



A Report to the Congress: Activities and Programs Implemented Under Section 319 of the Clean Water Act – Fiscal Year 1988

**A REPORT TO THE CONGRESS:
ACTIVITIES AND PROGRAMS
IMPLEMENTED UNDER SECTION 319 OF
THE CLEAN WATER ACT-FISCAL YEAR
1988**

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Abstract

This report summarizes the activities undertaken in Fiscal Year 1988 (FY88) at the state and federal levels with respect to nonpoint source (NPS) pollution control. Section 319(m)(1) of the Clean Water Act (CWA) calls upon the Administrator of the Environmental Protection Agency (EPA) to submit to the Congress an annual report that describes *the activities and programs implemented under this section and the progress made in reducing pollution in the navigable waters resulting from nonpoint sources and improving the quality of such waters*. Section 319(m)(2) of the CWA calls for a "Final Report" on January 1, 1990 that describes in broader scope and in greater detail the activities, successes, and lessons learned under section 319, and makes recommendations for future directions to control nonpoint sources of pollution. This report is structured to cover several of the topics that will also appear in the "Final Report" and to provide some preliminary information.

This report begins with the current assessment of NPS problems in the Nation, and describes in some detail the history of NPS control efforts in the United States. Following the introductory material is an accounting of state submittals of their NPS Assessment Reports and Management Programs, along with a description of EPA's review process and actions taken in response to the state submittals.

Subsequent sections describe the FY88 NPS actions taken by EPA and other federal agencies. In addition, the report offers some highlights of EPA's NPS activities planned for FY89.

Finally, the report includes summaries of the FY88 activities and highlights reported by each EPA Regional Office. Included is an accounting of state highlights as summarized by EPA.

Preface

EPA Regional Nonpoint Source Coordinators, EPA Headquarters offices within the Office of Water, the states, and other federal agencies contributed information for this NPS Report to Congress. Steven A. Dressing of the Nonpoint Sources Branch contributed to and compiled the report, with assistance from Thomas E. Davenport of EPA Region V. The document was reviewed in various stages by EPA Regions, the Office of Water, and other federal agencies.

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In Fiscal Year 1988 the states and the Environmental Protection Agency (EPA) took major steps toward implementing the national Nonpoint Source (NPS) Program. The states took the lead, with EPA helping direct their development of NPS Assessment Reports and Management Programs called for by section 319 of the Clean Water Act.¹ EPA also achieved better, closer intra-agency and inter-agency coordination and cooperation that should help assure strong federal leadership for the NPS Program. (See "Actions EPA Took to Support State Implementation of Effective NPS Programs" on page 27.)

The National NPS Program can only succeed with the strong support and commitment of the states. While many states made progress in preparing their Assessment Reports and Management Programs, much more needs to be done at all levels of government to make the NPS Program a success. As the states move toward implementation of their programs, we will begin to face the most important challenges of the national effort to address NPS pollution.

State Assessment Reports

The Clean Water Act requires states to assess the extent to which nonpoint sources cause water quality problems, and calls upon the states to describe programs and means for addressing these problems.

Nine states and Puerto Rico had submitted final Assessment Reports by the statutory deadline, August 4, 1988. As of January 30, 1989, an additional 13 states had submitted final Assessment Reports (see Table 3 on page 16). Six of these reports have been approved by EPA as of January 30, 1989. An additional 27 states, three territories, and the District of Columbia submitted draft Assessment Reports by January 30, 1989, and one state and one territory had not submitted any report by this same date.

The Clean Water Act created a large assessment and reporting burden for the states, including reports for

EXECUTIVE SUMMARY

section 304, section 305(b), section 314, section 319, and section 320. These many Clean Water Act requirements may have slowed state efforts under section 319.

The Assessment Reports will be summarized in the January 1, 1990, Report to Congress. At this time, available information seems to corroborate the findings of past reports regarding the major NPSs and the extent of the NPS problem. The bulk of NPS problems are caused by agricultural sources, urban runoff, hydromodification, resource extraction, and land disposal. Other sources such as septic tanks seem to constitute a larger proportion of the NPS problem than believed in past years.

State Management Programs

The Clean Water Act also calls upon states to develop state Management Programs detailing the programs, methods, timetables, and resources to be directed to addressing the problems identified in the Assessment Reports.

Five states and Puerto Rico had submitted final Management Programs by the statutory deadline of August 4, 1988. As of January 30, 1989, an additional 10 states had submitted final Management Programs (see Table 4 on page 18). Thirty-one other states, three territories and the District of Columbia had submitted draft Management Programs by January 30, 1989, and four states and one territory had not made any submittal by this same date.

One complete state Management Program and portions of two others have been approved by EPA as of January 30, 1989 (see "EPA Actions" on page 17). Thus far, EPA is finding the approval of portions of Management Programs to be a valuable tool because it allows the Agency to approve program elements that will produce water quality improvements, while holding in abeyance those program elements that the states must strengthen prior to approval.

¹ As amended by the Water Quality Act of 1987.

Progress Made in Reducing NPS Pollution

Some nonpoint source problems have been prevented and remedied through state, local, and federal efforts under the Clean Lakes Program, the Rural Clean Water Program, the Nationwide Urban Runoff Program, the Great Lakes Program, state and local programs, and other activities for which previous funding was provided. EPA will continue its role in these programs and encourage states and local governments to do the same.

EPA is not currently able to determine the overall trend regarding gains or losses in NPS control efforts, but development, the continued use of agricultural chemicals, past and present resource extraction, the continued demand for wood and paper products, and other environmental pressures all must be dealt with if we are to achieve significant environmental gains through our NPS control activities.

The aphorism, "An ounce of prevention is worth a pound of cure", is embodied in the NPS problem. We must keep constant vigil over NPSs if we are to succeed in preventing future problems. Both short-term and long-term solutions are needed to remedy the existing NPS problems.

EPA's Role

EPA's role in the NPS effort is to provide:

- Research on NPS impacts to receiving water resources.
- Technical training.
- Educational and informational materials.
- Technology transfer materials.
- Increased coordination with other federal agencies.

EPA's Agenda

EPA has established a full NPS agenda for the next few years (see "FY89 EPA Activities" on page 35). The Agency will continue to help states develop their Assessment Reports and Management Programs. Through its five-year NPS Agenda (see "Convened

NPS Agenda Task Force" on page 29) EPA will channel its resources and energies into assisting and supporting states and local governments in the following ways:

- Help raise the level of public awareness regarding NPS pollution.
- Provide information on practical, feasible, cost-effective solutions.
- Provide information on funding sources, and affect federal policy decisions that drive behavior that causes NPS pollution.
- Help states and local governments improve their capability to develop their own regulatory solutions, where necessary.
- Develop the "tools" to establish sound water-quality based programs for NPS.

EPA will also continue to work with other federal agencies, through existing programs such as the Rural Clean Water Program and Land & Water 201 Program, and through new initiatives such as the U.S. Department of Agriculture's water quality initiative proposed in the President's Fiscal Year 1990 Budget.

EPA is creating a NPS Clearinghouse that will serve as the focal point for sharing technical, educational, and informational materials among the states, local governments, and federal agencies. EPA will sponsor or co-sponsor several workshops to facilitate technology transfer and the exchange of program information.

EPA will produce several new technical materials pertaining to targeting in urban areas, NPS monitoring and evaluation techniques, best management practices for grazing lands and urban areas, the design and implementation of agricultural best management practices, and the utility and protection of wetlands in NPS control activities. The Agency will also produce a watershed project manual. Under its water quality standards program, EPA will assist states in developing water quality criteria that can be applied successfully to NPS problem identification and monitoring.

Through these activities and others, EPA intends to aid the states in meeting the challenge of protecting and restoring designated uses of the Nation's waters by providing strong leadership for the National NPS Program, and by helping state and local governments overcome barriers to successful implementation of NPS measures.

INTRODUCTION

Major Nonpoint Sources

Over the past two decades, several national reports and many site-specific reports have described the types of nonpoint sources (NPSs) of pollution that are impacting the uses of rivers and streams, lakes and ponds, wetlands, ground water, estuaries, and coastal waters. Nonpoint sources have been defined in several ways depending upon the perspective of the group defining them. In simple terms, NPSs are not point sources. Point sources are defined under section 502(14) of the Clean Water Act (CWA):

The term "point source" means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.

In practical terms, NPS pollution does not result from a discharge at a specific, single location (with the exception of agricultural stormwater discharges and irrigation return flows) but generally results from land runoff, precipitation, atmospheric deposition, drainage, or seepage. NPSs have generally been grouped in categories such as agriculture, urban runoff, hydromodification, resource extraction, silviculture, construction, land disposal, and in-place pollutants. These categories have been used for NPS reporting and program management, but are not exclusive of point sources. For example, the agriculture category includes both point sources (e.g., concentrated animal feeding operations) and nonpoint sources (irrigation return flows).

The Environmental Protection Agency's (EPA) most recently published section 305(b) report, titled *National Water Quality Inventory, 1986 Report to Congress*, provides information regarding the percent of the nation's waters that are not meeting their designated uses and the relative importance of various

pollution sources in impaired waters. Most of the assessed waters are meeting their designated uses. NPSs are the predominant sources causing impairment in waters not meeting their designated uses. Figure 1 on page 4 shows the relative importance of nonpoint sources in causing impairments to rivers and streams, lakes, and estuaries. For rivers and streams, the percentage represents that share of the impaired miles (37 states reporting) for which NPSs are the predominant sources causing use impairment. For lakes (31 states) and estuaries (16 states), the percentages show the portion of impaired area (acres and square miles, respectively) for which NPSs are the predominant sources causing use impairment. In all cases nonpoint sources are the primary remaining cause of water quality problems.

The majority of surface water quality problems caused by NPSs are attributed to agriculture (typically about 50-70% depending upon reference,² analytic approach used, and water resource). Urban runoff (5-15%), hydromodification (5-15%), silviculture (1-5%), resource extraction (1-10%), construction (1-5%), and land disposal (1-5%) are the other sources most responsible for NPS impacts (Figure 2 on page 5). These percentages are determined in several ways, including (1) the portion of waters impaired or threatened due to NPSs (miles for rivers, area for lakes and estuaries) for which the specific source is the primary NPS impacting the water, and (2) the percentage of states reporting the specific NPS as a problem. Table 1 on page 6 contains examples of the types of specific activities that fall under the major source categories.

These general categories are convenient, but only partially descriptive. One cannot envision the nature and magnitude of NPSs without further specificity regarding the type of source, the pollutants delivered from the source, the ways in which pollutants are transported from the source to receiving water bodies, and the perspective from which the source is observed. The following examples illustrate this point.

EXAMPLE 1: The source category is agriculture. The perspective from which agriculture is observed is

² Including *America's Clean Water, The States' Nonpoint Source Assessment 1985*, published by ASIWPCA, and EPA's *National Water Quality Inventory, 1986 Report to Congress*.

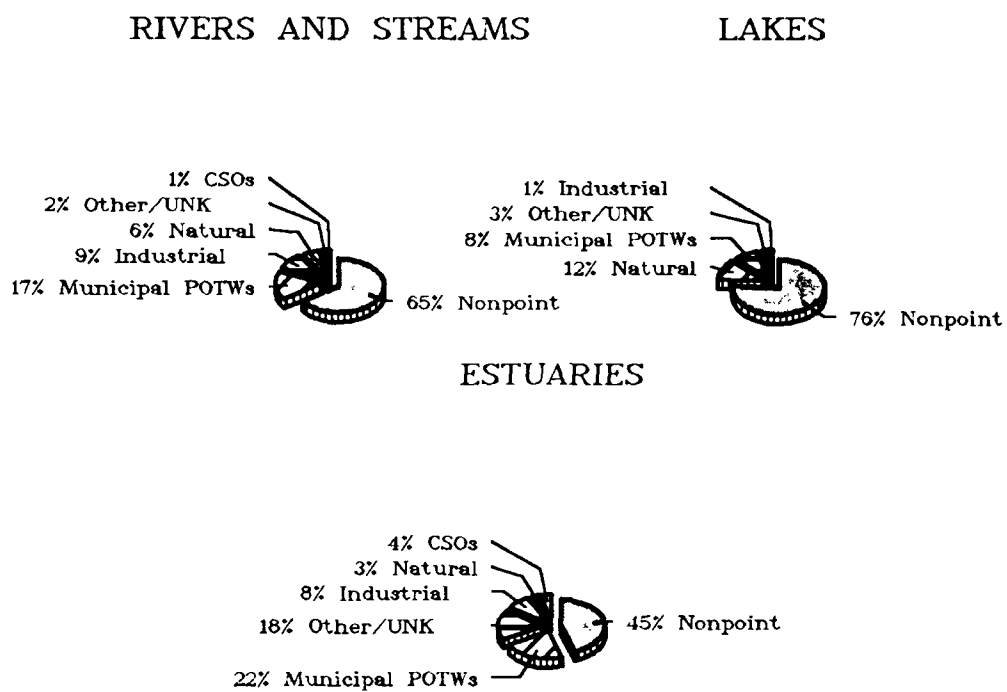


Figure 1. Primary Causes of Pollution in Surface Waters of the U.S.: SOURCE: EPA, *National Water Quality Inventory, 1986 Report to Congress*.

that of farmer A who's small creek is being trampled daily by his own dairy cows. Farmer A notes that the bottom of this very shallow creek can no longer be seen because the water is continually muddied by dairy cows wading through the creek. This situation concerns farmer A since his five-year-old girl often plays in the creek. The girl cannot fully enjoy these activities in a dirty creek, so farmer A wishes to keep the creek clean.

From the farmer's perspective, the source of his problem is his own dairy cows. The pollutant is suspended sediment that is generated by the dairy cows as they wade through the creek. The impaired use is recreation, and the solution is for the farmer to prevent his cows from entering the creek.

EXAMPLE 2: The creek in Example 1 flows into a small estuary that is the source of crabs and oysters for the surrounding communities. Three creeks flow into the estuary, but the creek passing through farmer A's dairy farm is the major tributary. Farmer A is at the upstream end of the creek, and five other dairy farms are situated along the creek as it winds down to the estuary. Shellfishing has recently been banned in the estuary due to bacterial contamination.

From the perspective of the fishermen, the source of the problem is the six dairy farms along the creek. Farmer A, in Example 1, hadn't considered that his cows were causing problems in the estuary, yet the same act of wading in the creek has contributed bacterial contamination as well as suspended sediment. The bacterial contamination results from the introduction of cow droppings as the cows wade. Farmer A hadn't thought of the creek as an important resource for shellfishing, yet it is the major source of freshwater to the estuary. Furthermore, from the fishermen's perspective, farmer A's cows are only part of the problem. The solution is to manage the dairy wastes from those farms (perhaps all six) that are polluting the estuary.

In the above examples, agriculture is the general source category, and dairy operations are the specific sources. Due to the different perspectives taken in the two examples, however, the pollutants of concern and the significance of farmer A's dairy operation are also different. These examples illustrate the difficulty associated with describing adequately in overview, the significance and complexity of nonpoint sources. Local NPS problems are often unique, meaning that site-specific information and perspective are needed to properly describe the problems.

Information regarding ground-water and wetlands problems is scarce due to the historical lack of monitoring activities targeted to these water resources. States, however, have reported that nonpoint sources

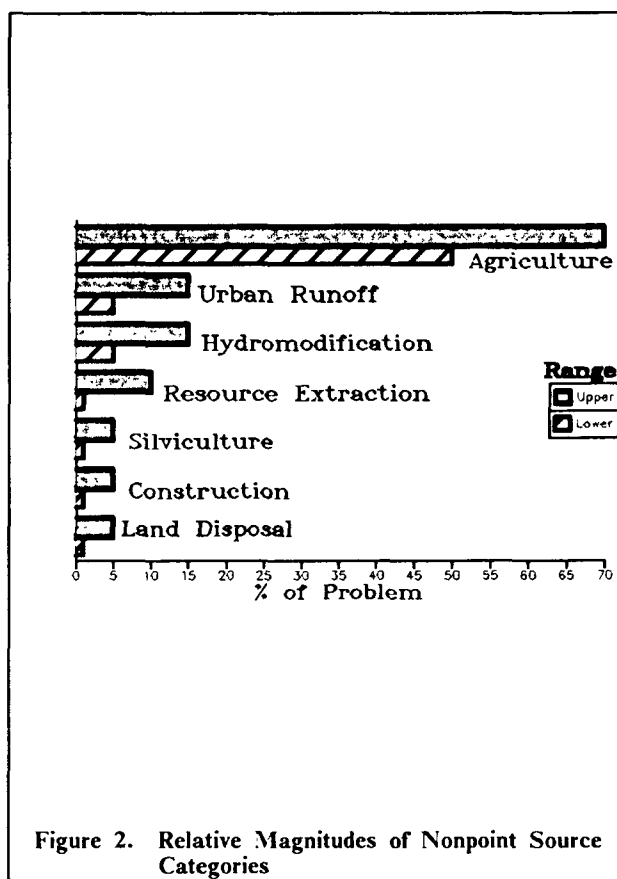
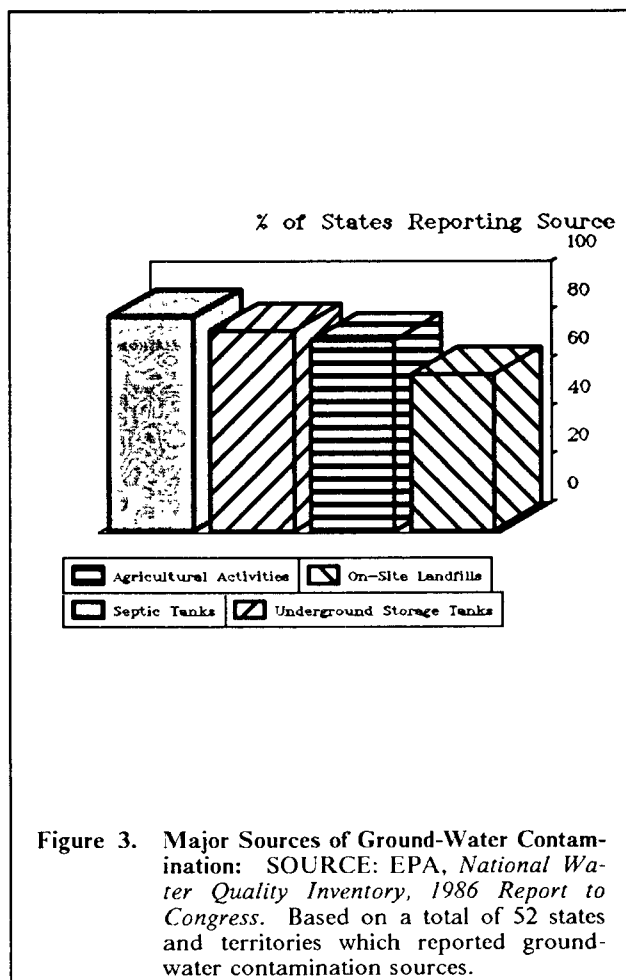


Figure 2. Relative Magnitudes of Nonpoint Source Categories

are causing problems in both ground water and wetlands. Figure 3 on page 6 shows that septic tanks, underground storage tanks, and agricultural activities are major sources of ground-water contamination in at least three-quarters of the states.

In *America's Clean Water, The States' Nonpoint Source Assessment 1985*, published by the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA), only 15 states were able to comment regarding the impacts of nonpoint sources on tidal and inland wetlands. In these 15 states, approximately 24,000 acres of wetlands were known not to support uses because of NPS impacts. An additional 700,000 acres of wetlands supported uses despite some known NPS impacts, whereas 1.6 million acres of wetlands were determined to be on the road toward impairment due to NPS impacts. The assessments made by these 15 states accounted for less than 12 million acres of inland and tidal wetlands. In 1984, it was estimated that there are 95 million acres of inland and tidal wetlands in the lower 48 states.³ As states perform more and better assessments of wetlands over time, we will have a more clear picture of the exact magnitude of the NPS impacts.

³ Tiner, R.W. 1984. *Wetlands of the United States: Current Status and Recent Trends*. U.S. Fish and Wildlife Service.



NPS CATEGORY	EXAMPLES
Agriculture	Pesticide seepage into ground-water supply
Agriculture	Phosphorus fertilizer runoff into lake
Agriculture	Wetlands drained to create cropland
Agriculture	Sediment from cropland smothers a salmonid spawning area
Construction	Sediment from shoreline development clogs river passage
Construction	Wetlands drained to build Nation's capital
Urban	Deposited metals from auto exhaust are washed into harbor
Urban	Salt from winter de-icing is washed into storm drains and river
Hydromodification	Mississippi River dredging resuspends toxic organics and metals
Hydromodification	Stream channelization degrades benthic habitat
Silviculture	Sediment from logging roads smothers spawning areas
Silviculture	Water temperature increases as tree canopy is removed, killing fish
Resource Extraction	Acid mine drainage from abandoned coal mines kills fish
Resource Extraction	Drilling muds fill wetlands on North Slope in Alaska
Land Disposal	Dump seepage contaminates local drinking water supply

Table 1. NPS Categories and Specific Examples

Major Nonpoint Source Impacts

Nonpoint source impacts have not been fully assessed. The Nation has focused largely on impacts caused by traditional point sources (POTWs and industrial dischargers) in the past because point source discharges were causing major, visible problems in our surface waters. Thus, very little attention has been given to assessing the impacts of NPSs. Point sources have been controlled to a large extent in most areas. Since water quality problems still exist in many areas, it is now very clear that NPSs have had and continue to have widespread impacts upon surface waters.

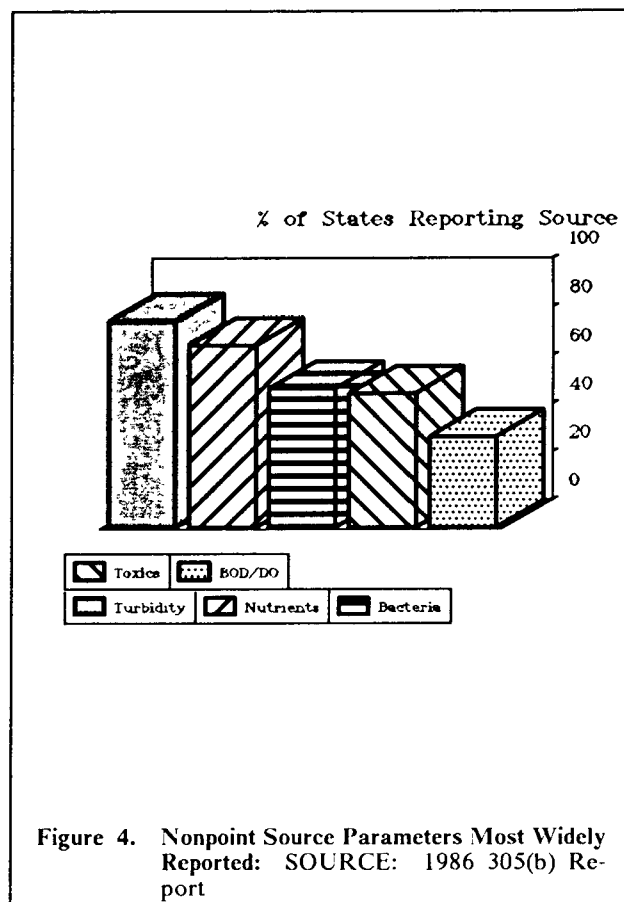
While NPS impacts have not been fully assessed, there is sufficient information to justify a strong commitment to NPS control programs and to begin implementation. The states have reported that the greatest proportion of NPS impacts in assessed rivers and lakes is caused by sediment and nutrients (Figures 4-5). Table 2 on page 9 illustrates the types of impacts that are routinely caused by major NPS pollutants. The relative severity identified for each example is a rough guide for gauging the significance of the various impacts. Since the importance of any given use for any water resource is a function of many factors, including human emotions, it is impossible to accurately measure or predict the absolute cost of NPS impacts.

It is clear, however, that NPSs can affect virtually every water user. For example, the following excerpt from the *Tillamook Bay Rural Clean Water Project Annual Report - 1987* shows how animal waste can cause problems for both industrial and recreational users of an estuary.

Downstream in the lowlands adjoining Tillamook Bay and in the lower river valleys large concentrations of livestock, primarily dairy cows, produce 322,500 tons of manure each year. The combination of this "never ending" volume of animal wastes and the predominantly wet climate created runoff and contamination conditions not equalled anywhere else in Oregon.

Further downstream in the estuary is Oregon's primary oyster growing area, an industry that has an economic impact from one to two million dollars annually - and was continually threatened by unexpected closure because of excessive fecal coliform bacteria levels in the growing waters. Affected along with the commercial oyster industry was rec-

reational clam digging, fishing, boating, and numerous other activities attracting more than a million tourists and sportsmen to the area each year.



All types of water resources - lakes, rivers, coastal waters, ground water, wetlands, and estuaries - are impacted by NPSs. Likewise, all types of water uses - including drinking, recreation, fisheries, wildlife, shellfishing, livestock watering, irrigation, transportation, industry - are impacted by NPSs.

Each state was required under section 319 of the Clean Water Act⁴ to provide to EPA and to the public a listing of those waters in the state that are either impacted or threatened by NPSs. The national summary of these Assessment Reports, to be contained in the January, 1990 "Final Report" for section 319, will give more specific information regarding NPS impacts.

⁴ As amended in 1987

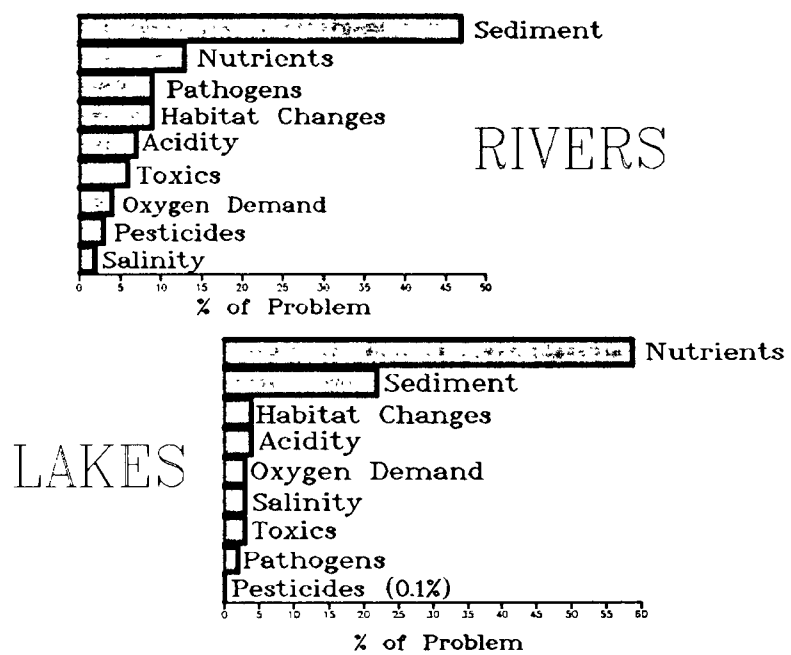


Figure 5. Primary NPS Pollutants in Impacted Rivers and Lakes: SOURCE: *America's Clean Water, The States' Nonpoint Source Assessment 1985*, ASIWPCA.

POLLUTANT	IMPACT	RELATIVE SEVERITY (Range)
Sediment	Salmon populations dwindle due to habitat destruction	5-10
Sediment	Navigation restricted due to sediment deposition	1-10
Nutrients	Lake weed problems impair recreational activities	1-10
Nutrients	Excessive and/or undesirable vegetation harms fisheries	1-10
Pathogens	Shellfishing beds closed	5-10
Pathogens	Public beaches closed	7-10
Pathogens	Drinking water supplies impaired	5-10
Pesticides	Ground-water supplies not potable; wells capped	7-10
Pesticides	Fish kills	1-10
Pesticides	Waterfowl and species that feed on aquatic species die	1-10
Oxygen Demand	Fish suffocate	1-10
Physical Habitat Alteration	Fisheries spawning areas destroyed; populations decline; fishing banned	1-10
Physical Habitat Alteration	Wetlands destroyed so waterfowl disappear; hunting banned	1-10
Physical Habitat Alteration	Wetlands and riparian areas developed; flooding increases	1-10
Toxics	In-place toxics contaminate food chain	1-10
Toxics	Fish kills	1-10
Acidity	Lakes sterilized; no fishing	1-10
Acidity	Silvicultural and agricultural yields decline	1-5
Salinity	Crop irrigation water impaired	1-5

Table 2. **Examples of Nonpoint Source Impacts:** Severity ranges from 1 (impact is localized, and/or of minor importance to ecology/society, and/or reversible) to 10 (impact is to large geographic areas, and/or of major importance to ecology/society, and/or irreversible), indicating the relative magnitude of impacts likely across the U.S.

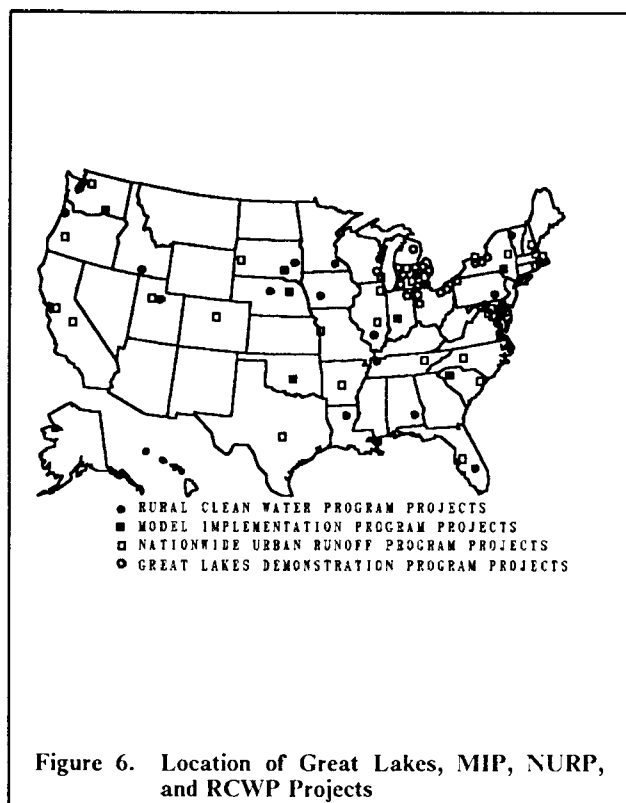
History of Nonpoint Source Control Programs

This brief history of NPS control programs is intended to give some perspective on what has already been accomplished in NPS control efforts, and to trace the origins of section 319 of the CWA.

