producers with state funds to alleviate associated financial burdens (ODNR undated).

Description

APAP was created in 1979 and is used by Ohio Department of Natural Resources, Division of Soils and Water Conservation (ODNR-DSWC) and Soil and Water Conservation Districts (SWCDs) to reach out to farmers to promote the wise use of BMPs and help resolve pollution problems to prevent pollution on many small and medium sized agricultural farms (OLEPTF 2008).

ODNR-DSWC administers APAP, and it is implemented locally by all 88 soil and water conservation districts. Depending on the BMP installed, the program offers three levels of funding caps: high (\$15,000), medium (\$10,000), and low (\$5,000) (ODNR undated).

If other public funds are involved in cost sharing to establish eligible BMPs, state funds can only be used to the extent that the combined allocation of public funds amount to no more than 75% of the cost of establishing the BMPs, or not more than \$15,000 per person per year, whichever is smaller (OAC 2005a). However, the \$15,000 maximum in public funds per person per year limit may be waived by majority vote of the Ohio Soil and Water Conservation Commission (OAC 2005a).

Restrictions on use of cost share funds include the following (OAC 2005a):

- Eligible practices which, through natural causes have lost their effectiveness, will qualify for further financial assistance. However, cost share monies will not be awarded to reestablish previously installed practices that have deteriorated due to operator negligence or mismanagement.
- Surface mined lands and oil and gas well drilling areas must have been reclaimed and be in active agricultural production or silvicultural uses as determined by the district to be eligible for cost sharing on needed conservation practices.
- Cost share funds may only be used for those practices necessary to control agricultural pollution as determined by the district with the approval of the chief of the division of soil and water conservation.
- Cost share funds will be available only to owners with a current operation and management plan.

All practices must meet the standards and specifications listed in the Ohio NRCS *Field Office Technical Guide*. If the *Field Office Technical Guide* does not apply, practices must meet standards and specifications approved by the chief of the division of soil and water conservation (OAC 2005a). Farmers wanting to know more about the program should contact their local SWCD for more information.

Assessment of How the Approach is Working

APAP is now entering its 30th year. Little publicly available information is available, however, on whether water quality improvements have been realized and how many agricultural operations have benefitted from the program.

Summary of Strengths and Weaknesses

Strengths

- The program provides valuable monetary assistance for BMP implementation for agricultural operations (ODNR undated).

Weaknesses

- This is a voluntary program and does not include enforcement provisions that allow the state to take action against an agricultural operation unless a complaint is submitted by a third party (DSWC, other agencies, or private citizens). One potential method for enforcement or penalty: if any person fails to comply with an order of the chief (of SWCD, OHDNR) they are guilty of a misdemeanor of the first degree. Action can also be taken if a person is found to have created some sort of danger to public health (OAC 2005b).
- There are no goals for water quality or load reduction.
- The program does not address all sources of NPS nutrients.

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Virginia Agricultural Stewardship Act

Overview

This accountability method is based on a regulation in Virginia, which allows the state to address water pollution concerns, including nutrients, posed by agricultural operations by utilizing a complaint-based system that affords voluntary compliance, with regulatory action available to the state in the event of continued noncompliance.

Description

In response to increased public concerns for a clean environment, Virginia's agricultural leadership sought a way of addressing agricultural water pollution that was different from previous approaches used with other industries, such as manufacturers. Most manufacturing plants must obtain permits and follow strict rules of operation. The agricultural community desired a different approach that did not rely on permits and strict operating rules, but took into account the wide variety of farming practices used in Virginia.

The state's Agricultural Stewardship Act (ASA) offers a positive approach to addressing pollution involving agricultural operations. The ASA provides procedures by which individual agricultural producers can be alerted to areas of their operations that may be causing water pollution. Rather than developing regulations with strict rules governing every type of farming practice, the ASA looks at each farm individually (VDACS 2004).

Assessment of How the Approach is Working

The procedures under the ASA are initiated when a complaint is made to the Commissioner of the Virginia Department of Agriculture and Consumer Services (VDACS). The Commissioner must accept those complaints alleging that a specific agricultural activity is causing or will cause water pollution. After the Commissioner receives a complaint warranting further investigation, the local soil and water conservation district (District) is contacted to determine whether the District wishes to investigate the complaint. If the District does not wish to investigate the complaint, the Commissioner will conduct an investigation. The purpose of the investigation is to determine whether the agricultural activity that initiated the complaint is causing or will cause water pollution. If no causative effect is found from the activity in question, the Commissioner will dismiss the complaint (VDACS 2004).

If the agricultural activity is causing or will cause water pollution, the owner/operator of the agricultural facility is given an opportunity to correct the problem. The owner/operator is tasked with the development of an agricultural stewardship plan that contains "stewardship measures" (i.e. best management practices), corrective measures to address the source of the water pollution or mitigate its impact on surface waters, as well as an implementation schedule (VDACS 2004). The District reviews the owner/operator's plan and makes recommendations to the Commissioner. If the Commissioner approves the plan, VDACS requests the owner/operator to implement the plan within 18 months (VDACS 2008).

If the owner/operator fails to implement stewardship measures after a plan is approved, enforcement action under the ASA is taken against the owner/operator in the form of levied

finer. In some cases, the ASA investigation will not produce sufficient evidence to support the conclusion that the agricultural activity in question is causing or will cause pollution. In those cases, the investigator will determine if the owner/operator is receptive to voluntarily implementing best management practices that will prevent future complaints (VDACS 2004).

The ASA also requires that the Commissioner develop and distribute an annual summarization of all ASA cases received and processed. The Virginia Agricultural Stewardship Act Annual Report includes an analysis of official complaints (those warranting further investigation) that categorizes complaints based on agricultural activity, the pollutant type responsible for the complaint (nutrients, sediments, and toxins), and the results each investigation grouped into founded, unfounded, dismissed, and carryover. The annual report also highlights the educational efforts undertaken by VDACS over the previous year (VDACS 2007)

Summary of Strengths and Weaknesses

Strengths

- Effective complaint based regulatory scheme of nonpoint agriculture
- Effective means of enforcement via fines
- Achieves program accountability via the Virginia Agricultural Stewardship Act Annual Report
- Transparent and simplistic process allows for quick action on agricultural pollutant sources and adequate remediation to address the problems
- Efficient use of state resources achieved via initial screening of complaints to determine those that warrant further action
- Holds nonpoint sources accountable

Weaknesses

- Investigative responsibilities of the Commissioner and Districts is not well defined, which may create confusion and lend to programmatic hurdles
- The annual report does not include any information concerning programmatic successes in terms of pollution reduction, instead success seems to be focused on administrative outputs, such as the number of complaints addressed
- The voluntary aspect of the ASA should offer the producer some incentive other than avoiding further complaints, which could be expert advice and logistical and economic support
- There are no goals or benchmarks for total nutrient reductions
- Not all sources are held responsible for reducing loads, just those with a complaint
- Equitability issue arises from the fact that those farms around higher population areas have an increased chance of being cited
- No quantification of loading or reductions

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Wisconsin Nonpoint Source Performance Standards and Prohibitions

Overview

The Wisconsin Department of Natural Resources (WDNR), in conjunction with the Department of Agriculture, Trade, and Consumer Protection (DATCP), manages legislation regulating nonpoint source (NPS) pollution from agricultural and urban areas. WDNR administers regulation NR 151 (in effect since October 2002), which contains agricultural cropland and livestock performance standards, manure management prohibitions, and non-agricultural performance standards for construction site erosion control, post-construction stormwater runoff and runoff from established urban areas (Holden 2009, personal communication). DATCP administers regulation ATCP 50, which outlines the technical standards required to implement the agricultural performance standards (including manure management prohibitions) in NR 151. Performance standards for non-agricultural construction/post-construction, developed urban areas (including turf management) are administered through NR 216, Storm Water Discharge Permits. Both the WDNR and DATCP administer state cost share programs to help farmers achieve compliance with the agricultural standards and prohibitions. WDNR administers cost share programs to assist urban municipalities in meeting non-agricultural performance standards.