Section 108 - Great Lakes Program

The CWA of 1972 authorized EPA to demonstrate pollution control technologies in the Great Lakes Basin.⁵ The program under which this demonstration was conducted addressed a wide variety of pollution control technologies, such as soil conservation, conservation tillage, and animal waste management, through grants to municipalities and soil and water conservation districts. Locations of the Great Lakes demonstration projects and other NPS projects are shown in Figure 6 on page 10.

⁵ Humenik, F.J., M.D. Smolen, and S.A. Dressing. 1987. *Pollution from nonpoint sources, Where we are and where we should go*. *Environmental Science and Technology*. 21(8): 737-742.



Some impacts of and lessons learned from the Great Lakes Program include:⁶

- Phosphorus loads have been identified as a key factor in the degradation of freshwater lakes, particularly in Lake Erie, Lake Ontario, and Saginaw Bay. The phosphorus load reduction plans developed and implemented by Indiana, Michigan, New York, Ohio, and Pennsylvania relied heavily on the lessons learned from 108a demonstration projects.
- State-implemented Remedial Action Plans for water quality limited areas in the Great Lakes drainage basin will use the information generated by the 108a demonstration projects to correct the NPS problems.
- The 108a multi-dimensional projects pioneered many methods (e.g., NPS water quality monitoring) used in subsequent NPS control programs (Rural Clean Water Program, Special Agricultural Conservation Program, and Model Implementation Program) and demonstrated the importance of one-on-one technical assistance to sustained landowner participation for creating a successful NPS program.
- During the Black Creek demonstration project, the development of a computer simulation model

to identify critical areas and to predict treatment effectiveness preceded an increased critical area emphasis in subsequent land treatment and water quality programs. Critical area delineation is becoming a standard component of new NPS projects.

- State NPS programs such as the Wisconsin Nonpoint Source Abatement Fund have been altered or established as a result of lessons learned.
- From the 108a projects we have come to recognize the importance of public awareness and participation in clean water goals, the practical necessity of targeting NPS control efforts to the most critical areas, and matching the specific water quality impairment to the most effective land treatment.
- The program has shown that the effects of NPS pollution can be moderated substantially using specific low-cost runoff management systems.

Section 208

As part of the water quality management program, planning under section 208 of the CWA required state and areawide agencies to identify water quality problems related to point and nonpoint sources. From 1974 to 1981, federal grants were provided to states, territories, and 176 areawide agencies for overall water quality management under section 208. Portions of these funds were directed at identifying NPS problems and developing strategies for their control. By 1982, 213 water quality management plans, which contained elements addressing NPS control, were approved by EPA.

Development and demonstration of best management practices (BMPs) for all NPSs occurred as part of section 208 water quality management plan development. Several states established information and education programs and formed interagency mechanisms to coordinate and target NPS efforts. In conjunction with section 208 plan development, the Agricultural Stabilization and Conservation Service (ASCS) of the U.S. Department of Agriculture (USDA) initiated the Agricultural Conservation Program (ACP) Special Water Quality Program. Some states combined this ACP program with section 208 plan development to evaluate possible control strategies. The lessons learned from developing section 208 water quality management plans served as the foundation for existing state NPS programs and section 319 program development and implementation.

⁶ USEPA Great Lakes National Program Office, *Great Lakes Demonstration Programs, Section 108a*, May, 1988.

Model Implementation Program

In early 1977, the USDA and EPA examined several alternative methods for implementing the agricultural and silvicultural NPS pollution portions of water quality management plans developed under section 208 of the CWA.⁷ In September 1977, USDA and EPA issued a Memorandum of Understanding to conduct the Model Implementation Program (MIP). This program was a large-scale cooperative effort to implement soil conservation and water quality-related agricultural land management practices in watershed projects in seven states across the Nation.⁸ The seven MIP projects, administered on a watershed basis, used existing program authorities and delivery systems of soil and water conservation districts, ASCS, USDA-Soil Conservation Service (SCS), and the Cooperative Extension Services (ES). State environmental agencies monitored water quality to evaluate project results.

The Yakima MIP in Washington reduced sediment yield from irrigation tracts, while the Cannonsville Reservoir MIP in New York reduced animal waste pollution from barnyards.⁹ Other MIP projects reduced cropland and pasture land erosion, or attempted to prevent ground-water contamination or stream bed erosion. None of the MIP projects, however, demonstrated clear-cut improvements in their designated impaired water resource areas, because monitoring periods were too short (two to three years) and pollution control efforts were generally scattered too widely to produce measurable improvements.

A number of major lessons, however, were learned from the MIPs.¹⁰ These were:

- NPS control programs should be administered on the basis of watershed boundaries rather than political boundaries.
- NPS programs need pre-project planning and identification of those critical areas in which the largest water quality benefits can be achieved by land treatment.

- NPS programs should be directed by an agency with a water quality orientation that can coordinate the efforts of cooperating agencies.

Nationwide Urban Runoff Program

The Nationwide Urban Runoff Program (NURP) was developed by EPA in 1978 as a five-year program to obtain data on control of urban runoff quality and its impact on receiving waters.¹¹ Data from 28 projects around the country confirmed that pollution problems such as coliform bacteria, nutrients, or heavy metals result from urban runoff. The most significant effects of urban stormwater runoff on aquatic life, however, are caused by hydrologic changes related to urbanization and construction activities. NURP data indicate that the impacts of urban runoff are highly site-specific and depend largely on the fraction of the drainage basin urbanized and the characteristics of the receiving water body.

Wet detention basins and infiltration of stormwater through recharge basins were shown to be effective for reducing the volume of surface runoff and surface water pollutant concentrations.¹² The ground-water impacts of these practices must be considered, however, before widespread application can be recommended. Other practices, such as installing stream buffers and grass swales and establishing wetlands also have been identified as potential urban NPS control practices. The effectiveness of street sweeping was highly variable.

Rural Clean Water Program

In 1977, Congress amended the CWA to include a new section 208(j), which provided for a program to enter into contracts with owners and operators of rural lands to implement BMPS to control NPS pollution. This program, the Rural Clean Water Program (RCWP), is administered by the USDA. The RCWP was ultimately authorized and funded under the Agriculture, Rural Development and Related Agencies Appropriations Acts. Congress appro-

⁷ From: Dressing, S.A., J.M. Kreglow, R.P. Maas, F.A. Koehler, F.J. Humenik, W.K. Snyder, W.A. Marks, L. Marston, M. Rubino, and R. Weaver. 1983. *An Evaluation of the Management and Water Quality Aspects of the Model Implementation Program, Final Report*. North Carolina State University and Harbridge House, Inc. for the USDA and EPA, p. 1.

⁸ Humenik, F.J., M.D. Smolen, and S.A. Dressing. 1987. *Pollution from nonpoint sources, Where we are and where we should go*. *Environmental Science and Technology*. 21(8): 737-742.

⁹ Ibid.

¹⁰ Ibid.

¹¹ Ibid.

¹² Ibid.

priated \$50 million in 1980 (P.L. 96-500) and \$20 million in 1981 (P.L. 96-528) to carry out an experimental program.

The RCWP began in 1980 in a cooperative model based on the MIP. The program funds 21 watershed projects whose objectives are to improve water quality, to help agricultural landowners and operators employ pollution control practices, and to develop and test programs, policies, and procedures for control of agricultural NPS pollution. Five of the projects were selected to receive additional funds for comprehensive monitoring and evaluation (CM&E). These CM&E projects were designed to provide more detailed water quality information than the other 16 projects.

The RCWP gained considerably from the Great Lakes Program, ACP Special Water Quality Projects, and MIP experiences.¹³ The implementation time frames are longer (10-15 years); critical area targeting is required; water quality objectives are clearly specified; and projects monitor water quality. Each project is administered locally and overseen by state and national RCWP coordinating committees. Strong local involvement and identification with the project objectives has been the key to success in several RCWP projects.

The RCWP has a much stronger water quality emphasis than most preceding conservation or demonstration programs.¹⁴ Approved BMPs include water management systems, animal waste management systems, and fertilizer and pesticide management, all of which are practices and systems designed to improve water quality and are not necessarily oriented to soil conservation or farm productivity.

Eight years into the program, most projects have exceeded their land treatment goals of contracting to treat agricultural NPSs in 75% of their critical areas. Projects that have achieved a high level of farmer participation have been successful because they offer cost-sharing for practices farmers want, such as animal waste storage structure installation, conservation tillage, and irrigation system improvements.¹⁵ Cost-sharing incentives, however, were unsuccessful in several projects when economic problems were too great in the farm community or when farmers were not enthusiastic about government programs.

Indications are that pest-scouting, manure sampling, and soil sampling may be the most effective and economical approaches to agricultural NPS control.¹⁶

These activities provide farmers with information needed to apply nutrients and agricultural chemicals in an efficient and effective manner to protect the environment and save money. Negative inducements have been effective for obtaining participation in several projects. Such inducements include invoking existing local or state regulations to gain compliance with water quality objectives, and milk cooperative penalties to dairy farmers using unsatisfactory animal waste management practices. The combination of negative inducements with technical and financial assistance seems to be effective in gaining farmer participation in NPS programs.

EPA has supported RCWP workshops for the past six years. These workshops, held for both land treatment and water quality technical experts, have been directed toward:

- Data analysis.
- Reporting.
- Tech transfer among all RCWP projects.
- Involving experts from outside RCWP.
- Teamwork.

The workshops have benefited the program considerably, resulting in improved data analysis and reporting by projects, and a greater understanding of NPS pollution and NPS control tools and strategies.

Water quality improvements have already been documented statistically in five of the RCWP projects, and it is possible that even more projects will show environmental benefits before the program ends. In fact, in a number of projects, there is the public perception that water quality has improved. It has, however, been shown by North Carolina State University, working under an RCWP grant, that a time frame longer than five years is usually necessary to document water quality improvements in agricultural NPS projects.

Section 314

The EPA's Clean Lakes Program began in 1975 with the purpose of demonstrating restoration, management, and protection activities for protecting publicly-owned freshwater lakes. Demonstration projects funded under this program proved that tech-

¹³ Ibid.

¹⁴ Ibid.

¹⁵ Ibid.

¹⁶ Ibid.

niques existed that could be applied to restore, protect, and manage lakes, and that lake restoration is an integral component of national water quality management strategy.

Because long-term effectiveness is a major concern, the Clean Lakes Program requires an integrated approach to solving lake water quality problems. Projects include provisions for controlling pollutants at the source, largely through watershed management, rather than simply eliminating their symptoms in the lake. Septic tank management ordinances, stormwater controls, and various institutional frameworks have been developed through the Clean Lakes Program. Since the Program's inception, 365 projects have been initiated. Most recently, EPA funded 17 Phase II implementation projects with FY87 funds totalling \$2.5 million.¹⁷

Summary of Section 319 Requirements

The Water Quality Act of 1987 (WQA) amended the CWA such that section 101(a)(7) states:

it is the national policy that programs for the control of nonpoint sources of pollution be developed and implemented in an expeditious manner so as to enable the goals of this Act to be met through the control of both point and nonpoint sources of pollution

This goal focuses on the importance of developing and implementing NPS controls while developing comprehensive programs, involving both point and nonpoint sources, to improve water quality. With the enactment of section 319 of the CWA, new direction and significant federal financial assistance for the implementation of state NPS programs has been authorized.¹⁸ The CWA requires two major documents to be completed by each state: an Assessment Report describing the state's NPS problems and a Management Program explaining what the state plans to do in the next four fiscal years to address its NPS problems. The CWA authorizes financial assistance for developing these reports and for implementing the states' NPS Management Programs.

Nonpoint Source Assessment Reports

Section 319 of the CWA requires that each state (or EPA in the event that a state fails to do so) submit a NPS Assessment Report which:

1. Identifies those navigable waters within the state which, without additional action to control NPSs, cannot reasonably be expected to attain or maintain applicable water quality standards or the goals and requirements of the CWA, and
2. Identifies those categories and subcategories of NPSs or, where appropriate, particular NPSs which add significant pollution to each portion of the navigable waters identified in (1) above in amounts which contribute to such portion not meeting such water quality standards or such goals and requirements.

NPS Assessment Reports submitted by states (but not those submitted by EPA in cases where states fail to submit reports) must also include sections which:

1. Describe the process, including intergovernmental coordination and public participation, for identifying BMPs and measures to control each category and subcategory of NPSs and, where appropriate, particular NPSs identified under (2) above and to reduce, to the maximum extent practicable, the level of pollution resulting from such category, subcategory, or source, and
2. Identify and describe state and local programs for controlling pollution added from NPSs to, and improving the quality of, each such portion of the navigable waters, including but not limited to those programs which are receiving federal assistance under subsections 319(h) and (i).

States that do not submit a report are not eligible for section 319 funding. All Assessment Reports were due to EPA by August 4, 1988, in accordance with the CWA.

NPS Management Programs

The required contents of a state NPS Management Program are:

1. An identification of the BMPs and measures which will be undertaken to reduce pollutant loadings resulting from each category, subcategory, or particular NPS designated in the Assessment Report, taking into account the impact of the practice on ground-water quality
2. An identification of programs (including, as appropriate, nonregulatory or regulatory programs for enforcement, technical assistance, financial assistance, education, training, technology transfer, and demonstration projects) to achieve implementation of the BMPs designated in (1)

¹⁷ *Clean Lakes Program 1987 Annual Report*, EPA.

¹⁸ *Nonpoint Source Guidance*. December 1987. USEPA Office of Water. page 1.

3. A schedule containing annual milestones for
 - a. Utilization of the program implementation methods identified in (2), and
 - b. Implementation of the BMPs identified in (1) by the categories, subcategories, or particular NPSs designated in the Assessment Report.

Such schedule shall provide for utilization of the BMPs at the earliest practicable date

4. A certification of the attorney general of the state or states (or the chief attorney of any state water pollution control agency which has independent legal counsel) that the laws of the state or states, as the case may be, provide adequate authority to implement such Management Program or, if there is not such adequate authority, a list of such additional authorities as will be necessary to implement such Management Program. A schedule and commitment by the state or states to seek such additional authorities as expeditiously as practicable.
5. Sources of federal and other assistance and funding (other than assistance provided under subsections 319(h) and (i)) which will be available in each of such fiscal years for supporting implementation of such practices and measures and the purposes for which such assistance will be used in each of such fiscal years
6. An identification of federal financial assistance programs and federal development projects for which the state will review individual assistance applications or development projects for their effect on water quality pursuant to the procedures set forth in Executive Order 12372 as in

effect on September 17, 1983, to determine whether such assistance applications or development projects would be consistent with the NPS Management Program; for the purposes of this subparagraph, identification shall not be limited to the assistance programs or development projects subject to Executive Order 12372 but may include any programs listed in the most recent Catalog of Federal Domestic Assistance which may have an effect on the purposes and objectives of the state's NPS Management Program.

The CWA specified that the NPS Management Programs were to be submitted to EPA by August 4, 1988.

Incentives

There are no penalties for states failing to prepare section 319 assessments and programs. EPA's initial challenge under section 319 was to encourage states to prepare and submit adequate Assessment Reports and strong Management Programs. EPA has worked and continues to work with the states to assure that section 319 is understood, and to foster development of sound NPS programs. Some states have already begun effective NPS programs, and most states will likely cooperate under section 319. EPA is providing technical and administrative leadership in trying to gain the support of all states under section 319.

Grant funds and funding guidance are two of EPA's tools for encouraging state action in NPS control programs. EPA has issued guidance regarding mechanisms for using CWA Title II and Title VI funds for section 319, and will continue to assist states in this area.

EPA Review Process

EPA transmitted to the states in December, 1987 its *Nonpoint Source Guidance* which included criteria for approval of the state Assessment Reports and state Management Programs. EPA Regions developed further guidance based upon the *Nonpoint Source Guidance* and section 319, and have worked with EPA Headquarters to assure understanding of the Assessment Report and Management Program approval criteria.

Approval/disapproval authority for the Assessment Reports and Management Programs was delegated to the EPA Regions on August 12, 1988. Thus, EPA Headquarters plays an advisory role in the review process. In a coordinated effort to obtain consistent, comprehensive reviews, several EPA offices have been given the opportunity to assist in the reviews of state reports:

- Office of Ground-Water Protection
- Office of Marine and Estuarine Protection
- Office of Municipal Pollution Control
- Office of Policy, Planning, and Evaluation
- Office of Water Regulations and Standards
- Office of Wetlands Protection

Nonpoint Source Assessments

National Description of NPS Problems

As shown in "Reports" on page 16, most of the state NPS Assessment Reports have not been approved yet. Because of this, it is not possible to utilize the section 319 assessment data in a national description of NPS problems. Instead, EPA has chosen to use its 1988 Strategic Planning and Management System (SPMS) database as a substitute for the section 319 data. The SPMS data consist largely of 1988 state section 305(b) data, with some updating provided by

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the EPA Regions. The SPMS data are not likely to match the section 319 assessment data, and are not available for all states and territories. *Therefore, these data should not be considered as representative of the content of state section 319 assessments, even though the data may ultimately be the same in some cases.* Instead, the data are used in this report to illustrate the relative constitution of the Nation's NPS problem at this point in time, with particular emphasis placed upon comparisons with data from past reports (see "Major Nonpoint Sources" on page 3 and "Major Nonpoint Source Impacts" on page 7). The section 319 assessment data will be reported in the "Final Report" which is due on January 1, 1990.

Since the SPMS data are *approximate*, the information is presented in a qualitative manner. The reasons for the approximate nature of these data include, but are not limited to:

- All states and territories are not represented. For example, 21 states have not provided useful data for lakes.
- Source category data are inflated due to the summation of subcategory data. For example, a mile of river impacted by pasture, irrigated cropland, and feedlots would be reported as *three* miles of river impacted by agriculture. It is likely that the data are inflated for the other source categories as well (e.g., urban, silviculture, land disposal). Compounding this problem is the fact that more than one source can impact upon any given portion of a water resource.
- The data cannot be used to quantify the extent of nonsupport or partial support of uses caused by NPSs versus that caused by point sources.

Because of the limitations inherent in using the SPMS data, this report seeks only to illustrate the *relative importance of NPS categories*.

The SPMS data indicate that agriculture probably plays a much larger role than other NPSs in causing partial support or nonsupport of uses in the Nation's rivers. Forty states reported information useful to this analysis, but some states with high levels of NPS activity, such as Ohio, Michigan, Wisconsin, Texas, Alaska, and Idaho are not included.

EPA's 1988 *Report to Congress: Water Quality of the Nation's Lakes* documents that of the pollution sources causing lake use impairments, 76 percent are nonpoint sources. Most states find that NPSs are responsible for the majority of use impairments in lakes, and several states attribute 100 percent of lake use impairments to NPSs. The SPMS data show that agriculture is probably the largest contributor to NPS problems in lakes. Twenty-nine states provided information for this analysis. Again, states such as Maine, Pennsylvania, Michigan, Ohio, Wisconsin, Texas, Arkansas, Nebraska, Alaska, Idaho, and Oregon are not included in this analysis.

The SPMS data for estuaries (19 states) are difficult to interpret since much of the NPS problem is credited to unknown and unspecified sources. states not reporting estuary data include Maine, Delaware, Texas, Oregon, and Alaska.

Land disposal is likely to be a major contributor to NPS problems in the Great Lakes and coastal waters. The information regarding land disposal is largely influenced by New York which reported that 500 miles of Great Lakes shoreline are impacted by land disposal. Land disposal includes septic tanks, landfills, sludge, industrial land treatment, and hazardous wastes. As for estuaries, unknown and unspecified sources are relatively important. Further data interpretation is made difficult by the lack of specific source information.

A comparison of these data with those from earlier reports (see "Major Nonpoint Sources" on page 3) *appears* to show that agriculture is possibly less responsible for NPS problems than believed in 1986. This is likely not the case for several reasons. Part of the explanation is that the total waters assessed and states providing the data are different in the SPMS data. Similarly, the information presented has been in the form of percentages, and do not tell the story regarding absolute miles or acres impaired. The section 319 assessment data must be analyzed to provide a more accurate information base for comparison against earlier data.

The relative importance of urban runoff, hydromodification, silviculture, resource extraction, and construction are about the same in the 1988 SPMS database as in earlier reports. The major differences in the SPMS data are the relative importance of land disposal (with the exception of rivers) and unknown/unspecified sources. These differences may be the result of refined assessments, differences in reporting, or differences in state representation in the various databases. Again, the section 319 data are needed to resolve these issues.

Reports

Summary of Report Submittals

All NPS Assessment Reports were due to EPA by August 4, 1988. For a variety of reasons, most states did not submit final Assessment Reports before or on the deadline date. However, nearly all states have now submitted final or draft reports. Some of the reasons for late submittals include:

- Very short time-frame in which to develop the reports and to encourage public participation.
- Lack of available data on a watershed basis.
- Public review process.

A summary of the status of state and territory submittals is given in Table 3. It can be seen from this table that while nine states and Puerto Rico had submitted final Assessment Reports by August 4, 1988, as of January 30, 1989, an additional 13 states had submitted final reports. Twenty-seven states, three territories, and the District of Columbia had submitted draft reports by January 30, 1989, while only one state and one territory had made no submittals by that same date.

EPA actions

EPA has approved six Assessment Reports as of January 30, 1989. The states of Delaware and South Dakota both received approval of their Assessment Reports in September, 1988. The reports submitted by Rhode Island and Vermont were approved in October, while Colorado's report was approved by EPA in November, 1988. Nebraska's Assessment Report was approved on January 5, 1989.

STATE/TERRITORY	SUBMITTAL DATE
Alabama	8/4/88 Draft
Alaska	1/11/89 Draft
American Samoa	6/9/88 Draft
Arizona	5/30/88 Draft
Arkansas	8/13/88 Final
California	4/30/88 Draft
Colorado	5/2/88 Final
Connecticut	8/4/88 Draft
Delaware	8/4/88 Final
District of Columbia	4/1/88 Draft
Florida	8/12/88 Draft
Georgia	8/4/88 Final

STATE/TERRITORY	SUBMITTAL DATE
Guam	8/4/88 Draft
Hawaii	8/9/88 Draft
Idaho	5/19/88 Draft
Illinois	4/30/88 Draft
Indiana	5/20/88 Draft
Iowa	10/28/88 Final
Kansas	4/1/88 Draft
Kentucky	8/4/88 Draft
Louisiana	10/24/88 Final
Maine	8/4/88 Draft
Maryland	8/4/88 Draft
Massachusetts	8/4/88 Final
Michigan	4/1/88 Draft
Minnesota	11/23/88 Final
Mississippi	8/8/88 Draft
Missouri	11/10/88 Final
Montana	8/4/88 Final
Nebraska	10/4/88 Final
Nevada	Not Submitted
New Hampshire	4/13/88 Draft
New Jersey	10/6/88 Draft
New Mexico	10/12/88 Final
New York	11/17/88 Draft
North Carolina	8/4/88 Draft
North Dakota	12/28/88 Final
Northern Marianas	8/30/88 Draft
Ohio	4/11/88 Draft
Oklahoma	10/18/88 Final
Oregon	8/88 Draft
Pennsylvania	8/9/88 Draft
Puerto Rico	8/4/88 Final
Rhode Island	8/4/88 Final
South Carolina	8/18/88 Draft
South Dakota	9/8/88 Final
Tennessee	8/4/88 Draft
Texas	8/4/88 Final
Utah	7/25/88 Draft
Vermont	8/4/88 Final
Virgin Islands	Not Submitted

STATE/TERRITORY	SUBMITTAL DATE
Virginia	8/4/88 Final
Washington	9/21/88 Final
West Virginia	9/12/88 Final
Wisconsin	4/1/88 Draft
Wyoming	10/28/88 Final

Table 3. Nonpoint Source Assessment Report Submittals as of January 30, 1989

Nonpoint Source Management Programs

Reports

Summary of Report Submittals

All NPS Management Programs were due to EPA by August 4, 1988. Most states did not submit final Management Programs by the deadline date. However, nearly all states have now submitted final or draft reports. The reasons for late submittals are basically the same as those given for late submittals of Assessment Reports (see "Summary of Report Submittals" on page 16).

A summary of the status of state and territory submittals is given in Table 4 on page 18. Five states and Puerto Rico had sent final Management Programs to EPA by August 4, 1988, and as of January 30, 1989, an additional 10 states had submitted final Management Programs. Thirty-one states, three territories, and the District of Columbia had submitted draft Management Programs by January 30, 1989, and four states and one territory had made no submittal by that same date.

EPA Actions

EPA approved Nebraska's Management Program on January 5, 1989. As of January 30, 1989, this was the only Management Program fully approved by EPA. However, in September, 1988, EPA approved *portions* of two state Management Programs, those of Delaware (see "DELAWARE" on page 47) and South Dakota. Approval of portions means that EPA has approved certain *elements* of a state's Management Program, but not the complete program. *Elements* may be functional (e.g., educational program), source-specific (e.g., agricultural management program), or geographic (e.g., a *program* of demonstration projects located in strategic areas across the

state) in nature. Approved elements can be funded under section 319, while the disapproved elements cannot be funded under section 319.

The major reasons for states not gaining EPA approval are:

- Lack of a strong statewide element to the Management Program.
- Lack of measurable milestones and schedule for program implementation.
- Lack of synthesis of existing federal, state & local programs into a comprehensive NPS program.
- Little or no delegation of authority and/or responsibilities among cooperating agencies and groups.

STATE/TERRITORY	SUBMITTAL DATE
Alabama	7/30/88 Draft
Alaska	1/30/89 Draft
American Samoa	8/7/88 Draft
Arizona	8/25/88 Draft
Arkansas	8/13/88 Final
California	5/20/88 Draft
Colorado	10/1/88 Draft
Connecticut	8/4/88 Draft
Delaware	8/4/88 Final
District of Columbia	8/15/88 Draft
Florida	8/12/88 Draft
Georgia	8/4/88 Final
Guam	8/4/88 Draft
Hawaii	8/9/88 Draft
Idaho	Not Submitted
Illinois	12/14/88 Draft
Indiana	8/1/88 Draft
Iowa	8/9/88 Draft
Kansas	8/4/88 Draft
Kentucky	8/4/88 Draft
Louisiana	10/24/88 Final
Maine	8/4/88 Draft
Maryland	Not Submitted
Massachusetts	8/4/88 Draft
Michigan	8/2/88 Draft
Minnesota	11/23/88 Final
Mississippi	8/8/88 Draft

STATE/TERRITORY	SUBMITTAL DATE
Missouri	8/4/88 Draft
Montana	8/4/88 Final
Nebraska	10/27/88 Final
Nevada	Not Submitted
New Hampshire	8/12/88 Draft
New Jersey	10/3/88 Draft
New Mexico	1/25/89 Draft
New York	12/31/88 Draft
North Carolina	8/4/88 Draft
North Dakota	12/28/88 Final
Northern Marianas	8/30/88 Draft
Ohio	8/30/88 Draft
Oklahoma	11/9/88 Draft
Oregon	10/30/88 Draft
Pennsylvania	8/9/88 Draft
Puerto Rico	8/4/88 Final
Rhode Island	12/12/88 Final
South Carolina	8/18/88 Draft
South Dakota	9/8/88 Final
Tennessee	8/4/88 Draft
Texas	8/4/88 Final
Utah	5/10/88 Draft
Vermont	11/21/88 Final
Virgin Islands	Not Submitted
Virginia	8/4/88 Final
Washington	9/21/88 Final
West Virginia	9/12/88 Final
Wisconsin	8/1/88 Draft
Wyoming	Not Submitted

Table 4. Nonpoint Source Management Program Submittals as of January 30, 1989

EPA has and continues to work with all states to improve their Management Programs. For example, EPA has met with the state of Delaware to discuss its Management Program, and to provide recommendations for improving the statewide components of its program. Furthermore, EPA has explored creative ways in which it can convince states to develop better Management Programs while still allowing the states to take advantage of available funds to get their programs underway.

National Description of NPS Programs

Overview

One of the major goals of EPA is that states will institutionalize their NPS programs through their section 319 efforts. For example, it is felt by at least one EPA Region that a successful Management Program first "institutionalizes" NPS within the daily operations of both the EPA Regional office and the states. In this way, NPS will become an integral part of the water quality control actions of the state and not just a continual planning process.

Some states have established strong NPS programs through means other than section 319, but many other states can take advantage of the focus on this program to strengthen their statewide NPS efforts. For example, most states in Region VI either do not have water quality standards for NPS parameters (nutrients, salinity, sediment) or have narrative standards that are not enforced for NPS pollutants. Adoption of both numeric and narrative water quality standards for NPS pollutants, and subsequent "enforcement" or management through BMPs to meet these standards would represent considerable progress in these states.

The process of developing NPS Management Programs under section 319 has not been easy, as discussed in "Reports" on page 17. While in the past states have been able to develop NPS programs as needed to deal with specific problems and/or specific areas, section 319 requires that states develop much more comprehensive NPS Management Programs (see "NPS Management Programs" on page 13). Many states were slow in responding to this new section 319 requirement for several reasons, including:

- Large workload related to other requirements of the WQA of 1987.
- Difficulty in addressing problems related to "exotic" types of NPSs such as toxic waste sites.

Several states have developed their NPS Management Programs from a base of programs and liaisons established under the earlier section 208 planning efforts (see "Section 208" on page 10). For example, Hawaii plans to revitalize public awareness regarding NPSs by calling upon those interested groups that were involved in section 208. Minnesota utilized many of the activities, resources, and accomplishments of the 208 planning process to prepare its NPS Assessment Report. North Carolina's Agriculture Task Force, which was established under section 208, is the means by which agricultural agencies in the state cooperate regarding NPS control.

Several states had difficulty with regard to setting implementation priorities for a variety of reasons, including:

- Lack of specific data and/or criteria to develop the definitive assessment required for setting implementation priorities.
- Considerations regarding leveraging and targeting of funds.

Several draft state NPS Management Programs fell short with respect to integration of existing programs that address different NPSs. For example, a few states had proposed separate BMP processes for the major NPSs. In its review comments to the states, EPA recommends to states with these types of problems that they do a better job of integrating the various NPS programs and provide for a single lead agency.

States are in general agreement that better statewide education and information transfer is needed as a priority implementation activity. One Region has noted, however, that most cooperating agencies from which support for this activity is sought are themselves looking for sources of funding to conduct these additional water quality activities.