Description

Agricultural Standards

All cropland and livestock operations in Wisconsin, regardless of size, must abide by the agricultural performance standards and manure management prohibitions established in NR 151. These include:

- Cropland Performance Standards
 - Reduce cropland soil erosion to meet tolerable soil loss (T)
 - Manage nutrient applications of fertilizer and manure to meet crop needs and reduce delivery of nutrients to waters of the state
- Livestock Performance Standards
 - Construct manure storage facilities to accepted standards
 - Properly close abandoned manure storage facilities
 - Abandon, upgrade or replace failing or leaking manure storage facilities
 - Divert clean water around feedlots in water quality management areas (300 feet from streams, 1,000 feet from lakes and in areas susceptible to groundwater contamination)
 - Manure Management Prohibitions
 - No overflow of manure storage structure
 - No unconfined manure stacks in Water Quality Management Areas
 - No direct runoff from feedlots or stored manure to waters of the state
 - No unlimited livestock access to waters of the state such that adequate sod cover is not maintained

ATCP 50, the companion regulation to NR 151, identifies the technical standards that can be used to comply with the agricultural performance standards set in NR 151. Many of the technical standards offered in ATCP 50 cross-reference NRCS technical standards.

Most agricultural performance standards and prohibitions became effective on October 1, 2002. Some exceptions were:

- Standards for new cropland went into effect October 1, 2003.
- Nutrient management standards for areas draining to outstanding, exceptional or impaired resource waters, or in source water protection areas, went into effect on January 1, 2005.
- Nutrient management standards for areas draining to all other waters went into effect on January 1, 2008.

Compliance with agricultural performance standards and prohibitions for cropland practices and livestock facilities in place prior to the effective date of the standard can only be required if a bona fide cost share offer is made to the landowner or operator. This is true whether the compliance requirement is imposed by a state agency under NR 151 or by a local governmental unit under local ordinance. This offer must be 70% (90% in cases of economic hardship) of the actual installation cost of required best management practices. Eligible best management practices are set forth in cost-share programs administered by DATCP (ATCP 50) and DNR (NR 153). Funding for the offer can be from any source (federal, state, local private nonprofit). If an offer is refused by the farmer, compliance can be required regardless of any future cost-share offer. In some cases, cross-compliance requirements impose compliance with NR 151 standards and prohibitions regardless of any additional cost sharing. This is the case for farmers that collect farmland preservation tax credits, obtain a livestock siting permit or are required to hold a WPDES permit for their livestock operation. Once compliance is documented, it must be maintained by the landowner and all future landowners, heirs and assign, regardless of future cost sharing.

Urban Standards

NR 151 contains performance standards for construction site erosion, post construction runoff from new construction and runoff from established urban areas. Construction sites must reduce delivery of eroded sediment by 80%. Post-construction runoff from new development must be managed to maintain pre-development peak flow discharges, maintain 60 – 90% of the pre-development infiltration volume, protect riparian areas and control runoff from fueling and maintenance areas. In addition, established urban areas are required to reduce total suspended solids on a municipality-wide basis by 20% (as compared to no controls) by March 10, 2008 and by 40% by March 10, 2013. These standards are implemented primarily through the WPDES storm water permits for construction sites and municipal separate storm sewer systems. In addition, there are additional developed area standards that apply to permitted and non-permitted municipalities alike provided they are incorporated and have a population density of at least 1,000/square mile. This requires primarily housekeeping practices and nutrient management for larger (over 5 acres) turf areas.

No cost share requirements apply to non-agricultural construction/post-construction, developed urban area, or turf management performance standards (Holden 2009, personal communication).

Assessment of How the Approach is Working

The state provides some funding to DNR and DATCP as pass-through funding to pay for best management practices (BMPs), staff, and technical support. For 2007, DNR provided \$2.3 million for BMPs and \$1 million for urban NPS planning (money for urban BMP construction was not available that year, but \$2.4 million was provided in 2006). DATCP provided \$9.3 million in staffing and support to county land conservation departments (who implemented the agricultural performance standards and other programs) and \$4.9 million in cost sharing. The 30 percent local share is often provided by federal sources and a few county cost share programs and nongovernmental organizations. DNR also passed through \$0.9 million in Clean Water Act section 319 funds. NRCS provided \$17 million through the Environmental Quality Incentives Program (EQIP) and \$0.5 million for the Conservation Reserve Enhancement Program (CREP) (Holden 2009, personal communication).

WDNR is in the process of revising NR 151. Propositions include new agricultural performance standards and modification of several agricultural and non-agricultural performance standards (Holden 2009, personal communication).

Summary of Strengths and Weaknesses

Strengths

- Program addresses both agricultural and non-agricultural NPS (Holden 2009, personal communication).
- Program sets a minimum level of expected nutrient management measures and provides a consistent framework for implementing agricultural BMPs (Holden 2009, personal communication).
- Provides cost-share options to support initial implementation of standards.
- The concept of “once in compliance, always in compliance,” means that the state only pays once for a BMP and does not have to further cost share practices that come out of compliance (Holden 2009, personal communication).
- Regulatory component provides a structure by which the worst sites can be targeted for remediation (Holden 2009, personal communication).
- Program gives local governments authority to enact ordinances to enforce performance standards at the local level. This increases local regulatory authority and reduces the burden on the state (Holden 2009, personal communication).
- Following the adoption of NR 151, several state NPS program partners worked together to develop a detailed implementation strategy that provides additional guidelines for complying with the standards. This approach supports implementation of the performance standards.

Weaknesses

- There is often a delay in the availability of cost share funds and staff time is often spent organizing and directing project resources. This can hamper regulatory enforcement of standards, as cost sharing must be offered to a producer before an agricultural performance standard can be enforced (Holden 2009, personal communication).
- Some city leaders have protested the structure of the cost share system. Cost sharing is not required for enforcement of non-agricultural practices, which some believe to be

unfair. The decision to create different enforcement rules was done to protect farmers who cannot pass on their costs like those in the non-agricultural sector (municipalities, construction companies, etc.) (Holden 2009, personal communication).

- The program lacks planning and evaluation components, which makes it difficult to connect performance standards to water quality improvements (Holden 2009, personal communication).
- The existing suite of performance standards is not as strong as DNR originally proposed (a result of modifications required to get the legislation passed) (Holden 2009, personal communication).

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Clean Air Act: State Implementation Plans

Overview

The accountability method for the Clean Air Act state implementation plans (SIPs) is based on mandatory reporting and EPA's regulatory authority to impose sanctions on states who do not comply.

Description

The Clean Air Act (CAA), last amended in 1990, is the comprehensive federal law that regulates air emissions from stationary and mobile sources. The CAA authorizes EPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and public welfare and to regulate emissions of hazardous air pollutants (USEPA 2009). The CAA also requires states to submit state implementation plans (SIPs) to EPA which provide for implementation, maintenance, and enforcement of the NAAQS established (carbon monoxide, lead, nitrogen dioxides, ozone, particulate matter and sulfur dioxide) (USEPA 2008b; USEPA 2008e).

Only one SIP exists for each state, and revisions are necessary when new federal or state requirements are enacted, when new data improves modeling techniques, when a specific area's attainment status changes, or when an area fails to reach attainment. Revisions are usually prepared for a specific area and include an assessment of the problem and measures to fix it (TCEQ 2008).