With regard to state NPS efforts that have been undertaken independent of section 319, several states have an impressive record of achievements. For example, NPS implementation has complemented Clean Lakes Program projects in a number of watersheds across the U.S. The Rural Clean Water Program, Great Lakes Program, ACP Special Water Quality, and similar programs have fostered successful NPS control implementation in many other areas. These programs, although federally funded, generally require financial, technical, and administrative commitments at the state, local, and landowner levels. These non-federal commitments have not been trivial; in fact, under the Rural Clean Water Program it is very common for farmers to contribute several thousands of dollars to implement agricultural control practices.

Beyond these federally funded efforts, many states have embarked upon NPS control efforts funded totally by the state and/or local governments. Examples include North Carolina's Agriculture Cost Share Program for which the state provides \$7 million per year to cost share with farmers in the installation of BMPs in 56 counties. Another example is Florida's Surface Water Improvement and Management Act for which the state provided \$15 million in FY88 to preserve and restore surface waters throughout the state, largely through NPS management. In addition, the state of Michigan awarded \$450,000 in FY88 to local units of government to implement NPS pollution abatement plans previously developed under Michigan's Clean Water Incentives Program.

Progress Made in Reducing Pollutant Loads and Improving Water Quality

Urban NPS Control: The City of Baltimore, with assistance from the Clean Lakes Program, retrofitted existing stormwater detention ponds for water quality purposes. Initial analysis of the quality of the water entering and leaving the modified basins indicates that the retrofit design removes over 90 percent of all particulate material and between 30 and 40 percent of total phosphorus. The low cost of the modifications and the high degree of sediment removal make this project a model for urban NPS control projects.

Other Clean Lakes projects, such as Lake Jackson (FL), Iroquois Lake (NY), and Lake Hopatcong (NJ), documented the effectiveness of retention and detention areas for stormwater and urban NPS control. In addition, other urban NPS controls, such as runoff and construction ordinances, have been demonstrated as being effective in a number of Clean Lakes projects; South Fork Rivanna Reservoir (VA), Lake Ballinger (WA), and Devil's Lake (OR).

Agricultural NPS Control: Through the Clean Lakes Program, the Illinois Environmental Protection Agency in cooperation with various federal and state agencies, demonstrated the effectiveness of watershed management in improving the water quality in Lake Le Aqua-Na, IL. After implementation of all watershed management activities, sediment yields had fallen 57 percent from pre-restoration levels. Continued monitoring of dissolved oxygen and visual examinations indicate that in-lake water quality is continuing to improve. Other Clean Lakes projects recently completed (Green Valley Lake, IA; Spiritwood Lake, ND; Panguitch Lake, UT; Swan Lake, IA; and Broadway Lake, SC) showed water quality improvements as a result of agricultural NPS control activities.

Several RCWP projects have documented water quality improvements associated with agricultural NPS management. These projects include:

- Rock Creek, Idaho - irrigated agriculture.
- Taylor Creek, Florida - dairy management.
- Tillamook Bay, Oregon - dairy management.
- Highland Silver Lake, Illinois - soil erosion control.
- Prairie Rose Lake, Iowa - soil erosion control.
- St. Albans Bay, VT - manure management.

In-place Pollutants: The state of Vermont, with assistance from the Clean Lakes Program, successfully demonstrated the treatment of phosphorus laden, hypolimnetic sediment with alum and sodium

aluminate to reduce internal phosphorus loading in Lake Morey. Two-year, post-treatment monitoring documented a reduction in total phosphorus concentration ranging from 50 to 75 percent from pre-treatment concentrations. Dredging is another lake restoration technique that is utilized to abate in-place pollutant problems. This technique was successfully utilized in the Lake Lansing (MI) and Ada City Lake (OK) Clean Lakes projects.

FY88 EPA and Other Federal Activities

Actions EPA Took to Facilitate Preparation of State NPS Assessments and Management Programs

Issued Guidance

EPA issued the *Nonpoint Source Guidance* in December, 1987. This 33-page guidance spelled out in some detail EPA's interpretation of section 319, including development of the Assessment Reports and Management Programs, annual reports, the procedure for approval, and other administrative provisions. EPA supplemented this guidance with a number of clarifications, including:

- *Section 305(b) Waterbody System User's Guide* (12/87).
- Checklist for Approval of State Assessment Reports (2/88).
- Checklist for Headquarters Review of Management Programs (7/88).
- Funding Questions and Answers (7/88).
- Federal Consistency guidance (revisions underway 8/15/88).
- Reporting Formats (1/88 and revised 4/88).
- Guidance on NPS Funding for Development and Implementation (6/88).
- State Revolving Fund and 201(g)(1)(B) guidance.
- REACH File Documentation.

EPA required all states to submit by April 1, 1988 the list of waters impaired or threatened by NPSs, and the categories and subcategories of NPSs impacting the waters on this list. The central purpose of this exercise was to guide states toward meeting the due date (August 4, 1988) for submittal of complete Assessment Reports (see "Nonpoint Source Assessment Reports" on page 13).

Provided Tools and Data

Reporting Software: EPA created the section 305(b) Waterbody System to organize and manage information that is to be reported under the CWA, as amended in 1987. This software program provides a geographically based framework for entering, tracking, and reporting information on the quality of individual waterbodies as they are defined by each state. EPA directed states to use - or provide information compatible with - the Waterbody System for their NPS Assessment Reports.

EPA issued reporting guidance for section 319 that included use of the 305(b) Waterbody System for the Assessment Reports, data forms for the Management Program, and draft reporting procedures and forms for annual reports required under section 319. EPA developed new software to assist states in reporting the information specified on the Management Program data forms. This software is separate from, but compatible with, the Waterbody System. The annual report formats have been distributed for review and comment by the states, with several states agreeing to test the formats on a pilot basis.

EPA's digital data base of surface waters, the REACH File, is the standard reference for surface waters in the United States, and is utilized as such by EPA and other agencies. The REACH File was updated in 1988 to double its existing size. The REACH File is the core of the Waterbody System, and additions to the REACH File mostly consisted of lower order streams which are those streams typically impacted more by nonpoint sources than by point sources. Therefore, REACH File enhancements are critical to states that use the Waterbody System to report their NPS assessments. EPA also provided in 1988 new software that enables state REACH File users to edit the REACH File from a personal computer (PC). This capability is critical to the survival and utility of the REACH File as it enables the users to monitor and manage the quality of the data base.

Data: EPA developed a summary of the NURP data base for use by all states and localities. Brochures describing the data base were distributed to all states. In addition, simplified procedures for estimating urban NPS pollutant discharges have been developed for and distributed by EPA.

EPA has developed a NPS Data Base for use by states and localities with access to EPA's mainframe computer. The data base consists largely of county information collected by other agencies such as the Department of Agriculture and the Department of Commerce.

EPA prepared a document titled *Municipal Facility/Waterbody Computerized Information, An Introduction* (October, 1987), which describes the waterbody and municipal facility data that are com-

plied on EPA's mainframe computer. Contact persons are identified for each data file or software program listed. Several of the data files and software programs could have been used by states in preparing their NPS assessments.

In support of state assessments, EPA mailed to the states data developed by the Ocean Assessments Division of the National Oceanographic and Atmospheric Administration (NOAA). NOAA had worked with EPA to develop ways in which NOAA's data could be useful to EPA's programs. This cooperative effort led to the sharing of NOAA's estuarine nonpoint source data with the states.

Technical Documents: EPA Headquarters and Regional staff prepared and/or cooperated in the development and distribution of several technical documents. These documents include:

- *Nonpoint Source Pollution Control: a Guide*, which presents information on best management practices and NPS assessment techniques.
- *Interfacing Nonpoint Source Programs With the Conservation Reserve: Guidance for Water Quality Managers*, which provides management guidance for gaining water quality benefits from USDA's Conservation Reserve program.
- *Creating Successful Nonpoint Source Programs: The Innovative Touch*, which is intended to help state and local program managers save time, money, and energy in solving their NPS management problems.
- *Nonpoint Source Monitoring and Evaluation Guide: DRAFT*, which provides technical information regarding NPS monitoring strategies, data analysis, and data interpretation.
- *Effectiveness of Agricultural and Silvicultural Nonpoint Source Controls*, which summarizes the types of NPS-related aquatic monitoring programs executed in the Pacific Northwest.
- *Setting Priorities: The Key to Nonpoint Source Control*, which is a working outline of the targeting process for identifying and managing priority water resources.

In addition to the above documents, the Soil and Water Conservation Society prepared for EPA a brochure, *Vegetative Filter Strips Now Eligible for CRP Enrollment - Consider the Advantages*, which explains how filter strips can be established under USDA's Conservation Reserve Program to improve water quality and wildlife habitat. Also, EPA has contributed to the development of *Assessment and Control of Nonpoint Source Pollution of Aquatic Systems: A Practical Approach*, which is being produced for UNESCO to provide sound information and guidelines for NPS assessment and control in a wide range

of environmental settings. Several other technical documents have been published in past years, including publications from the NURP and RCWP, and a handbook for evaluating the leaching potential of agricultural chemicals.

Provided Direct Assistance

EPA provided limited assistance to the states regarding the REACH File update and PC software. A few states received considerable direct assistance from EPA, yet most states were provided minimal assistance due to time constraints. Waterbody System training was also provided to EPA Regions and states.

In addition to the above guidance, EPA Headquarters has met twice with all EPA Regional NPS Coordinators to discuss various aspects of section 319. Each EPA Regional office, in turn, has held several section 319 workshops with the states and with other federal agencies.

EPA directly assisted several states as they prepared their assessments and Management Programs, including working with the states in the field and in state offices. For example, EPA representatives worked directly with Idaho, Delaware, the Virgin Islands, and Alaska, providing technical and administrative guidance.

Made Funds Available for State Use

Although there are several CWA funding sources that can be used to develop and/or implement state NPS programs, it is unlikely that large amounts of these funds will be used by the states for this purpose. For example, while some section 106 and section 205(j)(1) funds have been used in the past for NPS activities, the competition for these funds has increased due to the new point source activities required by the 1987 amendments to the CWA (e.g., toxics assessments and control strategies, stormwater runoff management). Still, states can link activities such as those under section 314 (the Clean Lakes Program) and section 320 (the National Estuary Program) to their NPS programs.

The fact that a non-federal match is required for implementation under section 319¹⁹ illustrates the intent of Congress to have the states commit a fair share of their own funds for NPS Management Program im-

plementation. As discussed earlier (see "EPA Actions" on page 17), however, most states cannot begin implementation since their Management Programs have not yet been approved. Nearly all funds utilized to date for section 319 purposes have been used for program development, which requires no non-federal funds. In fact, the states have provided very little new funding in response to section 319. Successful implementation will require a significant increase in state NPS expenditures.

Federal funds will also be important for successful implementation. The following discussion focuses on the use of section 319(h) and (i), section 205(j)(5), section 201(g)(1)(B), section 603(c)(2), and section 604(b) funds for implementation of the NPS Management Programs.

Section 319: Section 319(h) authorizes "grants for implementation of Management Programs", but not for the development of Assessment Reports or programs. Such grants may be made to states with approved Assessment Reports and approved or partially approved Management Programs provided that those states meet certain conditions that include a non-federal match of 40 percent²⁰ and state maintenance of effort funding.²¹ As noted in "EPA Actions" on page 17, grants can be made for implementing those approved elements of a partially approved Management Program.

Section 319(i) authorizes grants for assisting states in carrying out groundwater protection activities that will advance the state toward implementation of a comprehensive NPS control program. Such activities include research, planning, groundwater assessments, demonstration programs, enforcement, technical assistance, education, and training. These grants can be made to states with approved assessments and approved or partially approved Management Programs provided that those states meet conditions that include a non-federal match of 50 percent.

There was no Congressional appropriation of 319 grant funds for either FY88 or FY89.

Section 205(j)(5): Section 205(j)(5) of the Clean Water Act establishes a set-aside of construction grant funds "...for the purpose of carrying out section 319 of this Act." These funds may be used for

- Program development, the preparation of state NPS Assessment Reports and/or Management

¹⁹ *Nonpoint Source Guidance*. December 1987. USEPA Office of Water, page 30.

²⁰ For example, a federal grant of \$60,000 would have to be matched with \$40,000 from non-federal sources, for a total of \$100,000.

²¹ Maintenance of effort means that the level of state spending for NPS control in FY85 and FY86 must be maintained for the state to be eligible for a federal grant under section 319.

Programs, and the development, installation and refinement of NPS data management systems.

- The implementation of state Management Programs.

Grants from the 205(j)(5) reserve are awarded under the authority of section 319(h). The conditions for use of 205(j)(5) grant funds for program *implementation* are the same in every respect as the conditions for use of 319(h) and (i) grant funds, including the match requirements. However, no match is required for 205(j)(5) funds that are used for program *development*.

The greater of \$100,000 or 1% of the state's construction grants allotment is available for grants from the 205(j)(5) set-aside. New 205(j)(5) funds will be available as long as states receive construction grant allotments, the last of which are authorized for FY90. These funds are available for obligation for state use during the fiscal year in which they are appropriated and during the following fiscal year. For example, FY90 funds may be used to award grants in FY91.

EPA has tracked the availability and use of 205(j)(5) funds for NPS program development. The process by which states receive and spend these funds begins with the Congressional appropriation of Title II funds and the subsequent reservation²² of 205(j)(5) funds, followed by the award or obligation of these funds for state use, and the expenditure or drawdown of these funds. In general, these funds are used to maintain a minimum level of NPS staff, and are not used directly for NPS implementation.

Of the 57 states and territories, 51 received all or nearly all (less than \$1,000 unobligated) of their FY87 205(j)(5) funds as of September 30, 1988.²³ Two territories and four states had not applied for large amounts of available funds, including the states of Maryland (\$180,010 unobligated), Virginia (\$136,930), and Georgia (\$95,740), as well as the

Pacific Trust Territories and the Virgin Islands (\$100,000 each). It is important to note that all states and territories, with the exception of the Pacific Trust Territories and the Virgin Islands, had received the minimum of \$100,000²⁴ by September 30, 1988. *From the national perspective, \$12.5 million of FY87 205(j)(5) funds were reserved, and EPA awarded 95 percent (\$11.9 million) for section 319 program development by the end of FY88. Because these funds were targeted for program development no state match was required.*

As shown in Table 5 on page 24, only 13 states and one territory had received 100 percent of their FY88 205(j)(5) funds by September 30, 1988. All other states and territories had large sums of FY88 funds available at that date. *Nationally, \$23.1 million of FY88 205(j)(5) funds were reserved, and only 20 percent (\$4.6 million) were obligated by the end of FY88.* No state match was required since the funds were obligated for program development. As indicated above, these funds are available for obligation until the end of FY89.

In summary, through September 30, 1988, \$35.7 million of FY87 and FY88 funds was reserved for section 319 purposes under section 205(j)(5). Of this total reserve, \$16.6 million (\$11.9 million of FY87 and \$4.6 million of FY88 funds) has been obligated for section 319 program development, and therefore required no state match. EPA's records show that nationally only 17 percent (\$2.8 million) of the obligated FY87 and FY88 funds had been drawn down from letters of credit by September 30, 1988.

The sum of the FY89 reservation and the unobligated FY88²⁵ amount for each state is the total amount of 205(j)(5) funds available for section 319 purposes as of October 1, 1988. Nationally, the total available was \$29.1 million. Based upon the \$100,000 minimum and obligations as of 9/30/88, however, it can be shown that a minimum of \$14 million of the

²² For the purposes of this Report, financial terms are used in the following manner. Section 205(j)(5) funds are *reserved* by EPA from each state's Title II allotment to be used for NPS activities. While EPA retains these funds and *before* they are provided to a state by a grant award, the funds are *available* and *unobligated*. An *award* is the legal act of signing a grant and *obligating* 205(j)(5) funds for the use of the grantee (i.e., the state).

²³ SOURCE: EPA's Financial Management System, supplemented by information from EPA's Grants Information and Control System.

²⁴ If a state chooses not to use a minimum of \$100,000 of its reserve for NPS purposes, the difference between what is actually used for NPS purposes and \$100,000 will be reallocated to other states as construction grant funds, pursuant to 40 CFR 35.155. On the other hand, section 205(j)(5) states that "sums so reserved in a state in any fiscal year for which such state does not request the use of such sums, to the extent such sums exceed \$100,000, may be used by such state for other purposes under this title". In other words, for states with a reserve greater than \$100,000 the state may choose to use the amount in excess of \$100,000 for Title II purposes instead of for section 319. Three states (Georgia, Maryland, and Virginia) chose this option in applying for FY87 funds.

²⁵ Unobligated FY87 205(j)(5) funds are no longer available.

available funds (\$8.3 million from FY88, \$5.7 million from FY89) will be used.²⁶

These funds can be used for program implementation (see "Section 319" on page 22 for implementation grant requirements) and/or development. If the states and territories use only the minimum amount of available funds (\$14 million) solely for program development, then the total amount of FY87-89 205(j)(5) derived funds utilized for section 319 purposes would be \$30.6 million (\$16.6 million already

used + \$14 million). No state match would be provided under this extreme scenario. At the other extreme, if states and territories use the maximum amount of available funds (\$29.1 million) solely for implementation, the total amount of FY87-89 205(j)(5) derived funds used for section 319, including the 40 percent match, would be \$65.1 million (\$16.6 million already used + \$48.5 million). It is likely that the actual amount will fall somewhere between \$30.6 million and \$65.1 million.

STATE or TERRITORY	FY88		FY89	TOTAL AVAILABLE
	RESERVED	UNOBLIGATED	RESERVED	
Alabama	256,820	0	104,347	104,347
Alaska	137,460	137,460	100,000	237,460
Arizona	155,130	155,130	100,000	255,130
Arkansas	150,250	0	100,000	100,000
California	1,642,650	1,642,650	667,412	2,310,062
Colorado	183,720	42,413	100,000	142,413
Connecticut	281,370	281,370	114,322	395,692
Delaware	112,750	0	100,000	100,000
District of Columbia	112,750	112,750	100,000	212,750
Florida	775,280	775,280	314,999	1,090,279
Georgia	388,300	388,300	157,781	546,081
Hawaii	177,880	177,880	100,000	277,880
Idaho	112,750	112,750	100,000	212,750
Illinois	1,038,760	1,038,760	422,050	1,460,810
Indiana	553,520	479,791	224,897	704,688
Iowa	310,850	310,850	126,298	437,148
Kansas	207,320	207,320	100,000	307,320
Kentucky	292,320	0	118,769	118,769
Louisiana	252,480	252,480	102,585	355,065
Maine	177,790	177,790	100,000	277,790
Maryland	555,500	555,500	225,700	781,200
Massachusetts	779,800	779,800	316,835	1,096,635
Michigan	987,570	459,096	401,252	860,348
Minnesota	422,150	0	171,520	171,520
Mississippi	206,930	206,930	100,000	306,930
Missouri	636,710	636,710	258,696	895,406
Montana	112,750	0	100,000	100,000

²⁶ It was assumed for this analysis that funds in excess of \$100,000 that have not been obligated as of 9/30/88 will be diverted for Title II purposes.

STATE or TERRITORY	FY88		FY89	TOTAL AVAILABLE
	RESERVED	UNOBLIGATED	RESERVED	
Nebraska	117,480	117,480	100,000	217,480
Nevada	112,750	0	100,000	100,000
New Hampshire	229,530	229,530	100,000	329,530
New Jersey	938,560	544,150	381,340	925,490
New Mexico	112,750	112,750	100,000	212,750
New York	2,535,110	2,535,110	1,030,022	3,565,132
North Carolina	414,520	0	168,419	168,419
North Dakota	112,750	0	100,000	100,000
Ohio	1,292,990	1,292,990	525,345	1,818,335
Oklahoma	185,560	185,560	100,000	285,560
Oregon	259,460	0	105,418	105,418
Pennsylvania	909,790	909,790	369,650	1,279,440
Rhode Island	154,220	73,220	100,000	173,220
South Carolina	235,290	235,290	100,000	335,290
South Dakota	112,750	112,750	100,000	212,750
Tennessee	333,650	333,650	135,562	469,212
Texas	1,049,770	1,049,770	426,525	1,476,295
Utah	121,020	0	100,000	100,000
Vermont	112,750	112,750	100,000	212,750
Virginia	470,040	470,040	190,979	661,019
Washington	399,410	247,748	162,283	410,031
West Virginia	358,040	0	145,472	145,472
Wisconsin	620,920	275,900	252,283	528,183
Wyoming	112,750	0	100,000	100,000
American Samoa	100,000	100,000	100,000	200,000
Guam	100,000	100,000	100,000	200,000
Northern Marianas	100,000	0	100,000	100,000
Pacific Trust Territory	100,000	100,000	100,000	200,000
Puerto Rico	299,560	299,560	121,713	421,273
Virgin Islands	100,000	100,000	100,000	200,000
TOTAL U.S.	23,122,980	18,469,048	10,642,474	29,111,522

Table 5. Availability and Use of 205(j)(5) Funds for NPS Programs: SOURCE: EPA's Financial Management System and Grants Information and Control System

Section 201(g)(1)(B): The Water Quality Act of 1987 amended CWA section 201(g)(1) by adding subsection (B) which established a new purpose for which these funds can be used: "...any purpose for which a grant can be made under section 319(h) and

(i) of this Act (including any innovative and alternative approaches for the control of nonpoint sources of pollution)." The conditions for use of these funds are the same as those for the use of 319(h) and (i) grant funds, including the matching requirements.

The Act does not mandate use of these funds for NPS development or implementation. The funds can, however, be used to fund implementation of NPS Management Programs as a matter of state discretion. EPA is encouraging the states to use these funds for NPS purposes.²⁷ States can obligate up to 20 percent of their annual section 205 allotments for uses under section 319. However, FY90 is the last year that Title II funds are authorized for appropriation. These FY90 funds can be used to award grants in FY91.

Table 6 shows the amount of section 201(g)(1)(B) funds that were available for use under section 319 for FY87.²⁸ Similar amounts were available in FY88, but no states have yet used FY88 Title II appropriations for section 319 purposes. The table illustrates the general lack of use of these funds for NPS programs (0.5% nationally). Only two states (Delaware and South Dakota) have applied these funds to NPS implementation efforts. As discussed earlier (see "EPA Actions" on page 17), however, EPA had only approved Nebraska's Management Program and portions of the Delaware and South Dakota Management Programs by January 30, 1989. Since approval of Management Programs is a precondition for obligation of Title II funds for section 319 purposes, it is not surprising that only two states have used these funds for NPS implementation. It is also clear, however, that the potential for using Title II funds for NPS implementation was a strong incentive for those states to develop approvable Management Programs. The absence of more approvable Management Programs by January 30, 1989 may be an indication that few other states had a strong desire to use Title II funds for NPS implementation.²⁹

States are not expected to use a large portion of their section 201(g)(1)(B) funds for NPS management largely because of the high priority accorded to construction of publicly owned treatment works. Given that these funds are not authorized for appropriation after FY90, states with backlogs of wastewater treatment needs are not likely to use the 20 percent set-aside for NPS management. As one state reported, "neither the state revolving loan fund nor the Governor's discretionary funds will be used for NPS activities because of a backlog of point source needs".

STATE or TERRITORY	FY87 FUNDS AVAIL-ABLE (\$)	FY87 FUNDS USED FOR NPS (\$)
Alabama	5,324,600	0

STATE or TERRITORY	FY87 FUNDS AVAIL-ABLE (\$)	FY87 FUNDS USED FOR NPS (\$)
Alaska	2,850,000	0
Arizona	3,216,400	0
Arkansas	3,115,000	0
California	34,056,000	0
Colorado	3,809,200	0
Connecticut	5,833,600	0
Delaware	2,328,200	1,100,000
District of Columbia	2,328,200	0
Florida	16,073,600	0
Georgia	8,051,000	0
Hawaii	3,688,000	0
Idaho	2,328,200	0
Illinois	21,536,200	0
Indiana	11,476,000	0
Iowa	6,444,800	0
Kansas	4,298,200	0
Kentucky	6,060,600	0
Louisiana	5,234,600	0
Maine	3,661,600	0
Maryland	11,517,000	0
Massachusetts	16,167,400	0
Michigan	20,474,800	0
Minnesota	8,752,200	0
Mississippi	4,290,400	0
Missouri	13,200,600	0
Montana	2,328,200	0
Nebraska	2,435,800	0
Nevada	2,328,200	0
New Hampshire	4,758,600	0
New Jersey	19,458,800	0
New Mexico	2,328,200	0
New York	52,700,400	0

²⁷ For details on EPA policy regarding use of Title II and VI funds for NPS activities, see Office of Water memo of January 17, 1989.

²⁸ *Federal Register*, Vol. 52, No. 83, April 30, 1987 and Vol. 52, No. 231, December 2, 1987.

²⁹ SOURCE: EPA's Grants Information and Control System

STATE or TERRITORY	FY87 FUNDS AVAILABLE (\$)	FY87 FUNDS USED FOR NPS (\$)
North Carolina	8,593,800	0
North Dakota	2,328,200	0
Ohio	26,807,000	0
Oklahoma	3,847,000	0
Oregon	5,379,200	0
Pennsylvania	18,862,400	0
Rhode Island	3,174,800	0
South Carolina	4,878,000	0
South Dakota	2,328,200	1,200,000
Tennessee	6,917,400	0
Texas	19,877,200	0
Utah	2,509,000	0
Vermont	2,328,200	0
Virginia	9,745,200	0
Washington	8,280,800	0
West Virginia	7,423,000	0
Wisconsin	12,873,400	0
Wyoming	2,328,200	0
American Samoa	427,400	0
Guam	309,200	0
Northern Marianas	198,600	0
Pacific Trust Territory	387,400	0
Puerto Rico	6,210,800	0
Virgin Islands	248,000	0
TOTAL U.S.	468,717,000	2,300,000

Table 6. Section 201(g)(1)(B) Funds Applied to NPS Management

Section 603(c)(2): The Water Quality Act of 1987 added a new Title VI to the CWA that establishes a State Water Pollution Control Revolving Fund (SRF) program, and provides federal grants to capitalize SRFs. While Title II funding is being phased out, Title VI will continue through FY94. SRFs will provide funds in the form of loans, refinancings, bond insurance and guarantees, but not grants, that may be used for:

- The construction of publicly owned treatment works.
- The implementation of state NPS Management Programs.
- The development and implementation of state estuary conservation and management plans.

Section 603(c)(2) authorizes states to provide financial assistance "for the implementation of a Management Program established under section 319 of this Act..." CWA section 602(b)(5) states that "all funds in the fund as a result of capitalization grants under this title and section 205(m) of this Act will first be used to assure maintenance of progress, as determined by the Governor of the State, toward compliance with enforceable deadlines, goals, and requirements of this Act, including the municipal compliance deadline". States may satisfy the "first use" requirement by certifying that all National Municipal Policy projects in the state are: (1) in compliance, (2) on enforceable schedules, (3) have enforcement actions filed, or (4) have funding commitments during or prior to the first year covered by the Intended Use Plan. Other funds in the SRF, including state funds deposited in the SRF in excess of the required match, and bond proceeds from leveraging, are not so restricted as to initial use.

There were six SRFs established in FY88, and six more established in the first quarter of FY89. EPA expects that a majority of states will have approved SRFs by the end of FY89.

Section 604(b): Beginning in FY89, states must reserve each year one percent of their Title VI allotments or \$100,000, whichever is greater, to carry out planning under 205(j) and 303(e). Although NPS planning activities are eligible for funding under 205(j), EPA does not anticipate that significant additional funds will be available for NPS activities through the 604(b) reserve.

Actions EPA Took to Support State Implementation of Effective NPS Programs

Helped Support USDA-Soil Conservation Service Personnel Detailed to EPA Regions

In a cooperative effort with the Department of Agriculture, the Soil Conservation Service (SCS) has assigned persons to work in each of EPA's 10 Regions and EPA Headquarters. These 11 individuals have been instrumental in coordinating EPA NPS activities with USDA activities.

Established Memorandum of Understanding with Soil Conservation Service

EPA and SCS signed (October 20, 1988) an interim memorandum of understanding (MOU) that "establishes policies and administrative procedures for additional cooperative efforts toward water quality maintenance and improvement, particularly through using SCS and EPA authorities and programs to assist in the implementation of State Nonpoint Source (NPS) Management Programs". Some of the highlights of the MOU include:

- SCS agrees to utilize the results of the section 319 Assessment Reports, and future updates, in future water quality initiatives.
- EPA agrees to encourage states to include SCS in their ongoing development, update, and review of section 319 state Management Programs.
- SCS agrees to maintain and/or incized to protect wetlands, as well as inc to states for developing and implementing water quality programs and projects, including the state NPS Management Programs.
- SCS agrees to help states and EPA ensure that recommended practices are applied and watershed water quality objectives are being met.
- SCS agrees to implement internal policies that elevate the importance of water quality in all SCS programs and assure consistency of SCS actions with state NPS Management Programs.
- SCS agrees to continue to promote ways by which the Conservation Reserve Program will reduce NPS pollution.
- SCS agrees to encourage the targeting of P.L. 83-566 land treatment projects to watersheds included in the state NPS Management Programs and those selected as Clean Lakes projects.
- EPA agrees to encourage states to select agricultural BMPs that are, as a minimum, in accordance with SCS standards and specifications.
- EPA agrees to encourage states, consistent with state NPS Management Programs, to use the SCS and the conservation districts' existing delivery system to implement BMPs on agricultural lands.
- EPA agrees to encourage states to enter into agreements with SCS and/or conservation districts for levels of technical assistance established mutually by SCS and the state.
- EPA and SCS will jointly pursue the development of a broader agreement that designates water quality objectives as a priority in future

program and budget initiatives (including the Conservation Title in the 1990 Farm Bill).

SCS and EPA have agreed to enter into a final agreement following EPA's adoption of its NPS Agenda (see "Convened NPS Agenda Task Force" on page 29).

National Estuary Program

EPA's National Estuary Program (NEP), which began in 1985, focuses basinwide management attention on specific estuaries around the country. The NEP will continue as a formally established program under the Water Quality Act of 1987 amendments to the CWA. The new law encourages Governors to nominate estuaries, based upon national significance, for which the EPA Administrator would convene management conferences. The conferences will develop comprehensive conservation and management plans to protect and enhance estuarine environmental quality. These plans will address both point sources and nonpoint sources.

Estuaries that have been officially designated are Albemarle-Pamlico Sounds (NC), Long Island Sound (NY and CT), Narragansett Bay (RI), Buzzards Bay (MA), Puget Sound (WA), New York-New Jersey Harbor (NY and NJ), Delaware Bay (DE, PA, and NJ), Delaware Inland Bays (DE), Sarasota Bay (FL), San Francisco Bay (CA), Galveston Bay (TX), and Santa Monica Bay (CA).