The contents of a typical SIP fall into several categories (USEPA 2008a):

- 1) State-adopted control measures which consists of either rules/regulations or source-specific requirements (e.g., orders and consent decrees)
- 2) State-submitted comprehensive air quality plans (e.g., attainment plans, maintenance plans, rate of progress plans, transportation control plans) demonstrating how state regulatory and source-specific controls, in conjunction with federal programs, will bring and/or keep air quality in compliance with federal air quality standards
- 3) State-submitted "non-regulatory" requirements (e.g., emission inventories, small business compliance assistance programs, statutes demonstrating legal authority, monitoring networks, etc.)
- 4) Additional requirements promulgated by EPA (in the absence of a commensurate State provision) to satisfy a mandatory requirements

Each SIP revision submitted by the state must undergo reasonable notice and public hearing at the state level, and SIPs submitted to EPA to attain or maintain the NAAQS must include enforceable emission limitations and other control measures, schedules and timetables for compliance. EPA evaluates submitted SIPs to determine if they meet the CAA's requirements. If a SIP meets the Act's requirements, EPA will approve the SIP. EPA's notice of approval is published in the Federal Register and the approval is then codified in the Code of Federal Regulations (USEPA 2008b).

The enforcement of the SIP is a state responsibility. However, after the regulation is federally approved, EPA is authorized to take enforcement action against violators. Citizens are also

offered legal recourse to address violations as described in Section 304 of the CAA (USEPA 2008a).

Under the CAA, EPA is required to impose highway fund and other sanctions if they find that a state has failed to submit a required SIP or revision, if they disapprove a required SIP or revision, or if they find that a requirement of an approved SIP is not being implemented (USDOT 2008).

Assessment of How the Approach is Working

Prior to 1990, it was difficult for EPA to penalize violators of the CAA because courts were the only mechanisms for even minor violations. The 1990 Amendments strengthened EPA's power to enforce the CAA by increasing the range of civil and criminal sanctions available. When EPA finds that a violation has occurred, the agency can issue an order requiring the violator to comply, issue an administrative penalty, or bring a civil judicial action (USEPA 2008c).

The threat of sanctions is a powerful tool that Congress gave EPA to encourage state compliance with the CAA's objectives. EPA has formally notified the states of its intent to use sanctions 855 times since 1990. The actual imposing of sanctions, which cannot occur until 18 months after formal notification, is a relatively rare event. EPA imposed sanctions 14 times since 1990, and the only sanction currently in effect is for one small area in Montana (McCarthy 1997).

Examples of EPA action

- Clark County, Las Vegas: In August 1999, EPA found that Clark County missed a deadline to submit their SIP, which was in May 1999. The finding started an 18-month Clean Air Act "sanction clock," where it would have imposed more stringent permit requirements for industrial sources and limitations on the county's federal highway funds after 24 months. EPA determined that the SIP was complete in September 2000, which stopped the sanctions from applying. In July 2004, EPA finalized its approval of the SIP revisions for the attainment of carbon monoxide NAAQS, and in May 2005, EPA made the final decision that the area meets air quality standards for carbon monoxide (USEPA 2008d).
- Maricopa County, Arizona: In June 2007, EPA found that the Phoenix metropolitan area failed to attain particulate matter NAAQS by the December 2006 deadline. This required a SIP revision by December 2007, which provides for annual reductions of particulate matter of more than 5% per year of emissions until the NAAQS is attained. The County developed a plan to reduce emissions by 5% each year until NAAQS is attained, and submitted revised SIP to EPA in December 2007 (MCAQD undated).

The strength of this program is that when a state fails to submit a SIP, or depending on the contents of the SIP, the EPA can enforce sanctions. The direct linkage between failing to meet air quality standards and not providing highway funds helps EPA implement air quality standards. For water quality and nutrients, finding a direct leverage item may be important. If agriculture and urban development are penalized for not promoting best management practices, it may help reduce nonpoint source pollution.

Summary of Strengths and Weaknesses

Strengths

- Provides EPA with the legal tools to implement the submittal of SIPs, and impose sanctions if states do not comply (has regulatory teeth)
- Creates a strong negative incentive for states to comply
- Provides access for communities to get access to the document and file suits if necessary (because SIPs are mandatory)

Weaknesses

- EPA is responsible for many administrative tasks, such as tracking SIP due dates for each state.
- EPA needs to evaluate the SIPs and respond to the states with their decision within a set timeframe.
- Communication between the states and EPA is imperative.

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