Near Coastal Waters Initiative

The Near Coastal Water Initiative (NCW) began in 1985 as one of several long-term strategic planning initiatives developed by EPA. In 1986 EPA identified five major national environmental problems affecting near coastal waters:

- Toxics contamination.
- Eutrophication.
- Pathogens.
- Habitat loss or alteration.
- Changes in living resources.

In FY88 EPA worked with other federal agencies to inventory available data for near coastal waters. EPA and NOAA developed a case study assessment, producing the document *Strategic Assessment of Near Coastal Waters: Northeast Case Study* in November 1987. A supplemental document was also prepared, *Susceptibility and Status of Northeast Estuaries to Nutrient Discharges*, in July, 1988. This work accounted for both point and nonpoint sources, probable sources, and susceptibility of 17 Northeast estuaries to nutrient enrichment. EPA is also funding

several demonstration pilot projects in selected coastal waters around the country that include NPS control solutions.

Proposed Strategy to Address Pesticides in Ground-Water

In its *Agricultural Chemicals in Ground Water: EPA's Proposed Pesticides Strategy*, EPA establishes a goal of protecting the ground-water resource with a focus on preventing unacceptable contamination of current or potential drinking water supplies or ground water of ecological importance. The strategy also provides the states with the opportunity to take the lead role in meeting this goal by designing and implementing plans to manage pesticides to prevent unacceptable ground-water contamination. EPA believes that these state Pesticide/Ground-Water Management Plans can be used to strengthen EPA's foundation for the federal registration within states of pesticides posing ground-water contamination concerns.

EPA released the proposed strategy for public review and comment on February 26, 1988. EPA held workshops in late 1988 to explore with state agencies and others the Management Plan concept, including the appropriate components and emphasis of such plans and the degree of oversight that EPA should have in its development and implementation.

Convened NPS Agenda Task Force

EPA Headquarters, under the direction of the Acting Assistant Administrator for Water, initiated a NPS Agenda Task Force to lay out plans for Headquarters NPS activities for FY89-93. This Task Force involved all offices within the Office of Water (OW); the Office of Pesticides and Toxic Substances (OPTS); the Office of Policy, Planning & Evaluation (OPPE); the Office of Solid Waste and Emergency Response (OSWER); the Office of External Affairs (OEA); the Office of General Counsel (OGC); three EPA Regional offices; and the Chesapeake Bay Program.

The Task Force was created to explore new, creative, proactive approaches to implementing the NPS provisions of the Water Quality Act of 1987. Several workgroup level meetings were held in a six-month period to assess the situation, determine program needs, and decide upon actions to be taken by EPA. The Task Force established the following national NPS agenda goal:

"To protect and restore designated uses of the Nation's waters by providing strong leadership for the National nonpoint source program, and by helping States and local governments overcome barriers to successful implementation of NPS measures."

Other federal agencies, private interest groups, and environmental groups were invited to comment on an

early draft of the NPS agenda, and a widespread public comment period was held prior to Agenda finalization. The Agenda focuses on the section 319 state NPS Management Programs as the cornerstone of the national NPS program. The Agenda was approved by the EPA Administrator on January 18, 1989, and includes the following general themes:

- Help states and local governments raise the level of public awareness about how NPS pollution affects water quality and their daily lives.
- Provide states and local governments with information on practical, feasible solutions to prevent or control NPS pollution.
- Examine the economic forces that drive behavior causing the NPS problem.
- Help states and local governments improve their capability to develop their own regulatory solutions.
- Develop the tools states and local governments need to establish sound water quality-based programs for NPS, particularly water quality criteria and monitoring protocols that are specifically designed to evaluate NPS controls.

Issued Underground Storage Tank Regulations

Protection of ground water is the primary objective of EPA's regulations issued in September 1988 designed to prevent leaks and spills from underground storage tanks (USTs) and to ensure that the problems from existing leaks and spills are corrected properly. These regulations, which affect nearly two million tanks containing petroleum and hazardous substances, require owners and operators to test and upgrade existing tanks, to ensure new tanks are protected from corrosion and properly installed, and to report, investigate, and clean up any releases promptly. States have the lead role in implementing the UST regulations, and the number and effectiveness of state programs continued to grow this year. At the end of FY88, 42 states had UST-specific statutes, covering about 90 percent of federally regulated USTs.

The Leaking Underground Storage Tank (LUST) Trust Fund began its first full year of operation in FY88, and EPA provided states with \$34 million from the fund to ensure that releases from USTs are addressed. The fund enables states to oversee corrective actions by owners and operators, and where necessary, to take enforcement actions or to clean up a release if a capable responsible party is not found. State programs funded by the LUST Trust Fund were underway in 53 states and territories by the end of the year. Corrective actions had been initiated at more than 8,000 sites, of which 135 were Trust Fund financed.

Supported Professional Workshops

EPA sponsored or co-sponsored two workshops in FY88:

- 1988 RCWP Workshop, St. Paul, MN - Focused on nutrient and pesticide management, ground-water monitoring, and NPS data analysis. All states were invited as RCWP lessons learned were shared with those developing section 319 Assessment Reports and Management Programs.
- National Monitoring Symposium, Annapolis, MD - All states were invited to this meeting that included several presentations on NPS monitoring, aquatic life criteria, and GIS applications. A proceedings was published and distributed to all states.

Actions other Federal Agencies Took to Implement NPS Control

USDA Elevated Water Quality to Higher Priority

The goals expressed in USDA's updated National Program for Soil and Water Conservation (NCP) are to assure through 1997 that USDA programs assist land owners and land users to:

1. Maintain and enhance the quality of the resource base for sustained use.
2. Improve and protect the quality of the environment to provide attractive and satisfying places to live and opportunities for orderly growth.
3. Improve the standard of living and quality of life in rural communities.

The top priorities for USDA are:

1. Reducing the damage caused by the excessive soil erosion on crop, pasture, range, forest, and other rural lands.
2. Protecting the quality of ground and surface water against harmful contamination by nonpoint sources.

In short, the updated NCP has elevated water quality to the number two priority in SCS.

USDA Allows Filter Strips Under Farm Bill

The Food and Security Act of 1985 (PL 99-198, also known as FSA or the Farm Bill) includes a conservation title that provides ways in which those lands posing off-farm environmental effects can be dealt with.³⁰ The three key provisions of the conservation title are (1) the Highly Erodible Land Conservation Provision commonly referred to as Conservation Compliance (CC) and Sodbuster, (2) the Wetland Conservation Provision commonly referred to as Swampbuster, and (3) the Conservation Reserve Program (CRP). A fourth key provision, Conservation Easements, is included in the credit title of the legislation.

The Highly Erodible Land Conservation Provision provides exemptions to those producers of agricultural commodities on highly erodible land who have approved conservation plans. Those producers who sodbust highly erodible land after December 23, 1985 must have a conservation plan applied at the time sodbusted land is planted. The CC applies to those highly erodible lands used to produce agricultural commodities in any of the years 1981 through 1985. Those lands must have an approved conservation plan by January 1, 1990, and the plan must be fully implemented before January 1, 1995 to enable the producer to retain USDA program benefits.

Swampbuster provides that any person who in any crop year produces an agricultural commodity on any converted wetland shall be ineligible for any USDA program benefits. Converted wetland is any wetland drained, dredged, leveled, filled, or leveed after December 23, 1985.

The CRP will take up to 40-45 million acres of the most erodible cropland out of agricultural production during a 10-year period by developing rental agreements with landowners.

The potential water quality benefits that can accrue from the Farm Bill will not be fully realized unless (1) the CRP idles those lands causing water quality problems and (2) conservation plans mandated by the CC program are oriented to water quality-related problems.

EPA has and continues to work with USDA to modify the CRP to increase its potential for reducing off-farm environmental threats. Section 1231(c)(2) of the Farm Bill authorizes the Secretary of Agriculture to include in the CRP "...lands that are not highly erodible lands but that pose an off-farm environmental threat ..."; it is this option that EPA continues to encourage USDA to exercise in the CRP.

³⁰ Parts of this section are taken from: Humenik, F.J., M.D. Smolen, and S.A. Dressing, 1987. *Pollution from nonpoint sources, Where we are and where we should go*. *Environmental Science and Technology*. 21(8): 737-742.

EPA and other environmental groups represented on the CRP Work Group have cooperated with USDA to make riparian filter strips eligible under the CRP. EPA has published a Filter Strips brochure for the CRP that will help inform decision-makers, the agricultural community, and the general public regarding this modification to the program. Through the seventh filter strip enrollment in July, 1988, about 29,000 acres of filter strips were planned for installation.

In addition to the Filter Strips brochure, EPA has developed and distributed a guidance document that informs water quality managers of ways to link the CRP with their NPS Management Programs. For example, states may increase CRP enrollment in high priority watersheds by augmenting CRP rental payments with state cost-share funds.

ASCS has the lead responsibility for implementing the CRP, the CC, Swampbuster, and Sodbuster. Because it is the primary agency that administers USDA's commodity programs, ASCS is responsible for withholding program benefits for noncompliance with the new Farm Bill conservation title provisions. For example, in FY87, ASCS obtained 2.1 million certifications from agricultural producers who participated in federal farm programs to determine whether such producers have or have not newly cultivated highly erodible land or wetland. The ASCS also completed a 15 percent random sample compliance review of these agricultural producers to verify compliance with the law.

Soil Conservation Service Implemented New Water Quality Action Plan

The Soil Conservation Service (SCS) established a task force to implement its new Water Quality Action Plan (WQAP) in December, 1987. The WQAP, in general, is a program to develop and implement specific procedures to enable SCS to account for water quality in its activities. The key components of the WQAP include:

- Design of a comprehensive water quality evaluation system (CES).
- Formulation of a technical guidance (TCG) for the CES.
- Training of SCS and other USDA field office personnel, state water quality professionals, state agriculture department staff, and Conservation District personnel.

By early 1989, SCS will begin implementation of new nutrient management and pesticide management practices. These two practices are essential to SCS

activities in controlling agricultural NPS pollutants. By September, 1989, SCS expects to have completed training of SCS field personnel.

EPA will play a role by helping to disseminate information to state water quality agencies, asking states to make available to SCS its water quality problem area maps and data, providing information and assistance to SCS as it attempts to set priorities for managing pesticide problems, providing assistance to SCS as it develops the CES and TCG, and by assisting in the development of predictive models and other tools for estimating the water quality impacts of SCS activities.

SCS Assigned Details to State Water Quality Agencies

SCS has personnel detailed to the state water quality agency in 17 states to provide assistance in developing their water quality programs. This arrangement should provide a boost to those 17 states as they implement their NPS Management Programs.

Extension Service Focus on Water Quality

In 1986-1987 the Cooperative Extension System identified eight National Priority Initiatives, one of which was water quality.³¹ Extension Service identified four critical issues under its Water Quality initiative:

- What are the attributes of the hydrologic situation that make our water resources vulnerable to contamination?
- What are the impacts of agricultural, industrial, and household chemicals on water quality and on subsequent uses or users of the water?
- What can domestic, agricultural, and municipal water users do to conserve their water resource and to protect or enhance its quality?
- What can private citizens and/or local government officials do to address public concerns about the interactions of land use, chemical use, and water quality?

EPA and Extension Service have an opportunity to meet common goals under section 319 and the Water Quality initiative by working closely together. Extension's Water Quality initiative is focused primarily on human uses of water, whereas the state NPS Management Programs - although many have a strong drinking water focus - devote considerable attention to maintaining and restoring fish habitats,

³¹ United States Department of Agriculture, Extension Service. 1988. *Cooperative Extension System National Initiatives, Focus on Issues*.

recreational water uses, shellfishing beds, and other non-human uses of surface waters. Governor-designated state NPS management lead agencies should work with the Extension System to help them direct better their Water Quality initiative to meet state NPS needs.

Forest Service "Rise to the Future"

In 1987, the USDA Forest Service (FS) developed goals for an "aggressive program to maintain and enhance fishery resources in National Forests and National Grasslands".³² The importance of this program is highlighted by the fact that FS lands "in 43 states contain about 128,000 miles of streams and rivers; 2.2 million acres of ponds, lakes, and reservoirs; and 16,500 miles of coast and shorelines".

Action items of this FS fisheries program were to be implemented beginning in FY88. The following is a list of program goals:

- Enhance program identification by increasing awareness of fish habitat management throughout the Forest Service and among fishery users and cooperators.
- Use the best management technologies to increase habitat management efficiency and effectiveness.
- Communicate fish habitat improvement and access needs and market fishing opportunities.
- Strengthen partnerships with states, federal agencies, Tribal Governments, conservation groups, and publics to share in fisheries management.
- Use valid economic techniques to determine fishery values, supplies, and demands in the decision making process.
- Maintain a highly skilled workforce with strong managerial, analytical, and technical skills.
- Implement a program of activities and develop budgets to accomplish the above goals.

EPA is enthusiastic about the Forest Service's forward-thinking approach in its "Rise to the Future" program. In fact, EPA staff in the western Regions are working with their counterparts in the forests to promote new monitoring and restoration techniques that will ensure that fishery habitat will be maintained and improved in the vast tracts of public land managed by the Forest Service.

Agricultural Research Service (ARS) Provided Technical Support

ARS continues to support the development and implementation of agricultural NPS models, such as CREAMS (Chemical and Runoff Effects of Agricultural Management Systems), GLEAMS (Groundwater Loading Effects of Agricultural Management Systems), and AgNPS (Agricultural NonPoint Source). ARS is also developing techniques that predict and quantify pesticide contamination in ground and surface waters.

ASCS Supported Special Water Quality Projects

In FY88, ASCS allocated \$8 million of ACP funds to 24 special water quality projects nationwide. The agency continues to encourage state Agricultural Stabilization and Conservation committees to fund additional water quality projects with their state ACP allocation.

Federal Highway Administration

The Federal Highway Administration (FHWA) implements NPS through two facets of the highway development process; environmental analysis pursuant to the National Environmental Policy Act and the policies and procedures for the control of erosion, abatement of water pollution, and prevention of damage by sediment deposition.

Erosion control is emphasized in the preparation of plans, specifications, and estimates. It is also FHWA's policy to include permanent erosion and sediment at the earliest practicable time consistent with good construction practices. Also pollutants used during highway construction or operation and material from sediment traps shall not be stockpiled or disposed of in a manner that makes them readily susceptible to being washed into any watercourse by runoff or high water. These policies that are directed toward the design and construction phase of highway development are preceded by FHWA's policy during the environmental analysis process.

The FHWA technical advisory on guidance for preparing and processing environmental documents discusses water quality issues. The advisory indicates that proposed highway alternatives where roadway runoff or other NPS pollution may have an adverse impact on sensitive water resources must be addressed during the environmental process. The advisory also indicates that FHWA has procedures to determine the

³² United States Department of Agriculture-Forest Service. 1987. *Rise to the Future, Fish Your National Forests*.

level of potential impacts and appropriate mitigative measures.

Listed below are the publications that discuss measures to identify and mitigate highway runoff concerns:

- *Sources and Migration of Highway Runoff Pollutants.*
 - Vol. I: Executive Summary.
 - Vol. II: Methods.
 - Vol. III: Research Report.
 - Vol. IV: Appendix.
- *Effects of Highway Runoff on Receiving Waters.*
 - Vol. I: Executive Summary.
 - Vol. II: Research Report.
 - Vol. III: Resource Document for Environmental Assessments.
 - Vol. IV: Procedural Guidelines for Environmental Assessments.
 - Vol. V: Guidelines for Conducting Field Studies.
- *Highway Maintenance Impacts to Water Quality.*
 - Vol. I: Executive Summary.
 - Vol. II: Investigation of Impacts of Selected Highway Maintenance Practices on Water Quality.
 - Vol. III: Reference Manual for Assessing Water Quality Impacts from Highway Maintenance Practices.
 - Vol. IV: Guidelines Manual for Minimizing Water Quality Impacts from Highway Maintenance Practices.
- *Management Practices for Mitigation of Highway Stormwater Runoff Pollution.*
 - Vol. I: Guidelines.
 - Vol. II: Literature Review.
 - Vol. III: Research Report.
 - Vol. IV: Executive Summary.

These tools are being combined into the development of an "Interactive User Interface System" for assessing water pollutant impacts from highway stormwater runoff. The system is being developed on a microcomputer disc to be compatible with other FHWA systems for hydraulic evaluations, using FORTRAN 77 language. A users guide is also being prepared to

provide background information and guidance for use of the program provided on the microcomputer disc.

Federal Aviation Administration Developed Airport Standards

The Federal Aviation Administration (FAA) developed standards for the control of storm water discharges at new airports. These new standards should significantly reduce the potential for NPS problems associated with airports.

National Oceanic and Atmospheric Administration Provided Data

The National Oceanic and Atmospheric Administration (NOAA) supplied EPA with nutrient discharge estimates for estuaries across the U.S. These discharge estimates were used to assist the coastal states in developing NPS Assessment Reports. EPA is tracking the use of the NOAA data as it reviews the state reports.

NOAA also completed a database on agricultural pesticide use and runoff in estuarine drainage areas. The database contains estimates of agricultural pesticide use for 28 environmentally-important pesticides on 71 crops in the 92 estuarine drainage areas identified in Volume 1 of NOAA's *National Estuarine Inventory*. The database will form the basis for a series of assessment products evaluating pesticide use, runoff, and impact in estuarine drainage areas. These analyses are being conducted over the next two years as part of the *National Coastal Pollutant Discharge Inventory*.

NOAA completed and distributed a series of *National Coastal Pollutant Discharge Inventory* reports and data summaries characterizing the sources, magnitude, and relative importance of pollutant discharges on the West Coast. The series included a report on the analysis of West Coast point source discharges and data summaries for Puget Sound, the Columbia River, San Francisco Bay, Southern California Bight, and San Diego Bay. These reports were sent to over 200 users in federal, state, and local environmental agencies; academic institutions; and environmental organizations.

Fish and Wildlife Service Focused on NPS Pollution Management

During FY88, the Fish & Wildlife Service (FWS) focused attention on NPS pollution problems in a number of operational and research areas, including the following:

- Service research personnel continue to study the effects of pesticide chemicals on fish and wildlife

species and their habitats, work that has been continuously ongoing for over 40 years. Significant Service research efforts are also ongoing to define the scope and effect of NPS pollutants from urban runoff, resource extraction, and hydromodification, as well as agriculture. Other efforts focus on development of BMPs and optimal mitigation alternatives.

- Through the Department of the Interior's Irrigation Drainwater Program, Service personnel are defining the causes and extent of problems associated with excessive levels of micronutrients (e.g., selenium, boron) in irrigation wastewaters in arid western states, and developing controls and mitigation alternatives.
- Service operational personnel review thousands of permit/license applications, federal project construction and operational plans, resource management plans, conservation easements, and other types of land management plans each year and provide recommendations on BMPs to control NPS pollution at its source as well as mitigation measures to offset damages to fish and wildlife resources from these land management activities.
- On National Wildlife Refuges, National Fish Hatcheries, and other Service lands, a concerted effort is underway to identify and control sources of NPS pollutants. On refuges, for example, buffer strips are required along stream banks and around tilled areas, biological control methods are used to replace pesticides when possible, and other agricultural BMPs are being implemented.
- The Service has agreed to assist EPA in the review of state NPS Assessment Reports and Management Programs. The Service has also agreed to assist the states, if requested, in the preparation of their Assessment Reports.

Tennessee Valley Authority Participated in Several NPS Efforts

The Tennessee Valley Authority (TVA) carries out its statutory authority related to land management, administration of landrights, and permitting jurisdiction under section 26a of the TVA Act so as to protect or enhance the quality of the environment on its reservoir properties. In conducting its own operations and construction activities, TVA ensures the use of BMPs to control NPS pollution. In compliance with section 401(a) of the CWA, TVA requires that applicants proposing activities that may result in discharge into navigable waters provide state certification that they will comply with applicable provisions of the CWA. In addition, TVA requires that any permit approval, contract, license, or other authorization of any land-

disturbing activity (except agriculture) contain the following condition:

The applicant will conduct all land-disturbing activities in accordance with best management practices as defined by section 208 of the Clean Water Act and implement these practices to control erosion and sedimentation so as to prevent adverse water quality and related aquatic impacts. Such practice shall be consistent with sound engineering and construction principles; applicable federal, state, and local statutes, regulations, or ordinances; and proven techniques for controlling erosion and sedimentation.

TVA has established criteria for selection of TVA lands suitable for agricultural licensing for row crops. Agricultural licenses, as necessary, contain special provisions for NPS control.

The Land Between The Lakes is TVA's 170,000-acre recreation, environmental education, and natural resource management demonstration area in western Kentucky and Tennessee. Activities in this demonstration area include the establishment of cover crops on row-cropped lands, and BMPs for harvested forest lands.

TVA is a major participant in the Land and Water 201 Project (see "Land & Water 201 Project" on page 50). Demonstration projects include the Copper Basin in Tennessee where TVA has cooperated with industry to reclaim more than 1,500 acres of land denuded long ago by crude copper smelting practices. In addition, TVA has worked closely with USDA agencies, local soil and water conservation districts, and landowners to install conservation practices to clean agricultural runoff in the Middle Fork Holston River watershed in Virginia. In FY88 TVA cooperated with the FS and landowners to reclaim 135 acres of abandoned manganese mines as part of the South Fork Holston River basin rehabilitation effort in Tennessee and Virginia.

Other TVA activities under the Land and Water 201 Project include participation on an interstate committee to address the water quality concerns in the Clinch and Powell River watersheds of Tennessee and Virginia. TVA's participation in the Bear Creek floatway project is described under "ALABAMA" on page 51.

TVA is involved in several other activities related to water quality, including:

- Reclamation of the Double Top abandoned coal mine in Fentress County, Tennessee.
- Farm waste management demonstration projects.
- An innovative technology farm demonstration program.

- Resource management conservation demonstration farms.
- Nitrogen fertilizer research at TVA's National Fertilizer Development Center.

The James and Mattubby Watershed Project (see "MISSISSIPPI" on page 53) and the Gilbert Farm Project (see "ALABAMA" on page 51) are described elsewhere in this report.

FY89 EPA Activities

Issue Guidance

EPA will update its guidance on use of alternative federal funding sources for implementation of Management Programs. The Agency will also develop guidance on alternative federal and state financial incentives.

Provide Tools and Data for Section 319

Reporting Software

EPA will continue to improve upon the Waterbody System. In addition, REACH File updates and refinement will continue as planned.

EPA will work with selected states to test and refine its section 319 annual reporting format and software. Grant funds have been set aside for this task.

Data

EPA will add to its NPS Data Base data from the USDA, Department of Commerce, and other sources of useful information. Efforts will continue to link the NPS Data Base to other EPA databases.

EPA will have a functional electronic data base of information on the water quality benefits that can be expected from agricultural NPS management practices. The "BMP Matrix" project was initiated in FY88, with the focus on developing the data base structure. USDA has participated extensively in the initial stages of the project, and is expected to be a major beneficiary of the final product.

EPA will continue to develop its database for tracking CRP filter strip enrollment. This database, AGTRACK, will help EPA determine whether filter strips are being installed in counties where water resources are being impacted by agricultural NPSs. The linkage of EPA databases with those of USDA and other agencies is critical to enhancing coordination

among the various agencies that play a role in NPS management.

EPA will establish a NPS Clearinghouse in FY89. Initially, the Clearinghouse will serve as a source of reference materials and contact people for federal, state, and local use. As the Clearinghouse grows and user needs are more clearly focused, changes in the scope and/or level of information maintained will be adjusted to respond to user preferences.

Technical Documents

EPA has initiated several projects that will result in technical documents in FY89. Included are:

- A manual on the design and implementation of agricultural NPS management practices.
- A manual on NPS control measures for grazing land.
- Proceedings of a conference on urban runoff.
- Guidance on selection and targeting of BMPs in urban areas.
- A watershed project manual.
- A small watershed monitoring manual.
- A literature review of the utility of wetlands for NPS management.

In addition to the above projects, EPA has made a grant to test the utility of the model AgNPS in northern agricultural watersheds. The model, one which is used by many NPS professionals, will be tested in two watersheds where intensive water quality monitoring has been performed for several years. This kind of testing is absolutely necessary if we are to use models for NPS implementation planning and evaluation.

EPA will also develop screening procedures for assessing NPS impacts on receiving waters. The first phase of this effort will be to adapt the current urban runoff methodology (see "Data" on page 21) to lakes. In addition, EPA will continue its development of the *Nonpoint Source Monitoring and Evaluation Guide*.

Provide Assistance

EPA will continue to review state Assessment Reports and Management Programs in FY89. The review process used in FY88 (see "EPA Review Process" on page 15) will be followed in FY89, and actions taken in FY88 (see "FY88 EPA and Other Federal Activities" on page 20) will be emulated in FY89.

EPA and SCS will support a water quality specialist detailed to the Conservation Technology Information Center (CTIC) in West Lafayette, Indiana. The CTIC reaches out to a wide range of audiences in the agricultural community through a newsletter and by other means.

EPA will begin a national outreach program to help meet the information and education needs at the national level. Materials generated through this activity will be adapted for state and regional use as appropriate. In some cases materials may be developed to help meet specific state or regional needs. EPA realizes that these efforts are often much more successful if the materials are produced and delivered at the local level. Thus, EPA may serve more as a catalyst for outreach activities at the state and local levels.

NPS Program as Focal Point for NPS Control Efforts

The National NPS Program will provide the framework for coordinating and targeting efforts to control and prevent NPS pollution. The NPS Program's implementation and demonstration activities will complement existing programs (e.g., Clean Lakes and Superfund) whose purpose is restoration of impaired waterbodies. The NPS Program and state's section 319 Management Programs will be coordinated with other EPA programs, such as wellhead protection, in-place pollutants, and stormwater. The NPS program and state Management Programs will also provide direction for other agencies' programs. The federal consistency requirements of section 319 will ensure that states have the opportunity to integrate the existing federal programs into their program, wherever possible.

Where the wellhead protection program is linked to state Management Programs, the section 319 demonstration and implementation activities can be targeted to support these ground-water initiatives. The NPS Program can effectively prevent ground-water pollution if properly targeted. The provision in section 319 that requires states to take into account the impact of BMPs on ground-water quality and the federal consistency requirements, together, will minimize the potential adverse impacts that NPS control activities on the surface could have on ground-water.

With respect to air programs, the state section 319 Assessment Reports and future updates can identify atmospheric deposition problems and pollutants that could then be targeted for load reductions.

In-place pollutants (e.g., contaminated sediments) are considered a NPS according to section 305(b) guidelines. Presently, EPA has four programs that deal with the problem of contaminated sediments: Superfund, Clean Lakes, and sections 115 and 118 of the

CWA. The NPS Program will transfer the lessons learned through these programs to the states via the information/education program. Section 319 funds can be utilized to remedy contaminated sediments.

Presently the Clean Lakes Program regulations prohibit the use of section 314 funds to perform construction grant activities. There is no similar restriction for NPS work. Because long-term effectiveness is the major concern in lake management, projects must control pollutants at the source, largely through watershed management, rather than simply eliminate their symptoms in the lake. Because lake pollution comes from many sources, restoration projects are encouraged to cooperate in combining the resources of all available federal, state, and local programs to provide the most comprehensive pollution abatement possible. Section 319 activities can support the watershed management plan development and implementation in Clean Lakes projects, thus maximizing the potential benefits of both programs.

Urban stormwater has been found to include significant quantities of pollutants (see "Nationwide Urban Runoff Program" on page 11). To address urban stormwater problems, EPA and state pollution control agencies will begin to issue National Pollutant Discharge Elimination System (NPDES) discharge permits to the owners/operators of stormwater collection and conveyance systems and the related outfalls. These permits will require data collection and reporting, and the development and implementation of programs for reducing pollutant loadings to receiving waters. Programs in some cases will call for capital improvements, but in many instances the cost-effective approaches for solving the problems will be BMPs. These BMPs will reduce the introduction of pollutants to the storm sewer systems.

Section 319 Assessment Reports can be utilized to identify those areas appropriate for case-by-case designations for stormwater permits, in addition to those prescribed by law. The Management Programs provide the framework by which the urban NPS controls will be integrated with the stormwater permits.

For waters listed on the section 304(l)(1)(A) lists, state Management Programs can be integrated with the point source control efforts to identify both NPSs and point sources. The Management Programs can be used to implement control strategies for the NPSs, and the NPDES program can handle the point source problems. Future NPS assessment activities can assist in updating the section 304(l) lists.

The National NPS Program and state Management Programs can be implemented to assist in the cleanup at Superfund national priority list (NPL) sites by reducing off-site loads to the NPL sites. Section 319 efforts can also help in remedial efforts for sites that are not on the NPL, but are managed under state programs.

Section 319 provides the opportunity for states in or covered by the Great Lakes Program, Chesapeake Bay Program, and National Estuary Program to establish a foundation for controlling NPSs statewide rather than just within these designated watersheds. The statewide programs can be established to prevent future problems and to direct state resources outside of the designated watersheds. The processes for setting priorities in the statewide programs will, however, incorporate considerations for these national priority areas. Within the Great Lakes Basins, states will be utilizing their section 319 programs to develop and implement watershed management plans for Areas of Concern (AOCs). AOCs are waterbodies that the state has represented to the International Joint Commission as not meeting designated uses. States are expected to take similar approaches in watersheds designated under the National Estuary Program. As noted earlier (see "Section 108 - Great Lakes Program" on page 9), the Great Lakes Program has provided many lessons for the National NPS Program.

Section 319 Management Programs can be utilized to protect wetlands, as well as incorporate wetlands as BMPs for controlling NPSs. Section 319 watershed management plans can be integrated with section 404 (permits for dredge or fill material) activities to effectively protect high quality wetlands in critical areas for aquatic habitat. Similarly, mitigation efforts under section 404 can be targeted to priority watersheds identified in the Assessment Reports.

State NPS efforts can be integrated with Coastal Zone Management (CZM) programs to effectively reduce NPS impacts. The CZM programs provide the delivery system, while section 319 provides the state authority and framework for controlling NPSs in a comprehensive manner.

State Assessment Reports and Management Programs should help direct USDA programs to high priority watersheds. The overall statewide programs should assist USDA in reducing the off-site impacts of their resource base programs. State Management Programs can be integrated with P.L. 83-566 activities to develop and implement land treatment activities to reduce NPS loads to water bodies.

The CRP (see "USDA Allows Filter Strips Under Farm Bill" on page 30) can be targeted to highly impacted NPS water bodies to reduce the impacts of agricultural operations in these watersheds. State Assessment Reports and Management Programs can be utilized by ASCS to identify potential Special ACP Water Quality Projects.

The National NPS Program can develop assessment techniques and NPS abatement practices that the Forest Service can utilize to develop and implement Forest Management Plans that will allow water quality standards to be met and aquatic habitat to be

protected. State Management Programs can ensure that the same is done on state and private forests as appropriate. The Assessment Reports can be utilized to identify high priority waterbodies within the National Forest System that require special management due to their sensitivity to NPS impacts. The federal consistency requirements under section 319 will assist states in ensuring that Forest Management Plans and operations are consistent with the state NPS efforts. Aerial fertilization and pesticide applications are two areas in which states will be directing their efforts.

State Assessment Reports can be utilized to identify and set priorities for abandoned mining sites needing reclamation. State Management Programs can provide the BMPs for reducing the off-site impacts of these mining sites either under the Rural Abandoned Mines Program or under other programs.

The off-site impacts of transportation facilities (e.g., railroad yards, airports) can be identified through state NPS assessment efforts. Federal consistency requirements and the state Management Programs can be utilized to correct these NPS problems. The inclusion of NPS controls as part of the stormwater permits will probably be utilized to address most of these problems.

The national NPS and Wetlands programs will be working with the U.S. Army Corps of Engineers (COE) on the development of "boiler plate" language for section 404 permits that would specifically outline stormwater and sediment control responsibilities for permittees. The state Management Programs will provide BMPs for hydromodification (e.g., dredging and channelization) that permittees must utilize.

Under the National NPS Program, EPA's NPS personnel will work with the Agency's monitoring programs to develop and refine NPS assessment, analysis, and quantification techniques. The NPS Program will also develop a long-term, NPS research program, as well as an information/education program. The NPS Program will work with the Office of Research and Development, the Criteria and Standards Division, and the states in ensuring that there are adequate water quality criteria for assessing NPS impacts. Similarly, the NPS Program will be working with various federal agencies to identify where NPS concerns can be addressed within their permitting and grant programs.

Implement NPS Agenda Task Force Recommendations

Three public meetings were held in November and December of 1988 to allow a broad range of groups (EPA Regions, states, public interest groups, other federal agencies) to review and comment on the draft Agenda. The Agenda was finalized in January, 1989,

with implementation scheduled to begin as soon as possible in FY89. Implementation priorities will be acted upon as part of the Office of Water's work plans for FY89 and subsequent years.

Support Professional NPS Workshops

EPA will sponsor or co-sponsor several NPS workshops in FY89, including:

- North American Lake Management Society's (NALMS) 8th Annual International Symposium on Lake & Watershed Management, St. Louis, MO - This meeting addresses NPS assessment and control options in a number of sessions.
- Off-site Evaluation Workshop, St. Louis, MO - This workshop is designed to help participants recognize and quantify NPS problems and connect them with contributing sources.
- Nonpoint Source Conference, St. Louis, MO - This conference will provide a forum to review and examine existing local NPS pollution control efforts and effective local NPS control programs.
- 1989 Rural Clean Water Program Workshop - This workshop will help RCWP project participants share problems and lessons learned with other RCWP participants. The focus will be on technical matters such as BMP selection, monitoring, and data analysis and reporting.
- International Symposium on Dairy Manure Management, Syracuse, NY - This symposium, co-sponsored by EPA, several professional organizations, USDA, and industry, will focus on dairy manure and the environment, manure utilization, manure processing, and manure handling and storage.
- International Poultry Meeting.
- Ten workshops on strengthening state NPS Management Programs.
- National conference on wetlands protection and lake management.
- National Conference on Low-input Agriculture, Omaha, NE

Hold Workshops to Discuss State Pesticide/Ground-Water Management Plans

EPA held 10 workshops in November and December of 1988 to meet with states to discuss issues in estab-

lishing and implementing state Pesticide/Ground-Water Management Plans (see "Proposed Strategy to Address Pesticides in Ground-Water" on page 29). The development of these plans is a critical component of EPA's proposed strategy for addressing the concern regarding pesticides in ground water.

Continue Near Coastal Waters Activities

EPA Headquarters will continue to work with the Regions to assist in the development of coastal strategies and to develop better tools for near coastal water assessment and management. Nonpoint source management is included in these initiatives.

Assessment activities will be ongoing to provide increased understanding of the environmental problems in near coastal waters. This will include NPS assessments. A proposed near coastal waters segmentation scheme has been developed, and will be refined and integrated into the section 305(b) Waterbody System (see "Provided Tools and Data" on page 21).

Propose Ground-Water Restricted-Use Rule

EPA will propose adding new criteria for classifying pesticides for restricted-use classification based upon ground-water concerns. Pesticide products classified for restricted-use under authority of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) section 3(d) may be purchased and used only by certified applicators or individuals under their supervision. The Agency, in cooperation with Cornell University and the University of California, has developed a ground-water module that is now part of the training required to become a Certified Pesticide Applicator.

Revise Pesticide Storage and Disposal Regulations

As a result of the 1988 Amendments to FIFRA, EPA will be revising its pesticide storage, transportation, and disposal regulations. These Amendments authorize the Agency to establish labeling requirements for the transportation, storage, and disposal of pesticides and their containers within three years after enactment of the law. In addition to promulgating regulations, the Agency plans to develop public outreach and training programs to encourage waste minimization and recycling for all pesticide applicators.

Develop NPDES Storm Water Permitting Program

Although urban runoff, construction site runoff, and other diffuse sources of pollution are considered NPS pollution for the purpose of section 319, when collected and discharged from a discrete conveyance such as a separate storm sewer, the discharge is legally a point source, subject to section 402 of the CWA. (Agricultural storm water discharges and irrigation return flows are statutorily exempt from the definition of point source under the CWA.) On December 7, 1988, (53 *FR* 49416) EPA published a notice of proposed rulemaking (NPRM) that requested comments on National Pollutant Discharge Elimination System permit application requirements and application deadlines for:

- Storm water discharges associated with industrial activity.
- Discharges from large municipal separate storm sewer systems (systems serving a population of 250,000 or more).
- Discharge from medium municipal separate storm sewer systems (systems serving a population of 100,000 or more, but less than 250,000).
- Storm water discharges that the Administrator or the state NPDES Director determines contribute to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States.

Other storm water discharges are to be described in two reports to Congress required under section 402(p)(5). Based on the two reports, EPA, in consultation with state and local officials, is required to issue regulations by no later than October 1, 1992 which designate additional storm water discharges to be regulated to protect water quality and establish a comprehensive program to regulate such designated discharges, including requirements for state Storm Water Management Programs.

Appropriate portions of section 319 Assessment Reports and Management Programs can be used by EPA and state NPDES Directors to identify storm water discharges that contribute to a violation of a water quality standard or are a significant contributor of pollutants and are appropriate for case-by-case designation requiring a permit. In addition, section 319 reports will be considered in the development of the storm water reports to Congress. Implementation of section 319 Management Programs can establish a foundation for the development of state Storm Water Management Programs.

Issue Financial Responsibility Regulations for Underground Storage Tanks

In early FY89, EPA will issue Financial Responsibility regulations for underground storage tanks (USTs). These regulations will help to make sure that owners and operators of USTs can pay for correcting the problems created if their USTs leak. EPA will begin "approving" state programs to operate in lieu of federal programs. State activity under the Leaking Underground Storage Tank (LUST) Trust Fund will also increase as EPA increases the amount available to the states to \$42.5 million.

Work With Other Federal Agencies

EPA will continue to work with other federal agencies that have a role in NPS pollution abatement and/or prevention. For example, EPA will work toward improving the environmental aspects of the Farm Bill which will be considered for reauthorization in 1990.

Report to Congress

EPA will prepare in FY89 a Report to Congress that will meet the requirements under section 319(m)(2). EPA has decided to use the same reporting format for FY88 as it will use in the FY89 Report to Congress. It is expected that the states will respond favorably to consistent reporting guidance, which will enable EPA to address better the issues listed under section 319(m)(2).

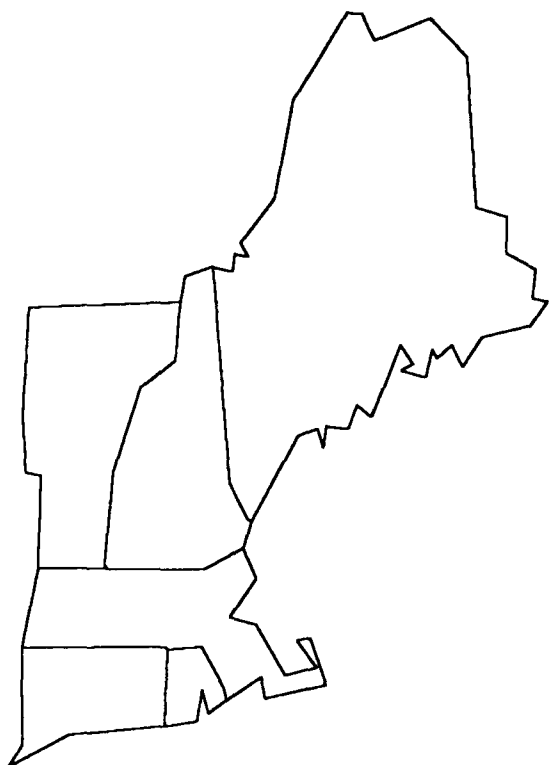
Despite state and EPA efforts to meet the reporting requirements under section 319, it is highly unlikely that the FY89 report will be as complete as envisioned by the Congress. As this report illustrates, states have only just begun to implement their section 319 Management Programs. Therefore, it will be very difficult for states to provide by January 1, 1990 the answers to the issues listed under section 319(m)(2).

Even the four-year program called for by the Act is much too short for states to assess their NPS problems; plan their NPS control activities; organize their financial, technical, and administrative resources; convince landowners to change the way they use and/or manage their land; implement NPS control measures; and document with water quality data the benefits gained from these NPS control activities. Agricultural research projects have demonstrated very clearly that at least five years are needed before meaningful water quality results can be expected from NPS implementation efforts. Furthermore, it can take as many as three years to implement NPS control measures on any given parcel of land even when the landowner volunteers to participate in a NPS Management Program, and could take much longer

for implementation on an entire watershed. One state commented in its annual report that "EPA's hope that "success" can be documented within one or two years is completely unrealistic". Thus, it may take the entire four years of the section 319 program to simply

gain enough NPS implementation in a fair number of watersheds across the Nation to reach the point where water quality should improve over the course of a few more years.

EPA REGIONAL OVERVIEWS



Region I - Boston, MA

Regional Summary

Assessments

Three New England states had submitted final Assessment Reports by August 4, 1988, while the other three states had submitted draft reports by the same date (see Table 3 on page 16). *The Assessment Reports prepared by Rhode Island and Vermont have been approved by EPA.* Each state organized an NPS Task Force, comprised of key state and federal agencies, regional and local officials, environmental organizations, and interest groups.

Management Programs

Two states had submitted final Management Programs by the middle of December, 1988, and the other four states had submitted draft programs in August (see Table 4 on page 18). Several states conducted regional/statewide workshops and used the process as a first step in developing state Clean Water Strategies. EPA involved other federal agencies such as the SCS, FS, FWS, and FHWA. An EPA inter-program team reviewed each draft Assessment Report and Management Program, and consolidated written comments were sent to each state by the Regional NPS Coordinator.

Regional Activities

Region I has been providing intensive guidance, checklists, handbooks, workshops, and technical assistance. The Regional workshops with the states addressed all Assessment Report requirements, and focused on technology transfer with regard to BMPs and estimating NPS loads. The technology transfer workshop drew over 150 state, federal, academic, environmental, and consultant participants from throughout New England. Technical guidance included a "NPS Ready Reference Guide for BMPs."

Regional guidance focused on:

- Targeting priority preventive measures and BMPs on priority waters.
- Strengthening state and local regulatory programs to prevent as well as mitigate NPS problems.
- Preventing degradation of existing high quality waters threatened by accelerated development pressures facing New England.
- Developing "creative financing" approaches to funding NPS programs; e.g., user fees on "direct identifiable beneficiaries," expanded state Revolving Funds (using the public utility concept), real estate transfer tax, tax incentives, state cost-sharing, etc.

State Highlights

CONNECTICUT

The Department of Environmental Protection (DEP) adopted its Environment/2000 process in September, 1987, and held the first annual public conference in January, 1988. This planning process, which involves extensive public participation, provides DEP with clear definition of its mission and goals, and guides policy and program development, establishment of priorities, and budgetary requests.

The state held "Municipal Inland Wetland Commissioners Training Program Workshops" for all eight counties in Connecticut. Through September, approximately 70 municipalities submitted revisions to their Inland Wetlands and Watercourses Regulations in accordance with revisions enacted to state law in 1987. DEP is providing technical assistance and support as delegation of authorities to about half of the state's towns that had no Inland Wetland Commission has been accomplished.

The Aquifer Protection Task Force submitted a report of its study and recommendations on the protection of aquifers to the General Assembly in March of 1988. Legislation passed in 1988 directed the Task Force to consider implementation of its aquifer protection recommendations.

The Task Force held weekly meetings to address topics such as the need for greater acquisition of property around wellfields, and the need to regulate or ban certain high risk activities (contamination threats) in critical areas surrounding the wellfields. DEP forwarded proposals to the Task Force regarding land acquisition, banned activities, zoning, regulation, enforcement, agriculture, monitoring, and education.

During 1988, repeat sampling was performed at 17 existing, stratified drift well monitoring sites as part of a cooperative study of pesticides in ground water. In addition, early and late summer sampling were completed at 26 new sites (13 non-agricultural uses, 13 sites in till/bedrock system).

MAINE

The state of Maine is developing an ambient biomonitoring program through enactment of narrative biological standards in its water classification statutes and development of administrative rules for data interpretation.³³ The primary role of the biolog-

ical information is to serve as impact standards assessing overall progress toward program goals.

Maine has developed an index of the relative vulnerability of lakes to additional phosphorus loadings associated with land development, reflecting the geohydrologic sensitivity of a lake and development trends. The state has been using this "Vulnerability Index" to show localities, regional planning commissions, and lake associations the water quality consequences of development patterns on a lake. The goal is to help localities plan for patterns, types, and intensities of land uses and management practices that will maintain lake quality.

MASSACHUSETTS

Massachusetts has launched demonstration projects to assist the localities implement BMPs, including stormwater management, in two Buzzards Bay estuaries that are closed to shellfishing. These projects are in concert with the Buzzards Bay National Estuary Program project.

In 1987 and again in 1988 legislation has been filed to create a state NPS pollution control program. The proposed program would provide grants to most public entities to conduct diagnostic/feasibility studies and implementation projects for the prevention, control, and abatement of NPS pollution in Massachusetts. Funding would total \$50 million over 10 years. Projects would have to be prioritized based upon water quality data, use or potential use as a potable water supply, recreational use, economic importance, and other relevant factors.

The transportation bond bill that recently passed the legislature contained stormwater runoff control measures. It authorizes a \$5 million stormwater runoff grant program to assist cities and towns in updating measures to control pollution from road runoff. It authorizes another \$5 million for local salt storage sheds and \$6 million for state sheds. Another provision authorizes \$20 million to protect the Cambridge Reservoir from stormwater runoff.

NEW HAMPSHIRE

One of the success stories of the existing NPS abatement effort in New Hampshire is the implementation of an intensive and extensive sediment and erosion control program. Focused on developers, loggers, and general construction activities, the Water Supply and Pollution Control Division of the Department of Environmental Services has established a permit application and plan review requirement that has

³³ Taken from: Courtemarch, D.L. and S.P. Davies, *Biological Standards in Maine*, IN: National Symposium on Water Quality Assessment, Meeting Summary, EPA, 1988.

significantly reduced sediment loading and erosion problems.

RHODE ISLAND

The state established a Water Quality Advisory Committee composed of various state, federal, and local agencies and environmental groups to assist the state in development of its Clean Water Strategy. The Committee has been further divided into subcommittees; the Nonpoint Source Pollution Subcommittee has been closely involved with development of the NPS Management Program. Establishment of the Water Quality Advisory Committee has helped to strengthen a network of agencies and individuals with expertise and/or legal jurisdiction in NPS pollution control issues. This interagency coordination has greatly benefited the Department of Environmental Management's NPS Pollution Management Program as well as the Narragansett Bay Project's Land Management Project.

A GIS was used to prepare maps to support the preparation and implementation of a watershed protection plan for the Scituate Reservoir. This reservoir provides drinking water for about 60 percent of the state's population. Surface and ground-water monitoring and modeling have been performed as an integral part of the watershed protection effort. The Scituate watershed protection effort serves as a model for developing and implementing stormwater management technical guidelines.

VERMONT

The St. Albans Bay RCWP project includes one of the most extensive NPS monitoring and evaluation efforts in the Nation. Due south of the St. Albans Bay project is the LaPlatte River (P.L. 83-566) watershed project which, like the RCWP project, is focused on the management of dairy wastes to reduce the impacts of NPS pollution on Lake Champlain.

Results to date show a significant decrease in bacteria levels throughout both study areas. Data analysis indicates that the decreases in bacterial contamination are correlated with improvements in animal waste management in both watersheds. From these projects the state and federal cooperators have learned valuable lessons regarding water quality and land use data collection, statistical approaches to analyzing NPS data, and GIS applications. The information gained from these projects has been shared with other states through presentations at Region I workshops, RCWP workshops (see "Rural Clean Water Program" on page 11), and EPA workshops and guidance documents.

Region II - New York, NY



Regional Summary

Assessments

Puerto Rico submitted its final Assessment Report on August 4, 1988 (see Table 3 on page 16). The Region has begun its review of the document, including review and comment from both the Region and EPA Headquarters, as well as public notification of the availability of the document. New Jersey and New York submitted draft Assessments by the end of November, 1988. The Virgin Islands had not made a submittal as of January 30, 1989.

Major NPS problems in the Region are caused with acid rain, agriculture, construction, urban runoff, landfills, underground storage tanks, and vessel wastes. These NPSs have impacted the Region's estuaries, bays and shoreline, ground water, rivers, and lakes.

Management Programs

Puerto Rico submitted its final Management Program on August 4, 1988 (see Table 4 on page 18). New Jersey submitted a draft Management Program in October, 1988, while New York submitted a draft on

December 31, 1988. The Virgin Islands had made no submittal as of January 30, 1989.

Regional Activities

The Region has entered into an Interagency Agreement (IAG) with SCS that allows for an SCS employee to work at the Regional office providing needed expertise to accelerate the Region's NPS program. In Puerto Rico, the Region revitalized the NPS Task Force consisting of ranking officials from federal, state, and local agencies dealing with NPS pollution. This group provides guidance and input in the development and implementation of Puerto Rico's NPS control programs, including the Clean Lakes Program. In addition to providing guidance to states in the preparation and development of their Assessment Reports and Management Programs, the Region has assisted states in many other ways:

- Participated in several state and local meetings throughout the Region to provide input for states in their public awareness and outreach programs.
- Gave presentations at annual meetings of the Northeast Association of Conservation Districts, New Jersey Association of Conservation Districts, New York Association of Conservation Districts, and the New York SCS.
- Coordinated interagency meetings at the Regional and state levels.

State Highlights

NEW JERSEY

NPS efforts in the state will be focused on estuaries, bays and shoreline, urban runoff, agriculture, site development, landfills, septic systems, surface mining, spills, channelization, and dredging. Implementation of the state's *Sedimentation and Erosion Control Act* continues to have a significant effect on controlling NPS pollution at construction sites.

Groundbreaking ceremonies were held for a horse manure composting facility in the Navesink River watershed where a large population of horses is the major contributor of NPS pollution. Several federal, state, and local agencies are cooperating in this effort, including the local Freehold Soil and Water Conservation District which is a project co-sponsor along with EPA and SCS. State environmental and agricultural officials are considering the development of a permit process for similar composting plants.

NEW YORK

The New York Department of Environmental Conservation (NYSDEC) has made some major efforts toward completion of the Assessment Report and Management Program. "Friends of NPS Pollution Control" throughout the state were invited to form a working group to develop the Assessment and Management Program. Some 75 individuals representing environmental groups and federal, state, and local agencies participated in four meetings. Additional meetings will be scheduled as needed.

Meetings co-sponsored by local Soil and Water Conservation Districts were held at various regions in the state to solicit information for the Assessment Report and Management Program. NYSDEC also met with the SCS for a complete review of SCS's activities related to NPS. The Assessment Report and Management Program are being coordinated with the Clean Lakes Program; Long Island Sound; New York Harbor, Delaware Bay, and the Chesapeake Bay projects; and Management Program activities in watersheds shared with adjacent states.

PUERTO RICO

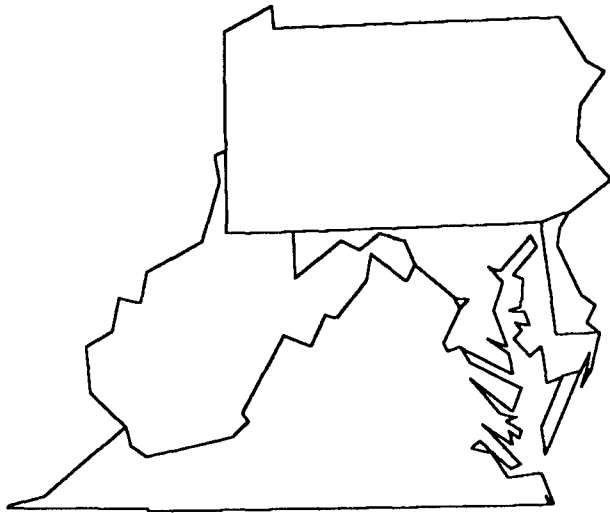
The Puerto Rico Environmental Quality Board (EQB) has completed both the Assessment Report and the Management Program for the Commonwealth of Puerto Rico. Both documents were submitted by the statutory deadline.

Major NPS problems on the island are associated with animal waste, agriculture, urban runoff, and landfills. Chicken waste disposal has been identified as a critical problem in the Lake La Plata watershed. Lake La Plata, one of the several reservoirs that provide drinking water to San Juan, has been severely impacted by animal waste. Through a Clean Lakes project, EPA, EQB, and other commonwealth and local agencies are cost-sharing in a demonstration project to construct a plant that will process chicken waste. The end-product from the plant will be used by farmers as fertilizer and/or soil amendments. The site is being located for construction that will be completed by June, 1989.

VIRGIN ISLANDS

The Virgin Islands Department of Planning and Natural Resources (DPNR) has received technical assistance from Region II in developing its draft Assessment Report and Management Program. Assistance from EPA is required since the DPNR finds it difficult to locate and retain qualified employees with expertise in NPS planning and implementation. Major NPS problems on the islands are associated with site development, vessel wastes, and leaking underground storage tanks.

Region III - Philadelphia, PA



Regional Summary

Assessments

Three states had submitted final NPS Assessment Reports by September 12, 1988, while two states and the District of Columbia had submitted drafts by early August (see Table 3 on page 16). *On September 29, 1988, EPA approved the Assessment Report submitted by the state of Delaware.* EPA will complete its review of these documents in early 1989. Generally, the Assessment Reports indicate that major NPS pollution is associated with nutrients and sediment, with both nitrogen and phosphorus emanating principally from various agricultural activities, and with acid mine drainage that significantly impacts a number of water uses. Two other sources of NPS pollution that have received increased attention are oil and gas production and the atmospheric deposition of nitrogen. Overall, these reports show that NPS pollutant loads are the leading contributor in 54% of the use-impaired stream miles and in 66% of the use-impaired lake acreage in the Region.

Nutrients: The upper Chesapeake Bay receives 48.6% of its phosphorus and 76.9% of its nitrogen from NPSs. The early spring runoff events move large amounts of phosphorus into the Bay, followed

a few weeks later by nitrogen carried by high base flows in the rivers. High nutrient levels are not only a problem in the Chesapeake Bay, but are also the cause of accelerated eutrophication in several mill ponds in Delaware. In addition, nitrate concentrations that exceed the drinking water criterion are found in southeastern Pennsylvania.

Acid Mine Drainage: Acid mine drainage, mainly from active and abandoned mines, is the cause of roughly 3,000 miles of ecologically impaired streams in Pennsylvania, northern West Virginia, and western Maryland. Adverse effects associated with acid mine drainage include impacts to aquatic life, contact recreation, water supplies, aesthetics, and man-made concrete and metal structures. Significant local contamination from mine wastes and tailings also pose a serious threat to water resources, particularly in many old mines that remain unreclaimed.

Oil and Gas Production: Foremost among the problems caused by oil and gas production is the disposal of brine that is produced as a natural by-product along with the oil or gas. Brine is the pre-historic deep ground water that is present in the oil and gas bearing zones. The brine contains contaminants such as sodium, chlorides, barium, arsenic, strontium, cadmium, iron, and sulfate in concentrations up to several thousand times higher than drinking water standards. Historically, brine disposal has occurred by methods such as discharge to pits, streams, or roads. In addition, in Pennsylvania many gas producers dispose of their brine by using "blow boxes", which are shallow in-ground basins that allow the percolation of the brine into the ground water.

A particular problem area regarding oil spills is in northwestern Pennsylvania, centered around the Allegheny Reservoir and Allegheny National Forest. The Allegheny Reservoir and its tributary streams currently support a diverse range of gamefish. However, as a result of oil spills, in particular, spills resulting from past operations or abandoned wells, the potential for water quality impacts on the reservoir is significant. Field investigations have identified serious problems along tributary streams and in forest areas. These problems include destroyed vegetation and polluted streams that can no longer support trout populations or, in some cases, appear totally devoid of aquatic life.

Management Programs

Delaware, Virginia, and West Virginia had all submitted final Management Programs to EPA by the middle of September, 1988 (see Table 4 on page 18). EPA is presently in the process of reviewing these documents, and will complete its review in early 1989. *EPA has approved a portion of Delaware's Management Program* (see "EPA Actions" on page 17), *and has awarded the state one of the Nation's first NPS*

implementation grants (see "DELAWARE" on page 47). Pennsylvania and the District of Columbia submitted draft Management Programs in August, 1988, while Maryland had made not submittal as of December 14, 1988.

Regional Activities

Chesapeake Bay Program



The EPA's 1983 study of the Chesapeake Bay found that NPSs were among the chief causes of the Bay's decline. Consequently, in December 1983, the Governors of Pennsylvania, Maryland, and Virginia; the Mayor of the District of Columbia; and the Administrator of EPA pledged to address nonpoint as well as other sources of pollution to restore and protect the Bay. This commitment, known as the Chesapeake Bay Agreement of 1983, established the Chesapeake Bay Executive Council to coordinate Bay cleanup efforts undertaken by the signatories to the Agreement. EPA provides funding to support this effort, as well as technical and administrative assistance. Implementing programs to reduce NPS pollution is one of the most significant elements of the cooperative cleanup effort.

In December 1987, a new Chesapeake Bay Agreement was signed which set not only goals for cleanup, but also specific schedules for accomplishing needed plans and actions to restore and protect the Bay's fragile living resources. One of the most significant goals in the 1987 Agreement is the commitment to nutrient enrichment, which states:

By July of 1988, to develop, adopt, and begin implementation of a basinwide strategy to equitably

achieve by the year 2000 at least a 40 percent reduction of nitrogen and phosphorus entering the mainstem of the Chesapeake Bay. The strategy should be based on agreed upon 1985 point source loads and on nonpoint loads in an average rainfall year.

This "Baywide Nutrient Reduction Strategy" was finalized in July of 1988 and is now in place.

Each state strategy called for the inclusion of nutrient management as a BMP. Pennsylvania is leading the way with manure management. Both Maryland and Virginia have developed manure and fertilizer management efforts that are now moving out of the pilot stage. Currently, all states are working to expand and intensify their nutrient management program for agriculture to include both animal manure and commercial fertilizer.

From 1984 through 1988 the states and EPA had committed \$61 million in NPS grants (50% match), with 60% of these funds used for BMP installation to treat 6.2% of the cropland needing treatment and 8.9% of the manure needing management. The USDA, through its ACP, has treated an additional 6.3% of the cropland within the basin. Also, some states are funding NPS control activities independent of the grants.

To enhance interagency cooperation and coordination within the Bay drainage area, Memoranda of Understanding (MOU) were negotiated and signed in 1984 between EPA and F&WS, SCS, NOAA, the U.S. Army Corps of Engineers (COE), and the U.S. Geological Survey (USGS). In addition, ASCS established an MOU with EPA concerning the 1987 agreement. EPA and the Department of Defense signed a Joint Resolution on Pollution Abatement in the Bay. Each of these agencies are contributing their own program expertise in implementing NPS programs.

SCS is the principal agency that will provide on-site conservation planning and nutrient management technical assistance to landusers in the Bay area. Over the past several years, SCS has increased its resources in the Bay states and the District, having 31 staff positions to provide needed technical expertise to the farm community in producing conservation plans. From 1984 through 1986, the SCS helped prepare conservation plans for more than 500,000 acres of farmland draining to the Bay.

Other Activities: In addition to the Chesapeake Bay activities, states have also participated in the USDA's Conservation Reserve Program (see "USDA Allows Filter Strips Under Farm Bill" on page 30). Through the sixth sign-up of the CRP, landusers in the five states in Region III had established 3,792 CRP contracts covering 114,359 acres.

State Highlights

DELAWARE

Management Program: EPA awarded Delaware \$1.0 million from FY87 funds available under section 201(g)(1)(B) (Table 6 on page 26). This grant, which required a state match of about \$600,000, has been made to fund implementation of the approved portion of Delaware's Management Program.

Delaware's Management Program includes strategies to address pollution from various NPS categories, and includes a demonstration program addressing the following sources:

- Animal holding/management areas.
- Construction - involving highway/road/bridge construction and land development.
- Urban runoff - involving storm sewers and surface runoff.
- Land disposal - involving sludge, wastewater, and on-site wastewater systems.

The state's Department of Natural Resources and Environmental Control (DNREC), as the NPS lead agency, will conduct demonstrations through local conservation districts in targeted basins, with the overall purpose to transfer successful program elements to other parts of the state and Nation as appropriate. One important component of the demonstration program that will be undertaken is a poultry management program geared to reduce the amount of nitrogen that is available for potential contamination of ground water.

Other Highlights: Almost all of the RCWP work has been completed in the Appoquinimink River watershed, and the results are impressive. Because of the high usage of no-till (90% of cropland), soil loss has been reduced by seven tons per acre per year. The reduced erosion, along with improved fertilizer and pesticide management techniques, has lowered the level of suspended solids in the river by 60 percent. In one of the ponds, analysis of monitoring data shows that both sediment and total phosphorus levels are declining. The benefits of the project have spilled over into other parts of New Castle County as well, in that most farmers in the county have voluntarily adopted no-till as their primary tillage practice.

DISTRICT OF COLUMBIA

The District of Columbia implemented a major component of its multi-year program to mitigate the effects of its combined sewers on the Anacostia River. The \$14-million swirl concentrator facility, an innovative structure which will remove solids and organic

material, while disinfecting water discharged to the river was dedicated in August, 1988, and will begin operating in the spring of 1989.

The CSO (combined sewer overflow) Abatement Program is one part of the Anacostia Restoration Agreement of 1987, a cooperative effort between Maryland and the District to improve water quality and protect aquatic life in the Anacostia River Basin. Two major parts of this effort are the BMP retrofit and streambank stabilization projects. Currently, a survey of retrofit sites is being undertaken and stabilization projects are underway on Watts Branch and Oxon Run.

MARYLAND

In 1970, a new Maryland law required each county to set up its own sediment/erosion control program. The program affects all construction sites with the exception of scattered, single-family dwellings. Since the program is run both at the state and at the county levels, there are probably at least 150 people implementing the law statewide.

The statewide Stormwater Management Program was enacted in 1982, and built upon the relationships established with local governments under the sediment/erosion control program. Currently, stormwater management is required of all development sites in the state.

PENNSYLVANIA

The greatest emphasis in the Conestoga Headwaters RCWP project has been placed on nutrient management to reduce the nutrient loading to both the surface water and the ground water. At Pennsylvania State University, agronomists and computer scientists have developed a computer program to aid in making detailed nutrient management plans on a field-by-field and/or farm basis. Implementation of these plans has not necessarily involved a cost for the farmers, but instead could produce substantial savings.

The state of Pennsylvania, under its Chesapeake Bay program, has been promoting the RCWP's nutrient management techniques in 13 other watersheds that are part of the Susquehanna system. Project officials believe that their work will someday result in an overall reduction of agricultural NPS pollution in the upper Bay. In addition, this farm-level approach to nutrient management has been presented at several technical workshops across the U.S.

Also in the Conestoga Headwaters project, the Pennsylvania Department of Environmental Resources and USGS have implemented an experimental system to show the effects of terraces and nutrient management on ground-water quality and surface runoff. Results to date are not definitive, yet

the highly sensitive monitoring program is capable of detecting impacts that may occur within the next few years, provided that funding is continued.

VIRGINIA

Since 1985 nutrient loads from agriculture have been reduced by up to 12% in river basins draining to the Chesapeake Bay. These efforts have resulted in a reduction of 270,000 pounds of phosphorus and 1,500,000 pounds of nitrogen entering the Bay.

A major success in Virginia has been the recognition by the legislature of the importance of NPS control efforts. This has resulted in increased state cost-share assistance funding, authorization for greatly expanded staffing for NPS control activities, and tightened laws for erosion and sediment control.

A particular ongoing success has been the development of a geographic information system (GIS) to quantify and identify the sources of agricultural NPS pollution. The VirGIS program will be the main tool to be utilized in targeting and prioritizing funding for agricultural NPS control in the future.

All of the major livestock operations, primarily swine, have participated in Virginia's RCWP project. Contracts have been signed for implementation of BMPs on two-thirds of the critical area of the Nansemond River and Chuckatuck Creek project area. Coordination among federal, state, and local agencies in this RCWP project has been exceptional, and serves as a model for other NPS implementation efforts.

WEST VIRGINIA

The Department of Energy-Abandoned Mine Lands Division and the Department of Natural Resources-Water Resources Division (DNR-WRD) entered into a Memorandum of Agreement on May 22, 1987, for the purpose of strengthening cooperative involvement in matters relating to each agency's areas of responsibility in abating water quality problems associated with abandoned mine lands (AML). This agreement also establishes the use of BMPs during the reclamation of AML sites. By recognizing the need to protect and, in many cases, improve the quality of the state's water resources being degraded by drainage from abandoned mines, coordinative efforts are employed by the two agencies to deal with this NPS problem.

Final plans for reclamation at the Meridian "A" Abandoned Mine Drainage (AMD) project were changed to avoid the re-creation of acid water quality from the site. The pre-reclamation discharge was alkaline while the coal involved is the highly acidic Kittanning seam. Reclamation called for drilling 6-foot boreholes to the mine void to directly drain water off. This was changed, after review by the NPS Mining Program, to eliminate the boreholes and col-

lect water in french drains where it seeps from the ground. The project is complete and water quality is still alkaline.

An example of technical assistance being provided is the AMD water quality improvement project in Big Sandy Creek in Preston County. A preliminary feasibility report was prepared for the Webster Gob project site that incorporated abatement techniques suggested through the NPS Mining Program. As a means to neutralize the acid mine drainage from the problem area, water discharging from three deep mine portals is directed into an alkaline leach bed before leaving the project site. Monitoring of Webster Gob since completion of the project shows that the discharge from the alkaline leach bed is greatly improved, thus reversing the pre-reclamation pH level from 3.2 to 7.2.

In July 1988, a massive fish kill associated with a severe pH depression was reported on the Tygart Valley River at Belington due to drought conditions. Field investigation revealed that the problem was caused by acid mine drainage, which constituted a growing proportion of the flow because of the drought. The source of the pollution problem was tracked to abandoned deep mine discharges in the Grassy Run watershed located 10 miles upstream of Belington.

The DNR-WRD, unable to correct the problem alone, sought and received the assistance of private and public organizations. Donations and other assistance were used to begin efforts to protect the Tygart Valley River from further damage and to neutralize those areas already impacted by acid mine drainage. Donations from coal, oil, and other companies included a pump and hoses, soda ash, sodium hydroxide, a large tank, diesel fuel, and hydro spraying of lime. As donations dried up, the U.S. Office of Surface Mining was called upon to take over the abatement activities through a contract with the DNR. The result of this cooperative effort was the successful protection of the Tygart Valley River.

An aggressive educational program has been developed for silviculture. The program is directed to both the logger and the owner of forested lands, and includes such topics as landowner/logger responsibilities for protecting water quality, BMPs, and the spin-off benefits each group can realize. Technical assistance and awards programs for exemplary performance help support the program.

Through cooperative efforts of government and industry, a demonstration project for the West Virginia construction industry is underway at Cedar Lakes near Ripley, WV. The purpose of the project is to demonstrate a wide variety of BMPs and commercially available sediment control products. On-site training and the production of films that illustrate the proper installation of the BMPs and products are two of the planned outputs for this project. Film editing

has begun as practice installation is essentially complete.

Region IV - Atlanta, GA



Regional Summary

Assessments

Georgia submitted its final Assessment Report on August 4, 1988, while the other seven states in Region IV submitted draft reports in August, 1988 (see Table 3 on page 16). Review of these reports is underway, and EPA's formal responses to the submittals were tentatively scheduled for early November, 1988.

For both the Assessment Reports and the Management Programs, Region IV has established a review team that includes a representative from the following EPA programs: EPA's Land & Water 201 Designee, Groundwater, Pesticides, Environmental Support (Athens technical support), Wetlands, Coastal, Construction Grants, Federal Activities and Drinking Water. Other federal agencies assisting the review include FWS, SCS and FS.

Criteria used in these reviews relate directly to evaluation criteria set forth in EPA's section 319 Guidance

dated December, 1987. The Region will work with states to improve those assessments that fall short of meeting EPA's approval criteria.

Clearly, nonpoint sources of pollution contribute a significant threat to waters within Region IV's eight states. Not only are main stems of major rivers and tributaries adversely affected by NPS pollution, but also many of the Region's numerous small mountain streams, natural and man-made lakes, its 29 estuaries and the Gulf of Mexico are impaired from these largely uncontrolled sources. Agricultural runoff from croplands and animal waste facilities rank among the highest contributors of NPS pollution. Untreated and uncontrolled urban runoff is a significant contributor. Runoff from construction, surface mining/resource extraction, and silviculture contribute varying degrees of localized pollution sources.

Management Programs

By August, 1988, one state had submitted a final Management Program and the other seven states had submitted draft Management Programs in response to section 319 requirements (see Table 4 on page 18). EPA is currently reviewing the Management Programs through its Regional review team, and will work with the states to improve those Management Programs that do not meet EPA's criteria for approval.

Several states within the Region have very active agricultural cost sharing programs for BMP installation, programs that have been developed independently of section 319 guidelines. For example, FY88 cost sharing budgets in North Carolina, Florida and Alabama were \$7 million, \$3 million and \$2 million respectively, with plans for program expansion. Similarly, ordinances dealing with stormwater, particularly as related to new construction, are not unusual. Existing federal programs particularly some housed within the U.S. Department of Agriculture, are being implemented on a broad scale and promise significant reduction of nonpoint sources of pollution. EPA is directly involved in several demonstration efforts aimed at NPS reduction.

Regional Activities

In addition to the Assessment Reports and Management Programs described above, the section 319 activities in Region IV have significantly improved communication and coordination between the state water quality agencies and myriad citizens, local, state, and federal agencies with overlapping interests and responsibilities. EPA contributed to these improvements by hosting state NPS coordinators meetings. Regular discussions and advisement were provided by the Region regarding funding issues, programmatic issues, and in coordinating document preparation.

Region IV NPS Staffing: Region IV has taken positive steps to initiate an effective NPS program by assembling a team of four qualified staff. During FY 88, several staff changes occurred, including the addition of one staff member and the partial funding of one state employee. One NPS staff member is on indefinite assignment to the Land & Water 201 Project Office, TVA at Muscle Shoals, Alabama. His work is devoted primarily to the NPS pollution problems within the 6-state Tennessee River Valley. The fourth staff member is an SCS employee on detail to the NPS program. Region IV is co-funding with TVA the costs for an engineer who will work for the state of North Carolina to develop new designs for animal waste treatment facilities.

EPA staff participated in several activities, including:

- Attended and made presentations at related conferences, field days, workshops sponsored by various local, state and federal agencies.
- Presented NPS paper at NALMS conference.
- Distributed to state, federal, and other agencies and groups information and educational materials including section 319 guidance, EPA's journal (agriculture theme), CRP filter strip pamphlet, wetlands documents, articles, and reprints relative to NPS concerns.
- Participated through WQ data collection, technical advice/review, and study/implementation plan formulation for various multiagency special projects designed to deal with impaired water body(ies). Examples include Sand Mountain Project (AL), Taylor Creek-Nubbin Slough/Lake Okeechobee (FL), Mississippi Delta/SCS (MS), and Boone Reservoir and Reelfoot Lake (TN).
- Supported coastal initiatives and cooperative efforts.
 - Gulf Initiative (Gulf of Mexico).
 - Albemarle-Pamlico Sounds Estuarine Study (NC).
 - Nominations of Sarasota Bay & Charleston Harbor to National Estuary Program (NEP) (FL & SC respectively).
 - Perdido Bay Near Coastal Waters Initiative Pilot Project (FL/AL).

Section 319 of the Water Quality Act of 1987 has led to three major accomplishments to date:

- Identification (subject to EPA approval) of impaired and threatened waters and categories of nonpoint sources of pollution that affect these waters in eight states.

- Development of management programs which, if approvable, could be implemented to lessen the identified pollution sources in eight states.
- Significantly improved communication and coordination between the state water quality NPS programs and myriad citizens, local, state and federal agencies with overlapping interests/responsibilities.

Estimated FY88 Federal Expenditures on NPS control: Region IV estimates that a total of \$52,500 of abatement, control and compliance (AC&C) funds were spent on the NPS program as follows. Note, however, that only \$15,000 of the total was applied to an implementation effort.

- Support for SCS Detailee - \$30,000.
- Assistance for Sand Mountain Multiagency Demonstration Project - \$15,000.
- Support to North Carolina for Animal Waste Treatment Design - \$7,500.

Land & Water 201 Project: EPA Region IV is an active participant in the Land & Water 201 Project (L&W; 201), a multiagency cooperative project to improve management of resources to 1) reduce soil erosion, 2) improve water quality, 3) increase farm income, and 4) serve as a national demonstration. This project encompasses the 201 counties of the Tennessee River watershed. L&W 201 provides a mechanism for agencies to work together, pooling their knowledge and expertise to solve problems of mutual interest. Involved are the USDA agencies, the TVA, EPA, and the states of Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee and Virginia.

Several demonstration projects are underway, the most significant being the Sand Mountain/Lake Guntersville project in Alabama that is characterized by a high density rural population with numerous poultry and hog operations. A task group, made up of representatives of several local organizations, determined that stormwater run-off rich in nutrients has affected the mountain streams and highly used recreational Lake Guntersville. At this point, several P.L. 83-566 watershed planning activities are underway and \$10 million has been allocated for cost sharing. ASCS has made available \$500,000 in special ACP funds. EPA, TVA, SCS and the state of Alabama are devoting approximately \$75,000 for baseline environmental monitoring, including biological and water chemistry monitoring.

In addition to the above activity, L&W 201 is helping with the \$7.0 million dollar North Carolina agricultural cost-share program (see "NORTH CAROLINA" on page 53). EPA and TVA are collectively providing \$37,000 to the North Carolina Soil

and Water Conservation Commission to hire an engineer to assist with animal waste management facility planning and design.

Gulf Initiative: Tremendous pollutant loads discharge into the Gulf of Mexico from the Mississippi and other major rivers. Coastal areas sustain great pressures for residential, navigation/port and recreational/tourism support. Gulf of Mexico states accounted for 35% of the U.S. population growth between 1980 and 1985. In recognition of these numerous factors affecting the health of the Gulf of Mexico, Region IV began its "Gulf Initiative", aimed at elevating to a national priority the continued health and production of the Gulf. Immediate efforts are aimed at initiating a comprehensive assessment of the system and developing and implementing sound, workable management strategies. No section 319 funding is available for this project.

Albemarle/Pamlico Sounds Estuarine Study (APES), North Carolina: Formal planning activities began in 1986 to address the problems associated with changes in the water quality and fisheries in the Albemarle/Pamlico Sounds areas of North Carolina. Conflicts between agricultural activities and fisheries is emphasized in the work plan. APES was formally designated as a "management conference" pursuant to the 1987 Act (see "National Estuary Program" on page 28), supported by a Region IV allocation of \$1.2 million for FY88. While much of the problems associated with the APES are thought to be agricultural and other NPS-related, no section 319 funding is available to assist in this effort.

Conservation Reserve Filter Strip Participation: SCS has aggressively applied its Conservation Reserve Filter Strip program in Region IV states. Of all nationwide participation in the CRP, 53% of all acreage signed up was from seven of Region IV's eight states.

FY89 Key Activities: The Region plans to initiate the development of a NPS video. A video that has national application is needed, yet a video tailored to the needs of the Region may also be considered. The Region will also encourage states to develop their own educational materials, including videos.

State-sited, multi-agency/organization NPS conferences in each state are planned for FY89 following EPA approval of the Management Programs as an assistance effort to the states in their initial implementation efforts. In addition, a Regional External Awards program will be developed to identify particularly noteworthy accomplishments in NPS pollution control and technology development.

EPA also plans to continue its participation in the Land & Water 201 national demonstration project and the Sand Mountain Project.

State Highlights

ALABAMA

TVA and SCS have funded and designed BMP implementation activities for the control of animal wastes in the watershed associated with the Bear Creek floatway in Alabama. The canoe trail has been closed over recent years due to high levels of bacteria. Voluntary participation by landowners in the program has been high and TVA is conducting water quality monitoring to determine the effectiveness of the BMP implementation.

The Alabama Agricultural Experiment Station, in conjunction with the TVA and SCS has installed an artificial wetland for the treatment of animal waste at the Sand Mountain Experiment Station for research and demonstration purposes. Additional NPS surveys are being conducted in the Warrior River Basin to determine NPS pollution impacts to streams and reservoirs below areas with a high density of poultry, mining or silvicultural operations.

Investigations of NPS related water pollution by the Alabama Department of Environmental Management (ADEM) are generally in response to citizen water pollution complaints. Investigations in FY88 have been made of agricultural, silvicultural, construction, mining and urban NPS water pollution. Specifically through the third quarter, 34 agricultural facilities, six silvicultural operations and 36 construction sites have been inspected. ADEM initially employs an educational and cooperative approach in resolving these complaints. Generally these efforts result in the implementation of best management practices. However when this approach is not unsuccessful, ADEM utilizes a graduated enforcement strategy to require compliance. Numerous Notices of Violation and two Administrative Orders have been issued to operations that previously failed to comply with the State Water Pollution Control Act and rules developed thereunder.

TVA operates a demonstration project that measures fertilizer runoff and soil erosion rates from conventional and conservation tillage at Gilbert Farm in Colbert County, Alabama. Following three years of data collection from a conventional tillage cotton system (1984-86), the 6-year watershed study is currently in its second year of measuring nutrient and sediment runoff after conservation tillage was implemented. Data to date show that sediment runoff loss has been reduced by from 29 to 65 percent under conservation tillage, depending upon the conventional tillage year selected for comparison. The information obtained from this study should be useful in selecting BMPs and evaluating the erosion and nutrient runoff losses that occur under cotton production in the karst terrain soils of the Limestone Valley region of northern Alabama.

FLORIDA

The state of Florida has a well established, ongoing program involving numerous state agencies/regulations/practices relating to NPS management. Florida's existing NPS management program was developed as part of the state's areawide water quality management planning program (section 208 program) conducted during the late 1970's and early 1980s. The program involves a complex network of participants in several federal, state and local agencies. The program is multi-faceted and includes regulatory and non-regulatory elements, technical assistance, financial assistance, education, training, technology transfer and research. The program has stressed and required the implementation of both structural BMPs and nonstructural controls. The elements of this broad NPS management program include the stormwater rule, requiring all new stormwater discharges to use design and BMPs such that performance standards are met that result in 80%-95% of the total annual pollutant load removed prior to discharge.

The Surface Water Improvement and Management (SWIM) Act was enacted in 1987 to preserve and restore surface waters throughout the state. Each water management district is directed to develop and implement watershed management plans and programs for the improvement and management of targeted, priority watersheds. The primary focus of these programs is NPS management.

The Florida Department of Environmental Regulation (FDER) is now implementing the "Dairy Rule" to reduce stormwater pollutant loadings from dairies within the Lake Okeechobee Drainage Basin. All dairies are to develop and implement site-specific management plans to collect, store, and treat all wastewater from the milking barn and 25 year storm runoff from high intensity areas of concentrated animal density. The state cost-share program was funded at \$3 million for FY 88.

The Lake Okeechobee, FL project is an example of multi-agency cooperation aimed at addressing the eutrophication problems in the lake, its tributaries and distributaries. Dairy farm waste, along with intensive cropland run-off, are principle contributors to the nutrient loadings. The South Florida Water Management District (SFWMD) and the Department of Environmental Regulation (FDER) have taken aggressive steps through application of the state's Stormwater Regulation, the newly-adopted Dairy Rule and the Surface Water Improvement and Management Act (SWIM-1987). The 110,000-acre Taylor Creek-Nubbin Slough watershed tributary to the Lake was designated as an project RCWP in 1981. Over 95% of this area is devoted to agriculture which was determined to be a major source of phosphorus, and to a lesser extent nitrogen entering the lake. As of

November 1987, 89% of the total critical areas were under contract for BMP implementation.

Total project costs exceed \$2.3 million and include funds from RCWP, SCS, farmers and SFWMD. The program has been cooperatively implemented by the ASCS, Cooperative Extension Service (ES), SCS, Florida Department of Agriculture and Consumer Services, Okeechobee Soil and Water Conservation District, SFWMD and FDER.

A second RCWP was initiated in the area in 1987 within the Lower Kissimmee River watershed and is scheduled for completion over the a three-year period. Water impairment problems and pollutant sources are similar in this project, funded at \$4.7 million, with the same slate of federal, state and landowner funding sources.

In 1987, the Lake Jackson project was named the Outstanding Restoration Project of the year by the North American Lake Management Society. This project represents the cooperative efforts of EPA, the Florida Department of Environmental Regulation, and the Northwest Florida Water Management District. A stormwater treatment facility was built along a natural inflow stream. This facility includes a detention pond, intermittent underdrain filters to remove solids and nutrients and a 3-cell marsh impoundment. Three years of post-project water quality monitoring data indicates that the detention pond/filter bed system can remove 91 to 98% of the suspended load while the marsh removes 75% of the remaining load. All other loading parameters show reduction ranging from 37 to 90%.

GEORGIA

Urban Stream Management: The Environmental Protection Division (EPD) has continued efforts to encourage three cities to develop stream management programs. Sustained efforts are underway to develop or foster urban stream assessment programs in four additional jurisdictions. Five presentations regarding stream management were made to various organizations. Quarterly EPD surveys of Flat Creek (with the City of Gainesville) continued. The Atlanta Regional Commission (in cooperation with the City of Chamblee, DeKalb County, and EPD) conducted an intensive assessment of potential sources of contamination in the Arrow Creek drainage basin and coordinated corrective actions. This study was the fifth in a series of demonstration studies to illustrate how urban governments can deal with urban stream problems.

Sanitary Surveys: Nineteen sanitary surveys of streams and river segments that were not fully supporting their beneficial use because of nonpoint sources were conducted during the Summer of 1987 to document fecal coliform levels, determine sources

that caused elevated levels, and, if possible, eliminate problem sources.

Agriculture: The Georgia Forestry Commission, in cooperation with the SCS and the Georgia Association Conservation District Supervisors, prepared a statewide assessment of potential water quality problems resulting from agriculture. This document provided a county by county assessment of pollution potential by agricultural activity, an overall county ranking, and suggested streams for demonstration projects.

EPD developed a cooperative agreement with SCS for permitting large confined animal feeding operations. Pursuant to this agreement, large operations that are required by federal regulations to use "no-discharge" treatment systems, must obtain a Land Application System (LAS) permit from Georgia EPD. SCS will initially review wastewater systems for large new or expanded operations to assure compliance with SCS design criteria and forward a certification letter and engineering drawings along with a LAS permit application to EPD for review and, if appropriate, issuance of a permit. Smaller systems must have "no-discharge" treatment systems that are acceptable to SCS. EPD will take corrective actions where such operations have an adverse impact on water quality.

KENTUCKY

The Little River watershed in Trigg and Christian counties, western Kentucky, has been targeted as a priority watershed. TVA conducted Low Altitude Photography (LAP) of the watershed in April, 1987, and in October 1987 provided maps detailing land use in the watershed. An intensive survey was performed on the Little River watershed this past April. Information provided by LAP and the intensive survey will help target sites for BMP application when the Little River watershed becomes a site for demonstration projects. In addition, the two NPS on-site planning teams, each consisting of one member from the Division of Conservation, and one from the Division of Water (DOW) will use the dual expertise of water quality and agriculture/soils backgrounds to help target BMP sites and monitor the progress of the project. Kentucky considers the on-site planning teams to be an innovative aspect of the NPS program.

The DOW issues construction and operation permits for no-discharge liquid waste handling systems that store or treat waste from concentrated animal feeding operations prior to land application. According to an MOU between the DOW and SCS, the respective permits are issued after SCS certifies that the facility will be designed in accordance with SCS criteria and after SCS submits final as-built plans. The DOW takes corrective action whenever these facilities adversely affect water quality.

MISSISSIPPI

Various sources of state monies are currently available to fund implementation activities. Sources of state monies include the State Revolving Loan Fund and the State Agricultural Cost Share Program.

Aerial photography and interpretation for NPS pollution control purposes have been completed in the James and Mattubby watershed area of northeast Mississippi. The results of this TVA effort will be used to develop cooperative programs with local, state, and federal agencies to correct the soil erosion and water quality problems in the watershed.

The Mississippi Forestry Commission, in cooperation with the Mississippi Forestry Association, developed silvicultural BMPs. Educating and training the state's foresters to implement these BMPs will be a high priority in Mississippi's NPS program.

NORTH CAROLINA

North Carolina has had numerous successes in NPS control in the past. Recent successes in NPS control are summarized below. The Agriculture Cost Share Program (ACSP) presently cost-shares with farmers in the installation of BMPs in 56 Soil and Water Conservation Districts (SWCD). Present state funding for this program is \$7.0 million per year. The program hopes to expand to all 100 SWCDs by 1990 with an annual budget of \$12 million. The Forestry Cost Share Program cost-shares with individuals in the installation of BMPs in Nutrient Sensitive Waters (NSW). Annual state expenditure for this program is \$130,000.

The Water Supply Protection Program employs an innovative, cooperative approach to assist local governments in achieving a higher level of protection for their surface water supplies. By classifying a water supply as a more highly protected watershed (WS-I or WS-II), a local community and adjacent jurisdictions within the watershed must have taken steps to control nonpoint sources of pollution. In turn, the state agrees to limit the type and amount of point source discharges in the watershed based on the water supply classification. Even those communities with a lower protective water supply classification (WS-III) are encouraged to take steps to reduce nonpoint sources of pollution by implementing the land use component of the Water Supply Protection Program.

In addition to controlling NPSs in water supply watersheds, the state has adopted Stormwater Regulations in its 20 coastal counties. These regulations require either limits on built-upon area or the installation of stormwater treatment systems such as infiltration or wet detention basins.

SOUTH CAROLINA

The Broadway Lake Sediment Reduction Program illustrates that with proper funding, information/ education and leadership, there is tremendous public readiness to deal with NPS problems. In-kind services and/or funding were provided in this effort by the landowners in the watershed, the SC Land Resources Commission, the Anderson County Council, the Anderson Soil and Water Conservation District, EPA, USDA and others.

The Charleston Harbor Estuary Citizens Committee was formed in 1988 for the purpose of developing and implementing a comprehensive management plan for Charleston Harbor. The Committee, which meets monthly, is comprised of citizens, agency representatives, city administrators, and many harbor user groups. The NPS Working Group, one of several such groups on the Committee, has goals to: (1) assess the current NPS situation in Charleston Harbor and address local issues, (2) develop measurable BMP implementation goals, and (3) develop educational information targeted to various groups.

South Carolina received a \$488,000 grant from the U.S. Department of Energy Petroleum Violation Escrow Funds. The South Carolina Land Resources Conservation Commission will use the grant to purchase 38 conservation tillage planters and drills, and 19 units of drip irrigation installation equipment. Land users will be able to lease the equipment from their local Soil and Water Conservation District.

TENNESSEE

Officers Branch Project - Putnam County: A stockpile of refuse (shale, fire clay, pyrite, etc.) from an abandoned deep mine was contaminating an adjacent stream. The 14 acre project involved removal of the toxic material, and burial in a specially designed trench. The trench was lined with limestone, protected with french drains, covered and revegetated. The stockpile area was also revegetated, and waterfalls for aeration and circulation were constructed. Plow controls were set up through the system for monitoring and operational purposes.

Innovative Funding/Cooperation and/or NPS Controls in State: The Tennessee Department of Health and Environment (TDHE) and Tennessee Wildlife Resources Agency (TWRA) through 106 workplan activities have cooperated in developing and funding various NPS related activities. Private environmental interest groups have gotten involved in the effort, such as the Tennessee Scenic Rivers Association and their "Adopt-A-River" Program. Other private "watchdog" efforts have resulted in NPS pollution being found and addressed.

Through the issuance of State Water Quality Permit for Aquatic Resource Alteration (T.C.A. 69-3-108b), the impacts of activities or work in waters of the state are minimized. This type of permit is required for most stream channel modifications such as channel improvements for flood control projects, channel relocations, stream impoundments, stream diversion, utility line crossings, and water withdrawals. The permit normally imposes proper erosion control measures and conditions under which a proposed project must be accomplished. If the permit conditions are violated, an enforcement action can be taken, beginning with a Notice of Noncompliance (NONC), and possibly resulting in a Civil Penalty Assessment. In FY87 approximately 30 to 40 NONCs were issued throughout the state.

Region V - Chicago, IL



Regional Summary

Assessments

One state had submitted a final Assessment Report by the end of November, 1988, while the other five states had submitted draft Assessment Reports by the end of May (see Table 3 on page 16). These Reports indicate that agriculture and hydromodification activities accounted for over 70 percent of the documented NPS problems in streams, while for lakes agriculture

and contaminated sediments were the largest problems. The assessment reports are presently being reviewed by the Water Division (four programs), Great Lakes National Program Office, and the Environmental Science Division (two programs).

Management Programs

One state had submitted a final Management Program by the end of November, 1988, in accordance with section 319, while the other five states had all submitted draft programs by December 14, 1988 (see Table 4 on page 18). These submittals are presently being reviewed. The same review process is used for Management Programs that was developed for the Assessment Reports.

Regional Activities

The Region made intensive effort to promote the CRP's Filter Strip component. Region V states on average had a 45 percent higher acreage sign-up than the national average. The Region expanded its Technology Exchange program to include Indian Tribes and the International Joint Commission. The Region distributed 32 documents through the Technology Exchange program. Based upon a survey of state needs, the Region is actively looking for material to include in this program.

The Region has continued its effort to implement the Regional Administrator's Agricultural Nonpoint Source Award. The number of states participating in the program doubled in the last year to four.

The Region has initiated development of a Regional nutrient and pesticide workgroup. The purpose of this workgroup is to coordinate and facilitate the development and implementation of EPA initiatives on agrichemicals. This workgroup will coordinate with other federal agencies.

The Region assisted SCS in the development of two new P.L. 83-566 projects within the Region and is presently assisting SCS on the development of another. The Region worked with the state of Indiana and SCS to accelerate the training of state and federal agency personnel in ground-water nonpoint issues. The Region continued working with USDA-ARS on the development of the Agricultural Nonpoint Source (AgNPS) model. Region V funded the development of the ground-water component of AgNPS and served on the Technical Steering Committee.

The Region continued to support the Conservation Technology Information Center's NPS information and education efforts by supplying articles for its newsletters and assisting in the development of its long-range plan. Region V worked with the North American Lake Management Society to develop the *Off-site Assessment Workshop* as part of its "8th

International Symposium on Lake and Watershed Management" in St. Louis. The workshop, held in November 1988, was designed to help participants recognize and quantify NPS problems and connect them with contributing sources. One of the major themes of the 8th International Symposium was NPS management. The Region is also a co-sponsor of two other national NPS conference in FY89.

Regional personnel made over 34 presentations on section 319 at various state and organizational meetings. These presentations covered the section 319 requirements and future directions. These meetings included the National Poultry Management Waste Symposium, National Association of Soil Erosion Control Administrators and others.

The Region also supported four National Network for Environmental Policy Studies projects in the area of NPS and clean lakes. Listed below is a brief description of these four projects:

- Extent of Nonpoint Source Pollution in Region V. The purpose of this project was to summarize the information presented in the state NPS Assessment and Management Programs in order to gain a Regional perspective of the problems. This Report will be finalized in the first quarter of 1989.
- Effectiveness of lake restoration, protection and management techniques being implemented through the Region V Clean Lakes Program. This project provides a survey of the techniques being implemented as part of the Clean Lakes program, which includes NPS controls. An analysis of frequency of techniques implemented in relation to identified problems is included. The Report will be finalized in the first quarter of 1989.
- Benefits of Nonpoint Source Models in Watershed Planning. This project was to discuss the qualitative and quantitative benefits of the use of models in watershed planning. The report will also include the results of a case study on the application of NPS modelling at the University of Colorado Research Park. The Report is expected the first quarter of 1989.
- Evaluation of the use of wetlands under EPA's Region V Clean Lakes program. This project examines the effectiveness of both institutional arrangements and physical mechanisms associated with wetland use. Wetlands have been used as NPS pollution abatement devices in a number of Clean Lakes projects. The final report will detail how wetlands have been used and future programs recommendations. The final report is expected during the first quarter of 1989.

Water Division continued to provide technical support to Great Lakes National Program Office. Water

Division completed the NPS components of the Upper Great Lakes Connecting Channel Study and the 1987 Progress Report on the Implementation of the United States Phosphorus Reduction Plan. In addition to these activities, the Water Division reviewed the NPS components of all 27 Remedial Action Plans. The Regional Nonpoint Source Program provides technical support to the Office of Ground Water, Superfund, Office of Pesticides and Toxic Substances, Environmental Review Branch, Wetlands program, and Monitoring programs.

The Nonpoint Source Program worked closely with the Permits Program to develop a prototype stormwater permit with NPS controls. The Region is funding a project on the application of stormwater runoff models with a geographic information system.

The Nonpoint Source Program is working with the Regional In-place Pollutant Task Force on the development of the Regional Strategy. The NPS Program is also providing technical assistance to the Environmental Sciences Division on the Madison PCB Sludge Application Project.

Great Lakes National Program Office (GLNPO): GLNPO is responsible for ensuring that the U.S. carries out its responsibilities under the Great Lakes Water Quality Agreement. On November 18, 1988, the Administrator of EPA, signed a new Great Lakes Water Quality Agreement together with the Canadian Minister of the Environment. In the new agreement is an Annex for control of NPS pollution. The purpose of Annex 13 is to further delineate programs and measures for the abatement and reduction of nonpoint sources of pollution from land-use activities. The Annex includes provisions for wetlands and their preservation, as well as a biennial reporting requirement. The provisions of this Annex will be implemented through the section 319 program.

GLNPO also continued its cooperation in the Environmental Protection Program between USA-USSR entitled *Protection of river basins, lakes and estuaries*. The program has a NPS component that will be presented at the International NPS Management Workshop in Austin, Texas during November, 1989.

GLNPO has submitted the U.S. portion of the Upper Great Lakes Connecting Channel study that has a significant NPS component. The 1987 Progress Report on the Implementation of the U.S. Phosphorus Plan was completed and a draft of the 1988 Progress Report was completed on December 15, 1988.

GLNPO has funded a significant number of demonstration projects during 1988, and continued providing assistance to states for the development of 30 Remedial Action Plans (RAPs) to correct acute localized problem areas, of which 26 have NPS components. These RAPs provide a foundation for federal, state

and local actions for the protection, management and restoration of the impacted water body. The NPS components of these RAPs will be implemented through the section 319 program.

Four major NPS projects were completed through the GLNPO in FY88:

- Political, Institutional and Fiscal Alternatives for Nonpoint Pollution Abatement Programs conference. GLNPO partially funded this international conference, while the Region's Water Division provided technical support. The conference was held in Milwaukee, WI on December 7-9, 1987. A conference proceedings was transmitted to each Great Lakes state.
- Great Lakes Demonstration Program Technology Transfer Document. GLNPO funded the development of this document, and the Water Division provided technical assistance. The document summarizes the lessons learned from section 108(A) demonstration projects. Final publication and distribution will be accomplished in FY89.
- Pesticide Survey. GLNPO funded Ohio State University Extension Service to survey landowners and operators regarding pesticide use in Ohio's Lake Erie drainage basin. The final report has been published and distributed to the states in Region V, the SCS, and various EPA program offices.
- Transect Survey. In order to obtain better information on the adoption of conservation tillage in the Lake Erie drainage basin, GLNPO funded the SCS in Michigan, Indiana, and Ohio to complete special transect surveys. The results from these surveys are utilized in reporting implementation progress under Annex 3 (phosphorus reduction plan).

For FY89, GLNPO has funded thirteen NPS projects.

State Highlights

ILLINOIS

Illinois EPA (IEPA) Standards and Specifications for Soil Erosion and Sedimentation Control were incorporated into the construction permitting process of the Division of Water Pollution Control. IEPA staff are participating on an Agrichemical Containment Committee with the Illinois Department of Agriculture. The intent of this committee is to strengthen the regulations on contaminant and to clarify standards and specifications for the containment of Agrichemicals.

INDIANA

Indiana has surpassed its phosphorus load reduction goal. The state continued "T by 2000", which is a comprehensive state-funded program aimed at significantly reducing soil erosion and resulting sedimentation throughout Indiana. The program has a Lake Enhancement component. Indiana continued its nitrates in ground-water effort and the ground-water pesticide monitoring projects.

MICHIGAN

Michigan awarded funds to local units of government to implement NPS pollution abatement plans they developed under the Michigan Clean Water incentives program. Michigan made a special effort to define "acceptable management practices" for livestock and poultry facilities. Michigan continued implementation of its Phosphorus Reduction Plan, and had significant achievement (over 90 percent of the goal) in Saginaw Bay.

MINNESOTA

Minnesota emphasized the State Clean Water Strategy Approach at the local level with its "Local Water Planning: A Minnesota Success Story". The Minnesota Pollution Control Agency (MPCA) has administrative rules in place for the Clean Water Partnership program. MPCA is developing BMP handbooks for agriculture, urban areas, forestry and mining. The state supported continued development of AgNPS model.

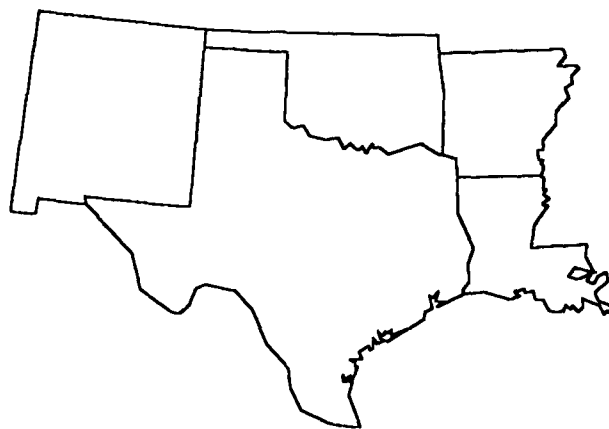
OHIO

Ohio EPA (OEPA) has been funded to develop a report describing Ohio's experience with low cost education and demonstration projects aimed at reducing nonpoint sources of pollution. OEPA has also developed a data management system for the state NPS assessment process and report, and has initiated a comprehensive program to update their existing NPS assessment.

WISCONSIN

During early 1988, the Wisconsin legislature enacted Act 297 which created regulatory authority for the abatement of NPS pollution associated with severe water quality problems. The state continued its NPS Pollution Abatement Program, and BMP standards and specifications to protect fish and wildlife habitat were completed. The Wisconsin Department of Natural Resources (WDNR) has been able to partially decentralize the NPS program to the District Offices.

Region VI - Dallas, TX



Regional Summary

Assessments

All five states had submitted final Assessment Reports by the end of October, 1988 (see "Summary of Report Submittals" on page 16). These reports show that agriculture causes NPS problems in five states; mining/resource extraction is a problem in four states; and construction, hydromodification, land disposal, and urban runoff are sources of concern in three states. The Regional review process involves several divisions within EPA, as well as a NPS Task Force.

Management Programs

Three states had submitted final Management Programs by the end of October, 1988, and the other two states had submitted draft programs by the end of January, 1989 (see "Summary of Report Submittals" on page 17). None of the states had a comprehensive NPS program prior to section 319. Thus the WQA has provided these states with an opportunity to move forward in the management of NPSs. All five states plan to develop and implement an agricultural NPS management program, and most plan to add management programs for other NPSs in the future.

Regional Activities

On August 11, 1988, the Regional Administrator issued a Regional Policy for use of section 205(j)(5) funds for FY88, FY89, and FY90. Basically, the policy directs grants to be used for implementation of NPS controls and conditions the award of these grants upon EPA approval of the NPS Assessment Reports and at least portions of the NPS Management Programs.

The Region developed generic NPS Assessments and NPS Management Programs for states to use as guides. The NPS Coordinator met with each state water quality agency almost quarterly in FY88 to discuss progress and to provide assistance as needed. The Region hosted two state workshops and two federal agency workshops to help states prepare their Assessment Reports and Management Programs.

Twelve information packages containing more than 30 technical and programmatic publications were transmitted to states in FY88. The Region delivered 10 NPS presentations to various groups and agencies. In additions, the SCS detail has spoken at more than 30 meetings of agencies, groups, and industry.

State Highlights

ARKANSAS

No implementation funds, federal or state, are proposed for FY88, FY89, or FY90.

LOUISIANA

The new cooperation between SCS, Louisiana Extension Service, and Louisiana Department of Environmental Quality (LDEQ) is one of the biggest measures of success in Louisiana. LDEQ will rely upon SCS and Extension as the implementing agents for the agricultural NPS Management Program.

The Fish and Wildlife Service is helping the state to identify fifty priority wetlands. Two areas of primary concern are the Gulf Coast and the Chenier Plain in the Delta.

NEW MEXICO

The state was successful, working through the designated management agency (U.S. Forest Service), in having disturbed areas at the Santa Fe Ski Basin revegetated to decrease sediment loading to the Rio en

Medio. The state was also successful in obtaining better on-site construction practices by the Sangre de Cristo Water Company for work at McClure Reservoir, preventing pollution of the Santa Fe River.

The Environmental Improvement Division (EID), in cooperation with the New Mexico Department of Game and Fish and the F&WS, worked with the U.S. Army Corps of Engineers to develop a plan to stabilize spoil material that had resulted in massive sedimentation of the Rio Chama below Abiquiu Dam. The EID also cooperated with the County of Los Alamos to prevent sediment inputs from construction sites and to develop a plan to prevent discharge of anoxic waters to the river during construction of a hydroelectric power facility at Abuiqui Dam.

OKLAHOMA

Since the Management Program is still under development, the primary "success" at the present time is the high degree of interagency coordination that has emerged on the part of the Oklahoma Conservation Commission (OCC) and the Oklahoma State Department of Agriculture (ODA). This spirit of cooperation will allow the development of a solid agricultural component for the Management Program, which will also involve the cooperation of the state's 89 Conservation Districts, SCS, and the Cooperative Extension Service.

The SCS has worked closely with the OCC in the development of their NPS Assessment Report and Management Program. In addition, SCS has helped develop standards for animal waste lagoons, dead bird pits, and animal feedlot restrictions.

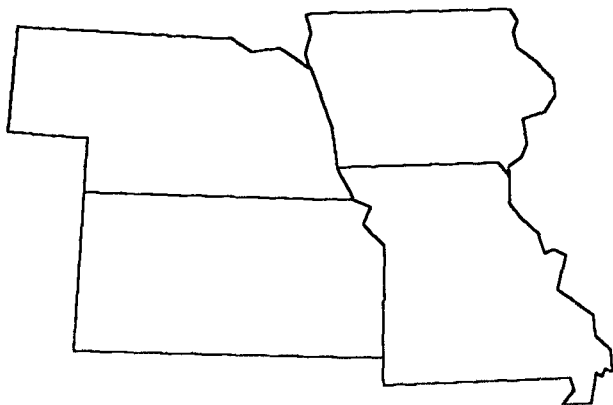
TEXAS

The NPS Assessment process led to the discovery that many suspected NPS problems were actually point source problems. These problems have been referred to the responsible municipalities for correction under terms of their permits.

The NURP study in Austin has led to the most comprehensive local watershed protection/control program in Texas. The Office of Public Information at the Texas Water Commission has initiated an information campaign with NPS as the focus beginning in September, 1988, and continuing through at least March, 1989.

In the Texarkana and Longview areas two major industries have spent about \$7 million over the past four years to remedy NPS toxics problems.

Region VII - Kansas City, KS



Regional Summary

Assessments

Three of the four states in Region VII had submitted final Assessment Reports by the middle of November, 1988, while the other state submitted a draft report in April (see Table 3 on page 16). *Nebraska's Assessment Report was approved on January 5, 1989.* In general, the states found that a lack of available data on a watershed basis and the short amount of time combined to produce a very difficult environment in which to qualify and identify surface and groundwater impacts due to NPS for the Assessment Report.

The resultant lack of specific waterbody and accompanying watershed area identification reduced the ability of the Management Programs to contain specific implementation priorities. It is clear that reliance on existing available information could not produce the definitive assessment of where and what the water quality impacts due to NPS were. Also contributing to some lack of specificity is the absence of national criteria to judge NPS control progress and the nature of current state water quality standards which are, for the most part, inadequate to deal with sediment and, in some cases, agricultural chemicals. Therefore, a key future activity in most states will be the refine-

ment and completion of a reassessment of state waters in order to better determine implementation priorities. This will occur at the same time limited implementation goes forward in those existing watersheds that have had NPS problems identified and match priorities of available funding.

Categories of NPS examined in Region VII state Assessment Reports were as follows: agricultural-cropland and irrigation land; animal waste; mining; urban stormwater; construction erosion; landfill leachate; silviculture; hydrologic/habitat modification; and septic tank leachate. Of these, only the agricultural NPS related sources were widespread in all states, and these will be the primary focus of watershed implementation programs.

Management Programs

The large workload in other areas related to the WQA of 1987 slowed development and completion of final section 319 Management Programs. Nebraska submitted its final Management Program in October, 1988, while the other three states submitted draft Management Programs in August (see Table 4 on page 18). *EPA approved Nebraska's Management Program on January 5, 1989.*

The need for better education and information transfer on a statewide basis was identified by most states as a priority implementation activity irrespective of individual watershed priorities. Region VII is impressed by the attitude and willingness of some federal and state agencies to undertake cooperative efforts aimed at implementation, especially in the agricultural NPS area. This level of implementation will not be high nor quickly reached however.

Regional Activities

Federal Agency Cooperation

- Region VII hosted a two-day workshop in May for USDA-SCS Headquarters and Technical Center staff to provide information and input into the development of technical water quality training information by SCS.
- In December, Region VII hosted the four states' SCS office directors along with the Midwest National Technical Center (MNTC) Director to explore state 319 program directions and opportunities for cooperation.
- Region VII attended the USDA's Conservation Review Group meetings, in all four states, to provide water quality input into USDA programs.
- Region VII staff conducted various visits with state offices of SCS and USGS, and with the

MNTC to discuss general NPS concerns and the progress of state 319 efforts.

- Region VII staff serve as members of the USGS Lower Kansas River Basin Study liaison committee, which is focused primarily on characterizing water quality effects from NPS.

General Coordination

- Region VII staff participated in an joint EPA-National Association of Conservation Districts (NACD) conference in Denver that was aimed at educating and informing state and local agencies on section 319 issues and requirements. Regional staff also participated in the NACD North Central regional meeting in Peoria, Illinois, in July and discussed 319 activities.
- Regional staff prepared a slide program to explain the 319 program to federal, state, and local agencies and groups.
- Region VII staff participated in meetings of the Mid-America Chlordane Group, an ad hoc group of states bordering the Mississippi River, who are attempting to find common approaches to dealing with chlordane contamination of sport fisheries on the Mississippi River. The chlordane contamination is believed partially due to urban run-off.
- Region VII maintained its SCS detail position in the region and utilized the resulting liaison with SCS and technical expertise to improve oversight and coordination of state NPS programs. Information on CRP, ES programs, technical mapping capabilities, etc., were provided to regional and state staff.
- Region VII participated extensively in the NPS Agenda Task Force (see "Convened NPS Agenda Task Force" on page 29) and its Steering Committee. The regional Water Management Division Director served on the Steering Committee and the Water Quality Branch Chief and NPS Coordinator, attended several task force meetings and/or provided extensive written comments and input.

Assistance to States for Preparation of Assessment Reports and Management Programs

- Region VII established specific state/EPA agreement commitments with additional regional output and milestone requirements for all states in order to insure timely preparation of the reports/programs.
- Region VII conducted quarterly meetings in all states to discuss progress of plan preparation with state environmental agencies.

- Region VII provided planning grant funds (205(j)(5)) in FY88 to all states for preparation of Management Programs and Assessment Reports.
- Region VII provided funds to the Big Spring Basin Demonstration Project in northeast Iowa. The Big Spring Project is a study of groundwater NPS interactions and it has contributed much to the understanding of how agricultural chemical impacts groundwater. An interdisciplinary team of federal, state, and university researchers are working on the Project which is also demonstrating the effectiveness of BMPs in controlling groundwater pollution.
- Region VII developed a regional Geographic Information System (GIS) project that will link the AgNPS watershed model to a GIS for a small watershed in Kansas to develop and assist testing of BMP and implementation effectiveness.
- Region VII is participating in a pilot test of linking the AGNPS watershed model to an in-lake model in Missouri using an existing Clean Lakes Phase I project. The state will utilize the output to refine BMP implementation in that and other target watersheds.
- Region VII hosted a three-day workshop aimed at improving the states' technical abilities to utilize NPS computer models in targeting critical areas. National experts in AGNPS, CREAMS, GLEAMS, and PRZM provided hands-on training to 66 individuals representing 19 agencies.

Regional Overview of 319 Program: Region VII initiated, developed, and participated in a wide range of activities during FY-88 that were aimed at assisting state agency development of section 319 plans, increasing federal interagency coordination on NPS issues, and strengthening the research data base on NPS surface and groundwater problems and solutions.

State Highlights

IOWA

A number of nonpoint control projects have been initiated in Iowa, and progress continues to be made in implementing these projects. In recent years, NPS control projects were initiated for nineteen Iowa lakes with five of these projects now completed. These projects are being funded by a variety of federal and state programs, and considerable BMP implementation has occurred during the reporting period. One new project, North Cedar Creek (a trout stream in Clayton County) was awarded partial project funding during FY88, and implementation of this project will

begin in FY89. In addition, NPS planning was initiated for Lake Iowa, Iowa County, in FY88, as part of a Phase I Clean Lakes diagnostic and feasibility study.

In several Iowa lake protection projects, EPA Clean Lakes Program funds have been combined with funds from the Publicly Owned Lakes Program (POLP) component of the state cost-share program, in order to provide a 75 percent cost share rate for installing permanent soil conservation practices in these lake watersheds. To accomplish this, the Department of Agriculture and Land Stewardship (DALs) rules for the state cost-share program have been written to give highest priority to projects where state funds are being combined with federal funds (such as Clean Lakes Program funds).

During its 1988 session, the Iowa Legislature established and funded a new program to enable county soil and water conservation districts to carry out local water quality projects (enabling legislation was HF 2381, funding for FY89 established at \$500,000). Details of this program are not currently known, as DALs has only recently begun development of proposed program rules. It is anticipated, however, that this program will provide support to and be carried out in conjunction with the state NPS Management Program.

An accounting of the installation of BMPs in the watersheds of priority Iowa lakes shows that more than \$470,000 was spent in FY87 and about \$160,000 was spent in the first quarter of FY88. Funding sources for the fifteen priority lakes include Agricultural Conservation Program (ACP) special project funds, the Resource Conservation and Development Program (RC&D), the Rural Clean Water Program (RCWP), the Clean Lakes Program, the Iowa POLP, local entities, and private landowners. In FY87 the state used about \$350,000 of federal/state/local funds to leverage an additional \$120,000 from private landowners. Through the first quarter of FY88 private landowners contributed about \$40,000 for BMP implementation. The lion's share of federal/state/local funds in both FY87 (\$213,000) and in the first quarter of FY88 (\$103,000) came from POLP. These numbers do not include additional POLP funds that were spent in Clean Lakes watersheds. The BMPs installed in these fifteen watersheds during FY87 and FY88 consisted mostly of terraces, waterways, and water and sediment basins.

The Iowa Groundwater Protection Act, passed in 1987, is a comprehensive piece of legislation addressing a wide range of ground-water issues. The Act includes several specific projects related to NPS pollution: (1) the Big Spring Demonstration Project (BSDP), (2) closure of abandoned wells, (3) registration of agricultural drainage wells, and (4) the Inte-

grated Farm Management Demonstration Project (IFMDP).

The BSDP includes approximately 128 on-farm demonstration projects of various scales, involving more than 1,000 plots. The IFMDP comprises more than 300 demonstration sites in nearly every county in Iowa. Some of the farm demonstrations are co-sponsored by the BSDP and the IFMDP. The demonstrations illustrate alternative, reduced tillage methods (e.g., ridge tilling); nutrient, particularly nitrogen, management; rotation benefits; pest control; weed management; and abandoned well plugging. Many educational efforts are underway, including tours, presentations at various meetings, press releases, a newsletter, and television and radio interviews. The IFMDP involved similar activities, but on a statewide scale. The more than 300 demonstration sites in 1988 included nearly every county in the state.

KANSAS

Assessment: In order to determine water quality problems caused by nonpoint sources, narrative criteria of the Kansas water quality standards were "interpreted" through a set of quantitative screening criteria.

SCS Interagency Team: The SCS in Kansas has established an interdisciplinary, interagency water quality planning team to develop the details of the SCS Water Quality Strategy. The Bureau of Water Protection within the Kansas Department of Health and Environment (KDHE) has two representatives on the team. The objectives of the strategy include developing a watershed planning methodology for addressing water quality problems in SCS sponsored projects and revision of the SCS technical guides to address nonpoint source pollution control.

Upper Delaware Water Quality Assessment: The SCS and KDHE have executed an agreement for KDHE - Bureau of Water Protection to conduct a water quality assessment of the Upper Delaware Watershed. The monitoring effort was to include 15 surface water quality monitoring sites, 10 ground-water quality sites, and up to eight biological monitoring sites. The assessment was to be completed by May 31, 1988.

Nonpoint Source Biotic Index: KDHE - Bureau of Water Protection has contracted with the Kansas Biological Survey to develop a *Biotic Index for Assessment of Nonpoint Sources of Pollution*. The index is intended to enable the use of biological measures and observations to assess the impacts of nonpoint pollution sources and estimate the likely improvements resulting from implementation of NPS pollution control measures.

Cedar Creek Water Quality Assessment: KDHE, the Kansas Water Office and EPA have entered into a joint project to demonstrate the use of GIS technology and the AgNPS model in the Cedar Creek Watershed in Bourbon County. KDHE will be responsible for making water quality interpretations and recommendations.

Farmstead Wells: The majority of pollution sources that can affect the quality of farmstead well water are NPSs. KDHE in cooperation with Kansas State University has completed a survey of farmstead well water quality, is developing a predictive modeling technique to estimate well water quality using information about farmstead activities, and is developing a series of educational materials to enable farmers and others to use the techniques to estimate well water quality, make informed decisions on locating pollutant sources and protecting well water quality.

Bourbon County Monitoring Network: The Bourbon County Conservation District has initiated a surface water quality monitoring network. The Bureau of Water Protection has provided technical assistance on the network design. Fort Scott Community College will be providing the majority of the sample analysis. The Bureau of Water Protection will provide analytical support for heavy metals and pesticides. The Bureau will also provide data analysis and interpretative assistance. The network consists of 12 sites to be sampled six times a year.

MISSOURI

The Division of Environmental Quality of the Department of Natural Resources (DNR) led Missouri's efforts to prepare an Assessment Report and develop a Management Program for NPS.

The projected activities of the Management Program are summarized below:

- Assessment and prioritization enhancement
- Project development
- Program commitment

- Public awareness

In addition to the above activities the state conducted the following activities related to NPS programs:

- Continued monitoring of stream/lake quality in four watersheds receiving state cost-share erosion control funding.
- Continued groundwater monitoring in suspected vulnerable areas in northeast Missouri and in the Bootheel area.
- DNR initiated the Woods Fork Demonstration Project that will address animal waste management and soil erosion practices. Implementation funding is provided by state soil erosion program and special ACP project funds.

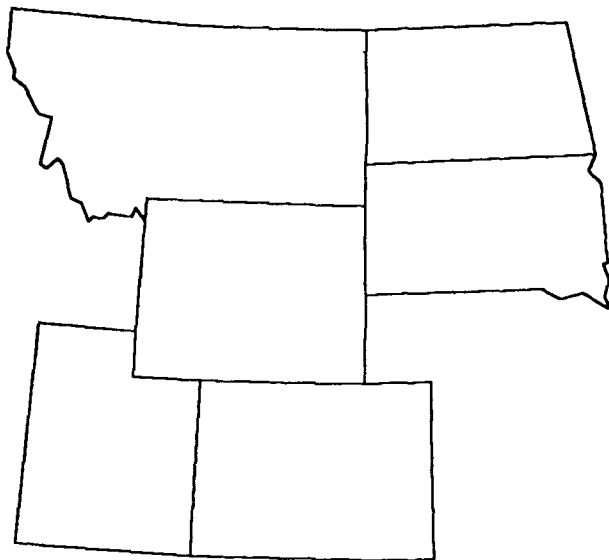
NEBRASKA

In FY88 six NPS programs or activities were conducted by the Nebraska Department of Environmental Control (NDEC). These programs or activities include the section 319 NPS Assessment Report, section 319 NPS Management Program, Special Protection Area (SPA) Program, Long Pine Creek RCWP project, application of the AgNPS watershed model to the Sand Draw watershed of the Long Pine Creek RCWP, and the Elm Creek (Webster County, Nebraska) project.

Three monitoring efforts are currently being conducted by NDEC in conjunction with the SPA program. Sampling is being done in the Beatrice, Fremont, and Superior, Nebraska vicinities to define pollutant sources and to assist with SPA designation decisions. Locally, the Central Platte Natural Resources District has implemented a groundwater quality management area to deal with nitrate contamination in their district.

To date, approximate expenditures by NDEC to develop NPS programs includes \$50,000 in surface water activities and \$300,000 in groundwater activities. An estimate of funds spent at the local level for NPS planning or activities is not immediately available.

Region VIII - Denver, CO



Regional Summary

Assessments

The Region had received final Assessment Reports from five states by the end of December, 1988, while the other state submitted a draft report in July (see Table 3 on page 16). *The South Dakota Assessment Report was approved in September, 1988. Colorado's Assessment Report was also approved by EPA, on November 25, 1988.* All states exerted extra effort to incorporate best professional judgment information on stream and lake conditions into the assessments along with conclusions based on available monitoring data. The conservation districts in all states have been very cooperative in providing information and thus these assessments will provide good water quality baselines for targeting the upcoming USDA Water Quality Initiative (see "Soil Conservation Service Implemented New Water Quality Action Plan" on page 31). Special attention has been given by the Region to incorporating water quality data from other federal agencies into the assessments. Region VIII also initiated evaluation of biological and aquatic habitat and riparian zone habitat impacts on fishery beneficial uses, since in many cases they are more indicative of the health of the stream than chemical data and may be more available. The Region strongly supports the

proposed future direction of NPS monitoring programs into the use of biological/habitat survey methods and has hired a staff person to provide expertise in this area.

In FY89 the Regional emphasis in NPS assessments will be:

- To continue to integrate other federal agencies and their data into the NPS assessments and assessment processes.
- To become more knowledgeable about biological/habitat monitoring of NPS impacts.
- To integrate additional groundwater, Clean Lakes, and wetland information into the assessments.
- To support the integration of the assessment reports into the SCS Water Quality Initiative.

Based on the large land area of Region VIII and the remoteness of many headwater streams (both pristine waters and those impacted by mine drainage), significant additional resources will be required to make the assessments comprehensive and inclusive. Evolving technology, such as rapid biosurvey methods, will also be helpful. There is also a need to collect and incorporate data on pesticides in surface or groundwaters.

Management Programs: Three states had submitted final Management Programs by the end of December, 1988, while two states had submitted draft programs by early October (see Table 4 on page 18). Wyoming had not submitted a Management Program as of January 30, 1989. *South Dakota received partial approval of its Management Program in September, 1988.*

Assembling the BMPs for the agricultural component of state NPS Management Programs has been straightforward, with all states adopting portions of the SCS Field Office Tech Guide practices as the baseline. The recently completed water quality/quantity footnotes for SCS practices will be integrated into the section 319 practices by state water quality staff.

Grazing practices have been a concern due to the direct impact of improper grazing on key western fisheries, the controversial nature of the grazing issue, and the fact that three federal agencies (Bureau of Land Management, Forest Service, and SCS) are all involved in grazing and are utilizing three different sets of grazing BMPs. It has also become evident from existing demonstration projects that grazing can be done on watersheds on a win-win basis, (both improved grazing and improved or restored fisheries) if the grazing systems are properly selected for the unique watershed ecosystem conditions. EPA is sponsoring a contract to document this process such that additional demonstration projects can be selected

and initiated as part of the section 319 program implementation. It will also provide a basis for updating existing grazing BMPs in the three federal agencies as well as providing grazing BMPs for the NPS Management Programs in western states.

All states are considering funding statewide educational programs on proper pesticide and fertilizer management to control NPS and also will be cooperating with USDA in the joint training of USDA and state water quality personnel on pesticide and fertilizer concerns in FY89. Region VIII will also be active in supporting these initiatives as well as cooperating in the South Dakota RCWP project, whose major focus is on developing techniques for monitoring pesticide and fertilization impacts on surface and ground waters.

Colorado has developed a program for control of NPS from the abandoned hard rock mines that impact many high country trout streams. This program is already being implemented by the Mined Land Reclamation Division. Montana is developing a similar program. Mining is a major NPS in both states. BMPs for abandoned gold mines are still in the development/experimental state.

Several states are developing control programs for silviculture and urban runoff. Controversy is anticipated in selecting and approving silvicultural BMPs due to the disparity in logging practices on state, private, and federal lands.

The review and approval/disapproval of all six state NPS Management Programs in Region VIII is anticipated to be controversial for programs dealing with grazing and/or silviculture due to the controversial nature of the source categories, the extensive federal land holdings, and the national environmental attention. Many trout streams, including threatened and endangered cutthroat streams, are being impacted by grazing and silviculture.

Regional Activities

South Dakota transferred section 201(g)(1)(B) funds into the NPS program during FY88, and several other states are considering doing the same in FY89. Major Regional initiatives in FY89 will be to integrate the Federal Consistency Guidance for NPS on federal lands into each state Management Program, to continue to work with other federal agencies on their own NPS control initiatives, and to support the SCS State Offices on USDA water quality initiatives. Technology transfer of biological/habitat monitoring methods to state and federal agencies will also be continued. The Region will continue its lead role for western Regional issues on the National NPS Interagency Task Force, the NPS Agenda Task Force, and as lead Region on grazing issues. The Region will also con-

tinue its lead responsibilities on the Colorado Salinity Forum.

State Highlights

COLORADO

The Water Quality Control Commission adopted a regulation allowing NPS passive treatment of abandoned/inactive mine drainage sites. This authority will allow individuals, corporations, agencies, and interest groups, to pursue low technology, low cost remediation of these mining sites. This is a significant step since these sources have often been referred to as Colorado's most serious water quality problem, and have received little attention in the past.

Silver Creek, a tributary of the Fall River and Clear Creek in Clear Creek County, is the object of a project of the Mined Land Reclamation Division. This project, recognized in the Colorado NPS Assessment Report as a severe impact due to abandoned/inactive mining is reclaiming Silver Creek through removal of old mill tailings and treatment of a mine adit discharge. Aquatic life may again return to Silver Creek due to these improvements.

MONTANA

Specific milestones were planned for agricultural, silvicultural, and resource extraction NPS pollution categories. Montana adopted the SCS standard conservation practices for agricultural BMPs. The state also adopted the BMPs developed by the Cumulative Watershed Effects Committee as its silvicultural BMPs.

Montana's NPS control program will be coordinated by a task force comprised of representatives of 31 organizations and agencies. This group will provide the essential guidance for the program. Cooperative efforts at the state level for NPS control include:

- The formation of the Riparian Education Committee to promote improved management of private lands.
- The Forest Practices Study Committees of the Environmental Quality Council.
- The Cumulative Effects Watershed Cooperative.
- The coordination and cooperation of private landowners and state and federal agencies on the development of demonstration projects.

NORTH DAKOTA

Spiritwood Lake, a 16-meter deep, natural lake, is situated on a 14,900-acre watershed. Best manage-

ment practices were implemented in 1983, with the Stutsman County Soil Conservation District having primary responsibility. Nearly all costs were provided by funding from the SCS, ASCS, North Dakota Game and Fish Department, and North Dakota State Department of Health (EPA and state funds). BMPs implemented included 58 miles of trees planted, 1296 acres of no-till, 3300 acres of protected fallow land, and 100 percent treatment for crop residue management in the watershed.

Hypolimnetic withdrawal of nutrient-rich water is accomplished by pumping via 4500 feet of perforated 16-inch polyethylene pipe on the lake bottom. Up to 1986, 44,139 pounds of total organic nitrogen and 3,482 pounds of total phosphate had been removed. A gradual reduction in nutrients has occurred, with increased water clarity, a favorable shift in the algae species present, and increased dissolved oxygen to lower depths. This is an ongoing project with continuing management and monitoring.

The Sheyenne River Improvement Project started in August, 1986, as a cooperative effort sponsored by the Ransom County Soil Conservation District and Water Management Board. The goals of the project were to reduce NPS impacts on the Sheyenne River, provide education and information to individuals within the project area, and clean up aesthetically displeasing areas to promote use of the river by the local population.

A ground-water protection map was completed in cooperation with the SCS and County Weed Board to identify ground-water areas that may be susceptible to contamination from noxious weed spraying. A public information campaign involving lectures at area schools, a booth at local fairs, and distribution of NPS information to area producers has been quite successful, and is on-going.

SOUTH DAKOTA

Although the section 319 NPS program will provide a welcome shot in the arm for NPS pollution control, South Dakota has long been involved in efforts to control NPS pollution. The South Dakota Clean Lakes Program includes consideration of NPSs through the use of the AgNPS model in diagnostic/feasibility studies. The model is used to delineate critical cells within a watershed so that control methods are implemented more efficiently and effectively. Other success stories related to NPS pollution control efforts include the Big Stone Lake Clean Lakes project, the Oakwood/Poinsett RCWP project, and the Lake Herman MIP project.

UTAH

Nonpoint source water quality planning activities are completed in three priority watersheds and in progress

in another 10 priority watersheds. These watersheds involve six different lead agencies at various levels of government; impairments caused by sediment, hydrologic modification, nutrients, sediment, and total dissolved solids; and at least five different funding sources. Two of the priority watersheds, the Heber Valley and Pineview Reservoir, are funded through the Clean Lakes Program.

The Utah Department of Agriculture believes that demonstration projects will be effective in gaining implementation of NPS control measures. The Newton Reservoir filter strip demonstration is considered very important because of its potential of a CRP filter strip educational program. A training, education, and demonstration program is planned for animal waste control in Cache Valley. Others will be scheduled as appropriate.

WYOMING

Ocean Lake has been severely impacted by sediment loads entering from irrigation return flows. The area drained by Drain 6 is a major source, and implementation of BMPs has the potential to significantly improve water quality in the lake. In FY88 a contract was initiated with the Riverton Conservation District (utilizing 205(j)(1) funds) to test the effectiveness of BMPs in controlling the channel erosion on Drain 6.

Region IX - San Francisco, CA



Regional Summary

Assessments

By the end of August, 1988, three states and all three territories had submitted draft Assessment Reports (see Table 3 on page 16). Nevada had not submitted a report as of January 30, 1989.

Management Programs

Three states and all three territories had submitted draft Management Programs by the end of August, 1988 (see Table 4 on page 18). Nevada had not made a submittal as of January 30, 1989.

Regional Activities

Region IX has focused its nonpoint source program efforts on the promotion of the section 319 Program to the states in the Region. In the first quarter of FY89, the Region intends to shift emphasis into that of reviewing the submittals and working with the state lead agencies to ensure that the documents meet the section 319 requirements. We already see certain areas where there are deficiencies in the drafts particularly in the areas of federal consistency, denominating funding alternatives and in setting milestones. In addition, we expect additional information on problems and programs to come in as the public becomes more aware of the program.

Part of the Region's promotional efforts have taken the form of public outreach. This outreach includes speeches to statewide conservation groups such as the California Association of Conservation Districts, the Hawaii Association of Conservation Districts, and the Western Region of the National Association of Conservation Districts (NACD). In addition, EPA representatives have given talks to local groups in an effort to encourage public participation in the state program development process.

Public outreach was emphasized as an integral component of the Region IX Nonpoint Source Strategy. Based on Headquarters guidance and discussion with representatives inside and external to EPA, this strategy recognized the need for state water quality planning agencies to move the program into implementation as quickly as feasible. Under the model of the Citizens Participation Handbook (prepared by the Institute for Participatory Management) the Region recognized that the key factor to ensure successful program implementation was to encourage early public involvement in the planning process and to work with the state lead agency. This was particularly important in those states where the lead agency had not made any special efforts to seek public input into the program. Despite the progress the Region

has made, in some states such as California, the public and interested groups are just becoming aware of the program development process and this will necessitate incorporation of these concerns into the Assessment Reports and Management Programs at a later date, perhaps as updates.

In addition to outreach to the public the Regional Strategy calls for internal coordination within the EPA Regional Office. Other programs participate in reviews of important elements of the program, including workplans, assessment reports and management programs. The Office of Ground Water, and the Wetlands and Estuary Programs are involved in these reviews. All of these offices and the Office of Pesticide Programs were involved in developing the Regional Strategy. Monthly coordination meetings have been held to keep other programs informed of program status and direction. Regional staff have devoted a great deal of time and energy assisting Headquarters in guidance development. The area of particular interest has been the guidance on the federal consistency requirement, section 319(b)(2)(F) and 319(k). This is an issue that is important to our states since Arizona, California and Nevada have large areas of land under federal jurisdiction, and the states have documented many water quality problems associated with activities on federal lands. The Region, however, anticipates problems with this section in the submittals because the states have not received detailed guidance on federal consistency requirements. Such guidance has only recently been put into a final draft form and most states will not see it until after the program submittals have been transmitted to EPA.

With the exception of Nevada, all of our states have used a portion of 205(j)(1) funds to initiate development of the assessment report and management program. This has been helpful because the Region has experienced difficulty in awarding the 205(j)(5) grants due to combination of problems including late availability of the funds, problems with the delegation authority and questions concerning specific legal regulatory requirements in grants provisions. In addition, because states had used other funding they did not submit workplans until quite late in the award cycle. The Region anticipates that most states will use the FY-88 and possibly the FY-89 205(j)(5) funds for continued development of their programs. Hawaii and California, however, may devote at least a portion of FY-88 and 89 to implementation. This is not surprising. In the absence of section 319(h) funding the incentive for states to complete the Assessment Reports and Management Programs is gone. The state lead agencies have a tendency to continue to use the 205(j)(5) funds in development as there is no match requirement associated with this activity. In addition, implementation is more involved and often requires giving funding to other agencies. In turn, the state lead agency must monitor closely funding to outside agencies, which is an added burden. From the Re-

gional perspective, it seems clear that at this time, because only 205(j)(5) funds are available, the state lead agencies are being rather cautious about making commitments to other agencies with regard to implementation funding. In Region IX, California is the only state that receives a large annual allotment of 205(j)(5) monies. The remaining states receive well under \$200,000. For this reason the focus has been on negotiating a policy that will result in the use of some of California's 1.6 million dollars in FY-88 funds for implementation projects. Finally, the Region has devoted its greatest effort towards providing program development assistance to the state lead agency. This job will continue to be the most important aspect of the Regional program as staff begin to review the program submittals. In order to prepare for this, the Region has recently reorganized and added staff to work on the program. The Region also anticipates having the assistance of a Soil Conservation Service person on temporary assignment to San Francisco. This person will provide expertise in irrigated and other agricultural problems.

In summary, the Region understands that the Nonpoint Management Program is an important aspect of the states' water quality management programs. It is also a complex and intractable problem that has gone unchecked for a long period of time. It will require much more than four years to begin to demonstrate significant water quality improvements as a result of the 319 program. Region IX, however, is committed to providing the states with the tools that are needed to tackle the problem. To this end the Region will continue to build its program.

State Highlights

ARIZONA

The Arizona State Environmental Quality Act (EQA) of 1986 directed the Department of Environmental Quality (DEQ) to regulate nonpoint source discharges to surface water and ground water. The state regulations require that the Director, adopt, by rule, a program to control nonpoint source discharges of any pollutant or combination of pollutants into navigable waters. This is important to note because this regulatory approach is quite different from the requirements contained in the section 319 provisions of the Water Quality Act of 1987. This difference impinges upon the development of Arizona's NPS program. Although Arizona is committed to the intent of section 319, the differences in the legal requirements between the state and federal requirements lead directly to differences in schedules for program development and implementation. Arizona's EQA contains requirements that schedule specific sources for program development and implementation within the first three years of the passage of its Act. DEQ expects its

final regulatory program to be completed in September 1989.

Arizona has committed more than \$1.8 million to develop and implement a program to manage NPSs. The largest problem with federal funds is that the federal support has been limited at best, and arguably nonexistent. The federal resources that have been made available to Arizona have been taken from existing entitlements but would have to be diverted from other programs. The net result has been to exacerbate competition for funding within different parts of the state's water quality management program.

Since Arizona is an arid state and ground water is the primary source of drinking water for the majority of the population, ground-water protection is of prime importance. Arizona is implementing the Pesticide Contamination Prevention Program, a provision of the EQA, which is instrumental in controlling pesticide application and registration in order to protect ground-water resources.

General permits for agriculture are aimed at protecting ground-water and surface water resources. Agricultural general permits are allowed by rule under the Aquifer Protection Permit provision of the EQA. Under this program a facility must operate in compliance with BMPs. At this time, regulated activities include nitrate application and concentrated animal feedlots. A draft handbook of Agricultural BMPs and Alternative Technologies has been developed based on the recommendations of two BMP committees. Hearings on these practices have been held and comments will be incorporated into the final document. This handbook will form part of the rules to implement this program. Under the EQA, the program must be implemented by July 1, 1989.

CALIFORNIA

The state plans to spend \$75 million in bond money for the Agricultural Drainage Program to deal with water quality problems caused by irrigated agriculture. The Agricultural Drainage Program is a revolving fund loan program set up to allow irrigation districts to invest in irrigation management facilities that will prevent pollution of water. The State Board approves potential loans and administers loan contracts that are submitted by the districts.

California has long maintained a program to deal with nonpoint problems through the authorities of Porter-Cologne granted to the nine Regional Water Quality Control Boards. For instance, the Central Valley Regional Board was instrumental last year in abating pollution that had been discharged to the Sacramento River from rice growing areas upstream from the City of Sacramento. Sacramento takes much of its drinking water from the Sacramento River and presence of

these chemicals was creating unacceptable odor and taste.

The success in handling this water quality problem should be attributed to the cooperation of multiple agencies at the state and federal agencies, as well as private entities. The Department of Food and Agriculture regulatory authorities were of major importance. These authorities allowed restrictions on herbicide use to be negotiated with the Rice Growers Association.

On the federal side, SCS provided technical assistance in devising and demonstrating BMPs for managing the use of the Bolero, Ordram and Basagram herbicides. In addition, ASCS was involved in the funding and contracts used to implement the demonstration projects. The result of their effort was an accepted BMP that calls for the treated rice pond water to be retained on the fields for a few additional days after application. This additional retention time allows the herbicide to decompose in the presence of ultra-violet into nontoxic constituents.

The result of these efforts was a demonstrated water quality improvement in the Sacramento River as shown in Table 7.

HERBICIDE	PEAK CONCENTRATION (ppb)		
	1982	1986	1988
Ordram	204	-	67
Bolero	55	-	4.5
Basagram	-	42	5.5
Note: Water quality goals to meet are 0.6 ppb in the San Francisco Bay Delta. Basagram monitoring began in 1986.			

Table 7. Monitoring Results of Colusa Basin Agricultural Drain, location near Knights Landing, Near Sacramento River, California

HAWAII

Hawaii DOH recognizes that the interested public are the key to successful implementation. Currently, the Department of Health (DOH) is focusing on disseminating information to the public regarding NPS pollution prevention. This is very important for the islands which have a finite amount of land area to support a growing number of inhabitants.

In many cases more information is needed concerning effective BMPs for use in island agriculture. Many of the generalized BMP Handbooks for mainland agriculture are not applicable to Hawaiian agriculture. In one instance, the macadamia nut growers have joined with university faculty, the local Conservation District, and others to study the cultural patterns,

plant needs and soil loss characteristics to devise BMPs for this type of orchard tree. The outcome of this study will be instrumental in implementation efforts associated with this crop.

NEVADA

Despite setbacks in the current development program, Nevada has had an ongoing program and several successful NPS projects that provide valuable insights for future program needs. For example, the Lake Tahoe Clean Lakes Project in Douglas County demonstrated that local control of NPS implementation is effective for Nevada. In that instance, Douglas County prepared the application for funds, developed the plans and provided the match. The project reduced sediment loadings to the lake from road maintenance and road and building construction.

In addition, the state has an ongoing program that requires BMP implementation for all activities on federal lands through an MOU with the FS and U.S. Bureau of Land Management (BLM). This program extends to private lands as well through the Diffuse Sources Regulation Program. The Councils of Governments require BMP implementation for activities in their jurisdictions and the Nevada Department of Environmental Protection (NDEP) is closely involved reviewing subdivision permits for developments in sensitive areas such as the Truckee Meadows and the Reno-Sparks areas. These reviews ensure that mitigation measures are implemented and that valuable wetland areas are protected during construction activities.

There are, however, recognized problems that Nevada is prepared to treat. These include programs to regulate the Department of Transportation (DOT) through permits for stream crossings, wetlands through dredge and fill permits, and mining through state permits. The permits for mining are critical since most of the new mining operations involve a cyanide heap leach process used to recover chemical gold from low grade ores.

Despite the lack of financial resources in the state, Nevada has attempted to solve its documented problems using innovative approaches. Because the state has scarce water resources, these approaches strive to make the best use of treated effluent to mitigate water quality problems caused by water diversions. At the same time enhancement of wetlands is another state goal. Unfortunately, EPA has not always concurred with this innovative approach. For example, on the Carson River, in Douglas County, Nevada proposed the use of land application of secondary treated effluent for the Douglas County Sewer Improvement District facility. Use of this effluent would have reduced water diversions from the Carson River and curtailed irrigation return flows in the area around Gardnerville. EPA, however, would not issue a sec-

tion 404 permit for the project despite the fact that USFWS had approved the proposal. The District and NDEP felt frustrated in its attempts to employ this innovative approach. Nevada has had successes in other areas, however, including the Incline Village Project in Carson Valley which uses secondary effluent to create and enhance wetlands in that Valley.

Finally, NDEP is currently working with EPA, the Cities of Reno and Sparks, Washoe County, and the Paiute Tribe to develop a strategy to maintain water quality in the Truckee River and Pyramid Lake. An area of great promise is use of point source effluent to achieve some nonpoint source tradeoffs for water quality problems involving nutrients and temperature by using effluent for irrigation instead of diverting additional water from the Truckee River.

Region X - Seattle, WA



Regional Summary

Assessments

One state had submitted a final Assessment Report by the end of September, 1988, and the other three states had all submitted draft reports by the middle of January, 1989 (see Table 3 on page 16).

Washington's final Assessment Report is currently being reviewed by EPA. The delays in submittals to EPA were due to the: (1) limited time available to prepare the reports, and (2) need to involve a number of interested and affected groups in their development and review.

Riparian area degradation is the common denominator in many of the Region's most serious water quality problems from NPS. This is particularly true for those problems involving loss of aquatic resources, such as sedimentation of salmon spawning gravels and bacterial contamination of shellfish beds. This degradation results primarily from cattle grazing, agriculture, timber harvesting, and urban development.

EPA has provided extensive comments to each state on their draft Assessment. In general, states have done a good job of identifying: (1) navigable waters impacted by NPS, and (2) categories of NPS impacting state waters. Draft Assessments were generally inadequate in identifying: (1) processes for describing BMPs, and (2) state and local programs for controlling NPS pollution. These deficiencies will be corrected in final Assessments before their approval by EPA.

The major strengths of NPS Assessments reviewed in Region X are:

- Much of the available information and many sources were used.
- Impaired, threatened, and high quality waters were included.
- Ground-water information was included.
- NPS categories and sub-categories impacting water quality were identified.

The major weaknesses are:

- Lack of clear focus in identifying priority NPS problems.
- No strategy and timetable provided for completing Assessments.
- BMP identification process not adequately summarized.
- Limited public involvement in preparing Assessments.

The criteria for Approval of state Assessment Reports in EPA's NPS Guidance (see "Issued Guidance" on page 20) have been used as the basis for reviewing the adequacy of draft Assessments. This guidance was provided to all states and to a number of interested and affected groups. It has been discussed and interpreted extensively with state water quality agencies.

Management Programs

Washington submitted its final Management Program to EPA on September 21, 1988 (see Table 4 on page 18). Oregon and Alaska had both submitted draft Management Programs by January 30, 1989, but Idaho had made no submittal as of that same date. The reasons for the delays in the submittals to EPA are the same as those listed for the NPS Assessment Reports.

The section 319 requirement to develop NPS Management Programs, the magnitude of NPS problems, and the potential availability of federal funding to support program development and implementation have all contributed to the increased priority given to NPS by states. Oregon's and Washington's Management Programs will place increased emphasis on public education and involvement, and working with local, state, and federal agencies to implement NPS controls.

Regional Activities

Assessments and Management Programs: Regional funding guidance was issued to the states, and the Region assisted Headquarters in developing the Agency's "Federal Consistency Guidance." Several drafts and finals of Headquarters guidance were also provided states for their reviews, comments and use. Two regional meetings of state NPS program managers were held to provide guidance and exchange information among states. A number of individual meetings were also held with states to provide assistance and guidance in their preparation of 319 reports. A number of federal agencies, especially from USDA, have participated with states in developing their Assessments and Management Programs. These agencies have also implemented a number of NPS controls.

The Region has strongly encouraged states to develop good Assessments and effective Management Programs. Extensive comments were provided each state on draft section 319 reports. Several areas of improvement were requested as a prerequisite to EPA's approval. Required revisions related to the needs for: (1) improved interagency leveraging of resources, (2) stronger accountability of implementing agencies, and (3) better definition of in-stream environmental results anticipated.

The Region's FY89 actions to implement section 319 will be in the following areas: (1) review and approval of section 319 reports; (2) providing technical and financial assistance to states for implementing NPS Management Programs; and (3) assisting states and federal agencies in complying with the federal consistency requirements in state Management Programs.

Partnership in Education: The Region is working with state water quality agencies and universities to strengthen technology transfer and accountability for NPS controls. Water quality agencies are being encouraged to specifically work with universities with water quality expertise in: (1) sponsoring updated technical training for field professionals; (2) coordinating and supplementing interagency research; and (3) providing forums for public dialogue, consensus building, and evaluating the effectiveness of NPS controls in protecting water quality.

This need for a strong university role in water quality management has been validated in practice by a few universities in the Region. Universities are uniquely qualified to bring diverse groups together to address issues of concern. They are generally recognized as non-biased and technically competent. Universities have also expressed a high level of interest in working with states in resolving environmental management issues and concerns.

Region X Risk Management Strategy for NPS Discharges: The Region used a risk-based approach to assist in setting priorities for the use of resources and solving priority problems. A broad range of EPA issues and programs were assessed and ranked according to their ecological and human health risks. Risk management strategies were developed to address high-risk problems.

Nonpoint source discharges was ranked in the highest ecological risk category (with a ranking of number 4 out of 15 problem areas). The Region's Risk Management Strategy proposes to focus EPA and state resources into two priority areas: (1) protecting vulnerable ground-water aquifers from contamination by agricultural chemicals; and (2) reducing destruction of critical salmon spawning habitat and other water uses from timber harvesting.

The Region's strategy includes: (1) public education; (2) development of agricultural BMPs to protect ground water; (3) development of guidelines for monitoring impacts from silvicultural activities; (4) two demonstration project pilot basins; and (5) encouraging states to implement solutions to agricultural and silvicultural problems in their NPS Management Programs. The Region is currently pursuing funding options to implement the Risk Management Strategy. Both Regional and Headquarters funding options are being evaluated.

Other Regional Activities: The Regional staffing for NPS controls was increased. Three U.S. Forest Service employees (one each in Idaho, Washington, and the Regional Office) were detailed for two assignments to work on NPS programs. An SCS employee was detailed to the Regional Office to work on agricultural NPS controls.

Two graduate students were funded as part of EPA's National Network for Water Policy Studies to conduct NPS projects. Both projects evaluated the effectiveness of silvicultural NPS controls on selected national forests. In addition, a technical document on evaluating the *Effectiveness of Agricultural and Silvicultural NPS Controls* was developed using contract dollars.

State Highlights

ALASKA

Alaska hired new staff to prepare its section 319 Assessment Report and Management Program. Delays in hiring, the need for orientation and understanding the program, and the very limited amount of available NPS information have all contributed to substantial delays in Alaska's development of its reports. The Region has had little success in encouraging the state to meet the date commitments made for completing these reports.

IDAHO

Idaho assessed 47% of its total stream miles, finding that NPSs are the cause of use impairment in 64% of those waters assessed. The major sources of NPS-caused impairments in Idaho are agriculture, hydromodification, forest practices, and construction.

Idaho used monitoring data and other information (e.g., observational) to compile its Assessment. Survey questionnaires were used extensively to gather water quality information based on best professional judgment of field practitioners. Technical and interagency review groups were used to assist in the design, development, and review of the state's Assessment. Idaho used an extensive mailing to solicit additional comments on its Assessment.

The Rock Creek RCWP project has been successful in generating information on the effectiveness of BMPs in irrigated cropping systems.³⁴ Implementation of sediment retention structures, irrigation management systems, and conservation tillage has resulted in statistically significant reductions in suspended sediment levels in five of six monitored subbasins.

OREGON

Oregon used monitoring and other (e.g., surveys) data to compile its Assessment. The state used technical

and interagency review groups to assist in the design, development, and review of its Assessment. Only about one-third (31%) of the river miles in Oregon was assessed, with over half (54%) of the assessed miles suffering from use impairments caused by NPSs. The principal NPSs causing the use impairments include riparian disturbance, vegetation removal, surface erosion, stream channelization, and animal waste management.

Thirteen public meetings were held throughout Oregon to summarize the results of the state's Assessment and receive comments and additional information. Approximately 275 interested persons participated in these meetings.

Oregon's Draft NPS Management Program is currently being reviewed by interested and affected groups and EPA. The draft program focuses on implementation needs for NPS categories and watersheds of concern. There is a strong reliance on updating and developing memoranda of understanding with federal, state, and local implementing agencies to achieve the program's goals. Oregon, like Washington, had developed a NPS program prior to section 319 as a part of its section 208 planning and implementation.

The Tillamook Bay RCWP project has made important contributions concerning the effectiveness of animal waste management for improving water quality at the watershed level.³⁵ Water quality monitoring data show a 40-50 percent reduction in mean fecal coliform (bacteria) concentration that is attributed to improved management of about 60 percent of the animal waste produced in the watershed. Bacterial contamination levels have decreased both in the tributaries and in Tillamook Bay where commercial shellfishing is a \$1.5 million industry.

WASHINGTON

Statewide Activities: Washington used EPA's computerized Waterbody System (see "Reporting Software" on page 21) and relied primarily on monitoring data in developing its Assessment. The heavy reliance on monitoring data in Washington resulted in a relatively small percentage (12%) of the total river miles being assessed. Of those river miles assessed, one-half had use impairments caused by NPSs. Major sources affecting water quality are pastureland, removal of riparian vegetation, urban runoff, irrigated crop production, animal holding areas, forest practices, on-site sewage systems, surface mining, and boats and marinas.

³⁴ Smolen, M.D., et al. 1988. *NWQEP 1987 Annual Report - Status of Agricultural Nonpoint Source Projects*. Biological and Agricultural Engineering Dept., North Carolina State University, Raleigh, NC, p. 2.13 - 2.20.

³⁵ Ibid., p. 2.83 - 2.87.

Washington's water quality agency staff developed their initial review draft. This draft was widely distributed for public review. Washington held six public meetings to explain their Assessment approach and to receive public comments.

Washington's final Management Program is also being reviewed. EPA's action on the Management Program will be completed by February 4, 1989. The plan emphasizes using state and local education and technical assistance initiatives to implement the four-year Management Program. The program is presented in four levels with increasing complexity and costs.

Washington had a NPS program prior to section 319. This program was developed as a part of section 208 planning and implementation. Implementation of the existing program has been severely limited by the lack of funding and the low priority assigned to NPS controls by the state water quality agency.

Puget Sound: The Puget Sound Water Quality Management Plan has a strong emphasis on NPS controls. The Plan was developed by the Puget Sound Water Quality Authority and adopted by the state legislature. The three themes of the NPS element of the plan are: (1) identification of priority watersheds; (2) local implementation; and (3) voluntary controls. A state law was passed requiring local

governments to establish priorities for watersheds and develop action plans to address priority problems.

Local planning committees have been established in each Puget Sound County. These committees include government representatives, tribes, interested citizens, and interest groups. The committees must complete their plans by April 1, 1990. Plans must be approved by the Department of Ecology to be eligible to receive state implementation funding.

Funding to assist locals in implementing their NPS plans will be provided from the state's Centennial Clean Water Fund. The account created by this fund anticipates: 40 million dollars for fiscal year 1989; and 45 million dollars annually for each fiscal year thereafter through 1995. Ten percent (10%) of these funds shall be used for activities that control NPSs of water pollution.

Public involvement and education are the cornerstone of the Puget Sound Plan. The Puget Sound Water Quality Authority has developed and implemented a number of model programs for public involvement and education. The state legislature appropriated one million dollars of Centennial Clean Water Act funding to the Authority for public involvement and education. The Authority has funded over 40 projects since 1987. Many of the NPS projects are directed toward "peer to peer education" by contractors associations, dairy farmers, commercial fishermen, and others.

GLOSSARY

ACP: Agricultural Conservation Program	LUST: Leaking Underground Storage Tank
AgNPS: Agricultural NPS Model	MIP: Model Implementation Program
ARS: Agricultural Research Service of USDA	MOU: Memorandum of Understanding
ASCS: Agricultural Stabilization and Conservation Service of USDA	NCP: USDA's National Program for Soil and Water Conservation
ASIWPCA: Association of State and Interstate Water Pollution Control Administrators	NCW: Near Coastal Waters
BLM: U.S. Bureau of Land Management	NEP: National Estuary Program
BMP: Best Management Practice	NEPA: National Environmental Policy Act
CC: Conservation Compliance Program	NOAA: National Oceanic and Atmospheric Administration of the Department of Commerce
CES: Comprehensive Water Quality Evaluation System	NPDES: National Pollutant Discharge Elimination System
CM&E: Comprehensive Monitoring and Evaluation	NPS: Nonpoint Source
COE: U.S. Army Corps of Engineers	NURP: Nationwide Urban Runoff Program
CRP: Conservation Reserve Program	PC: Personal Computer
CWA: Clean Water Act	POTW: Publicly Owned Treatment Works
DOI: U.S. Department of the Interior	RCWP: Rural Clean Water Program
DOT: U.S. Department of Transportation	SCS: Soil Conservation Service of USDA
EPA: U.S. Environmental Protection Agency	SPMS: EPA's Strategic Planning and Management System
ES: Extension Service of USDA	SRF: State Water Pollution Control Revolving Fund
FAA: Federal Aviation Administration	TCG: SCS's Technical Guidance under the WQAP
FHWA: U.S. Federal Highway Administration	TVA: Tennessee Valley Authority
FMS: EPA's Financial Management System	UNESCO: United Nations Educational, Scientific, and Cultural Organization
FS: Forest Service of USDA	USDA: U.S. Department of Agriculture
FWS: Fish and Wildlife Service of the DOI	UST: Underground Storage Tank
FY88, FY89, etc.: Fiscal Year 1988, 1989, etc.	WQA: 1987 Water Quality Act which amended the CWA
GICS: EPA's Grants Information Control System	WQAP: SCS's Water Quality Action Plan
L&W 201: Land & Water 201 Project in the Tennessee Valley	